Vector inverter for Hybrid injection molding machines

ADP200

Functions description and parameters list

Language: English

Information about this manual

This manual explains the functions and the description of the parameters.

The informations about mechanical installation, electrical connection and fast start-up can be found on the ADP200 Quick start guide.

The whole set of manuals (included the expansions and field bus manuals) can be found on the WEG website, Downloads section (https://www.weg.net/...).

Software version

This manual is updated according the software version V 4.X.3

Variation of the number replacing "X" have no influence on the functionality of the device.

The identification number of the software version is indicated on the identification plate of the drive or can be checked with the Firmware ver.rel - PAR 490 parameter, menu 2.6.

General information

Note ! In industry, the terms "Inverter", "Regulator" and "Drive" are sometimes interchanged. In this document, the term "Drive" will be used.

Before using the product, read the safety instruction section carefully. Keep the manual in a safe place and available to engineering and installation personnel during the product functioning period.

WEG Automation Europe S.r.l. has the right to modify products, data and dimensions without notice. The data can only be used for the product description and they can not be understood as legally stated properties.

Thank you for choosing this WEG product.

We will be glad to receive any possible information which could help us improving this manual. The e-mail address is the following: techdoc@weg.net.

Symbols used in the manual

Warning

Indicates a procedure, condition, or statement that, if not strictly observed, could result in personal injury or death.

Indique le mode d'utilisation, la procédure et la condition d'exploitation. Si ces consignes ne sont passtrictement respectées, il y a des risques de blessures corporelles ou de mort.

Caution

Indicates a procedure, condition, or statement that, if not strictly observed, could result in damage to or destruction of equipment.

Indique et le mode d'utilisation, la procédure et la condition d'exploitation. Si ces consignes ne sont pas strictement respectées, il y a des risques de détérioration ou de destruction des appareils.

Indicates that the presence of electrostatic discharge could damage the appliance. When handling the boards, always wear a grounded bracelet.

Indique que la présence de décharges électrostatiques est susceptible d'endommager l'appareil. Toujours porter un bracelet de mise à la terre lors de la manipulation des cartes.

Important

Indicates a procedure, condition, or statement that should be strictly followed in order to optimize these applications.

Indique le mode d'utilisation, la procédure et la condition d'exploitation. Ces consignes doivent êtrerigoureusement respectées pour optimiser ces applications.

Note ! Indicates an essential or important procedure, condition, or statement.

Indique un mode d'utilisation, de procédure et de condition d'exploitation essentiels ou importants

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A.1 Menu display modes

The programming menu can be displayed in two modes, which can be selected using the **Access mode** parameter (04 - DRIVE CONFIG menu):

- **Easy** (default) only the main parameters are displayed.
- **Expert** all the parameters are displayed

A.2 Programming of “function block” analog and digital input signals

The signals, variables and parameters of each single “function block” of the drive are interconnected in order to achieve the configurations and controls inside the control system.

These can be managed and modified using the keypad, PC configurator or fieldbus programming.

The programming mode is based on the following logic:

Src (source; i.e.: **Ramp ref 1 src**, PAR: 610)

This term defines **the source of the function block input,** i.e. the signal to be processed in the function block.

The different configurations are defined in the relative ***selection lists***.

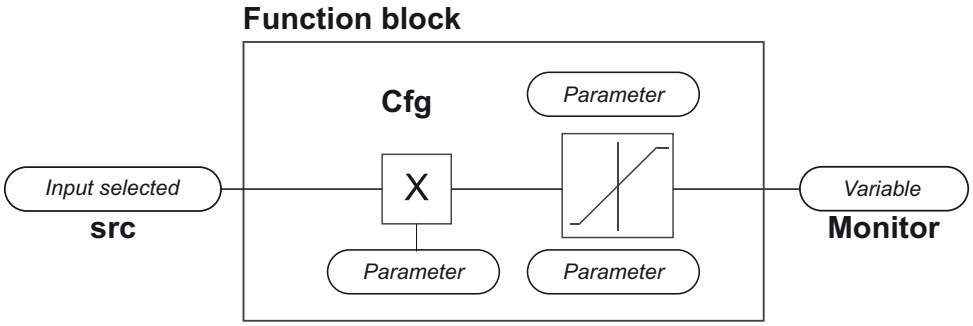
cfg (configuration; i.e.: **Mpot init cfg**, PAR: 880)

This term refers to ***the parameter setting and its effect on the function block.***

For example: Ramp times, internal reference adjustment, etc...

mon (display; i.e.: **Ramp ref 1 mon**, PAR: 620)

This term refers to the ***variable output from the function block, which is the result of the calculations performed on the actual block***.



A.3 Variable interconnections mode

The **source (src)** allows the desired control signal to be assigned to the function block input.

This operation is performed by using specific selection lists.

Possible control signal sources:

1 – Physical terminal

The analog and digital signals come from the terminal strip of the regulation card and/or from those of the expansion cards.

2 – Drive internal variables

Internal drive control system variables, from “function block” calculations, sent via keypad, PC configurator or fieldbus.

Practical example

The following examples illustrate the philosophies and methods with which more or less complex operations are performed in the single “function blocks”, the results of which represent the output of the block.

• Example: Changing the Speed Reference source

The main drive reference (in the default configuration) **Ramp ref 1 mon** (PAR: 620) is generated by the output of the function block “**Ramp setpoint Block**”.

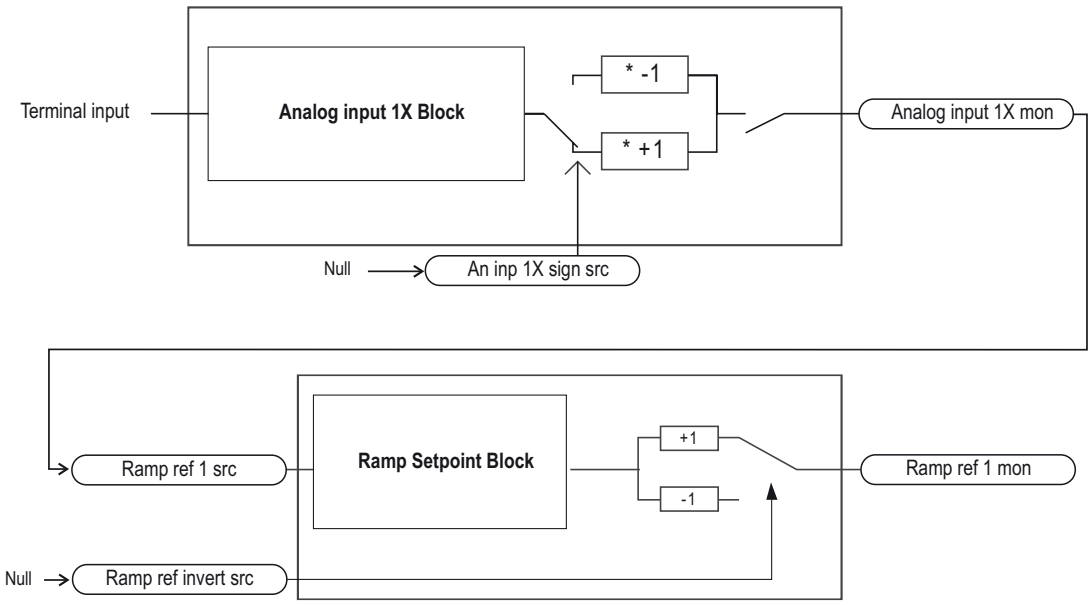
Its default source is the **Analog input 1X mon** signal (PAR: 1600), from the output of the function block “**Analog input 1X Block**”, which in this case refers to analog input 1X of the signal terminal strip.

To change the reference source from the analog input to a digital reference inside the drive, the input signal must be changed to “**Ramp setpoint Block**”.

Enter the **Ramp ref 1 src** parameter (PAR: 610) and set a new reference, selecting it from among those listed in the L_MLTREF selection list, for example **Dig ramp ref 1** (PAR: 600).

• Example: Inverting the analog reference signal

To invert the “**Analog input 1X Block**” output signal, the value of the **An inp 1X sign src** parameter (PAR: 1626), which has a default setting of **Null** (no operation), must be changed by selecting the source of the command signal from among those listed in the L_DIGSEL 2 selection list, for example **Digital input xX mon**, **One** (function always enabled), etc.



The diagrams above illustrate the internal processing philosophy of the single “function blocks” and the result of these changes on the other interconnected “function blocks”.

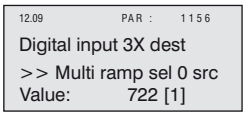
Note ! This section contains a brief description of the functions of the other parameters in the function blocks not included for the changes in the example

The **Ramp ref invert src** parameter (PAR: 616) can be used to select the source for the command to reverse the “**Ramp setpoint**” function block output.

The output signal from the “**Ramp setpoint**” block is displayed in the **Ramp ref 1 mon** parameter (PAR: 620).

A.4 Multiple destination

Several functions can be assigned together to each input: to display which and how many functions have been assigned to each input, check the relative "**dest**" parameter to see whether there is a number shown in square brackets to the right of the number of the selected parameter (as shown in the figure below).



If there is a number, press the key to display the next source applied to the selected input.

B – Parameters and functions description (Expert list)

Legend

⓿ Menu	❶ PAR	❷ Description	❸ UM	Type	❹ FB BIT	❺ Def	❻	❼ Min	❽ Max	❾ Acc	❿ Mod
1 - MONITOR						*(Level 1 menu)*					
1.1	**250**	**Output current**	A	FLOAT	16/32	0.0		0.0	0.0	R	F__
1.2	**252**	**Output voltage**	V	FLOAT	16/32	0.0		0.0	0.0	R	F__
22.2 – FUNCTIONS/DROOP						*(Level 2 menu)*					
22.2.1	**3052**	**Droop ref src**		LINK	16/32	6000		0	16384	ERW	F__
				L_LIM		*(Selection List) [*]*					

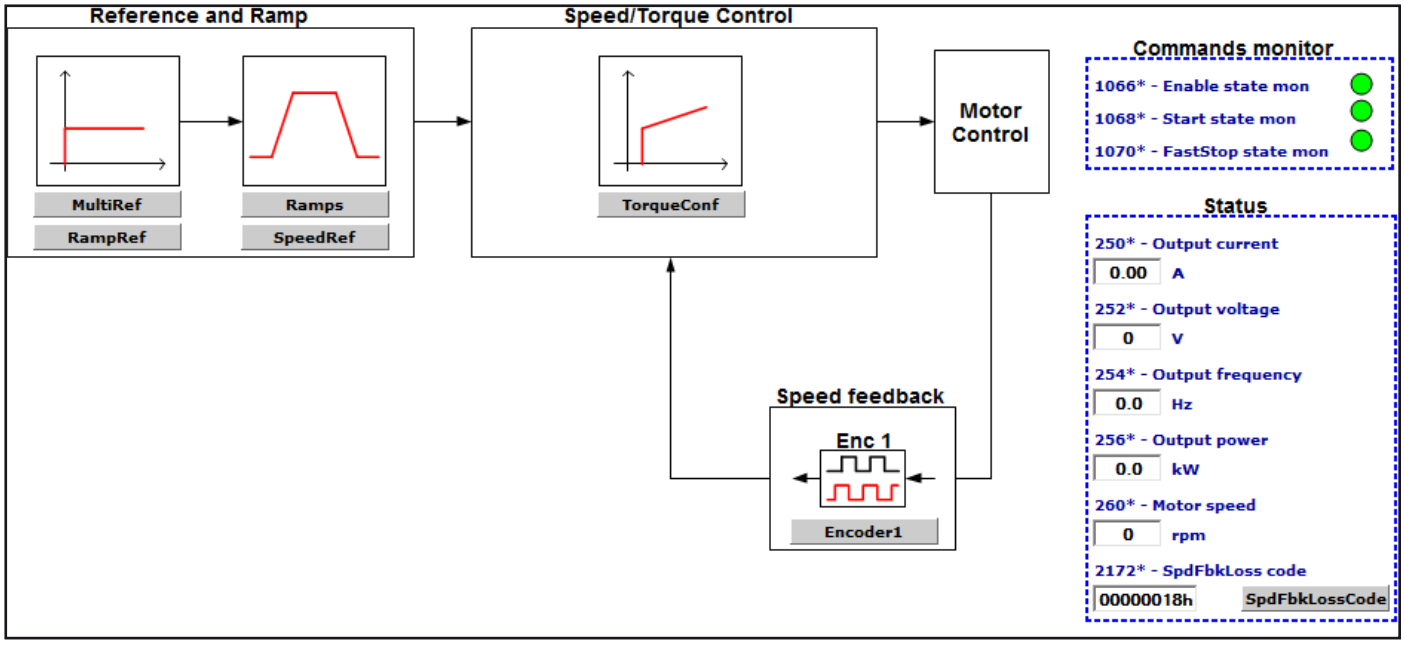
⓿	Indexing of the menu and parameter
❶	Parameter identifier
❷	Parameter description
❸	UM: unit of measure
❹	Type of parameter BIT Boolean, from modbus seen as 16 bits ENUM Selection list, from modbus seen as 16 bits FLOAT Real, from modbus seen as 32 bits FBM2SIPA 16-bit unsigned integer. Only PAR of existing parameters accepted. FBS2MIPA 16-bit unsigned integer. Only PAR of existing parameters accepted. INT16 Integer with sign 16 bits, from modbus seen as 16 bits INT32 Integer with sign 32 bits, from modbus seen as 32 bits ILINK Selection list, from modbus seen as 16 bits LINK Selection list, from modbus seen as 16 bits UINT16 Integer without sign 16 bits, from modbus seen as 16 bits UINT32 Integer without sign 32 bits, from modbus seen as 32 bits SINT Integer 8 bits
❺	Format of data exchanged on Fieldbus (16BIT, 32BIT)

❻	Default value	CALCF Value calculated as a number with floating point CALCI Value calculated as a whole number SIZE Value depending on the size of the drive
❼	Minimum value	
❽	Maximum value	
❾	Accessibility : E Expert R Read S Size (set value depending on the size of the device) W Write Z parameters that can be modified ONLY with the drive disabled	
❿	Available in regulation mode: F = Vect Flux CL	
[*]	**Selection lists:** The "... src" format parameters are linked to a selection list. The source of the signal that will control the parameter can be selected from the list indicated. The lists are indicated in paragraph C of this manual.	

Note ! The drive is factory-set to control synchronous motors.

1 – MONITOR

The monitor menu displays the measured values of the sizes and of the drive operating parameters.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.1	250	**Output current**	A	FLOAT	16/32	0.0	0.0	0.0	R	F__

The drive output current is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.2	252	**Output voltage**	V	FLOAT	16/32	0.0	0.0	0.0	R	F__

The drive line voltage output is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.3	254	**Output frequency**	Hz	FLOAT	16/32	0	0	0	R	F__

The drive output frequency is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.4	256	**Output power**	kW	FLOAT	16/32	0.0	0.0	0.0	R	F__

Displays the drive output power.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.5	628	**Ramp setpoint**	FF	INT16	16/32	0	0	0	R	F__

The ramp reference is displayed. This is the speed value the drive must reach at the end of the ramp.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.6	664	**Speed setpoint**	FF	INT16	16/32	0	0	0	R	F__

The speed reference is displayed. This is the value measured at the output of the speed reference circuit.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.7	260	**Motor speed**	FF	INT16	16/32	0	0	0	R	F__

The actual output speed of the motor is displayed (in FOC = speed measured by the encoder, in SLS/VF = speed estimated by the drive).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.8	**270**	**DC link voltage**	V	FLOAT	16/32	0.0	0.0	0.0	ER	F__

The direct voltage of the intermediate circuit capacitors is displayed (DC-Bus).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.9	**272**	**Heatsink temperature**	degC	INT16	16	0	0	0	ER	F__

The temperature measured on the drive heatsink is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.10	**290**	**Motor temperature**	degC	FLOAT	16	0.0	0.0	0.0	ER	F__

Displays motor temperature in °C based on type of sensor selected in parameter PAR 4538 **MotorOT sensor**. Available only with expansion I/O card 7 or 8 when select KTY84 sensor. In other case displayed always 0.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.11	**280**	**Torque current ref**	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__

The current reference used for torque control is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.12	**282**	**Magnet current ref**	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__

The magnetizing current reference is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.13	**284**	**Torque current**	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__

The actual torque current value is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.14	**286**	**Magnet current**	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__

The actual magnetizing current value is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.15	**3212**	**Motor overload accum**	perc	UINT16	16/32	0	0	100	ER	F__

The motor overload level is displayed (100% = alarm threshold).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.16	**368**	**Drive overload accum**	perc	UINT16	16/32	0	0	100	ER	F__

The slow drive overload level is displayed. An instantaneous overload of 170% of the drive rated current is allowed for 60 s. The thermal image I^2t adjusts the drive output current thresholds. When the overload level **par. 368 Drive overload accum** reaches 100%, the output current threshold is reduced to 100% of the rated current, and stays at that value until the I^2t integrator cycle is complete. At this point the 170% instantaneous overload is re-enabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.17	**370**	**Drive ovl fst accum**	perc	UINT16	16/32	0	0	100	ER	F__

The fast drive overload level is displayed. An instantaneous overload of 200% of the drive rated current is allowed for 3 s. The thermal image I^2t adjusts the drive output current thresholds.

When the overload level par. 370 **Drive ovl fst accum** reaches 100%, the output current threshold is reduced to 170% of the rated current, and stays at that value until the I^2t integrator cycle is complete. At this point the 200% instantaneous overload is re-enabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.18	**372**	**Drive overload limit**	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__

The actual Drive overload limit is displayed.

The thermal image I^2t adjusts the drive output current thresholds.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.19	**3260**	**Bres overload accum**	perc	UINT16	16/32	0	0	100	ER	F__

The braking resistor overload limit is displayed (100% = alarm threshold).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.20	**1066**	**Enable state mon**		BIT	16	0	0	1	R	F__

The drive Enable command status is displayed. Voltage must be present on terminal 7. The FR Forwardstart command is needed to start the inverter.

0 Disabled drive disabled
1 Enabled drive enabled

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.21	**1068**	**Start state mon**		BIT	16	0	0	1	R	F__

The drive **Start** command status is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.22	**1070**	**FastStop state mon**		BIT	16	0	0	1	R	F__

The drive **FastStop** command status is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.23	**1200**	**Digital input X mon**		UINT16	16	0	0	0	R	F__

The status of the digital inputs of the expansion card is displayed. It can also be read via a serial line or fieldbus. The data are contained in a word, where each bit is 1 if voltage is supplied to the corresponding input terminal. Bit 0 = **Active DI E**, bit 1 = **Active DI 1x.**

1 Input enabled.
0 Input disabled.

Example:

0 0 0 0 0 0 0 0 0 0 **1** **1**
Enable
DI 1

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.24	**1400**	**Digital output X mon**		UINT16		0	0	0	R	F__

The status of the digital outputs of the expansion card is displayed. It can also be read via a serial line or fieldbus. The data are contained in a word, where each bit is 1 if voltage is supplied to the corresponding input terminal.

1 Output enabled.
0 Output disabled.

Example:

0 0 0 0 0 0 0 0 0 0 **1** **1**
DO 1
DO 2

2 – DRIVE INFO

This menu displays the information for identifying and configuring the drive.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.1	**480**	**Control type**		ENUM		Syn			R	F__

The type of motor control mode is displayed.

25 Synchronous

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.2	**482**	**Drive size**		UINT16		0	0	0	RS	F__

The drive size identification code is displayed.

Size code	Size text	Family code	Family text
7	7.5 kW	1	230V..480V
8	11.0 kW	1	230V..480V
9	15.0 kW	1	230V..480V
10	18.5 kW	1	230V..480V
11	22.0 kW	1	230V..480V
12	30.0 kW	1	230V..480V
13	37.0 kW	1	230V..480V
14	45.0 kW	1	230V..480V
15	55.0 kW	1	230V..480V
16	75.0 kW	1	230V..480V

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.3	**484**	**Drive family**		ENUM		No Power			RS	F__

The available mains voltage is displayed (e.g. 400V). The undervoltage alarm refers to this voltage value.

The condition No power occurs when the regulation board has just left from production and has never been configured for any power. The configuration adjustment for a given power is achieved by linking it to a power board and running a **Save parameters**.

0 No Power

1 230V..480V

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.4	**486**	**Drive region**		ENUM		EU			R	F__

The geographical area (Europe or USA) is displayed. The factory settings for the power supply voltage and frequency used by the drive are defined accordingly.

0 EU (400V / 50Hz)

1 USA (460 / 60 Hz)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.5	**488**	**Drive cont current**	A	FLOAT		CALCF	0.0	0.0	RZS	F__

The current that the drive can deliver continuously according to size, supply voltage and programmed switching frequency is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.6	**490**	**Firmware ver.rel**		UINT16		0	0	0	R	F__

The version and release number of the firmware used in the drive are displayed. On the keypad they are displayed in the format version.release. When the parameter is read via serial line or fieldbus the version is returned in the high byte and the release in the low byte.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.7	**496**	**Firmware type**		UINT16		0	0	0	R	F__

The type of firmware installed in the drive is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.8	**504**	**Application ver.rel**		UINT16		0	0	0	ER	F__

The version and release number of the application used in the drive are displayed. On the keypad these are displayed in version.release format. When the parameter is read via serial line or fieldbus the version is returned in the high byte and the release in the low byte.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.9	**506**	**Application type**		UINT16		37	0	0	ER	F__

The type of application currently used by the drive is displayed.

37 PID_IMM (Hybrid Injection Molding Machine with Servopump)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.10	**508**	**Application subver**		UINT16		0	0	0	ER	F__

The sub version of the application used in the drive is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.11	**510**	**Time drive power on**	h.min	UINT32		0	0	0	ER	F__

The total time for which the drive has been powered is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.12	**512**	**Time drive enable**	h.min	UINT32		0	0	0	ER	F__

The time for which the enable hardware contact on the drive has been connected is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.13	**514**	**Number power up**		UINT16		0	0	0	ER	F__

The number of times the drive has been powered on is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.14	**516**	**Time fan on**	h.min	UINT32		0	0	0	ER	F__

The total operating time of the drive fan is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.15	**526**	**Power file ver.rel**		UINT16		0	0	0	ER	F__

The version number and release number of the drive power card are displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.16	**530**	**Slot 1 card type**		ENUM		None			R	F__

The type of expansion IO card installed in the relative slot of the drive is displayed.

0 None
257 I/O 1 (EXP-IO-D4-ADL)
1281 I/O 2 (EXP-IO-D8R4-ADL)
2305 I/O 3 (EXP-IO-D16R4-ADL)
3841 I/O 4 (EXP-IO-D12A2R4-ADL)
4865 I/O 5 (EXP-IO-D8A4R4-ADL)
5377 I/O 6 (EXP-IO-D5R3-F-ADL)
7937 I/O 7 (EXP-IO-D10A3R2-ADP)
8961 I/O 8 (EXP-IO-D8A4R2-ADP)
9985 I/O 9 (EXP-IO-D8A4R2-S-ADP)
255 Unknown

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.17	**532**	**Slot 2 card type**		ENUM		None			R	F__

The type of expansion Encoder card installed in the relative slot of the drive is displayed.

0	None	
8	Enc 1	(EXP-DE-I1R1F2-ADL)
264	Enc 2	(EXP-SE-I1R1F2-ADL)
520	Enc 3	(EXP-SESC-I1R1F2-ADL)
776	Enc 4	(EXP-EN/SSI-I1R1F2-ADL)
1032	Enc 5	(EXP-HIP-I1R1F2-ADL)
1288	Enc 6	(EXP-RES-I1-ADP/EXP-RES-I1R1-ADP)
255	Unknown	

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.18	**534**	**Slot 3 card type**		ENUM		None			R	F__

SLOT 3 indicates the presence of the CAN interface on the regulation card.

0	None
4	CAN

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.19	**546**	**Fw enc sl2 ver.rel**		UINT16		0	0	0	R	F__

The version and release number of the firmware installed on the encoder (mounted in slot 2) used in the drive are displayed. When the parameter is read via serial line or fieldbus the version is returned in the high byte and the release in the low byte.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.20	**548**	**Fw enc sl2 type**		UINT16		0	0	0	R	F__

The version of firmware on the encoder card mounted in slot 2 is displayed.

3 – STARTUP WIZARD

The startup wizard menu suggests a procedure for commissioning the drive quickly with a reduced number of settings. Advanced customization requires the use of the single parameters relating to the specific performance levels. See the procedure described in the chapter **Startup wizard** on ADP200 QS manual.

4 – DRIVE CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.1	**550**	**Save parameters**		BIT		0	0	1	RW	F__

Any changes to parameter values immediately affect drive operations, but are not automatically saved in the permanent memory.

The “Save Parameters” command is used to save current parameter values in the permanent memory.

Any changes that are not saved will be lost when the drive is switched off.

To save parameters follow the procedure described in **STEP 6** of the **Startup wizard**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.2	**582**	**Drive reset**		BIT		0	0	1	RWZ	F__

The “Drive reset” command is used to re-boot the drive.

Any changes that are not saved will be lost when this command is performed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.3	**552**	**Regulation mode**		ENUM		Flux vector CL			RWZ	F__

The ADP200 is capable of operating with different control modes:

2 Flux vector CL (Synchronous with permanent magnets)

3 Autotune

In the **field oriented vector mode** (**Flux vector CL/** Synchronous) an encoder is required for closed loop feedback. With this mode it is possible to achieve extremely high dynamic responses thanks to the regulation bandwidth, maximum torque even with the rotor blocked, speed and torque control. Numerous regulation parameters can be used to adjust the drive to each specific application, for instance adaptive gains, system inertia compensation, etc..

If the **Startup wizard** procedure is not used, self-tuning of the motor parameters is possible in the **self-tuning mode** (**Autotune**).

This procedure must be used for both self-tuning with the engine standing still and with the motor turning.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.4	**554**	**Access mode**		ENUM		Easy			RW	F__

With this parameter you can restrict access to advanced configuration.

0 Easy

1 Expert

The **Easy** mode gives access to a list of parameters that can be used for rapid drive commissioning. This type of configuration is suitable for the majority of applications.

Setting the parameter to **Expert** gives access to all the parameters in the firmware. This mode allows an extremely high level of customization to be achieved in order to exploit the potential of the ADP200 to the full.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.5	**558**	**Application select**		ENUM		1			ERWZ	F__

Selection of which IEC 61131-3-compliant application.

0 None

1 Application 1

2 Application 2

This drive is supplied already incorporating PID IMM application developed in the IEC 61331-3 environment. This application is specific for Hybrid Injection Molding Machine with Servopump and it is already enabled when the drive is power-on (see menu 26 - PID IMM for the description of this application).

NOTE! The **Load Default** command (par. 580) does not modify this parameter

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.6	**560**	**Mains voltage**		ENUM		400 V			ERWZS	F__

Setting of the available mains voltage value in Volts. Detection of the undervoltage alarm refers to this value.

0 None
1 230 V
2 380 V
3 400 V
4 415 V
5 440 V
6 460 V
7 480 V

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.7	**586**	**DC supply**		ENUM		None			ERWZS	F__

Selection of the voltage applied to the DC link if the drive is powered by an AC/DC power supply unit, whether standard or regenerative (e.g. AFE200). If a value of other than "**None**" is selected, all parameters that depend on **Mains voltage** (PAR 560) are calculated on the basis of the voltage shown in the table below, while the value of PAR 560 **Mains voltage** is set automatically.

If "None" is selected, these parameters are calculated according to the value of parameter 560 **Mains voltage**.

	DC power supply	**Drive family 380V..480V Mains voltage**
0	None	Use P560
1	540 V (230-480V)	400 V
2	650 V (230-480V)	460 V
3	750 V (230-480V)	460 V

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.8	**450**	**Undervoltage**	V	FLOAT		CALCF			ERWZS	F__

Setting of the drive minimum operating voltage. The maximum and minimum default values are calculated automatically by the drive according to the value set in parameter 560 **Mains voltage**, as shown in the table below.

Table of undervoltage limits

	Mains voltage	**Def**	**Min**	**Max**
0	None	(Vdc)	(Vdc)	(Vdc)
1	230 V	225	200	282
2	380 V	372	330	466
3	400 V	392	330	490
4	415 V	407	360	509
5	440 V	431	382	539
6	460 V	451	400	564
7	480 V	470	417	588

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.9	**562**	**Switching frequency**		ENUM		SIZE			ERWS	F__

Setting of the switching frequency value in kHz. The maximum value that can be set depends on the size of the drive.

2 4 kHz
4 8 kHz

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.10	**568**	**Switching freq mode**		ENUM		0			ERWZS	F__

The factory switching frequency setting is 4 kHz for motors between 7.5 kW and 75 kW.

Setting a higher switching frequency will increase drive losses and thus increase the heatsink temperature, but it will also reduce noise. To combine the advantages of both settings, with the ADP drive the heatsink temperature can be controlled by reducing the switching frequency if it increases.

0 Costant

1 Variable

If set to **Constant**, the switching frequency is fixed and set with the **Switching freq mode** parameter according to the size of the drive.

If set to Variable, the switching frequency is set to 8 kHz (for sizes between 7.5 kW and 75 kW) and the drive heat sink temperature and output frequency values are also controlled. If the heat sink temperature exceeds a given threshold (which depends on the size of the drive) the switching frequency is automatically reduced to 4 kHz (again considering sizes of between 7.5 kW and 75 kW), to avoid any derating of the output current value.

The switching frequency is reduced in a single step. **With this setting the switching frequency value selected in the Switching frequency parameter is ineffective**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.11	**454**	**Chopper ON**	V	Float		CALCF	CALCF	CALCF	ERWZS	FVS

Corresponding to the threshold of activation of the braking resistor.

It is so possible to increase this value just below the **Overvoltage** threshold level (820 Vdc).

Parameter's range are defined thru PAR 560 **Mains voltage** setting.

Note ! If **Mains voltage** is set at the maximum possible value, the activation threshold of the braking resistor can only assume the max value and can not be changed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.12	**570**	**Password**		UINT32		0	0	99999	ERW	F__

You can enter a **password** to protect the parameters from unauthorized tampering: the password can consist of a combination of a maximum of any 5 figures that can be selected by the user. All parameters are locked, except this one and **Save parameters**.

After entering the password, press the E key once to enter it into the memory and again to enable it (= Enabled is displayed to indicate that the password is enabled).

So that the password remains valid even after switching the unit off and then switching it back on, save it using the **Save parameters** command.

When the password is enabled any attempts to modify a parameter are blocked and the **Password enabled** message is displayed.

To disable the password, enter the **Password** parameter (**572**) in the **DRIVE CONFIG menu**.

Check that the password is enabled (**Enabled**), press **E** and enter the combination of figures that make up the password.

Press E again. A message is displayed telling you the password is no longer enabled (**Disabled**).

To make sure the password continues to be disabled even after switching the unit off and then switching it back on, save this configuration using the **Save parameters** command.

When an incorrect password is entered, the Password wrong message is displayed

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.13	**572**	**Application key**		UINT32		0	0	4294967295	ERW	F__

This parameter can be used to enter the key for enabling the PLC application.

You may need to enter a key to definitively enable some PLC applications. Please contact WEG for details about which PLC applications require the key.

If executing an application that envisages a key verification and the key is incorrect, enabling is forced for 200 hours (time drive enabled).

In this phase a message is displayed informing you that the period of forced enabling time is about to expire.

At the first power-on after the 200 hours an alarm is generated and the application does not start.

Please contact WEG for the numerical value of the key.

The default application PID IMM PLC is always available and it doesn't require any application key.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.14	**574**	**Startup display**		INT16		-1	-1	20000	ERW	F__

This is used to set the parameter that will be displayed automatically at drive power-on. Entering the value -1 (default), the function is disabled and the main menu is displayed at power-on.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.15	**576**	**Display backlight**		BIT		0	0	1	ERW	F__

Enabling of the backlight on the drive display.

If set to **0** the display backlight will go off when the drive has been on for three minutes.

If set to **1** the backlight will stay on for as long as the drive is powered.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.16	**578**	**Language select**		ENUM		English			RWZ	F__

Setting of the drive programming language.

0 English
1 Italian
2 French
3 German
4 Spanish
5 Polish
6 Romanian
7 Russian
8 Turkish
9 Portuguese

Note ! The **Load Default** command (par. 580) does not modify this parameter.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.17	**580**	**Load default**		BIT		0	0	1	RWZ	F__

Transfers the standard factory settings to the drive memory ("Def" column in the parameters table).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.18	**590**	**Save par to keypad**		BIT		0	0	1	RW	F__

Transfers the parameters currently stored in the drive and saves them in the keypad memory (See ADP200 Quick Start manual, "Saving of parameters on the keypad" chapter.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.19	**592**	**Load par from keypad**		BIT		0	0	1	RWZ	F__

Transfers the parameters from the keypad memory to the drive (See ADP200 Quick Start manual, "Transfer of parameters between drives " chapter).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.20	**594**	**Keypad memory select**		UINT16		1	1	5	ERW	F__

Selection of the area of the keypad memory to which to transfer and save the parameters stored in the drive.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.21	**596**	**Save to SD card**		BIT		0	0	1	RW	F__

Transfers the drive parameters to the SD memory card (See Quick start-up guide).

Note ! This function is available only via optional keypad.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.22	**598**	**Load from SD card**		BIT		0	0	1	RWZ	F__

Transfers the parameters or new firmware version from the SD memory card to the drive (See Quick start-up guide).

Note ! This function is available only via optional keypad.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.23	**6150**	**EXP card type recog**		ENUM		HW			RW	FVS

Recognition technique configuration of expansion card type (I/O or encoder cards, i.e: EXP-IO-...-ADP, EXP-RES-ADP, EXP-DE-ADL, etc.).

0 HW (Hardware)
1 HW-SW (Hardware & SW)

If set 0 (defaut) the expansion card type recognition technique is based on reading the memory present on expansion cards.

If set 1 the expansion card type is identified through HW and SW method. If HW expansion card recognition fails, the expansion card type is loaded following the previous internally stored configuration.

REPLACING OF I/O OR ENCODER EXPANSION CARDS PROCEDURE

This procedure must be followed in case of replacing of an I/O or encoder expansion card with another card of different type. This procedure is not required if a card is substituted with one of the same type.

Before remove the expansion card

- Set PAR 6150 **EXP card type recog.** = 0 (HW);
- Run **Save parameters** command (menu 4 - DRIVE CONFIG);
- Power off drive.

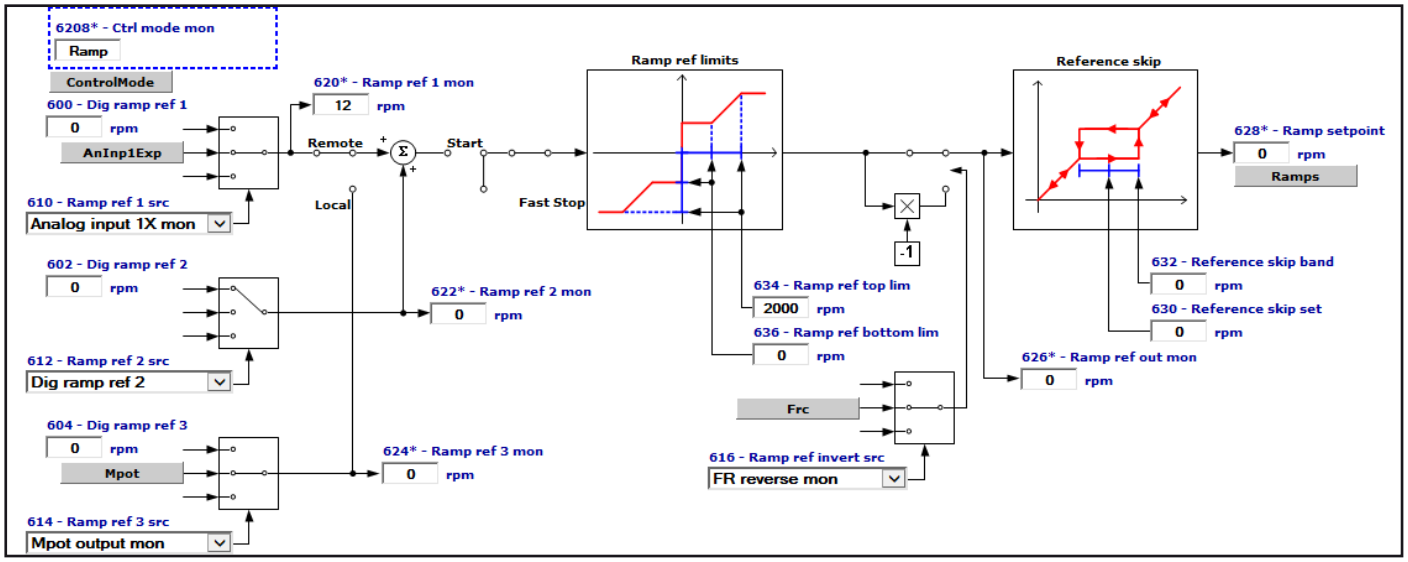
After replacing the expansion card

- Check parameters 530 **Slot1 card type**, 532 **Slot2 card type** (no OCFG error should occur);
- If expansion card is correctly recognized, set PAR 6150 **EXP card type recog.** = 1 (HW-SW);
- Run **Save parameters** command (menu 4 - DRIVE CONFIG).

5 – REFERENCES

ADP200 drives are provided with a speed regulation circuit, which can be adapted to suit the various applications. In the standard version, the regulator has PI behaviour and the regulator parameters are the same for the entire field of regulation.

Different sources can be used for the speed and torque references, depending on how the **556 Control mode select** parameter is set.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1	600	**Dig ramp ref 1**	FF	INT16	16/32	0	CALCI	CALCI	RW	F__

Setting of the digital ramp reference. The speed that the drive must reach after completing the acceleration phase is set with the ramp reference. Variations in the ramp reference are made with the selected ramp times. The size of the ramp reference determines the motor speed value. The sign determines the direction of rotation. The **Ramp ref** parameter also refers to a minimum speed, if set. When the "**Motor potentiometer**" or "**Multispeed**" functions are selected the relative references are used. This reference can only be used in the **Remote** mode.

The overall ramp reference is the result of the sum of the values with sign of **Ramp ref 1** and **Ramp ref 2**.

Example 1: **Ramp ref 1** = + 500 rpm **Ramp ref 2** = + 300 rpm
Ramp ref = 500 rpm + 300 rpm = 800 rpm

Example 2: **Ramp ref 1** = + 400 rpm **Ramp ref 2** = - 600 rpm
Ramp ref = 400 rpm – 600 rpm = - 200 rpm

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2	602	**Dig ramp ref 2**	FF	INT16	16/32	0	CALCI	CALCI	ERW	F__

Setting of the digital ramp reference. The speed that the drive must reach after completing the acceleration phase is set with the ramp reference. Variations in the ramp reference are made with the selected ramp times. The size of the ramp reference determines the motor speed value. The sign determines the direction of rotation. The **Ramp ref** parameter also refers to a minimum speed, if set. When the "**Motor potentiometer**" or "**Multispeed**" functions are selected the relative references are used.

In **Remote** mode the overall ramp reference is the result of the sum of the values with sign of Ramp ref 1 and Ramp ref 2.

Example 1: **Ramp ref 1** = + 500 rpm **Ramp ref 2** = + 300 rpm
Ramp ref = 500 rpm + 300 rpm = 800 rpm

Example 2: **Ramp ref 1** = + 400 rpm **Ramp ref 2** = - 600 rpm

Ramp ref = 400 rpm – 600 rpm = - 200 rpm

In **Local** mode the overall ramp reference is the result of the sum of the values with sign of **Ramp ref 3** and **Ramp ref 2**.

Example 1: **Ramp ref 3** = + 500 rpm **Ramp ref 2** = + 300 rpm
Ramp ref = 500 rpm + 300 rpm = 800 rpm

Example 2: **Ramp ref 3** = + 400 rpm **Ramp ref 2** = - 600 rpm
Ramp ref = 400 rpm – 600 rpm = - 200 rpm

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3	**604**	**Dig ramp ref 3**	FF	INT16	16/32	0	CALCI	CALCI	ERW	F__

Setting of the digital ramp reference. The speed that the drive must reach after completing the acceleration phase is set with the ramp reference. Variations in the ramp reference are made with the selected ramp times. The size of the ramp reference determines the motor speed value. The sign determines the direction of rotation. The **Ramp ref** parameter also refers to a minimum speed, if set. When the "**Motor potentiometer**" or "**Multispeed**" functions are selected the relative references are used. This reference can only be used in the **Local** mode.

The overall ramp reference is the result of the sum of the values with sign of **Ramp ref 3** and **Ramp ref 2**.

Example 1: **Ramp ref 3** = + 500 rpm **Ramp ref 2** = + 300 rpm
Ramp ref = 500 rpm + 300 rpm = 800 rpm

Example 2: **Ramp ref 3** = + 400 rpm **Ramp ref 2** = - 600 rpm
Ramp ref = 400 rpm – 600 rpm = - 200 rpm

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4	**610**	**Ramp ref 1 src**		LINK	16/32	1600	0	16384	RW	F__
5.5	**612**	**Ramp ref 2 src**		LINK	16/32	602	0	16384	ERW	F__
5.6	**614**	**Ramp ref 3 src**		LINK	16/32	894	0	16384	ERW	F__

Selection of the origin (source) of the reference signals on the input of the ramp function block, that defines the main drive speed. The ramp reference values can be selected from among those listed in the "**L_MLTREF**" selection list.

When assigning the reference via terminals, signals with ±10V, 0 ...10V, 0... 20 mA and 4 ... 20 mA can be used.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7	**616**	**Ramp ref invert src**		LINK	16	1050	0	16384	ERW	F__

Selection of the origin (source) of the signal that inverts the ramp reference output from the "Ramp ref" block. The signal that can be used for this function can be selected from among those listed in the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.8	**620**	**Ramp ref 1 mon**	FF	INT16		0	0	0	R	F__
5.9	**622**	**Ramp ref 2 mon**	FF	INT16		0	0	0	ER	F__
5.10	**624**	**Ramp ref 3 mon**	FF	INT16		0	0	0	ER	F__

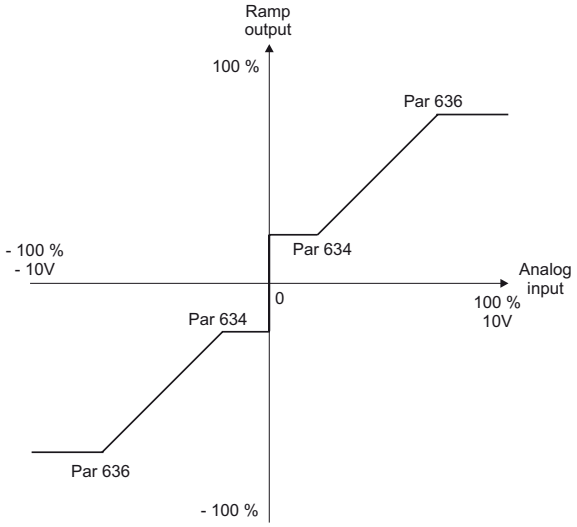
The value of the relative ramp reference on the output of the relative function block is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.11	**634**	**Ramp ref top lim**	FF	INT32		0	0	CALCI	ERWZ	F__

It defines the maximum value of the output of the ramp reference block, regardless of the signal that is present. The ramp reference follows the reference signal from the value set in parameter PAR 636 **Ramp ref bottom lim** up to the value set with this parameter, after which the motor speed remains constant. The limit is valid for both directions of rotation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.12	**636**	**Ramp ref bottom lim**	FF	INT32		0	0	CALCI	ERWZ	F__

It defines the minimum value of the output of the ramp reference block, regardless of the signal that is present. The ramp block output remains at the value set with this parameter until the analog signal exceeds this threshold: the ramp output value then starts to follow the reference up to the value set in parameter PAR 634 **Ramp ref top lim**. The limit is valid for both directions of rotation.

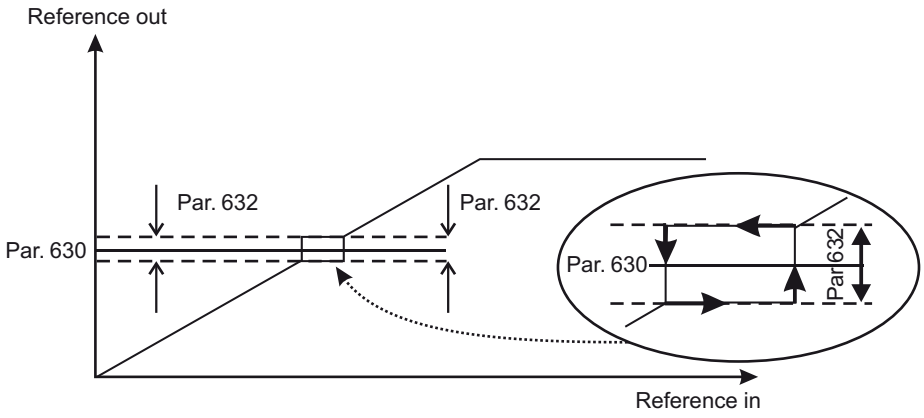


Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.13	**630**	**Reference skip set**	rpm	INT16		0	0	CALCI	ERW	F__

Setting of the prohibited speed threshold at which the drive cannot operate.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.14	**632**	**Reference skip band**	rpm	INT16		0	0	CALCI	ERW	F__

Setting of the prohibited bandwidth.



Example:

A) Increase in the reference by values of less than ***Par. 630***

Par. 630 = 300 rpm (prohibited speed threshold)

Par. 632 = 10 rpm (thus prohibited band: 290rpm.310rpm)

Set speed reference = 295 rpmHz

Output speed = 290 rpm

Set speed reference = 305 rpm

Output speed = 290 rpm

B) Decrease in the reference by values above ***Par. 630***

Par.630 = 300 rpm (prohibited speed threshold)

Par.632 = 10 rpm (thus tolerance band: 290 rpm…310 rpm)

Set speed reference = 305 rpm

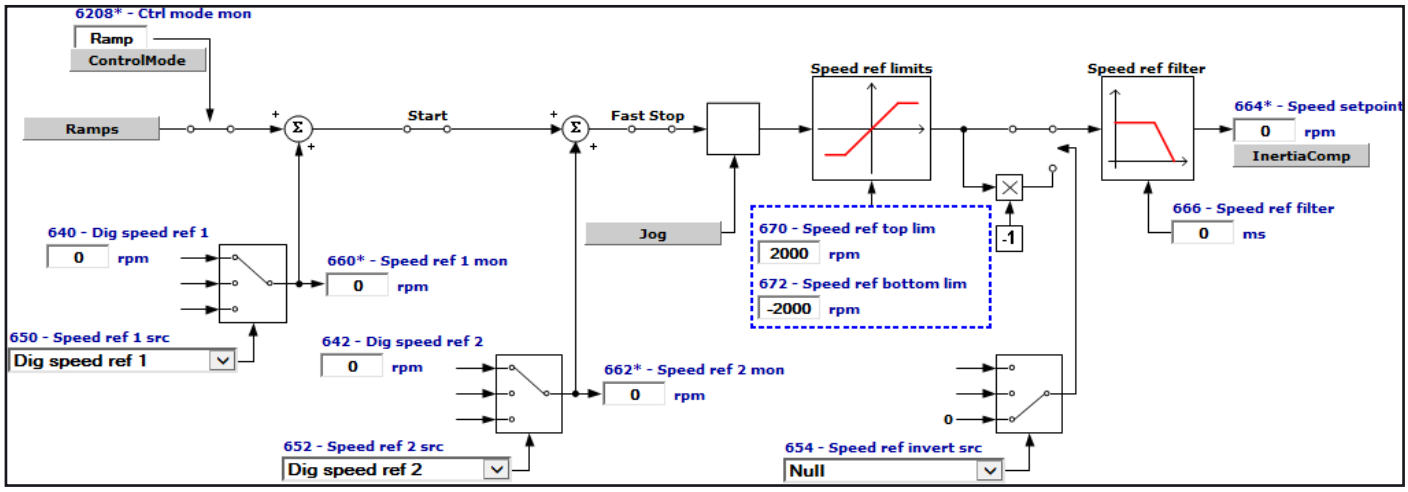
Output frequency = 310 rpm

Set speed reference = 295 rpm

Output frequency = 310 rpm

The user can thus set any reference value, but if the set value is within the prohibited range, the drive automatically maintains the speed outside the limits defined by the tolerance band.

During ramp phases the prohibited speed is passed freely and there are no points of discontinuity in the generation of the output frequency.



The speed reference supplies the desired speed to the drive, which directly follows the reference pattern. This only happens when the available torque is sufficient. In this case the drive functions at its current limit, until reaching the set speed. The speed reference value determines the motor speed value. The sign determines the direction of rotation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.15	**640**	**Dig speed ref 1**	FF	INT16	16/32	0	CALCI	CALCI	ERW	F__
5.16	**642**	**Dig speed ref 2**	FF	INT16	16/32	0	CALCI	CALCI	ERW	F__

Setting of the digital speed references. The overall speed reference is the result of the sum of the values with the respective signs, of **Dig speed ref 1** and **Dig speed ref 2**. The digital speed references are linked to the ramp circuit output.

The overall speed reference is the result of the sum of the values, with sign, of **Speed ref 1** and **Speed ref 2**.

Example 1: **Speed ref 1** = + 500 rpm **Speed ref 2** = + 300 rpm
Speed ref = 500 rpm + 300 rpm = 800 rpm

Example 2: **Speed ref 1** = + 400 rpm **Speed ref 2** = - 600 rpm
Speed ref = 400 rpm – 600 rpm = - 200 rpm

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.17	**650**	**Speed ref 1 src**		LINK	16/32	640	0	16384	ERW	F__
5.18	**652**	**Speed ref 2 src**		LINK	16/32	642	0	16384	ERW	F__

Selection of the origin (source) of the drive speed reference signals. The values that can be used as speed references can be selected from those listed in the "**L_MLTREF**" selection list.

When assigning the reference via terminals, signals with ±10V, 0 ...10V, 0... 20 mA and 4 ... 20 mA can be used.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.19	**654**	**Speed ref invert src**		LINK	16	6000	0	16384	ERWZ	F__

Selection of the origin (source) of the signal that inverts the speed reference output from the regulator. The terminal that can be used for this function can be selected from among those listed in the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.20	**660**	**Speed ref 1 mon**	FF	INT16		0	0	0	ER	F__
5.21	**662**	**Speed ref 2 mon**	FF	INT16		0	0	0	ER	F__

The value of the relative speed reference is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.22	**670**	**Speed ref top lim**	FF	INT32		CALCI	0	CALCI	ERWZ	F__

Setting of the upper speed reference limit. If the speed reference exceeds the limits, the motor speed remains at the set limit value in any case. Speed limits cannot be more than 200% of the value set in the **Full scale speed** parameter (REFENCES menu par. 680).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.23	**672**	**Speed ref bottom lim**	FF	INT32		CALCI	CALCI	0	ERWZ	F__

Setting of the lower speed reference limit. If the speed reference exceeds the limits, the motor speed remains at the set limit value in any case. Speed limits cannot be more than 200% of the value set in the **Full scale speed** parameter (REFERENCES menu par. 680).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.24	**666**	**Speed ref filter**	ms	UINT16		0	0	1000	ERW	F__

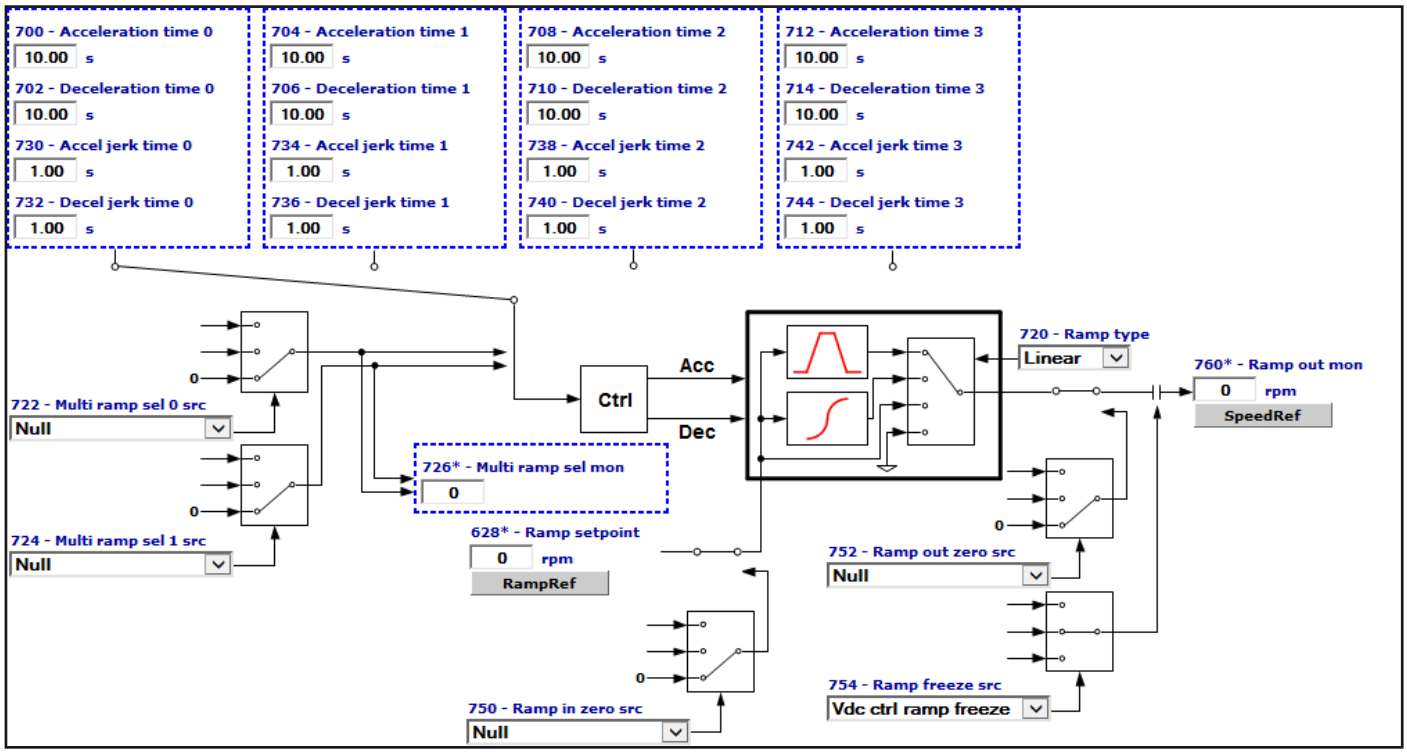
Filter to the speed reference value. If IPA 666 **Speed ref filter** is set to 0, filter is disabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.25	**680**	**Full scale speed**	rpm	INT16		CALCI	50	32000	RWZ	F__

Setting of the reference value for all speed percentage data (References, Speed adaptives ...) corresponding to 100 % of the actual speed. This parameter can only be changed with the inverter blocked (Enable drive = Disabled). The recommended setting for the value of this parameter is the motor rated speed. If altered, the self-tuning procedure should be repeated.

Full scale speed does not define the maximum possible speed. In any case, the maximum speed percentage value is ± 200 % of the **Full scale speed** value.

6 – RAMPS



The ramp (reference integrator) determines the acceleration and deceleration times of the drive. Times can be set independently.

The ramp times of Fast stop command are set on **Acceleration time 3** and **Deceleration time 3**. The command can be enabled from the terminal strip..

The ramp can be linear or S-shaped, as preferred.

The references can be set in different ways:
- with the Ramp ref 1 and / or Ramp ref 2 references
- with the Ramp ref 3 and / or Ramp ref 2 references
- with the Multi speed function
- with the Motor potentiometer function
- with the Jog function

The ramp generator can be used in the “stand alone” mode. When disabled (**Ramp type = Off**), the “Enable drive, Start/Stop and Fast stop” commands do not affect the ramp generator. In this condition the ramp generator can be used separately.

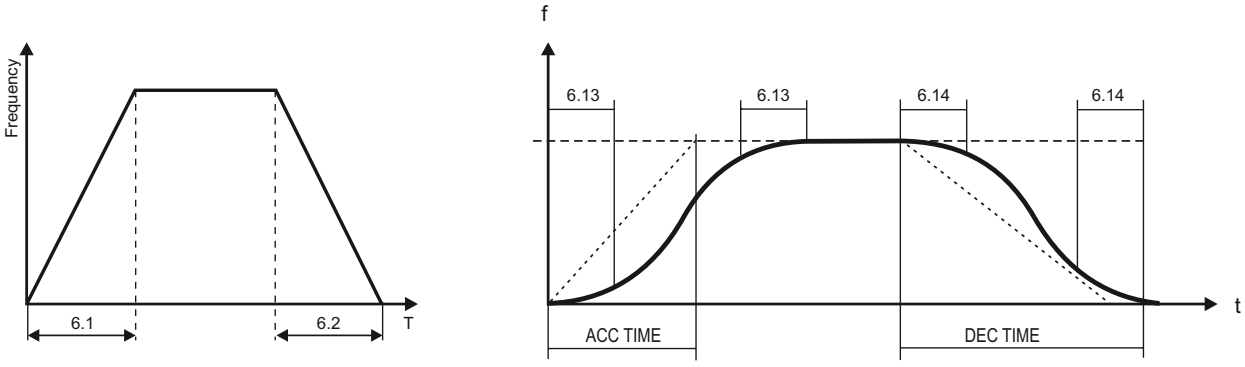
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
6.1	**700**	**Acceleration time 0**	s	FLOAT		10.00	0.01	1000.00	RW	F__
6.2	**702**	**Deceleration time 0**	s	FLOAT		10.00	0.01	1000.00	RW	F__
6.3	**704**	**Acceleration time 1**	s	FLOAT		10.00	0.01	1000.00	ERW	F__
6.4	**706**	**Deceleration time 1**	s	FLOAT		10.00	0.01	1000.00	ERW	F__
6.5	**708**	**Acceleration time 2**	s	FLOAT		10.00	0.01	1000.00	ERW	F__
6.6	**710**	**Deceleration time 2**	s	FLOAT		10.00	0.01	1000.00	ERW	F__
6.7	**712**	**Acceleration time 3**	s	FLOAT		10.00	0.01	1000.00	ERW	F__
6.8	**714**	**Deceleration time 3**	s	FLOAT		10.00	0.01	1000.00	ERW	F__

The acceleration and deceleration ramp times are used to avoid sudden changes in the drive output frequency, which could cause mechanical shocks, excessive current on the motor and excessive DC-bus voltage values. The acceleration times (**6.1, 6.3, 6.5, 6.7**) are expressed as the time necessary to bring the frequency from zero to the maximum value set in the **Full scale speed (PAR 680**). On the other hand, the deceleration times (**6.2, 6.4, 6.6, 6.8**) are expressed as the time necessary to bring the frequency from the maximum value set in the **Full scale speed (5.25)** parameter to zero. Each of the 4 available ramp selections can be selected using one or two digital inputs programmed as **Multi ramp sel**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
6.9	**720**	**Ramp type**		ENUM		Linear			ERWZ	F__

This parameter defines the ramp shape (linear/S-shape). It can only be modified with the drive disabled.

0 Linear
1 S-Shape
2 Bypass
3 Off



0 = Linear 1 = S-Shape

When linear ramps are set (**Linear**) the motor speed varies in a way that is directly in proportion to the frequency.

When S-shape ramps are set (**S-Shape**) it is possible to avoid sudden mechanical variations in the system at the beginning and end of the acceleration and deceleration phase.

The ramp time, meaning the time necessary to accelerate from zero to the maximum frequency value set, is given by the sum of the linear ramp time and that of the associated **Jerks** (see par. 6.13 – 6.20).

The **Bypass** excludes the ramp circuit and the reference is brought directly to the speed regulator input.

With **Off** the ramp reference is set to zero.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
6.10	**722**	**Multi ramp sel 0 src**		LINK	16	6000	0	16384	ERW	F__
6.11	**724**	**Multi ramp sel 1 src**		LINK	16	6000	0	16384	ERW	F__

1 or 2 digital inputs can be used to select one of the 4 available sets of ramps.

The origin (source) of the command to enable the ramp selection function can be selected from the "**L_DIGSEL2**" selection list.

The following table describes the ramp selection procedure:

Enabled ramp time	Multi ramp sel 0	Multi ramp sel 1
Acceleration time 0 Deceleration time 0	0	0
Acceleration time 1 Deceleration time 1	1	0
Acceleration time 2 Deceleration time 2	0	1

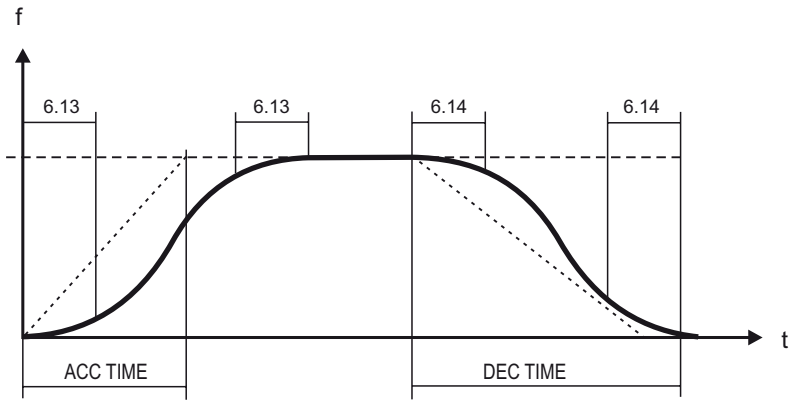
Acceleration time 3 Deceleration time 3	1	1

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
6.12	**726**	**Multi ramp sel mon**		UINT16		0	0	3	ER	F__

The set of acceleration/deceleration ramps selected using the digital inputs is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
6.13	**730**	**Accel jerk time 0**	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.14	**732**	**Decel jerk time 0**	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.15	**734**	**Accel jerk time 1**	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.16	**736**	**Decel jerk time 1**	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.17	**738**	**Accel jerk time 2**	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.18	**740**	**Decel jerk time 2**	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.19	**742**	**Accel jerk time 3**	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.20	**744**	**Decel jerk time 3**	s	FLOAT		1.0	0.02	10.0	ERW	F__

Jerks are variations of acceleration in time. They are used when there is a need to dampen the beginning and end of the ramp. The Jerk value is added, regardless of the variation in speed, to the linear ramp time.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
6.21	**750**	**Ramp in zero src**		LINK	16	6000	0	16384	ERW	F__

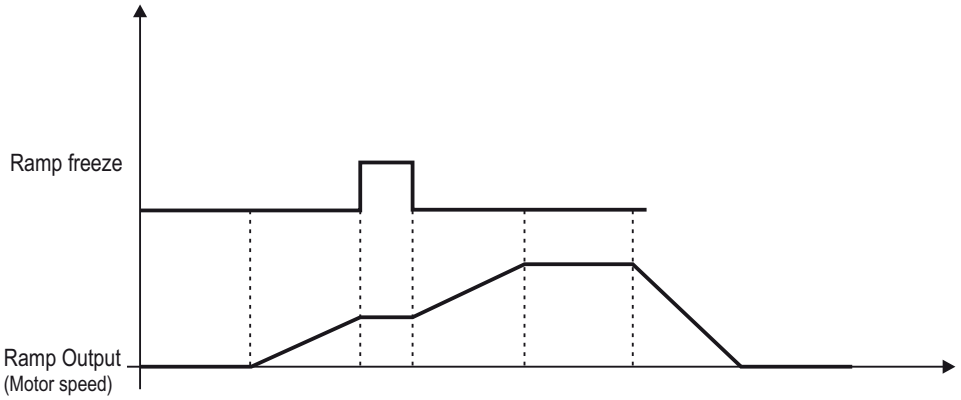
Selection of the origin (source) of the signal that blocks the ramp input and moves the reference to zero. If the ramp input is enabled, the **Ramp ref** parameter corresponds to the set reference. If the ramp input is blocked, the drive slows down with the set deceleration time until reaching zero speed. The terminal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
6.22	**752**	**Ramp out zero src**		LINK	16	6000	0	16384	ERW	F__

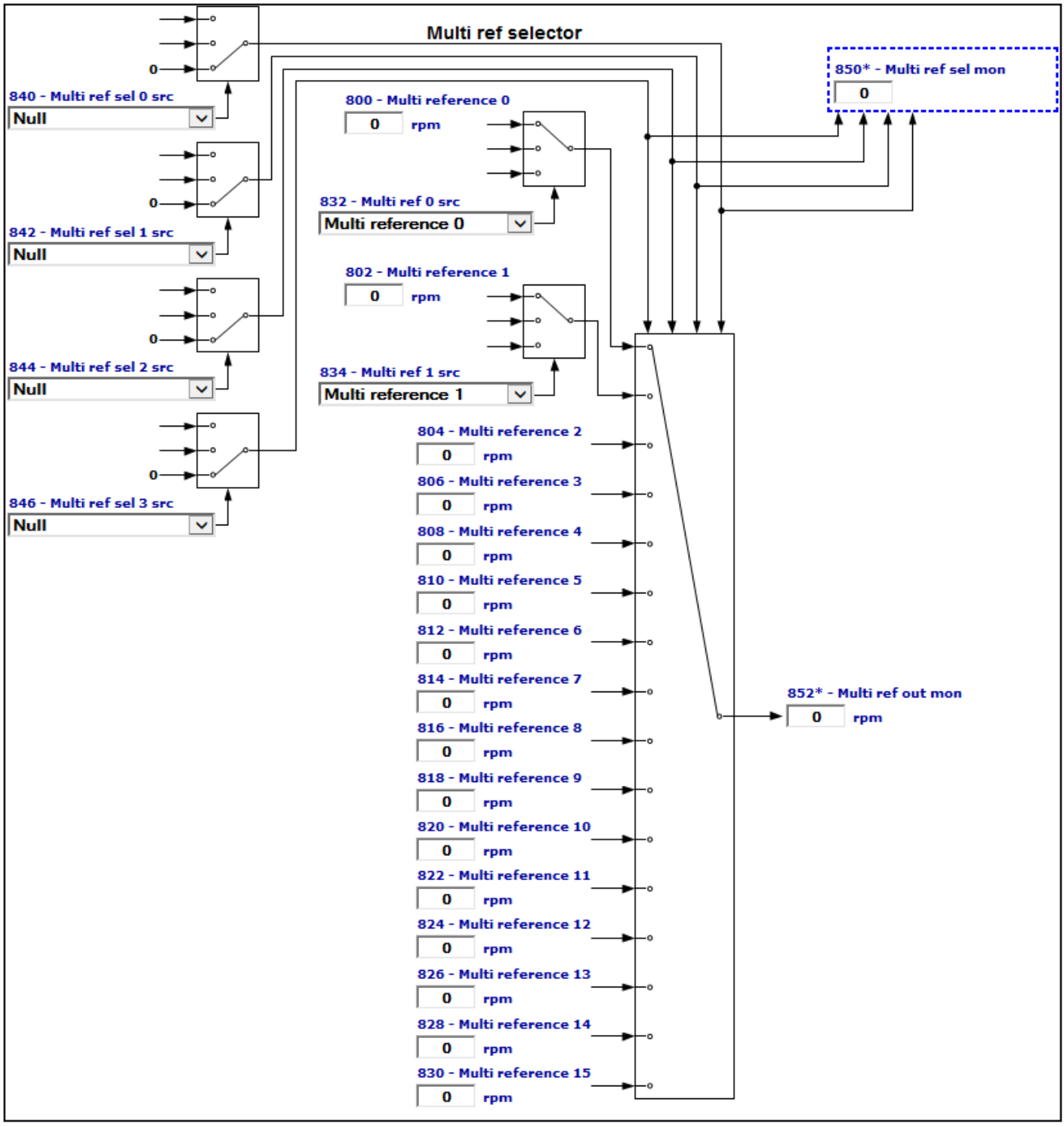
Selection of the origin (source) of the signal that brings the ramp output to 0. When the ramp output is set to zero using **Ramp out zero**, the drive brakes with the maximum available torque; in this case the ramp is disabled. The terminal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
6.23	**754**	**Ramp freeze src**		LINK	16	3480	0	16384	ERW	F__

Selection of the origin (source) of the signal that temporarily freezes the ramp output value, regardless of any changes in the input reference. The terminal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.


Ramp freeze
Ramp Output
(Motor speed)

7 – MULTI REFERENCE



With the “Multispeed” function (**Multi references**) it is possible to recall up to sixteen internally saved speed references to be recalled using a digital signal or via digital inputs on the terminal strip.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
7.1	**800**	**Multi reference 0**	FF	INT16	16/32	0	CALCI	CALCI	RW	F__
7.2	**802**	**Multi reference 1**	FF	INT16	16/32	0	CALCI	CALCI	RW	F__
7.3	**804**	**Multi reference 2**	FF	INT16		0	CALCI	CALCI	RW	F__
7.4	**806**	**Multi reference 3**	FF	INT16		0	CALCI	CALCI	RW	F__
7.5	**808**	**Multi reference 4**	FF	INT16		0	CALCI	CALCI	RW	F__
7.6	**810**	**Multi reference 5**	FF	INT16		0	CALCI	CALCI	RW	F__

7.7	**812**	**Multi reference 6**	FF	INT16	0	CALCI	CALCI	RW	F__
7.8	**814**	**Multi reference 7**	FF	INT16	0	CALCI	CALCI	RW	F__
7.9	**816**	**Multi reference 8**	FF	INT16	0	CALCI	CALCI	ERW	F__
7.10	**818**	**Multi reference 9**	FF	INT16	0	CALCI	CALCI	ERW	F__
7.11	**820**	**Multi reference 10**	FF	INT16	0	CALCI	CALCI	ERW	F__
7.12	**822**	**Multi reference 11**	FF	INT16	0	CALCI	CALCI	ERW	F__
7.13	**824**	**Multi reference 12**	FF	INT16	0	CALCI	CALCI	ERW	F__
7.14	**826**	**Multi reference 13**	FF	INT16	0	CALCI	CALCI	ERW	F__
7.15	**828**	**Multi reference 14**	FF	INT16	0	CALCI	CALCI	ERW	F__
7.16	**830**	**Multi reference 15**	FF	INT16	0	CALCI	CALCI	ERW	F__

It is possible to select up to 16 operating frequencies, which can be set in these parameters.

The frequencies are selected using the binary code of the digital inputs programmed using the **Multi ref sel 0 src**, **Multi ref sel 1 src**, **Multi ref sel 2 src** and **Multi ref sel 3 src** parameters.

References can be set via the keypad, serial line, digital inputs and BUS.

A sign can be given to the references, so that when they are defined so too is the desired direction of rotation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
7.17	**832**	**Multi ref 0 src**		LINK	16/32	800	0	16384	RW	F__
7.18	**834**	**Multi ref 1 src**		LINK	16/32	802	0	16384	RW	F__

Selection of the origin (source) of the drive speed reference signals. The speed reference values can be selected from those listed in the "**L_MLTREF**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
7.19	**840**	**Multi ref sel 0 src**		LINK	16	6000	0	16384	RW	F__
7.20	**842**	**Multi ref sel 1 src**		LINK	16	6000	0	16384	RW	F__
7.21	**844**	**Multi ref sel 2 src**		LINK	16	6000	0	16384	RW	F__
7.22	**846**	**Multi ref sel 3 src**		LINK	16	6000	0	16384	ERW	F__

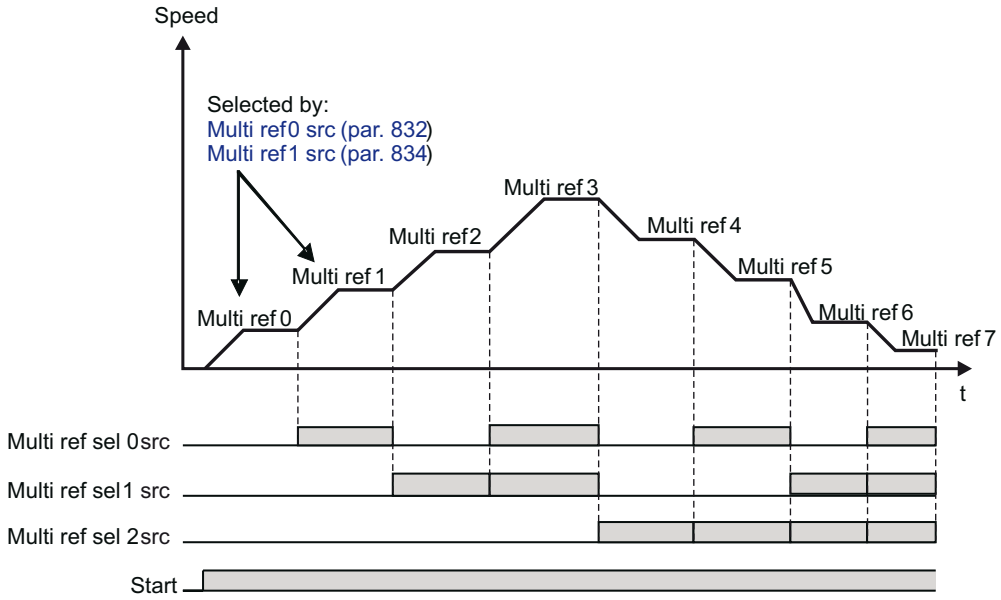
Selection of the origin (source) of the signals used to select one of the preset speeds. These parameters can only be used together in combinations. The terminals that can be used for this function can be selected from among those listed in the "**L_DIGSEL2**" selection list.

The following table describes the selection of the Multispeed function:

Active speed ref	Multi ref sel 0 src	Multi ref sel 1 src	Multi ref sel 2 src	Multi ref sel 3 src
Multi reference 0	0	0	0	0
Multi reference 1	1	0	0	0
Multi reference 2	0	1	0	0
Multi reference 3	1	1	0	0
Multi reference 4	0	0	1	0
Multi reference 5	1	0	1	0
Multi reference 6	0	1	1	0
Multi reference 7	1	1	1	0
Multi reference 8	0	0	0	1
Multi reference 9	1	0	0	1
Multi reference 10	0	1	0	1
Multi reference 11	1	1	0	1
Multi reference 12	0	0	1	1
Multi reference 13	1	0	1	1

Active speed ref	Multi ref sel 0 src	Multi ref sel 1 src	Multi ref sel 2 src	Multi ref sel 3 src
Multi reference 14	0	1	1	1
Multi reference 15	1	1	1	1

The following figure describes the selection of a control for 8 Multispeeds.



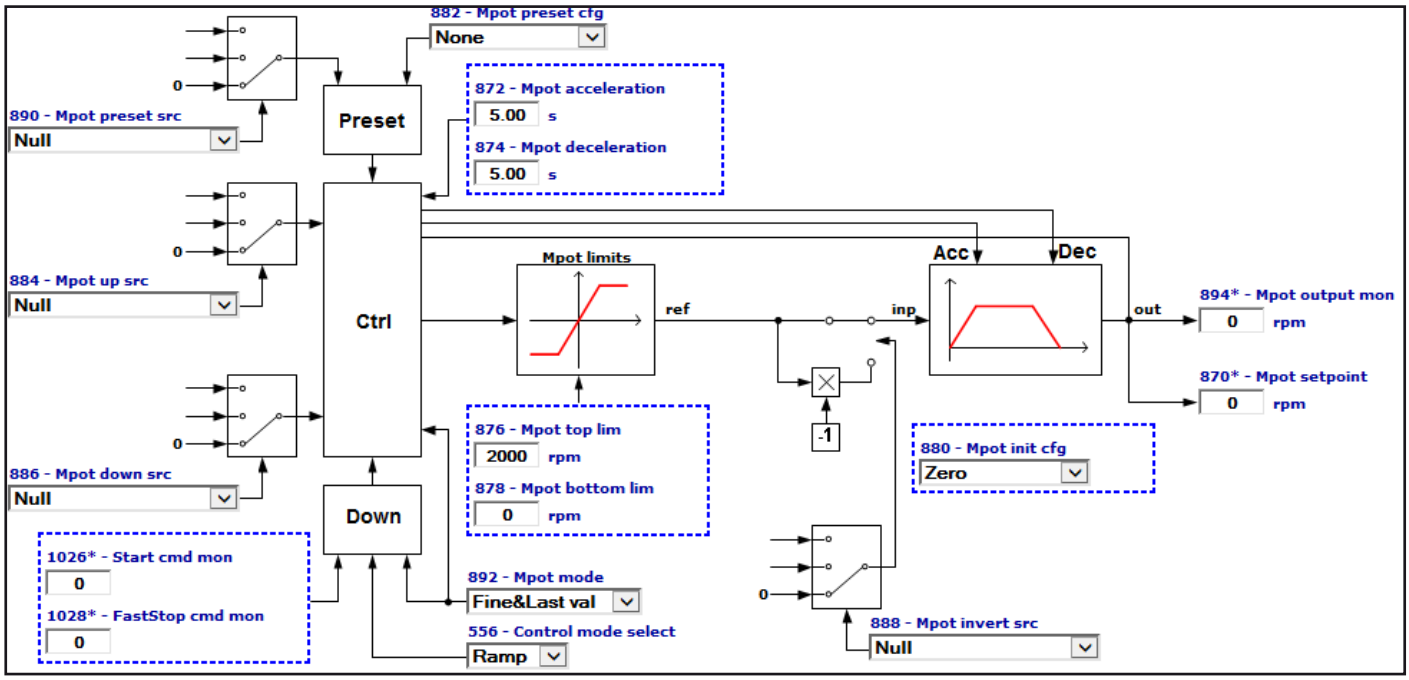
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
7.23	**850**	**Multi ref sel mon**		UINT16		0	0	15	R	F__

The multispeed that has been selected using the digital commands or by the digital inputs selected in the terminal strip.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
7.24	**852**	**Multi ref out mon**	FF	INT16	16/32	0	0	0	R	F__

The selected speed reference on the Multispeed block output is displayed.

8 – MOTORPOTENTIOMETER



The Motor potentiometer function allows the speed reference of the drive to be changed by pressing buttons with which the UP and DOWN commands are associated.

The UP and DOWN commands can be sent from the keypad, by digital inputs, the serial line or fieldbus.

To send the UP and DOWN commands from the keypad, enter the **MPot setpoint** parameter modify mode and press the UP and DOWN keys.

The UP and DOWN commands increase or decrease the speed of the motor for as long as they are present. The simultaneous presence of both commands will not produce any change (see time chart).

The speed changes according to the set ramp times and within the set lower and upper limits.

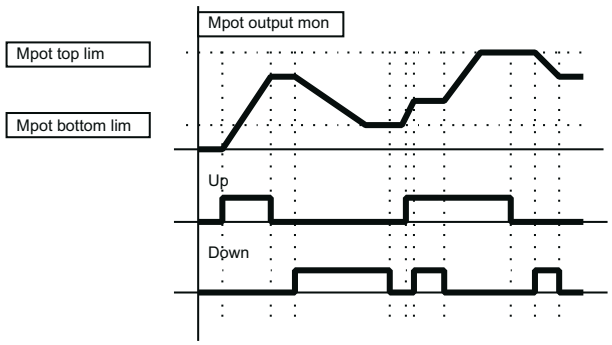
The value of the Motor potentiometer function output at drive power-on can be configured.

The preset command can be used to force a preset value for the input and output of the Motor potentiometer function.

The invert command can be used to force an inversion of the reference sign of the Motor potentiometer function.

In the default condition, the speed reference produced by the Motor potentiometer function is connected in input to the Ramp function. For direct control of the motor speed, the Acceleration time and Deceleration time parameters in the RAMP menu should be set = 0.

Note ! The Motor potentiometer function produces a speed reference. Therefore a RUN command must always be sent to start motor rotation.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
8.1	**870**	**Mpot setpoint**	rpm	INT16	16/32	0	CALCI	CALCI	R	F__

The speed reference value of the Motor potentiometer function is displayed.

Enter this parameter to send the UP and DOWN commands from the keypad.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
8.2	**872**	**Mpot acceleration**	s	FLOAT		5.0	0.01	1000.00	RW	F__
8.3	**874**	**Mpot deceleration**	s	FLOAT		5.0	0.01	1000.00	RW	F__

Setting of the acceleration/deceleration ramp times (in seconds) used with the Motor potentiometer function.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
8.4	**876**	**Mpot top lim**	rpm	INT16		CALCI	CALCI	CALCI	ERW	F__

Setting of the top limit for the speed reference output from the motor potentiometer.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
8.5	**878**	**Mpot bottom limit**	rpm	INT16		0	CALCI	CALCI	ERW	F__

Setting of the bottom limit for the speed reference output from the motor potentiometer.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
8.6	**880**	**Mpot init cfg**		ENUM		Zero			ERW	F__

Use this parameter to configure the output value of the Motor potentiometer at drive start-up.

0 Last power off
1 Zero
2 Lower Limit
3 Upper Limit

When set to **Last power off**, the motor potentiometer output starts from the last frequency that was set before the drive was switched off.

When set to **Zero** the motor potentiometer output starts from a value of 0.

When set to **Lower limit** the output of the motor potentiometer starts from the value of the lower limit set in the **Mpot bottom limit** parameter.

When set to **Upper limit** the output of the motor potentiometer starts from the value of the upper limit set in the **Mpot top limit** parameter.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
8.7	**882**	**Mpot preset cfg**		ENUM		None			ERW	F__

This parameter can be used to configure the preset of the Motor potentiometer function, i.e. to configure the value at which the Motor potentiometer input and output are set when the Preset command is enabled.

The Preset command has priority over the Up command and the Down command.

Mpot mode (PAR 892) = [1] **Ramp&Follow** has priority over the Preset command, i.e. actions programmed with **Mpot preset cfg** (PAR 882) are not executed.

The Up and Down commands are enabled again when the Preset command is disabled.

0 None
1 Input = 0
2 Input = low lim
3 Input & ref = 0
4 Input & ref = low lim
5 Output = 0
6 Output = low lim

7 Output & ref = 0

8 Output & ref = low lim

9 Input = upp lim

10 Input & ref = upp lim

11 Freeze input

When set to **None**, no setting is executed.

Input = 0 sets input = 0 i.e. a temporary reference setting is performed and the previous reference value is maintained. The output of the Motor potentiometer function varies with the set ramp times. The previous reference value is restored when the preset command is removed.

Input = low lim sets Inp = low lim i.e. a temporary reference setting is performed and the previous reference value is maintained. The output of the Motor potentiometer function varies with the set ramp times. The previous reference value is restored when the preset command is removed.

Input & ref = 0 sets Inp = 0 and Ref = 0 i.e. a definitive reference setting is performed. The output of the Motor potentiometer function varies with the set ramp times.

Input & ref = low lim sets Inp = low lim and Ref = low lim i.e. a definitive reference setting is performed. The output of the Motor potentiometer function varies with the set ramp times.

Output = 0 sets Out = 0 i.e. a temporary output setting for the Motor potentiometer function is performed. The previous reference value is maintained. If the preset command is enabled, the output of the Motor potentiometer function continues to be = 0, if the preset command is not enabled the output of the Motor potentiometer function varies with the set ramp times.

Output = low lim sets Out = low lim i.e. a temporary setting for the output of the Motor potentiometer function is performed. Il precedente valore di riferimento viene mantenuto .The previous reference value is maintained. If the preset command is enabled, the output of the Motor potentiometer function continues to be = low lim, if the preset command is not enabled the output of the Motor potentiometer function varies with the set ramp times.

Output & ref = 0 sets Out = 0 i.e. a definitive setting for the output of the Motor potentiometer function is performed.

Output & ref = low lim sets Out = low lim i.e. a definitive setting for the output of the Motor potentiometer function is performed.

Input = upp lim sets Inp = upp lim i.e. a temporary setting for the reference is performed and the previous reference value is maintained. The output of the Motor potentiometer function varies with the set ramp times. The previous reference value is restored when the preset command is removed.

Input & ref = upp lim sets Inp = upp lim and Ref = upp lim i.e. a definitive reference setting is performed. The output of the Motor potentiometer function varies with the set ramp times.

When **Freeze input** is set, the Up and Down commands are temporarily disabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
8.8	**884**	**Mpot up src**		LINK	16	6000	0	16384	RW	F__

Selection of the origin (source) of the signal that increases the speed reference of the motor potentiometer with the set ramp. The terminal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
8.9	**886**	**Mpot down src**		LINK	16	6000	0	16384	RW	F__

Selection of the origin (source) of the signal that decreases the speed reference of the motor potentiometer with the set ramp. The terminal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
8.10	**888**	**Mpot invert src**		LINK	16	6000	0	16384	ERW	F__

Selection of the origin (source) of the signal that inverts the speed reference of the motor potentiometer. The

terminal to be associated with this function can be selected from the “**L_DIGSEL2**” selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
8.11	**890**	**Mpot preset src**		LINK	16	6000	0	16384	ERW	F__

Selection of the origin (source) of the signal to preset the motor potentiometer function. The signal to be associated with this function can be selected from the “**L_DIGSEL2**” selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
8.12	**892**	**Mpot mode**		ENUM		Fine&Last val			ERW	F__

Setting of the configuration of two possible options of the Motor potentiometer function. There are two operating modes for each of the two options.

0 Ramp&Last val
1 Ramp&Follow
2 Fine&Last val
3 Fine&Follow

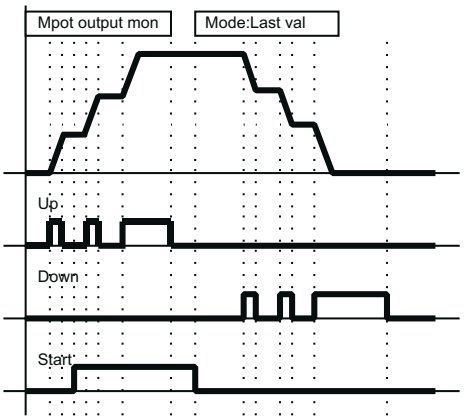
Option 1: Behaviour of the Motor potentiometer function with the Stop or FastStop command present with the **Control mode = Ramp** parameter.

The two operating modes are: **Last val** or **Follow**.

With the Control mode not equal to Ramp setting, this option is not completely applicable and it always behaves in Last val mode.

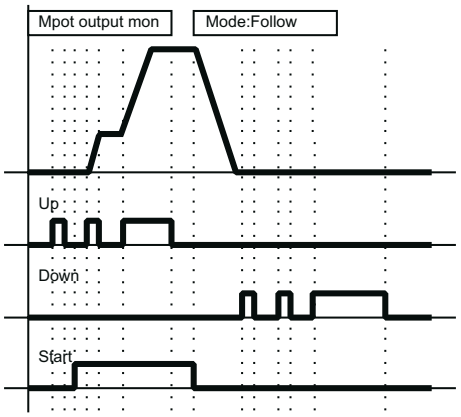
In **Last val** mode with the Stop or FastStop command present, the speed reference of the Motor potentiometer function is not altered.

The motor speed moves to 0 according to the selected control mode (**Control mode = Ramp** or **Control mode = Speed**). When the Run command is sent, the motor speed moves to the speed reference set by the motor potentiometer function according to the selected control mode.



In **Follow** mode with the Stop or FastStop command present, the Down command is simulated, i.e. the output of the Motor potentiometer function moves to 0 with the set ramp time.

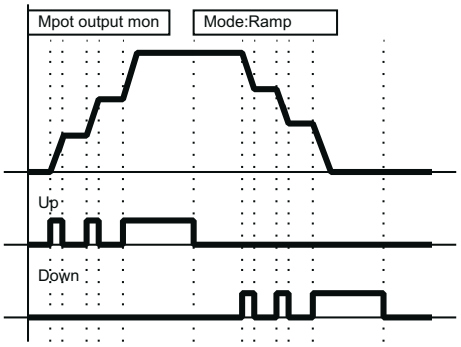
If the Run command is sent when the 0 speed has been reached, it is maintained until the Up command is sent. If the Run command is sent before the motor reaches the 0 speed, the speed at that moment is taken as the new reference.



Option 2: Ramp behaviour

The two operating modes are: **Ramp** or **Fine**

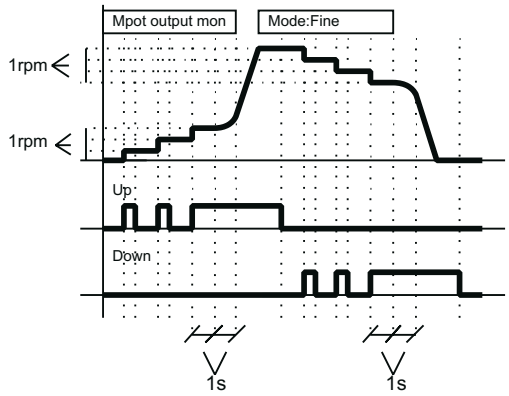
In **Ramp** mode, each time the Up or Down commands are enabled, the output of the Motor potentiometer function increases or decreases with the set ramp. When the Up or Down command is removed, the last value that was reached is maintained.



In **Fine** mode, each time the Up or Down commands are enabled, the output of the Motor potentiometer function increases or decreases by 1 rpm.

If the command persists for less than 1 second, no other changes are made on the output.

If the command persists for more than 1 second, the output increases or decreases with the set ramp. The variation with the set ramp is performed gradually (1 second). When the Up or Down command is removed the last value that was reached is maintained.



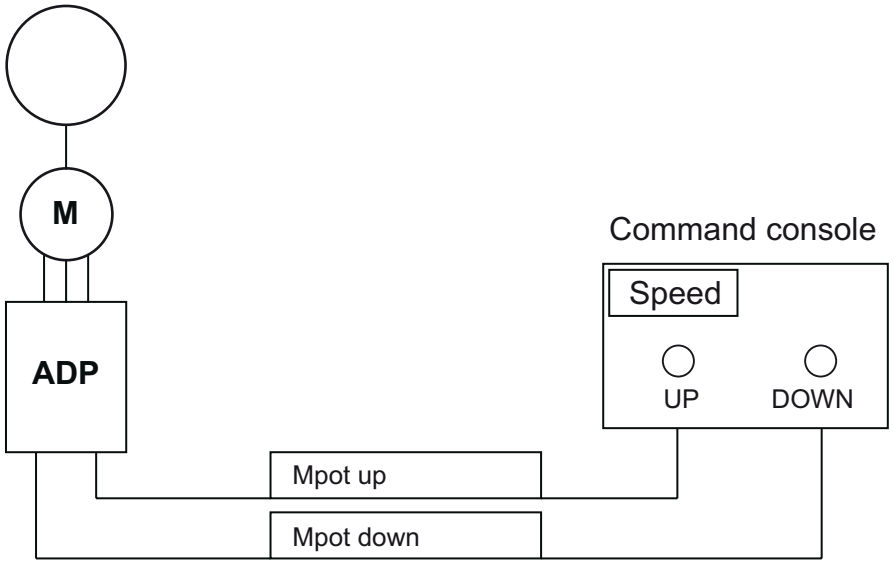
Mpot mode	**Ramp behaviour**	Behaviour of the Motor potentiometer function with the Stop or FastStop command present with the **Control mode** = **Ramp** parameter.
0	Ramp	Last val
1	Ramp	Follow
2	Fine	Last val
3	Fine	Follow

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
8.13	**894**	**Mpot output mon**	rpm	INT16	16/32	0	0	0	ER	F__

The value of the output of the motor potentiometer function is displayed.

Two examples of application of the motor potentiometer function are shown below.

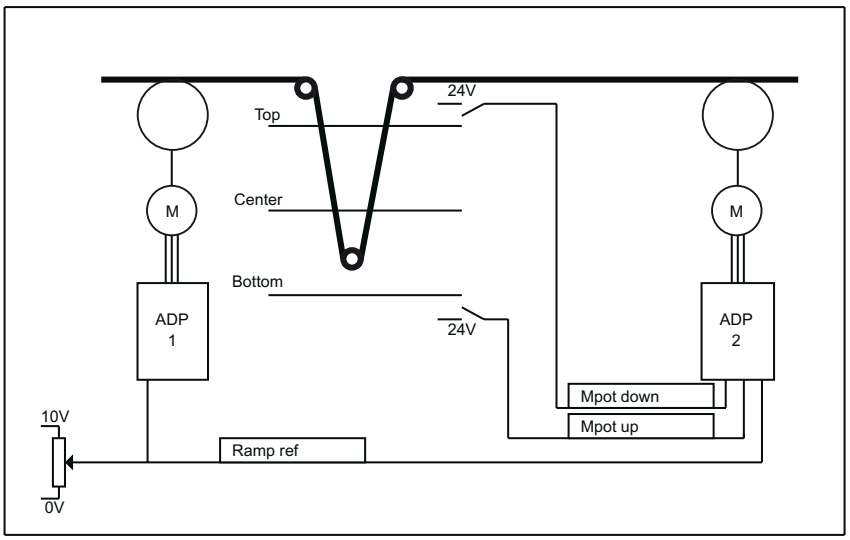
Manual speed control with command sent from control desk.



The Up and Down keys are used to adjust the speed of a motor.

For fine-tuning of the speed reference value the recommended settings are **Mpot Mode = Fine&Follow** or **Fine&Last Val**. Each time they are pressed for 1 second, the speed increases by 1 rpm. For an immediate effect on motor speed, the Acceleration time and Deceleration time parameters should be set to short times.

Automatic speed control for rudimentary dancer control.

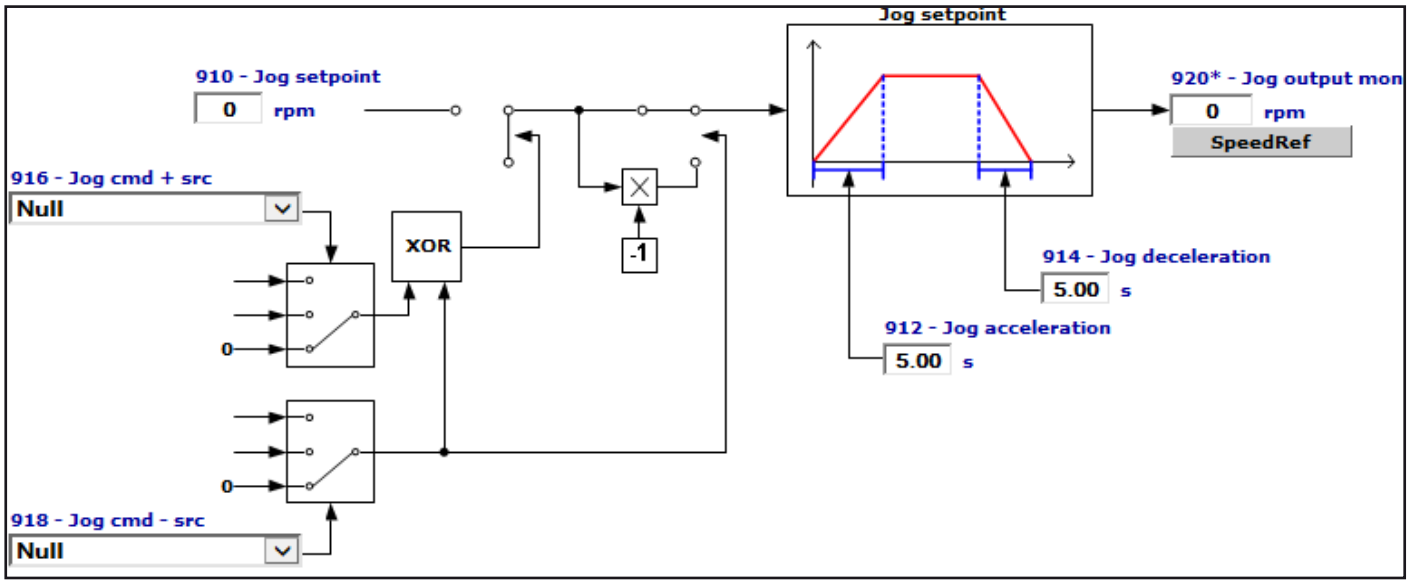


The limit switches at the ends of dancer travel ranges are connected to the Up and Down commands in the motor potentiometer function. If the dancer presses the bottom limit switch, this means motor 2 is running slowly and the Up command must be sent. If the dancer presses the top limit switch, this means motor 2 is running quickly and the Down command must be sent.

Connect the line reference to **Ramp ref 1 src** on both drives, connect the motor potentiometer function output to **Speed ref 1 src** on drive 2.

To change the motor speed immediately, the recommended settings are **Mpot Mode = Ramp&Follow** or **Rampa&Last Val**.

9 – JOG FUNCTION



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
9.1	**910**	**Jog setpoint**	rpm	INT16		0	CALCI	CALCI	RW	F__

The reference for Jog mode operation. This reference can also be set via an analog input. The **Jog** reference is enabled when the signal used for the **Jog +** or **Jog –** command is enabled, the Run command is not present and the drive output frequency is zero.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
9.2	**912**	**Jog acceleration**	s	FLOAT		5.0	0.01	1000.00	RW	F__
9.3	**914**	**Jog deceleration**	s	FLOAT		5.0	0.01	1000.00	RW	F__

Setting of the acceleration/deceleration ramp time (in seconds) used during **Jog** operation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
9.4	**916**	**Jog cmd + src**		LINK	16	6000	0	16384	RW	F__

Selection of the origin (source) of the **Jog +** function enabling signal. When this command is enabled it generates a Jog Mode reference with a sign matching the value entered for the **Jog setpoint value** parameter. The signal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.

Note ! The **Run** command has priority over the **Jog +** command.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
9.5	**918**	**Jog cmd - src**		LINK	16	6000	0	16384	RW	F__

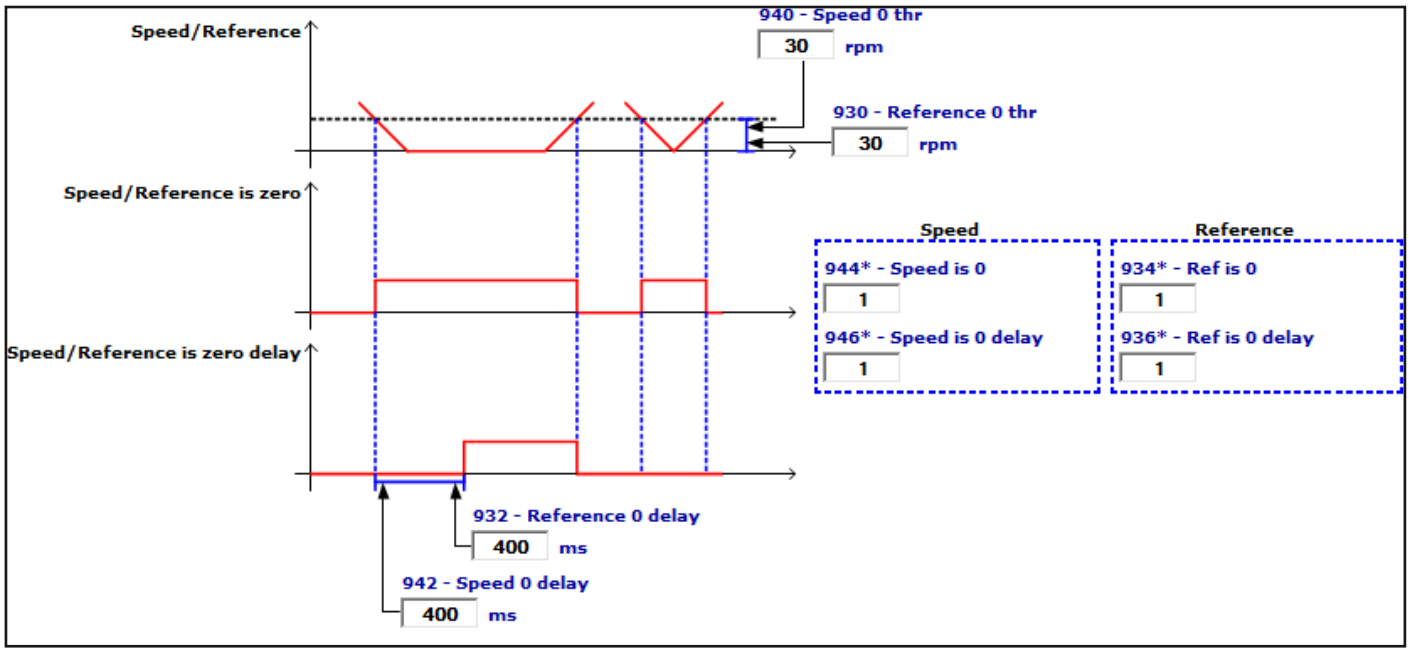
Selection of the origin (source) of the **Jog -** function enabling signal. When this command is enabled the Jog Mode reference sign is inverted with respect to the value entered in the **Jog setpoint value** parameter. The signal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.

Note ! The **Run** command has priority over the **Jog -** command.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
9.6	**920**	**Jog output mon**	rpm	INT16	16/32	0	0	0	ER	F__

The speed reference used by the **Jog** command is displayed.

10 – MONITOR FUNCTION



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.1	**930**	**Reference 0 thr**	rpm	INT16		30	0	CALCI	RW	F__

Setting of the threshold for recognition of the speed = 0 reference. The value is valid for both directions of rotation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.2	**932**	**Reference 0 delay**	ms	UINT16		400	0	10000	RW	F__

Setting of the delay in milliseconds after which the reference = 0 reached signal is enabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.3	**940**	**Speed 0 thr**	rpm	INT16		30	0	CALCI	RW	F__

Setting of the threshold for recognizing speed value = 0. The value is valid for both directions of rotation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.4	**942**	**Speed 0 delay**	ms	UINT16		400	0	10000	RW	F__

Setting of the delay in milliseconds after which the speed = 0 reached signal is enabled.

When the motor reaches a speed that is below the zero speed threshold, it stops and the n=0 LED lights up.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.5	**950**	**Speed threshold 1**	rpm	INT32		0	CALCI	CALCI	RW	F__

Setting of speed threshold 1 (upper). When the threshold is exceeded the **Speed threshold** signal is disabled, with a delay that can be set in **Speed threshold dly**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.6	**952**	**Speed threshold 2**	rpm	INT32		0	CALCI	CALCI	RW	F__

Setting of speed threshold 2 (lower). When the threshold is exceeded the **Speed threshold** signal is disabled, with a delay that can be set in **Speed threshold dly**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.7	**954**	**Speed threshold dly**	ms	UINT16		0	0	50000	RW	F__

Setting of the delay after which the transition from 0 ⇨1 is activated. The transition from 0 ⇨1 occurs when the speed is within the set limits. **The Speed threshold signal transition from 1 ⇨ 0 is always immediate**.

If the motor speed is between **Speed threshold 1** and **Speed threshold 2**, the **Speed threshold** signal is active. If **Speed threshold 1** < **Speed threshold 2** the **Speed threshold** signal is not significant.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.8	**960**	**Set speed ref src**		LINK	16/32	628	0	16384	ERW	F__

Selection of the origin (source) of the signal used as speed reference and on which the speed reached control is performed (for control with ramp, use **Ramp setpoint**, for control without ramp, use **Speed setpoint**). The signal that can be used as the speed reference can be selected from among those listed in the "**L_CMP**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.9	**962**	**Set speed error**	rpm	INT16		100	0	CALCI	RW	F__

Setting of the bandwidth of the tolerance within which, even if the speed is not equal to the reference, the two values are considered to coincide and the **Set speed** signal is enabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.10	**964**	**Set speed delay**	ms	UINT16		0	0	50000	RW	F__

Setting of a delay in ms before the signal (**Set speed** programmed on a digital output), if the speed is within a tolerance band defined by the **Set speed error** parameter, after which the transition from 0 ⇨1 is enabled.

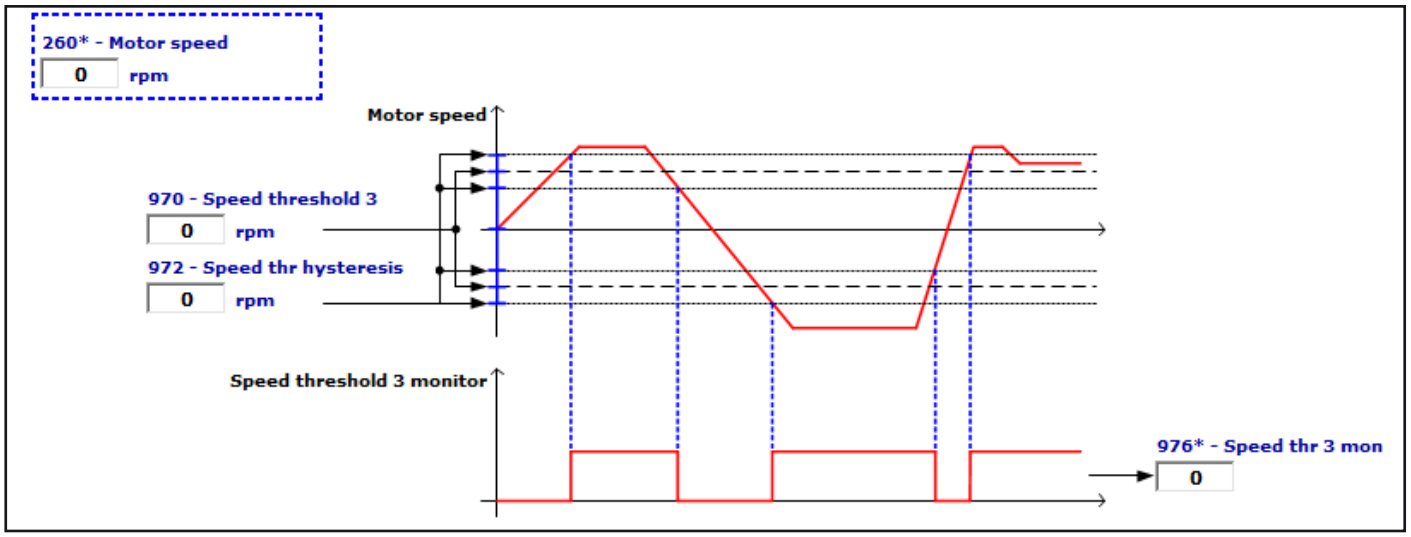
The transition of the Set Speed signal from 0 ⇨1 is always immediate.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.11	**968**	**Dig set speed ref**	rpm	UINT16	16/32	0	CALCI	CALCI	RW	F__

Setting of the threshold used as the speed reference: this parameter is used to set a fixed threshold regardless of the speed reference.

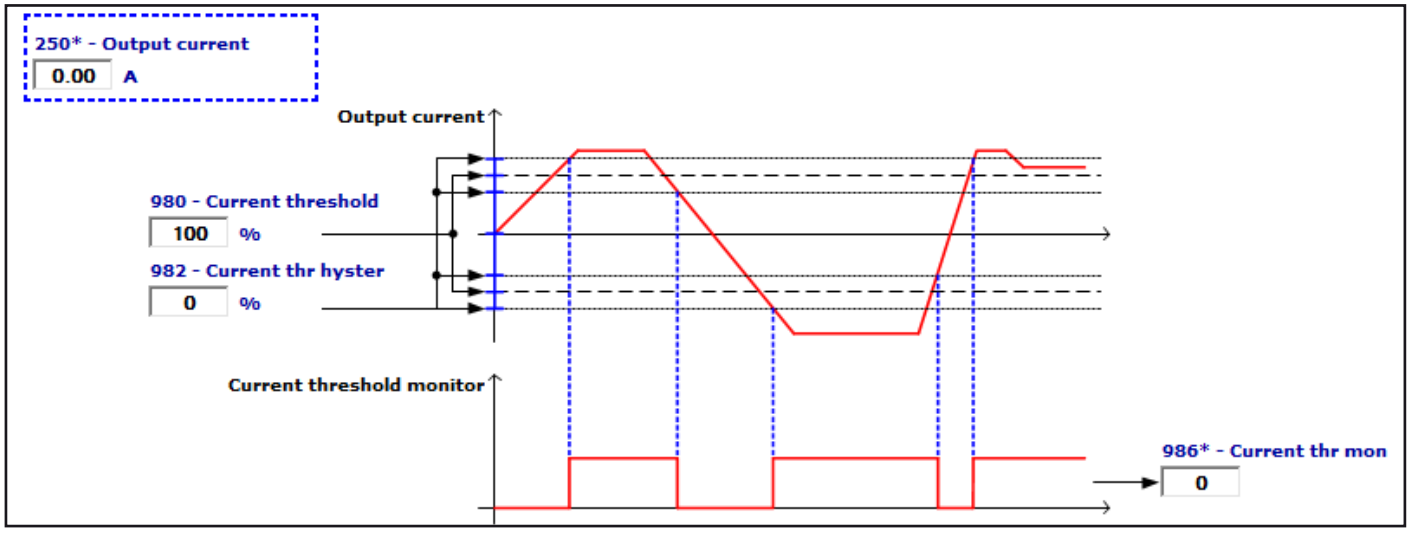
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.12	**970**	**Speed threshold 3**	rpm	INT32		0	0	CALCI	ERW	F__

Setting of the speed 3 threshold. When this threshold + the tolerance band set in parameter **972 Speed thr hysteresis** are exceeded, parameter **976 Speed thr 3 mon** is enabled. The signal is disabled when the motor speed falls below the threshold - the tolerance band. If the threshold value is lower than the value set in **972 Speed thr hysteresis**, the result produced is always 0. The value set in this parameter is active in both directions of rotation.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.13	**972**	**Speed thr hysteresis**	rpm	UINT16		0	0	CALCI	RW	F__

Setting of the tolerance band around **Speed threshold 3**. The tolerance band is the same for both directions of rotation of the motor.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.14	**980**	**Current threshold**	perc	UINT16		100	0	200	RW	F__

Setting of the current threshold. A value of 100% corresponds to the value of the drive continuous current, displayed in parameter **488 Drive cont current**.

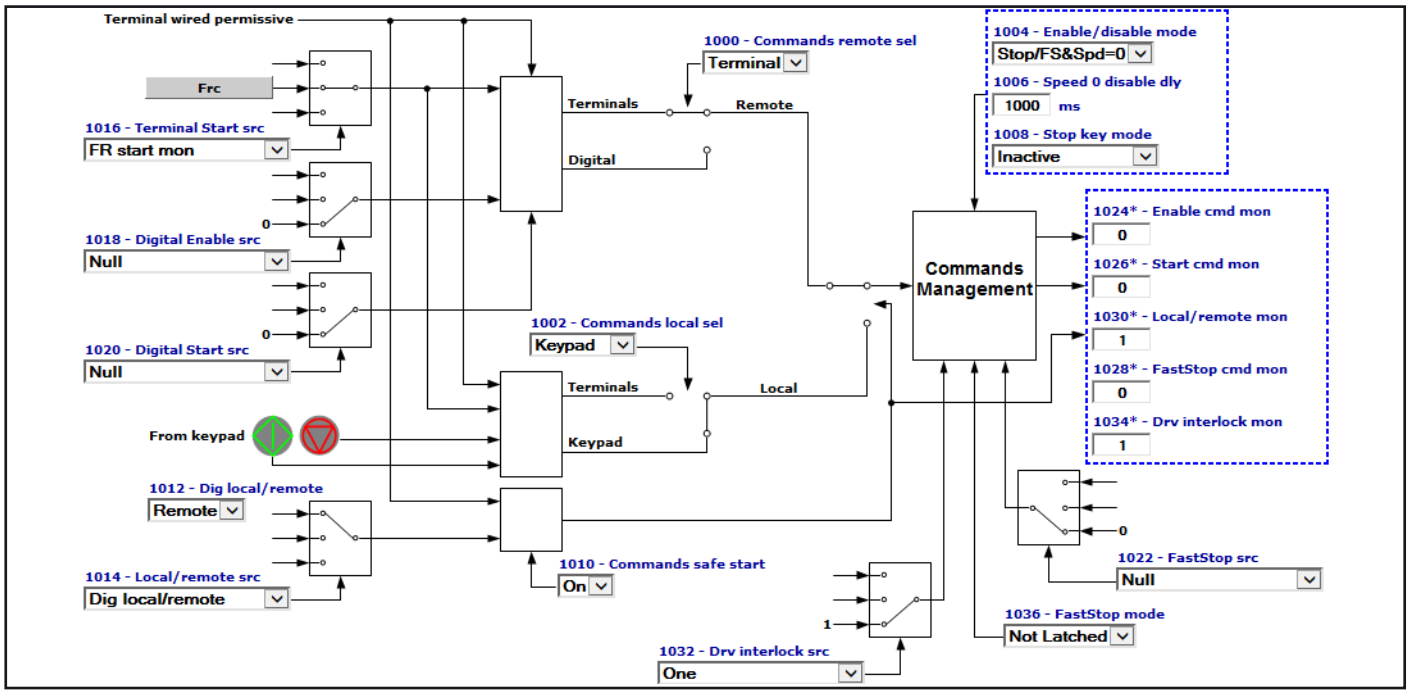
When this threshold + the tolerance band set in parameter **982 Current thr hyster** are exceeded, parameter **986 Current thr mon** is enabled. The signal is disabled when the motor speed falls below the threshold - the tolerance band. If the threshold value is lower than the value set in **982 Current thr hyster**, the result produced is always 0. The value set in this parameter is active in both directions of rotation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.15	**982**	**Current thr hyster**	perc	UINT16		0	0	100	RW	F__

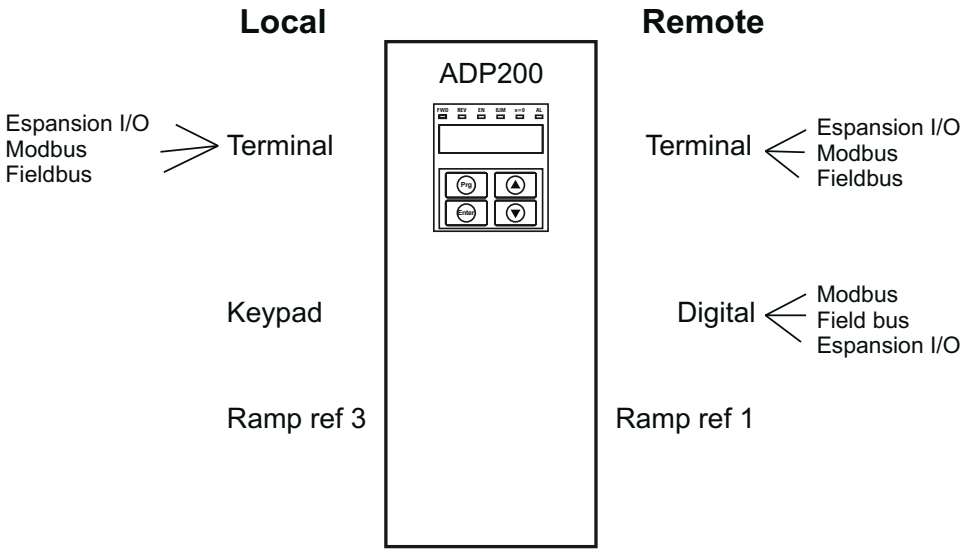
Setting of the tolerance band around the current threshold. A value of 100% corresponds to the value of the drive continuous current, displayed in parameter **488 Drive cont current**.

The tolerance band is the same for both directions of rotation of the motor.

11 – COMMANDS



It is possible to work in **Local** or **Remote** mode.



When switching between **Remote** and **Local** modes the origin of the Enable and Start commands is switched and in the **Ramp Ref** block, switching occurs between Ramp ref 1 and Ramp ref 3.

In **Remote** mode the "**Commands remote sel**" parameter is used to configure the source of the Enable and Start commands which can be **Terminal** (expansion digital input, Modbus, Fieldbus) or **Digital** (Modbus, Fieldbus).

In **Local** mode the "**Commands local sel**" parameter is used to configure the source of the Enable and Start commands, which can be **Terminal** (expansion digital input, Modbus, Fieldbus) or **Keypad** (Start key, Stop key).

In **Remote** ⇨ **Digital** mode the **Digital Enable src** and **Digital Start src** parameters must be used to configure the source.

Normally the sources are the Pad parameters. Modbus or Fieldbus must therefore write the desired value on the Pad parameters. Alternatively, the value of 6000 can be written directly on the **Digital Enable src** and **Digital Start src** parameters for a source of Null (0) or the value of 6002 for a source of One (1).

Another alternative is to configure the **Digital Enable src** and **Digital Start src** sources on the **BitX decomp mon** parameters, so that the Modbus or Fieldbus can then write the desired value on the **Dig word decomp** parameter.

Local ⇔ Remote switching is performed with the variable value configured as **Loc/Remote src**, i.e. it can be an expansion digital input, Modbus, Fieldbus, **Dig Local/Remote**.

In the default condition, the associated variable is **Dig Local/Remote**, which is written by the **LOC** key from the keypad: switching is thus performed by pressing the **LOC** key.

For safety reasons, **Local ⇔ Remote** switching is only performed with **Terminal Enable = 0**.

Example 1

With the machine in automatic operating mode, the drive works in Remote -> Digital -> Fieldbus mode.

With the machine in manual operating mode, the drive works in Local -> Terminal -> Expansion digital input mode.

If switching from automatic to manual machine operation, the drive must switch between Remote and Local mode. The switch command must be sent via Expansion digital input or fieldbus.

Example 2

With the machine controlled from console A, the drive operates in Local -> Terminal -> Expansion digital input mode.

With the machine controlled from console B, the drive operates in Remote ->Digital -> Expansion digital input mode.

When switching the control console, the drive must switch between Remote and Local mode. The switch command must be sent via Expansion digital input.

This configuration is allowed because the Terminal variables are available in the digital command selection lists.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.1	**1000**	**Commands remote sel**		ENUM		Terminals			RWZ	F__

This parameter defines the source of the command signals when the drive is used in the Remote mode.

The Enable command can only be set via hardware, connecting a positive voltage (+24VDC) to dedicated terminal.

0 Terminals
1 Digital

When the parameter is set to **Terminals** the source of the **Enable cmd mon** command is the **Enable** terminal and the origin of the **Start cmd mon** command is configured using the **Terminal Start src** parameter.

When the parameter is set to **Digital** the origin of the **Enable cmd mon** command is configured using the **Digital Enable src** parameter and the origin of the **Start cmd mon** command is configured using the **Digital Start src** parameter.

If **Digital** is set to generate the **Enable cmd mon** command, as well as the variable associated with **Digital Enable src**, the enable hardware command must also be sent to the **Enable** terminal.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.2	**1002**	**Commands local sel**		ENUM		Keypad			ERWZ	F__

This parameter defines the source of the command signals when the drive is used in the **Local** mode.

0 Terminals
2 Keypad

When the parameter is set to **Terminals** the source of the **Enable cmd mon** command is the **Enable** terminal- and the origin of the **Start cmd mon** command is configured using the **Terminal Start src** parameter.

When the parameter is set to **Keypad** the origin of the **Enable cmd mon** and **Start cmd mon** commands is the Start key. When **Keypad** is set to generate the **Enable cmd mon** command, as well as the Start key the enable hardware command must also be sent to the **Enable** terminal.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.3	**1004**	**Enable/disable mode**		ENUM		Stop/FS&Spd=0			ERWZ	F__

This parameter is used to define the generation of **Enable cmd mon**, i.e. to configure the type of control used for enabling and disabling the drive.

0 Off
1 Stop/FS&Spd = 0
2 Stop&Spd = 0
3 FS&Spd = 0

If set to **0 Off**:

In **Terminal** mode the drive is enabled and disabled via the **Enable** terminal.

In **Digital** mode the drive is enabled and disabled when the signal on the **Enable** terminal and the **Digital Enable** command are present simultaneously.

In **Keypad** mode the drive is enabled if the hardware is enabled on the **Enable** terminal and the **Start** key is pressed.

In **Keypad** mode it is disabled if the hardware is not enabled on the **Enable** terminal or if the **Stop** key is pressed twice.

If **1 Stop/FS&Spd = 0** is set:

In **Terminal** mode the drive is enabled when the hardware is enabled on the **Enable** terminal, on the terminal programmed as **Terminal Start** and the **FastStop** terminal must not be enabled.

In **Terminal** mode the drive is instantly disabled if there is no signal on the **Enable** terminal, or when speed=0 is reached if the **Start command** is disabled or the terminal programmed as **FastStop** is enabled.

In **Digital** mode the drive is enabled when the hardware is enabled on the **Enable** terminal, the **Digital Enable**, In **Digital** mode the drive is instantly disabled if there is no signal on the **Enable** terminal, or when speed=0 is reached if the **Digital Start** command is disabled or the terminal programmed as **FastStop** is enabled.

In **Keypad** mode the drive is enabled if the hardware is enabled on the **Enable** terminal and the **Start** key is pressed, with the command disabled on the **FastStop** terminal.

In **Keypad** mode the drive is disabled instantly if the signal is not present on the **Enable** terminal or the **Stop** key is pressed twice.

If **2 Stop&Spd = 0** is set:

In **Terminal** mode the drive is enabled if the hardware is enabled on the **Enable** terminal and the signal is enabled on the terminal programmed as **Terminal Start**.

In **Terminal** mode the drive is instantly disabled if there is no signal on the **Enable** terminal, or if, upon reaching the speed=0, the **Terminal Start** command is disabled.

In **Digital** mode the drive is enabled when the hardware is enabled on the **Enable** terminal and the **Digital Enable** and **DigitalStart** signals are present.

In **Digital** mode the drive is instantly disabled if the signal is not present on the **Enable** terminal, or the **Digital Enable** command is not present, or upon reaching the speed=0 if the **Digital Start** command is set to 0.

In **Keypad** mode the drive is enabled when the hardware is enabled on the **Enable** terminal and the **Start** key is pressed.

In **Keypad** mode the drive is instantly disabled if the signal is not present on the **Enable** terminal or the **Stop** key is pressed twice, or when the speed=0 is reached if the **Stop** key is pressed.

If **3 FS&Spd = 0** is set:

In **Terminal** mode the drive is enabled when the hardware is enabled on the **Enable** terminal and the **FastStop terminal** is not enabled.

In **Terminal** mode the drive is instantly disabled if there is no signal on the **Enable** terminal, or when the speed=0 is reached if the terminal programmed as **FastStop** is enabled.

In **Digital** mode the drive is enabled if the hardware is enabled on the **Enable** terminal and the **Digital Enable**

signal is present, with the command on the **FastStop** terminal disabled.

In **Digital** mode the drive is instantly disabled if there is no signal on the **Enable** terminal, or no **Digital Enable** command, or when the speed=0 is reached if the **Digital Start** command is set to 0.

In **Keypad** mode the drive is enabled if the hardware is enabled on the **Enable** terminal and the **Start** key is pressed, with the **FastStop** command disabled.

In **Keypad** mode the drive is instantly disabled if there is no signal on the **Enable** terminal or the **Stop** key is pressed twice, or if, when the speed=0 is reached, the terminal programmed as **FastStop** is enabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.4	**1006**	**Speed 0 disable dly**	ms	UINT16		1000	0	10000	ERW	F__

Setting of a delay in milliseconds between reaching the zero speed and disabling the drive when **Enable/Disable mode** is set to a value other than **Off**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.5	**1008**	**Stop key mode**		ENUM		Inactive			ERW	F__

Setting of the stop key functioning on the keypad. In Local with command from Keypad , this configuration is ineffective.

Active in remote control mode (PAR 1012=1) both by using “Terminals” command or “Digital” commands and, in local control mode (PAR 1012=0) by using “Terminals” command

0 Inactive

1 EmgStop&Alarm

If the command is set to **Inactive**, pressing the Stop key on the keypad is ineffective.

If the command is set to **EmgStop&Alarm**, when the Stop key is pressed the motor stops in FastStop mode and the **Emg stop alarm** is generated. When the motor reaches the speed=0, the drive is automatically disabled and waits for the **Fault reset** command. The **Fault reset** command must be sent twice to reset the drive.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.6	**1010**	**Commands safe start**		BIT		1	0	1	ERW	F__

This parameter is used to define whether the safe start command is disabled or enabled at drive power-on.

0 Off

1 On

If set to **Off**, the safe start command is disabled. If the drive is powered-on with the hardware enabled on the **Enable** terminal, the motor could start rotating.

When set to **On**, the safe start command is enabled. If the drive is powered-on with the hardware enabled on the **Enable** terminal, the motor will not rotate. To set the drive to accept subsequent commands, open the hardware enabling contact on the **Enable** terminal and then close it again.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.7	**1012**	**Dig local/remote**		ENUM	16	Remote			ERW	F__

Setting **Local** or **Remote** operating mode.

0 Local

1 Remote

Writing this parameter is only effective if it is associated with **Local/Remote src** and if performed without the hardware enabled on the **Enable** terminal. Press LOC to modify the value of this parameter 0<->1.

To disable the LOC key, set **Local/Remote src** to a value other than **Dig local/remote**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.8	**1014**	**Local/remote src**		LINK	16	1012	0	16384	ERW	F__

Selection of the origin (source) of the signal that switches between **Remote** and **Local**. Switching can only be performed if the hardware is not enabled on the **Enable** terminal.

The signal to be associated with this function can be selected from the "**L_DIGSEL3**" selection list.

0 Local

1 Remote

In **Remote** mode the "**Commands remote sel**" parameter is used to configure the source of the Enable and Start commands, which can be **Terminal** (standard digital input, expansion digital input) or **Digital** (Modbus, Fieldbus).

In **Local** mode the "**Commands local sel**" parameter is used to configure the source of the Enable and Start commands, which can be **Terminal** (standard digital input, expansion digital input) or **Keypad** (Start key, Stop key).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.9	**1016**	**Terminal Start src**		LINK	16	1048	0	16384	ERW	F__

Selection of the origin (source) of the **Terminal Start** signal. Switching can only be performed if the hardware is not enabled on the **Enable** terminal.

The signal to be associated with this function can be selected from the "**L_DIGSEL3**" selection list.

In the default condition, the origin of the Terminal Start signal is the **Start** output of the ForwardReverseControl (FRC) block.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.10	**1018**	**Digital Enable src**		LINK	16	6000	0	16384	ERW	F__

Selection of the origin (source) of the signal that defines the enabling of the drive when the commands are sent via serial line or fieldbus. The command to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.11	**1020**	**Digital Start src**		LINK	16	6000	0	16384	ERW	F__

Selection of the origin (source) of the Digital Start signal. The signal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.12	**1022**	**FastStop src**		LINK	16	6000	0	16384	ERW	F__

Selection of the origin (source) for the fast stop signal (FastStop). The terminal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list. During the execution of the FastStop command the ramps used are **Acceleration time 3** and **Deceleration time 3**.

The **FastStop mode** (PAR 1036) parameter can be used to define the specific operating modes for automatic motor restart.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.13	**1024**	**Enable cmd mon**		BIT	16	0	0	1	R	F__

The status of the enable command is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.14	**1026**	**Start cmd mon**		BIT	16	0	0	1	R	F__

The status of the Start command is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.15	**1028**	**FastStop cmd mon**		BIT	16	0	0	1	R	F__

This parameter is used to display the value of the FastStop command state.

0 FastStop not active

1 FastStop active

If the “FastStop mode” parameter is set to 0 = “Not Latched”, the value of the FastStop command monitor changes to 1 when the FastStop input is activated and remains high (1) until the Enable or FastStop inputs are deactivated (0 state).

If the “FastStop mode” parameter is set to 1 = “Latched”, the value of the FastStop command monitor changes to 1 when the FastStop input is activated and remains high (1) until the Enable, Start, FastStop inputs are deactivated (0 state).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.16	**1040**	**FR mode**		ENUM		Two wire			ERWZ	F__

Setting of the operating mode of the Forward Reverse Control (FRC) block.

0 Normal

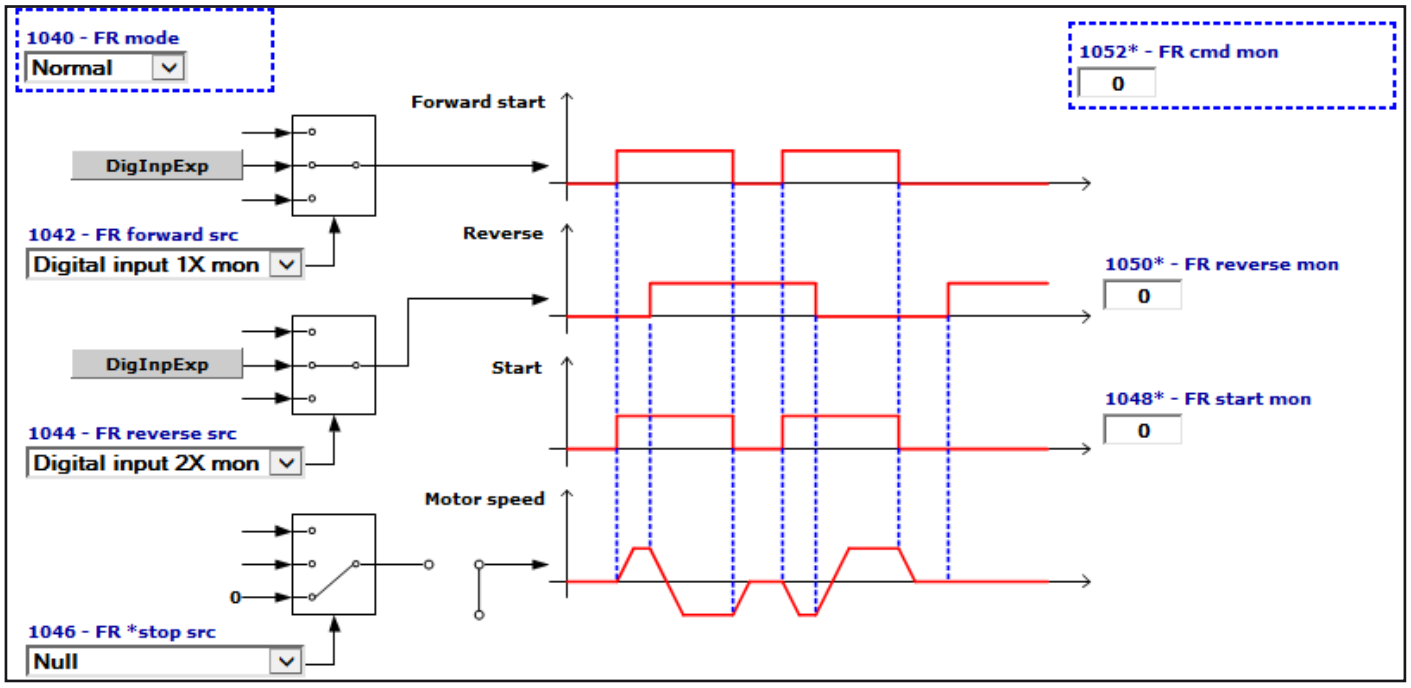
1 Two wire Two wire control

2 Three wire Three wire control

The default use of the FRC block is shown below.

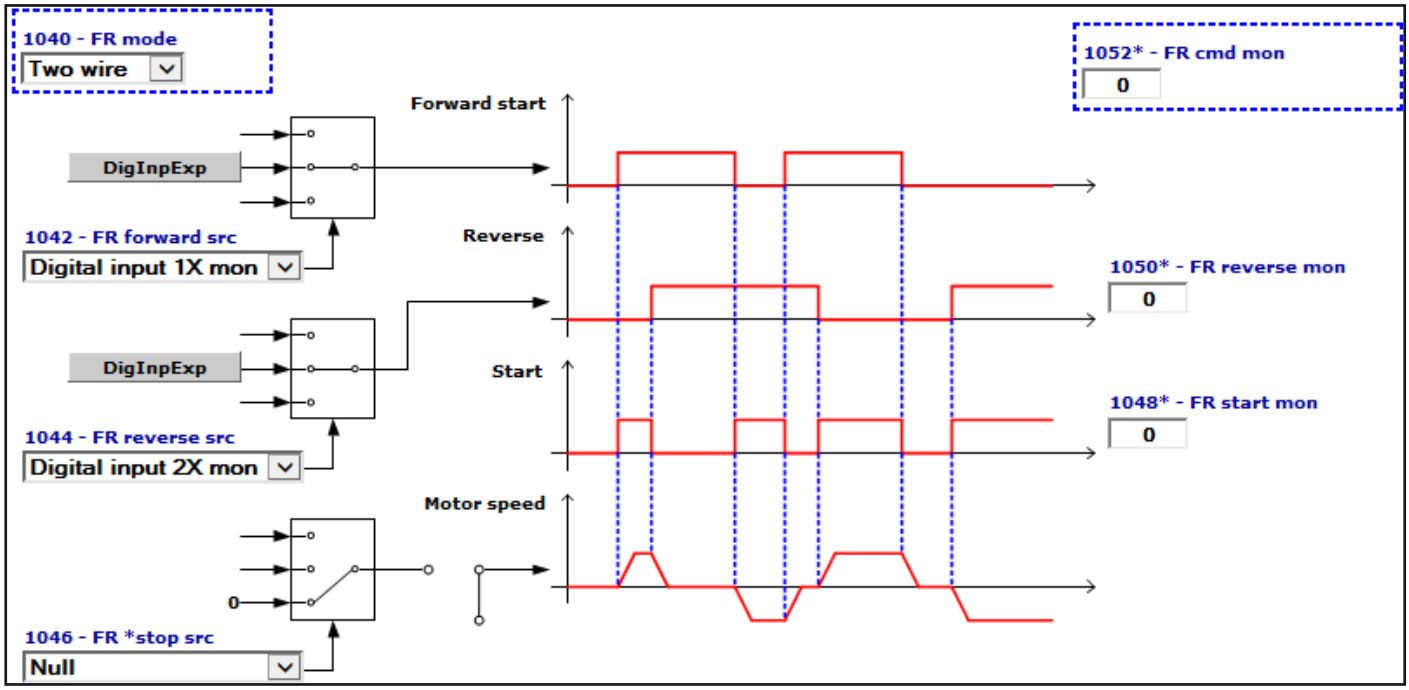
The Start command is linked to the Start terminal and the Reverse command is linked to Ramp ref invert.

The function diagrams of the 3 modes are shown below.



When **0 - Normal** control is set the motor only starts rotating when the **FR Forward** command is sent. If the **FR Reverse** command is present the motor rotates in the reverse direction,

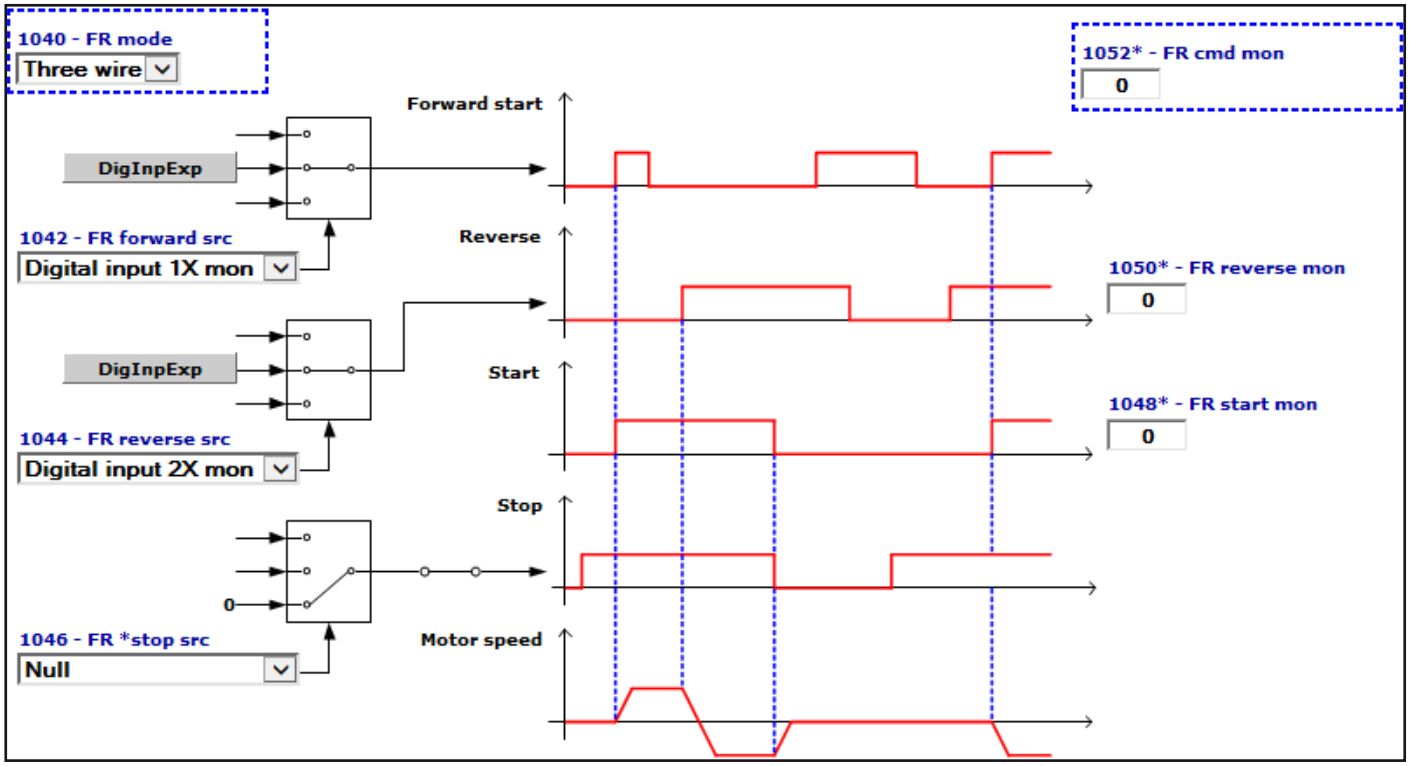
The **FR start mon** output repeats the status of the **FR Forward** command, while the **FR reverse mon** output repeats the status of the **FR Reverse** command.



When set to **1 - Two wire** control, the motor only rotates if the **FR Forward** command or **FR Reverse** command is present. The simultaneous presence of the **FR Forward** and **FR Reverse** commands causes the motor to stop.

The **FR start mon** output is enabled if the **FR Forward** and **FR Reverse** commands are not present simultaneously.

The **FR reverse mon** output repeats the status of the **FR Reverse** command.



For **2 - Three wire** control the **FR *stop** command must be present on a digital input programmed via the **FR *stop src** parameter (not present in the default condition). When set to **Three wire** control, the motor starts upon receiving an impulse of not less than 50 msec on the **FR Forward** terminal. Once the motor has started the command is no longer necessary on the **FR Forward** terminal. To reverse the direction of rotation enable the FR Reverse command: the motor will be brought to the zero speed with the set ramp and will restart in the opposite direction of rotation. The motor rotates in the Reverse direction for as long as the FR Reverse signal is enabled. If the **FR Reverse** signal is disabled the motor rotates in the **Forward** direction. To stop the motor open the FR *stop contact.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.17	**1042**	**FR forward src**		LINK	16	1210	0	16384	ERW	F__

Selection of the origin (source) for the FR forwardstart signal. With this command the motor starts to rotate (with the **Enable** command enabled). The terminal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.18	**1044**	**FR reverse src**		LINK	16	1212	0	16384	ERW	F__

Selection of the origin (source) for the FR reverse signal. With this command the motor reverses the direction of rotation (with the **Enable** command enabled). The terminal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.19	**1046**	**FR *stop src**		LINK	16	6000	0	16384	ERW	F__

Selection of the origin (source) for the FR stop signal. The terminal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.20	**1048**	**FR start mon**		BIT	16	0	0	1	ER	F__

The status of the Start output of the **Forward Reverse Control (FRC)** block is displayed.

0 Stop
1 Start

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.21	**1050**	**FR reverse mon**		BIT	16	0	0	1	ER	F__

The status of the Reverse output of the **Forward Reverse Control (FRC)** block is displayed.

0 No Reverse
1 Reverse

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.22	**1052**	**FR cdm mon**		UINT16		0	0	0	ER	F__

The status of the commands of the **Forward Reverse Control (FRC)** block are displayed.

FR *stop src	FR reverse src	FR forward src	FR cdm mon
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	0	0	4
1	0	1	5
1	1	0	6
1	1	1	7

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.23	**1032**	**Drv Interlock src**		LINK	16	6002	0	16384	ERW	F__

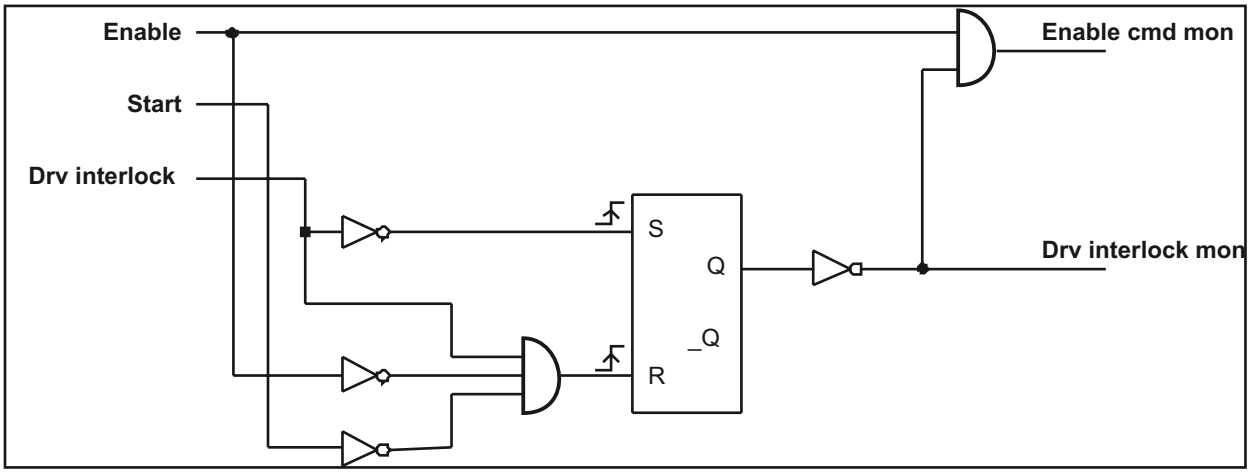
This parameter is used to select the origin (source) of the Drv Interlock signal.
The signal to be associated with this function can be selected from the "L_DIGSEL2" selection list.

0 Drive interlock active (Drive disabled)
1 Drive interlock not active (Drive can be enabled)

If the Drive Interlock command is active, the drive cannot be enabled (Drive Enable command).

If the Drive Interlock command is not active, the drive can be enabled by applying the Drive enable command.

In default conditions the "**Drv Interlock src**" signal is connected to "One". In this configuration the Drive interlock function is not active and the drive can only be enabled with the "Enable" command.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.24	**1034**	**Drv interlock mon**		BIT	16	0	0	1	ER	F__

In "**Drv interlock mon**" the Drive interlock state remains active until the Safety card is deactivated and the "Enable" and "Start" commands are set to low (0).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.25	**1036**	**FastStop mode**		ENUM		Not Latched			ERW	F__

This parameter is used to select the operating mode of the FastStop command.

0 Not Latched

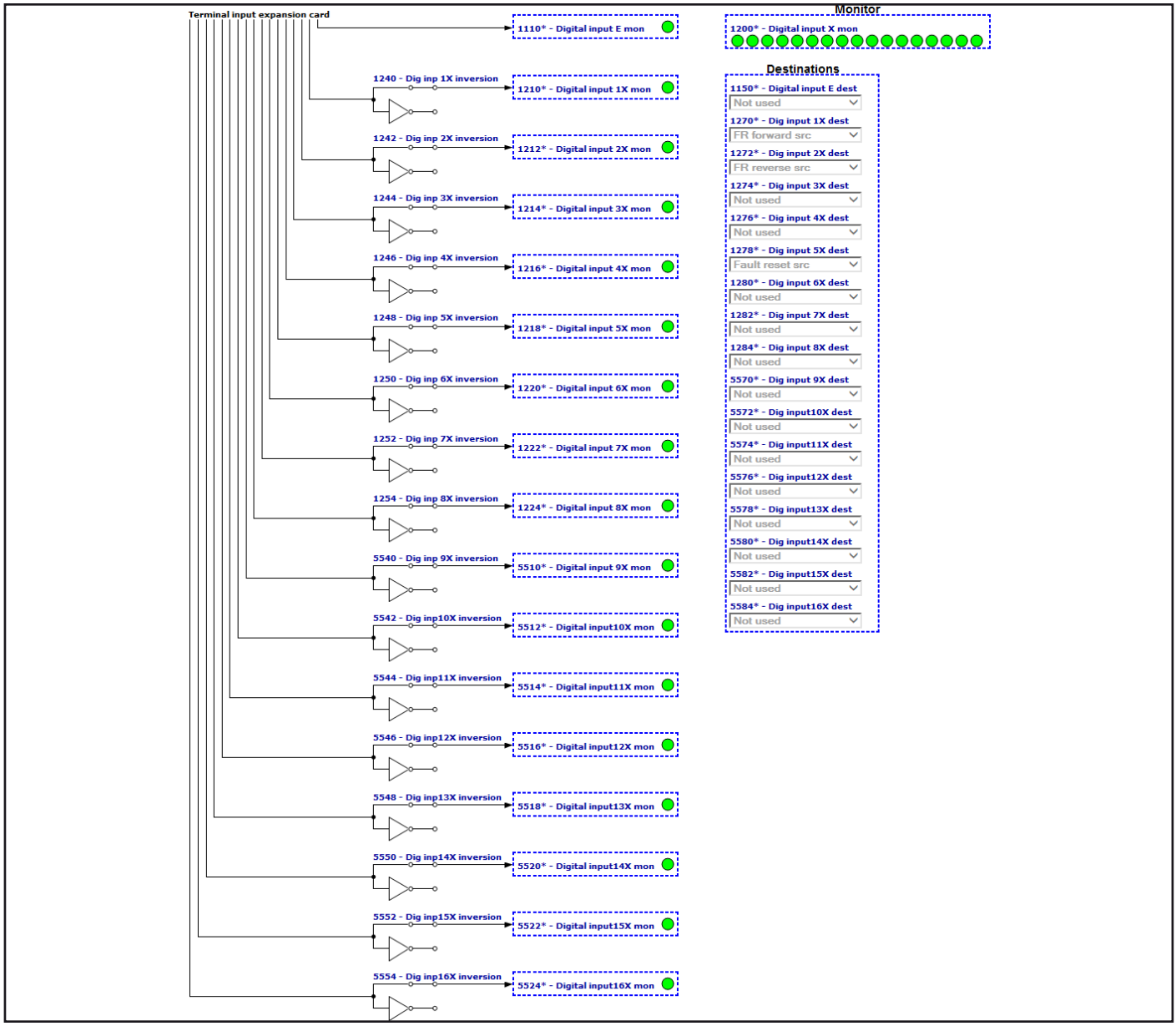
1 Latched

If set to 0 (Not Latched), the FastStop command is not stored. Therefore, if the FastStop command is removed the drive automatically restarts.

If set to 1 (Latched) the FastStop command is stored. If the FastStop command is removed, the drive will not restart automatically. It can only restart after removing the FastStop command and sending a new Enable and Start command.

12 – DIGITAL INPUTS

Note: The numbering and description of the following parameters may change if an MDPLc application is active.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
12.1	**1240**	**Dig inp 1X inversion**		BIT		0	0	1	RW	F__
12.2	**1242**	**Dig inp 2X inversion**		BIT		0	0	1	RW	F__
12.3	**1244**	**Dig inp 3X inversion**		BIT		0	0	1	RW	F__
12.4	**1246**	**Dig inp 4X inversion**		BIT		0	0	1	RW	F__
12.5	**1248**	**Dig inp 5X inversion**		BIT		0	0	1	RW	F__
12.6	**1250**	**Dig inp 6X inversion**		BIT		0	0	1	RW	F__
12.7	**1252**	**Dig inp 7X inversion**		BIT		0	0	1	RW	F__
12.8	**1254**	**Dig inp 8X inversion**		BIT		0	0	1	RW	F__
12.9	**5540**	**Dig inp 9X inversion**		BIT		0	0	1	ERW	F__
12.10	**5542**	**Dig inp 10X inversion**		BIT		0	0	1	ERW	F__
12.11	**5544**	**Dig inp 11X inversion**		BIT		0	0	1	ERW	F__

12.12	**5546 Dig inp 12X inversion**	BIT	0	0	1	ERW	F__
12.13	**5548 Dig inp 13X inversion**	BIT	0	0	1	ERW	F__
12.14	**5550 Dig inp 14X inversion**	BIT	0	0	1	ERW	F__
12.15	**5552 Dig inp 15X inversion**	BIT	0	0	1	ERW	F__
12.16	**5554 Dig inp 16X inversion**	BIT	0	0	1	ERW	F__

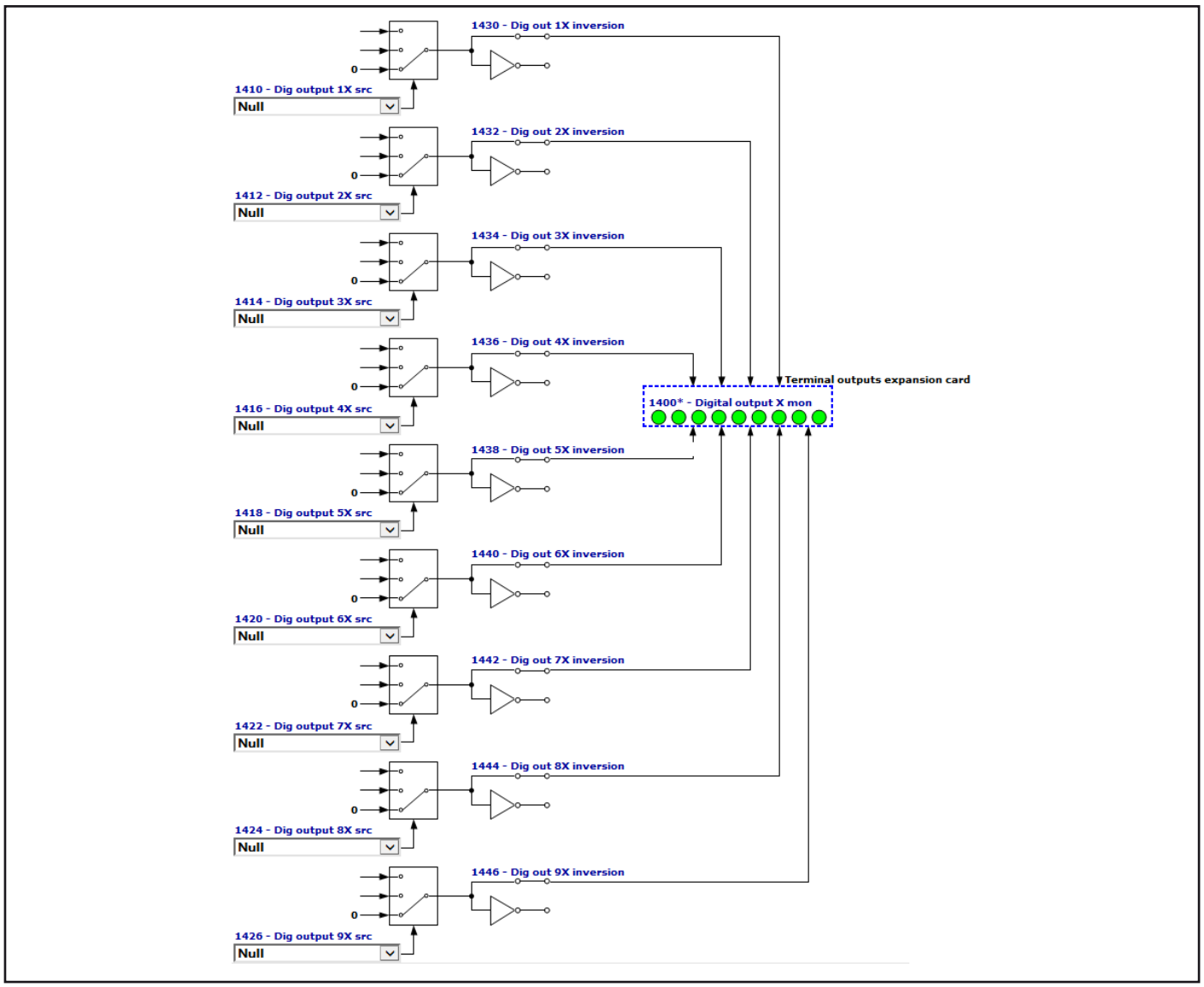
These parameters invert the state of the corresponding digital input of the expansion.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
12.17	**1150**	**Digital input E dest**		ILINK		0	0	0	ER	F__
12.18	**1270**	**Dig input 1X dest**		ILINK		0	0	0	ER	F__
12.19	**1272**	**Dig input 2X dest**		ILINK		0	0	0	ER	F__
12.20	**1274**	**Dig input 3X dest**		ILINK		0	0	0	ER	F__
12.21	**1276**	**Dig input 4X dest**		ILINK		0	0	0	ER	F__
12.22	**1278**	**Dig input 5X dest**		ILINK		0	0	0	ER	F__
12.23	**1280**	**Dig input 6X dest**		ILINK		0	0	0	ER	F__
12.24	**1282**	**Dig input 7X dest**		ILINK		0	0	0	ER	F__
12.25	**1284**	**Dig input 8X dest**		ILINK		0	0	0	ER	F__
12.26	**5570**	**Dig input 9X dest**		ILINK		0	0	0	ER	F__
12.27	**5572**	**Dig input 10X dest**		ILINK		0	0	0	ER	F__
12.28	**5574**	**Dig input 11X dest**		ILINK		0	0	0	ER	F__
12.29	**5576**	**Dig input 12X dest**		ILINK		0	0	0	ER	F__
12.30	**5578**	**Dig input 13X dest**		ILINK		0	0	0	ER	F__
12.31	**5580**	**Dig input 14X dest**		ILINK		0	0	0	ER	F__
12.32	**5582**	**Dig input 15X dest**		ILINK		0	0	0	ER	F__
12.33	**5584**	**Dig input 16X dest**		ILINK		0	0	0	ER	F__

These parameters show which “src” parameter is using the corresponding digital input of the expansion card.

13 – DIGITAL OUTPUTS

Note: The numbering and description of the following parameters may change if an MDPLc application is active.



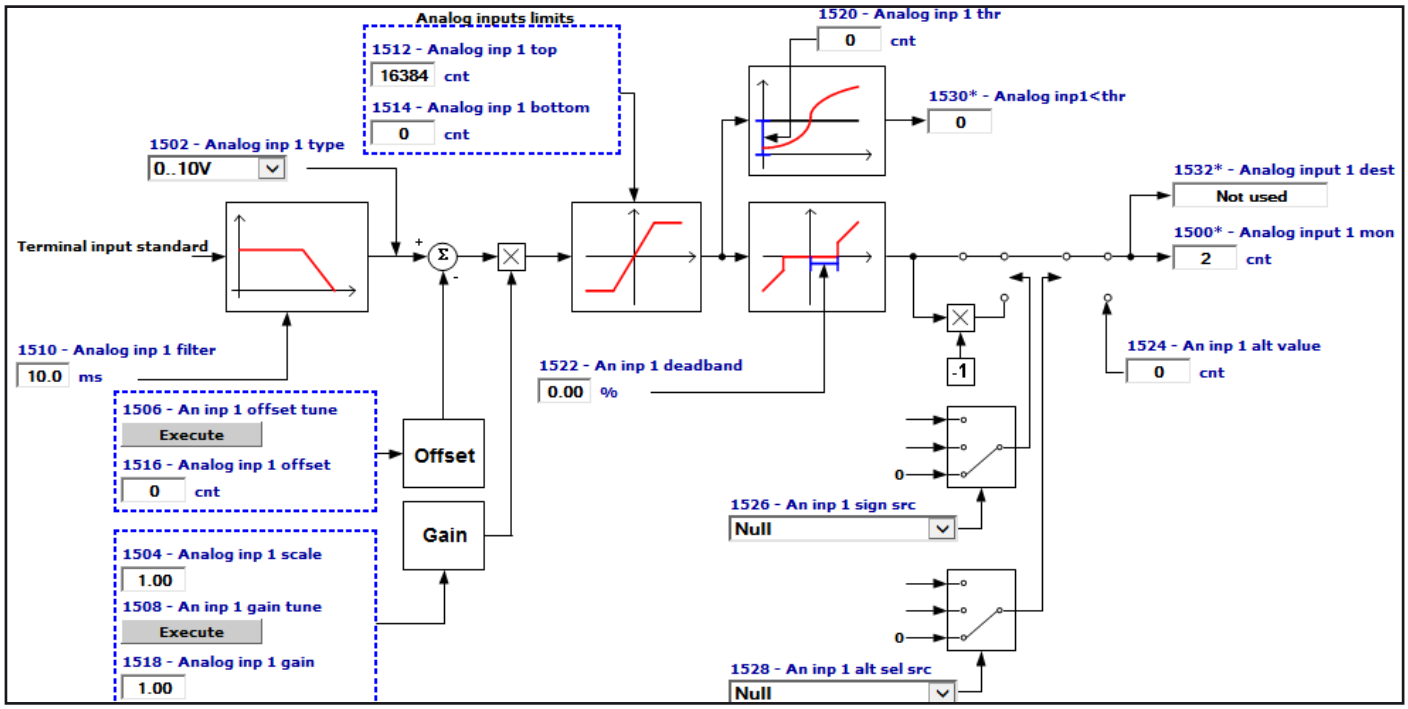
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
13.1	**1410**	**Dig output 1X src**		LINK	16	6000	0	16384	RW	F__
13.2	**1412**	**Dig output 2X src**		LINK	16	6000	0	16384	RW	F__
13.3	**1414**	**Dig output 3X src**		LINK	16	6000	0	16384	RW	F__
13.4	**1416**	**Dig output 4X src**		LINK	16	6000	0	16384	RW	F__
13.5	**1418**	**Dig output 5X src**		LINK	16	6000	0	16384	RW	F__
13.6	**1420**	**Dig output 6X src**		LINK	16	6000	0	16384	RW	F__
13.7	**1422**	**Dig output 7X src**		LINK	16	6000	0	16384	RW	F__
13.8	**1424**	**Dig output 8X src**		LINK	16	6000	0	16384	RW	F__
13.9	**1426**	**Dig output 9X src**		LINK	16	6000	0	16384	RW	F__

Selection of the origin (source) of the signal to be assigned to the relative digital output of the expansion card. The functions that can be associated with the digital outputs are listed in the "**L_DIGSEL1**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
13.10	**1430**	**Dig out 1X inversion**		BIT		0	0	1	RW	F__
13.11	**1432**	**Dig out 2X inversion**		BIT		0	0	1	RW	F__

13.12	**1434 Dig out 3X inversion**	BIT	0	0	1	RW	F__
13.13	**1436 Dig out 4X inversion**	BIT	0	0	1	RW	F__
13.14	**1438 Dig out 5X inversion**	BIT	0	0	1	RW	F__
13.15	**1440 Dig out 6X inversion**	BIT	0	0	1	RW	F__
13.16	**1442 Dig out 7X inversion**	BIT	0	0	1	RW	F__
13.17	**1444 Dig out 8X inversion**	BIT	0	0	1	RW	F__
13.18	**1446 Dig out 9X inversion**	BIT	0	0	1	RW	F__

Reversal of the logic status of the function associated with the digital output of the expansion card.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.1	**1500**	**Analog input 1 mon**	cnt	INT16	16/32	0	0	0	R	F__

The value of the voltage on the output of the function block of the relative analog input is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.2	**1502**	**Analog inp 1 type**		ENUM		0..10V			RW	F__

Note ! Available only with expansion I/O card type 7 or 8. In PID_IMM application, this input, is used to connect the pressure feedback sensor. For completely electrical characteristic of this input referred to Quick start-up guide.

Selection of the type of input (voltage or current). Depending on the input signal, move the switches on the regulation card. The factory parameter is inputs set for differential voltage signals (± 0..10V).

0 -10V…+10V
1 0.20mA … 10V
2 4..20mA
3 0..30mA
7 0.1V..10.1V
8 0..10.1V

Option **0**: not available on I/O card type 7 or 8.

Select option **1** or **3** to connect a max voltage of 10.1V (typically +10V) or a signal in current from 0 ... 20 mA to the analog input.

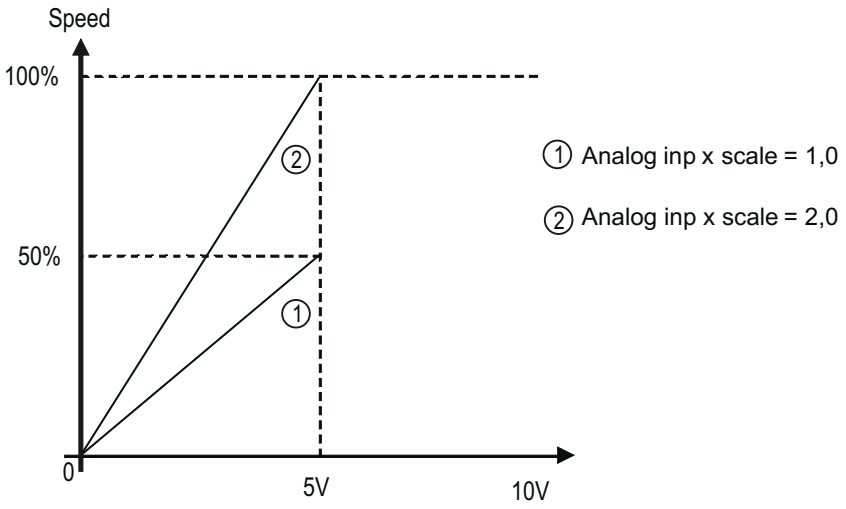
Select option **2** to connect a current signal of 4...20 mA to the analog input. In case of disconnection of the signal an error indication will be generated in PAR 1540 **An inp 1 err mon** after the time indicated in PAR 1538 **An inp 1 err delay**.

Select option **7** to connect pressure sensor with 0.1..10.1V output characteristic. In case of disconnection of the signal an error indication will be generated in PAR 1540 **An inp 1 err mon** after the time indicated in PAR 1538 **An inp 1 err delay**.

Selection option **8** to connect pressure sensor with 0.1..10.1V output characteristic. In case of disconnection of the signal there isn't any error indication.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.3	**1504**	**Analog inp 1 scale**		FLOAT		1.0	-10.0	10.0	RW	F__

Setting of a multiplier factor to apply to the relative analog input.



Example:

The speed reference of a drive is assigned with a max external voltage of 5V. With this value the drive must reach the maximum speed allowed (set using **Full scale speed**).

As the **Analog inp x scale** parameter a scale factor of 2 is entered (10V : 5V)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.4	**1506**	**An inp 1 offset tune**		BIT		0	0	1	RW	F__

Self-tuning command for the relative analog input offset. Automatic fine tuning of the input. To perform self-tuning, set the input signal to its minimum value and execute the command. The conditions containing an offset can be compensated. When this command is sent, **An inp x offset tune** is automatically selected so that the available input signal corresponds to the zero value of the variable. Offset tuning can also be performed with the drive enabled.

Automatic tuning can only be performed if the following condition is present:

- Input voltage less than 1V or input current less than 2 mA

Note ! The value that is obtained automatically can be changed manually if necessary, using **Analog inp x offset.**

If the voltage setting on the analog input is higher than 1V, the Value too low alarm is generated.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.5	**1508**	**An inp 1 gain tune**		BIT		0	0	1	RW	F__

Self-tuning command for the relative analog input gain. Automatic fine tuning of the input. When this command is sent, **Analog inp 1 gain x** is automatically selected so that the available input signal corresponds to the maximum value of the variable. Offset tuning can also be performed with the drive enabled.

Two conditions are necessary in order to perform automatic tuning:

- Input voltage greater than 1V or input current greater than 2 mA
- Positive polarity. The value that is found is automatically accepted for the other direction of rotation.

Note ! If necessary, the value obtained automatically can be changed manually via **Analog inp x gain**.

To perform self-tuning, set the input signal to its maximum value and execute the command. A multiplier factor is calculated to apply to the input signal value (not considering the **Analog inp scale** parameter) to reach the full scale value.

If the voltage setting on the analog input is less than 1V, the Value too low alarm is generated.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.6	**1510**	**Analog inp 1 filter**	ms	FLOAT		10.0	1.0	1000.0	ERW	F__

Filter on the measurement of the corresponding analog input. This parameter can be used to control the response of the analog input and reduce any possible noise and interference.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.7	**1512**	**Analog inp 1 top**	cnt	INT16		16384	-32768	+32767	ERW	F__

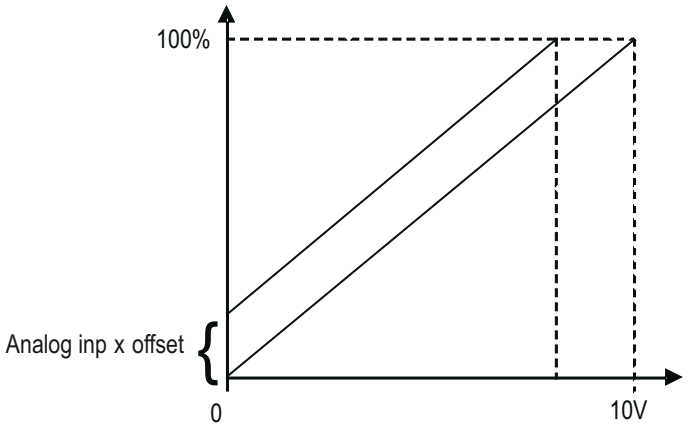
Setting of the upper speed reference limit as a function of the voltage (or current) of the relative analog reference.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.8	**1514**	**Analog inp 1 bottom**	cnt	INT16		-16384	-32768	+ 32767	ERW	F__

Setting of the lower speed reference limit as a function of the voltage (or current) of the relative analog reference.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.9	**1516**	**Analog inp 1 offset**	cnt	INT16		0	-32768	+ 32767	ERW	F__

Setting of a value to compensate the condition in which the analog signal contains an offset, or when the variable assigned to the input already has a value even though no signal is connected.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.10	**1518**	**Analog inp 1 gain**		FLOAT		1.0	-10.0	10.0	ERW	F__

This parameter contains the value of the multiplier factor to apply to the analog reference calculated using the **Analog inp gain tune** function.

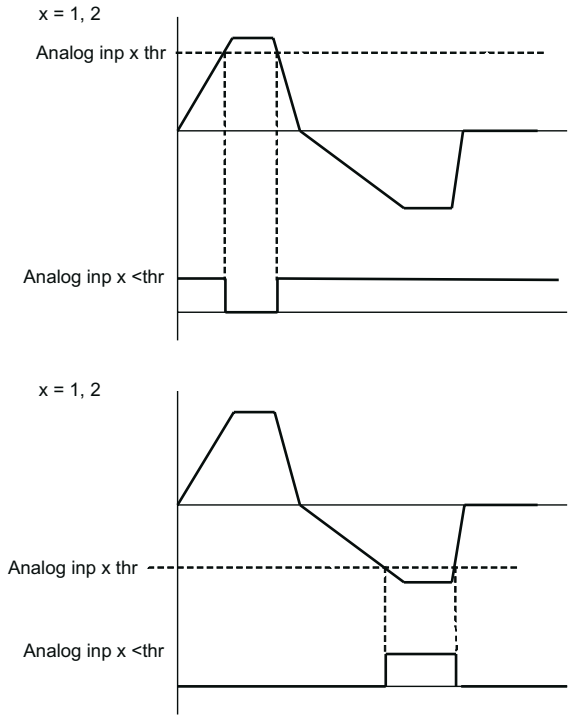
Example:

An external analog reference only reaches a maximum of 9.8V instead of 10V. 1.020 (10V : 9.8V) is entered as the **Analog inp x gain** parameter.

The same result can be achieved using the **An inp x gain tune** function. This parameter can be selected from the keypad menu. The maximum analog value available (in this case 9.8V) must be present on the terminal, with positive polarity. Press the Enter key on the keypad to start analog reference self-tuning.

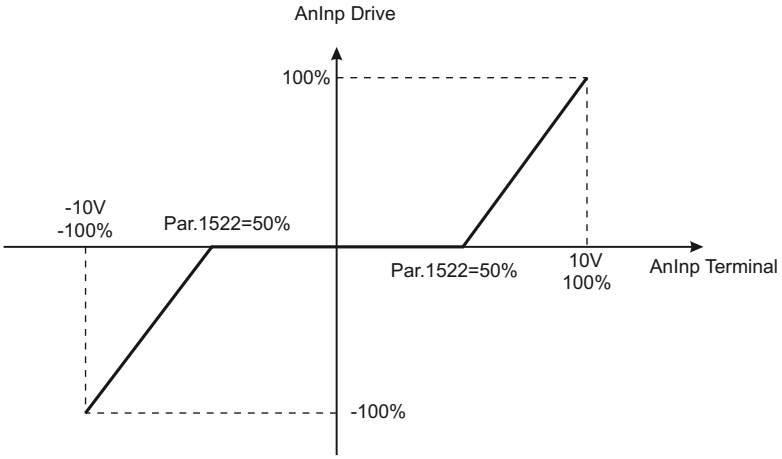
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.11	**1520**	**Analog inp 1 thr**		INT16		0	-16384	+ 16383	ERW	F__

Setting of the analog input threshold for the **speed not exceeded** signal, which allows enabling of the digital outputs **Analog inp1** (PAR 1530).



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.12	**1522**	**An inp 1 deadband**	perc	FLOAT		0	0	100.0	ERW	F__

Deadband referring to the analog input signal. When the value on the input terminal is below the threshold defined by the parameter, the output signal of the analog input block is forced to zero. Outside the deadband, the block output varies linearly from zero to 100%.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.13	**1524**	**An inp 1 alt value**	cnt	INT16	16/32	0	-16384	16384	ERW	F__

Setting of a fixed alternative value for the relative analog input, which can be selected via a command enabled by a digital input programmed with the **An inp alt sel src** parameter.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.14	**1526**	**An inp 1 sign src**		LINK	16	6000	0	16384	ERW	F__

Selection of the origin (source) of the signal to be assigned to the relative digital input for selecting the direction of rotation of the motor. The functions that can be associated with the digital outputs are listed in the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.15	**1528**	**An inp 1 alt sel src**		LINK	16	6000	0	16384	ERW	F__

Selection of the origin (source) of the signal to be assigned to the relative digital input for selecting the alternative analog reference. The functions that can be associated with the digital outputs are listed in the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.16	**1532**	**Analog inp 1 dest**		ILINK		0	0	0	ER	F__

The function for which the relative analog input has been programmed and on which it acts is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.17	**1538**	**An inp 1 err delay**	s	FLOAT		0.1	0.01	10.0	ERW	F__

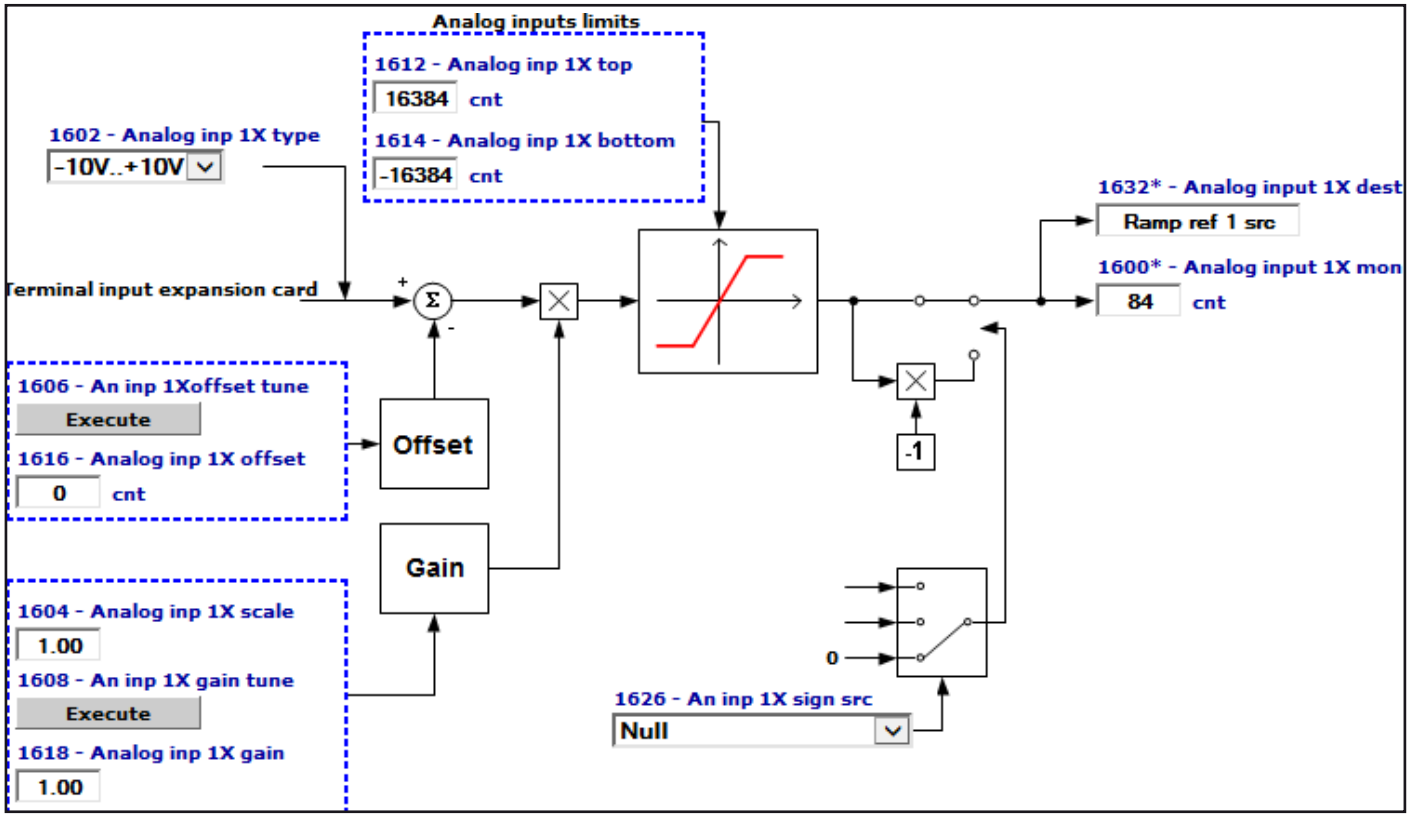
Time after which the PAR 1540 **An inp 1 err mon** indication will be generated in case of disconnection of the analog signal (only available with analog input 1 type 2 and 7).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.18	**1540**	**An inp 1 err mon**		**BIT**	**16BIT**	**0**	**0**	**1**	**ER**	F__

Indication of disconnection of the analog signal (only available with analog input 1 type 2 and 7).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.19	**1600**	**Analog input 1X mon**	cnt	INT16	16/32	0	-16384	16384	R	F__
14.32	**1650**	**Analog input 2X mon**	cnt	INT16	16/32	0	-16384	16384	R	F__

The value of the voltage output of the function block of the relative analog input is displayed.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.20	**1602**	**Analog inp 1X type**		ENUM		-10V..+10V			RW	F__
14.33	**1652**	**Analog inp 2X type**		ENUM		-10V..+10V			RW	F__

Selection of the type of expansion card input (voltage or current input). Depending on the input signal, move the switches on the expansion card. Standard inputs are coded for voltage signals.

0 -10V…+10V

1 0..10V

2 4..20mA

3 0..20mA

Select option **0** in order to connect a maximum voltage of ±12.5V (typically ±10V/5mA) to the analog input concerned. If the signal is used as a reference, reverse the direction of rotation of the drive by inverting the voltage polarity.

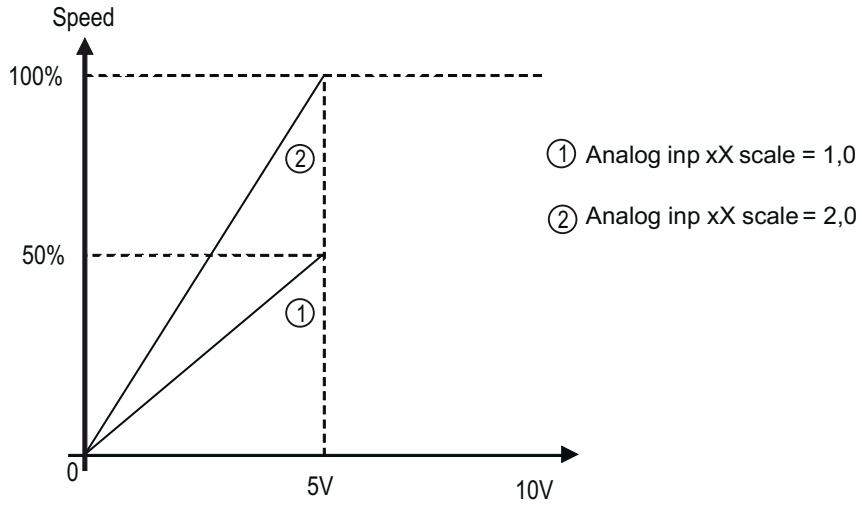
Select option **1** to connect a max voltage of 12.5V (typically 10V/5mA).

Select option **2** to connect a current signal of 4...20 mA to the analog input concerned. The signal must be positive.

Select option **3** to connect a current signal of 0...20 mA to the analog input concerned. The signal must be positive.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.21	**1604**	**Analog inp 1X scale**		FLOAT		1.0	-20.0	20.0	RW	F__
14.34	**1654**	**Analog inp 2X scale**		FLOAT		1.0	-20.0	20.0	RW	F__

Setting of a multiplier factor to apply to the relative analog input of the expansion card.



Example:

The speed reference of a drive is assigned with a max external voltage of 5V. With this value the drive must reach the maximum speed allowed (set using **Full scale speed**).

As the **Analog inp X scale** parameter the scale factor of 2 is entered (10V : 5V)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.22	**1606**	**An inp 1Xoffset tune**		BIT		0	0	1	RWZ	F__
14.35	**1656**	**An inp 2Xoffset tune**		BIT		0	0	1	RWZ	F__

Self-tuning command for the offset of the relative analog input of the expansion card. Automatic fine tuning of the input. To perform self-tuning, set the input signal to its minimum value and execute the command. The conditions containing an offset can be compensated. When this command is sent, **An inp xX offset tune** is automatically selected so that the available input signal corresponds to the zero value of the variable.

Automatic tuning can only be performed if the following condition is present:

- Input voltage less than 1V or input current less than 2 mA

Note ! The value that is obtained automatically can be changed manually, if necessary, using **An inp offset xX**.

If the voltage setting on the analog input is higher than 1V, the Value too low alarm is generated.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.23	**1608**	**An inp 1X gain tune**		BIT		0	0	1	RWZ	F__
14.36	**1658**	**An inp 2X gain tune**		BIT		0	0	1	RWZ	F__

Self-tuning command for the relative analog input gain. Automatic fine tuning of the input. When this command is sent, **Analog inp 1 gain x** is automatically selected so that the available input signal corresponds to the maximum value of the variable.

Two conditions are necessary in order to perform automatic tuning:

- Input voltage greater than 1V or input current greater than 2 mA
- Positive polarity. The value that is found is automatically accepted for the other direction of rotation.

Note ! If necessary, the value obtained automatically can be changed manually via **Analog inp Xx gain**.

To perform self-tuning, set the input signal to its maximum value and execute the command. A multiplier factor is calculated to apply to the input signal value (not considering the **Analog inp scale** parameter) to reach the full scale value.

If the voltage setting on the analog input is less than 1V, the Value too low alarm is generated.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.24	**1612**	**Analog inp 1X top**	cnt	INT16		16384	-32768	+ 32767	ERW	F__
14.37	**1662**	**Analog inp 2X top**	cnt	INT16		16384	-32768	+ 32767	ERW	F__

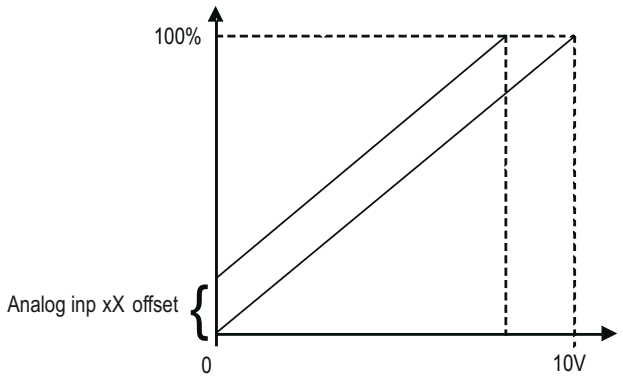
Setting of the upper speed reference limit as a function of the voltage (or current) of the relative analog reference of the expansion card.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.25	**1614**	**Analog inp 1X bottom**	cnt	INT16		-16384	-32768	+ 32767	ERW	F__
14.38	**1664**	**Analog inp 2X bottom**	cnt	INT16		-16384	-32768	+ 32767	ERW	F__

Setting of the lower speed reference limit as a function of the voltage (or current) of the relative analog reference of the expansion card.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.26	**1616**	**Analog inp 1X offset**	cnt	INT16		0	-32768	+ 32767	ERW	F__
14.39	**1666**	**Analog inp 2X offset**	cnt	INT16		0	-32768	+ 32767	ERW	F__

Setting of an offset value to algebrically add to the relative analog input of the expansion card.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.27	**1618**	**Analog inp 1X gain**		FLOAT		1.0	-20.0	20.0	ERW	F__
14.40	**1668**	**Analog inp 2X gain**		FLOAT		1.0	-20.0	20.0	ERW	F__

This parameter contains the value of the multiplier factor to apply to the analog reference of the expansion card calculated using the **Analog inp gain tune** function.

Example:

An external analog reference only reaches a maximum of 9.8V instead of 10V. 1.020 (10V : 9.8V) is entered as the **Analog inp x gain** parameter.

The same result can be achieved using the **Analog inp x gain tune** function. This parameter can be selected from the keypad menu. The maximum analog value available (in this case 9.8V) must be present on the terminal, with positive polarity. Press the Enter key on the keypad to start analog reference self-tuning.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.28	**1626**	**An inp 1X sign src**		LINK	16	6000	0	16384	ERW	F__
14.41	**1676**	**An inp 2X sign src**		LINK	16	6000	0	16384	ERW	F__

Selection of the origin (source) of the signal to be assigned to the relative digital input of the expansion card for selecting the direction of rotation of the motor. The functions that can be associated with the digital outputs are listed in the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.29	**1632**	**Analog inp 1X dest**		ILINK		0	0	0	ER	F__
14.42	**1682**	**Analog inp 2X dest**		ILINK		0	0	0	ER	F__

The function for which the relative analog input of the expansion card has been programmed and on which it acts is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.30	**1638**	**An inp 1X err delay**	s	FLOAT		0.1	0.01	10.0	ERW	F__
14.43	**1688**	**An inp 2X err delay**	s	FLOAT		0.1	0.01	10.0	ERW	F__

Time after which the PAR 1540 **An inp 1 err mon** indication will be generated in case of disconnection of the analog signal (only available with analog input x type 2).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.31	**1640**	**An inp 1X err mon**		BIT	16BIT	0	0	1	ER	F__
14.44	**1690**	**An inp 2X err mon**		BIT	16BIT	0	0	1	ER	F__

Indication of disconnection of the analog signal (only available with analog input x type 2).

15 – ANALOG OUTPUTS

Table: value of the signal of the analog outputs according to the measurement used

PAR	Description	Full scale output
626	Ramp ref out mon	10V = Full scale speed (Par 680)
628	Ramp setpoint	
760	Ramp out mon	
664	Speed setpoint	
260	Motor speed	
262	Motor speed nofilter	
2150	Encoder 1 speed	
852	Multi ref out mon	
870	Mpot setpoint	
894	Mpot output mon	
920	Jog output mon	
250	Output current	10V = 200% CT drive rated current (this value can be found in the manual and is defined @400Vac, default switching frequency and 40°C)
280	Torque current ref	
282	Magnet current ref	
284	Torque current	
286	Magnet current	
2360	Torque lim Pos Inuse	
2362	Torque lim Neg Inuse	
256	Output power	0V = 100% of RatedPower
2386	Torque ref	10V = 200% Nominal motor torque
2388	Torque ref nofilter	
2394	Torque %	
2396	Torque no filter	
2346	Torque current ref 1	
2246	Speed reg P factor	
2248	Speed reg I factor	
3070	Droop out mon	
3104	Inertia comp mon	
252	Output voltage	10V = 200% Mains voltage (Par 560)
254	Output frequency	10V = 1000Hz
270	DC link voltage	10V = 7000V
3006	Speed ratio out mon	10V = 100%
1500	Analog input 1 mon	10V = 10V Analog input
1600	Analog input 1X mon	
1650	Analog input 2X mon	
368	Drive overload accum	5V = 100% Accumulator
370	Drive ovl fst accum	
372	Drive overload limit	
3212	Motor overload accum	
3260	Bres overload accum	
2232	Spd reg P gain Inuse	10V = 400%
2234	Spd reg I gain Inuse	
3446	Powerloss nextratio	10V = 50%
4024 … 4174	Fieldbus M->SX mon	10V = 16384 * 2 ^ 16
3700 … 3730	Pad X	

Description of function block Analog Output.

The following description is valid for all Analog outputs.

The value of parameter “Analog out type” must be set in accord with hardware available on card.

Refer to the description of the hardware cards to know the type of available output.

Examples:

Selection -10v..+10V will work properly only if hardware card manages output -10V..+10V.

Selection 0..20mA will work properly only if hardware card manages output 0..20mA.

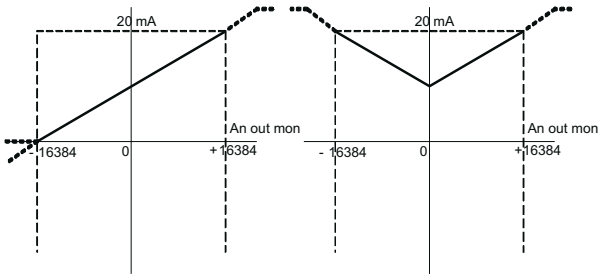
“Analog out src” parameter allow to select the variable on the analog output.

“Analog out mon” parameter show the cnt value of variable on the analog output.

The signal obtained on analog output depends from “Analog out type”, “Analog out min”, “Analog out max” parameters.

Table: Signal obtained on analog output

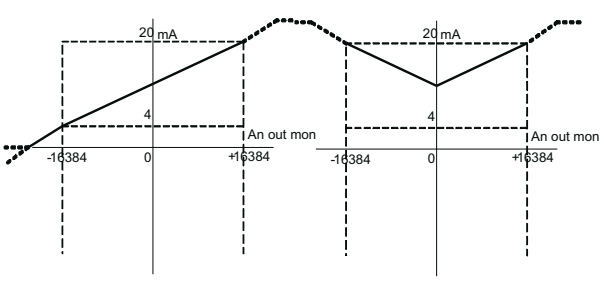
An out type = 0.20mA



An out min = 16384
An out max = +16384
An out abs = Disabled

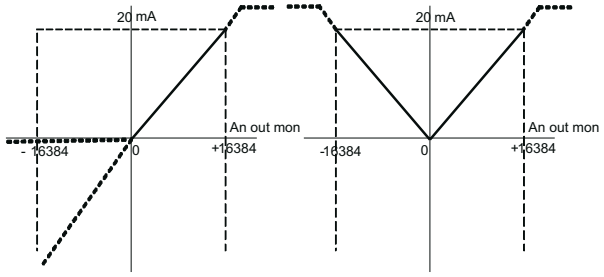
An out min =16384
An out max= +16384
An out abs = Enabled

An out type= 4..20 mA



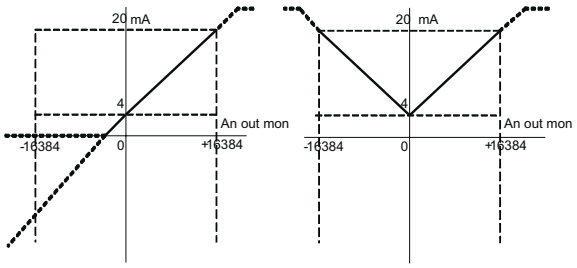
An out min =-16384
An out max = + 16384
An out abs =Disabled

An out min =-16384
An out max = +16384
An out abs =Enabled



An out min =0
An out max = +16384
An out abs =Disabled

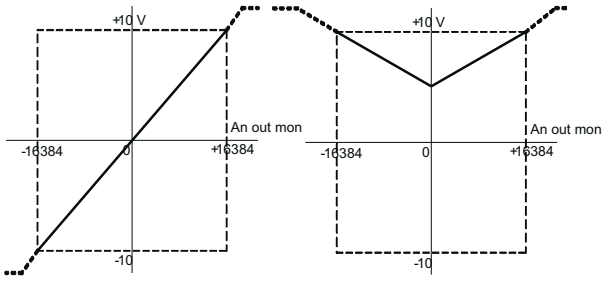
An out min =0
An out max = +16384
An out abs =Enabled



An out min =0
An out max = + 16384
An out abs =Disabled

An out min =0
An out max = +16384
An out abs =Enabled

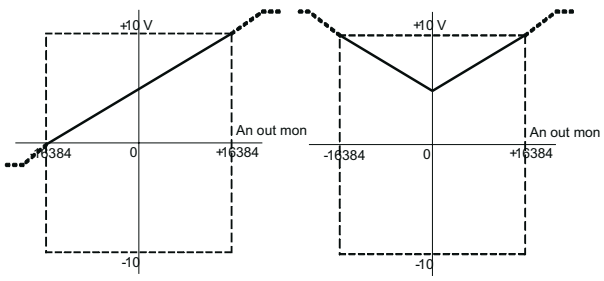
An out type= -10V..+10V



An out min =-16384
An out max = +16384
An out abs =Disabled

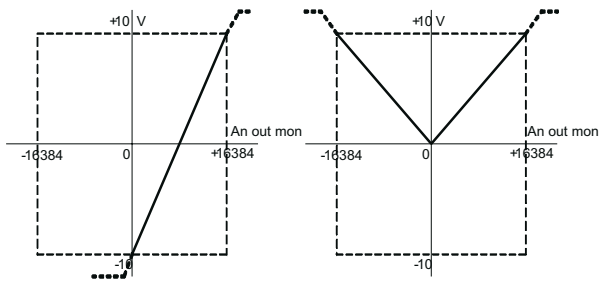
An out min =-16384
An out max = + 16384
An out abs =Enabled

An out type= 0..+10V



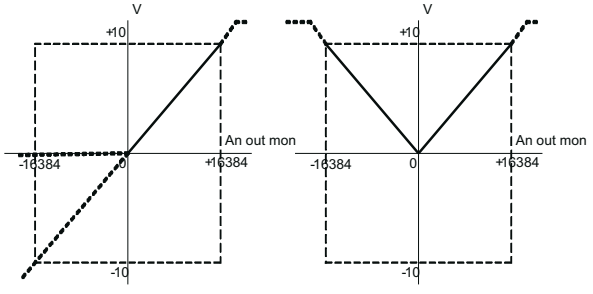
An out min = -16384
An out max = +16384
An out abs = Disabled

An out min = -16384
An out max = +16384
An out abs = Enabled



An out min = 0
An out max = +16384
An out abs = Disabled

An out min = 0
An out max = +16384
An out abs =Enabled

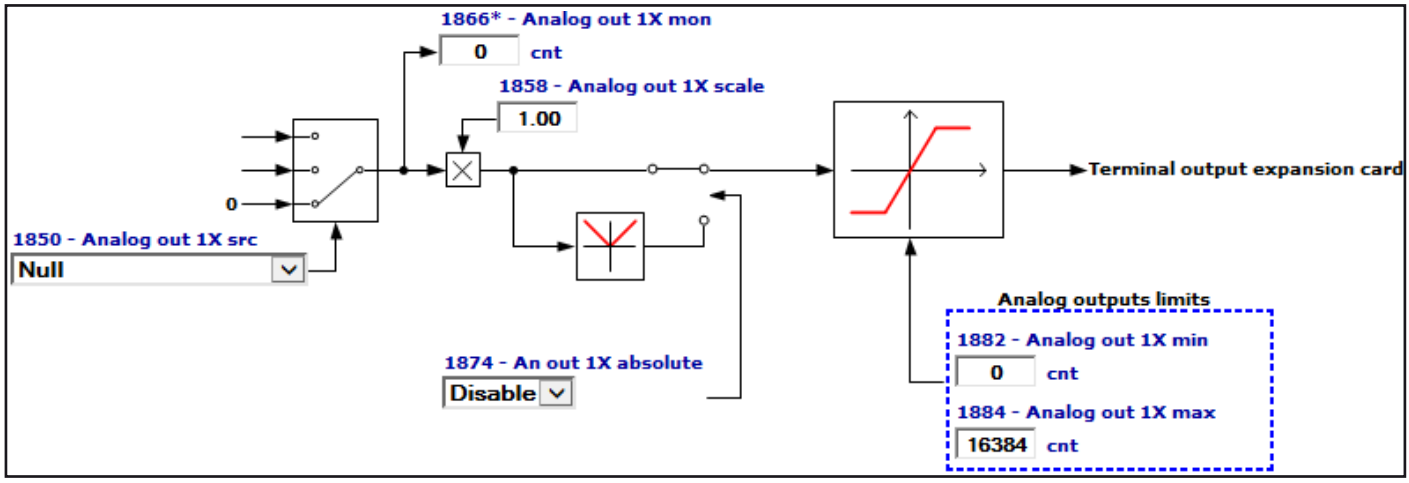


An out min =0
An out max =16384
An out abs =Disabled

An out min =0
An out max =16384
An out abs =Enabled

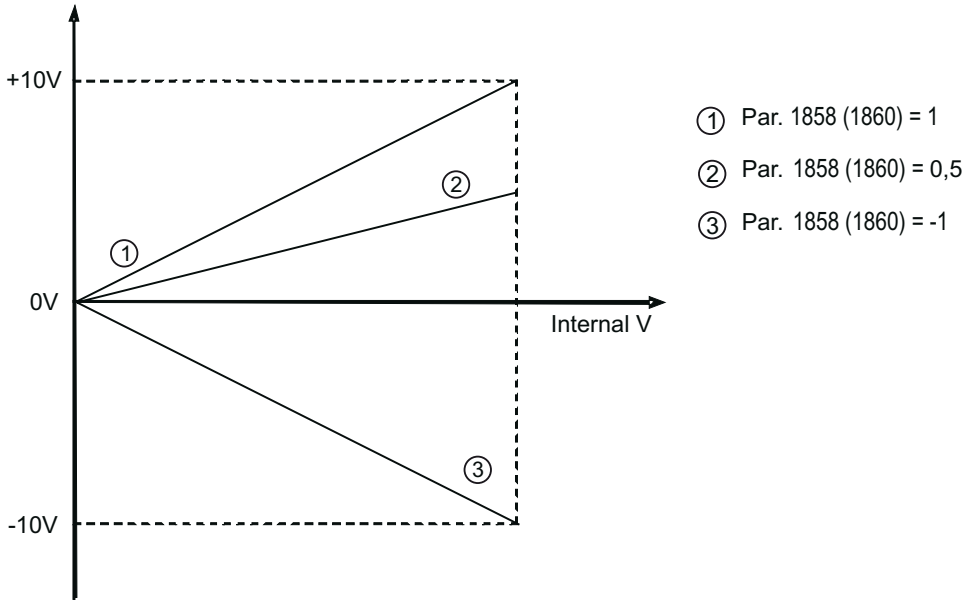
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.1	**1850**	**Analog out 1X src**		LINK	16/32	6000	0	16384	RW	F__
15.2	**1852**	**Analog out 2X src**		LINK	16/32	6000	0	16384	RW	F__

Selection of the origin (source) of the signals that can be placed as variables on the analog outputs of the expansion card. The functions that can be assigned to the analog outputs are listed in the "**L_ANOUT**" selection list.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.3	**1858**	**Analog out 1X scale**		FLOAT		1.0	-20.0	20.0	RW	F__
15.4	**1860**	**Analog out 2X scale**		FLOAT		1.0	-20.0	20.0	RW	F__

Parameter for setting a multiplier factor of the signal of the relative analog output of the expansion card. It can be used to amplify or reduce the input value of the relative analog output block.



$$Vout = 10 \times \left(\frac{\text{Stp Var x par. 1858 (1860)}}{\text{FS Var}} \right)$$

where:

Vout output voltage on the card terminals.

Stp Var actual value of the variable (variable unit)

FS Var full scale of the variable (variable unit)

Example of calculation of the **Analog out Xx scale factor**

To display the drive speed, use an analog instrument with field of measurement from 0 ... 2V. This means that, to display the speed of the drive, a voltage of 2V on the analog output of the drive must correspond to the maximum speed. With a scale factor of 1 this would be 10V (Scale factor = 2V / 10 V = 0.200).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.5	**1866**	**Analog out 1X mon**	cnt	INT16		0	0	0	ER	F__

The actual value of the voltage present on analog output 1 of the expansion card is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.6	**1868**	**Analog out 2X mon**	cnt	INT16		0	0	0	ER	F__

The actual value of the voltage or current present on analog output 2 of the expansion card is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.7	**1874**	**An out 1X absolute**		ENUM		Disable			ERW	F__
15.8	**1876**	**An out 2X absolute**		ENUM		Disable			ERW	F__

Enables the relative analog output as an absolute value. If this parameter is set to 1 the voltage on the analog output assumes the value of 0 - 10V regardless of the sign of the command signal.

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.9	**1882**	**Analog out 1X min**	cnt	INT16		0	-32768	+32767	ERW	F__
15.10	**1884**	**Analog out 1X max**	cnt	INT16		16384	-32768	+32767	ERW	F__

Setting of the minimum and maximum values for the analog output for the voltage present on analog output 1 of the expansion card.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.11	**1886**	**Analog out 1X type**		ENUM		0..10V			ERW	F__

Selection of the programmed signal on analog output 1 of the expansion card. Depending on the output signal, move the dedicated switch on the expansion card. The standard output is coded for the signal in voltage.

0 0...20mA
1 4..20mA
2 -10V..+10V
3 0..10V

If set to **0** the analog output sends 0...20mA
If set to **1** the analog output sends 4...20mA
If set to **2** the analog output sends -10..+10V
If set to **3** the analog output sends 0..+10V.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.12	**1890**	**Analog out 2X min**	cnt	INT16		-16384	-32768	+32767	ERW	F__
15.13	**1892**	**Analog out 2X max**	cnt	INT16		16384	-32768	+32767	ERW	F__

Setting of the minimum and maximum values for the analog output in current or voltage present on analog output 2 of the expansion card.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.14	**1898**	**Analog out 2X type**		ENUM		-10V..+10V			ERW	F__

Selection of the programmed signal on analog output 2 of the expansion card. Depending on the output signal, move the dedicated switch on the expansion card. The standard output is coded for the signal in voltage.

0 0...20mA
1 4..20mA
2 -10V..+10V
3 0..10V

If set to **0** the analog output sends 0...20mA
If set to **1** the analog output sends 4...20mA
If set to **2** the analog output sends -10..+10V
If set to **3** the analog output sends 0..+10V.

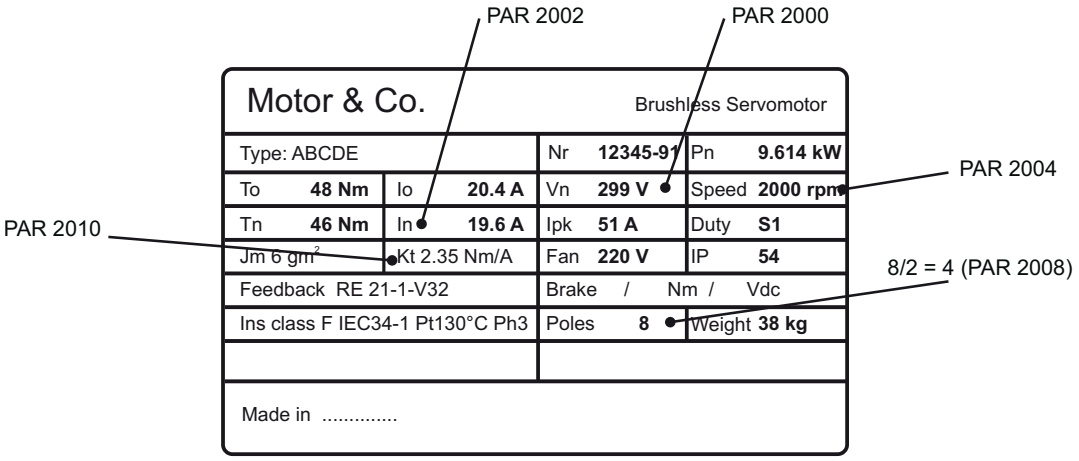
16 – MOTOR DATA

From this menu you can enter the motor plate data and “basic” values for the voltage/frequency characteristics. It is important to enter the correct data in order to optimize drive operation and that of the application as a whole. These data are required in order to obtain:

a) Computation of the normalization factors necessary for regulation

b) Computation of the estimated values for the motor parameters necessary for regulation

Rated voltage, Rated speed, Rated current must be entered. After entering these parameters, send a Take motor par command to calculate (a) and (b) above. The motor cannot be enabled until the Take motor par command has been set. If some results are inconsistent, or if the motor is much smaller than the inverter, an error message is displayed indicating a numerical capacity overflow and the previous set of parameters is restored in the “Mot plate data” sub-menu.



Motor data plates

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.1	**2000**	**Rated voltage**	V	FLOAT		SIZE	50.0	690.0	RWZS	F__

Set the motor rated voltage as indicated on the data plate. This is the voltage the drive must supply at the motor rated frequency.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.2	**2002**	**Rated current**	A	FLOAT		SIZE	1.0	2200.0	RWZS	F__

The motor rated current at its rated power (kW / Hp) and voltage (indicated on the motor data plate).

If using a single drive to control several motors connected in parallel (only possible in the V/f mode), enter a value that corresponds to the sum of the rated currents of all the motors; in this case do not perform any self-tuning operations.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.3	**2004**	**Rated speed**	rpm	FLOAT		SIZE	10.0	32000.0	RWZS	F__

Rated speed of the motor with full load in rpm (rpm = m-1).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.4	**2008**	**Pole pairs**		UINT16		SIZE	1	CALCI	RWZS	F__

Setting of the number of motor pole pairs.

Closed Loop = 50pp (max).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.5	**2010**	**Torque constant**	Nm/A	FLOAT		SIZE	0.1	100.0	RWZS	F__

Setting of the ratio between the torque generated and the rated current of the motor.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.6	**2012**	**EMF constant**	Wb	FLOAT		SIZE	0.0	100.0	RWZS	F__

Setting of the electromotive force constant, which represents the ratio between motor voltage and motor rated speed (can be calculated by dividing the torque constant by √3)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.7	**2020**	**Take parameters**		BIT		0	0	1	RWZ	F__

Saves the set motor data in the drive. This command must be supplied last after entering the appropriate values of all the parameters listed above. This means calculating the normalization factors (a) and estimated values for the motor parameters (b). The drive cannot be started until the **Take parameters** command has been set.

Note ! This is not saved permanently. Use the "**Save Parameters**" command in the **DRIVE CONFIG** menu to save in the permanent memory.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.8	**2022**	**Autotune rotation**		BIT		0	0	1	RWZ	F__

Performs self-tuning in rotation: the motor must be uncoupled from the load or the transmission must not represent more than 5% of the load. This procedure allows the greatest degree of accuracy in measuring the motor parameters. To execute the command you must first open the hardware enabling contact between terminals 7 and S3. Next set the **Regulation mode** parameter to **Autotune**. If you are not already in Local mode, press the Local key (the LOC LED will light up) and close the hardware enabling contact again (terminals 7 and S3). Selt-tuning can now be performed. At the end of the self-tuning procedure, open the contact between terminals 7 and S3 again and reset the parameters that were modified.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.9	**2024**	**Autotune still**		BIT		0	0	1	RWZ	F__

Performs self-tuning with the motor coupled to the transmission. The self-tuning procedure may cause limited rotation of the motor shaft. To perform self-tuning, follow the procedure described for the previous parameter.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.10	**2026**	**Autotune mode**		ENUM		Reduced			ERWZ	F__

Selection of the motor parameter self-tuning mode.

0 Reduced

1 Extended

If set to **0** all the motor parameters are measured except those relating to the non-linear saturation curve. Use this mode to obtain a faster self-tuning procedure.

If set to **1** all the motor parameters are measured. Use this mode to obtain maximum efficiency: this procedure may take a few minutes.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.11	**2028**	**Take par status**		ENUM		Required			R	F__

Indication of the status of parameter saving.

0 Required

1 Done

The parameter displays the Required message when the motor parameters that have been entered need to be saved. When they have been saved the parameter indicates Done.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.12	**2030**	**Autotune status**		ENUM		Required			R	F__

Indication of the status of execution of motor parameter self-tuning.

0 Required

1 Done

The parameter displays the **Required** message when motor parameter self-tuning is required. When self-tuning is complete the parameter indicates **Done**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.13	**2050**	**Measured Rs**	ohm	FLOAT		CALCF	0.0005	200	ERWS	F__

Measured stator resistance value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.14	**2052**	**Measured DTL**	V	FLOAT		0.0	0.0	100.0	ERWS	F__

Measured value of dead time compensation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.15	**2054**	**Measured DTS**	V/A	FLOAT		0.0	0.0	100.0	ERWS	F__

Measured compensation gradient value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.16	**2056**	**Measured Lsig**	mH	FLOAT		CALCF	0.001	200.0	ERWS	F__

Measured leakage inductance value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.17	**2074**	**Measured Lsig min**	mH	FLOAT		CALCF	0.001	200.0	ERWS	F__

Value of minimum inductance leakage measured during autotuning.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.18	**2078**	**Take tune parameters**		BIT		0	0	1	ERWZ	F__

Saves the motor data calculated by the self-tuning procedure in the drive.

Note ! Data are not saved permanently. Use the "**Save Parameters**" command in the **DRIVE CONFIG** menu to save in the permanent memory.

17 – ENCODER CONFIG

The closed-loop control mode requires a speed reading by a digital encoder on the motor shaft. Optional cards have been developed to acquire different types of encoder signals. These enable the drive to use both incremental and absolute signals as its feedback. In the field oriented vector mode, closed-loop encoder feedback is essential for correct drive operation.

For further information, see the ADP200 QS guide.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.1	**2100**	**Encoder 1 pulses**	ppr	UINT16		CALCI	CALCI	CALCI	RWZ	F__

Setting of the number of feedback encoder impulses.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.2	**2102**	**Encoder 1 supply**	V	FLOAT		5.2	5.2	CALCF	ERWZ	F__

Setting of the encoder supply voltage supplied by the relative optional card. Min and max values are modified according to the type of encoder card applied.

Encoder option type		Def	Min	Max
Enc1	EXP-DE-I1R1F2-ADV	5.2V	5.2V	20.0V
Enc2	EXP-SE-I1R1F2-ADV	5.2V	5.2V	6.0V
Enc3	EXP-SESC-I1R1F2-ADV	5.2V	5.2V	6.0V
Enc4	EXP-EN/SSI-I1R1F2-ADV	5.2V	5.2V	10.0V
Enc5	EXP-HIP-I1R1F2-ADV	8.0V	7.0V	12.0V
Enc6	EXP-RES-I1R1-ADP	(*)	-	-

(*) The encoder repetition of Resolver expansion card is always TTL.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.3	**2104**	**Encoder 1 input cfg**		ENUM		TTL			ERWZ	F__

Setting of the input configuration of the incremental digital encoder, TTL or HTL.

0 HTL
1 TTL

The value of this parameter is automatically set in HTL when the value entered in the **Encoder 1 supply** parameter is more than 6.0V.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.4	**2106**	**Encoder 1 repetition**		ENUM		No division			ERWZ	F__

Setting of the divider to apply to the encoder repetition output frequency.

0 No division
1 Divide 2
2 Divide 4
3 Divide 8

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.5	**2108**	**Encoder 1 signal Vpp**	V	FLOAT		1.0	0.8	1.2	ERWZ	F__

Setting of the encoder signal peak-to-peak voltage value. Incremental sinusoidal encoders and absolute SinCos encoders normally produce signals with a peak-to-peak voltage of 1 Vpp. Due to voltage drops along the cable, the signal may have a lower peak-to-peak voltage when it reaches the feedback card, triggering the **Speed fbk loss** alarm.

This parameter is used to configure the value of the peak-to-peak voltage of the incremental sinusoidal encoders and absolute SinCos encoders on the input terminals of the feedback card.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.6	**2110**	**Encoder1signal check**		ENUM		Check A-B			ERWZ	F__

Configuration of which channels of the incremental digital encoder must be controlled for processing the **Speed fbk loss [22]**.

0 Check disabled
1 Check A-B
2 Check A-B-Z
4 Check A-B-Z-P

If set to 1, the application checks for the presence of the signals of channels A-B

If set to 2, the application checks for the presence of the signals of channels A-B-Z

If set to 4, the application checks for the presence of the signals of channels A-B-Z and the expected number of pulses per revolution.

If the application detects the absence of feedback the **Speed fbk loss [22]** is generated.

As loss of feedback cannot be detected at speeds of around zero, the control is only performed if the speed reference is higher than the value set in parameter **4564 SpdFbkLoss threshold**. It is also important to consider the fact that when working with a speed reference slightly above the limit set in parameter **4564 SpdFbkLoss threshold**, the speed error could exceed the set threshold, given the load or current limit, and generate false alarms.

In that case increase the value of parameter **4550 SpdRefLoss threshold** or of parameter **4554 SpdRefLoss holdoff**.

enu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.7	**2112**	**Encoder SSI clocks**		UINT16		13	3	31	ERWZ	F__

Setting of the length of the serial package of the SSI encoder used. The value is shown on the encoder datasheet and defined in clock cycles (usually from 13 to 25 bits).

Example of single-turn encoder

13 position bits: set par 2114 = 13.

13 clock bits: set par 2112 = 13.

Example of multi-turn encoder

13 position bits: set par 2114 = 13.

25 clock bits: set par 2112 = 25.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.8	**2114**	**Encoder SSI pos bits**		UINT16		13	3	31	ERWZ	F__

Setting of the number of bits used by the SSI encoder to define the position.

See examples of PAR 2112.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.9	**2182**	**Encoder ENDAT clock**		ENUM		1 MHz			ERWZ	F__

Selection of clock value for Encoder ENDAT type.

0 1 MHz
1 500 kHz

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.10	**2116**	**Resolver pole pairs**		UINT16		1	1	5	ERWZ	F__

Setting of pairs of poles of resolver used (see resolver plate data).

1 1 pair of poles
2 2 pairs of poles

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.11	**2118**	**Resolver frequency**	Hz	UINT16		5000	2000.0	10000.0	ERWZ	F__

Value of the resolver frequency (see Resover name plate data). Step 250Hz.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.12	**2122**	**Resolver repetition**		ENUM		16384 ppr			ERWZ	F__

Simulated selection of the resolver repetition.

0 256 ppr
1 1024 ppr
2 4096 ppr
3 16384 ppr

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.13	**2124**	**Resolver LOS thr**	V	FLOAT		2.200	0.000	4.820	ERWZ	F__

Loss Of Signal threshold: Setting of the lower threshold value of the Resolver signal. Values below this setting will generate a **Speed fbk loss [22]** alarm.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.14	**2126**	**Resolver OVR thr**	V	FLOAT		4.100	0.000	4.820	ERWZ	F__

Over range Threshold: Setting of the higher threshold value of the Resolver signal. Values higher than this setting will generate a **Speed fbk loss [22]** alarm.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.15	**2128**	**Resolver MIS thr**	V	FLOAT		0.380	0.000	4.820	ERWZ	F__

Mismatch value threshold between Sin and Cos signals.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.16	**2130**	**Encoder 1 direction**		ENUM		Not inverted			RWZ	F__

Selection of the encoder direction

0 Not inverted
1 Inverted

By setting **0** the encoder feedback signals are not inverted.
By setting **1** the encoder feedback signals are inverted.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.17	**2132**	**Encoder 1 mode**		ENUM		None			ERWZ	F__

Setting of the method for measuring the speed of the encoder connected to the optional card. The drive automatically recognises the encoder card that is inserted and only shows the methods that are compatible.

0 None
1 Digital FP
2 Digital F
3 Sinus
4 Sinus SINCOS
5 Sinus ENDAT
6 Sinus SSI
7 Sinus HIPER
8 Resolver
9 Abs SINCOS

The speed measurement procedure depends on the type of encoder card; minimum and maximum default values are set according to the type of feedback card that is applied.

Encoder option type	Def	Min	Max
Enc 1	Digital F	Digital FP	Digital F

Encoder option type	Def	Min	Max
Enc 2	Sinus	Sinus	Sinus
Enc 3	Sinus SINCOS	Sinus SINCOS	Sinus SINCOS
Enc 4	Sinus SSI	Sinus ENDAT	Sinus SSI
Enc 5	Sinus HIPER	Sinus HIPER	Sinus HIPER
Enc 6	Resolver	Resolver	Resolver

(*) The card automatically select the correct mode in relation to the encoder type.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.18	**2134**	**Encoder1speed filter**	ms	FLOAT		2.0	0.125	20.0	ERW	F__

Setting of the time constant of the filter applied to the feedback encoder pulse reading. The parameter affects both the accuracy of the speed measurement and the dynamics obtainable in closed loop control. Long updating times allow greater stability (more filtering) of the speed measurement, as a higher number of encoder pulses are counted at a given speed of rotation. On the other hand, the use of a speed measurement filter introduces delays that do not permit high control loop dynamics. Low settings extend the regulation bandwidth but may accentuate any disturbance.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.19	**2150**	**Encoder 1 speed**	rpm	INT16	16/32	0	0	0	ER	F__

The motor speed measured by the encoder is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.20	**2162**	**Encoder 1 position**	cnt	UINT16	16	0	0	0	ER	F__

The encoder position is displayed. The scale is Number of encoder impulses *4.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.21	**2172**	**SpdFbkLoss code**		UINT32		0	0	0	ER	F__

The **Speed fbk loss** alarm generated by an encoder fault is displayed. As each type of encoder generates the alarm differently (incremental signal error, absolute signal error, serial error), this parameter displays information about the alarm that has occurred. If there are several, simultaneous causes, these are shown in this parameter.

Bit	Value	Name
0	0x01	CHA
1	0x02	CHB
2	0x04	CHZ
3	0x08	MOD_INCR
4	0x10	MOD_ABS
5	0x20	CRC_CKS_P
6	0x40	ACK_TMO
7	0x80	DT1_ERR
8	0x100	Error Setup
10..15		Free
16..31		Depending on the type of feedback.

For further details please refer to the description of the **Speed fbk loss** alarm and the “C.1 Speed fbk loss alarm according to the type of feedback” on page 141.

Note ! To interpret the causes of the alarm correctly, you will need to convert the hexadecimal code written in parameter 17.29 **SpdFbkLoss code**, PAR 2172, into the corresponding binary code and then use the table of the encoder being used to check the various active bits and relative description.

Example with Endat encoder:

PAR 2172 = A0H (hexadecimal value)

A0 is not present in the value column of the " **Speed fbk loss** [22] with absolute EnDat encoder" table.

A0 must be seen as a bitword meaning A0 -> 10100000 -> bit 5 and bit 7. This indicates the simultaneous intervention of the following causes:

Bit 5 = 20H Cause: disturbed SSI signals cause a **CKS** error or **Parity**

Bit 7 = 80H Cause: Encoder has detected malfunction and signals this to the drive via Error bit. Bits 16..31 contain the type of malfunction detected by the encoder.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.22	**2176**	**Encoder sync mode**		UINT16		1	0	3	ERWZ	F__

Setting of the frequency of synchronisation of incremental tracks with absolute tracks.

If set to 0 synchronisation is performed once at power-on.

If set to 1 synchronisation is set each time the start command is sent.

If set to 2 synchronisation is performed every 128 ms.

If set to 3 synchronisation is always performed, using the absolute part.

This function is only available with absolute encoders and the minimum and maximum default values are modified according to the type of encoder.

Encoder option type	Def	Min	Max
Enc 1	1	0	3
Enc 2	1	0	3
Enc 3	1	0	3
Enc 4	1	0	3
Enc 5	1	0	1
Enc 6	1	0	3

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.23	**2190**	**Autophase rotation**		BIT		0	0	1	RWZ	F__

This parameter can be set to perform encoder phasing with the motor turning: the motor must be free to turn and with no load applied (the brake must be released). This procedure allows the greatest degree of accuracy.

To execute the command:

- open the Enable command.
- set this parameter to 1 (for serial control)
- press Enter to confirm (for keypad control)
- when prompted to close the enable command, apply the command to terminal 9 (Enable)
- when the procedure is complete you will be asked to confirm by re-opening the Enable command.

Note ! See section "Phasing" of the Appendix to the Quick start guide for further information.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.24	**2192**	**Autophase still**		BIT		0	0	1	RWZ	F__

This parameter can be set to perform encoder phasing without the motor turning: the brake must be closed.

To execute the command:

- open the Enable command.
- set this parameter to 1
- press Enter to confirm
- when prompted to close the enable command, apply the command to terminal 9 (Enable)
- when the procedure is complete you will be asked to confirm by re-opening the Enable command.

Note ! See section “Phasing” of the Appendix to the ADP200 Quick start guide for further information.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.25	**2194**	**Autophase still mode**		ENUM		Mode 1			ERWZ	F__

You can select two different static phasing methods based on the different characteristics of synchronous motors on the market. We recommend using **Mode 1** as the first option. If **Mode 1** does not run correctly, the motor (due to its constructive characteristics) requires a different mode (i.e., **Mode 2**).

0 Mode 1

1 Mode 2

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.26	**2196**	**Autophase still run**		ENUM		First enable			ERWZ	F__

Selection of execution of motor phasing with an incremental digital encoder (for synchronous motors). Can be done only at the first enabling of the drive or at each enabling of the drive.

1 First enable At first enabling.

2 Each enable At each enabling.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.27	**2186**	**Poles/EncRev - 0=Off**		UINT16		0	0	65535	ERWZ	F__

Enabling of management of peripheral encoder used with “Torque” synchronous motors.

0 = function disabled. Gear ratio set to 1

To enable the motor/encoder gear ratio, set in this parameter the number of motor pole pairs corresponding to one encoder revolution.

Example:

With a synchronous motor with 10 Pole Pairs and an encoder ratio “K” of 6:3, you get:

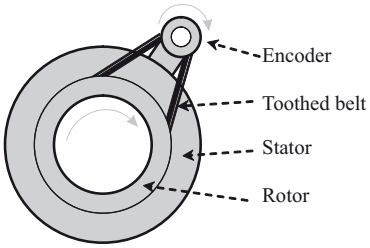
PP / K = 10 / (6/3) = 5

Note ! Not all “K” ratios are permitted: only those that give “finite” numbers.

The maximum programmable value is equal to the number of pole pairs set in the drive.

If when programming the pole pairs you enter a number lower than the value in PAR 2186, PAR 2196 is automatically set to 0 and the function is disabled.

Use of a Geared Encoder

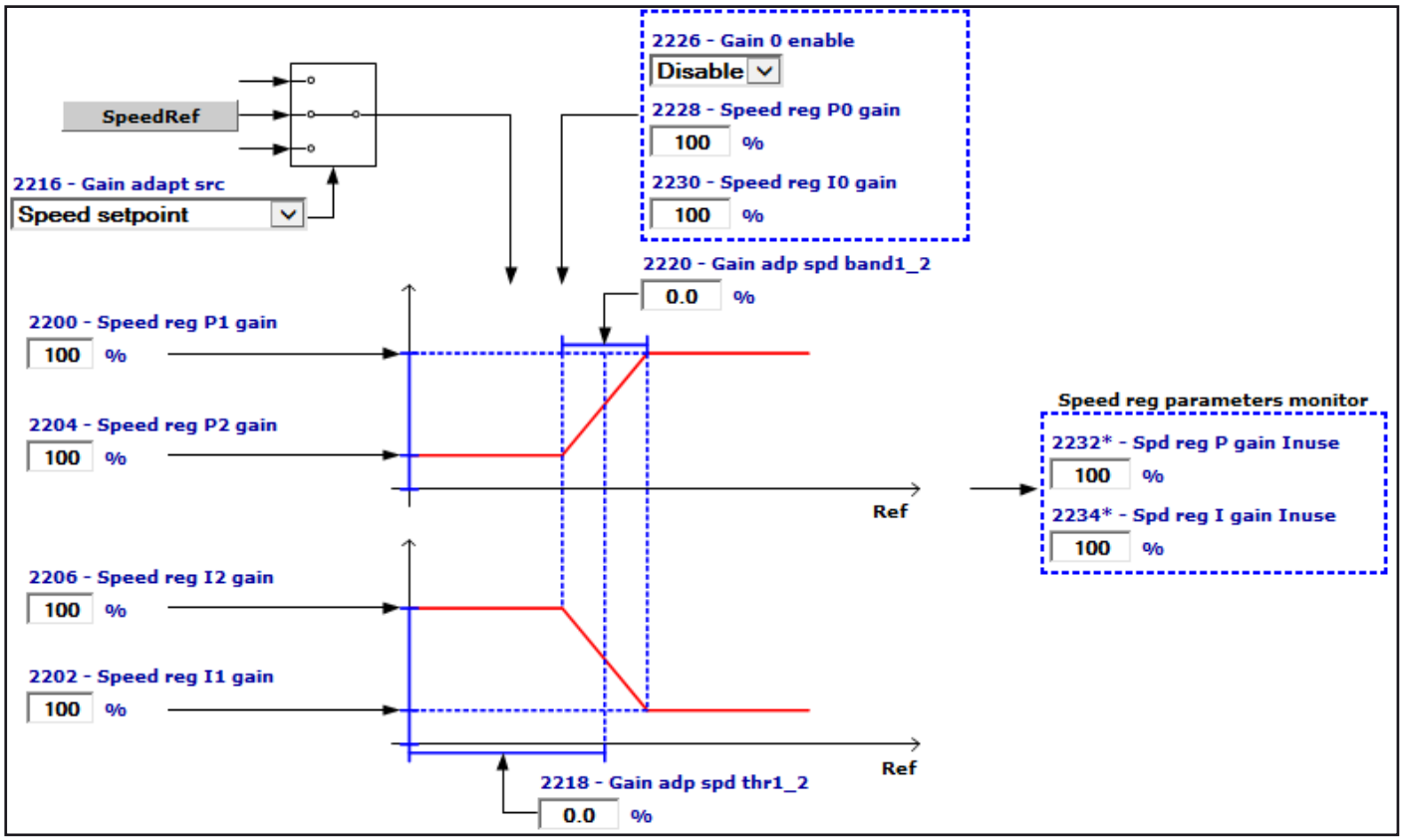


There are engines on the market that have the device mounted position feedback via toothed belt or other multiplier (see figure). This implies a kinematic unit that should not be considered for the proper torque (case of absolute encoder) and the calculation of motor speed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.28	**2188**	**Enc ratio**		FLOAT		0	0	0	ER	F__

This read-only parameter displays the motor/encoder gear ratio calculated by the drive.

18 – SPEED REG GAINS



The speed adaptive allows different speed regulator gains to be obtained according to the speed or another value. The behaviour of the speed regulator can thus be configured in the best way for the specific application requirements.

Note ! Current, flux and voltage regulators can be set using the self-tuning procedure. If this is not successful, current and flux regulators can be tuned manually (this does not apply to voltage regulators, whch must not be modified by the user). The speed regulator must be tuned manually. Gains are usually adjusted according to the drive speed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.1	**2200**	**Speed reg P1 gain**	perc	INT16		100	0	1000	RW	F__
18.2	**2202**	**Speed reg I1 time**	perc	INT16		100	0	1000	RW	F__

Setting of the proportional and integral gain of the speed regulator, set 1.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.3	**2204**	**Speed reg P2 gain**	perc	INT16		100	0	1000	ERW	F__
18.4	**2206**	**Speed reg I2 time**	perc	INT16		100	0	1000	ERW	F__

Setting of the proportional and integral gain of the speed regulator, set 2.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.5	**2216**	**Gain adapt src**		LINK	16/32	664	0	16384	ERW	F__

Selection of the origin (source) of the signal to be used for the adaptive speed gain. The values that can be associated with the function are listed in the "**L_REF**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.6	**2218**	**Gain adapt spd thr 1_2**	perc	FLOAT		0.0	0.0	100.0	ERW	F__

Setting of the speed threshold for changing gains from set 1 to set 2.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.7	**2220**	**Gain adapt spd band 1_2**	perc	FLOAT		0.0	0.0	100.0	ERW	F__

Setting of the band within which gains vary between set 1 and set 2. The use of this parameter ensures a smooth transition between the two parameter sets.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.8	**2226**	**Gain 0 enable**		ENUM		Disable			ERW	F__

Enabling of the gain at zero speed.

0 Disable

1 Enable

When this parameter is set to 0 the control of gains at zero speed is disabled.

When this parameter is set to 1 the control of gains at zero speed is enabled. This function is used to improve the response of the motor below the zero speed threshold (Speed zero threshold)..

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.9	**2228**	**Speed reg P0 gain**	perc	INT16		100	0	1000	ERW	F__

Setting of the proportional gain of the speed regulator at zero speed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.10	**2230**	**Speed reg I0 gain**	perc	INT16		100	0	1000	ERW	F__

Setting of the integral gain of the speed regulator at zero speed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.11	**2232**	**Spd reg P gain Inuse**	perc	INT16	16/32	100	0	1000	ER	F__

The current proportional coefficient of the speed regulator is displayed as a percentage.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.12	**2234**	**Spd reg I gain Inuse**	perc	INT16	16/32	100	0	1000	ER	F__

The current integral coefficient of the speed regulator is displayed as a percentage.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.13	**2236**	**Speed reg P gain**	N/rpm	FLOAT		CALCF	0.0	500.0	ERWS	F__

Setting of the proportional coefficient of the speed regulator.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.14	**2238**	**Speed reg I time**	ms	FLOAT		CALCF	1.0	5000.0	ERWS	F__

Setting of the integral coefficient of the speed regulator. Reducing the integral time value increases the integral action of the regulator.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.15	**2244**	**Speed reg I dis src**		LINK	16/32	6000	0	16384	ERW	F__

Selection of the origin (source) of the signal for Enabling/disabling of the Integral part of the Speed regulator (Null= enabled). The signal to be associated with this function can be selected from the “L_DIGSEL2” selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.16	**2246**	**Speed reg P factor**	perc	FLOAT	16/32	0	0	0	ER	F__

Monitoring of the Proportional part of the speed regulator output. The value is available via analog output.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.17	**2248**	**Speed reg I factor**	perc	FLOAT	16/32	0	0	0	ER	F__

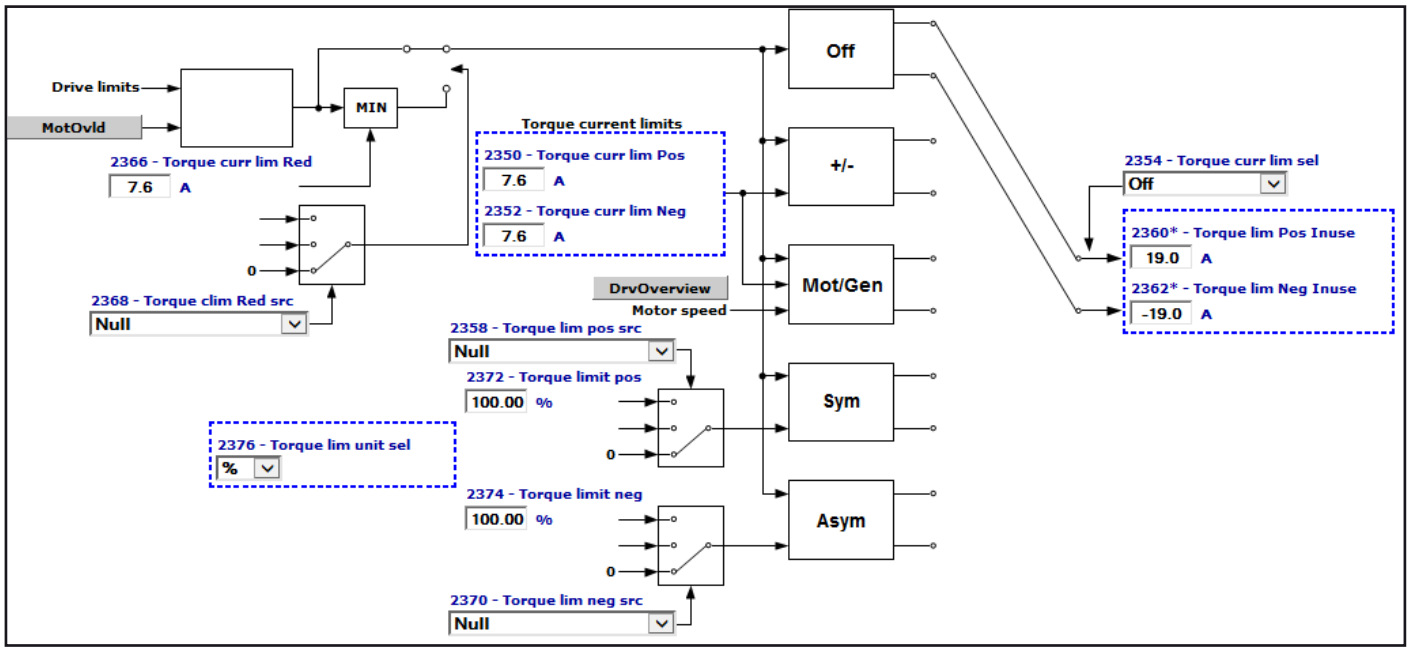
Monitoring of the Integral part of the speed regulator output. The value is available on analog output

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.18	**2240**	**Inertia**	kgm^2	FLOAT		SIZE	0.0001	100.0	RWZS	F__

Setting of total inertia of the application with reference to the motor shaft. When this parameter is modified, all speed regulator gains are initialised according to the value specified by parameter PAR 2242. An increase in the dynamic response of the speed regulator to a variation in the reference, can be modified by changing the current value during the acceleration/deceleration phase, to counter the applied machine inertia.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.19	**2242**	**Bandwidth**	rad/s	FLOAT		SIZE	1.0	500.0	RWZS	F__

Setting of the bandwidth. Increasing the setting of this parameter increases the dynamic response and makes the system more rigid.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.1	**2250**	**Current reg P gain**	V/A	FLOAT		CALCF	0.0	0.0	ERWS	F__

Setting of the proportional coefficient of the current regulator.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.2	**2252**	**Current reg I time**	ms	FLOAT		CALCF	0.01	10000.0	ERWS	F__

Setting of the integral coefficient of the current regulator.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.3	**2270**	**Voltage reg P gain**	Wb/V	FLOAT		CALCF	0.0	0.0	ERWS	F__

Setting of the proportional coefficient of the voltage regulator.

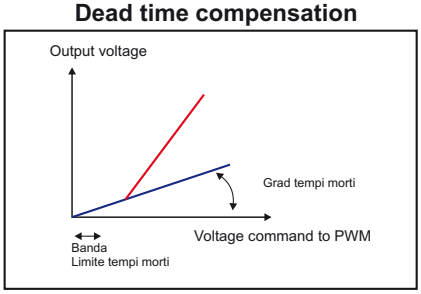
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.4	**2272**	**Voltage reg I time**	s	FLOAT		CALCF	0.1	100.0	ERWS	F_

Setting of the integral coefficient of the voltage regulator.
Distortion of output voltage could cause irregular motor rotation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.5	**2280**	**Dead time limit**	V	FLOAT		SIZE	0.0	50.0	ERWS	F__

Setting of the dead time voltage compensation value.

Dead time compensation



The dead time compensation function (**Dead time compensation**), compensates the distortion of output voltage caused by the voltage drop on the IGBT devices and their switching characteristics.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.6	**2282**	**Dead time slope**	V/A	FLOAT		SIZE	0.0	200.0	ERWS	F__

Setting of the dead time compensation slope value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.7	**2290**	**Voltage base**	V	FLOAT		CALCF	50.0	690.0	ERWS	F__

Setting of the basic voltage of the motor. This parameter is calculated automatically by the self-tuning procedure.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.8	**2292**	**Voltage margin**	perc	FLOAT		5.0	0.0	10.0	ERWS	F__

Setting of the voltage regulation margin according to the available voltage. In case of a **Voltage base** setting close to or equal to the actual mains value, **Voltage margin** represents the margin allowable by the voltage regulation to perform rapid current variations when load steps are suddenly applied.

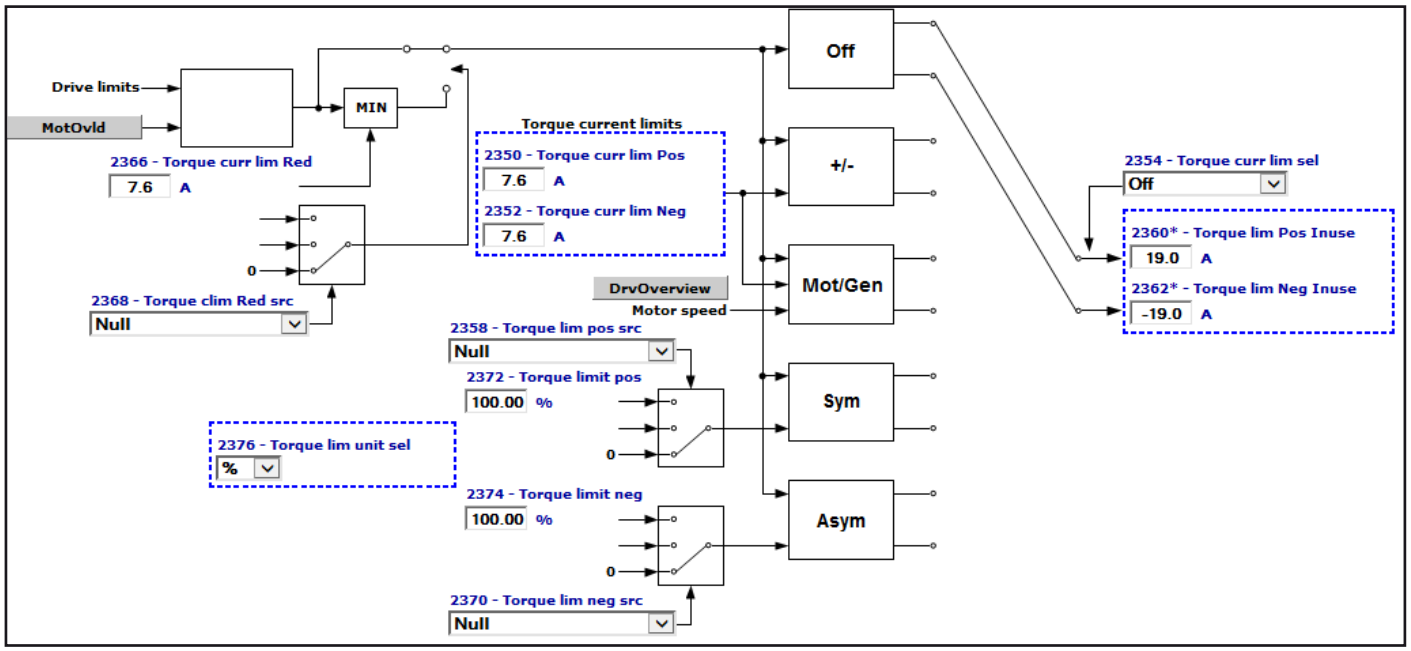
A value of 5% allows a very fast response to load steps but with a loss of output voltage and thus power output (reduced power output).

The minimum value (1%) allows a maximum output voltage (around 98%) of the mains voltage to be achieved but with loss of quality of the dynamic response.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.9			Magnet current lim			A	FLOAT		CALCF	0.0
CALCF	ERWZS F__									

Setting of the magnetisation current with operation at above the motor rated speed.

20 – TORQUE CONFIG



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.1	**2350**	**Torque curr lim Pos**	A	FLOAT	16/32	CALCF	0.0	CALCF	ERWS	F__

Setting of the active torque limit of the drive for the positive current direction (clockwise rotation and anti-clockwise braking).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.2	**2352**	**Torque curr lim Neg**	A	FLOAT	16/32	CALCF	0.0	CALCF	ERWS	F__

Setting of the active torque limit of the drive for the negative current direction (anti-clockwise rotation and clockwise braking).

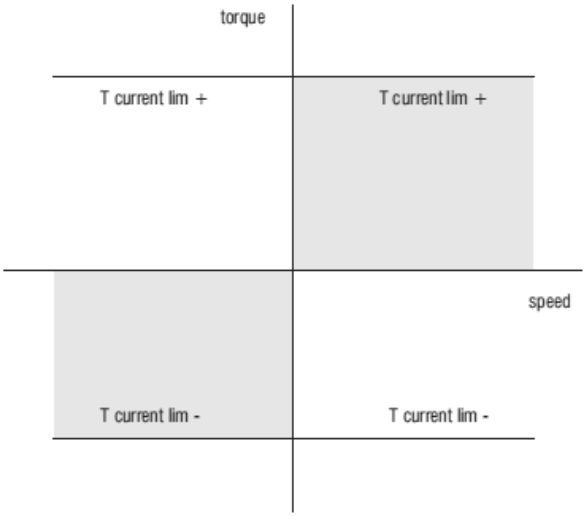
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.3	**2354**	**Torque curr lim sel**		ENUM		Off			ERWZ	F__

Setting of the type of behaviour of the drive in the current limit condition.

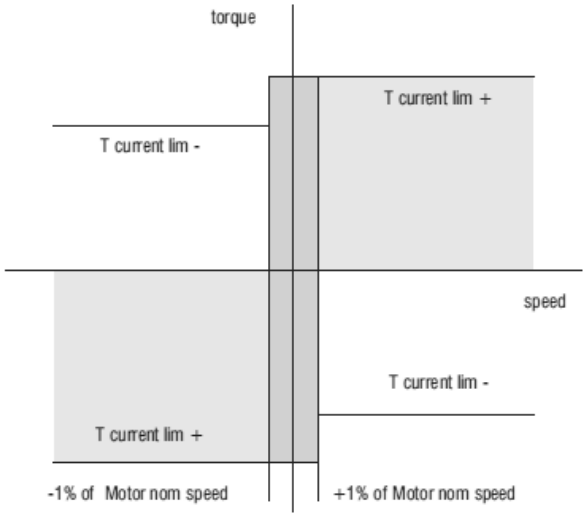
0 Off
1 T clim +/-
2 T clim mot/gen
3 T lim sym
4 T lim pos/neg

If set to **0** no specific type of current limitation is set.

If set to **1** the active positive torque limit is **Torque curr lim Pos** and the active negative torque limit is **Torque curr lim Neg**; the limit is provided on the torque current.



Torque limits with **Torque curr lim Sel** = 1



Torque limits with **Torque curr lim sel** = 2

If set to **2** three conditions are possible:

1 - If the motor speed is > +1% of **Rated speed** the active positive torque limit is **Torque curr lim Pos** and the active negative torque limit is **Torque curr lim Neg**.

2 - If the motor speed is < -1% of **Rated speed** the active positive torque limit is **Torque curr lim Neg** and the active negative torque limit is **Torque curr lim Pos**.

3 - If -1% of Motor non speed < motor speed < + 1% of **Rated speed** the active positive torque limit is **Torque curr lim Pos** and the active negative torque limit is **Torque curr lim Neg**

If set to **3** the torque limits are symmetrical. The torque reference is the value of parameter **2358 Torque lim pos src**. The limit is provided on the torque current.

If set to 4 the torque limits are assigned independently, setting the value of parameter **2358 Torque lim pos src** as the positive torque reference and the value of parameter **2370 Torque lim neg src** as the negative torque reference. The torque reference is the value of parameter **2370 Torque lim neg src**. The limit is provided on the torque current.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.4	**2358**	**Torque lim pos src**		LINK	16/32	6000	0	16384	ERWZ	F__

Selection of the origin (source) to be used to set the torque limit:

If parameter **2354 Torque curr lim sel** is set to 3 the torque limit is symmetrical
If parameter **2354 Torque curr lim sel** is set to 4 the torque limit is positive

The signals that can be associated with the function can be selected from the **"L_PLIM"** selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.5	**2370**	**Torque lim neg src**		LINK	16/32	6000	0	16384	ERWZ	F__

Selection of the origin (source) to be used for the negative torque limit. The signals that can be associated with the function can be selected from the **"L_LIM"** selection list

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.6	**2372**	**Torque limit pos**	perc	FLOAT	16/32	CALCF	0.0	CALCF	ERW	F__

Setting of the positive limit for torque limitation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.7	**2374**	**Torque limit neg**	perc	FLOAT	16/32	CALCF	0.0	CALCF	ERW	F__

Setting of the negative limit for torque limitation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.8	**2376**	**Torque lim unit sel**		ENUM		%			ERW	F__

Setting of the unit of measure for torque limits.

0 %

1 Nm

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.9	**2360**	**Torque lim Pos Inuse**	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__

The positive torque limit value currently being used is displayed. When parameter 2354 is set to [3] T lim sym or [4] T lim pos/neg, the unit of measure of parameter 2360 is Nm.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.10	**2362**	**Torque lim Neg Inuse**	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__

The negative torque limit value currently being used is displayed. When parameter 2354 is set to [3] T lim sym or [4] T lim pos/neg, the unit of measure of parameter 2362 is Nm.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.11	**2378**	**Torque ref 1 filter**	ms	FLOAT		0.0	0.0	1000.0	ERW	F__

Torque Feed forward filter. If IPA2378=0, disabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.12	**2380**	**Dig torque ref 1**	perc	FLOAT	16/32	0.0	-300.0	300.0	ERW	F__

Setting of a digital torque reference. The current reference value is proportional to the active motor current and determines the torque value. The sign determines the torque direction.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.13	**2382**	**Torque ref 1 src**		LINK	16/32	3104	0.0	16384	ERWZ	F__

Selection of the origin (source) of the signal to be used for the torque reference. The values that can be sociabili alla funzione sono nella lista di selezione “**L_VREF**”.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.14	**2392**	**Torque ref 1 mon %**	perc	FLOAT	16/32	0.0	0.0	0.0	ER	F__

Torque ref 1 monitor in %

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.15	**2346**	**Torque current ref 1**	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__

Represents the monitor of Torque feed-forward reference expressed in ampere.

Note ! Monitoring is always active both when the drive is enabled or disabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.16	**2348**	**Torque ref 1 mon**	Nm	FLOAT		0.0	0.0	0.0	ER	F__

Torque ref 1 monitor in Nm.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.17	**2384**	**Torque ref filter**	ms	FLOAT		1.0	0.125	10.0	ERW	F__

Setting of a filter on the torque reference monitoring.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.18	**2386**	**Torque ref %**	perc	FLOAT	16/32	0.0	0.0	0.0	ER	F__

Monitoring of the torque reference value in %.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.19	**2390**	**Torque ref**	**Nm**	**FLOAT**	**16/32**	**0.0**	**0.0**	**0.0**	**ER**	**F__**

Monitoring of the torque reference value in Nm.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.20	**2394**	**Torque %**	perc	FLOAT	16/32	0.0	0.0	0.0	ER	F__

Monitoring of the % value of the motor nominal Torque.

Values are available thru analog outputs.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.21	**2398**	**Torque**	Nm	FLOAT		0.0	0.0	0.0	ER	F__

Monitoring of the Nm value of the motor nominal Torque.

Values are available thru analog outputs.

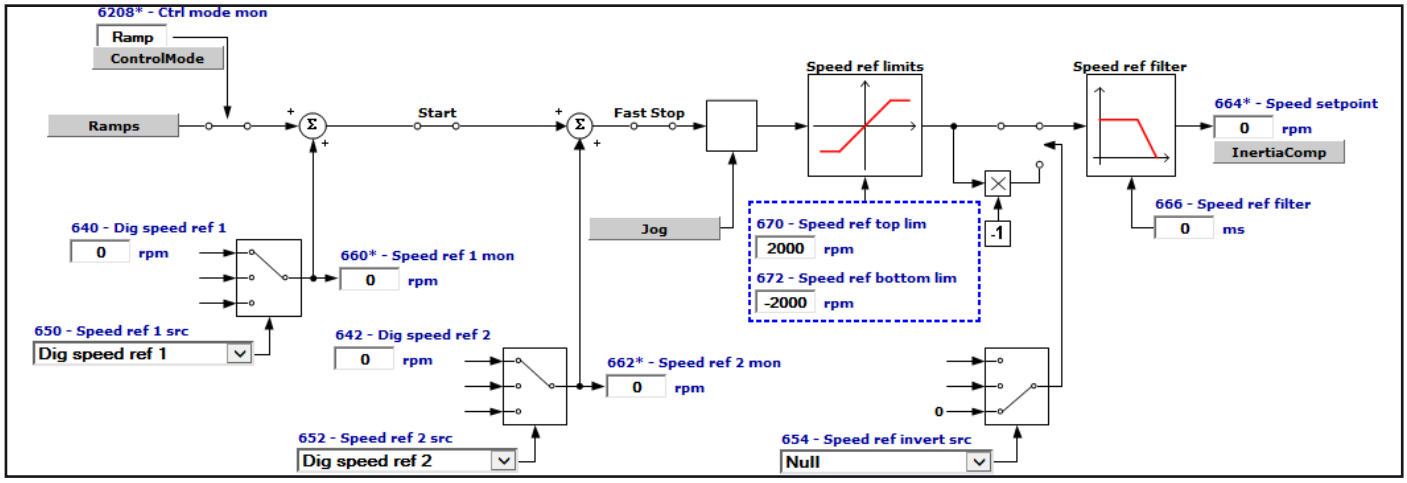
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.22	**2366**	**Torque curr lim Red**	A	FLOAT	16/32	CALCF	0.0	CALCF	ERWS	F__

Setting of the torque current limit when the **2368 Torque clim Red src** command is enabled. The default value and maximum value are automatically calculated by the drive whenever any changes are made to the motor plate data and after autotuning.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.23	**2368**	**Torque clim Red src**		LINK	16BIT	6000	0	16384	ERW	F__

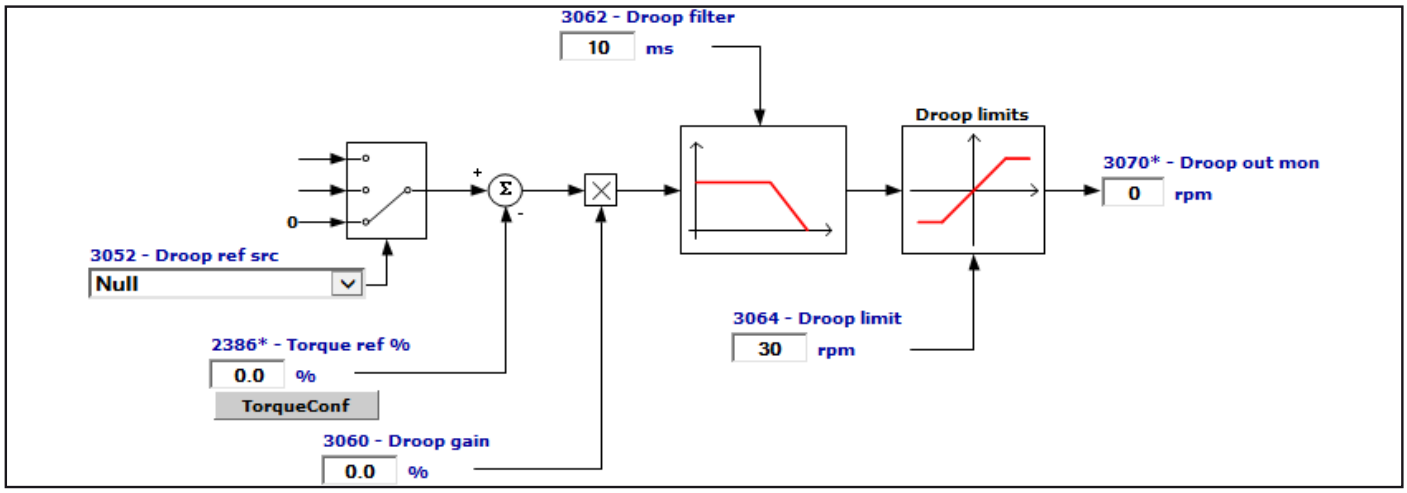
Selection of the origin (source) to be used to reduce the torque current limit. When this command is enabled the torque limit passes to the level set in parameter **2366 Torque curr lim Red**. The signals that can be associated with the function can be selected from the **"L_DIGSEL2"** selection list.

22 – FUNCTIONS



22.1 –

22.2 – FUNCTIONS/DROOP



The block consists of:

- a node of comparison between **Droop ref src** connected to the **Analog inp** of the master drive torque reference (set Torque ref nofilter on the master analog output) and slave drive torque reference (**Torque ref nofilter** produced by the speed regulator).
- a proportional regulator the output of which is added to or subtracted from the reference of the slave drive speed regulator. Set **Speed ref 1 src** equal to **Droop out mon**.

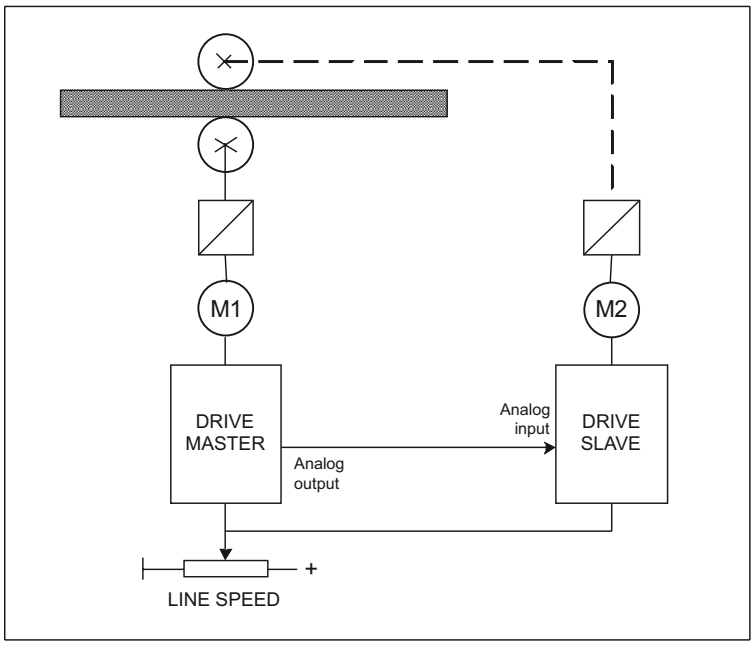
Before it is applied to the reference of the slave drive speed regulator, the adjustment passes through a low-pass filter and a limit.

The Droop function is used to control two coupled motors.

The advantage of using the Droop block is that the speed regulator can remain enabled on both drives. If using the Droop function, it can be adjusted to avoid speed regulator saturation on one of the two drives. Should there be a loss of load by one of the two drives, the adjustment provided by the Droop block is limited by the dedicated parameter.

This function is used to scale the current. This block is typically used when two motors are coupled mechanically to one another (for example if they are connected to the same shaft). They must turn at the same speed. If one of the two motors tends to turn faster, the result is a difference in the load conditions which leads to an Overload condition. The second motor acts as a brake. This causes a current unbalance, which can be eliminated by using the Droop function. An adjustment is added to or subtracted from the reference of the slave drive speed regulator (proportional to the load difference) to re-balance the two currents.

Example of machine on which the droop function can be used.



Parameter configuration:

Master drive:

Analog out x src connected to **Torque ref nofilter**

Slave drive:

Droop ref src connected to **Analog inp**.

Speed ref 1 src connected to **Droop out mon**.

Set "**Droop gain**", **Droop limit**, **Droop filter**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.2.1	**3052**	**Droop ref src**		LINK	16/32	6000	0	16384	ERW	F__

This parameter can be used to select the origin (source) of the **Droop ref src** signal. The signal to be associated with this function can be selected from the "**L_LIM**" selection list. Select an analog input to which an analog signal from the master drive with information about the torque reference level will be connected.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.2.2	**3060**	**Droop gain**	perc	FLOAT		0.0	0.0	100.0	ERW	F__

Use the **Droop gain** parameter to tune the proportional regulator gain. Setting this parameter to 0.0 forces the output of the Droop block to 0.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.2.3	**3062**	**Droop filter**	ms	UINT16		10	1	100	ERW	F__

The **Droop filter** parameter can be used to tune the filter time constant.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.2.4	**3064**	**Droop limit**	rpm	INT16	16/32	30	0	CALCI	ERWZ	F__

The **Droop limit** parameter can be used to tune the absolute value of the maximum adjustment applied by the Droop block to the speed reference.

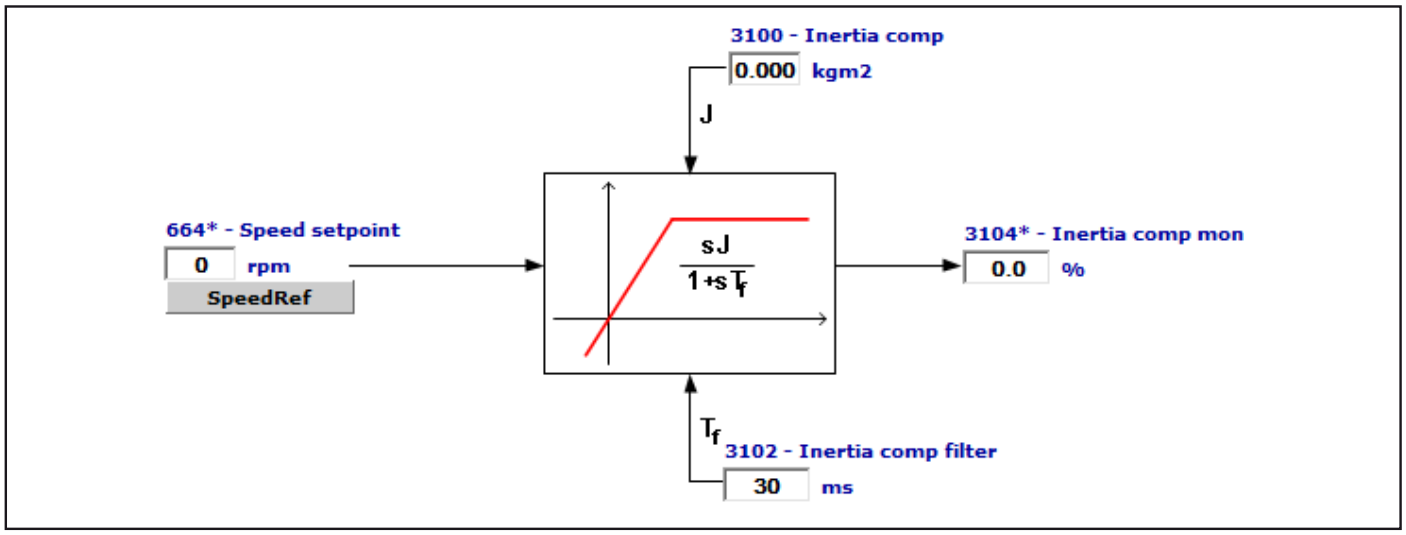
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.2.5	**3070**	**Droop out mon**	rpm	INT16	16/32	0	0	0	ER	F__

The **Droop out mon** parameter can be used to read the size of the adjustment applied by the Droop block.

This variable is typically connected to **Speed ref 1 src** to add or substrat the adjustment by the Droop function to or from the speed reference.

This parameter is available in the speed reference, analog output, slave->master and compare selection lists.

22.3 – FUNCTIONS/INERTIA COMP



An increase in the dynamic response of the speed regulator with a variation in the reference, can be modified by varying the current value during the acceleration/ deceleration phase, to counter the applied inertia of the machine.
These parameters can be set manually by the user.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.3.1	**3100**	**Inertia comp**	kgm²	FLOAT		0.0	0.0	100.0	ERWS	F__

Total value of the inertia on the motor shaft in Kgm² .

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.3.2	**3102**	**Inertia comp filter**	ms	UINT16		30	1	100	ERW	F__

Setting of a filter on the torque compensation. The filter reduces noise due to speed differentiation in the inertia block.

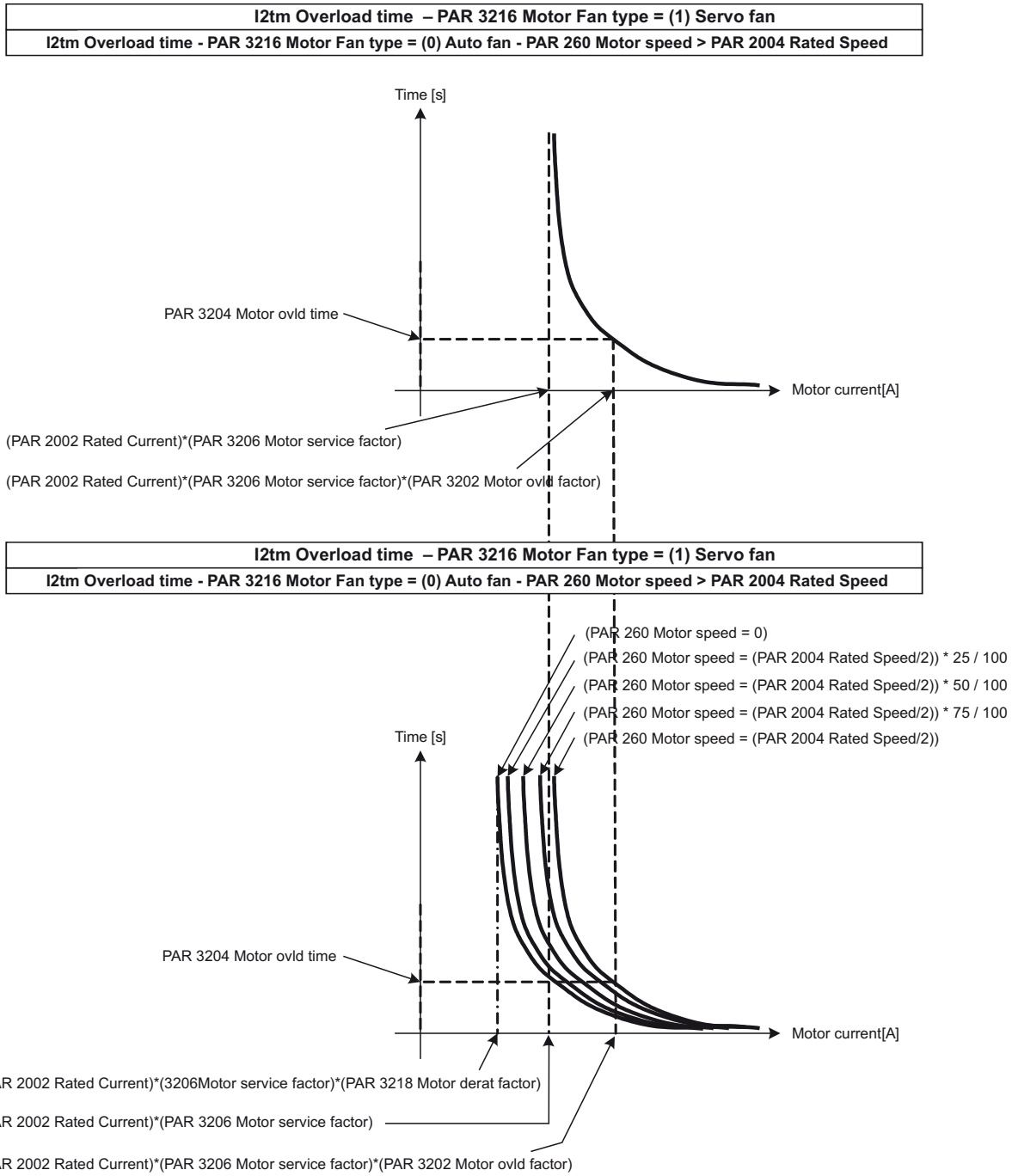
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.3.3	**3104**	**Inertia comp mon**	perc	FLOAT	16/32	0.0	0.0	0.0	ER	F__

The value of inertia compensation on the function block output is displayed.

22.4 – FUNCTIONS/MOTOR OVERLOAD

The overload control function provides integrator logic to protect the motor against thermal overload. This protection presents the characteristic I²t behaviour and is an emulation of the thermal relay of the motor controlled by the ADP200 drive.

When the function is enabled, the value reached by the integrator is stored each time the drive is switched off. The saved value is restored each time the drive is switched on.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.4.1	**3200**	**Motor ovld enable**		BIT		0	0	1	ERW	F__

Enabling of the motor overload control.

0 Disable
1 Enable

If set to 0 the MOTOR OVERLOAD function is disabled.
If set to 1 the MOTOR OVERLOAD function is enabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.4.2	**3202**	**Motor ovld factor**	perc	FLOAT		150.0	100.0	300.0	ERWS	F__

Setting of the motor overload value. The value is expressed as a percentage of **Rated current** (PAR 2002) * **Motor service factor** (PAR 3206).

The current obtained from **Rated current** (PAR 2002) * **Motor service factor** (PAR 3206) * **Motor ovld factor** (PAR 3202) is the maximum current that can circulate in the motor.

If the MOTOR OVERLOAD function is enabled the drive automatically sets the torque current limit so that Iout max. does not exceed this value. The MOTOR OVERLOAD function can be used to deliver current to the motor at the overload value for a time set in **Motor ovld time** (PAR 3204). After the set time, the MOTOR OVERLOAD function automatically sets the torque current limit so that Iout max. does not exceed **Rated current** (PAR 2002) * **Motor service factor** (PAR 3206).

If the value of parameter 3202 **Motor ovld factor** is 100 % the overload current of the Motor Overload function is equal to the continuous current of the Motor Overload function. In this case the drive behaves as if the overload cycle has been executed and so sets the torque current limit so that Iout max is not more than the continuous current, i.e. **Rated current** (PAR 2002) * **Motor service factor** (PAR 3206).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.4.3	**3204**	**Motor ovld time**	s	FLOAT		30.0	10.0	300.0	ERWS	F__

Setting of the motor overload duration in seconds.

With the MOTOR OVERLOAD function a current equal to the level of **Rated current** (PAR 2002) * **Motor service factor** (PAR 3206) * **Motor ovld factor** (PAR 3202) is supplied to the motor for the time set in **Motor ovld time** (PAR 3204).

The MOTOR OVERLOAD protection intervention time depends on the level of current circulating in the motor, a current equal to the overload level is allowed for the time set in **Motor ovld time**, a current at below the overload level is allowed for longer.

This alarm can be assigned to a programmable digital output (**Motor overload trip**).

The trip time depends on the motor current value, see figure on previous page.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.4.4	**3206**	**Motor service factor**	perc	FLOAT		100.0	25.0	200.0	ERWS	F__

Setting of the motor service factor. The value is expressed as a percentage of **Rated current** (PAR 2002).

The current obtained from **Rated current** (PAR 2002) * **Motor service factor** (PAR 3206) * **Motor ovld factor** (PAR 3202) is the maximum current that can circulate in the motor.

If the MOTOR OVERLOAD function is enabled the drive automatically sets the torque current limit so that Iout max. does not exceed this value. The MOTOR OVERLOAD function can be used to deliver current to the motor at the overload value for a time set in **Motor ovld time** (PAR 3204). After the set time, the MOTOR OVERLOAD function automatically sets the torque current limit so that Iout max. does not exceed **Rated current** (PAR 2002) * **Motor service factor** (PAR 3206).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.4.5	**3216**	**Motor fan type**		ENUM		Servo fan			ERW	F__

This parameter is used to set the type of motor cooling system.

0 Auto fan
1 Servo fan

Auto fan indicates the presence of a fan unit mounted on the motor shaft that therefore turns at a speed proportional to the motor speed. Cooling is not very effective at low motor speeds.

Servo fan indicates the presence of an independent fan unit that therefore always runs at the rated speed. It ensures optimum cooling efficiency at all motor speeds.

When the current motor speed is below (PAR 2004 **Rated speed** / 2) and PAR 3216 **Motor fan type** = Auto fan; , the MOTOR OVERLOAD protection intervention time must be reduced as cooling is insufficient.

At below (PAR 2004 **Rated speed** / 2) the protection intervention time is reduced by reducing the direct current of the MOTOR OVERLOAD function.

When the motor speed is equal to (PAR 2004 **Rated speed** / 2) the direct current of the MOTOR OVERLOAD func-

tion is equal to PAR 2002 **Rated current** * PAR 3206 **Motor service factor**, , whereas below that limit it is modified following a linear pattern until PAR 2002 **Rated current** * 3206 **Motor service factor** * PAR 3218 **Motor derat factor** when the motor speed reaches zero.

The overload current of the MOTOR OVERLOAD function is obtained by PAR 2002 **Rated current** * 3206 **Motor service factor** * PAR 3202 **Motor ovld factor** and is the maximum current that can circulate in the motor. If the MOTOR OVERLOAD function is enabled the drive automatically sets the torque current limit so that Iout max. does not exceed this value.

With the MOTOR OVERLOAD function a current equal to the Overload level is supplied to the motor for the maximum time set in PAR 3204 **Motor ovld time**, The slower the motor speed, the shorter the time allowed (see figure at beginning of chapter).

After the set time, the MOTOR OVERLOAD function automatically sets the torque current limit so that Iout max. does not exceed the direct current of the MOTOR OVERLOAD function.

When the motor current speed exceeds (PAR 2004 **Rated speed** / 2) and PAR 3216 **Motor fan type** = Auto fan, the direct current is not reduced as cooling is sufficient.

When PAR 3216 **Motor fan type** = Servo fan, the direct current is not reduced as cooling is sufficient.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.4.6	**3218**	**Motor derat factor**	perc	FLOAT		50.0	0.0	100.0	ERWS	F__

This parameter is used to set the derating factor. The value is expressed as a percentage of PAR 2002 **Rated current** * PAR 3206 **Motor service factor**.

When the current motor speed is below (PAR 2004 **Rated speed** / 2) and PAR 3216 **Motor fan type** = Auto fan, the protection intervention time must be reduced as cooling is insufficient.

At below (PAR 2004 **Rated speed** / 2) sthe protection intervention time is reduced by reducing the direct current of the MOTOR OVERLOAD function.

When the motor speed is equal to (PAR 2004 **Rated speed** / 2)) the direct current of the MOTOR OVERLOAD function is equal to PAR 2002 **Rated current** * PAR 3206 **Motor service factor**, whereas below that limit it is modified following a linear pattern until PAR 2002 **Rated current** * PAR 3206 **Motor service factor** * PAR 3218 **Motor derat factor** when the motor speed reaches zero.

The overload current of the MOTOR OVERLOAD function is obtained by PAR 2002 **Rated current** * PAR 3206 **Motor service factor** * PAR 3202 **Motor ovld factor** and is the maximum current that can circulate in the motor. If the MOTOR OVERLOAD function is enabled the drive automatically sets the torque current limit so that Iout max. does not exceed this value.

With the MOTOR OVERLOAD function a current equal to the Overload level is supplied to the motor for the maximum time set in PAR 3204 **Motor ovld time**, The slower the motor speed, the shorter the time allowed (see graphs).

After the set time, the MOTOR OVERLOAD function automatically sets the torque current limit so that Iout max. does not exceed the direct current of the MOTOR OVERLOAD function.

When the motor current speed exceeds (PAR 2004 **Rated speed** / 2) and PAR 3216 **Motor fan type** = Auto fan, the direct current is not reduced as cooling is sufficient.

When PAR 3216 **Motor fan type** = Servo fan, the direct current is not reduced as cooling is sufficient.

If the value of parameter 3202 **Motor ovld factor** is 100 % the overload current of the Motor Overload function is equal to the continuous current of the Motor Overload function. In this case the drive behaves as if the overload cycle has been executed and so sets the torque current limit so that Iout max is not more than the continuous current, i.e. **Rated current** (PAR 2002) * **Motor service factor** (PAR 3206) * **Motor derat factor** (PAR 3218).

We recommend setting parameter 3218 **Motor derat factor** to a value so that **Rated current** (PAR 2002) * **Motor service factor** (PAR 3206) * **Motor derat factor** (PAR 3218) produces a result that is more than the motor magnetisation current.

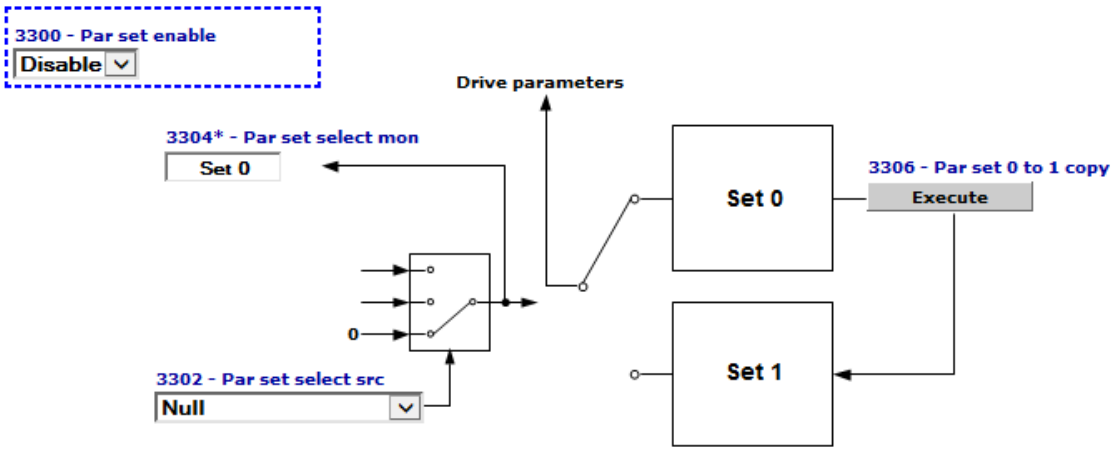
22.5 – FUNCTIONS/BRES OVERLOAD

Warning

Braking resistors may be subject to sudden overloads following failures.
Always protect resistors by using thermal protection devices.
These devices do not have to interrupt the circuit where the resistor is installed, but their auxiliary contact must interrupt the power supply of the drive power section. If the resistor requires the presence of a protection contact, this must be used together with the one belonging to the thermal protection device.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.5.1	**3250**	**Bres control**		BIT		0	0	1	ERWZS	F__
		Enabling of the overload control of the external braking resistor.								
22.5.2	**3252**	**Bres value**	ohm	FLOAT		SIZE	5.0	1000.0	ERWS	F__
		Setting of the ohm value of the external braking resistor.								
22.5.3	**3254**	**Bres cont power**	kW	FLOAT		SIZE	0.1	100.0	ERWS	F__
		Setting of the power that can be continuously dissipated by the external braking resistor.								
22.5.4	**3256**	**Bres overload factor**		FLOAT		SIZE	1.5	10.0	ERWS	F__
		Setting of the external resistor overload factor.								
22.5.5	**3258**	**Bres overload time**	s	FLOAT		SIZE	0.5	50.0	ERWS	F__
		Setting of the intervention time of the external braking resistor overload.								

22.6 – FUNCTIONS/DOUBLE PAR SET



Two independent sets of parameters can be stored in the ADP200 drive. These can be selected via the keypad or by using an external command.
This makes it possible to change all the drive parameters quickly and automatically according to the various operating requirements. For example, two motors with different characteristics can be controlled alternately.
MDPLC application parameters are not included in the two sets of parameters. This makes it possible to switch between all drive parameters in two separate groups, while having a single set of parameters for the application.

With the WEG_eXpress configurator this function can be managed using the commands in the program toolbar.
R0|1 -> "read set 0/1"
This command is used to read set 0 (and store set 1 in a .gfe file) or vice versa, depending on which set is currently active
W0|1 -> " write set 0/1"
This command is used to load both sets of parameters to the drive
The toolbar commands "**Copy set 0**" and "**Copy set 1**" are used, after opening a .gfe file where the two sets have been

stored, to load set 0 and set 1, respectively, to the parameter grid, without interacting with the drive. The previous contents of the parameter grid (which will not necessarily have coincided with either set 0 or set 1) are lost. Use this command to find out which values will actually be sent to the drive.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.6.1	**3300**	**Par set enable**		ENUM		Disable			ERW	F__

Enabling of management of two parameter sets

0 Disable
1 Enable

When set to **0** only one parameter set is managed (the one used as the default set).

If set to **1** two separate parameter sets can be configured. These can be selected using a command signal on a digital input of the terminal strip.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.6.2	**3302**	**Par set select src**		LINK	16	6000	0	16384	ERWZ	F__

Selection of the origin (source) of the signal to be used to select the parameter set. The terminal or digital command that can be associated with this function can be selected from among those available in the "**L_DIG-SEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.6.3	**3304**	**Par set select mon**		ENUM	16	Set 0			ER	F__

The parameter set currently in use is displayed.

0 Set 0
1 Set 1

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.6.4	**3306**	**Par set 0 to 1 copy**		BIT		0	0	1	ERW	F__

Procedures for setting up and managing the double parameter set

Creating the second set:

This function copies parameter set 0 onto set 1. Before enabling management of the double parameter set, the first set should be programmed with the correct values.

When the first set is ready, the second can be activated as follows:

1 Activate management of the double parameter set by enabling parameter **3300 Par set enable**.
2 Copy set 0 onto set 1 using command **3306 Par set 0 to 1 copy**.
This creates an initial parameter base in set 1 to which changes can be made.
Save the parameters.
3 Activate set 1 using parameter **3302 Par set select src**.
To select set 1 manually, set this parameter to "**One**".
Otherwise select the desired source.
4 Modify the parameters in set 1 as necessary.
5 Save the parameters.

You can change the set being used by changing the source selected in parameter **3302 Par set select src**. This can only be changed with the drive disabled.

When the double parameter set is active, the number of the set being used is shown next to the number of each parameter on the keypad.

Modifying and saving parameters:

When the double parameter set is active, any parameters that need to be the same in the two sets must be modified in each set separately.

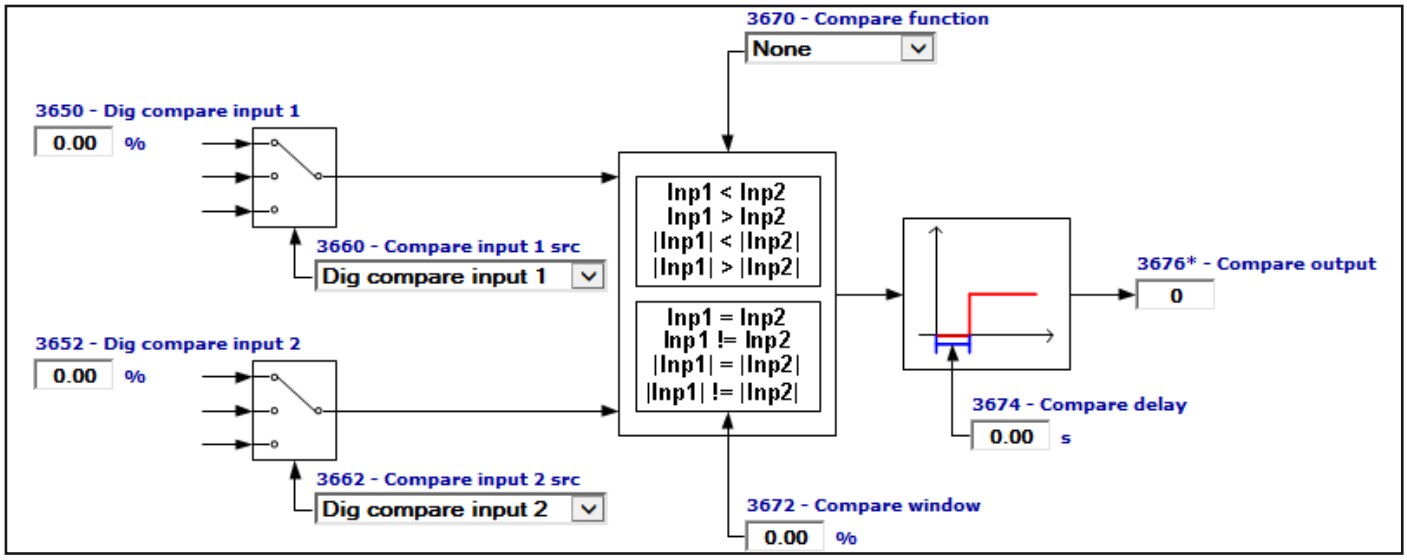
Parameters are only saved in the set that is active at the time. To save both sets, you must first save one and then select and save the other.

Note ! Any changes to the parameters regarding the "parameter sets", performed when enabled, will be lost at the next switching unless a **Par set 0 to 1 copy** command is sent. To save data permanently (even when the drive is switched off), send the **Save parameters** command (DRIVE CONFIG menu).

22.7 –

22.8 –

22.9– FUNCTIONS/COMPARE



This function allows the comparison among two signals or values.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.9.1	**3650**	**Dig compare input 1**	perc	FLOAT	32	0.0	-100.0	100.0	ERW	F__

Setting of the digital value of the first element of comparison.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.9.2	**3652**	**Dig compare input 2**	perc	FLOAT	32	0.0	-100.0	100.0	ERW	F__

Setting of the digital value of the second element of comparison.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.9.3	**3660**	**Compare input 1 src**		LINK	32	3650	0	16384	ERW	F__

Selection of the origin (source) of the signal to be used as the first term of comparison. The values that can be selected in the compare function are listed in the "**L_CMP**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.9.4	**3662**	**Compare input 2 src**		LINK	32	3652	0	16384	ERW	F__

Selection of the origin (source) of the signal to be used as the second term of comparison. The values that can be selected in the compare function are listed in the "**L_CMP**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.9.5	**3670**	**Compare function**		ENUM		None			ERW	F__

Setting of the compare function between **Compare input 2** and **Compare input 1** to enable **Compare output** PAR 3676.

0 None
1 Inp1=Inp2
2 Inp1!=Inp2
3 Inp1<Inp2
4 Inp1>Inp2

5 |Inp1|=|Inp2|

6 |Inp1|!=|Inp2|

7 |Inp1|<|Inp2|

8 |Inp1|>|Inp2|

If set to **0** the comparator is not enabled

If set to **1** the comparator output is enabled when the value of **Compare digital inp** 1 is inside the window resulting from the value of **Compare digital inp** 2 ± the tolerance set via the **Comparator Window**.

If set to **2** the comparator output is enabled when the value of **Compare digital inp** 1 is not inside the window resulting from the value of **Compare digital inp** 2 ± the tolerance set via the **Comparator Window**.

If set to **3** the comparator output is enabled when **Compare input 1** is less than **Compare input 2**.

If set to **4** the comparator output is enabled when **Compare input 1** is greater than **Compare input 2**.

If set to **5** the comparator output is enabled when the value of **Compare digital inp** 1 is inside the window resulting from the absolute value of **Compare digital inp** 2 ± the tolerance set via the **Comparator Window**.

If set to **6** the comparator output is enabled when the absolute value of **Compare digital inp 1** is not inside the window resulting from the absolute value of **Compare digital inp 2** ± the tolerance set via the **Comparator Window**.

If set to **7** the comparator output is enabled when the absolute value of **Compare digital inp 1** is less than the absolute value of **Compare digital inp 2**.

If set to **8** the comparator output is enabled when the absolute value of **Digital compar inp1** is more than the absolute value of **Digital compar in2**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.9.6	**3672**	**Compare window**	perc	FLOAT		0.0	0.0	100.0	ERW	F__

Setting of the tolerance window for comparing the **Compare input 1** and **Compare input 2** signals.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.9.7	**3674**	**Compare delay**	s	FLOAT		0.0	0.0	30.0	ERW	F__

Setting of the delay for signalling the result of the comparison.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.9.8	**3676**	**Compare output**		BIT	16	0	0	1	ER	F__

The status of the comparator output is displayed:

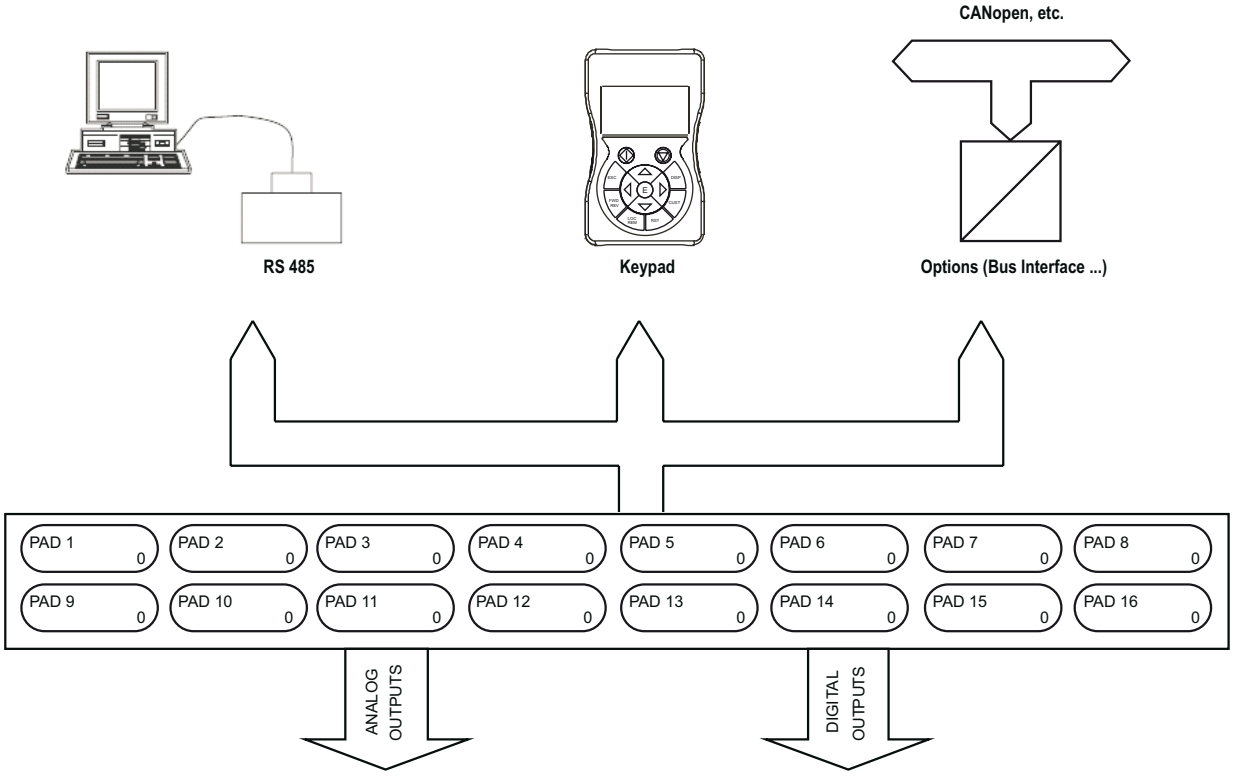
0 The result of the set comparison is negative

1 The result of the set comparison is positive

22.10 – FUNCTIONS/PADS

The general variables are used to exchange data between the various components of a Bus system. They are similar to the variables of a PLC. The basic structure of the system is illustrated below. Pads can be used, for example, to send information from a fieldbus to an optional card. All Pads can be read and written.

The Pads can also be used to exchange data with an MDPlc application installed in the drive. See the MDPlc manual for more details.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.10.1	**3700**	**Pad 1**		INT32	32	0	0	0	ERW	F__
22.10.2	**3702**	**Pad 2**		INT32	32	0	0	0	ERW	F__
22.10.3	**3704**	**Pad 3**		INT32	32	0	0	0	ERW	F__
22.10.4	**3706**	**Pad 4**		INT32	32	0	0	0	ERW	F__
22.10.5	**3708**	**Pad 5**		INT32	32	0	0	0	ERW	F__
22.10.6	**3710**	**Pad 6**		INT32	32	0	0	0	ERW	F__
22.10.7	**3712**	**Pad 7**		INT32	32	0	0	0	ERW	F__
22.10.8	**3714**	**Pad 8**		INT32	32	0	0	0	ERW	F__
22.10.9	**3716**	**Pad 9**		INT32	32	0	0	0	ERW	F__
22.10.10	**3718**	**Pad 10**		INT32	32	0	0	0	ERW	F__
22.10.11	**3720**	**Pad 11**		INT32	32	0	0	0	ERW	F__
22.10.12	**3722**	**Pad 12**		INT32	32	0	0	0	ERW	F__
22.10.13	**3724**	**Pad 13**		INT32	32	0	0	0	ERW	F__
22.10.14	**3726**	**Pad 14**		INT32	32	0	0	0	ERW	F__
22.10.15	**3728**	**Pad 15**		INT32	32	0	0	0	ERW	F__
22.10.16	**3730**	**Pad 16**		INT32	32	0	0	0	ERW	F__

Setting of general, 32 Bit variables. PAD parameters can be used as supporting parameters to send values written by the fieldbus, serial line, etc. to analog or digital outputs.

22.11 - FUNCTIONS/VDC CONTROL

This function is used to control the voltage and power recovered in the DC link during regeneration (e.g. braking ramp). When this function is enabled, if the power regenerated by the load during braking increases the DC link voltage, the drive prevents triggering of the **Overvoltage** alarm by limiting the regenerated current.

The **Vdc control function** is enabled automatically (if parameter **3450 Vdc control function** is set to 1) when the DC link voltage exceeds a preset threshold, depending on the mains voltage and lower than the **Overvoltage** threshold.

This threshold is also used for the regulator that controls the regenerated current limit.

If the **Vdc control function** is enabled, the motor speed need not follow the set ramp.

If the regulator is unable to limit the regenerated power during the deceleration ramp and prevent the **Overvoltage** alarm from being generated, the ramp can be temporarily blocked by setting parameter **754 Ramp freeze src** using the information in **Vdc ctrl ramp freeze**.

The function remains enabled until the power regenerated by the load is cancelled and the DC link voltage falls below the disable threshold (below the enable threshold).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.11.1	**3450**	**Vdc control function**		ENUM		Disable			ERWZ	F__

This parameter is used to enable the **Vdc control function**.

0 Disable

1 Enable

If set to **0** the function is disabled: in case of power recovery the Sovratensione alarm is generated.

If set to **1** the function is enabled: in case of power recovery the function is enabled and attempts to control the current regenerated by the motor and prevent the **Overvoltage** alarm from being generated.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.11.2	**3470**	**Vdc control P gain**	A/V	FLOAT		CALCF	0.0	100.000	ERWS	F__

Setting of the proportional gain used during the **Vdc control function**. The set value must be increased if the **Overvoltage** alarm is generated. The Sovratensione alarm can also be prevented by lengthening the deceleration ramp. The value of this parameter must also be increased if the DC link voltage is set to a value other than the setpoint

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.11.3	**3472**	**Vdc control I time**	ms	FLOAT		CALCF	1.0	1000.0	ERWS	F__

Setting of the integral time used during the **Vdc control function**. The set value must be reduced if the DC link voltage is set to a value other than the setpoint.

22.12 -

22.13 - FUNCTIONS/DIMENSION FACT

The function factor allows the drive speed to be expressed in a unit of measure other than rpm, generally referred to as user units. A conversion factor is used to convert the value from rpm to user units. This can be set as a fraction using two parameters:

PAR 3900 **Dim factor num** and PAR 3902 **Dim factor den**.

The conversion formula is rpm = **Dim factor num / Dim factor den * user unit**

The unit of measure displayed for parameters expressed in user units is user definable, but requires the use of the WEG_eXpress configurator. The text of the unit of measure is set in PAR 3904 **Dim factor text**. Since this is a UINT32 it can contain a maximum of 4 characters.

The default values of the parameters that define the function factor are:

PAR **3900 Dim factor num** = 1; PAR **3902 Dim factor den** = 1; PAR **3904 Dim factor text** = “rpm“

The following parameters expressed by default in rpm can be displayed in user units:

PAR	Description	UM	UU
628	Ramp setpoint	rpm	X
664	Speed setpoint	rpm	X
260	Motor speed	rpm	X
600	Dig ramp ref 1	rpm	X
602	Dig ramp ref 2	rpm	X
604	Dig ramp ref 3	rpm	X
620	Ramp ref 1 mon	rpm	X
622	Ramp ref 2 mon	rpm	X
624	Ramp ref 3 mon	rpm	X
626	Ramp ref out mon	rpm	X
634	Ramp ref top lim	rpm	X
636	Ramp ref bottom lim	rpm	X
630	Reference skip set	rpm	
632	Reference skip band	rpm	
640	Dig speed ref 1	rpm	X
642	Dig speed ref 2	rpm	X
660	Speed ref 1 mon	rpm	X
662	Speed ref 2 mon	rpm	X
670	Speed ref top lim	rpm	X
672	Speed ref bottom lim	rpm	X
680	Full scale speed	rpm	
760	Ramp outmon	rpm	X
800	Multi reference 0	rpm	X
802	Multi reference 1	rpm	X
804	Multi reference 2	rpm	X
806	Multi reference 3	rpm	X
808	Multi reference 4	rpm	X

PAR	Description	UM	UU
810	Multi reference 5	rpm	X
812	Multi reference 6	rpm	X
814	Multi reference 7	rpm	X
816	Multi reference 8	rpm	X
818	Multi reference 9	rpm	X
820	Multi reference 10	rpm	X
822	Multi reference 11	rpm	X
824	Multi reference 12	rpm	X
826	Multi reference 13	rpm	X
828	Multi reference 14	rpm	X
830	Multi reference 15	rpm	X
852	Multi ref out mon	rpm	X
870	Mpot setpoint	rpm	
876	Mpot top lim	rpm	
878	Mpot bottom lim	rpm	
894	Mpot output mon	rpm	
910	Jog setpoint	rpm	
920	Jog output mon	rpm	
930	Reference 0 thr	rpm	
940	Speed 0 thr	rpm	
950	Speed threshold 1	rpm	
952	Speed threshold 2	rpm	
962	Set speed error	rpm	
968	Dig set speed ref	rpm	
970	Speed threshold 3	rpm	
972	Speed thr hysteresis	rpm	

If a function factor is set, all the parameters in the above table are converted into user units.

Calculation of the minimum and maximum values of parameters “Dim factor num” and “Dim factor den”

Calculation of the minimum and maximum values of parameters “**Dim factor num**” and “**Dim factor den**”.

Limits must be included when setting the values of PAR 3900 **Dim factor num** and PAR 3902 **Dim factor den** to prevent the internal variables of the drive moving out of range.

Fixed limits for each of the two parameters cannot be defined since it is the ratio between the two that must be limited and because this limit also depends on parameter 680 **Full scale speed**.

There is the possibility of an overflow depending on the order in which the two

parameters PAR 3900 **Dim factor num** and PAR 3902 **Dim factor den** are set and their initial value.

The conditions in which an overflow could occur are described in the table below.

Initial value	Values to be set	Order	Overflow
Den = 1 Num = 1	Den 30 – Num 10	Num – Den	No
Den = 1 Num = 1	Den 30 – Num 10	Den – Num	Si
Den = 30 Num = 10	Den 1 – Num 1	Num – Den	Si
Den = 30 Num = 10	Den 1 – Num 1	Den – Num	No

If an overflow occurs when setting one of the two parameters, the other parameter is automatically set to the same value so that the conversion value is equal to 1.

Sent via the configurator

If the parameters are sent by the WEG_eXpress configurator, they are written in a set order and an intermediate overflow could occur while setting valid values.

If the value of the first parameter sent by the configurator generates an overflow, the second parameter is set to the same value as the first (this temporarily forces the dimension factor to 1); when the second parameter is written the dimension factor returns to the correct value.

Changing the end of scale speed

When modifying PAR 680 **Full scale speed**, parameters PAR 3900 **Dim factor num** and PAR 3902 **Dim factor den** are forced to 1.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.13.1	**3900**	**Dim factor num**		UINT16		1	1	65535	ERW	F__
		Numerator dimension factor								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.13.2	**3902**	**Dim factor den**		UINT16		1	1	65535	ERW	F__
		Denominator dimension factor								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.13.3	**3904**	**Dim factor text**		UINT32		7172210	0	0	ERW	F__

The unit of measure displayed for parameters expressed in user units is user definable but requires the use of the configurator. The text of the unit of measure can contain up to a maximum of 4 characters.

22.14 - FUNCTIONS/CONTROL MODE

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.14.1	**556**	**Control mode select**		ENUM		Ramp			ERWZ	F__

Selection of the drive control mode.

Vett Flusso CL mode

0 Torque

1 Speed

2 Ramp

In **torque control (0 - Torque)** the reference and load of the motor determine its speed and direction of rotation. Symmetrical torque limits can be set, for each direction of rotation and for motor/generator operation. This type of control is only available in the **Flux vector CL** control mode. In this mode the **Ramp** function is not used to generate the drive speed reference so it can be used in stand-alone mode.

In **speed control (1 - Speed)** the reference arrives straight after the ramp circuit, enabling an extremely rapid response to signal variations. This is ideal for applications that require a highly dynamic response. This type of control is available in the **Flux vector CL** and **Flux vector OL** control modes. In this mode the **Ramp** function is not used to generate the drive speed reference so it can be used in stand-alone mode.

In **control with ramp (2 - Ramp)** the speed reference is applied to the input of the "**Ramp**" block and is produced by the "**Ramp ref**" block. This allows setting of both the acceleration/deceleration times and the ramp time (linear or S-shaped with customizable jerks). This type of control is available in all control.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.14.2	**6200**	**Ctrl mode src**		LINK	16BIT	556	0	16384	ERWZ	F__

Selection of source of **Control Mode** function. The parameter to be assigned to this function is selected from the "**L_CTRLMODE**" selection list.

If IPA 6200 = **Control mode select**, IPA6208 value is set thru IPA556.

If IPA 6200 = **Ctrl mode sel mon,** IPA6208 value is set thru IPA6206.

If IPA 6200 is a **PAD X**, the PAD value will be considered.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.14.3	**6202**	**Ctrl mode sel 0 src**		LINK	16BIT	6000	0	16384	ERWZ	F__
22.14.4	**6204**	**Ctrl mode sel 1 src**		LINK	16BIT	6000	0	16384	ERWZ	F__

Selection of the drive control mode thru digital inputs

Ctrl mode sel 0 src	Ctrl mode sel 1 src		
0	0	0	Torque
0	1	1	Speed
1	0	2	Ramp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.14.5	**6206**	**Ctrl mode sel mon**		UINT32		0	0	3	ER	F__

Monitoring of the selection done thru the IPA6202 **Ctrl mode sel 0 src** and IPA6204 **Ctrl mode sel 1 src.**

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.14.6	**6208**	**Ctrl mode mon**		ENUM		Torque			ER	F__

Torque-Speed-Ramp selection done thru the IPA6200 "Ctrl mode src, IPA6202 **Ctrl mode sel 0 src** and IPA6204 **Ctrl mode sel 1 src.**

0 Torque

1 Speed

2 Ramp

22.15 - FUNCTIONS/TEMP CONTROL

This function basically includes two comparators with hysteresis. You can manage temperature signals such as external solenoids to command activation of cooling systems for the drive and/or motor via digital outputs.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.15.1	**3500**	**Drv temp src**		LINK	32BIT	6000	0	16384	ERW	F__

Selection of signal origin (source) for management of a temperature signal. The parameter to be assigned to this function is selected from the "**L_TEMPCTRL**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.15.2	**3504**	**Drv temp thr**	degC	INT32		45	1	100	ERW	F__

Setting of trip threshold for an alarm signal.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.15.3	**3508**	**Drv temp hys**	degC	INT32		2	0	CALCI	ERW	F__

Setting of a tolerance band for the trip threshold set in PAR 3504.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.15.4	**3502**	**Mot temp src**		LINK	32BIT	6000	0	16384	ERW	F__

Selection of signal origin (source) for management of a temperature signal. The parameter to be assigned to this function is selected from the "**L_TEMPCTRL**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.15.5	**3506**	**Mot temp thr**	degC	INT32		45	1	100	ERW	F__

Setting of trip threshold for an alarm signal.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.15.6	**3510**	**Mot temp hys**	degC	INT32		2	0	CALCI	ERW	F__

Setting of a tolerance band for the trip threshold set in PAR 3506.

23 – COMMUNICATION

23.1 – COMMUNICATION/RS485

The ADP200 drive is provided with a standard port (9 pole sub-D connector: XS) for connecting the RS485 serial line used for drive-PC point-to-point communication (via the WEG_eXpress configuration software) or for the multidrop connection.

The RS485 serial line format is: 8 data bits, no parity and one stop bit.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.1.1	**3800**	**Drive address**		UINT16		1	1	255	ERW	F__

Setting of the address to which the drive responds when connected to the RS485 serial line.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.1.2	**3802**	**Serial baudrate**		ENUM		38400			ERW	F__

Setting of the RS485 serial communication speed (Baud Rate).

0 9600
1 19200
2 38400

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.1.3	**3810**	**Serial parameter**		ENUM		None,8,1			ERW	F__

Setting of the format of the RS485 serial communication data.

0 None,8,1
1 None,8,2
2 Even,8,1
3 Odd,8,1

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.1.4	**3804**	**Serial protocol**		ENUM		Modbus			ERW	F__

Setting of the serial communication protocol:

0 Modbus
1 Jbus

Setting to **0** selects the Modbus RTU (Remote Terminal Unit) serial communication protocol.

Setting to **1** selects the Jbus serial communication protocol. The Jbus protocol is functionally identical to the Modbus, except for the different numbering of addresses: in the Modbus these start from zero (0000 = 1st address) while in the JBUS they start from one (0001 = 1st address) and maintain this difference throughout numbering.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.1.5	**3806**	**Serial delay**	ms	UINT16		0	0	1000	ERW	F__

Setting of the minimum delay between the drive receiving the last byte and starting its response. This delay avoids conflicts on the serial line when the RS485 interface that is used has not been pre-set for automatic Tx/Rx switching. The parameter only concerns the use of the standard RS485 serial line.

Example: if the delay in Tx/Rx switching on the master is a maximum of 20ms, the Ser answer delay parameter must be set to at least 20ms: 22ms

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.1.6	**3808**	**Serial swap data**		BIT		0	0	1	ERW	F__

This parameter enables the exchange of the reading of the High and Low parts of the words for FLOAT, UINT32, INT32 type parameters when using the Modbus protocol.

23.2 – COMMUNICATION/FIELDBUS CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.2.1	**4000**	**Fieldbus type**		ENUM		Off			RW	F__

Setting of the type of fieldbus to be used.

0 Off
1 CanOpen

If set to **0** no fieldbus is selected.
If set to **1** the CanOpen fieldbus profile is selected.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.2.2	**4004**	**Fieldbus baudrate**		ENUM		500k			RW	F__

Setting of the communication network speed (Baud Rate).

0 Auto
1 125k
2 250k
3 500k
4 1M

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.2.3	**4006**	**Fieldbus address**		INT16		3	0	255	RW	F__

Setting of the node address of the drive when connected to the network.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.2.4	**4010**	**Fieldbus M->S enable**		ENUM		Enable			ERWZ	F__

Setting of fieldbus data updating.

0 Disable
1 Enable

If set to **0**, the possibility of sending commands and references from the drive PLC via the fieldbus is disabled.
If set to **1** the possibility of sending commands and references from the drive PLC via the fieldbus is enabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.2.5	**4012**	**Fieldbus alarm mode**		INT32		0	0	1	ERWZ	F__

Setting of the **Opt Bus Fault** alarm generation mode.

0 Off
1 On

If set to **0** the alarm is only generated if the drive is enabled.

If set to **1** the alarm is generated even with the drive disabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.2.6	**4014**	**Fieldbus state**		ENUM		Stop			R	F__

The logic status of the fieldbus connection is displayed. The value depends on the type of bus that is used.
The following logic states are displayed if the CANopen or Rte fieldbus is selected:

0 Stop
1 PreOperational
2 Operational

23.3 – COMMUNICATION/FIELDBUS M->S

Configuration of input data

There are 16 groups of parameters, with the same structure, for configuring data to be exchanged cyclically with the fieldbus. Each group permits the exchange of a single datum, which corresponds to a single drive parameter.

The data written by the Master (a PLC, PC or control panel) to the Slave (the drive) can be configured in the COMMUNICATION/FIELDBUS M2S menu, hence the name of the M->S menu:

Parameter for setting input data:

It must contain a valid IPA corresponding to the parameter to be written, or 0 if sys (PAR 4022...4172 **Fieldbus M->Sn sys**) is **Fill** or **Mdplc**.

For *src* (Source) parameters, if you select PAR 4024 **Fieldbus M->S1 mon** in the corresponding enum, the value of parameter 4020 is automatically set to the IPA of the *src*.

E.g.: if PAR 4020 **Fieldbus M->S1 ipa** = 610 then PAR 610 **Ramp ref 1 src** = PAR 4020 **Fieldbus M->S1 ipa**.

For *src* parameters with a FB type other than 0, the datum coming to the fieldbus is not written in the enum selection but directly in the mon associated with the *src*.

E.g.: PAR 4020 **Fieldbus M->S1 ipa** = 610, the reference from the bus is sent to PAR 620 **Ramp ref 1 mon**, it does not modify the selection of PAR 610 **Ramp ref 1 src** which continues to be set to PAR 4020 **Fieldbus M->S1 ipa**.

If it contains a valid IPA and is forced to 0 the corresponding sys parameter assumes the value of Fill (16 or 32 depending on the previous setting), to guarantee that the structure of the exchanged data area is not changed.

PAR 4022 **Fieldbus M->S1 sys** Format of the datum to exchange

This parameter is automatically adjusted to the recommended value when the corresponding PAR 4020...4170 **Fieldbus M->Sn ipa** is modified. Although the automatic value is user-definable, acceptable values depend on the datum IPA parameter: some combinations are not allowed and generate a configuration alarm at restart.

Values:

- **Not assigned**: if set to "**Not assigned**" this and all subsequent groups (regardless of their sys) are not part of the data exchanged, regardless of the IPA.
- **Fill16/32**: the datum is exchanged on the fieldbus but not written in any parameter.
- **Eu**: the datum is exchanged in 16-bit signed integer format with the parameter unit configured in the corresponding IPA or, in the case of src with the corresponding mon (e.g.: if PAR 4020 **Fieldbus M->S1 ipa** = PAR 610 **Ramp ref 1 src** and PAR 4022 **Fieldbus M->S1 sys** = Eu the datum is in rpm), multiplied by div. This setting is only possible for some parameters. See the table of FBUS types in the list of parameters. For these parameters the datum is exchanged every ms.
- **Eu_float** : Eu_float: same as Eu, but the datum is in floating point 32-bit IEEE754 single precision format.
- **Count16/32**: the datum is exchanged in internal units (see scaling table) every ms (e.g.: if PAR 4020 Fieldbus M->S1 IPA = 610, PAR 610 **Ramp ref 1 src** and PAR 4022 **Fieldbus M->S1 sys** = Count16 the datum is scaled so that a value of 0x4000 produces a reference equal to PAR 680 **Full scale speed**).

  This setting is only possible for some parameters. See the table of FBUS types in the list of parameters: if the field is empty Count cannot be set in the parameter. Some parameters permit the use of Count16 (usually values in which there is no need to exchange the least significant 16 bits) and Count32, according to the following rule: if FBUS = 32bit only Count32 can be set, if 16hi or 16lo Count32 and Count16 can both be set, indicating which word of the parameter is actually used. If Count32 is used and the internal type of the parameter is FLOAT the datum must be exchanged in floating point IEEE754 single precision format, otherwise as an integer (signed or unsigned, again according to the internal type).
- **MdPlc16/32**: this indicates that the datum is for use by the MdPlc application, which will use the value of PAR 4024...4174 **Fieldbus M->Sn mon** accordingly. If set to MdPlc16 the 16 bits of the low part of the mon are exchanged, if set to MdPlc32 all 32 bits are exchanged. All this applies if PAR 4020...4170 **Fieldbus M->Sn mon** = 0, otherwise it behaves in the same way as Count.
- **Par16/32**: this is the default setting for all parameters with FB type empty so that data cannot be exchanged at 1 ms and the datum is updated in background. The datum format depends on the format of the parameter and the setting: with Par16 the datum is a 16-bit integer (signed or unsigned, according to

the external type of the parameter) with the same unit of measure as the selected parameter (multiplied by div); Par16 is only available if the parameter is not actually a 32-bit one (e.g. it is not possible for iPad and Compare). With Par32 the format is float if the external type of the parameter is float, otherwise it is integer, always with the unit of the parameter. Parameters with FB type not empty can also be exchanged as PAR, according to the same rules listed above.

If using the CANopen fieldbus, the sys is also used to structure the data area in 8-byte PDOs. The PDOs are created starting from the first group and it is necessary to guarantee that the data are contained in the PDO. Therefore, for example, a setting with PAR 4022 Fieldbus M->S1 sys = Count32, PAR 4032 Fieldbus M->S2 sys = Count16, PAR 4042 Sys M->S3 Fieldbus = Count32 is not valid, as the datum in group 3 would straddle the first two 2 PDOs. In these cases, shorter PDOs can be generated by using the Count setting with IPA 0 (in the example PAR 4040 **IPA M->S3 Fieldbus** = 0, PAR 4042 **Fieldbus M->S3 sys** = Count16, PAR 4050 **Fieldbus M->S4 ipa** = IPA of the parameter that was previously in 3 and PAR 4052 **Fieldbus M->S4 sys** = Count32, thus using a first PDO with 6 bytes), or by creating unused areas in the PDO using Fill (the PDO has a size of 8 bytes but the last word is not used).

If the data cannot be mapped in the PDOs, a specific alarm is generated at startup, indicating the group with the problem. Note that this only applies to CANopen. For the other fieldbuses the exchange area is contiguous with a max size of 16 words (14 for DeviceNet).

PAR 4024 **Fieldbus M->S1 mon** Monitor of datum coming from the master

This is the value, already scaled in internal counts, of the datum arriving from the master. If, for example, a value equal to PAR 680 **Full scale speed** is sent to PAR 610 **Ramp ref 1 src** in rpm, the internal value is 0x40000000 = 1073741824. The scaling also includes the division of the div parameter.

PAR 4026 **Fieldbus M->S1 div** Divider to apply to the parameter

This can only be used for sys = Eu or Par. It divides the incoming datum by the value entered: this makes it possible to increase the resolution of the datum. For example, if IPA = PAR 610 **Ramp ref 1 src**, sys is automatically set to Eu. When div = 10 is entered, the Master must send the datum in rpm multiplied by 10, for example to send a reference equal to 100.5 rpm the datum exchanged on the bus is 1005: the resolution is therefore in tenths of a degree. Before entering a value, it is important to consider the maximum value of the datum exchanged, to make sure it can be contained in a 16-bit integer (in the example, the maximum possible speed is 3276.7 rpm).

Use

This group of parameters is repeated 16 times, making it possible to configure up to 16 input data, but also bearing in mind the maximum limit of 16 words in all (14 for DeviceNet). The total number of configurable data thus also depends on the format, whether 16 or 32-bit, according to the above rules for *sys*.

The drive only implements the parameters in the COMMUNICATION/FIELDBUS M2S menu at startup. Once set, they must therefore be saved and the drive restarted (this procedure is not necessary for values set via dynamic mapping by the master, currently only supported by CANopen). The data are processed in order from 1 to the first with sys = **Not assigned**: depending on the configuration, an area for exchanging data with the fieldbus is created, the size and composition of which are clearly-defined.

If the data entered are not consistent (for example if sys is set as Eu or Count for a parameter that does not support these, or set to 16-bit for a parameter that can only be 32, or if the IPA does not exist, or if the PDO is not the right size, etc.) alarm “[17] **Opt Bus fault**” is generated with a subcode indicating the type of problem and group in which it occurred (code meanings are described in the Interface page in Menu/FIELDBUS WORDS MAP/M->S in WEG_eXpress).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.3.1	**4020**	**Fieldbus M->S1 ipa**		FBM2SIPA		0	0	20000	RW	F__
23.3.5	**4030**	**Fieldbus M->S2 ipa**		FBM2SIPA		0	0	20000	RW	F__
23.3.9	**4040**	**Fieldbus M->S3 ipa**		FBM2SIPA		0	0	20000	RW	F__
23.3.13	**4050**	**Fieldbus M->S4 ipa**		FBM2SIPA		0	0	20000	RW	F__
23.3.17	**4060**	**Fieldbus M->S5 ipa**		FBM2SIPA		0	0	20000	RW	F__
23.3.21	**4070**	**Fieldbus M->S6 ipa**		FBM2SIPA		0	0	20000	RW	F__
23.3.25	**4080**	**Fieldbus M->S7 ipa**		FBM2SIPA		0	0	20000	RW	F__
23.3.29	**4090**	**Fieldbus M->S8 ipa**		FBM2SIPA		0	0	20000	RW	F__

23.3.33	**4100 Fieldbus M->S9 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.3.37	**4110 Fieldbus M->S10 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.3.41	**4120 Fieldbus M->S11 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.3.45	**4130 Fieldbus M->S12 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.3.49	**4140 Fieldbus M->S13 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.3.53	**4150 Fieldbus M->S14 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.3.57	**4160 Fieldbus M->S15 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.3.61	**4170 Fieldbus M->S16 ipa**	FBM2SIPA	0	0	20000	RW	F__

Setting of the parameter to associate with the bus channel. The default setting is 0, which means channel not active.

If the parameter to be connected is a **sorg** (source), the channel and parameter can also be associated by modifying the **sorg** parameter in its menu.

When setting a parameter, the format is also automatically set in the sys parameter.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.3.2	**4022**	**Fieldbus M->S1 sys**		ENUM		Not assigned			RW	F__
23.3.6	**4032**	**Fieldbus M->S2 sys**		ENUM		Not assigned			RW	F__
23.3.10	**4042**	**Fieldbus M->S3 sys**		ENUM		Not assigned			RW	F__
23.3.14	**4052**	**Fieldbus M->S4 sys**		ENUM		Not assigned			RW	F__
23.3.18	**4062**	**Fieldbus M->S5 sys**		ENUM		Not assigned			RW	F__
23.3.22	**4072**	**Fieldbus M->S6 sys**		ENUM		Not assigned			RW	F__
23.3.26	**4082**	**Fieldbus M->S7 sys**		ENUM		Not assigned			RW	F__
23.3.30	**4092**	**Fieldbus M->S8 sys**		ENUM		Not assigned			RW	F__
23.3.34	**4102**	**Fieldbus M->S9 sys**		ENUM		Not assigned			RW	F__
23.3.38	**4112**	**Fieldbus M->S10 sys**		ENUM		Not assigned			RW	F__
23.3.42	**4122**	**Fieldbus M->S11 sys**		ENUM		Not assigned			RW	F__
23.3.46	**4132**	**Fieldbus M->S12 sys**		ENUM		Not assigned			RW	F__
23.3.50	**4142**	**Fieldbus M->S13 sys**		ENUM		Not assigned			RW	F__
23.3.54	**4152**	**Fieldbus M->S14 sys**		ENUM		Not assigned			RW	F__
23.3.58	**4162**	**Fieldbus M->S15 sys**		ENUM		Not assigned			RW	F__
23.3.62	**4172**	**Fieldbus M->S16 sys**		ENUM		Not assigned			RW	F__

Setting of the format of the datum received on the channel. When the src parameter is programmed, the format is automatically programmed on the relative sys. If the src parameter is reset to null, the format does not change. The value of the format can be selected from the following list, according to the parameter selected as the source:

0 Not assigned
1 Count 16
2 Count 32
3 Fill 16
4 Fill 32
5 Mdplc 16
6 Mdplc 32
7 Eu
8 Eu float
9 Par 16
10 Par 32

If set to **0** the channel is not assigned.

If set to **1** the datum is assigned a 16-bit count.

If set to **2** the datum is assigned a 32-bit count.

If set to **3** 16 bits on the channel are reserved for the datum, not used.

If set to **4** 32 bits on the channel are reserved for the datum, not used.

If set to **5** the datum is assigned a 16-bit count used by MDPLC.

If set to **6** the datum is assigned a 32-bit count used by MDPLC.

If set to **7** the datum is assigned engineering units on a 16-bit integer.

If set to **8** the datum is assigned engineering units on a 32-bit integer.

If set to **9**, the datum is assigned a 16-bit integer engineering unit format not in real time (5-10ms)

If set to **10** the datum is assigned a 32-bit integer engineering unit format or float format if the associated parameter is a float-type parameter not in real time (5-10ms)

Note! If the sys parameter is **not assigned**, none of the subsequent fieldbus channels are read, even if programmed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.3.3	**4024**	**Fieldbus M->S1 mon**		INT32	32	0	0	0	ER	F__
23.3.7	**4034**	**Fieldbus M->S2 mon**		INT32	32	0	0	0	ER	F__
23.3.11	**4044**	**Fieldbus M->S3 mon**		INT32	32	0	0	0	ER	F__
23.3.15	**4054**	**Fieldbus M->S4 mon**		INT32	32	0	0	0	ER	F__
23.3.19	**4064**	**Fieldbus M->S5 mon**		INT32	32	0	0	0	ER	F__
23.3.23	**4074**	**Fieldbus M->S6 mon**		INT32	32	0	0	0	ER	F__
23.3.27	**4084**	**Fieldbus M->S7 mon**		INT32	32	0	0	0	ER	F__
23.3.31	**4094**	**Fieldbus M->S8 mon**		INT32	32	0	0	0	ER	F__
23.3.35	**4104**	**Fieldbus M->S9 mon**		INT32	32	0	0	0	ER	F__
23.3.39	**4114**	**Fieldbus M->S10 mon**		INT32	32	0	0	0	ER	F__
23.3.43	**4124**	**Fieldbus M->S11 mon**		INT32	32	0	0	0	ER	F__
23.3.47	**4134**	**Fieldbus M->S12 mon**		INT32	32	0	0	0	ER	F__
23.3.51	**4144**	**Fieldbus M->S13 mon**		INT32	32	0	0	0	ER	F__
23.3.55	**4154**	**Fieldbus M->S14 mon**		INT32	32	0	0	0	ER	F__
23.3.59	**4164**	**Fieldbus M->S15 mon**		INT32	32	0	0	0	ER	F__
23.3.63	**4174**	**Fieldbus M->S16 mon**		INT32	32	0	0	0	ER	F__

The value received from the bus is displayed. This parameter must be associated with the src parameter to enable the **M->S** channel.

The user may modify the **M->S** and by **S->M** sys parameters. The consistency of the sys with the parameter assigned to the channel is checked.

A Fieldbus M->S X Mon parameter can only be assigned to a single “src”. If assigned to more than one src, an error signal is generated during fieldbus initialization.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.3.4	**4026**	**Fieldbus M->S1 div**		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.8	**4036**	**Fieldbus M->S2 div**		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.12	**4046**	**Fieldbus M->S3 div**		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.16	**4056**	**Fieldbus M->S4 div**		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.20	**4066**	**Fieldbus M->S5 div**		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.24	**4076**	**Fieldbus M->S6 div**		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.28	**4086**	**Fieldbus M->S7 div**		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.32	**4096**	**Fieldbus M->S8 div**		FLOAT		1.0	1.0	1000.0	ERW	F__

23.3.36	**4106 Fieldbus M->S9 div**	FLOAT	1.0	1.0	1000.0	ERW	F__
23.3.40	**4116 Fieldbus M->S10 div**	FLOAT	1.0	1.0	1000.0	ERW	F__
23.3.44	**4126 Fieldbus M->S11 div**	FLOAT	1.0	1.0	1000.0	ERW	F__
23.3.48	**4136 Fieldbus M->S12 div**	FLOAT	1.0	1.0	1000.0	ERW	F__
23.3.52	**4146 Fieldbus M->S13 div**	FLOAT	1.0	1.0	1000.0	ERW	F__
23.3.56	**4154 Fieldbus M->S14 div**	FLOAT	1.0	1.0	1000.0	ERW	F__
23.3.60	**4166 Fieldbus M->S15 div**	FLOAT	1.0	1.0	1000.0	ERW	F__
23.3.64	**4176 Fieldbus M->S16 div**	FLOAT	1.0	1.0	1000.0	ERW	F__

The **Div M->Sx fieldbus** parameters can be used to increase the resolution of the datum sent on the bus to the drive in the corresponding channel in EU and EU_float exchange mode. The parameter value is used by the drive as the divider of the incoming datum, so that a number with decimal digits can be transferred.

N.B.: You must check the size in bits of the datum that is sent to make sure that the maximum value in bits fits in a 16-bit integer. For example, if specifying the divider as “Fieldbus M->Sn div” = 1000, the maximum value that can be used for the exchanged datum is 32.768 (32768/1000).

.

Example: **Div M->Sx fieldbus** = 10, **M->S1 fieldbus par** = **Ramp ref src 1**, **Sys M->S1 fieldbus** = **Eu**. If the PLC sends the decimal value 1000 on the first word the value of **ramp ref 1** on the drive is 1000/10 = 100.

23.4 – COMMUNICATION/FIELDBUS S->M

Configuration of output data

The data read by the Master (a PLC, PC or control panel) sent by the slave (the drive) can be configured in the COMMUNICATION/FIELDBUS S2M menu.

Since the functions of the 16 groups are similar to those of the COMMUNICATION/FIELDBUS S2M menu, only the differences are listed here:

PAR 4180 **Fieldbus S->M1 ipa**: unlike with M->S, the src are not managed. The IPA therefore always refers to the parameter that is entered (e.g. to monitor ramp 1 input I must select PAR 620 **Ramp ref 1 mon** whereas if I select PAR 610 **Ramp ref 1 src** I would read the selection of the enum of that src).

Moreover, with sys = MdPlc16/32, you cannot enter IPA 0 but must enter the IPA of the corresponding dig, for the first group PAR 4184 **Dig Fieldbus S->M1**, etc..), the MdPlc application then writes a value in this parameter, which is sent to the bus in 16 or 32-bit format according to the sys.

If you enter 0 when the IPA was set to a value other than zero, the sys is automatically set to Fill16 or 32, to guarantee the structure of the data exchange area.

PAR 4182 **Fieldbus S->M1 sys** : the only difference regards the MdPlc16/32 setting, as explained above, to send all 32 bits or just the low word of the corresponding dig.

PAR 4186 **Fieldbus S->M1 mul**: this works symmetrically with respect to M>S. In this case a multiplier is applied to increase the resolution of the output datum (for Eu and Par only). For example, if PAR 4180 **Fieldbus S->M1 ipa** = PAR 260 **Motor speed,** PAR 4182 **Fieldbus S->M1 sys** = Eu, PAR 4186 **Fieldbus S->M1 mul** = 10 the datum sent to the bus is in rpm multiplied by 10: if the drive turns at 100.5 rpm the master receives a value equal to 1005.

PAR 4184 **Dig Fieldbus S->M1**: there are no monitors for output data, the digs send a fixed datum to the bus (with the sys set to Count32) or for the MdPlc application, which writes a value in these parameters (with sys set to MdPlc16/32).

The groups are processed in order at startup as for M>S. If there are any configuration errors, alarm “[17] **Opt Bus fault**” is generated with a subcode indicating the type of problem and the group in which it occurred (see the S->M page in WEG_eXpress for the meaning of the code).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod

23.4.1	**4180 Fieldbus S->M1 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.5	**4190 Fieldbus S->M2 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.9	**4200 Fieldbus S->M3 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.13	**4210 Fieldbus S->M4 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.17	**4220 Fieldbus S->M5 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.21	**4230 Fieldbus S->M6 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.25	**4240 Fieldbus S->M7 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.29	**4250 Fieldbus S->M8 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.33	**4260 Fieldbus S->M9 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.37	**4270 Fieldbus S->M10 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.41	**4280 Fieldbus S->M11 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.45	**4290 Fieldbus S->M12 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.49	**4300 Fieldbus S->M13 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.53	**4310 Fieldbus S->M14 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.57	**4320 Fieldbus S->M15 ipa**	FBM2SIPA	0	0	20000	RW	F__
23.4.61	**4330 Fieldbus S->M16 ipa**	FBM2SIPA	0	0	20000	RW	F__

Setting of the parameter to associate with the bus channel. The default setting is 0, which means channel not active.
When setting a parameter, the format is also automatically set in the sys parameter

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.4.2	**4182**	**Fieldbus S->M1 sys**		ENUM		Not assigned			RW	F__
23.4.6	**4192**	**Fieldbus S->M2 sys**		ENUM		Not assigned			RW	F__
23.4.10	**4202**	**Fieldbus S->M3 sys**		ENUM		Not assigned			RW	F__
23.4.14	**4212**	**Fieldbus S->M4 sys**		ENUM		Not assigned			RW	F__
23.4.18	**4222**	**Fieldbus S->M5 sys**		ENUM		Not assigned			RW	F__
23.4.22	**4232**	**Fieldbus S->M6 sys**		ENUM		Not assigned			RW	F__
23.4.26	**4242**	**Fieldbus S->M7 sys**		ENUM		Not assigned			RW	F__
23.4.30	**4252**	**Fieldbus S->M8 sys**		ENUM		Not assigned			RW	F__
23.4.34	**4262**	**Fieldbus S->M9 sys**		ENUM		Not assigned			RW	F__
23.4.38	**4272**	**Fieldbus S->M10 sys**		ENUM		Not assigned			RW	F__
23.4.42	**4282**	**Fieldbus S->M11 sys**		ENUM		Not assigned			RW	F__
23.4.46	**4292**	**Fieldbus S->M12 sys**		ENUM		Not assigned			RW	F__
23.4.50	**4302**	**Fieldbus S->M13 sys**		ENUM		Not assigned			RW	F__
23.4.54	**4312**	**Fieldbus S->M14 sys**		ENUM		Not assigned			RW	F__
23.4.58	**4322**	**Fieldbus S->M15 sys**		ENUM		Not assigned			RW	F__
23.4.62	**4332**	**Fieldbus S->M16 sys**		ENUM		Not assigned			RW	F__

When setting the sorg parameter the format is automatically set on the relative **sys**. If **sorg** is set to **null**, the data format does not change. The value of the format can be selected from the following list, according to the parameter selected as the source:

0 Not assigned
1 Count 16
2 Count 32
3 Fill 16
4 Fill 32
5 Mdplc 16
6 Mdplc 32
7 Eu

8 Eu float
9 Par 16
10 Par 32

If set to **0** the channel is not assigned.
If set to **1** the datum is assigned a 16-bit count.
If set to **2** the datum is assigned a 32-bit count.
If set to **3** 16 bits on the channel are reserved for the datum, not used.
If set to **4** 32 bits on the channel are reserved for the datum, not used.
If set to **5** the datum is assigned a 16-bit count used by MDPLC.
If set to **6** the datum is assigned a 32-bit count used by MDPLC.
If set to **7** the datum is assigned engineering units on a 16-bit integer.
If set to **8** the datum is assigned engineering units on a 32-bit integer.
If set to **9**, the datum is assigned a 16-bit integer engineering unit format not in real time (5-10ms)
If set to **10** the datum is assigned a 32-bit integer engineering unit format or float format if the associated parameter is a float-type parameter not in real time (5-10ms)

Note ! If the sys parameter is **not assigned**, none of the subsequent channels are transferred to the fieldbus, even if programmed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.4.3	**4184**	**Dig Fieldbus S->M1**		INT32	32	0	0	0	ERW	F__
23.4.7	**4194**	**Dig Fieldbus S->M2**		INT32	32	0	0	0	ERW	F__
23.4.11	**4204**	**Dig Fieldbus S->M3**		INT32	32	0	0	0	ERW	F__
23.4.15	**4214**	**Dig Fieldbus S->M4**		INT32	32	0	0	0	ERW	F__
23.4.19	**4224**	**Dig Fieldbus S->M5**		INT32	32	0	0	0	ERW	F__
23.4.23	**4234**	**Dig Fieldbus S->M6**		INT32	32	0	0	0	ERW	F__
23.4.27	**4244**	**Dig Fieldbus S->M7**		INT32	32	0	0	0	ERW	F__
23.4.31	**4254**	**Dig Fieldbus S->M8**		INT32	32	0	0	0	ERW	F__
23.4.35	**4264**	**Dig Fieldbus S->M9**		INT32	32	0	0	0	ERW	F__
23.4.39	**4274**	**Dig Fieldbus S->M10**		INT32	32	0	0	0	ERW	F__
23.4.43	**4284**	**Dig Fieldbus S->M11**		INT32	32	0	0	0	ERW	F__
23.4.47	**4294**	**Dig Fieldbus S->M12**		INT32	32	0	0	0	ERW	F__
23.4.51	**4304**	**Dig Fieldbus S->M13**		INT32	32	0	0	0	ERW	F__
23.4.55	**4314**	**Dig Fieldbus S->M14**		INT32	32	0	0	0	ERW	F__
23.4.59	**4324**	**Dig Fieldbus S->M15**		INT32	32	0	0	0	ERW	F__
23.4.63	**4334**	**Dig Fieldbus S->M16**		INT32	32	0	0	0	ERW	F__

If associated with the relative src, the value of this parameter is sent to the bus.

The user may modify the M->S and by S->M sys parameters. The consistency of the sys with the parameter assigned to the channel is checked.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.4.4	**4186**	**Fieldbus S->M1 mul**		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.8	**4196**	**Fieldbus S->M2 mul**		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.12	**4206**	**Fieldbus S->M3 mul**		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.16	**4216**	**Fieldbus S->M4 mul**		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.20	**4226**	**Fieldbus S->M5 mul**		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.24	**4236**	**Fieldbus S->M6 mul**		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.28	**4246**	**Fieldbus S->M7 mul**		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.32	**4256**	**Fieldbus S->M8 mul**		FLOAT		1.0	1.0	1000.0	ERW	F__

23.4.36	**4266 Fieldbus S->M9 mul**	FLOAT	1.0	1.0	1000.0	ERW	F__
23.4.40	**4276 Fieldbus S->M10 mul**	FLOAT	1.0	1.0	1000.0	ERW	F__
23.4.44	**4286 Fieldbus S->M11 mul**	FLOAT	1.0	1.0	1000.0	ERW	F__
23.4.48	**4296 Fieldbus S->M12 mul**	FLOAT	1.0	1.0	1000.0	ERW	F__
23.4.52	**4306 Fieldbus S->M13 mul**	FLOAT	1.0	1.0	1000.0	ERW	F__
23.4.56	**4316 Fieldbus S->M14 mul**	FLOAT	1.0	1.0	1000.0	ERW	F__
23.4.60	**4326 Fieldbus S->M15 mul**	FLOAT	1.0	1.0	1000.0	ERW	F__
23.4.64	**4336 Fieldbus S->M16 mul**	FLOAT	1.0	1.0	1000.0	ERW	F__

The "**Fieldbus S->Mx mul**" parameters are multipliers that the drive applies to the datum before sending it to the bus. It is therefore possible to increase the resolution of some values read in EU and EU_float mode, also using decimal digits.

N.B.: The drive does not check that the multiplied parameter expressed in bits fits in a 16-bit integer. You must make sure that the multiplier is compatible with the maximum value of the exchanged parameter and that it does not exceed the maximum size of 32768.

Example: **Fieldbus S->Mx mul** = 10, **S->M1 fieldbus par** = **Motor speed**, **Sys S->M1 fieldbus** = **Eu**.

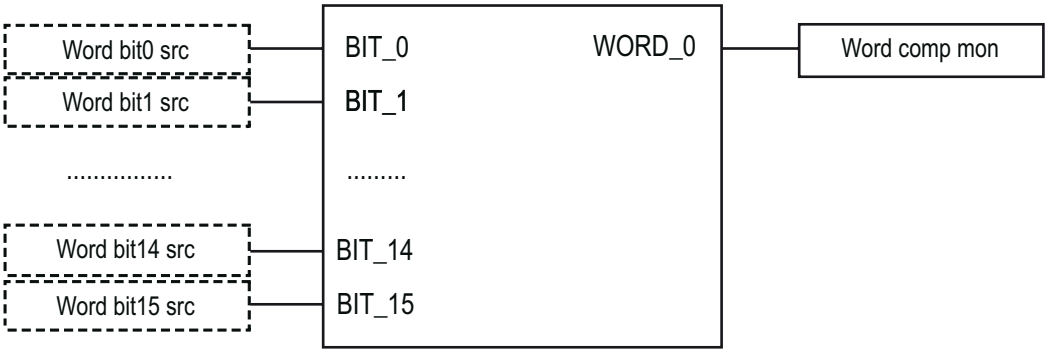
If the motor is running at 100 rpm, the PLC reads the value 100 * 10 = 1000 on the first word that is exchanged.

23.5 – COMMUNICATION/WORD COMP

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.5.1	**4400**	**Word bit0 src**		LINK	16	6000	0	16384	ERW	F__
23.5.2	**4402**	**Word bit1 src**		LINK	16	6000	0	16384	ERW	F__
23.5.3	**4404**	**Word bit2 src**		LINK	16	6000	0	16384	ERW	F__
23.5.4	**4406**	**Word bit3 src**		LINK	16	6000	0	16384	ERW	F__
23.5.5	**4408**	**Word bit4 src**		LINK	16	6000	0	16384	ERW	F__
23.5.6	**4410**	**Word bit5 src**		LINK	16	6000	0	16384	ERW	F__
23.5.7	**4412**	**Word bit6 src**		LINK	16	6000	0	16384	ERW	F__
23.5.8	**4414**	**Word bit7 src**		LINK	16	6000	0	16384	ERW	F__
23.5.9	**4416**	**Word bit8 src**		LINK	16	6000	0	16384	ERW	F__
23.5.10	**4418**	**Word bit9 src**		LINK	16	6000	0	16384	ERW	F__
23.5.11	**4420**	**Word bit10 src**		LINK	16	6000	0	16384	ERW	F__
23.5.12	**4422**	**Word bit11 src**		LINK	16	6000	0	16384	ERW	F__
23.5.13	**4424**	**Word bit12 src**		LINK	16	6000	0	16384	ERW	F__
23.5.14	**4426**	**Word bit13 src**		LINK	16	6000	0	16384	ERW	F__
23.5.15	**4428**	**Word bit14 src**		LINK	16	6000	0	16384	ERW	F__
23.5.16	**4430**	**Word bit15 src**		LINK	16	6000	0	16384	ERW	F__

Selection of the origin (source) of the signal to be used for coding in **Word comp**. This function allows the user to compose a single word composed of 16 signals, each of which can be selected from among those listed in the "**L_DIGSEL1**" selection list.

The values of the sectioned sizes are converted into a single word.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.5.17	**4432**	**Word comp mon**		UINT32	16	0	0	0	ER	F__

The hexadecimal value of the Word comp output is displayed.

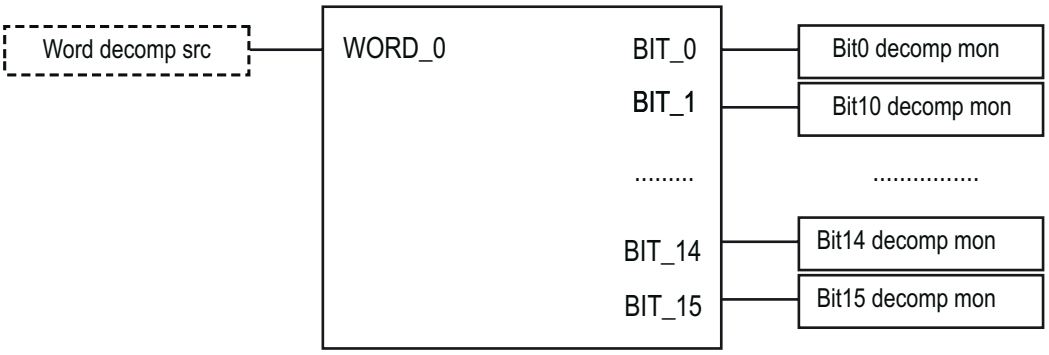
23.6 – COMMUNICATION/WORD DECOMP

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.6.1	**4450**	**Dig word decomp**		UINT32	16	0	0	0	ERW	F__

Setting of the digital input decoded by the "**Word decomp**" block.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.6.2	**4452**	**Word decomp src**		LINK	16	4450	0	16384	ERW	F__

Selection of the origin (source) of the word to be decoded by the "**Word decomp**" block. Each bit that is part of the word to be decoded is associated with the output channel of the "**Word decomp**" block. The variables that can be used for this function can be selected from among those listed in the "**L_WDECOMP**" selection list.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.6.3	**4454**	**Bit0 decomp mon**		BIT	16	0	0	1	ER	F__
23.6.4	**4456**	**Bit1 decomp mon**		BIT	16	0	0	1	ER	F__
23.6.5	**4458**	**Bit2 decomp mon**		BIT	16	0	0	1	ER	F__
23.6.6	**4460**	**Bit3 decomp mon**		BIT	16	0	0	1	ER	F__
23.6.7	**4462**	**Bit4 decomp mon**		BIT	16	0	0	1	ER	F__
23.6.8	**4464**	**Bit5 decomp mon**		BIT	16	0	0	1	ER	F__
23.6.9	**4466**	**Bit6 decomp mon**		BIT	16	0	0	1	ER	F__
23.6.10	**4468**	**Bit7 decomp mon**		BIT	16	0	0	1	ER	F__
23.6.11	**4470**	**Bit8 decomp mon**		BIT	16	0	0	1	ER	F__
23.6.12	**4472**	**Bit9 decomp mon**		BIT	16	0	0	1	ER	F__
23.6.13	**4474**	**Bit10 decomp mon**		BIT	16	0	0	1	ER	F__

23.6.14	**4476 Bit11 decomp mon**	BIT	16	0	0	1	ER	F__
23.6.15	**4478 Bit12 decomp mon**	BIT	16	0	0	1	ER	F__
23.6.16	**4480 Bit13 decomp mon**	BIT	16	0	0	1	ER	F__
23.6.17	**4482 Bit14 decomp mon**	BIT	16	0	0	1	ER	F__
23.6.18	**4484 Bit15 decomp mon**	BIT	16	0	0	1	ER	F__

The single bits that make up the selected word are displayed.

24 – ALARM CONFIG

In the **ALARM CONFIG** menu the type of effect any alarm signals have on the drive is determined:

- The alarm status is saved
- How must the drive react to the alarm signal?
- Auto restart
- Alarm reset

For some alarms, behaviour can be configured separately for each signal, while for the others the **Disable drive** is executed. Individual signals can also be sent to a programmable digital output.

Activity	**Ignore**	The alarm is not included in the list of alarms, it is not included in the alarm log, it is not signalled on the digital outputs, no drive commands are modified.
	Warning	The alarm is included in the list of alarms, it is included in the alarm log, it is signalled on the digital outputs, the First alarm information is updated, the Alarm enabled information is updated, no drive commands are modified.
	Disable drive	The alarm is included in the list of alarms, it is included in the alarm log, it is signalled on the digital outputs, the First alarm information is updated, the Alarm enabled information is updated, a command is sent to stop and disable the motor, which stops due to inertia.
	Stop	The alarm is included in the list of alarms, it is included in the alarm log, it is signalled on the digital outputs, the First alarm information is updated, the Alarm enabled information is updated, a Stop command is sent. When the zero speed is reached the drive is disabled. If **Ramp** control mode is enabled, the drive moves to the zero speed with the set ramp time; when the **Speed delay 0** signal is activated the drive is disabled. If **Speed** control mode is enabled, the drive moves to the zero speed with the maximum current possible; when the **Speed delay 0** signal is activated the drive is disabled. If **Torque** control mode is enabled, the drive moves to the zero speed with the time set by the load; when the **Speed delay 0** signal is activated the drive is disabled.
	Fast stop	The alarm is included in the list of alarms, it is included in the alarm log, it is signalled on the digital outputs, the First alarm information is updated, the Alarm enabled information is updated, a Fast Stop command is sent. When the zero speed is reached the drive is disabled. If **Ramp** control mode is enabled, the drive moves to the zero speed with the set fast stop ramp time (deceleration time 3); when the **Speed delay 0** signal is activated the drive is disabled. If **Speed** control mode is enabled, the drive moves to the zero speed with the maximum current possible; when the **Speed delay 0** signal is activated the drive is disabled. If **Torque** control mode is enabled, the drive moves to the zero speed with the set load time; when the **Speed delay 0** signal is activated the drive is disabled.

n alarms with Activity = Ignore or Warning can be enabled at the same time.

If an alarm with Activity = Stop or Fast Stop is enabled and another alarm with an Activity other than Ignore or Warning is enabled, the drive stops and is disabled.

Not all alarms allow the controlled stopping of the drive. The following table shows the possibility of setting the Activities for the individual alarm signals.

Alarm	Ignore	Warning	Disable drive	Stop	Fast stop
ExtFlt	✓	✓	✓	✓	✓
Motor OT	✓	✓	✓	✓	✓
MotorOT pre	✓	✓	✓	✓	✓
Overspeed	✓	✓	✓	✓	✓
SpdRefLoss	✓	✓	✓	✓	✓
SpdFbkLoss	✓	✓	✓	✓	✓
Drive ovld	✓	✓	✓	✓	✓
Motor ovld	✓	✓	✓	✓	✓
Bres ovld	✓	✓	✓	✓	✓
HTsens	-	-	✓	✓	✓
InAir	✓	✓	✓	✓	✓
Desat	-	-	✓	-	-
IOverC	-	-	✓	-	-
OverV	-	-	✓	-	-
UnderV	-	-	✓	-	-
PhLoss	✓	✓	✓	✓	✓
Bus option	✓	✓	✓	✓	✓
GroundFault thr	-	-	✓	-	-
Missing Motor phase	✓	✓	✓	✓	✓

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.1	**4500**	**Fault reset src**		LINK	16	1120	0	16384	RW	F__

Selection of the origin (source) of the signal to be used for the command to reset the drive after an alarm. The terminal that can be used for this function can be selected from among those listed in the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.2	**4502**	**ExtFlt src**		LINK	16	6000	0	16384	RW	F__

Selection of the origin (source) of the signal to be used as the input for the drive external fault alarm **ExtFlt**. The terminal that can be used for this function can be selected from among those listed in the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.3	**4504**	**ExtFlt activity**		ENUM		Disable			RW	F__

Setting of the behaviour of the drive in the event of an external fault alarm **ExtFlt**. This alarm indicates the intervention of a drive external protection.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.4	**4506**	**ExtFlt restart**		ENUM		Disable			RW	F__

Enabling of automatic restart after the external fault alarm **ExtFlt**

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.5	**4508**	**ExtFlt restart time**	ms	UINT16		1000	120	30000	RW	F__

Setting of the time within which the **External Fault** alarm must be reset in order to perform automatic restart.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.6	**4510**	**ExtFlt holdoff**	ms	UINT16		0	0	10000	RW	F__

Setting of the delay between the signalling of the external fault alarm **ExtFlt** and enabling of the alarm. If an alarm condition occurs, the drive will wait for the set time before blocking is enabled. If the alarm is removed within the set time, the drive will not indicate any alarm condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.7	**4516**	**MotorOT pre activity**		ENUM		Ignore			ERW	F__

Manages activity from motor overtemperature prealarm.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.8	**4518**	**MotorOT pre thr**	perc	UINT16		60	0	100	ERW	F__

Represents the threshold, in % of the value set in IPA 4532 **MotorOT thr**, at which the motor overtemperature prealarm trips.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.9	**4520**	**MotorOT src**		LINK	16	6000	0	16384	RW	F__

Selection of the origin (source) of the signal to be used for the motor overtemperature alarm **MotorOT**. The terminal that can be used for this function can be selected from among those listed in the "**L_DIGSEL2**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.10	**4522**	**MotorOT activity**		ENUM		Disable			RW	F__

Setting of the behaviour of the drive in case of a motor overtemperature alarm **MotorOT**. This alarm indicates that the motor temperature is too high.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.11	**4524**	**MotorOT restart**		ENUM		Disable			RW	F__

Enabling of automatic restart after the motor overtemperature alarm **MotorOT**.

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.12	**4526**	**MotorOT restart time**	ms	UINT16		1000	120	30000	RW	F__

Setting of the time within which the **Motor Overtemperature** alarm must be reset in order to perform automatic restart.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.13	**4528**	**MotorOT holdoff**	ms	UINT16		1000	0	30000	RW	F__

Setting of the delay between the signalling of the motor overtemperature alarm **MotorOT** and enabling of the alarm. If an alarm condition occurs, the drive will wait for the set time before enabling the alarm. If the alarm is removed within the set time, the drive will not indicate any alarm condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.14	**4530**	**MotorOT probe**		ENUM		MotorOT Sensor			ERW	F__

Selection of the source to manage the Motor OT protection. The following can be selected:

0 SRC alarm managed via IPA 4520 **MotorOT src**
9 MotorOT Sensor alarm managed via IPA 4538 **MotorOT Sensor**

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.15	**4532**	**MotorOT thr**	cnt	UINT16		0	0	32767	ERW	F__

Represents the resistance threshold at which the "**Motor OT**" alarm must trip.

The parameter is expressed in ohms and the default value depending on the type of sensor selected.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.16	**4536**	**MotorOT mon**	cnt	INT16		0	0	32767	ER	F__

Represent the MotorOT sensor resistance measured, expressed in ohms.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.17	**4538**	**MotorOT Sensor**		ENUM		NC contact	0	4	ERW	F__

Selection of the type of motor thermal protection sensor (available only with expansion I/O card 7 and 8).

The following can be selected:

0 None
1 PTC
2 NC contact
3 KTY84 (PAR 290 **Motor temperature** in °C available)
4 PT1000 (PAR 290 **Motor temperature** in °C available)

Note ! The changes of this selection causes the modify of IPA 4532 **MotorOT thr**.

MotorOT Sensor	Wrong connection of the sensor (fixed)	Default MotorOT thr
PTC	<50	≥1900
KTY84	<350	≥1100
PT1000	< 830	≥1441

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.18	**4540**	**Overspeed threshold**	rpm	INT32		CALCI	0	CALCI	RW	F__

Setting of the threshold above which the overspeed alarm **Overspeed** is enabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.19	**4542**	**Overspeed activity**		ENUM		Disable			RW	F__

Setting of the behaviour of the drive in case of a motor overspeed alarm **Overspeed**. This alarm indicates that the motor speed has exceeded the threshold set in the **Speed ref top lim** and **Speed ref bottom lim** parameters in the COMMANDS menu.

0 Ignore
1 Warning
2 Disable
3 Stop

4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.20	**4544**	**Overspeed holdoff**	ms	UINT16		0	0	5000	RW	F__

Setting of the delay between the signalling of the motor overspeed alarm **Overspeed** and enabling of the alarm. If an alarm condition occurs, the drive will wait for the set time before enabling the alarm. If the alarm is removed within the set time, the drive will not indicate any alarm condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.21	**4550**	**SpdRefLoss threshold**	rpm	INT16		100	0	CALCI	RW	F__

Setting of the threshold below which the speed reference loss alarm **SpdRefLoss** occurs.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.22	**4552**	**SpdRefLoss activity**		ENUM		Ignore			RW	F__

Setting of the behaviour of the drive in case of a speed reference loss alarm **SpdRefLoss**. This alarm indicates that the difference between the speed regulator reference and the actual motor speed is more than 100 rpm.

This alarm must be disabled (= 0 Ignore) when parameter 556 **Control mode select** is set to Torque (0) or when parameter 2354 is set to a value other than zero.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.23	**4554**	**SpdRefLoss holdoff**	ms	UINT16		1000	0	10000	RW	F__

Setting of the delay between the signalling of the speed reference loss alarm condition SpdRefLoss and enabling of the alarm. If an alarm condition occurs, the drive will wait for the set time before enabling the alarm. If the alarm is removed within the set time, the drive will not indicate any alarm condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.24	**4556**	**SpdRefLoss max spdOL**	rpm	INT16		CALCI	0	CALCI	RW	F__

This parameter (active with **Flux vector CL**) can be used to activate an alarm if the drive does not start or the rotor is blocked. The setting refers to a speed threshold value before checking whether the rotor is blocked or the motor is not running.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.25	**4560**	**SpdFbkLoss activity**		ENUM		Disable			RW	F__

Setting of the behaviour of the drive in case of a speed feedback loss alarm **SpdFbkLoss**. This alarm indicates the loss of the encoder feedback signals.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.26	**4562**	**SpdFbkLoss holdoff**	ms	UINT16		200	0	10000	RW	F__

Setting of the delay between the signalling of the speed feedback loss alarm condition **SpdFbkLoss** and the enabling of the alarm. If an alarm condition occurs, the drive will wait for the set time before enabling the alarm. If the alarm is removed within the set time, the drive will not indicate any alarm condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.27	**4564**	**SpdFbkLoss threshold**	rpm	INT16		100	5	CALCI	RW	F__

For SE (single ended) encoders and with parameters 2110 or 5110 = (3) Control A-B-SE.

The **Speed fbk loss [22]** alarm control is enabled when the speed reference is higher than the value set in this parameter

If using incremental digital encoders in single-ended mode, this parameter sets the limit above which the drive executes the action set with parameter 4560 **SpdFbkLoss activity**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.28	**4570**	**Drive ovld activity**		ENUM		Ignore			ERW	F__

Setting of the behaviour of the drive in case of a drive overload alarm **Drive ovld [13]**. This alarm indicates that the drive overload threshold has been reached.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.29	**4572**	**Motor ovld activity**		ENUM		Warning			ERW	F__

Setting of the behaviour of the drive in case of a motor overload alarm **Motor ovld [14]**. This alarm indicates that the motor overload threshold has been reached.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.30	**4574**	**Bres ovld activity**		ENUM		Disable			ERW	F__

Setting of the behaviour of the drive in case of a braking resistor overload alarm **Bres ovld**. This alarm indicates that the braking resistor overload threshold has been reached.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.31	**4582**	**HTsens restart**		ENUM		Disable			ERW	F__

Enabling of automatic restart after the drive heatsink overtemperature alarm **HeatsinkS OTUT [10]**.

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.32	**4584**	**HTsens restart time**	ms	UINT16		20000	120	60000	ERW	F__

Setting of the time within which the **HeatsinkS OTUT [10]** alarm must be reset in order to perform automatic restart.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.33	**4600**	**InAir activity**		ENUM		Stop			ERW	F__

Setting of the behaviour of the drive in case of an intake air overtemperature alarm **Intakeair OT [11].**This

alarm indicates that the temperature of the intake cooling air is too high.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.34	**4602**	**InAir restart**		ENUM		Disable			ERW	F__

Enabling of automatic restart after the intake air overtemperature alarm **Intakeair OT [11]**.

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.35	**4604**	**InAir restart time**	ms	UINT16		1000	120	30000	ERW	F__

Setting of the time within which the **Intakeair OT [11]** alarm must be reset in order to perform automatic restart.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.36	**4606**	**InAir holdoff**	ms	UINT16		10000	0	30000	ERW	F__

Setting of the delay between the signalling of the intake air overtemperature alarm **Intakeair OT [11]** and enabling of the alarm. If an alarm condition occurs, the drive will wait for the set time before enabling the alarm. If the alarm is removed within the set time, the drive will not indicate any alarm condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.37	**4610**	**Desat restart**		ENUM		Disable			ERW	F__

Enabling of automatic restart after the desaturation alarm **Desat**. This alarm indicates a short circuit between the motor phases or on the power bridge.

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.38	**4612**	**Desat restart time**	ms	UINT16		2000	1000	10000	ERW	F__

Setting of the time within which the **Desaturation** alarm must be reset in order to perform automatic restart. (Time with alarm signal active + 1000 msec).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.39	**4620**	**IOverC restart**		ENUM		Disable			ERW	F__

Enabling of automatic restart after the drive overcurrent alarm. This alarm indicates an overcurrent (or short circuit between phases or towards the ground).

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.40	**4622**	**IOverC restart time**	ms	UINT16		2000	1000	10000	ERW	F__

Setting of the time within which the **Overcurrent** alarm must be reset in order to perform automatic restart. (Time with alarm signal active + 1000 msec).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.41	**4630**	**OverV restart**		ENUM		Disable			ERW	F__

Enabling of automatic restart after the overvoltage alarm. This alarm indicates an overvoltage on the intermediate circuit (DC link)

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.42	**4632**	**OverV restart time**	ms	UINT16		2000	1000	10000	ERW	F__

Setting of the time within which the **Overvoltage** alarm must be reset in order to perform automatic restart. (Time with alarm signal active + 1000 msec).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.43	**4640**	**UnderV restart**		ENUM		Enable			ERW	F__

Enabling of automatic restart after the undervoltage alarm. This alarm indicates an undervoltage on the intermediate circuit (DC link)

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.44	**4642**	**UnderV restart time**	ms	UINT16		1000	120	10000	ERW	F__

Setting of the time within which the **Undervoltage** alarm must be reset in order to perform automatic restart. (Time with alarm signal active + 100 msec).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.45	**4650**	**UVRep attempts**		UINT16		5	0	1000	ERW	F__

Setting of the maximum number of attempts at automatic restart after the **Undervoltage** alarm before a **Mult Undervoltage** alarm is generated. If this parameter is set to 1000 an infinite number of attempts are available.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.46	**4652**	**UVRep delay**	s	UINT16		240	0	300	ERW	F__

Setting of the time within which, if no automatic restarts are executed after the **Undervoltage** alarm, the attempts counter is reset. In this way the number of attempts set in **UVRep attempt** are still available.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.47	**4660**	**PhLoss activity**		ENUM		Disable			ERW	F__

Setting of the behaviour of the drive in case of a no phase alarm. This alarm indicates the absence of a drive power supply phase.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.48	**4662**	**PhLoss restart**		ENUM		Disable			ERW	F__

Enabling of automatic restart after the no phase alarm.

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.49	**4664**	**PhLoss restart time**	ms	UINT16		1000	120	10000	ERW	F__

Setting of the time within which the **Phase loss** alarm must be reset in order to perform automatic restart. (Time with alarm signal active + 100 msec).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.50	**4670**	**Optionbus activity**		ENUM		Disable			ERW	F__

Setting of the behaviour of the drive in case of an **Opt Bus Fault** alarm.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.51	**4672**	**Optbus fault en src**		LINK	16	6002	0	16384	ERW	F__

Through the appropriate selection list, It allows to enable or disable "**Opt bus fault" [17]** fieldbus alarm

The default is **One (**PAR 6002). If it is selected the **Local / remote mon** (PAR1030) , it can inhibit the alarm only when you switch from "Remote" to "Local".

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.52	**4680**	**Ground Fault thr**	perc	FLOAT		10.0	0	150.0	ERWS	F__

Setting of the threshold for the ground short circuit alarm **Ground Fault.**

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.53	**4654**	**Mot PhLoss activity**		ENUM		Ignore			ERW	F__

The "**Motor phase loss**" alarm signals the loss of a motor phase. This parameter manages the alarm activity.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.54	**4656**	**Mot PhLoss holdoff**	ms	UINT16		800	800	10000	ERW	F__

Represents the time the alarm condition has to persist before the alarm is actually generated.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.55	**4658**	**Mot PhLoss threshold**	A	FLOAT		CALCF	0	CALCF	ERW	F__

Represents a current threshold for generating the alarm.

The value has to be lower than the torque current value set in the drive.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.56	**4674**	**Mot PhLoss min speed**	rpm	INT16		30	10	32000	ERW	F__

Minimum speed threshold (on speed reference block) in which the alarm is triggered.

It can be used to mask the alarm at very low speed during the start and stop transients when noise could cause alarm tripping.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.57	**4700**	**Alarm dig sel 1**		ENUM		No alarm			ERW	F__
24.58	**4702**	**Alarm dig sel 2**		ENUM		No alarm			ERW	F__
24.59	**4704**	**Alarm dig sel 3**		ENUM		No alarm			ERW	F__
24.60	**4706**	**Alarm dig sel 4**		ENUM		No alarm			ERW	F__

Setting of the alarm signal to enable on a digital output. The digital output is selected using parameters **Alm dig out mon 1÷4**, which can be enabled in the **L_DIGSEL1** selection list.

0 No alarm
1 Overvoltage
2 Undervoltage
3 Ground fault
4 Overcurrent
5 Desaturation
6 MultiUndervolt
7 MultiOvercurr
8 MultiDesat
9 Heatsink OT
10 HeatsinkS OTUT
11 Intakeair OT
12 Motor OT
13 Drive overload
14 Motor overload
15 Bres overload
16 Phaseloss
17 Opt Bus fault
18 Opt 1 IO fault
19 Opt 2 IO fault
20 Opt Enc fault
21 External fault
22 Speed fbk loss
23 Overspeed
24 Speed ref loss
25 Emg stop alarm
26 Power down
27 ExtIO fault
28 FastLink fault
29 Brake fault
30 Motor pre OT
31 Mot phase loss
32 Not Used2
33 Plc1 fault
34 Plc2 fault
35 Plc3 fault
36 Plc4 fault
37 Plc5 fault
38 Plc6 fault
39 Plc7 fault
40 Plc8 fault
41 Watchdog
42 Trap error
43 System error
44 User error
45 Param error
46 Load def par
47 Plc cfg error
48 Load def plc
49 Key failed
50 Encoder error
51 Opt cfg change
52 Power config
53 Plc9 fault
54 Plc10 fault

55 Plc11 fault
56 Plc12 fault
57 Plc13 fault
58 Plc14 fault
59 Plc15 fault
60 Plc16 fault

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.61	**4720**	**Alm autoreset time**	s	FLOAT		0.0	0.0	60.0	ERW	F__

Setting of the time interval that must pass before executing an automatic reset.

If no alarms are enabled the drive is set to restart.

If some alarms are still enabled the drive is set to execute a new attempt at automatic reset.

At each attempted reset a counter increases. If the limit set in the **Alm autoreset number** parameter is reached the drive is set to make no more attempts at reset and waits for a user reset.

The counter is set to zero when an automatic reset or user reset is performed and no alarms are enabled.

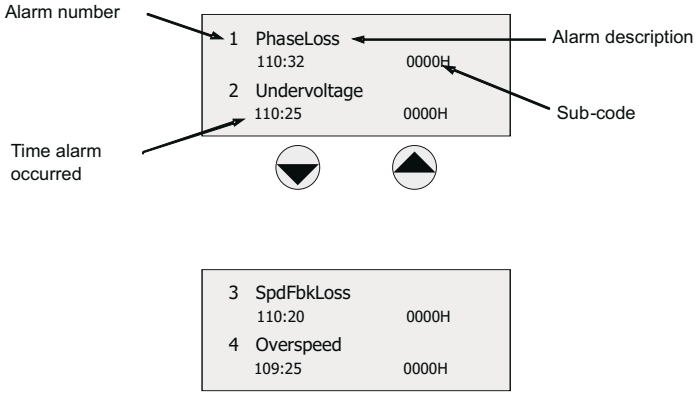
If the parameter is 0 the function is disabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.62	**4722**	**Alm autoreset number**		UINT16		20	0	100	ERW	F__

Setting of the maximum number of attempted automatic resets.

25 – ALARM LOG

This is the menu in which the log of previous alarms is saved, with the time the alarm occurred (in relation to the **Time drive power** on parameter). The alarms are displayed starting from the most recent (No. 1) up to the furthest back in time (No. 30). Up to 30 alarm signals can be displayed. The sub-code is used by service technicians to identify the specific type of alarm. Press the ▲ and ▼ keys to scroll the screen pages of the alarm log. The alarm log cannot be deleted.



26 – APPLICATION

This menu is designed to host two applications using the MDPlc program.
The PID_IMM application is installed by default in the APPLICATION / **APPLICATION 1** menu.
Refer to PID_IMM application instruction manual for details.

28 - RECIPE CONFIG

Lets you create a custom menu from the keypad (or from WEG_eXpress), composed of a maximum of 30 parameters (menu 29 - RECIPE).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
28.1	**6300**	**Recipe config 1**		UINT16		0	0	0	RW	FVS
28.2	**6302**	**Recipe config 2**		UINT16		0	0	0	RW	FVS
28.3	**6304**	**Recipe config 3**		UINT16		0	0	0	RW	FVS
28.4	**6306**	**Recipe config 4**		UINT16		0	0	0	RW	FVS
28.5	**6308**	**Recipe config 5**		UINT16		0	0	0	RW	FVS
28.6	**6310**	**Recipe config 6**		UINT16		0	0	0	RW	FVS
28.7	**6312**	**Recipe config 7**		UINT16		0	0	0	RW	FVS
28.8	**6314**	**Recipe config 8**		UINT16		0	0	0	RW	FVS
28.9	**6316**	**Recipe config 9**		UINT16		0	0	0	RW	FVS
28.10	**6318**	**Recipe config 10**		UINT16		0	0	0	RW	FVS
28.11	**6320**	**Recipe config 11**		UINT16		0	0	0	RW	FVS
28.12	**6322**	**Recipe config 12**		UINT16		0	0	0	RW	FVS
28.13	**6324**	**Recipe config 13**		UINT16		0	0	0	RW	FVS
28.14	**6326**	**Recipe config 14**		UINT16		0	0	0	RW	FVS
28.15	**6328**	**Recipe config 15**		UINT16		0	0	0	RW	FVS
28.16	**6330**	**Recipe config 16**		UINT16		0	0	0	RW	FVS
28.17	**6332**	**Recipe config 17**		UINT16		0	0	0	RW	FVS
28.18	**6334**	**Recipe config 18**		UINT16		0	0	0	RW	FVS
28.19	**6336**	**Recipe config 19**		UINT16		0	0	0	RW	FVS
28.20	**6338**	**Recipe config 20**		UINT16		0	0	0	RW	FVS
28.21	**6340**	**Recipe config 21**		UINT16		0	0	0	RW	FVS
28.22	**6342**	**Recipe config 22**		UINT16		0	0	0	RW	FVS
28.23	**6344**	**Recipe config 23**		UINT16		0	0	0	RW	FVS
28.24	**6346**	**Recipe config 24**		UINT16		0	0	0	RW	FVS
28.25	**6348**	**Recipe config 25**		UINT16		0	0	0	RW	FVS
28.26	**6350**	**Recipe config 26**		UINT16		0	0	0	RW	FVS
28.27	**6352**	**Recipe config 27**		UINT16		0	0	0	RW	FVS
28.28	**6354**	**Recipe config 28**		UINT16		0	0	0	RW	FVS
28.29	**6356**	**Recipe config 29**		UINT16		0	0	0	RW	FVS
28.30	**6358**	**Recipe config 30**		UINT16		0	0	0	RW	FVS

Configuration parameters for creating custom menu.

Select a **Recipe config X** parameter, press **Enter** and insert the IPA of the parameter to be added to the custom list (will be available on menu 29 - RECIPE).

To remove an IPA from the list of custom menus, set the related parameter **Recipe config X** = 0.

When settings are done, use the "**Save parameters**" command on the DRIVE CONFIG menu to save in permanent memory.

29 - RECIPE

The parameters configured on menu 28 - RECIPE CONFIG. are written on the RECIPE menu (initially empty).

PARAMETERS ON SELECTION LISTS, BUT NOT DISPLAYED ON KEYPAD

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	262	**Motor speed nofilter**	FF	INT16	16	0	0	0	ER	

This parameter indicates the unfiltered motor speed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	362	**Drive overload trip**		BIT	16	0	0	1	ER	

This signal indicates that the drive is in the overload condition. In the default condition the alarm is not triggered as the relative action is set to **Ignore**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	366	**Drive overload 80**		BIT	16	0	0	1	ER	

This signal indicates that the drive has reached 80% of the thermal image accumulator (drive overload).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	626	**Ramp ref out mon**	FF	INT16	16	0	0	0	ER	

This parameter displays the reference value output of the ramp remference function block.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	760	**Ramp out mon**	FF	INT16	16	0	0	0	ER	

This parameter displays the reference value output of the ramp function block.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	764	**Ramp acc state**		BIT	16	0	0	1	ER	

This signal indicates whether the acceleration ramp is active.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	766	**SRamp dec state**		BIT	16	0	0	1	ER	

This signal indicates whether the deceleration ramp is active.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	934	**Ref is 0**		BIT	16	0	0	1	ER	

This signal is active when the reference is below the limit set in parameter **930 Reference 0 threshold**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	936	**Ref is 0 delay**		BIT	16	0	0	1	ER	

This parameter is active when the reference is below the threshold set in parameter **930 Reference 0 threshold**. The signal is enabled after the delay set with parameter **932 Reference delay 0**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	944	**Speed is 0**		BIT	16	0	0	1	ER	

This parameter is active when the speed is below the threshold set in parameter **940 Speed 0 threshold**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	946	**Speed is 0 delay**		BIT	16	0	0	1	ER	

This signal is active when the reference is below the threshold set in parameter **940 Speed 0 threshold**. The signal is activated after the delay set in parameter **942 Speed 0 delay**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	956	**Speed thr 1_2 mon**		BIT	16	0	0	1	ER	

To display the speed threshold status: if the motor speed is higher than the value set in parameter **950 Speed threshold 1** or lower than the value set in parameter **952 Speed threshold 2** this parameter assumes the value of 0.

If the motor speed is between the value of **950 Speed threshold 1** and that of **952 Speed threshold 2**, this parameter assumes the value of 1.

Use parameter **954 Speed threshold dly** to set a delay time for the transition from 0 to 1 of parameter **956 Speed thr 1_2 mon**; the transition from 1 to 0 is always immediate.

When **950 Speed threshold 1** is set to a value higher than **952 Speed threshold 2**, if the motor speed is between the thresholds this parameter assumes the value of 1. If **950 Speed threshold 1** is set to a value lower than **952 Speed threshold 2**, the threshold status is not significant

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	966	**Set speed**		BIT	16	0	0	1	ER	

This signal is active when the error between the speed reference and actual motor speed is greater than the tolerance set in parameter **962 Set speed error**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	976	**Speed thr 3 mon**		BIT	16	0	0	1	ER	

The status of the block that detects exceeding of the speed 3 threshold is displayed.

0 Actual speed below threshold
1 Actual speed above threshold

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	986	**Current thr mon**		BIT	16	0	0	1	ER	

The status of the block that detects exceeding of the current threshold is displayed.

0 Actual output current below threshold
1 Actual output current above threshold.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	1030	**Local/remote mon**		BIT	16	0	0	1	ER	

This signal is active when the drive is in the **Remote** operating mode.

0 Local
1 Remote

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	1060	**Sequencer status**		UINT16	16	0	0	0	ER	

This signal indicates the state of the “machine states” that controls drive operation.

STS_INIT	0
STS_MAGN	1
STS_STOP	2
STS_START	3
STS_FS_STOP	4
STS_FS_START	5
STS_QSTOP	6
STS_FS_MAGN	7
STS_W_QSTOP	8
STS_READY	9
STS_MAGN_START	10
STS_ALM_DISABLED	11
STS_ALM_END_ACTION	12

STS_ALM_STOP	13
STS_ALM_FSTOP	14
STS_ALM_R_TO_NORMAL	15
STS_READY_START	16
STS_READY_FSTOP	17
STS_ALM_NO_RESTART	18
STS_FS_MAGN_START	19

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	1062	**Drive OK**		BIT	16	0	0	1	ER	

This signal is active when the drive is in the “OK” condition and no alarms are present.
Connected to the relay output, the normally open relay contact closes when:
- the drive is powered
- no alarm conditions are active.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	1064	**Drive ready**		BIT	16	0	0	1	ER	

This signal is active when the drive reference is in the “Ready” to run condition.
Connected to the relay output, the normally open relay contact closes when:
- the drive is powered
- preloading is complete
- no alarm conditions are active
- the drive is enabled
- motor magnetisation is complete.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	1110	**Digital input E mon**		BIT	16	0	0	1	ER	

These signals represent the state of the corresponding digital input.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	1210	**Digital input 1X mon**		BIT	16	0	0	1	ER	
	1212	**Digital input 2X mon**		BIT	16	0	0	1	ER	
	1214	**Digital input 3X mon**		BIT	16	0	0	1	ER	
	1216	**Digital input 4X mon**		BIT	16	0	0	1	ER	
	1218	**Digital input 5X mon**		BIT	16	0	0	1	ER	
	1220	**Digital input 6X mon**		BIT	16	0	0	1	ER	
	1222	**Digital input 7X mon**		BIT	16	0	0	1	ER	
	1224	**Digital input 8X mon**		BIT	16	0	0	1	ER	

These signals represent the state of the corresponding digital input on the expansion card.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	1530	**Analog inp1**		BIT	16	0	0	1	ER	

This signal is active when the value of the analog input is below the threshold set in parameter **1520 Analog inp 1 thr**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	1544	**An inp 1 der mon**	cnt	INT16	16BIT	0	-16384	16384	ER	

Derivative value of input 1 dedicated to the pressure sensor.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	2388	**Torque ref nofilter**	perc	FLOAT	16	0.0	0.0	0.0	ER	

The torque control reference current without filter is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	2396	**Torque nofilter**	perc	FLOAT	16	0.0	0.0	0.0	ER	

Monitoring of the actual torque reference without filters.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	3006	**Speed ratio out mon**	rpm	INT16	16	0	0	0	ER	

This parameter displays the value of the speed ratio used by the “Speed draw” function (speed ratio).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	3180	**Brake control mon**	rpm	INT16	16	0	0	1	ER	

This parameter displays the status of the brake command.

0 Brake closed

1 Brake open

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	3192	**Brake open thr mon**	perc	FLOAT		0	0.0	0	ERS	

Brake opening threshold value. Only if **Hoist mode 2** has been selected.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	3214	**Motor overload trip**		BIT	16	0	0	1	ER	

This signal is active when the drive is in the motor overload alarm condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	3262	**Bres overload trip**		BIT	16	0	0	1	ER	

This signal is active when the drive is in the braking resistor overload alarm condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	3442	**Powerloss rampdown**		BIT	16	0	0	1	ER	

This parameter indicates the status of the Powerloss function deceleration ramp

0 Powerloss function deceleration ramp not ended

1 Powerloss function deceleration ramp ended

The signal is enabled at the end of the Powerloss function deceleration ramp.

The signal is disabled at different times depending on the **Powerloss mode** setting.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	3446	**Powerloss nextratio**		INT32	32	0	0	0	ER	

This parameter gives the ratio between the motor speed and the speed reference.

For machines with several drives, line synchronisation can be achieved by connecting the **Powerloss mode** output of the master to the **Speed ratio src** input of the slave drives. The master => slave connection can be achieved via analog signals or fieldbus.

The value 2^30 corresponds to a ratio of 1.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	3448	**Powerloss nextactive**		BIT	16	0	0	1	ER	

This parameter indicates the status of the Powerloss function

0 Powerloss not enabled

1 Powerloss enabled

The function is enabled when there is a power failure.

The function is disabled at different times depending on the **Powerloss mode** setting.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	3480	**Vdc ctrl ramp freeze**		BIT	16	0	0	1	ER	

This parameter displays when the deceleration ramp block is requested during the **Vdc control function**.

0 VdcCtrl function not enabled
1 VdcCtrl function enabled

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	3512	**Drv thr overtemp mon**		UINT32		0	0	0	ER	

Signals that the threshold set in PAR 3504 **Drv temp thr** has been exceeded.

0 Threshold not exceeded
1 Threshold exceeded

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	3514	**Mot thr overtemp mon**		UINT32		0	0	0	ER	

Signals that the threshold set in PAR 3506 **Mot temp thr** has been exceeded.

0 Threshold not exceeded
1 Threshold exceeded

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	4708	**Alm dig out mon 1**		BIT	16	0	0	1	ER	

This signal is activated when the alarm configured in parameter **4700 alarm dig sel 1** is active.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	4710	**Alm dig out mon 2**		BIT	16	0	0	1	ER	

This signal is activated when the alarm configured in parameter **4702 alarm dig sel 2** is active.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	4712	**Alm dig out mon 3**		BIT	16	0	0	1	ER	

This signal is activated when the alarm configured in parameter **4704 alarm dig sel 3** is active.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	4714	**Alm dig out mon 4**		BIT	16	0	0	1	ER	

This signal is activated when the alarm configured in parameter **4706 alarm dig sel 4** is active.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	4770	**First alarm**		UINT32	16	0	0	0	ERW	

This parameter displays the first alarm to be activated.

0 No alarm
1 Overvoltage
2 Undervoltage
3 Ground fault
4 Overcurrent
5 Desaturation
6 MultiUndervolt
7 MultiOvercurr
8 MultiDesat
9 Heatsink OT
10 HeatsinkS OTUT
11 Intakeair OT
12 Motor OT
13 Drive overload
14 Motor overload

15 Bres overload
16 Phaseloss
17 Opt Bus fault
18 Opt 1 IO fault
19 Opt 2 IO fault
20 Opt Enc fault
21 External fault
22 Speed fbk loss
23 Overspeed
24 Speed ref loss
25 Emg stop alarm
26 Power down
27 ExtIO fault
28 FastLink fault
29 Brake fault
30 Motor pre OT
31 Mot phase loss
32 Not Used2
33 Plc1 fault
34 Plc2 fault
35 Plc3 fault
36 Plc4 fault
37 Plc5 fault
38 Plc6 fault
39 Plc7 fault
40 Plc8 fault
41 Watchdog
42 Trap error
43 System error
44 User error
45 Param error
46 Load def par
47 Plc cfg error
48 Load def plc
49 Key failed
50 Encoder error
51 Opt cfg change
52 Power config
53 Plc9 fault
54 Plc10 fault
55 Plc11 fault
56 Plc12 fault
57 Plc13 fault
58 Plc14 fault
59 Plc15 fault
60 Plc16 fault

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	4780	**Alarm PLC**		UINT16		0	0	0	ER	

This parameter displays the state of the alarms generated by the application written with the internal PLC

Bit	Description
0	1 = PLC 1 fault active
1	1 = PLC 2 fault active
2	1 = PLC 3 fault active
3	1 = PLC 4 fault active
4	1 = PLC 5 fault active

Bit	Description
5	1 = PLC 6 fault active
6	1 = PLC 7 fault active
7	1 = PLC 8 fault active

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	4840	**Alarm lo state**		UINT32	32	0	0	0	ER	

This parameter displays the state of alarms 1..32 of the drive.

Bit	Description
0	1 = Overvoltage active
1	1 = Undervoltage active
2	1 = Ground fault active
3	1 = Overcurrent active
4	1 = Desaturation active
5	1 – MultiUndervolt active
6	1 = MultiOvercurr active
7	1 – MultiDesat active
8	1 = Heatsink OT active
9	1 = Heatsink lin OT active
10	1 = Air OT active
11	1 = Motor OT active
12	1 = Drive overload active
13	1 = Motor overload active
14	1 = Bres overload active
15	1 = Phase loss active
16	1 = Opt bus fault active
17	1 = Opt 1 I/O fault active
18	1 = Opt 2 I/O fault active
19	1 = Opt enc fault active
20	1 = External fault active
21	1 = Fbk loss active
22	1 = Overspeed active
23	1 = Ref loss active
24	1 = Emg stop alarm active
25	1 = Power down active
26	1 = not used
27	1 = not used
28	1 = not used
29	1 = not used
30	1 = not used
31	1 = not used

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	4842	**Alarm hi state**		UINT32	32	0	0	0	ER	

This parameter displays the state of alarms 33...64 of the drive.

Bit	Description
0	1 = PLC 1 fault active
1	1 = PLC 2 fault active
2	1 = PLC 3 fault active
3	1 = PLC 4 fault active
4	1 = PLC 5 fault active
5	1 = PLC 6 fault active
6	1 = PLC 7 fault active
7	1 = PLC 8 fault active

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	**5510**	**Digital input 9X mon**		BIT	16BIT	0	0	1	ER	
-	**5512**	**Digital input10X mon**		BIT	16BIT	0	0	1	ER	
-	**5514**	**Digital input11X mon**		BIT	16BIT	0	0	1	ER	
-	**5516**	**Digital input12X mon**		BIT	16BIT	0	0	1	ER	
-	**5518**	**Digital input13X mon**		BIT	16BIT	0	0	1	ER	
-	**5520**	**Digital input14X mon**		BIT	16BIT	0	0	1	ER	
-	**5522**	**Digital input15X mon**		BIT	16BIT	0	0	1	ER	
-	**5524**	**Digital input16X mon**		BIT	16BIT	0	0	1	ER	

These signals represent the state of the corresponding digital input on the expansion card.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	6000	**Null**		UINT32	32	0	0	0	ER	

This signal forces the variable to the zero level (always disabled).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	6002	**One**		UINT32	32	1	1	1	ER	

This signal forces the variable to level one (always active).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	6004	**Speed limit state**		BIT	16	0	0	1	ER	

This signal is activated when the drive is in the speed limit condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
	6006	**Current limit state**		BIT	16	0	0	1	ER	

This signal is activated when the drive is in the current limit condition.

C – TROUBLESHOOTING - Alarms

Note ! To reset alarms, see Quick start guide.

In the following table, the Code is visible only from serial line.

Code	Error message shown on the display [on the integrated keypad]	Sub-code	Description
0	**No alarm**		**Condition:** No alarm present
1	**Overvoltage [OV]** 		**Condition: DC link overvoltage alarm due to energy recovered from the motor.** The voltage arriving at the drive power section is too high compared to the maximum threshold relating to the PAR 560 **Mains voltage** parameter setting.
			Solution: - Extend the deceleration ramp. - Use a braking resistor between terminals BR1 and BR2 to dissipate the recovered energy - Use the VDC Control function
2	**Undervoltage [UV]** 		**Condition:** DC link undervoltage alarm. The voltage arriving at the drive power section is too low compared to the minimum threshold relating to the PAR 560 **Mains voltage** parameter setting due to: - the mains voltage being too low or overextended voltage drops. - poor cable connections (e.g. loose contactor terminals, inductance, filter, etc.).
			Solution: Check the connections.
3	**Ground fault [GNDF]** 		**Condition:** Ground short circuit alarm
			Solution: - Check drive and motor wiring. - Check that the motor is not grounded.
4	**Overcurrent [OC]** 		**Condition: Instantaneous overcurrent protection intervention alarm.** This may be due to the incorrect setting of current regulator parameters or a short circuit between phases or ground fault on the drive output.
			Solution: - Check the current regulator parameters - Check wiring towards the motor
5	**Desaturation [DES]** 		**Condition: Instantaneous overcurrent in the IGBT bridge alarm.**
			Solution: Switch the drive off and then switch it on again. If the alarm persists, contact the technical service centre.
6	**MultiUndervolt [MUV]** 		**Condition:** The number of attempted automatic restarts after the **Undervoltage** alarm has exceeded the set PAR 4650 **UVRep attempts** value in the PAR 4652 **UVRep delay** time.
			Solution: Too many Undervoltage alarms. Adopt the proposed solutions for the Undervoltage alarm.
7	**MultiOvercurr [MOC]** 		**Condition:** 2 attempted automatic restarts after the Overcurrent alarm within 30 seconds. If more than 30 seconds pass after the Overcurrent alarm was generated, the attempt counter is reset.
			Solution: Too many Overcurrent alarms. Adopt the proposed solutions for the Overcurrent alarm.
8	**MultiDesat [MDES]** 		**Condition:** 2 attempted at automatic restarts after the Desaturation alarm within 30 seconds. If more than 30 seconds pass after the Desaturation alarm was generated, the attempt counter is reset.
			Solution: Too many **Desaturation** alarms. Adopt the proposed solutions for the **Desaturation** alarm.
9	**Heatsink OT [HOT]** 		**Condition:** Heatsink temperature too high alarm
			Solution: - Verify the correct operation of the cooling fan. - Check that the heatsinks are not clogged - Check that the openings for the cabinet cooling air are not blocked.
10	**HeatsinkS OTUT [HSOT]** 		**Condition:** IGBT modules temperature too high or too low alarm
			Solution: - Verify the correct operation of the cooling fan. - Check that the heatsinks are not clogged - Check that the openings for the cabinet cooling air are not blocked.

Code	Error message shown on the display [on the integrated keypad]	Sub-code	Description
11	**Intakeair OT [IOT]** 		**Condition:** Intake drive air temperature too high alarm.
			Solution: - Check correct fan operation - Check that panel cooling air openings are unobstructed. - Check temperature in electrical panel.
12	**Motor OT [MOT]** 		**Condition:** Motor overtemperature alarm. Possible causes: - Load cycle too heavy - The motor is installed in a place where the ambient temperature is too high - If the motor is provided with a blower: the fan is not working - If the motor is not provided with a blower: the load is too high at slow speeds. Cooling the fan on the motor shaft is not sufficient for this load cycle. - The motor is used at less than the rated frequency, causing additional magnetic losses. - Motor temperature probe not connected or incorrect setting of parameters 4530, 4538 and 4522.
			Solution: - Change the processing cycle. - Use a cooling fan to cool the motor. - Check the connection of the motor temperature probe or the settings of parameters 4530, 4538 and 4522.
13	**Drive overload [DOL]** 		**Condition:** Drive overload alarm. - The inverter output current has exceeded the allowed overload value. - The overload cycle has exceeded the allowed values.
			Solution: - Check that the load is not excessive. - Check that accelerations are not excessive. - Check that the overload cycle is within allowed limits.
14	**Motor overload [MOL]** 		**Condition:** Motor overload alarm. The current absorbed during operation is greater than that specified on the motor data plate. The overload threshold of the accumulator of the I^2t motor thermal image has been exceeded.
			Solution: - Reduce the motor load. - Increase the size of the motor.
15	**Bres overload [BOL]** 		**Condition:** Braking resistor overload alarm. The current absorbed by the resistor is greater than the rated current. The overload threshold of the accumulator of the I^2t braking resistor thermal image has been exceeded. For standard external braking resistor the Max overload (factory set) is 1" service 10% (see Table 5.4.1 on ADP200 QS manual).
			Solution: - Check the size of the braking resistor. - Check the condition of the braking resistor Use braking resistor with higher energy value and change the parameters on 22.5 - FUNCTIONS/BRES OVERLOAD menu.
16	**Phaseloss [PHL]** 		**Condition:** Power phase loss alarm.
			Solution: Check the mains voltage and whether any protections upstream of the drive have been tripped.
17	**Opt Bus fault [OPTB]** 		**Condition:** Error in the configuration stage or communication error.
		XXX0H-X	If the first digit to the left of "H" in the alarm sub-code is 0, the error regards a communication problem.
		XXXXH-X	If the first digit to the left of "H" in the alarm sub-code is other than 0, the error regards a configuration problem.
			Solution: For configuration errors, check the configuration of the bus communication, type of bus, baudrate, address, parameter setting. For communication errors verify wiring, resistance of terminations, interference immunity, timeout settings. For further details, please refer to the user guide for the specific bus.
18	**Opt 1 IO fault [OPT1]** 		**Condition:** Error in the communication between Regulation and I/O expansion card in slot 1
			Solution: Check that it has been inserted correctly, see ADP200 QS manual.
19	**Opt 2 IO fault [OPT2]**		**Condition:** Error in the communication between Regulation and I/O expansion card in slot 2

Code	Error message shown on the display [on the integrated keypad]	Sub-code	Description
	oPt2		**Solution:** Check that it has been inserted correctly, see ADP200 QS manual.
20	**Opt Enc fault [OPTE]** oPtE		**Condition:** Error in the communication between Regulation and Encoder feedback card. **Solution:** Check that it has been inserted correctly, see ADP200 QS manual.
21	**External fault [EF]** EF		**Condition:** External alarm present. A digital input has been programmed as an external alarm, but the +24V voltage is not available on the terminal. **Solution:** Check that the terminal screws are tight
22	**Speed fbk loss [SFL]** SFL		**Condition:** Speed feedback loss alarm. The encoder is not connected, not connected properly or not powered: verify encoder operation by selecting the **Motor speed** parameter in the MONITOR menu. **Solution:** - Check encoder wiring for integrity. - Check that the encoder is connected to the power supply. - With the drive disabled, turn the motor clockwise (seen from the motor shaft side). A positive value must be displayed. - If the value does not change or values are indicated randomly, check the encoder power supply and cables. - If the value displayed is negative, invert the encoder connections. Change channel A+ and A- or B+ and B-. - Check that the encoder electronics are consistent with those of the relative expansion card. - Generated in case of an encoder fault. Each type of encoder generates a "Loss of feedback" alarm differently. See parameter 2172 **SpdFbkLoss code** for information about the cause of the alarm and chapter C.1 Speed fbk loss alarm.
23	**Overspeed [OS]** oS		**Condition:** Motor overspeed alarm. The motor speed exceeds the limits set in the PAR 670 **Speed ref top lim** and PAR 672 **Speed ref bottom lim** parameters. **Solution:** - Limit the speed reference. - Check that the motor is not driven in overspeed during rotation.
24	**Speed ref loss [SRL]** SrL		**Condition: Speed reference loss alarm;** occurs if the difference between the speed regulator reference and the actual motor speed is more than 100 rpm. This condition occurs because the drive is in the current limit condition. It is only available in the **Flux Vect OL** and **Flux Vect OC** mode (see PAR 4550). **Solution:** - Check the drive load conditions - Check the number of encoder impulses
25	**Emg stop alarm [EMGS]** EMGS		**Condition:** Emergency stop alarm. The Stop key on the keypad was pressed with the PAR 1008 **Stop key mode** parameter set to **EmgStop&Alarm.** Active in remote control mode (PAR 1012=1) both by using "Terminals" command or "Digital" commands and, in local control mode (PAR 1012=0) by using "Terminals" command. **Solution:** Eliminate the reason for which the Stop key on the keypad was pressed and reset the drive.
26	**Power down [PD]** Pd		**Condition:** The drive was enabled with no supply voltage at the power section. **Solution:** Check the drive power supply
27-28-29	**Not Used**		
30	**Motor pre OT [PROT]** Prot		**Condition:** Motor overtemperature prealarm. % value of threshold compared to PAR 4532 **MotorOT thr,** **Solution:** Value set too low for duty cycle.
31	**Mot phase loss [PHLO]** PHLo		**Condition:** Output phase loss. **Solution:** Check Drive/motor connection.
32	**Not Used 2**		

Code	Error message shown on the display [on the integrated keypad]	Sub-code	Description
33 ... 40	**Plc1 fault [PL01]** **...** **Plc8 fault [PL08]** 	**Condition:** Enabled application developed in the IEC 61131-3 environment has found the conditions for generating this specific alarm to be true. The meaning of the alarm depends on the type of application. For more information, refer to the documentation concerning the specific application..	
		XXXXH-X	The XXXXH-X code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Solution: Refer to the documentation concerning the enabled application.	
41	**Watchdog [WDT]** 	**Condition:** may occur during functioning when the watchdog protection of the micro is activated; the alarm is inserted in the alarm list and alarm log. After this alarm: - the drive automatically runs a reset - motor control is not available.	
		XXXXH-X	The XXXXH-X code indicates the reason for the error: take note for examination with the service centre.
		Solution: If the alarm was a consequence of a variation to the drive configuration (parameter setting, installation of an option, downloading of a PLC application), remove it. Switch the drive off and then switch it on again.	
42	**Trap error [TRAP]** 	**Condition:** this condition can occur during operation when the trap micro protection is enabled; the alarm is included in the list of alarms and alarm log. After this alarm: - the drive automatically runs a reset - motor control is not available.	
		XXXXH-X	The XXXXH-X code (SubHandler-Class) indicates the reason for the error: take note for examination with the service centre.
		Solution: If the alarm was a consequence of a variation to the drive configuration (parameter setting, installation of an option, downloading of a PLC application), remove it. Switch the drive off and then switch it on again.	
43	**System error [SYS]** 	**Condition:** this condition can occur during operation when the operating system protection is enabled; the alarm is included in the list of alarms and alarm log. After this alarm: - the drive automatically runs a reset - motor control is not available.	
		XXXXH-X	The XXXXH-X code (Error-Pid) indicates the reason for the error: take note for examination with the service centre.
		Solution: If the alarm was a consequence of a variation to the drive configuration (parameter setting, installation of an option, downloading of a PLC application), remove it. Switch the drive off and then switch it on again.	
44	**User error [USR]** 	**Condition:** this condition can occur during operation when the software protection is enabled; the alarm is included in the list of alarms and alarm log. After this alarm: - the drive automatically runs a reset - motor control is not available.	
		XXXXH-X	The XXXXH-X (Error-Pid) code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Solution: If the alarm was a consequence of a variation to the drive configuration (parameter setting, installation of an option, downloading of a PLC application), remove it. Switch the drive off and then switch it on again.	
45	**Param error [PRR]** 	**Condition:** if an error occurs during the enabling of the parameter database saved in the Flash memory; the alarm is included in the list of alarms and alarm log.	
		XXXH-X	Code XXXXH-X indicates the IPA of the parameter that has been set outside the range allowed when the database is enabled.
		Solution: Set the parameter causing the error to a value within the range and run **Save parameter**. Switch the drive off and then switch it back on again. If the IPA of the parameter is not shown in the manual, contact the service centre.	
46	**Load default [LD]** 	**Condition:** this can occur during loading of the parameter database saved in the Flash memory it is normal if it appears in the following conditions: the first time the drive is switched on, when a new version of the firmware is downloaded, when the regulation is installed on a new size, when a new region is entered. If this message appears when the drive is already in use it means there has been a problem in the parameter database saved in the Flash memory. If this message is displayed the drive restores the default database, i.e. the one downloaded during production.	
		0001H-1	The database saved is not valid
		0002H-2	The database saved is not compatible
		0003H-3	The saved database refers to a different size and not to the current size
		0004H-4	The saved database refers to a different region and not to the current region

Code	Error message shown on the display [on the integrated keypad]	Sub-code	Description
		Solution: Set the parameters to the desired value and run **Save parameter**	
47	**Plc cfg error [PLCE]** 	**Condition:** this can occur during loading of the MDPLC application The Mdplc application present on the drive is not run.	
		0004H-4	The application that has been downloaded has a different Crc on the DataBlock and Function table.
		0065H-101	The application that has been downloaded has an invalid identification code (Info).
		0066H-102	The applciation that has been downloaded uses an incorrect task number (Info).
		0067H-103	The application that has been downloaded has an incorrect software configuration.
		0068H-104	The application that has been downloaded has a different Crc on the DataBlock and Function table.
		0069H-105	A Trap error or System error has occurred. The drive has automatically executed a Power-up operation. Application not executed. See the Alarm List for more information about an error that has occurred.
		006AH-106	The application that has been downloaded has an invalid identification code (Task).
		006BH-107	The application that has been downloaded uses an incorrect task number (Task).
		006CH-108	The application that has been downloaded has an incorrect Crc (Tables + Code)
		Solution: Remove the MDPLC application or download a correct MDPLC application.	
48	**Init_LdPlcPar [LDP]** 	**Condition:** this can occur during loading of the parameter database saved in the Flash memory of the MDPLC application it is normal if it appears the first time the drive is switched on, after downloading a new application. If this message appears when the drive is already in use it means there has been a problem in the parameter database saved in the Flash memory. If this message appears the drive automatically runs the **Load default** PAR 580 command.	
		0001H-1	The database saved is not valid
		Solution: Set the parameters to the desired value and run **Save parameter.**	
49	**Key failed [KEY]** 	**Condition:** Shis may occur at drive power-on if the incorrect enabling key was inserted for a given firmware function.	
		0001H-1	Incorrect PLC key. PLC application not available.
		Solution: Ask WEG for the correct key to enable the desired firmware function.	
50	**Encoder error [ENC]** 	**Condition:** this condition may occur when the drive is powered during encoder setup each time parameter 552 **Regulation mode** is set.	
		100H-256	An error occurred during setup; the information received from the encoder is not reliable. If the encoder is used for feedback the **Speed fbk loss** [22] alarm is also generated.
		Solution: Take the recommended action for the **Speed fbk loss** [22] alarm.	
		200H-512	Cause: The firmware on the optional encoder card is incompatible with that on the regulation card. The information received from the encoder is not reliable
		Solution: Contact WEG in order to update the firmware on the optional encoder card.	
51	**Opt cfg change [OCFG]** 	**Condition**: this may occur when powering the drive if an expansion card has been removed or replaced or the incorrect enable key is inserted for a given firmware function.	
		0064H-100	Card removed from slot 1.
		0014H-20	Card removed from slot 2
		0003H-3	Card removed from slot 3
		0078H-120	Card removed from slot 1 and from slot 2
		0067H-103	Card removed from slot 1 and from slot 3.
		0017H-23	Card removed from slot 2 and from slot 3.
		007BH-123	Card removed from slot 1, from slot 2 and from slot 3
		Solution: Check the hardware configuration, then press ESC. Save the parameters (**Save parameters**, menu 04.01 par 550) to save the new hardware configuration.	
52	**Power config [PCFG]** 	**Condition:** It can occur at the power-on during recognition size phase.	
		Solution: Contact the WEG technical support centre.	

Code	Error message shown on the display [on the integrated keypad]	Sub-code	Description
53 ... 60	**Plc9 fault [PL09]** ... **Plc16 fault [PL16]** 		**Condition:** Enabled application developed in the IEC 61131-3 environment has found the conditions for generating this specific alarm to be true. The meaning of the alarm depends on the type of application. For more information, refer to the documentation concerning the specific application..
		XXXXH-X	The XXXXH-X code indicates the reason for the error: make a note of this to discuss it with the service centre.
			Solution: Refer to the documentation concerning the enabled application.
64	**Fault code 64 [FC64]** 		**Condition:** It can occur at drive disabling
			Solution: Contact the WEG technical support center

C.1 Speed fbk loss alarm according to the type of feedback

Note ! For the correct interpretation of the cause of the alarm trigger, it is necessary to transform the hex code indicated in parameter 17.38 **SpdFbkLoss code,** PAR 2172 , in the corresponding binary and verify in the encoder table that the active bits and related description are used.

Example with encoder Endat:

PAR 2172 = A0H (hex value)

In the table "Speed fbk loss [22] alarm with absolute encoder EnDat" A0 is not indicated in the value column.

A0 should be contemplated as a bitword with meaning A0 -> 10100000 -> bit 5 and bit 7 . The following causes simultaneously intervene:

- Bit 5 = 20H Cause: the SSI signal interferences cause an error in the CKS or parity.

- Bit 7 = 80H Cause: The encoder has detected an incorrect operation and communicates it to the converter through the Error bit. Bits 16..31 present the type of incorrect encoder operation detected.

The value is displayed in hexadecimal format on the optional and standard keypad.

- **Speed fbk loss [22] alarm with Resolver**

Code	Name	Error description	Possible solution
0x00000001	D0 FAULT REGISTER	Configuration parity error	Reset Resolver card
0x00000002	D1 FAULT REGISTER	Phase error exceeds phase lock range	
0x00000004	D2 FAULT REGISTER	Velocity exceeds maximum tracking rate	
0x00000008	D3 FAULT REGISTER	Tracking error exceeds LOT (Loss of Signal) threshold	
0x00000010	D4 FAULT REGISTER	SIN/COS inputs exceed DOS (Degradation of signal) mismatch threshold	Check the connection of the Resolver input pins (SIN-,SIN+,COS-,COS+), check PAR 2128
0x00000020	D5 FAULT REGISTER	SIN/COS inputs exceed DOS (Degradation of signal) over range threshold	Check the connection of the Resolver input pins (SIN-,SIN+,COS-,COS+), check PAR 2126
0x00000040	D6 FAULT REGISTER	SIN/COS inputs below LOS (Loss of Signal) threshold	Check the connection of the Resolver input pins (SIN-,SIN+,COS-,COS+), check PAR 2124
0x00000080	D7 FAULT REGISTER	SIN/COS inputs clipped	Check if any of the Resolver input pins (SIN-,SIN+,COS-,COS+) are shorted with power input or ground of the resolver board

- **Speed fbk loss [22] alarm with digital incremental encoder**

Bit	Value					Name	Description
	D7.. D4	D3	D2	D1	D0		
0					0x1	CHA	**Cause:** no impulses or disturbance on incremental channel A.

Bit	Value					Name	Description
	D7.. D4	D3	D2	D1	D0		
							Solution: Check the connection of the encoder-drive channel A, check the connection of the screen, check the encoder supply voltage. Check parameters 2102 **Encoder 1 supply** and 2104 **Encoder 1 input cfg** (if encoder 1 is used). Check parameters 5102 **Encoder 2 supply** and 5104 **Encoder 2 input cfg** (if encoder 2 is used).
1					0x2	CHB	**Cause:** no impulses or disturbance on incremental channel B.
							Solution: Check the connection of the encoder-drive channel B, check the connection of the screen, check the Encoder 1 supply voltage. Check parameters 2102 **Encoder 1 supply** and 2104 **Encoder 1 input cfg** (if encoder 1 is used). Check parameters 5102 **Encoder 2 supply** and 5104 **Encoder 2 input cfg** (if encoder 2 is used).
2					0x4	CHZ	**Cause:** no impulses or disturbance on incremental channel Z.
							Solution: Check the connection of the encoder-drive channel Z, check the connection of the screen, check the Encoder 1 supply voltage. Check parameters 2102 **Encoder 1 supply** and 2104 **Encoder 1 input cfg** (if encoder 1 is used). Check parameters 5102 **Encoder 2 supply** and 5104 **Encoder 2 input cfg** (if encoder 2 is used).

- **Speed fbk loss [22] alarm with sinusoidal incremental encoder**

Bit	Value					Name	Description
	D7.. D4	D3	D2	D1	D0		
3					0x8	MOD_ INCR	**Cause:** voltage level not correct or disturbance on signals of incremental channels A-B.
							Solution: Check the connection of the encoder-drive channels A-B, check the connection of the screen, check the encoder supply voltage, check parameter 2102 **Encoder 1 supply,** check parameter 2108 **Encoder 1 signal Vpp.**

- **Speed fbk loss [22] alarm with SinCos encoder**

Bit	Value					Name	Description
	D7.. D4	D3	D2	D1	D0		
3					0x8	MOD_ INCR	**Cause:** voltage level not correct or disturbance on signals of incremental channels A-B.
							Solution: Check the connection of the the encoder-drive channels A-B, check the connection of the screen, check the encoder supply voltage, check parameter 2102 **Encoder 1 supply**, check parameter 2108 **Encoder 1 signal Vpp**.
4				0x1	0x0	MOD_ABS	**Cause:** voltage level not correct or disturbance on signals of absolute SinCos channels.
							Solution: Check the connection of the the encoder-drive channels A-B, check the connection of the screen, check the encoder supply voltage, check parameter 2102 **Encoder 1 supply**, check parameter 2108 **Encoder 1 signal Vpp**.

- **Speed fbk loss [22] alarm with SSI absolute encoder**

Bit	Value					Name	Description
	D7.. D4	D3	D2	D1	D0		
3					0x8	MOD_ INCR	**Cause:** voltage level not correct or disturbance on signals of incremental channels A-B.
							Solution: Check the connection of the the encoder-drive channels A-B, check the connection of the screen, check the encoder supply voltage, check parameter 2102 **Encoder 1 supply**, check parameter 2108 **Encoder 1 signal Vpp**.
5				0x2	0x0	CRC_ CKS_P	**Cause:** SSI signals not present or disturbed.

Bit	Value					Name	Description
	D7.. D4	D3	D2	D1	D0		
							Solution: Check the connection of the clock and encoder-drive data, check the connection of the screen, check the encoder supply voltage, check parameter 2102 **Encoder 1 supply**, check parameter 2112 **Encoder 1 SSI bits**.
8			**0x1**	**0x0**	**0x0**	**Setup error**	**Cause:** An error occurred during setup.
							Solution: Check the connection of the clock and encoder-drive data, check the connection of the screen, check the encoder supply voltage, check parameter 2102 **Encoder 1 supply**, check parameter 2112 **Encoder 1 SSI bits**.

- **Speed fbk loss [22] alarm with EnDat absolute encoder**

Bit	Value					Name	Description
	D7.. D4	D3	D2	D1	D0		
3					**0x8**	**MOD_ INCR**	**Cause: v**oltage level not correct or disturbance on signals of incremental channels A-B.
							Solution: Check the connection of the the encoder-drive channels A-B, check the connection of the screen, check the encoder supply voltage, check parameter 2102 **Encoder 1 supply**, check parameter 2108 **Encoder 1 signal Vpp**.
5				**0x2**	**0x0**	**CRC_ CKS_P**	**Cause:** SSI signals not present or disturbed cause an error on CRC
							Solution: Check the connection of the clock and encoder-drive data, check the connection of the screen, check the encoder supply voltage, check parameter 2102 **Encoder 1 supply**.
8			**0x1**	**0x0**	**0x0**	**Setup error**	**Cause:** An error occurred during setup.
							Solution: Check the connection of the clock and encoder-drive data, check the connection of the screen, check the encoder supply voltage, check parameter 2102 **Encoder 1 supply**.

The following conditions occur while resetting the encoder following **Speed fbk loss** [22] activation

Bit	Value					Name	Description			
	D7.. D4	D3	D2	D1	D0					
6				**0x4**	**0x0**	**ACK_TMO**	**Cause:** SSI signals not present or disturbed cause an error on CRC			
							Solution: Check the connection of the clock and encoder-drive data, check the connection of the screen, check the encoder supply voltage, check parameter 2102 **Encoder 1 supply**.			
7				**0x8**	**0x0**	**DT1_ERR**	**Cause:** Encoder has detected malfunction and signals this to the drive via bit DT1. Bits 16..31 contain the type of malfunction detected by the encoder.			
							Solution: See the encoder manufacturer's technical guide.			
16.31	**xxxx**						**Bit**		**=0**	**=1**
							0	Light source	OK	Failure (1)
							1	Signal amplitude	OK	Erroneous (1)
							2	Position value	OK	Erroneous (1)
							3	Over voltage	NO	Yes (1)
							4	Under voltage	NO	Under voltage supply (1)
							5	Over current	NO	Yes (1)
							6	Battery	OK	Change the battery (2)
							7..15			
							(1) Can also be set after the power supply is switched off or on. (2) Only for battery-buffered encoders			

- **Speed fbk loss [22] alarm with Hiperface absolute encoder**

Bit	Value					Name	Description
	D7.. D4	D3	D2	D1	D0		
3					0x8		**Cause:** voltage level not correct or disturbance on signals of incremental channels A-B.
							Solution: Check the connection of the the encoder-drive channels A-B, check the connection of the screen, check the encoder supply voltage, check parameter 2102 **Encoder 1 supply**, check parameter 2108 **Encoder 1 signal Vpp**.
5				0x2	0x0		**Cause:** disturbed SSI signals cause a CKS error or Parity
							Solution: Check the connection of the clock and encoder-drive data, check the connection of the screen, check the encoder supply voltage, check parameter 2102 **Encoder 1 supply**.
6				0x4	0x0		**Cause:** Encoder does not recognise the command that has been sent to it and replies with ACK. The SSI signals not present cause a TMO error.
							Solution: Check the connection of the clock and encoder-drive data, check the connection of the screen, check the encoder supply voltage, check parameter 2102 **Encoder 1 supply.**
8			0x1	0x0	0x0		**Cause:** An error occurred during setup.
							Solution: Check the connection of the clock and encoder-drive data, check the connection of the screen, check the encoder supply voltage, check parameter 2102 **Encoder 1 supply**.

The following conditions occur while resetting the encoder following **Speed fbk loss** [22] activation.

Bit	Value					Name	Description		
	D7.. D4	D3	D2	D1	D0				
7				0x8	0x0	DT1_ERR	**Cause:** Encoder has detected malfunction and signals this to the drive via Error bit. Bits 16..31 contain the type of malfunction detected by the encoder.		
							Solution: See the encoder manufacturer's technical guide.		
16.31	xxxx						**Type**	**Code**	**Description**
							Transmis-sion	09h	Transmitted parity bit is incorrect
								0AH	Checksum of transmitted data is wrong
								0BH	Incorrect command code
								0CH	Wrong number of transmitted data
								0DH	Illegal transmitted command argument
								0FH	Wrong access authorization specified
								0EH	Selected field has READ ONLY status
								10H	Data field (re) definition not executable due to field size
								11H	Specified address is not available in selected field
								12H	Selected field does not yet exist
								00H	No encoder error, no error message
								03H	Data field operations disabled
								04H	Analog monitoring inoperative
								08H	Counting register overflow
								01H	Encoder analog signals are unreliable
								02H	Wrong synchronisation or offset
								05H-07H	Encoder-internal hardware fault, no operation possible
								1CH-1DH	Error in sampling, no operation possible
								1EH	Permissible operation temperature is exceeded

C.1.1 Reset Speed fbk loss alarm

The reasons for activating the **Speed fbk loss** alarm and the information acquired by the encoder are shown in parameter 2172 **SpdFbkLoss code.**

If no card has been installed the **Speed fbk loss** [22] alarm is generated and no cause is displayed in parameter 2172 **SpdFbkLoss code**. Several causes may be present at the same time.

If no card is recognised, the system runs a routine that always returns **Speed fbk loss** [22] active without specifying a cause.

C.1.2 Encoder error alarm

Setup is performed each time the drive is turned on, regardless of the regulation mode that has been selected. If an error is detected during setup the **Encoder error** alarm is generated with the following codes:

Bit	Value					Name	Description
	D7.. D4	D3	D2	D1	D0		
8			0x1	0x0	0x0	**Setup error**	**Cause:** An error occurred during setup. When this has been signalled the information obtained from the encoder is not reliable.
							Solution: Take the action recommended for **Speed fbk loss** [22] alarm according to the type of encoder.
9			0x2	0x0	0x0	**Compatibility error**	**Cause:** Firmware on option card incompatible with firmware on regulation card. When this has been signalled the information obtained from the encoder is not reliable.
							Solution: Contact WEG in order to update the firmware on the optional card.

D – MESSAGES

Note ! For more information see Quick start guide, "Displaying and closing Messages" **chapter**.

Index	Error message shown on the display [on the integrated keypad]	Sub-code	Description
1	**Load default param [LDEF]** 	**Condition:** may occur during loading of the parameter database saved in flash normally appears in the following conditions: at initial power-on when a new firmware version is downloaded, when the regulation is installed on a new size, when the region is changed. If this message is displayed when the drive is already operating, this means that a problem has occurred in the parameter database saved in Flash. If this message is displayed, the drive automatically performs the **Load default** command.	
		0001H-1	The database saved is not valid
		0002H-2	The database saved is not compatible
		0003H-3	The database saved refers to a different size from the current size
		0004H-4	The database saved refers to a different region from the current region
		Solution: Set the parameters to the value required and perform **Save parameter**	
2	**Option detect slot 1 [OPT1]** 	**Condition:** at power-on, the drive recognizes the presence of an optional card in one of the three expansion slots. One of the three messages is shown on the display	
		0H-0	None
		0004H-4	CAN
3	**Option detect slot 2 [OPT2]** 	**0008H-8**	Enc 1 (EXP-DE-I1R1F2-ADL)
		0108H-264	Enc 2 (EXP-SE-I1R1F2-ADL)
		0208H-520	Enc 3 (EXP-SESC- I1R1F2-ADL)
		0308H-776	Enc 4 (EXP-EN/SSI- I1R1F2-ADL)
4	**Option detect slot 3 [OPT3]** 	**0408H-1032**	Enc 5 (EXP-HIP- I1R1F2-ADL)
		0508H-1288	Enc 6 (EXP-RES-I1-ADP/ EXP-RES-I1R1-ADP)
		0101H-257	I/O 1 (EXP-IO-D4-ADL)
		0501H-1281	I/O 2 (EXP-IO-D8R4-ADL)
		0901H-2305	I/O 3 (EXP-IO-D16R4-ADL)
		0F01H-3841	I/O 4 (EXP-IO-D12A2R4-ADL)
		1301H-4865	I/O 5 (EXP-IO-D8A4R4-ADL)
		1501H-5377	I/O 6 (EXP-IO-D5R3-F-ADL)
		1F01H-7937	I/O 7 (EXP-IO-D10A3R2-ADP)
		2301H-8961	I/O 8 (EXP-IO-D8A4R2-ADP)
		00FFH-255	Unknown
		Solution:	
5	**Autotune (motor) [SLFT]** 	**Condition:** this may occur during the **Autotune** procedure	
		0	No error
		1	The commands are not configured in Local mode.
			Solution: Execute the requested configuration
		2	The Commands local sel parameter has not been configured from the keypad
			Solution: Execute the requested configuration
		3	The motor plate data parameters have changed but the **Take parameters** command, PAR 2020, has not been executed
			Solution: Execute the **Take parameters** command.
		4	Error in motor connection.
			Solution: Check the motor connection, set the value of the direct current of the motor to 1/3 and perform the motor autotune procedure. Then increase the direct current until autotuning is executed. The penultimate value is the nominal current value at which the drive performs autotuning.
		5	While running self-tuning the ESC key was pressed or the enable contact was opened or an alarm occurred. The **Autotune** command was sent with the drive in the alarm condition
			Solution: Eliminate the reason for the alarm, remove the reason for the opening of the enable contact, reset alarms.
		6	A setting performed by the **Autotune** function produced a parameter value outside the min or max range.
			Solution: Check the motor plate data or drive and motor sizes have been combined incorrectly.

Index	Error message shown on the display [on the integrated keypad]	Sub-code	Description
		7	The **Autotune** command was sent without being enabled.
			Solution: Close the enable contact before sending the **Autotune** command
		8	Internal calculation error concerning IGBT control
			Solution: Perform autotuning once more, if the problem persists, contact the WEG technical support centre.
		9	The drive has measured a stator resistance value exceeding the set limit.
			Solution: contact the WEG technical support centre.
		10	The drive has measured a stator resistance value below the set limit.
			Solution: contact the WEG technical support centre.
		11-12	Measurement of DTL internal compensation voltage outside accepted range.
			Solution: check connection between drive and motor. If correct, the drive is faulty, contact the WEG technical support centre.
		13-14	Measurement of DTS internal voltage outside accepted range.
			Solution: check connection between drive and motor. If correct, the drive is faulty, contact the WEG technical support centre.
		15 - 16 -17	LS leakage inductance value outside accepted range.
			Solution: Perform autotuning once more, if the problem persists, contact the WEG technical support centre.
		18-19	Measurement of Im magnetising current outside accepted range.
			Solution: Perform autotuning once more, if the problem persists, contact the WEG technical support centre.
		20-21	Measurement of Rr rotor resistor outside accepted range.
			Solution: Perform autotuning once more, if the problem persists, contact the WEG technical support centre.
		30	The Enable was not given or removed in time during the phasing procedure.
			Solution: Repeat the phasing procedure and check the connection of the enable signals.
		Solution: If the message appears with a value other than 0, follow the instructions supplied for each particular case and repeat **Autotune**. This should be performed using the wizard function available from the keypad (STARTUP WIZARD) and the Tool software on the PC. Pay attention to all motor plate data parameters, especially: - **Rated speed**, **Motor rated speed** in rpm. - **Rated frequency**, **Motor rated frequency** in Hz - **Pole pairs**, **Motor pole pairs** Take care to set the **Rated speed** parameter to the synchronous speed. If the problem persists even after following the instructions supplied, confirm the values of the motor plate data parameters, execute the **Take parameters** command but not **Autotune**.	
6	**Power config [PC]** PC	**Condition:** may occur during recognition of power cards. If this message is displayed, it is not possible to drive the motor.	
		0020H-32	The power card is configured for a drive that is incompatible with the regulation card
		0021H-33	The configuration of the power card is not compatible with the regulation card
		0017H-23	The configuration required is not available on the power card
		Solution: Download the correct configuration on the power card	
7	**Save par failed [FAIL]** FAIL	**Condition:** during transfer of the parameters from the drive to the memory of the keypad	
		0H-0	Communication error
		0023H-35	System error, the memory is insufficent
		0024H-36	System error, memory is not valid
		Solution:	
8	**Load par failed [FAIL]** FAIL	**Condition:** during transfer of the parameters from the memory of the keypad to the drive	
		0H-0	Communication error
		0024H-36	System error, the memory is insufficent
9	**Load par incomplete [LPNC]** LPnC	**0025H-37**	The data saved on the keypad are not valid. No parameter is transferred from the keypad to the drive
		0026H-38	Incompatible drive series. No parameter is transferred from the keypad to the drive
		0027H-39	Incompatible software version. All the parameters present in the memory of the keypad have been transferred to the drive. The set of parameters transferred refers to a drive with a different firmware version; therefore, certain parameters may not be updated.

Index	Error message shown on the display [on the integrated keypad]	Sub-code	Description
		0028H-40	Incompatible drive size. All the parameters present in the memory of the keypad (excluding those that depend on the size of the drive), have been transferred to the drive. The parameters that depend on size maintain their original value.
		0029H-41	Error during saving of parameters on the drive. All the parameters present in the memory of the keypad have been transferred to the drive. The transfer of one or more parameters has caused an "out of range" error, or one or more parameters does not exist. At the end of transfer, one or more parameters may not have been updated.
		002AH-42	PLC application release and version not compatible. All parameters in the keypad memory have been transferred to the drive. The transferred set of parameters relates to a drive with a PLC application in which the version and release of the application are different. As a result some of the PLC application parameters may not be updated.
		002BH-43	PLC application not compatible. All the parameters in the keypad memory except those relating to the PLC application have been transferred to the drive. The transferred set of parameters relates to a drive with a different PLC application. As a result none of the PLC application parameters are updated.
		Solution: Recover a set of parameters from a compatible drive (model and size)	
10	**Options config error [OPTC]** oPtC	**Condition:** may occur at drive start-up, during recognition of the optional cards installed	
		0001H-1	Non-permissible optional card in slot 1
		0002H-2	Non-permissible optional card in slot 2
		0004H-4	
		0010H-16	Conflict slot 1 with slot 2
		0020H-32	
		0040H-64	
		Solution: Remove the optional cards from the incorrect slots and insert them in the correct slots	
11	**Load def plc [LDPL]** LdPL	**Condition:** may occur during loading of the parameter database saved in the Flash of the Mdplc application Normally appears at initial power-on after downloading a new application. If this message is displayed when the drive is already operating, this means that a problem has occurred in the parameter database saved in Flash. If this message appears the drive restores the default database, i.e. the one that was downloaded.	
		0001H-1	The database saved is not valid
		Solution: Set the parameters to the value required and perform **Save parameter**	
12	**Plc cfg error [PLCE]** PLCE	**Condition:** may occur during loading of the Mdplc application The Mdplc application present on the drive is not run.	
		0004H-4	The application downloaded has a different Crc on DataBlock and Function table
		0065H-101	The application downloaded has an invalid identifier (Info)
		0066H-102	The application downloaded has an incorrect task number (Info)
		0067H-103	The application downloaded has an incorrect software configuration
		0068H-104	The application downloaded has a different Crc on DataBlock and Function table
		0069H-105	A Trap error or System error has occurred. The drive automatically performs a Power-up operation. The application is not run. See in Alarm List for further information regarding the error occurred
		006AH-106	The application downloaded has an incorrect identifier (Task)
		006BH-107	The application downloaded has an incorrect task number (Task)
		006CH-108	The application downloaded has an incorrect Crc (Tables + Code)
		Solution: Remove the Mdplc application or download a correct Mdplc application	

Index	Error message shown on the display [on the integrated keypad]	Sub-code	Description
13	**Plc 1 [PLC1]** 	Reserved messages and dedicated to the PLC application. See the application manual.	
14	**Plc 2 [PLC2]** 		
15	**Plc 3 [PLC3]** 		
16	**Plc 4 [PLC4]** 		
17	**Option bus fault [OPTB]** 	**Condition:** this may occur when the drive is turned on, during fieldbus card setup. Error during configuration or communication error.	
		XXX0H-X	If the first digit to the left of "H" in the alarm sub-code is 0, the error regards a communication problem.
		XXX0H-X	If the first digit to the left of "H" in the alarm sub-code is other than 0, the error regards a configuration problem.
		Solution: For configuration errors, check the configuration of the bus communication, type of bus, baudrate, address, parameter setting. For communication errors, check wiring, termination resistors, disturbance immunity, timeout settings. For further details, please refer to the user guide for the specific bus.	
18	**Key failed [KEYF]** 	**Condition**: this may occur when powering the drive, if the incorrect enable key is inserted for a given firmware function.	
		0001H-1	Incorrect PLC key. PLC application not available.
		Solution: Ask WEG to supply the correct key to enable the desired firmware function.	
19	**Key expiring [KEYE]** 	**Condition:** this may occur at drive power-on if the incorrect enabling key was inserted for a given firmware function. At this stage the firmware function can still be used freely, but this time limit is about to expire.	
		XXXXH-X	Number of hours for which the function can still be used freely.
		Solution: Ask WEG for the correct key to enable the desired firmware function.	
20	**Param error [PE]** 	**Condition**: if an error occurs during activation of the parameter database saved in flash; the alarm is inserted in the alarm list and alarm log.	
		XXX0H-X	The code XXXXH-X indicates the IPA of the parameter that has been set outside the range allowed when the database is enabled.
		Solution: Set the parameter causing the error to a value within the range and run **Save parameters**. Switch the drive off and then switch it back on again. If the IPA of the parameter is not shown in the manual, contact the service centre.	
21	**Encoder error [ENCE]** 	**Condition:** this condition may occur when the drive is powered during encoder setup each time parameter **552 Regulation mode** is set.	
		100H-2564	**Cause**: An error occurred during setup; the information received from the encoder is not reliable. If the encoder is used for feedback the **Speed fbk loss** [22] alarm is also generated.
		Solution: Take the recommended action for the **Speed fbk loss**[22] alarm.	
		200H-512	**Cause**: The firmware on the optional encoder card is incompatible with that on the regulation card. The information received from the encoder is not reliable
		Solution: Contact WEG in order to update the firmware on the optional encoder card.	
22	**Options cfg changed [OCFG]** 	**Condition**: this may occur when powering the drive if an expansion card has been removed or replaced or the incorrect enable key is inserted for a given firmware function.	
		0064H-100	Card removed from slot 1
		0014H-20	Card removed from slot 2
		0003H-3	Card removed from slot 3
		0078H-120	Card removed from slot 1 and from slot 2
		0067H-103	Card removed from slot 1 and from slot 3
		0017H-23	Card removed from slot 2 and from slot 3
		007BH-123	Card removed from slot 1, from slot 2 and from slot 3
		Solution: Check the hardware configuration, then press ESC. Save the parameters (**Save parameters**, menu 04.01 par 550) to save the new hardware configuration.	

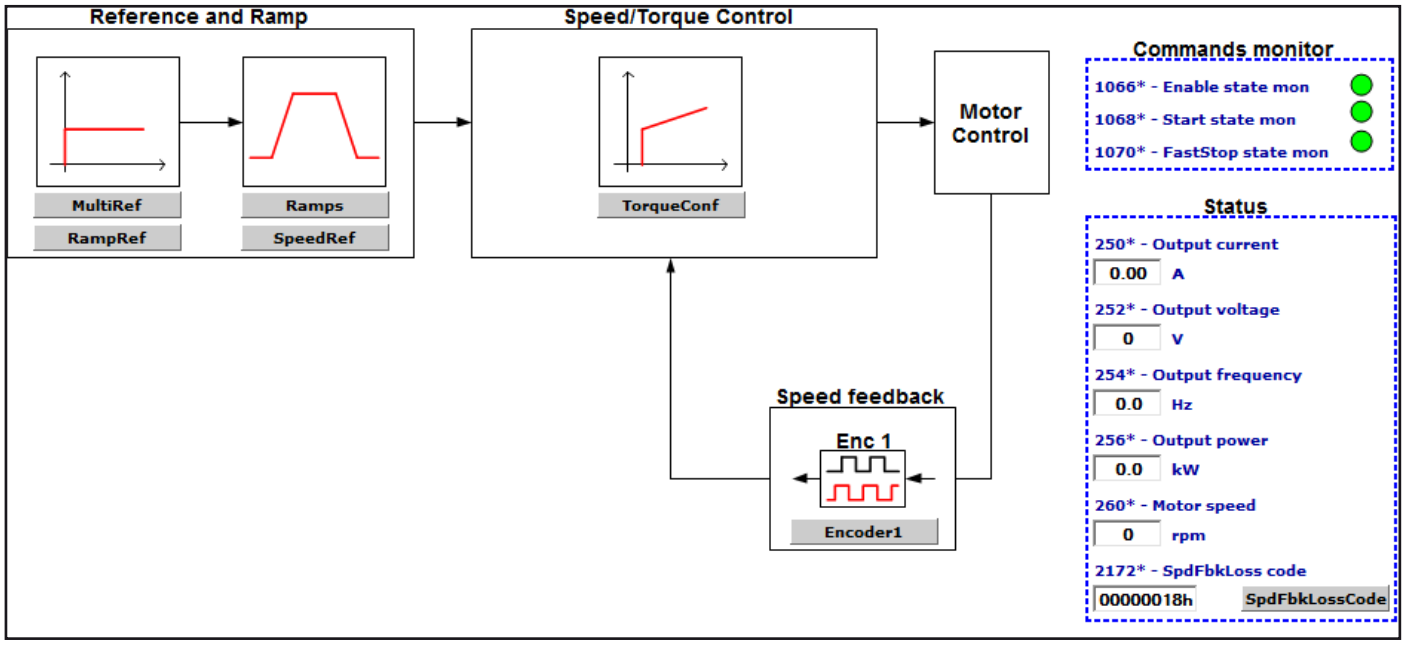
Index	Error message shown on the display [on the integrated keypad]	Sub-code	Description
23	**Autotune** (phasing) [SLFP] 	**0**	No error
		1	The commands are not configured in Local mode.
			Solution: Execute the requested configuration
		2	The Commands local sel parameter has not been configured from the keypad
			Solution: Execute the requested configuration
		3	The motor plate data parameters have changed but the **Take parameters** command, PAR 2020, has not been executed
			Solution: Execute the **Take parameters** command.
		4	Error in motor connection.
			Solution: Check the motor connection, set the value of the direct current of the motor to 1/3 and perform the motor autotune procedure. Then increase the direct current until autotuning is executed. The penultimate value is the nominal current value at which the drive performs autotuning.
		5	While running self-tuning the ESC key was pressed or the enable contact was opened or an alarm occurred. The **Autotune** command was sent with the drive in the alarm condition
			Solution: Eliminate the reason for the alarm, remove the reason for the opening of the enable contact, reset alarms.
		6	A setting performed by the **Autotune** function produced a parameter value outside the min or max range.
			Solution: Check the motor plate data or drive and motor sizes have been combined incorrectly.
		7	The **Autotune** command was sent without being enabled.
			Solution: Close the enable contact before sending the **Autotune** command
		40	The encoder card in use cannot manage automatic phasing.
			Solution: Use the appropriate encoder card
		41	Incorrect Incremental encoder impulse count
			Solution: Check the electric signals of the incremental encoder. Check the value of the encoder impulse parameter
		42	Incorrect absolute encoder impulse count
			Solution: Check the electric signals of the absolute encoder. Check the configuration of the absolute encoder
		43	Incorrect incremental encoder impulse count or incorrect absolute encoder impulse count probably caused by an incorrect value of the pole pairs parameter or a load applied to the motor.
			Solution: Check the value of the pole pairs parameter, check whether a load is applied
		44	Incorrect incremental encoder impulse count probably caused by the incorrect value of the encoder impulse parameter.
			Solution: Check the electric signals of the incremental encoder. Check the value of the encoder impulse parameter.
		45	Incorrect absolute encoder impulse count
			Solution: Check the electric signals of the absolute encoder. Check the configuration of the absolute encoder.
		46	Incremental encoder impulse count sign inverted with respect to the absolute encoder impulse count.
			Solution: Invert the A+ and A- signal of the incremental encoder.
		47	Incremental encoder impulse count sign inverted with respect to the absolute encoder impulse count.
			Solution: Invert the A+ and A- signal of the absolute encoder.
		48	Incorrect phase sequence. (Message not signalled)
			Solution: The automatic procedure has modified the setting of the Encoder direction parameter. No other action is required
		49	During automatic phasing a communication channel is activated between the drive and encoder. An error has occurred on this communication channel.
			Solution: Repeat the procedure.
		Solution: If the message has a value other than 0 follow the instructions provided for each case and repeat automatic phasing.	
27	**SD card error [FAIL]** 	**Condition:** this condition may occur when sending data from the drive to the SD card or from the SD card to the drive. It could be due to a memory card that is incompatible or not present.	
		0000H-0	Communication error
		Solution: Check the memory card being used	

Index	Error message shown on the display [on the integrated keypad]	Sub-code	Description
28	**Fw update failed [FAIL]** 	**Condition:** When updating the firmware, check whether the file is in the wrong format or corrupt.	
		Solution: try again with a correct file.	

Note! For any messages that are displayed but not included in this list, reference should be made to the manual for the application used by the drive.

System Diagrams Index

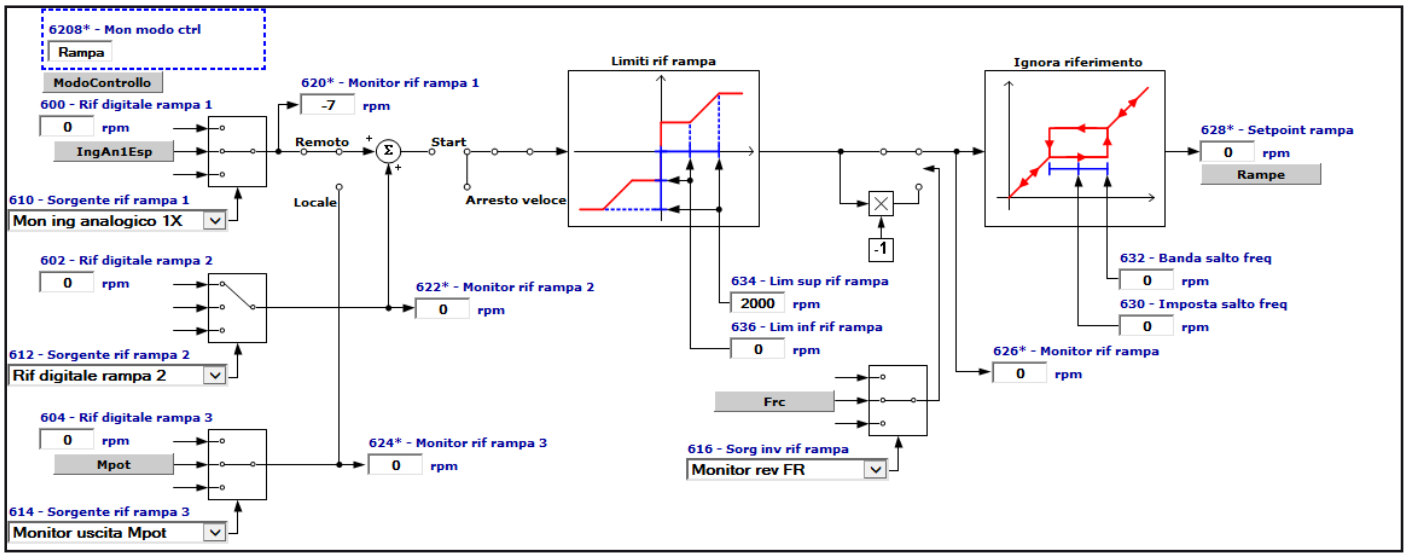
Drive overview

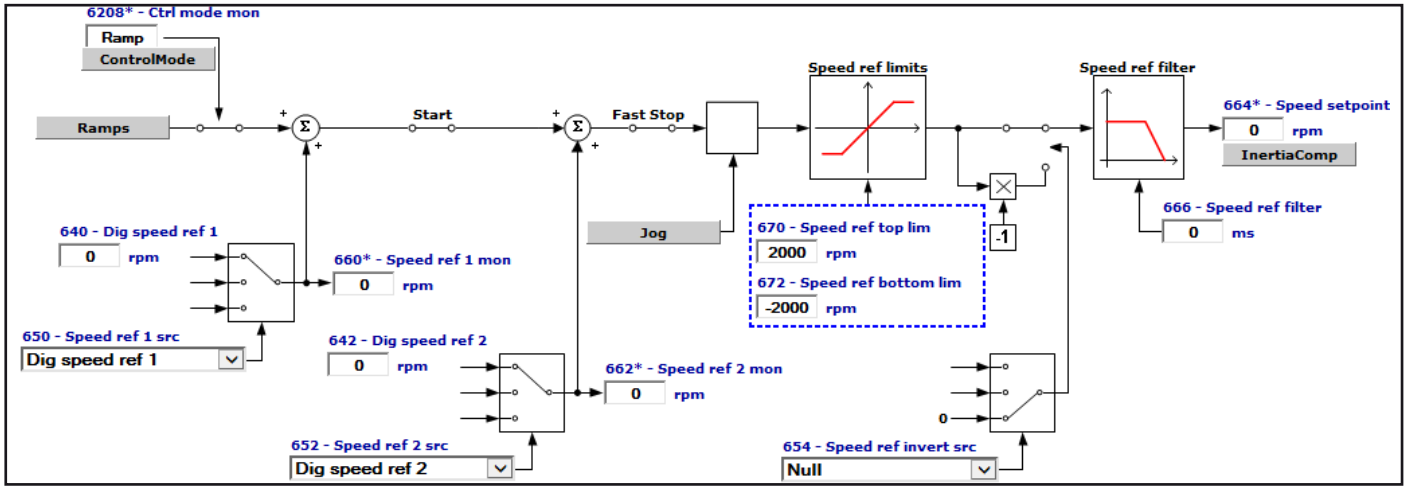


References

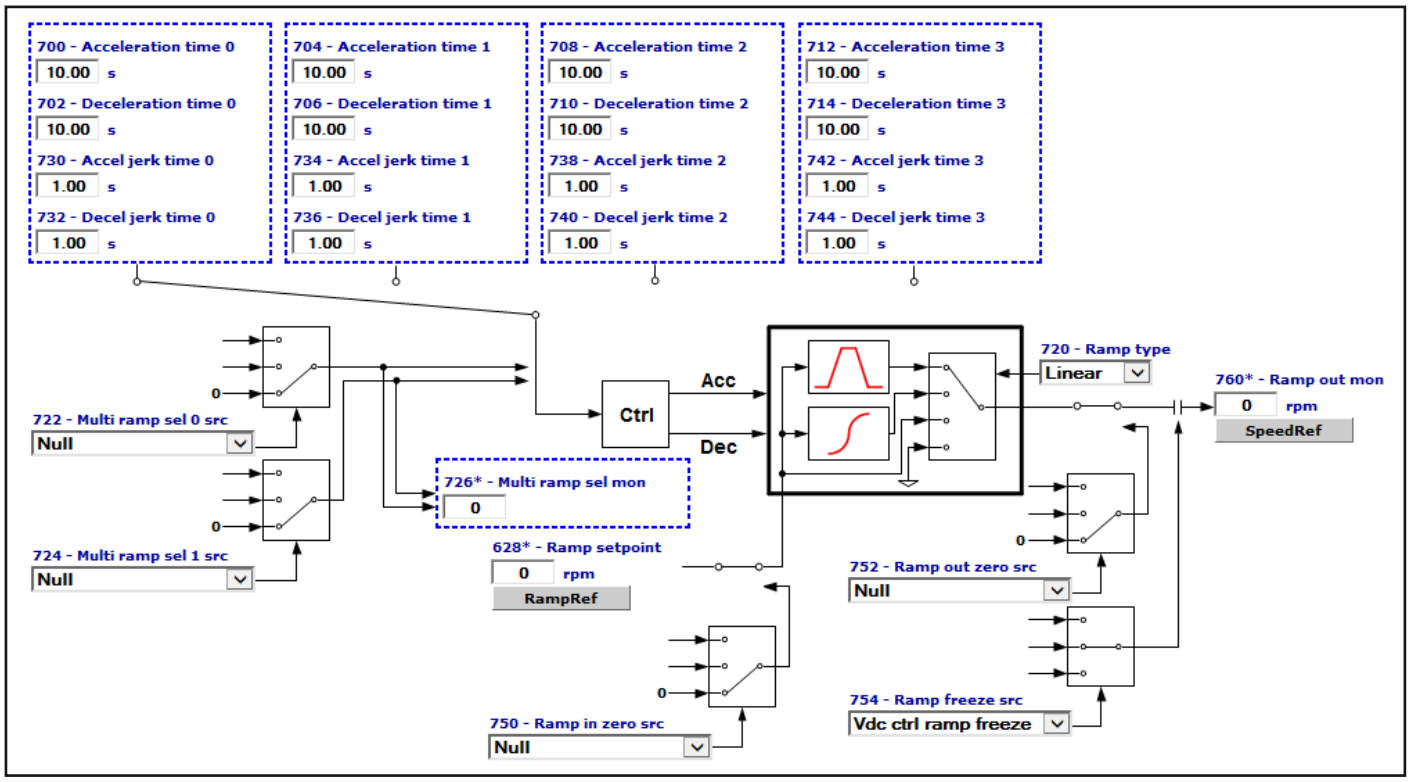
RAMP REFERENCE RampRef

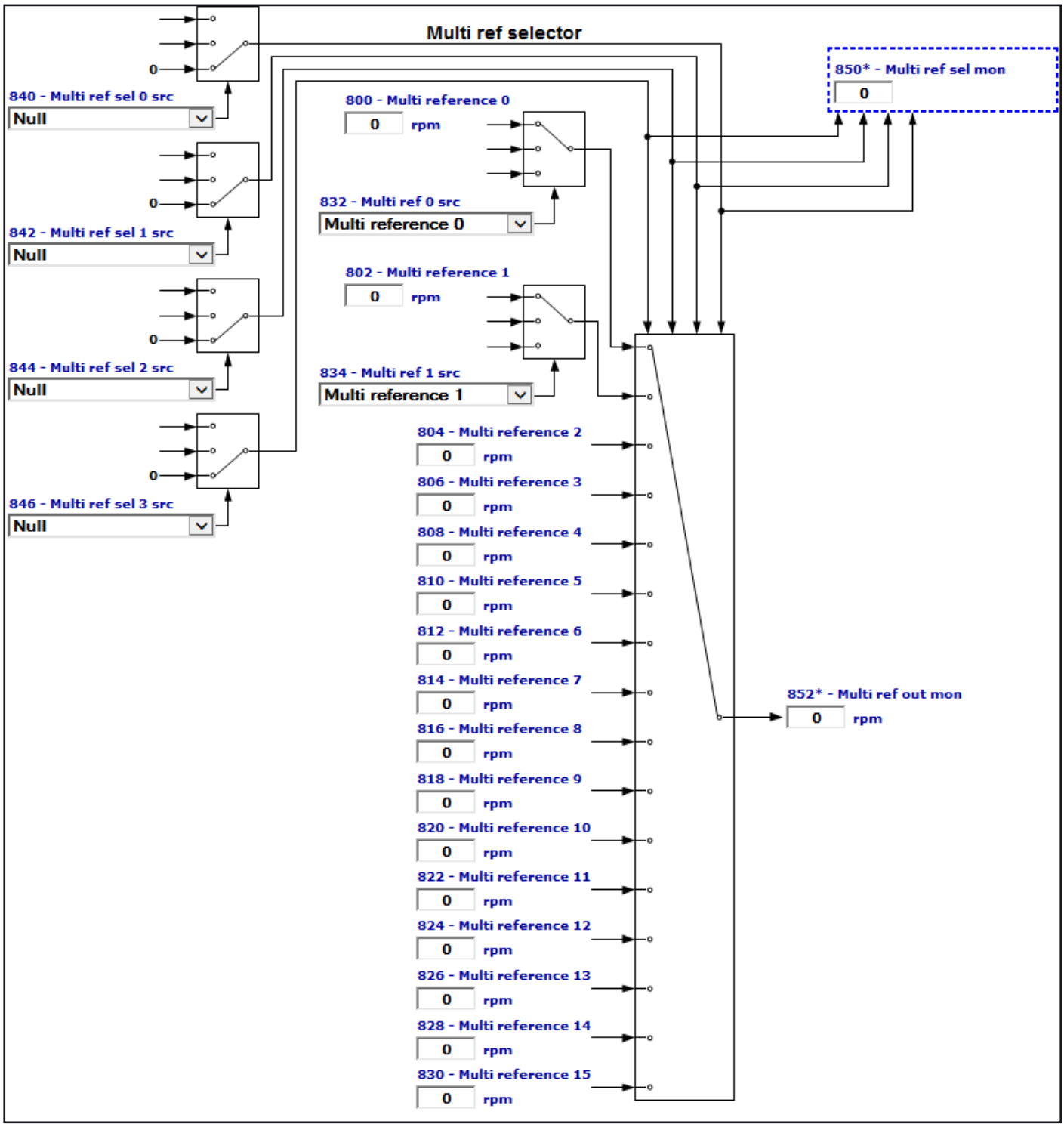
SPEED REFERENCE SpeedRef



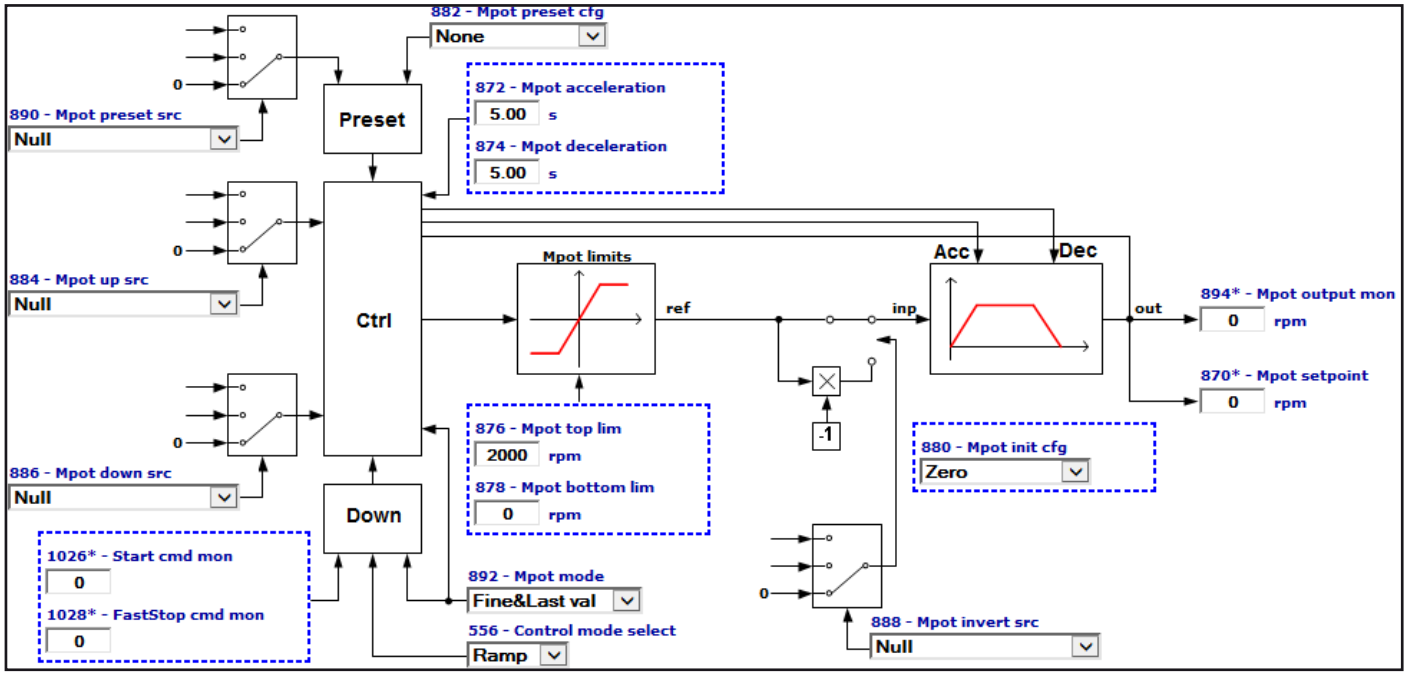


Ramps

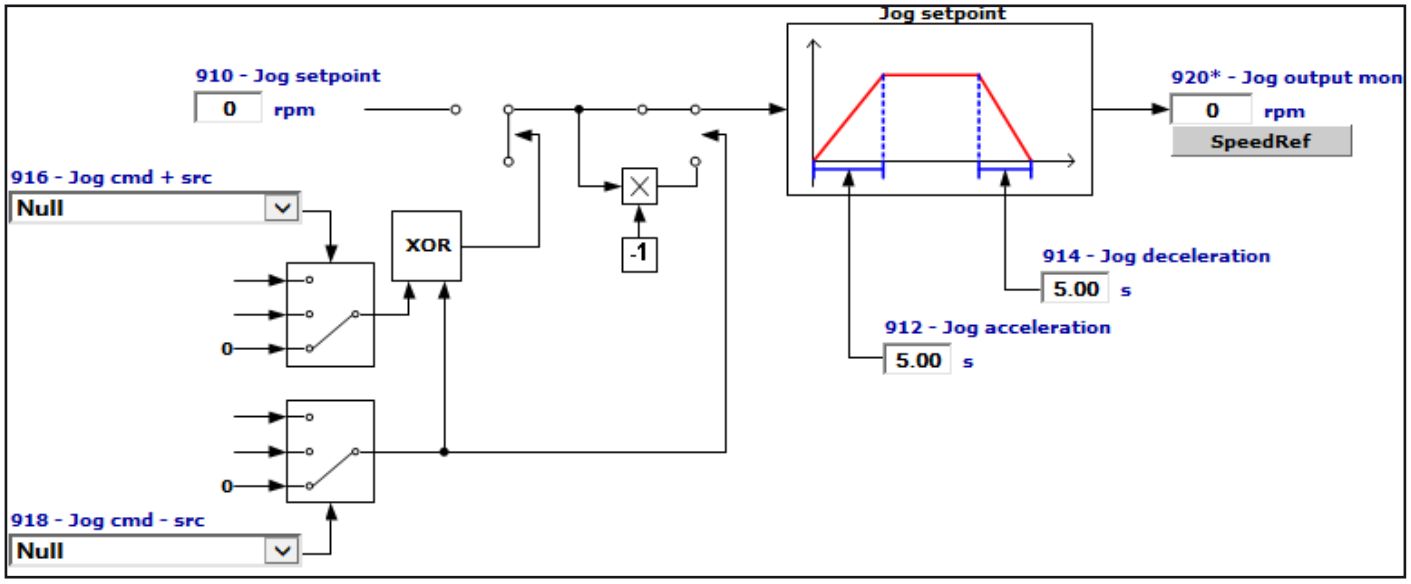

700 - Acceleration time 0
10.00 s
702 - Deceleration time 0
10.00 s
730 - Accel jerk time 0
1.00 s
732 - Decel jerk time 0
1.00 s
704 - Acceleration time 1
10.00 s
706 - Deceleration time 1
10.00 s
734 - Accel jerk time 1
1.00 s
736 - Decel jerk time 1
1.00 s
708 - Acceleration time 2
10.00 s
710 - Deceleration time 2
10.00 s
738 - Accel jerk time 2
1.00 s
740 - Decel jerk time 2
1.00 s
712 - Acceleration time 3
10.00 s
714 - Deceleration time 3
10.00 s
742 - Accel jerk time 3
1.00 s
744 - Decel jerk time 3
1.00 s
722 - Multi ramp sel 0 src
Null
724 - Multi ramp sel 1 src
Null
726* - Multi ramp sel mon
0
628* - Ramp setpoint
0 rpm
RampRef
Ctrl
Acc
Dec
720 - Ramp type
Linear
760* - Ramp out mon
0 rpm
SpeedRef
752 - Ramp out zero src
Null
754 - Ramp freeze src
Vdc ctrl ramp freeze
750 - Ramp in zero src
Null


Multi ref selector
850* - Multi ref sel mon
0
840 - Multi ref sel 0 src
Null
800 - Multi reference 0
0 rpm
832 - Multi ref 0 src
Multi reference 0
842 - Multi ref sel 1 src
Null
802 - Multi reference 1
0 rpm
834 - Multi ref 1 src
Multi reference 1
844 - Multi ref sel 2 src
Null
804 - Multi reference 2
0 rpm
806 - Multi reference 3
0 rpm
808 - Multi reference 4
0 rpm
810 - Multi reference 5
0 rpm
812 - Multi reference 6
0 rpm
814 - Multi reference 7
0 rpm
816 - Multi reference 8
0 rpm
818 - Multi reference 9
0 rpm
820 - Multi reference 10
0 rpm
822 - Multi reference 11
0 rpm
824 - Multi reference 12
0 rpm
826 - Multi reference 13
0 rpm
828 - Multi reference 14
0 rpm
830 - Multi reference 15
0 rpm
846 - Multi ref sel 3 src
Null
852* - Multi ref out mon
0 rpm

Motorpotentiometer



Jog function



Monitor function

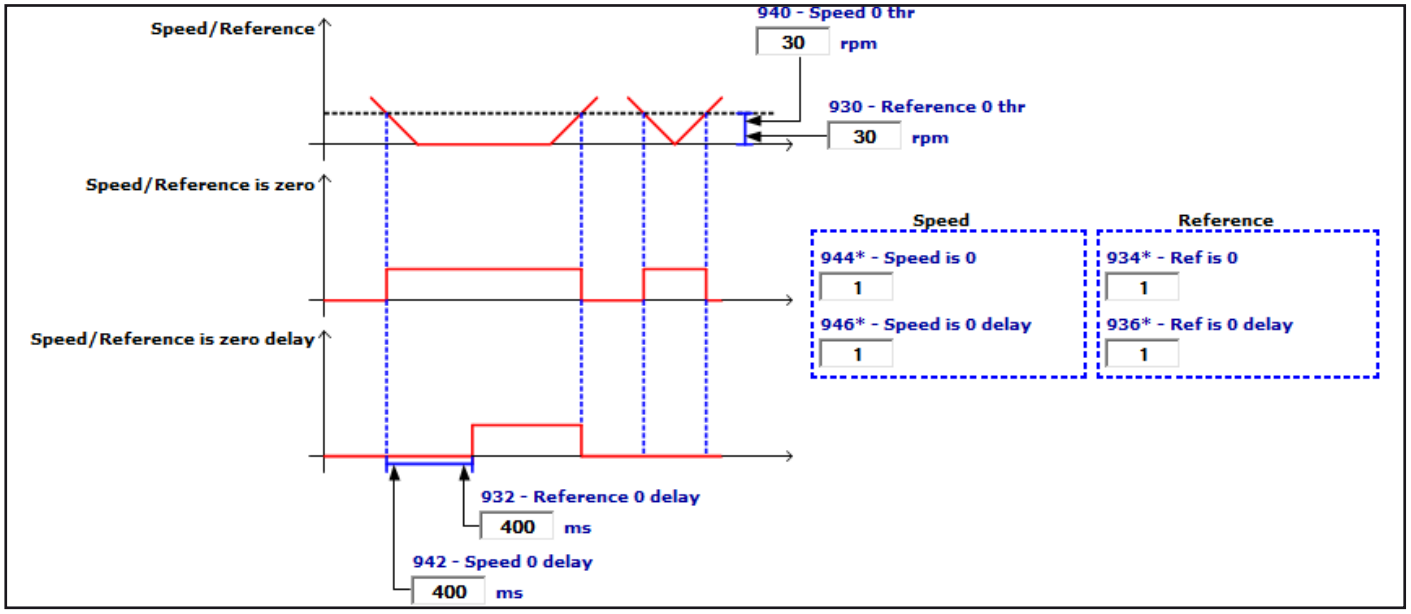
SPEED/REFERENCE ZERO — SpeedRefZero

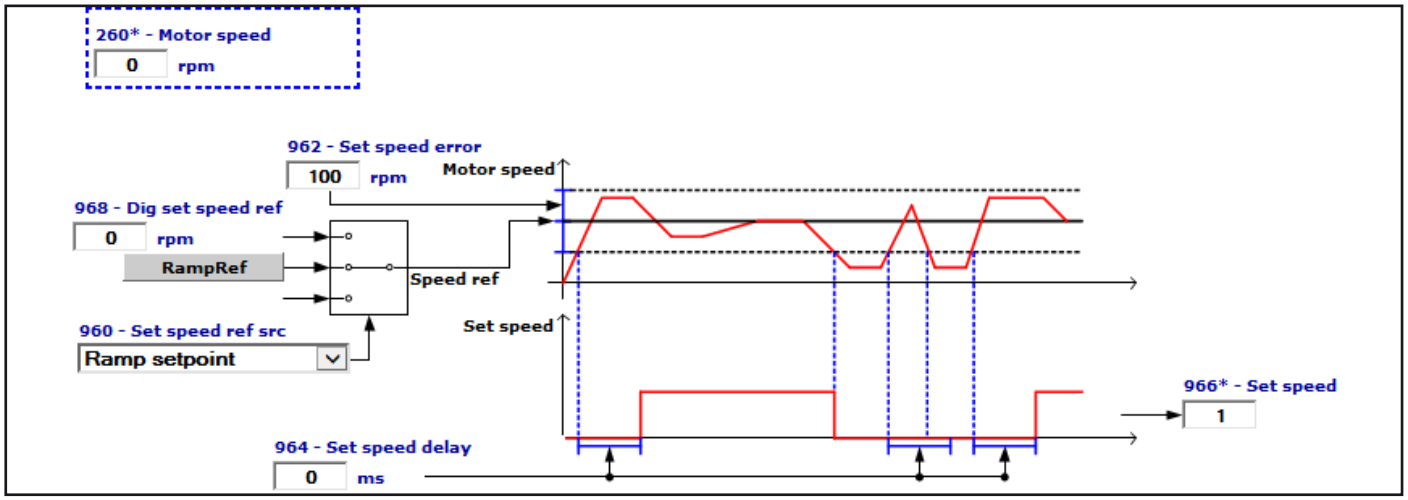
SPEED THRESHOLD 1-2 — SpeedThr1_2

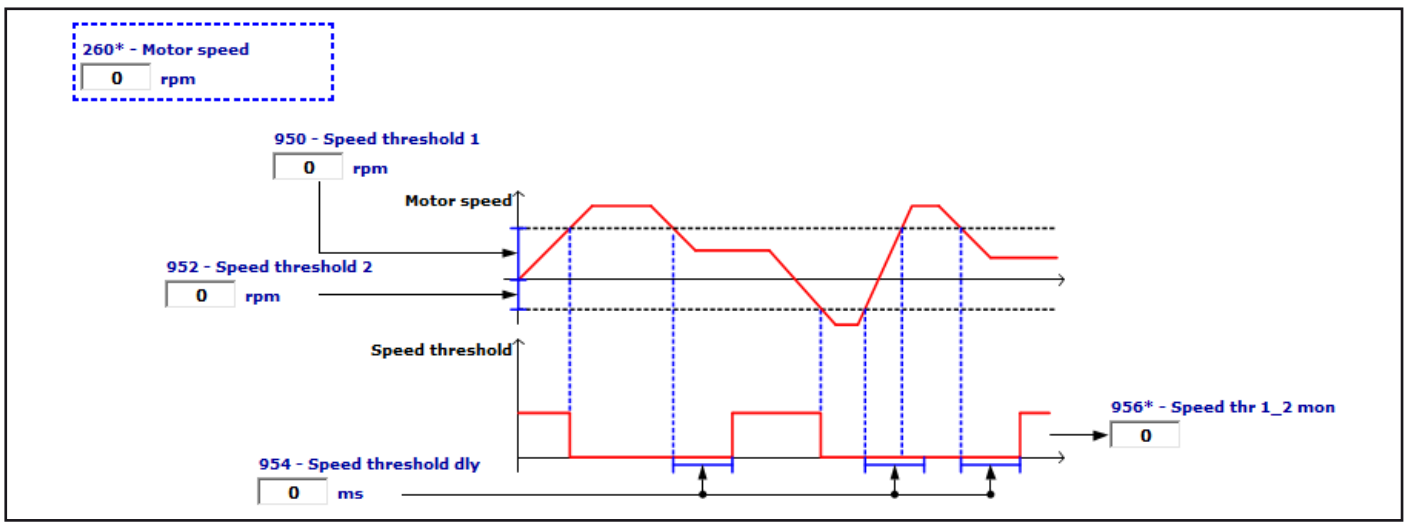
SPEED THRESHOLD 3 — SpeedThr3

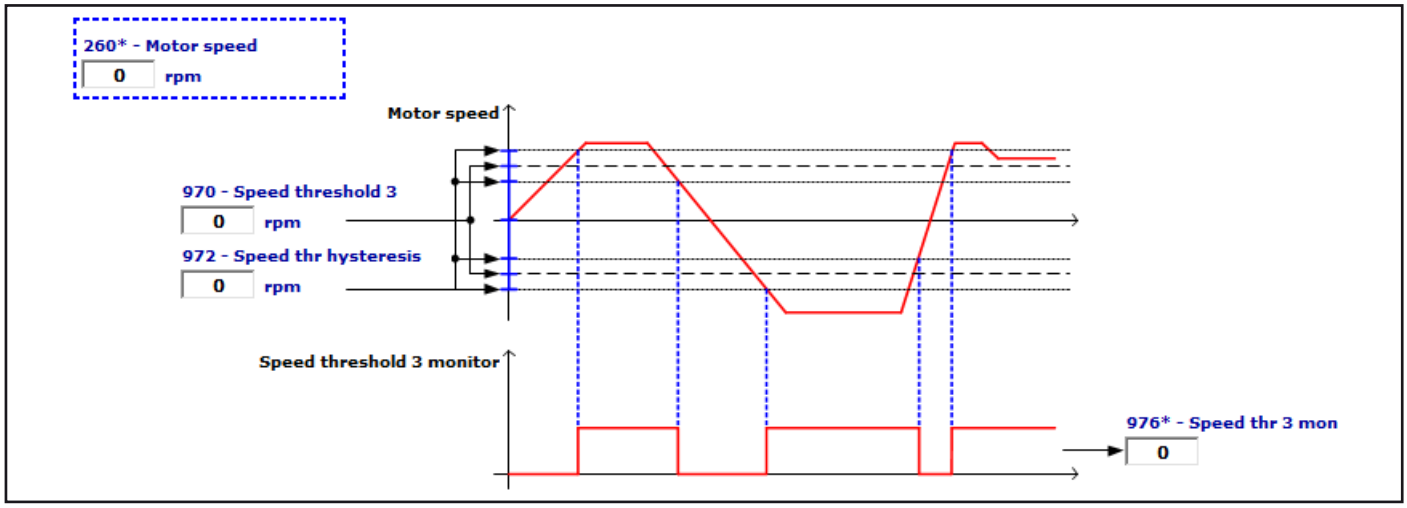
SET SPEED — SetSpeed

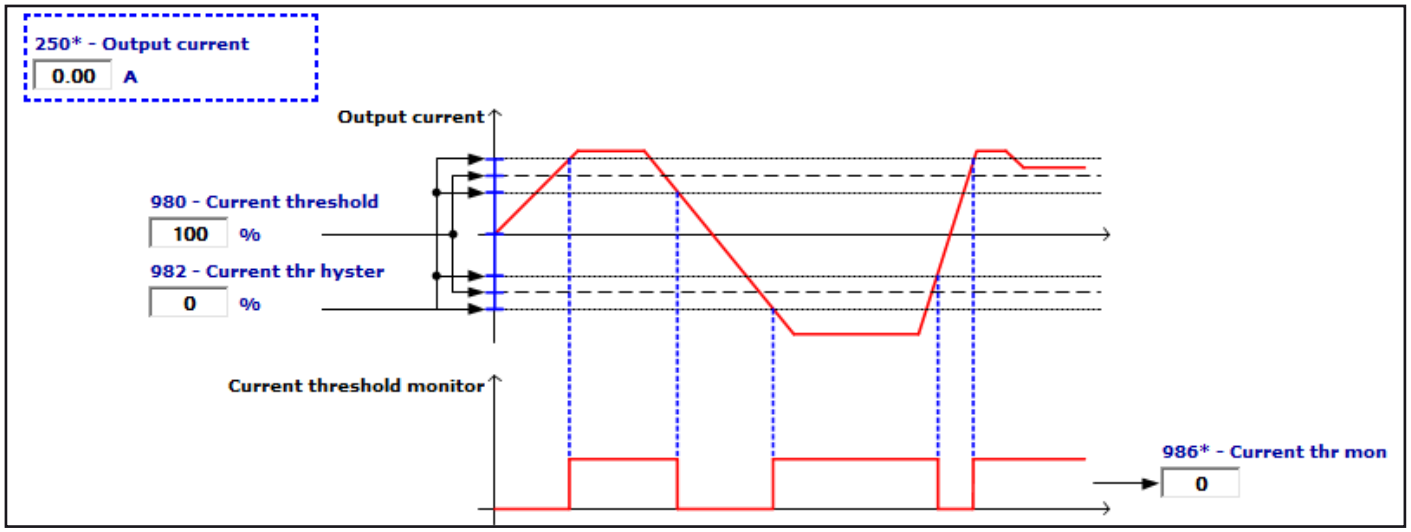
CURRENT THRESHOLD — CurrThr





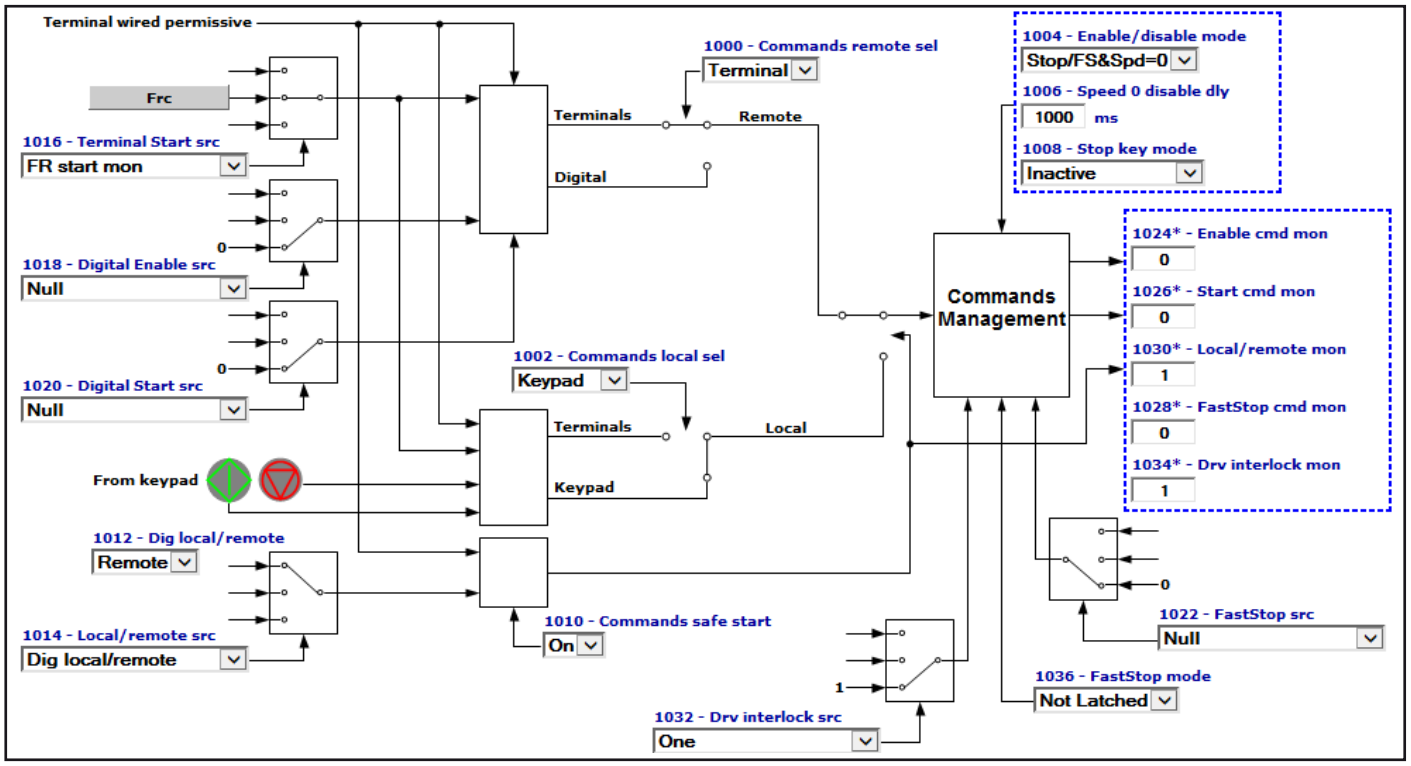


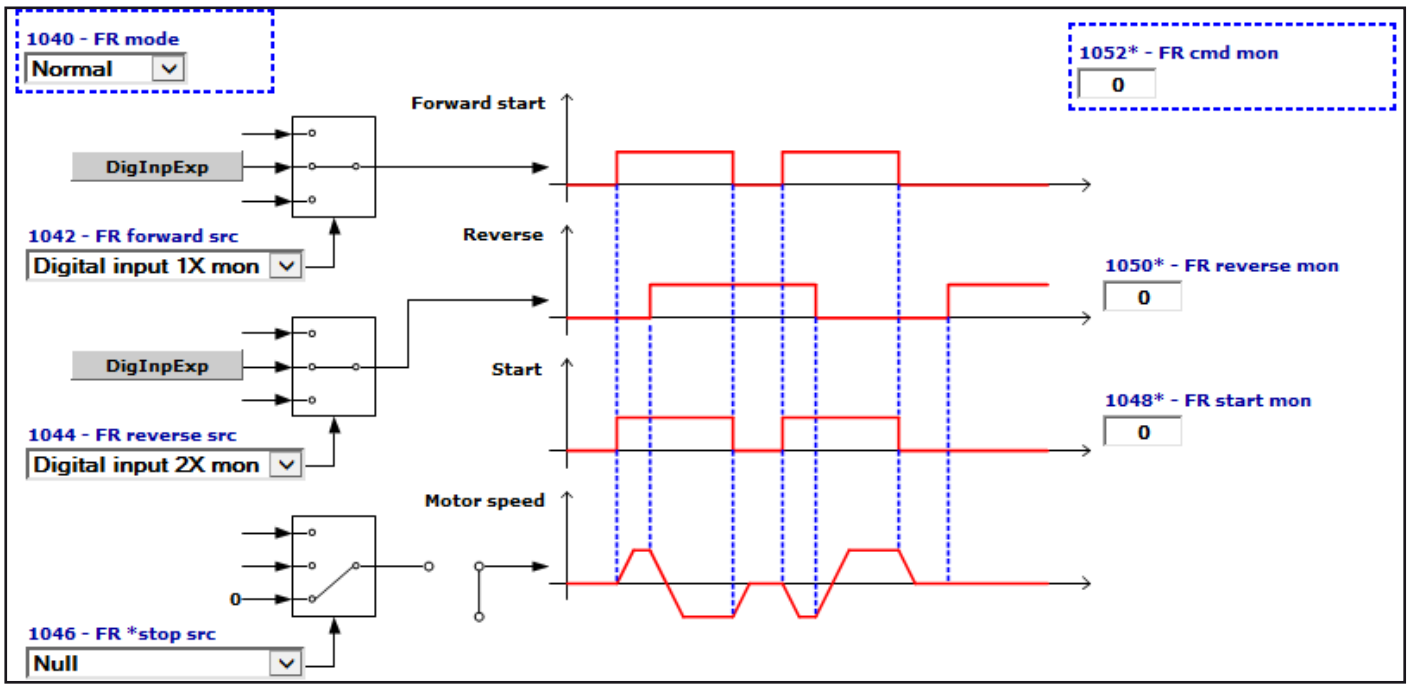

260* - Motor speed
0 rpm
Motor speed
970 - Speed threshold 3
0 rpm
972 - Speed thr hysteresis
0 rpm
Speed threshold 3 monitor
976* - Speed thr 3 mon
0

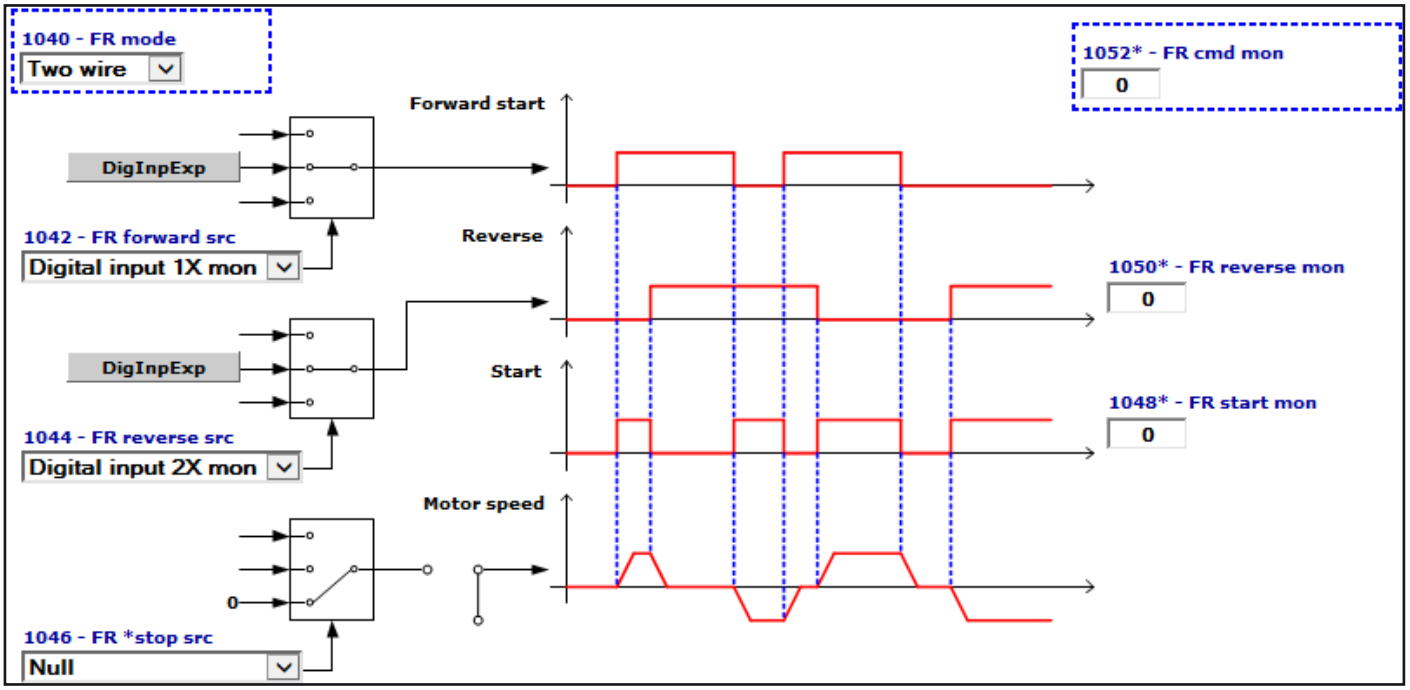

250* - Output current
0.00 A
Output current
980 - Current threshold
100 %
982 - Current thr hyster
0 %
Current threshold monitor
986* - Current thr mon
0

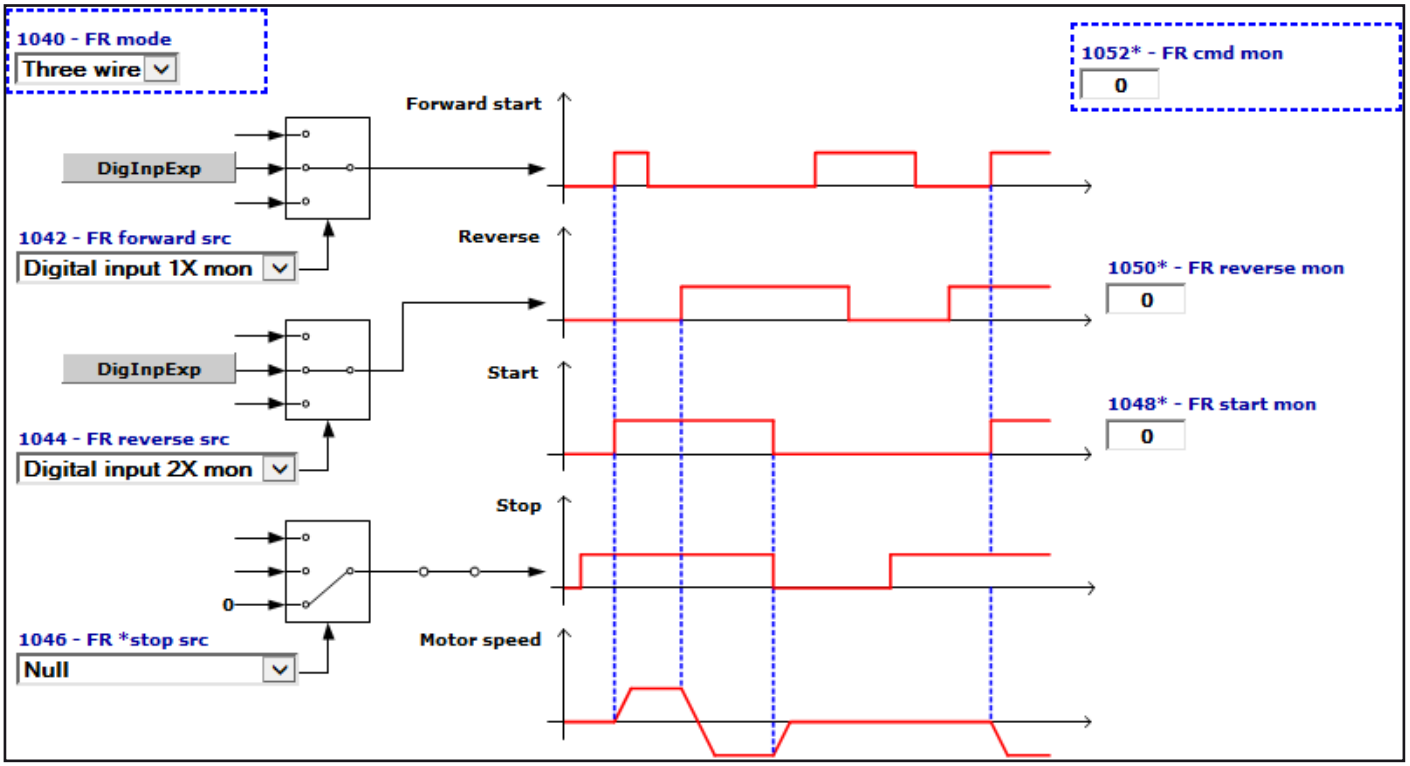
COMMANDS MANAGEMENT CommManage

FORWARD REVERSE CONTROL Frc

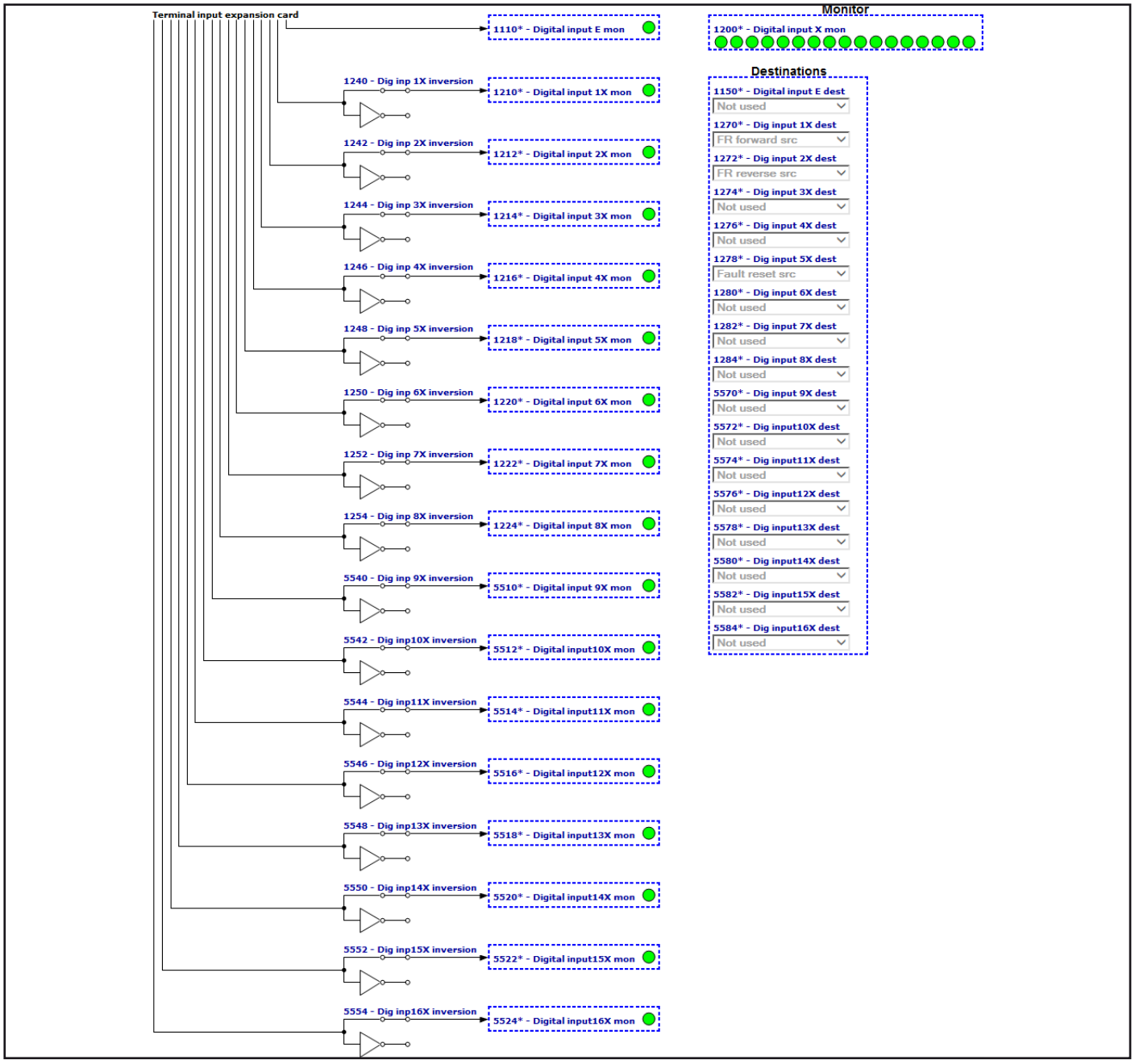




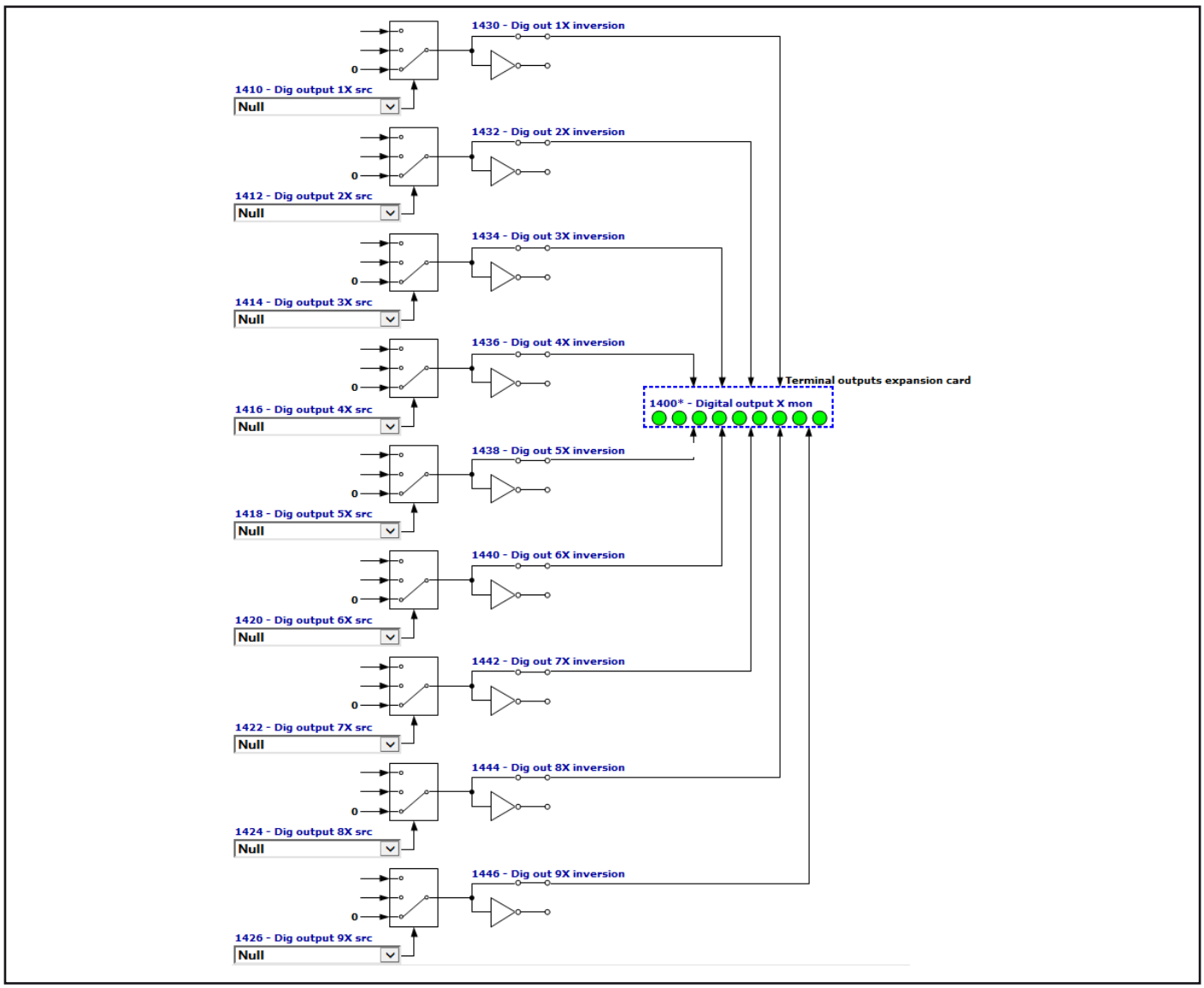

1040 - FR mode
Two wire
1052* - FR cmd mon
0
Forward start
DigInpExp
1042 - FR forward src
Digital input 1X mon
Reverse
1050* - FR reverse mon
0
DigInpExp
Start
1048* - FR start mon
0
1044 - FR reverse src
Digital input 2X mon
Motor speed
0
1046 - FR *stop src
Null


1040 - FR mode
Three wire
1052* - FR cmd mon
0
Forward start
DigInpExp
1042 - FR forward src
Digital input 1X mon
Reverse
1050* - FR reverse mon
0
DigInpExp
Start
1048* - FR start mon
0
1044 - FR reverse src
Digital input 2X mon
Stop
0
1046 - FR *stop src
Null
Motor speed

Digital inputs



Digital outputs

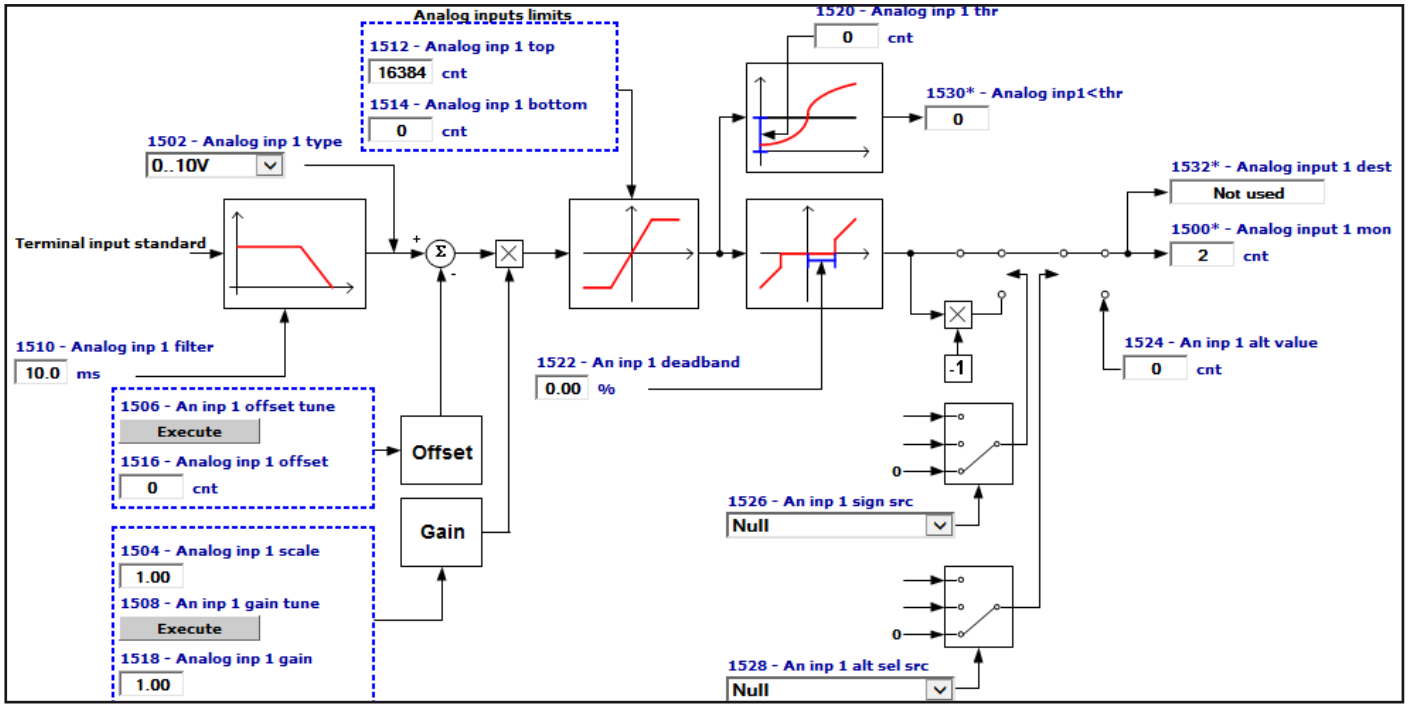


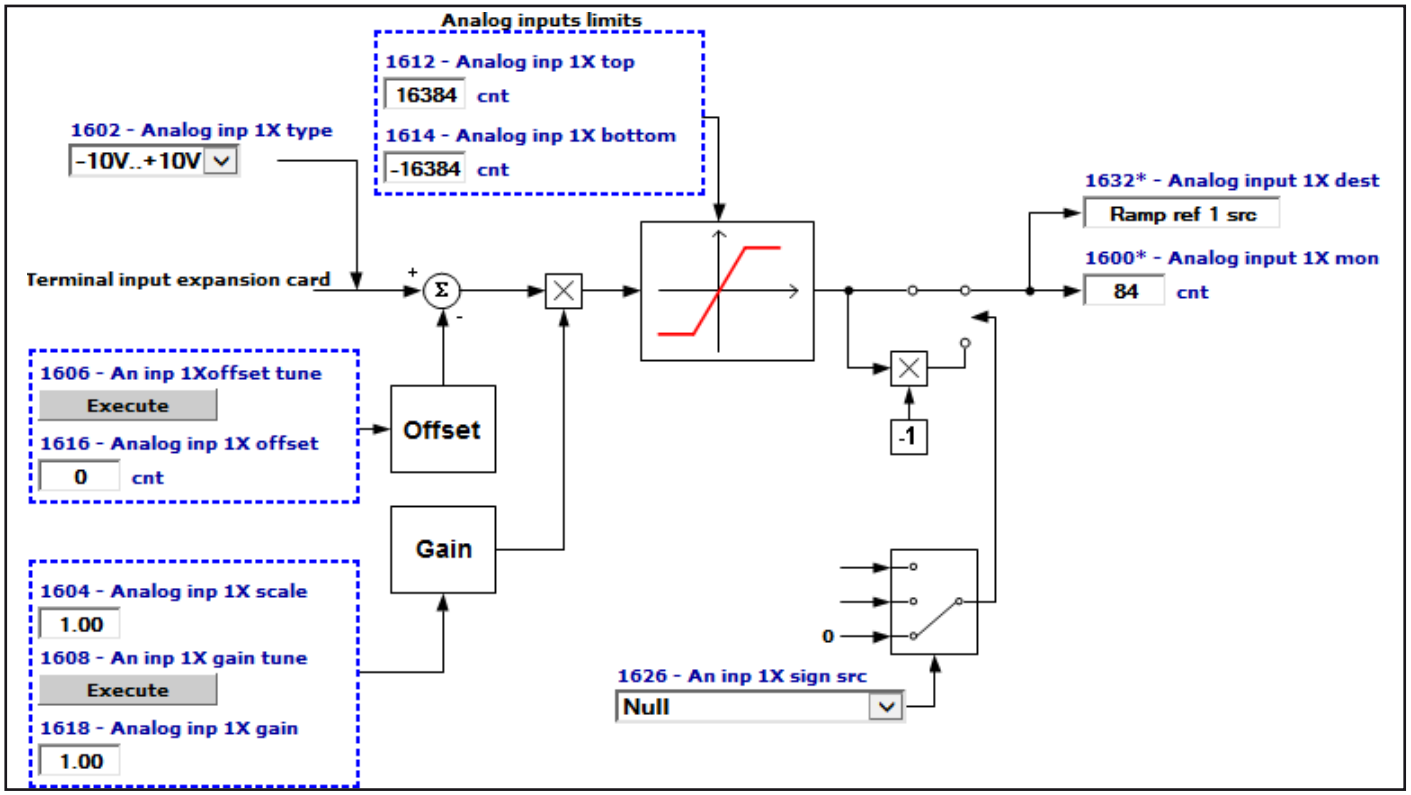
Analog inputs

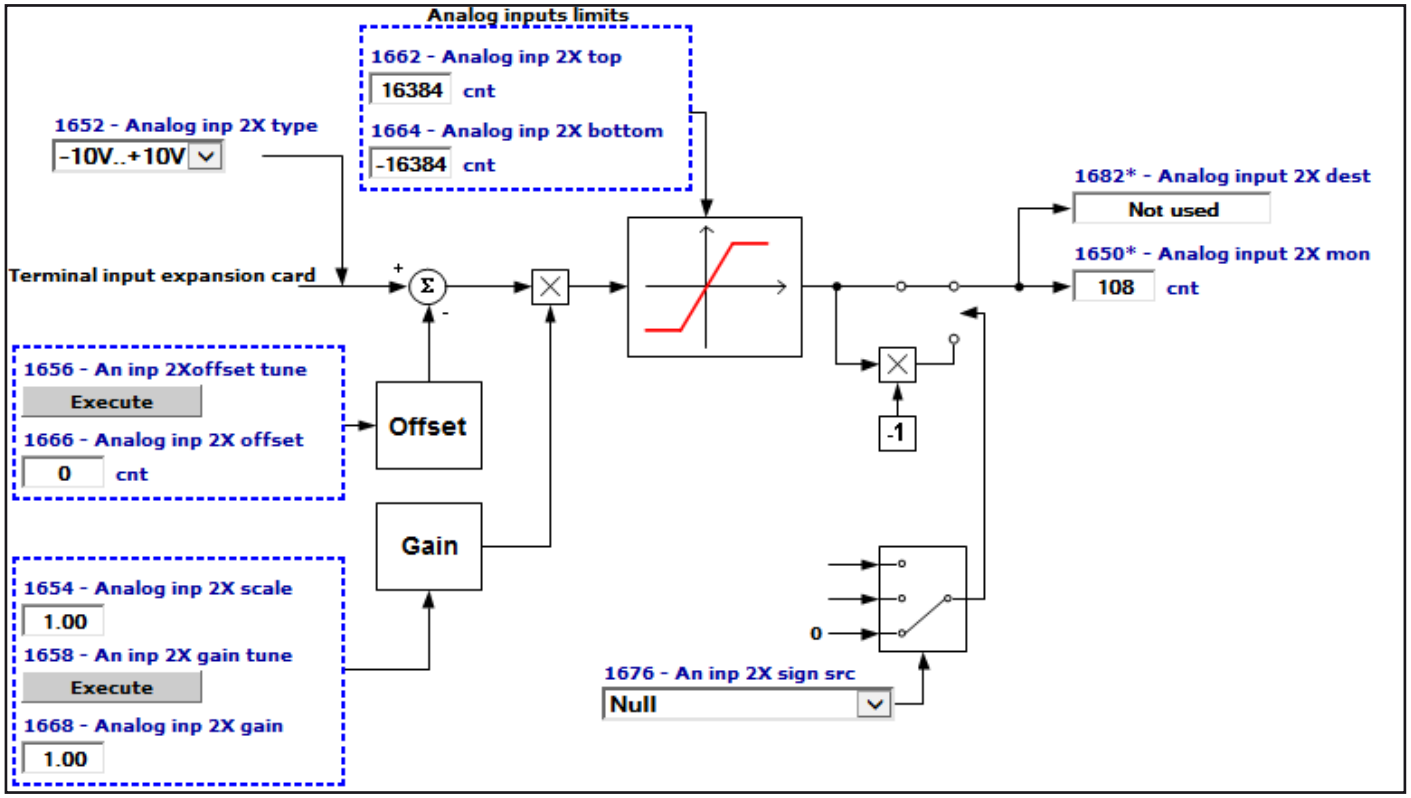
ANALOG INPUT 1 STANDARD AnInp1Std

ANALOG INPUT 1 EXPANSION CARD AnInp1Exp

ANALOG INPUT 2 EXPANSION CARD AnInp2Exp



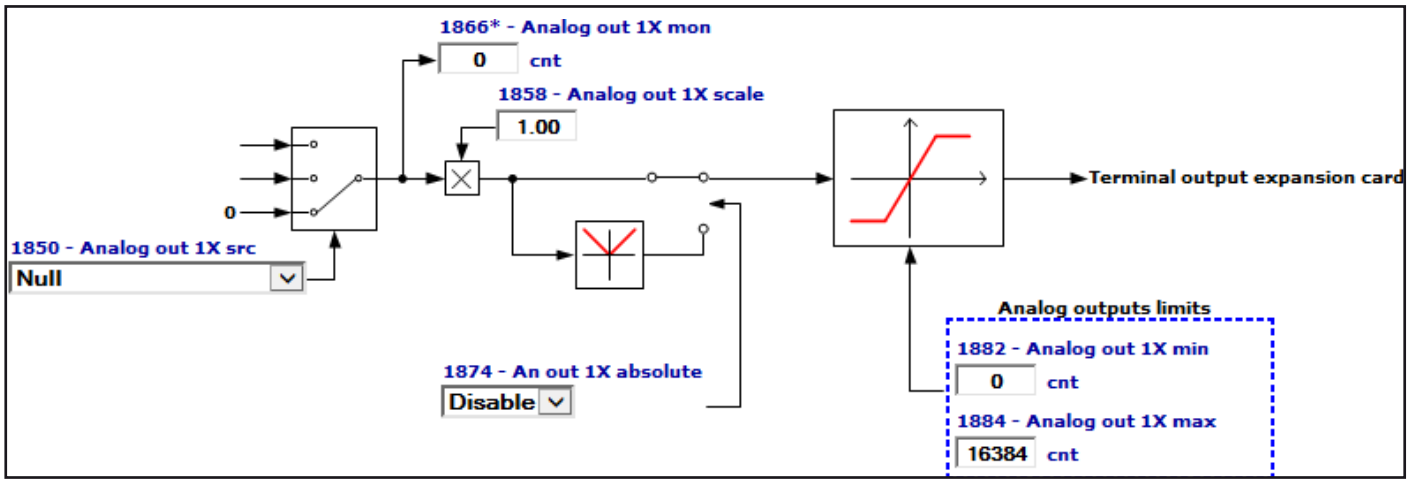


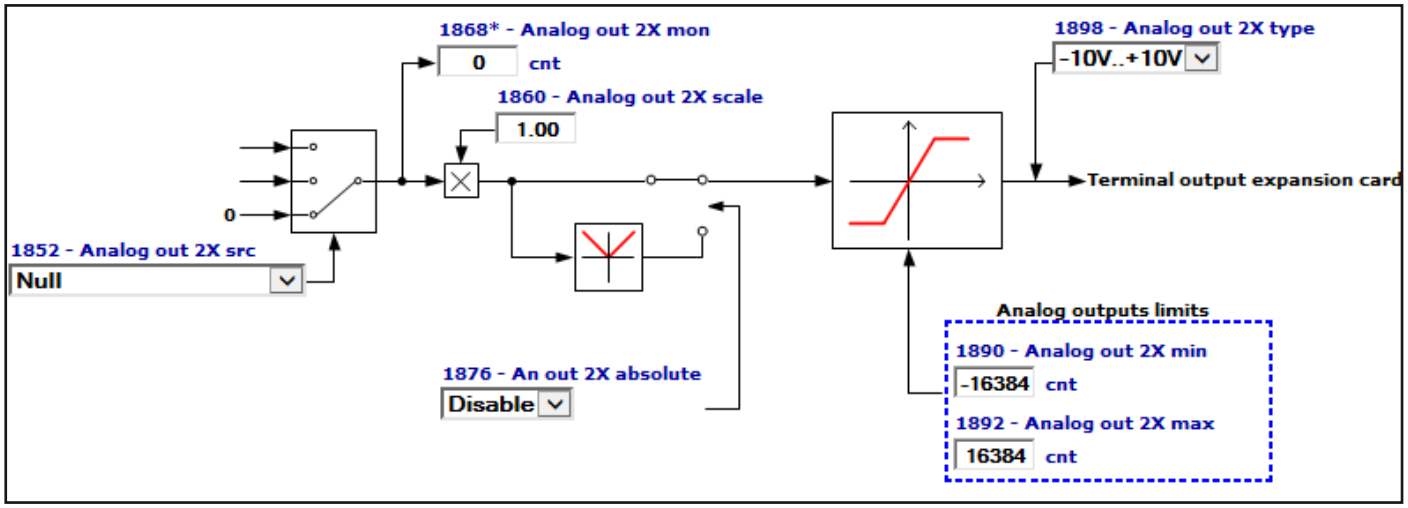

Analog inputs limits
1662 - Analog inp 2X top
16384 cnt
1664 - Analog inp 2X bottom
-16384 cnt
1652 - Analog inp 2X type
-10V..+10V
1682* - Analog input 2X dest
Not used
1650* - Analog input 2X mon
108 cnt
Terminal input expansion card
+
Σ
-
1656 - An inp 2Xoffset tune
Execute
1666 - Analog inp 2X offset
0 cnt
Offset
Gain
-1
1654 - Analog inp 2X scale
1.00
1658 - An inp 2X gain tune
Execute
1668 - Analog inp 2X gain
1.00
0
1676 - An inp 2X sign src
Null

Analog outputs

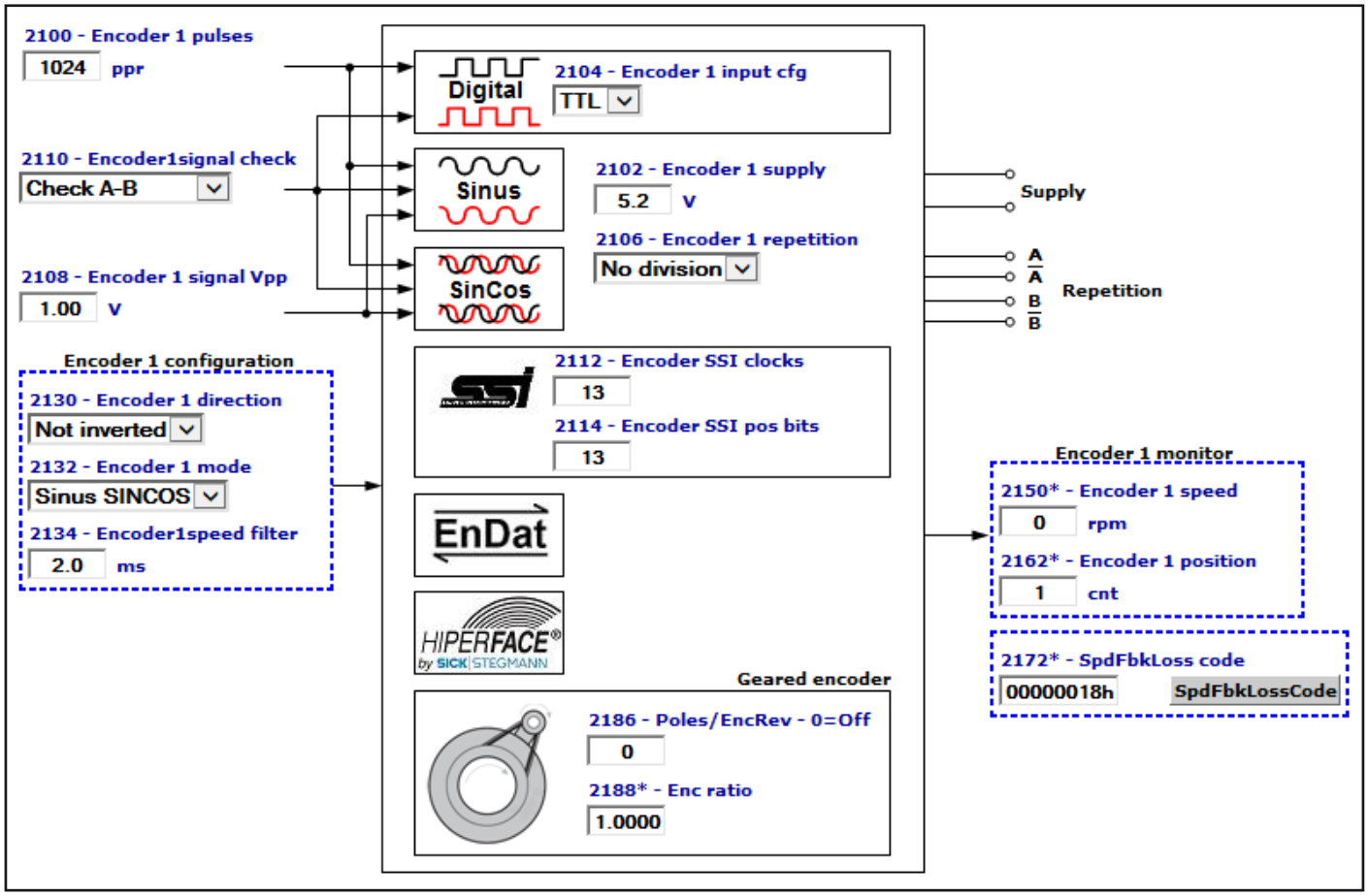
ANALOG OUTPUT 1 EXPANSION CARD AnOut1Exp

ANALOG OUTPUT 2 EXPANSION CARD AnOut2Exp

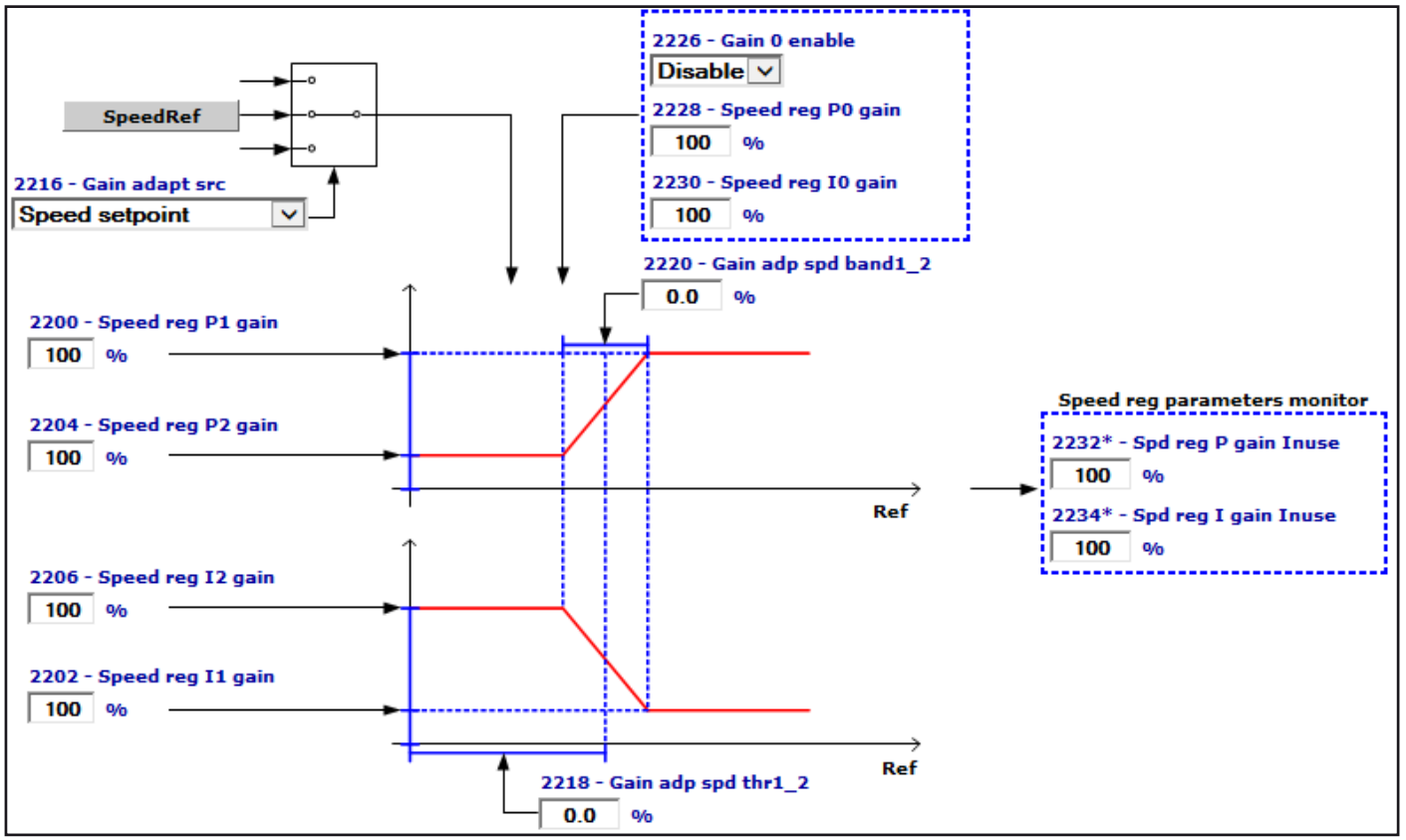




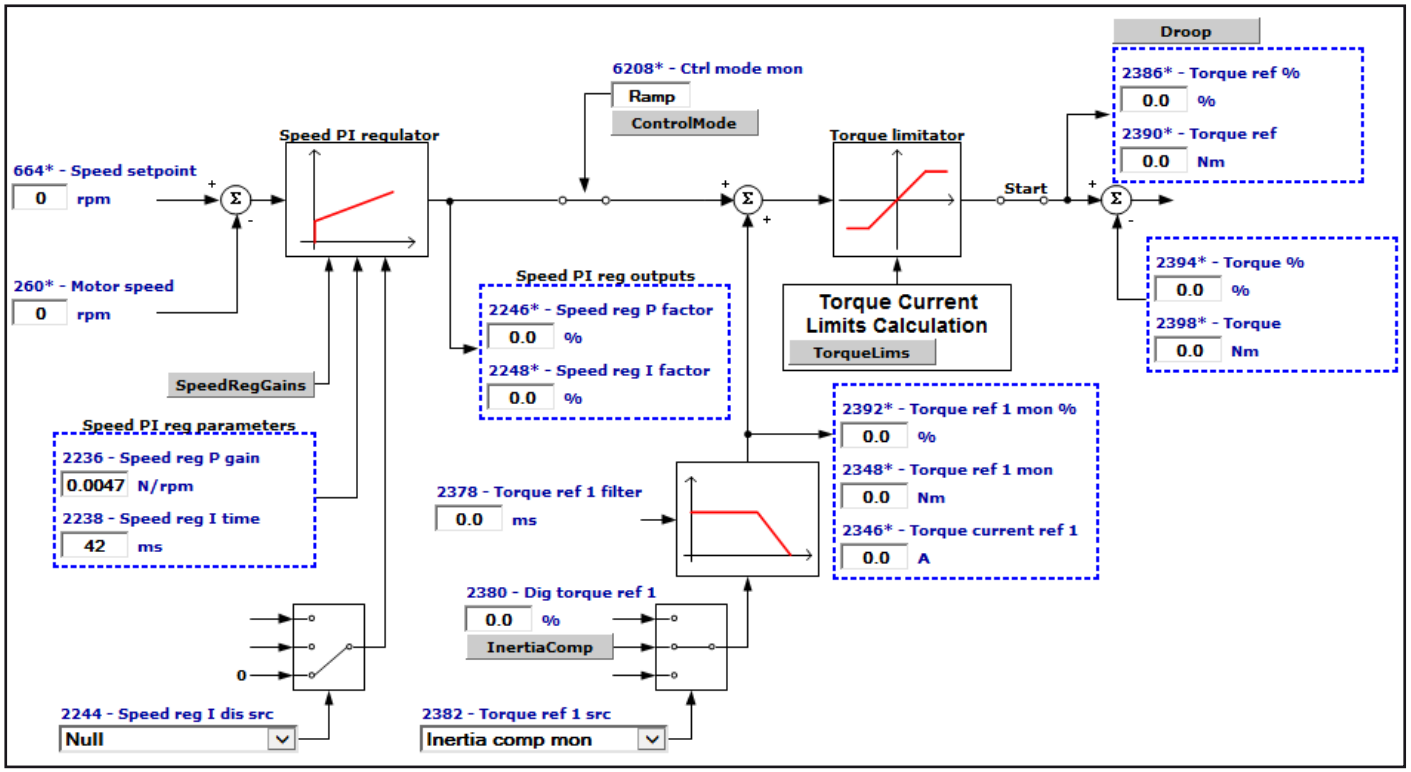
Encoder config

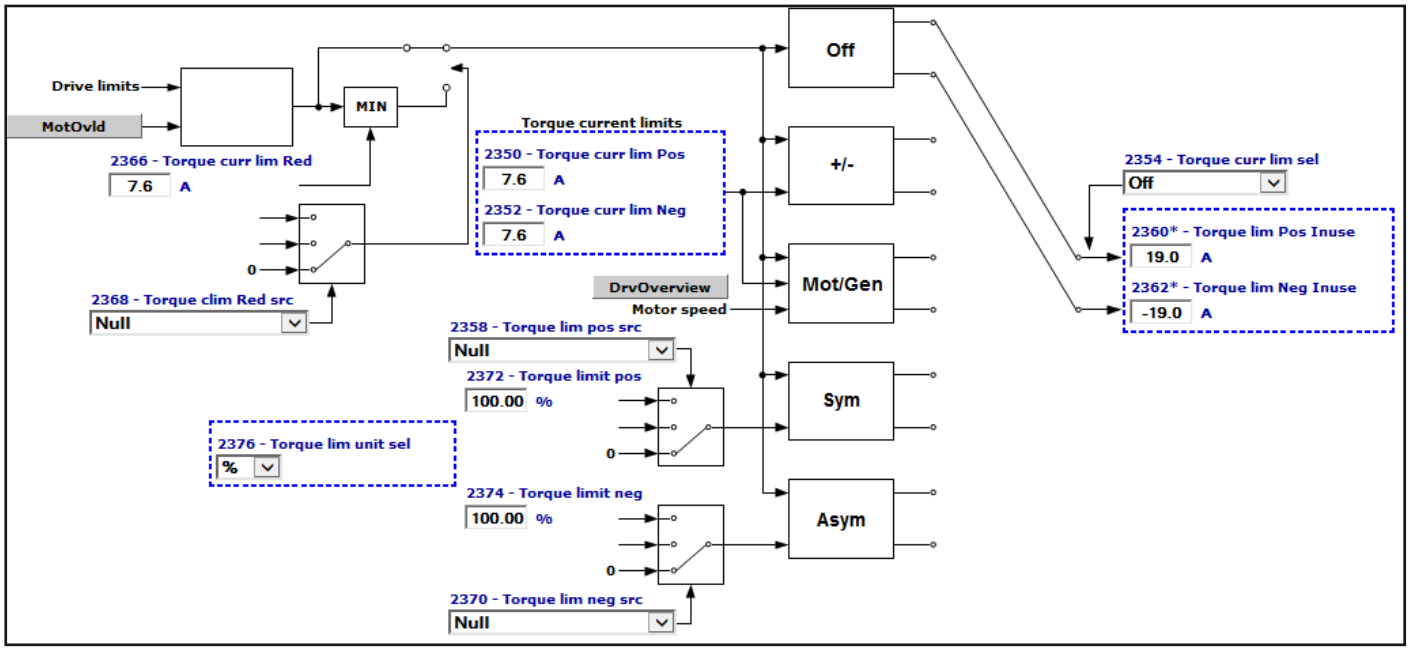


Speed reg gains

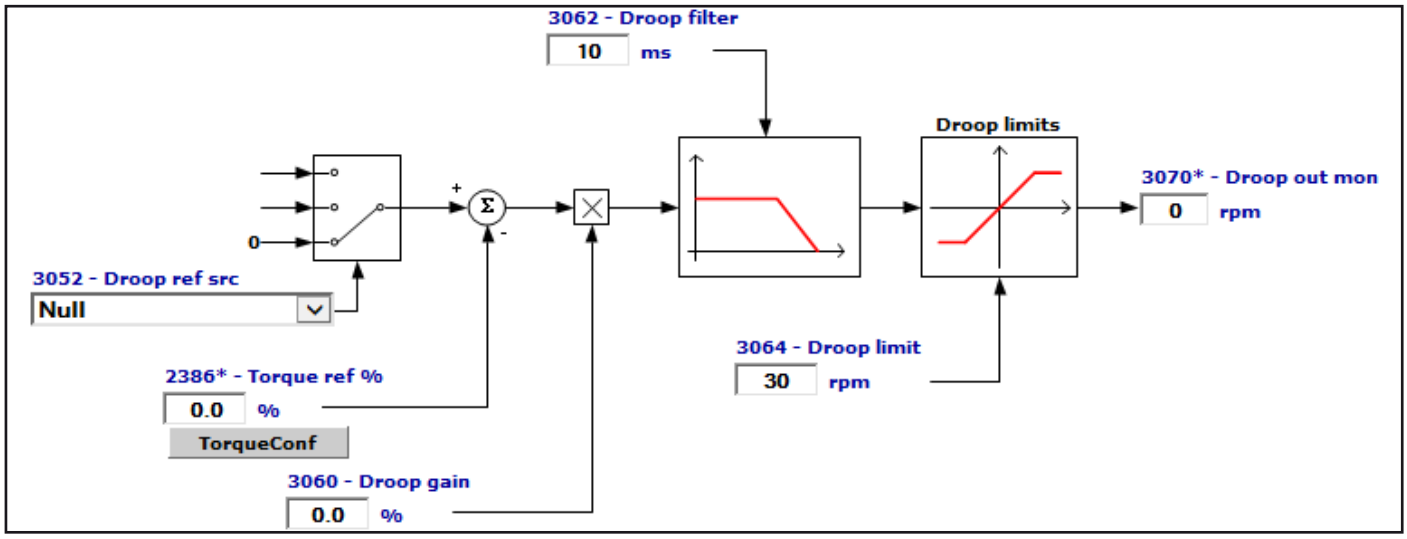


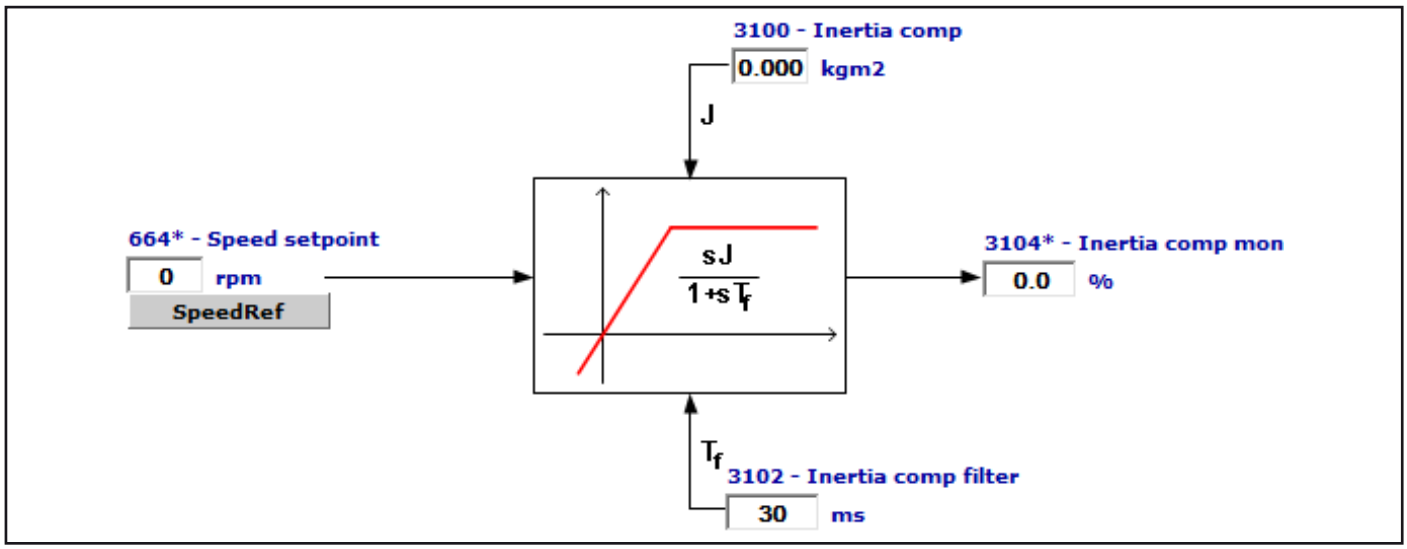
Torque config

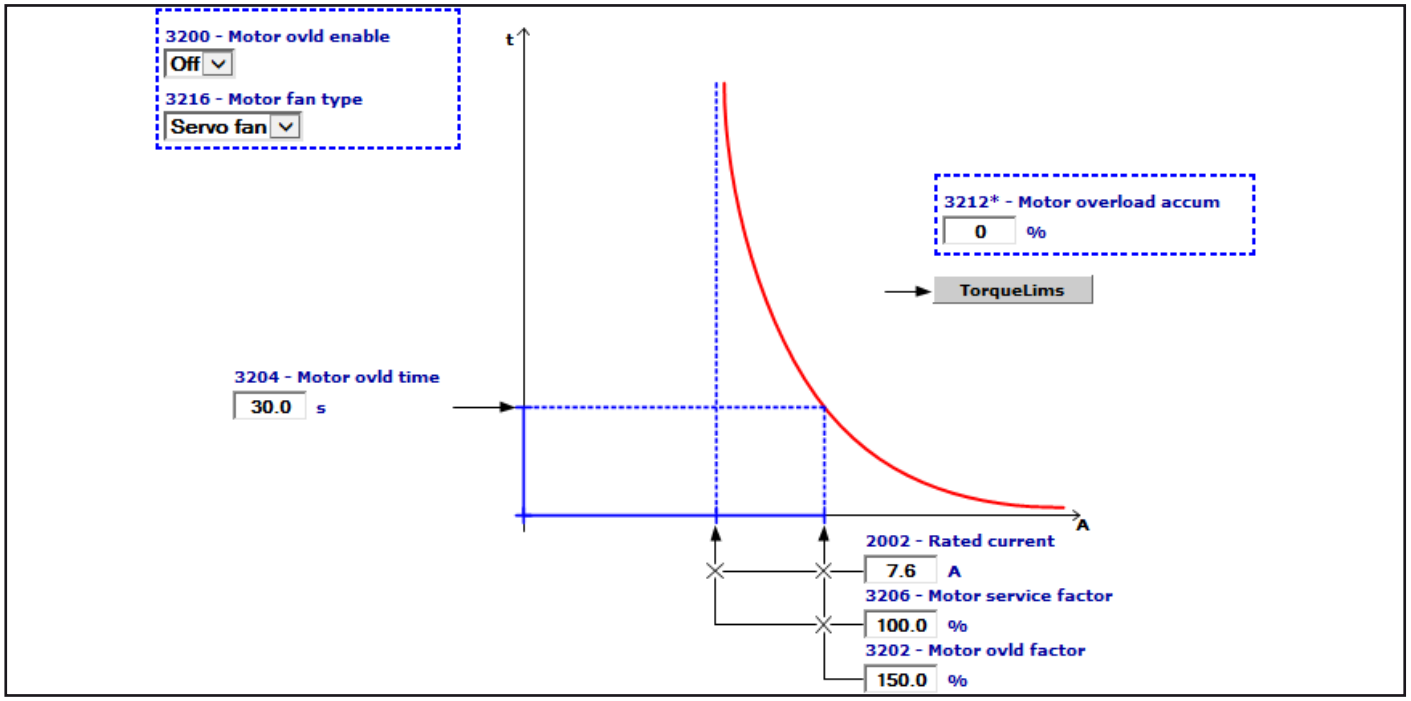


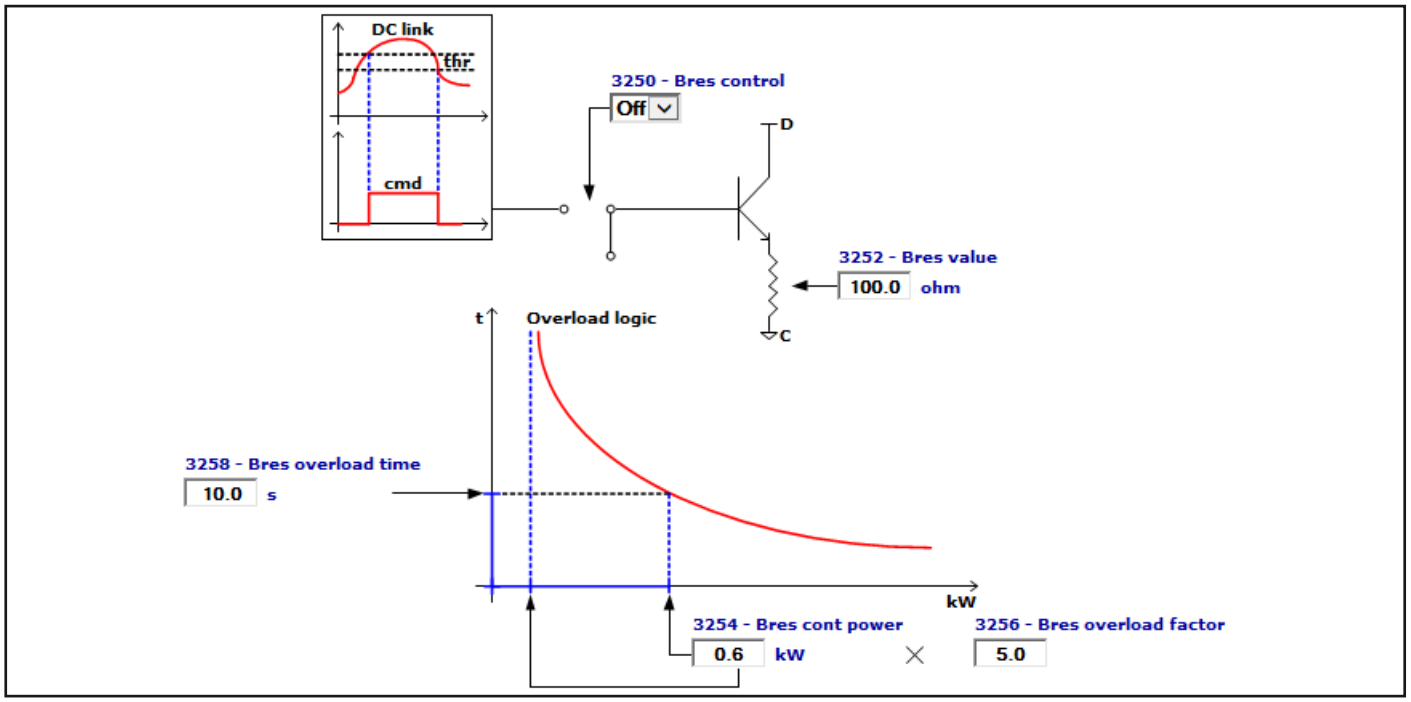


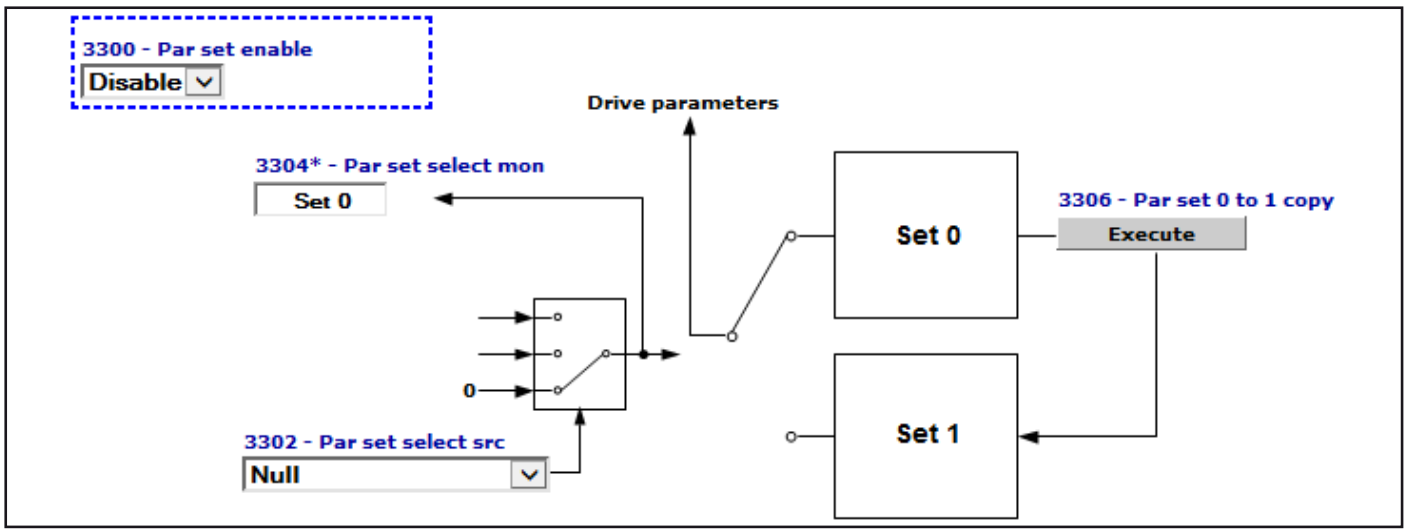
DROOP	Droop
INERTIA COMP	InertiaComp
MOTOR OVERLOAD	MotOvld
BRES OVERLOAD	BresOvld
DOUBLE PAR SET	DoubleParSet
COMPARE	Compare
DIMENSION FACT	DimFactor
CONTROL MODE	ControlMode
TEMP CONTROL	TempControl

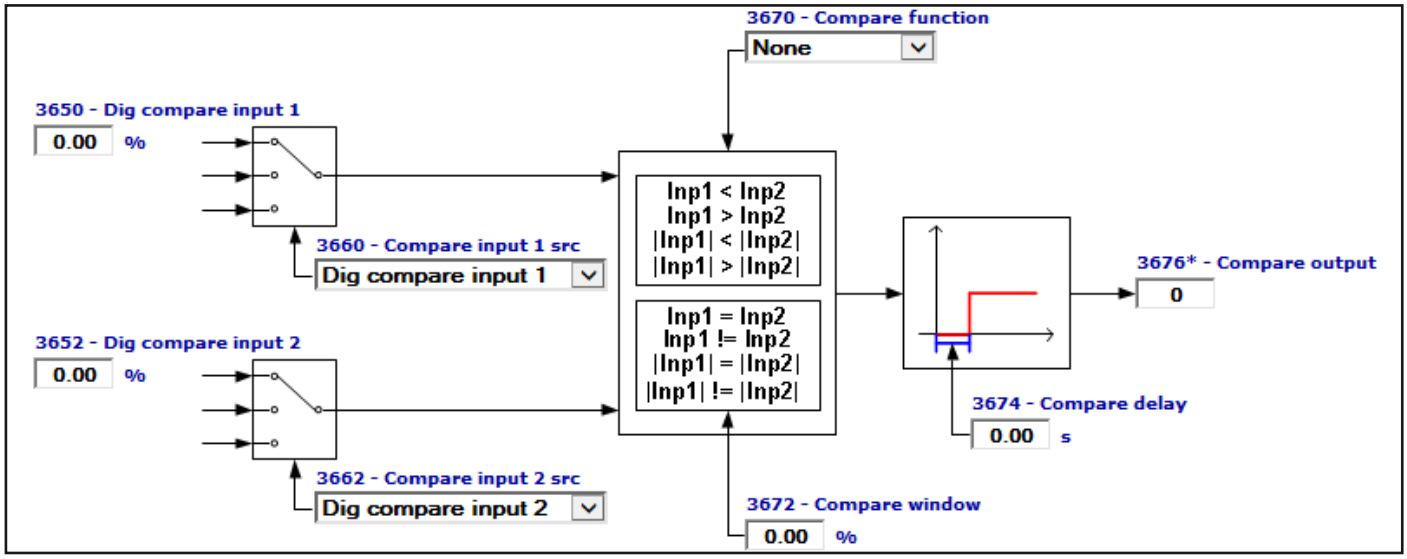


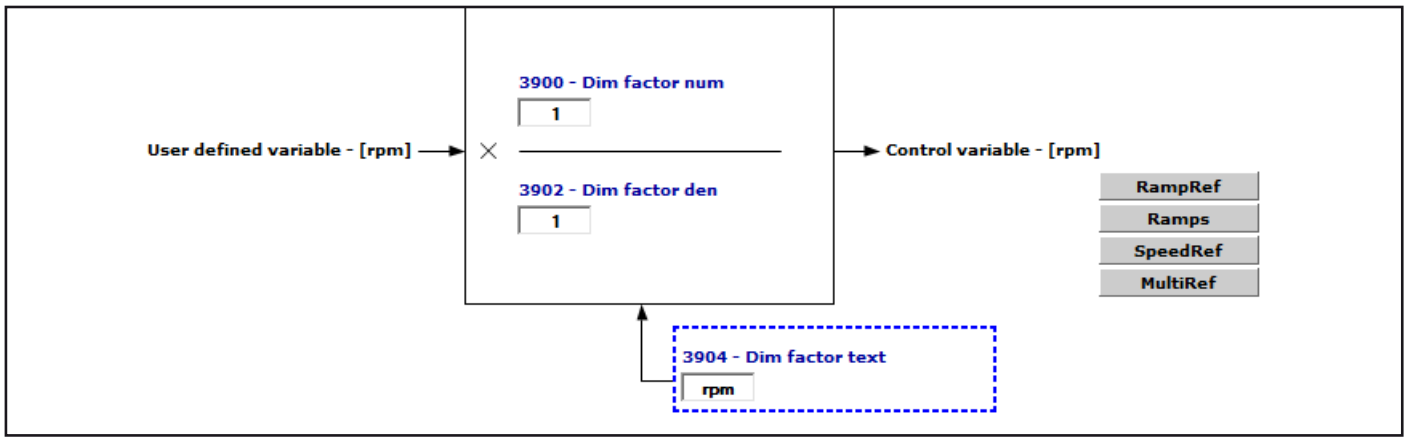


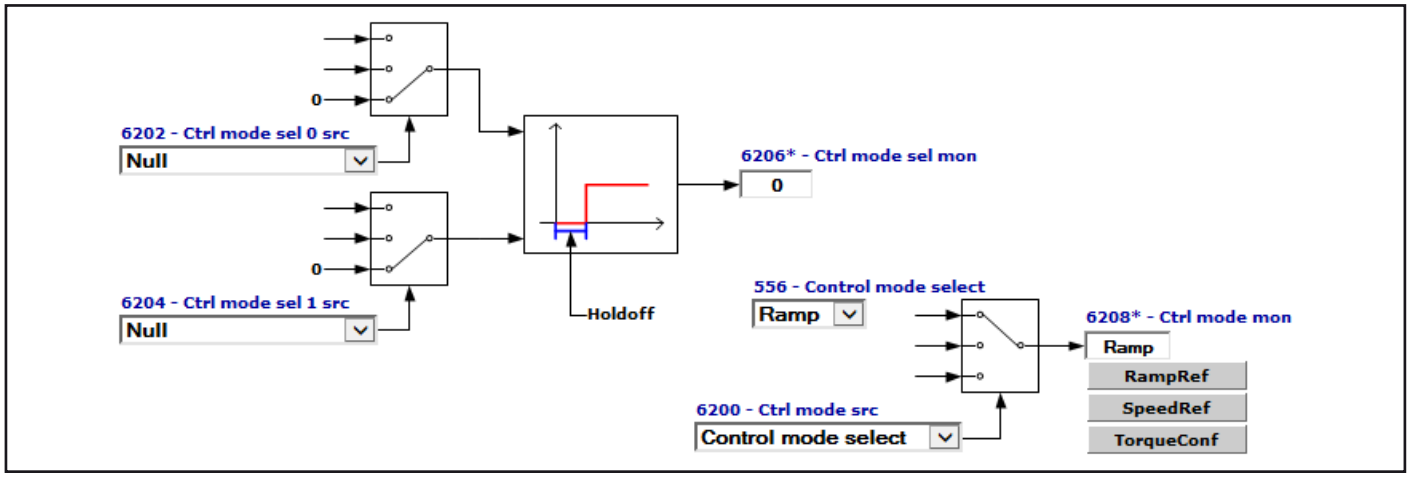

3200 - Motor ovld enable
Off
3216 - Motor fan type
Servo fan
t
3212* - Motor overload accum
0 %
TorqueLims
3204 - Motor ovld time
30.0 s
A
2002 - Rated current
7.6 A
3206 - Motor service factor
100.0 %
3202 - Motor ovld factor
150.0 %

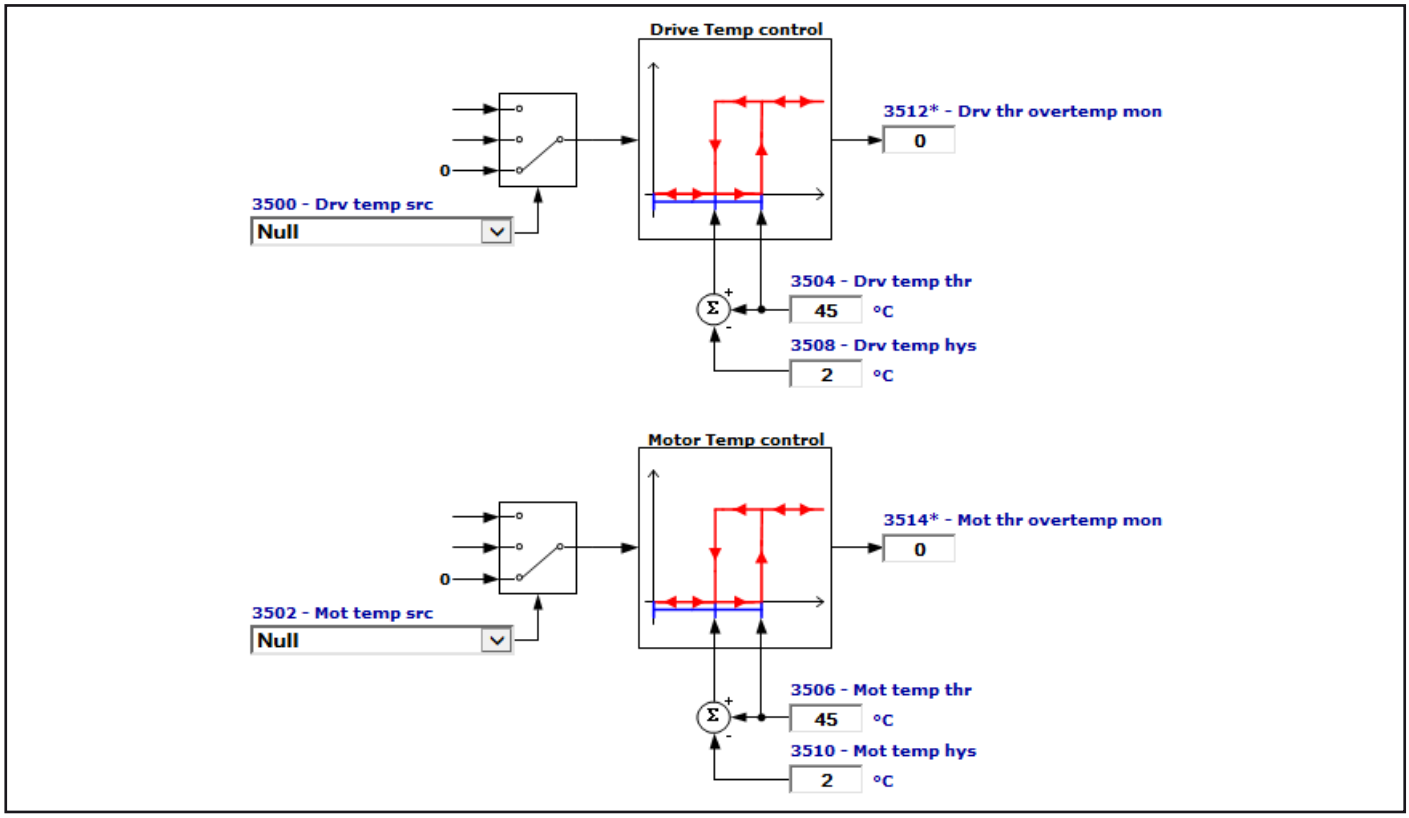

DC link
thr
cmd
3250 - Bres control
Off
D
C
3252 - Bres value
100.0 ohm
t
Overload logic
3258 - Bres overload time
10.0 s
kW
3254 - Bres cont power
0.6 kW
3256 - Bres overload factor
5.0


3300 - Par set enable
Disable
Drive parameters
3304* - Par set select mon
Set 0
Set 0
3306 - Par set 0 to 1 copy
Execute
0
Set 1
3302 - Par set select src
Null


3670 - Compare function
None
3650 - Dig compare input 1
0.00 %
3660 - Compare input 1 src
Dig compare input 1
3652 - Dig compare input 2
0.00 %
3662 - Compare input 2 src
Dig compare input 2
Inp1 < Inp2
Inp1 > Inp2
|Inp1| < |Inp2|
|Inp1| > |Inp2|
Inp1 = Inp2
Inp1 != Inp2
|Inp1| = |Inp2|
|Inp1| != |Inp2|
3676* - Compare output
0
3674 - Compare delay
0.00 s
3672 - Compare window
0.00 %


3900 - Dim factor num
1
User defined variable - [rpm]
3902 - Dim factor den
1
Control variable - [rpm]
RampRef
Ramps
SpeedRef
MultiRef
3904 - Dim factor text
rpm


0
6202 - Ctrl mode sel 0 src
Null
0
6204 - Ctrl mode sel 1 src
Null
6206* - Ctrl mode sel mon
0
Holdoff
556 - Control mode select
Ramp
6208* - Ctrl mode mon
Ramp
RampRef
SpeedRef
TorqueConf
6200 - Ctrl mode src
Control mode select


Drive Temp control
3512* - Drv thr overtemp mon
0
0
3500 - Drv temp src
Null
3504 - Drv temp thr
45 °C
3508 - Drv temp hys
2 °C
Motor Temp control
3514* - Mot thr overtemp mon
0
0
3502 - Mot temp src
Null
3506 - Mot temp thr
45 °C
3510 - Mot temp hys
2 °C

F - Parameters List (Expert)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1 - MONITOR										
1.1	250	Output current	A	FLOAT	16/32	0.0	0.0	0.0	R	F__
1.2	252	Output voltage	V	FLOAT	16/32	0.0	0.0	0.0	R	F__
1.3	254	Output frequency	Hz	FLOAT	16/32	0.0	0.0	0.0	R	F__
1.4	256	Output power	kW	FLOAT	16/32	0.0	0.0	0.0	R	F__
1.5	628	Ramp setpoint	FF	INT16	16/32	0	0	0	R	F__
1.6	664	Speed setpoint	FF	INT16	16/32	0	0	0	R	F__
1.7	260	Motor speed	FF	INT16	16/32	0	0	0	R	F__
1.8	270	DC link voltage	V	FLOAT	16/32	0.0	0.0	0.0	ER	F__
1.9	272	Heatsink temperature	degC	INT16	16BIT	0	0	0	ER	F__
1.10	290	Motor temperature	degC	FLOAT	16BIT	0.0	0.0	0.0	ER	F__
1.11	280	Torque current ref	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__
1.12	282	Magnet current ref	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__
1.13	284	Torque current	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__
1.14	286	Magnet current	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__
1.15	3212	Motor overload accum	perc	UINT16	16/32	0	0	100	ER	F__
1.16	368	Drive overload accum	perc	UINT16	16/32	0	0	100	ER	F__
1.17	370	Drive ovl fst accum	perc	UINT16	16/32	0	0	100	ER	F__
1.18	372	Drive overload limit	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__
1.19	3260	Bres overload accum	perc	UINT16	16/32	0	0	100	ER	F__
1.20	1066	Enable state mon		BIT	16	0	0	1	R	F__
1.21	1068	Start state mon		BIT	16BIT	0	0	1	R	F__
1.22	1070	FastStop state mon		BIT	16BIT	0	0	1	R	F__
1.23	1200	Digital input X mon		UINT16	16BIT	0	0	0	R	F__
1.24	1400	Digital output X mon		UINT16		0	0	0	R	F__
2 - DRIVE INFO										
2.1	480	Control type		ENUM		Syn			R	F__
				25	Synchronous					
2.2	482	Drive size		UINT16		0	0	0	RS	F__
2.3	484	Drive family		ENUM		No power			RS	F__
				0	No power					
				1	230V..480V					
2.4	486	Drive region		ENUM		EU			R	F__
				0	EU					
				1	USA					
2.5	488	Drive cont current	A	FLOAT		CALCF	0.0	0.0	RZS	F__
2.6	490	Firmware ver.rel		UINT16		0	0	0	R	F__
2.7	496	Firmware type		UINT16		0	0	0	R	F__
2.8	504	Application ver.rel		UINT16		0	0	0	ER	F__
2.9	506	Application type		UINT16		0	0	0	ER	F__
2.10	508	Application subver		UINT16		0	0	0	ER	F__
2.11	510	Time drive power on	h.min	UINT32		0	0	0	ER	F__
2.12	512	Time drive enable	h.min	UINT32		0	0	0	ER	F__
2.13	514	Number power up		UINT16		0	0	0	ER	F__
2.14	516	Time fan on	h.min	UINT32		0	0	0	ER	F__
2.15	526	Power file ver.rel		UINT16		0	0	0	ER	F__
2.16	530	Slot1 card type		ENUM		None			R	F__
				0	None					
				257	I/O 1					
				1281	I/O 2					
				2305	I/O 3					
				3841	I/O 4					
				255	Unknown					
				4865	I/O 5					
				5377	I/O 6					
				7937	I/O 7					
				8961	I/O 8					
2.17	532	Slot2 card type		ENUM		None			R	F__
				0	None					
				8	Enc 1					
				264	Enc 2					
				520	Enc 3					
				776	Enc 4					
				1032	Enc 5					

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
				255	Unknown					
				8961	I/O 8					
2.18	534	Slot3 card type		ENUM		None			R	F__
				0	None					
				4	CAN					
2.19	546	Fw enc sl2 ver.rel		UINT16		0	0	0	R	F__
2.20	548	Fw enc sl2 type		UINT16		0	0	0	R	F__

3 - STARTUP WIZARD

4 - DRIVE CONFIG

4.1	550	Save parameters		BIT		0	0	1	RW	F__
4.2	582	Drive reset		BIT		0	0	1	RWZ	F__
4.3	552	Regulation mode		ENUM		Flux vector CL			RWZ	F__
				2	Flux vector CL					
				3	Autotune					
4.4	554	Access mode		ENUM		Easy			RW	F__
				0	Easy					
				1	Expert					
4.5	558	Application select		ENUM		Application 1			ERWZ	F__
				0	None					
				1	Application 1					
				2	Application 2					
4.6	560	Mains voltage		ENUM		400 V			ERWZS	F__
				0	None					
				1	230 V					
				2	380 V					
				3	400 V					
				4	415 V					
				5	440 V					
				6	460 V					
				7	480 V					
4.7	586	DC supply		ENUM		None			ERWZS	F__
				0	None					
				1	540V(230-480V)					
				2	650V(230-480V)					
				3	750V(230-480V)					
4.8	450	Undervoltage	V	FLOAT		CALCF	CALCF	CALCF	ERWZS	F__
4.9	562	Switching frequency		ENUM		SIZE			ERWS	F__
				2	4 kHz					
				4	8 kHz					
4.10	568	Switching freq mode		ENUM		Constant			ERWZS	F__
				0	Constant					
				1	Variable					
4.11	454	Chopper ON	V	Float		CALCF	CALCF	CALCF	ERWZS	FVS
4.12	570	Password		UINT32		0	0	99999	ERW	F__
4.13	572	Application key		UINT32		0	0	4294967295	ERW	F__
4.14	574	Startup display		INT16		-1	-1	20000	ERW	F__
4.15	576	Display backlight		BIT		0	0	1	ERW	F__
4.16	578	Language select		ENUM		1			RWZ	F__
				0	English					
				1	Italian					
				2	French					
				3	German					
				4	Spanish					
				5	Polish					
				6	Romanian					
				7	Russian					
				8	Turkish					
				9	Portuguese					
4.17	580	Load default		BIT		0	0	1	RWZ	F__
4.18	590	Save par to keypad		BIT		0	0	1	RW	F__
4.19	592	Load par from keypad		BIT		0	0	1	RWZ	F__
4.20	594	Keypad memory select		UINT16		1	1	5	ERW	F__
4.21	596	Save to SD card		BIT		0	0	1	RW	F__
4.22	598	Load from SD card		BIT		0	0	1	RWZ	F__

5 - REFERENCES

5.1	600	Dig ramp ref 1	FF	INT16	16/32	0	CALCI	CALCI	RW	F__

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2	602	Dig ramp ref 2	FF	INT16	16/32	0	CALCI	CALCI	ERW	F__
5.3	604	Dig ramp ref 3	FF	INT16	16/32	0	CALCI	CALCI	ERW	F__
5.4	610	Ramp ref 1 src		LINK L_MLTREF	16/32	1600	0	16384	RW	F__
5.5	612	Ramp ref 2 src		LINK L_MLTREF	16/32	602	0	16384	ERW	F__
5.6	614	Ramp ref 3 src		LINK L_MLTREF	16/32	894	0	16384	ERW	F__
5.7	616	Ramp ref invert src		LINK L_DIGSEL2	16BIT	1050	0	16384	ERW	F__
5.8	620	Ramp ref 1 mon	FF	INT16		0	0	0	R	F__
5.9	622	Ramp ref 2 mon	FF	INT16		0	0	0	ER	F__
5.10	624	Ramp ref 3 mon	FF	INT16		0	0	0	ER	F__
5.11	634	Ramp ref top lim	FF	INT32		0	0	CALCI	ERWZ	F__
5.12	636	Ramp ref bottom lim	FF	INT32		0	0	CALCI	ERWZ	F__
5.13	630	Reference skip set	rpm	INT16		0	0	CALCI	ERW	F__
5.14	632	Reference skip band	rpm	INT16		0	0	CALCI	ERW	F__
5.15	640	Dig speed ref 1	FF	INT16	16/32	0	CALCI	CALCI	ERW	F__
5.16	642	Dig speed ref 2	FF	INT16	16/32	0	CALCI	CALCI	ERW	F__
5.17	650	Speed ref 1 src		LINK L_MLTREF	16/32	640	0	16384	ERW	F__
5.18	652	Speed ref 2 src		LINK L_MLTREF	16/32	642	0	16384	ERW	F__
5.19	654	Speed ref invert src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERWZ	F__
5.20	660	Speed ref 1 mon	FF	INT16		0	0	0	ER	F__
5.21	662	Speed ref 2 mon	FF	INT16		0	0	0	ER	F__
5.22	670	Speed ref top lim	FF	INT32		CALCI	0	CALCI	ERWZ	F__
5.23	672	Speed ref bottom lim	FF	INT32		CALCI	CALCI	0	ERWZ	F__
5.24	666	Speed ref filter	ms	UINT16		0	0	1000	ERW	F__
5.25	680	Full scale speed	rpm	INT16		CALCI	50	32000	RWZ	F__

6 - RAMPS

6.1	700	Acceleration time 0	s	FLOAT		10.0	0.01	1000.0	RW	F__
6.2	702	Deceleration time 0	s	FLOAT		10.0	0.01	1000.0	RW	F__
6.3	704	Acceleration time 1	s	FLOAT		10.0	0.01	1000.0	ERW	F__
6.4	706	Deceleration time 1	s	FLOAT		10.0	0.01	1000.0	ERW	F__
6.5	708	Acceleration time 2	s	FLOAT		10.0	0.01	1000.0	ERW	F__
6.6	710	Deceleration time 2	s	FLOAT		10.0	0.01	1000.0	ERW	F__
6.7	712	Acceleration time 3	s	FLOAT		10.0	0.01	1000.0	ERW	F__
6.8	714	Deceleration time 3	s	FLOAT		10.0	0.01	1000.0	ERW	F__
6.9	720	Ramp type		ENUM 0 1 2 3	 Linear S-Shape Bypass Off	Linear			ERWZ	F__
6.10	722	Multi ramp sel 0 src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERW	F__
6.11	724	Multi ramp sel 1 src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERW	F__
6.12	726	Multi ramp sel mon		UINT16		0	0	3	ER	F__
6.13	730	Accel jerk time 0	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.14	732	Decel jerk time 0	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.15	734	Accel jerk time 1	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.16	736	Decel jerk time 1	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.17	738	Accel jerk time 2	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.18	740	Decel jerk time 2	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.19	742	Accel jerk time 3	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.20	744	Decel jerk time 3	s	FLOAT		1.0	0.02	10.0	ERW	F__
6.21	750	Ramp in zero src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERW	F__
6.22	752	Ramp out zero src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERW	F__
6.23	754	Ramp freeze src		LINK L_DIGSEL2	16BIT	3480	0	16384	ERW	F__

7 - MULTI REFERENCE

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
7.1	800	Multi reference 0	FF	INT16	16/32	0	CALCI	CALCI	RW	F__
7.2	802	Multi reference 1	FF	INT16	16/32	0	CALCI	CALCI	RW	F__
7.3	804	Multi reference 2	FF	INT16		0	CALCI	CALCI	RW	F__
7.4	806	Multi reference 3	FF	INT16		0	CALCI	CALCI	RW	F__
7.5	808	Multi reference 4	FF	INT16		0	CALCI	CALCI	RW	F__
7.6	810	Multi reference 5	FF	INT16		0	CALCI	CALCI	RW	F__
7.7	812	Multi reference 6	FF	INT16		0	CALCI	CALCI	RW	F__
7.8	814	Multi reference 7	FF	INT16		0	CALCI	CALCI	RW	F__
7.9	816	Multi reference 8	FF	INT16		0	CALCI	CALCI	ERW	F__
7.10	818	Multi reference 9	FF	INT16		0	CALCI	CALCI	ERW	F__
7.11	820	Multi reference 10	FF	INT16		0	CALCI	CALCI	ERW	F__
7.12	822	Multi reference 11	FF	INT16		0	CALCI	CALCI	ERW	F__
7.13	824	Multi reference 12	FF	INT16		0	CALCI	CALCI	ERW	F__
7.14	826	Multi reference 13	FF	INT16		0	CALCI	CALCI	ERW	F__
7.15	828	Multi reference 14	FF	INT16		0	CALCI	CALCI	ERW	F__
7.16	830	Multi reference 15	FF	INT16		0	CALCI	CALCI	ERW	F__
7.17	832	Multi ref 0 src		LINK L_MLTREF	16/32	800	0	16384	RW	F__
7.18	834	Multi ref 1 src		LINK L_MLTREF	16/32	802	0	16384	RW	F__
7.19	840	Multi ref sel 0 src		LINK L_DIGSEL2	16BIT	6000	0	16384	RW	F__
7.20	842	Multi ref sel 1 src		LINK L_DIGSEL2	16BIT	6000	0	16384	RW	F__
7.21	844	Multi ref sel 2 src		LINK L_DIGSEL2	16BIT	6000	0	16384	RW	F__
7.22	846	Multi ref sel 3 src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERW	F__
7.23	850	Multi ref sel mon		UINT16		0	0	15	R	F__
7.24	852	Multi ref out mon	FF	INT16	16/32	0	0	0	R	F__

8 - MOTORPOTENTIOMETER

8.1	870	Mpot setpoint	rpm	INT16	16/32	0	CALCI	CALCI	R	F__
8.2	872	Mpot acceleration	s	FLOAT		5.0	0.01	1000.0	RW	F__
8.3	874	Mpot deceleration	s	FLOAT		5.0	0.01	1000.0	RW	F__
8.4	876	Mpot top lim	rpm	INT16		CALCI	CALCI	CALCI	ERW	F__
8.5	878	Mpot bottom lim	rpm	INT16		0	CALCI	CALCI	ERW	F__
8.6	880	Mpot init cfg		ENUM		Zero			ERW	F__
				0	Last Power Off					
				1	Zero					
				2	Lower Limit					
				3	Upper Limit					
8.7	882	Mpot preset cfg		ENUM		None			ERW	F__
				0	None					
				1	Input=0					
				2	Input=low lim					
				3	Input&ref=0					
				4	Input&ref=low					
				5	Output=0					
				6	Output=low lim					
				7	Output&ref=0					
				8	Output&ref=low					
				9	Input=upp lim					
				10	Input&ref=upp					
				11	Freeze input					
8.8	884	Mpot up src		LINK L_DIGSEL2	16BIT	6000	0	16384	RW	F__
8.9	886	Mpot down src		LINK L_DIGSEL2	16BIT	6000	0	16384	RW	F__
8.10	888	Mpot invert src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERW	F__
8.11	890	Mpot preset src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERW	F__
8.12	892	Mpot mode		ENUM		Fine&Last val			ERW	F__
				0	Ramp&Last val					
				1	Ramp&Follow					
				2	Fine&Last val					
				3	Fine&Follow					
8.13	894	Mpot output mon	rpm	INT16	16/32	0	0	0	ER	F__

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
9 - JOG FUNCTION										
9.1	910	Jog setpoint	rpm	INT16		0	CALCI	CALCI	RW	F__
9.2	912	Jog acceleration	s	FLOAT		5.0	0.01	1000.0	RW	F__
9.3	914	Jog deceleration	s	FLOAT		5.0	0.01	1000.0	RW	F__
9.4	916	Jog cmd + src		LINK L_DIGSEL2	16BIT	6000	0	16384	RW	F__
9.5	918	Jog cmd - src		LINK L_DIGSEL2	16BIT	6000	0	16384	RW	F__
9.6	920	Jog output mon	rpm	INT16	16/32	0	0	0	ER	F__
10 - MONITOR FUNCTION										
10.1	930	Reference 0 thr	rpm	INT16		30	0	CALCI	RW	F__
10.2	932	Reference 0 delay	ms	UINT16		400	0	10000	RW	F__
10.3	940	Speed 0 thr	rpm	INT16		30	0	CALCI	RW	F__
10.4	942	Speed 0 delay	ms	UINT16		400	0	10000	RW	F__
10.5	950	Speed threshold 1	rpm	INT32		0	CALCI	CALCI	RW	F__
10.6	952	Speed threshold 2	rpm	INT32		0	CALCI	CALCI	RW	F__
10.7	954	Speed threshold dly	ms	UINT16		0	0	50000	RW	F__
10.8	960	Set speed ref src		LINK L_CMP	16/32	628	0	16384	ERW	F__
10.9	962	Set speed error	rpm	INT16		100	0	CALCI	RW	F__
10.10	964	Set speed delay	ms	UINT16		0	0	50000	RW	F__
10.11	968	Dig set speed ref	rpm	INT16	16/32	0	CALCI	CALCI	ERW	F__
10.12	970	Speed threshold 3	rpm	INT32		0	0	CALCI	RW	F__
10.13	972	Speed thr hysteresis	rpm	INT16		0	0	CALCI	RW	F__
10.14	980	Current threshold	perc	INT16		100	0	200	RW	F__
10.15	982	Current thr hyster	perc	INT16		0	0	100	RW	F__
11 - COMMANDS										
11.1	1000	Commands remote sel		ENUM		Terminal			RWZ	F__
				0	Terminal					
				1	Digital					
11.2	1002	Commands local sel		ENUM		Keypad			ERWZ	F__
				0	Terminal					
				2	Keypad					
11.3	1004	Enable/disable mode		ENUM		Stop/FS&Spd=0			ERWZ	F__
				0	Off					
				1	Stop/FS&Spd=0					
				2	Stop&Spd=0					
				3	FS&Spd=0					
11.4	1006	Speed 0 disable dly	ms	UINT16		1000	0	10000	ERW	F__
11.5	1008	Stop key mode		ENUM		Inactive			ERW	F__
				0	Inactive					
				1	EmgStop&Alarm					
11.6	1010	Commands safe start		BIT		1	0	1	ERW	F__
11.7	1012	Dig local/remote		ENUM	16BIT	Remote			ERW	F__
				0	Local					
				1	Remote					
11.8	1014	Local/remote src		LINK L_DIGSEL3	16BIT	1012	0	16384	ERW	F__
11.9	1016	Terminal Start src		LINK L_DIGSEL2	16BIT	1048	0	16384	ERW	F__
11.10	1018	Digital Enable src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERW	F__
11.11	1020	Digital Start src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERW	F__
11.12	1022	FastStop src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERW	F__
11.13	1024	Enable cmd mon		BIT	16BIT	0	0	1	R	F__
11.14	1026	Start cmd mon		BIT	16BIT	0	0	1	R	F__
11.15	1028	FastStop cmd mon		BIT	16BIT	0	0	1	R	F__
11.16	1040	FR mode		ENUM		Two wire			ERWZ	F__
				0	Normal					
				1	Two wire					
				2	Three wire					
11.17	1042	FR forward src		LINK L_DIGSEL2	16BIT	1210	0	16384	ERW	F__
11.18	1044	FR reverse src		LINK	16BIT	1212	0	16384	ERW	F__

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
				L_DIGSEL2						
11.19	1046	FR *stop src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERW	F__
11.20	1048	FR start mon		BIT	16BIT	0	0	1	ER	F__
11.21	1050	FR reverse mon		BIT	16BIT	0	0	1	ER	F__
11.22	1052	FR cmd mon		UINT16		0	0	0	ER	F__
11.23	1032	Drv interlock src		LINK L_DIGSEL2	16BIT	6002	0	16384	ERW	F__
11.24	1034	Drv interlock mon		BIT	16BIT	0	0	1	ER	F__
11.25	1036	FastStop mode		ENUM 0 1	 Not Latched Latched	Not Latched			ERW	F__

12 - DIGITAL INPUTS

12.1	1240	Dig inp 1X inversion		BIT		0	0	1	RW	F__
12.2	1242	Dig inp 2X inversion		BIT		0	0	1	RW	F__
12.3	1244	Dig inp 3X inversion		BIT		0	0	1	RW	F__
12.4	1246	Dig inp 4X inversion		BIT		0	0	1	RW	F__
12.5	1248	Dig inp 5X inversion		BIT		0	0	1	RW	F__
12.6	1250	Dig inp 6X inversion		BIT		0	0	1	RW	F__
12.7	1252	Dig inp 7X inversion		BIT		0	0	1	RW	F__
12.8	1254	Dig inp 8X inversion		BIT		0	0	1	RW	F__
12.9	5540	Dig inp 9X inversion		BIT		0	0	1	ERW	F__
12.10	5542	Dig inp10X inversion		BIT		0	0	1	ERW	F__
12.11	5544	Dig inp11X inversion		BIT		0	0	1	ERW	F__
12.12	5546	Dig inp12X inversion		BIT		0	0	1	ERW	F__
12.13	5548	Dig inp13X inversion		BIT		0	0	1	ERW	F__
12.14	5550	Dig inp14X inversion		BIT		0	0	1	ERW	F__
12.15	5552	Dig inp15X inversion		BIT		0	0	1	ERW	F__
12.16	5554	Dig inp16X inversion		BIT		0	0	1	ERW	F__
12.17	1150	Digital input E dest		ILINK		0	0	0	ER	F__
12.18	1270	Dig input 1X dest		ILINK		0	0	0	ER	F__
12.19	1272	Dig input 2X dest		ILINK		0	0	0	ER	F__
12.20	1274	Dig input 3X dest		ILINK		0	0	0	ER	F__
12.21	1276	Dig input 4X dest		ILINK		0	0	0	ER	F__
12.22	1278	Dig input 5X dest		ILINK		0	0	0	ER	F__
12.23	1280	Dig input 6X dest		ILINK		0	0	0	ER	F__
12.24	1282	Dig input 7X dest		ILINK		0	0	0	ER	F__
12.25	1284	Dig input 8X dest		ILINK		0	0	0	ER	F__
12.26	5570	Dig input 9X dest		ILINK		0	0	0	ER	F__
12.27	5572	Dig input10X dest		ILINK		0	0	0	ER	F__
12.28	5574	Dig input11X dest		ILINK		0	0	0	ER	F__
12.29	5576	Dig input12X dest		ILINK		0	0	0	ER	F__
12.30	5578	Dig input13X dest		ILINK		0	0	0	ER	F__
12.31	5580	Dig input14X dest		ILINK		0	0	0	ER	F__
12.32	5582	Dig input15X dest		ILINK		0	0	0	ER	F__
12.33	5584	Dig input16X dest		ILINK		0	0	0	ER	F__

13 - DIGITAL OUTPUTS

13.1	1410	Dig output 1X src		LINK L_DIGSEL1	16BIT	6000	0	16384	RW	F__
13.2	1412	Dig output 2X src		LINK L_DIGSEL1	16BIT	6000	0	16384	RW	F__
13.3	1414	Dig output 3X src		LINK L_DIGSEL1	16BIT	6000	0	16384	RW	F__
13.4	1416	Dig output 4X src		LINK L_DIGSEL1	16BIT	6000	0	16384	RW	F__
13.5	1418	Dig output 5X src		LINK L_DIGSEL1	16BIT	6000	0	16384	RW	F__
13.6	1420	Dig output 6X src		LINK L_DIGSEL1	16BIT	6000	0	16384	RW	F__
13.7	1422	Dig output 7X src		LINK L_DIGSEL1	16BIT	6000	0	16384	RW	F__
13.8	1424	Dig output 8X src		LINK L_DIGSEL1	16BIT	6000	0	16384	RW	F__
13.9	1426	Dig output 9X src		LINK L_DIGSEL1	16BIT	6000	0	16384	RW	F__

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
13.10	1430	Dig out 1X inversion		BIT		0	0	1	RW	F__
13.11	1432	Dig out 2X inversion		BIT		0	0	1	RW	F__
13.12	1434	Dig out 3X inversion		BIT		0	0	1	RW	F__
13.13	1436	Dig out 4X inversion		BIT		0	0	1	RW	F__
13.14	1438	Dig out 5X inversion		BIT		0	0	1	RW	F__
13.15	1440	Dig out 6X inversion		BIT		0	0	1	RW	F__
13.16	1442	Dig out 7X inversion		BIT		0	0	1	RW	F__
13.17	1444	Dig out 8X inversion		BIT		0	0	1	RW	F__
13.18	1446	Dig out 9X inversion		BIT		0	0	1	RW	F__

14 - ANALOG INPUTS

14.1	1500	Analog input 1 mon	cnt	INT16	16/32	0	-16384	16384	R	F__
14.2	1502	Analog inp 1 type		ENUM		0..10V			RW	F__
				0		-10V..+10V				
				1		0..10V				
				2		4..20mA				
				3		0..20mA				
				7		0.1V..10.1V				
				8		0..10.1V				
14.3	1504	Analog inp 1 scale		FLOAT		1.0	-10.0	10.0	RW	F__
14.4	1506	An inp 1 offset tune		BIT		0	0	1	RW	F__
14.5	1508	An inp 1 gain tune		BIT		0	0	1	RW	F__
14.6	1510	Analog inp 1 filter	ms	FLOAT		10.0	1.0	1000.0	ERW	F__
14.7	1512	Analog inp 1 top	cnt	INT16		16384	-32768	+32767	ERW	F__
14.8	1514	Analog inp 1 bottom	cnt	INT16		0	-32768	+32767	ERW	F__
14.9	1516	Analog inp 1 offset	cnt	INT16		0	-32768	+32767	ERW	F__
14.10	1518	Analog inp 1 gain		FLOAT		1.0	-10.0	10.0	ERW	F__
14.11	1520	Analog inp 1 thr	cnt	INT16		0	-16384	+16384	ERW	F__
14.12	1522	An inp 1 deadband	perc	FLOAT		0.0	0.0	100.0	ERW	F__
14.13	1524	An inp 1 alt value	cnt	INT16	16/32	0	-16384	16384	ERW	F__
14.14	1526	An inp 1 sign src		LINK	16BIT	6000	0	16384	ERW	F__
				L_DIGSEL2						
14.15	1528	An inp 1 alt sel src		LINK	16BIT	6000	0	16384	ERW	F__
				L_DIGSEL2						
14.16	1532	Analog input 1 dest		ILINK		0	0	0	ER	F__
14.17	1538	An inp 1 err delay	s	FLOAT		0.1	0.01	10.0	ERW	F__
14.18	1540	An inp 1 err mon		BIT	16BIT	0	0	1	ER	F__
14.19	1600	Analog input 1X mon	cnt	INT16	16/32	0	-16384	16384	R	F__
14.20	1602	Analog inp 1X type		ENUM		-10V..+10V			RW	F__
				0		-10V..+10V				
				1		0..10V				
				2		4..20mA				
				3		0..20mA				
14.21	1604	Analog inp 1X scale		FLOAT		1.0	-20.0	20.0	RW	F__
14.22	1606	An inp 1Xoffset tune		BIT		0	0	1	RW	F__
14.23	1608	An inp 1X gain tune		BIT		0	0	1	RW	F__
14.24	1612	Analog inp 1X top	cnt	INT16		16384	-32768	+32767	ERW	F__
14.25	1614	Analog inp 1X bottom	cnt	INT16		-16384	-32768	+32767	ERW	F__
14.26	1616	Analog inp 1X offset	cnt	INT16		0	-32768	+32767	ERW	F__
14.27	1618	Analog inp 1X gain		FLOAT		1.0	-20.0	20.0	ERW	F__
14.28	1626	An inp 1X sign src		LINK	16BIT	6000	0	16384	ERW	F__
				L_DIGSEL2						
14.29	1632	Analog input 1X dest		ILINK		0	0	0	ER	F__
14.30	1638	An inp 1X err delay	s	FLOAT		0.1	0.01	10.0	ERW	F__
14.31	1640	An inp 1X err mon		BIT	16BIT	0	0	1	ER	F__
14.32	1650	Analog input 2X mon	cnt	INT16	16/32	0	-16384	16384	R	F__
14.33	1652	Analog inp 2X type		ENUM		-10V..+10V			RW	F__
				0		-10V..+10V				
				1		0..10V				
				2		4..20mA				
				3		0..20mA				
14.34	1654	Analog inp 2X scale		FLOAT		1.0	-20.0	20.0	RW	F__
14.35	1656	An inp 2Xoffset tune		BIT		0	0	1	RW	F__
14.36	1658	An inp 2X gain tune		BIT		0	0	1	RW	F__
14.37	1662	Analog inp 2X top	cnt	INT16		16384	-32768	+32767	ERW	F__
14.38	1664	Analog inp 2X bottom	cnt	INT16		-16384	-32768	+32767	ERW	F__
14.39	1666	Analog inp 2X offset	cnt	INT16		0	-32768	+32767	ERW	F__
14.40	1668	Analog inp 2X gain		FLOAT		1.0	-20.0	20.0	ERW	F__

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.41	1676	An inp 2X sign src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERW	F__
14.42	1682	Analog input 2X dest		ILINK		0	0	0	ER	F__
14.43	1688	An inp 2X err delay	s	FLOAT		0.1	0.01	10.0	ERW	F__
14.44	1690	An inp 2X err mon		BIT	16	0	0	1	ER	F__

15 - ANALOG OUTPUTS

15.1	1850	Analog out 1X src		LINK L_ANOUT	16/32	6000	0	16384	RW	F__
15.2	1852	Analog out 2X src		LINK L_ANOUT	16/32	6000	0	16384	RW	F__
15.3	1858	Analog out 1X scale		FLOAT		1.0	-20.0	20.0	RW	F__
15.4	1860	Analog out 2X scale		FLOAT		1.0	-20.0	20.0	RW	F__
15.5	1866	Analog out 1X mon	cnt	INT16		0	0	0	ER	F__
15.6	1868	Analog out 2X mon	cnt	INT16		0	0	0	ER	F__
15.7	1874	An out 1X absolute		ENUM		Disable			ERW	F__
				0	Disable					
				1	Enable					
15.8	1876	An out 2X absolute		ENUM		Disable			ERW	F__
				0	Disable					
				1	Enable					
15.9	1882	Analog out 1X min	cnt	INT16		0	-32768	+32767	ERW	F__
15.10	1884	Analog out 1X max	cnt	INT16		16384	-32768	+32767	ERW	F__
15.11	1886	Analog out 1X type		ENUM		0..10V			ERW	F__
				0	0..20mA					
				1	4..20mA					
				2	-10V..+10V					
				3	0..10V					
15.12	1890	Analog out 2X min	cnt	INT16		-16384	-32768	+32767	ERW	F__
15.13	1892	Analog out 2X max	cnt	INT16		16384	-32768	+32767	ERW	F__
15.14	1898	Analog out 2X type		ENUM		-10V..+10V			ERW	F__
				0	0..20mA					
				1	4..20mA					
				2	-10V..+10V					
				3	0..10V					

16 - MOTOR DATA

16.1	2000	Rated voltage	V	FLOAT		SIZE	50.0	690.0	RWZS	F__
16.2	2002	Rated current	A	FLOAT		SIZE	1.0	2200.0	RWZS	F__
16.3	2004	Rated speed	rpm	FLOAT		SIZE	10.0	32000.0	RWZS	F__
16.4	2008	Pole pairs		UINT16		SIZE	1	CALCI	RWZS	F__
16.5	2010	Torque constant	Nm/A	FLOAT		SIZE	0.1	100.0	RWZS	F__
16.6	2012	EMF constant	Wb	FLOAT		SIZE	0.0	100.0	RWZS	F__
16.7	2020	Take parameters		BIT		0	0	1	RWZ	F__
16.8	2022	Autotune rotation		BIT		0	0	1	RWZ	F__
16.9	2024	Autotune still		BIT		0	0	1	RWZ	F__
16.10	2026	Autotune mode		ENUM		Reduced			ERWZ	F__
				0	Reduced					
				1	Extended					
16.11	2028	Take par status		ENUM		Required			R	F__
				0	Required					
				1	Done					
16.12	2030	Autotune status		ENUM		Required			R	F__
				0	Required					
				1	Done					
16.13	2050	Measured Rs	ohm	FLOAT		CALCF	0.0005	200.0	ERWS	F__
16.14	2052	Measured DTL	V	FLOAT		0.0	0.0	100.0	ERWS	F__
16.15	2054	Measured DTS	V/A	FLOAT		0.0	0.0	100.0	ERWS	F__
16.16	2056	Measured Lsig	mH	FLOAT		CALCF	0.001	200.0	ERWS	F__
16.17	2074	Measured Lsig min	mH	FLOAT		CALCF	0.001	200.0	ERWS	F__
16.18	2078	Take tune parameters		BIT		0	0	1	ERWZ	F__

17 - ENCODER CONFIG

17.1	2100	Encoder 1 pulses	ppr	UINT16		CALCI	CALCI	CALCI	RWZ	F__
17.2	2102	Encoder 1 supply	V	FLOAT		5.2	5.2	CALCF	ERWZ	F__
17.3	2104	Encoder 1 input cfg		ENUM		TTL			ERWZ	F__
				0	HTL					

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
				1	TTL					
17.4	2106	Encoder 1 repetition		ENUM		No division			ERWZ	F__
				0	No division					
				1	Divide 2					
				2	Divide 4					
				3	Divide 8					
17.5	2108	Encoder 1 signal Vpp	V	FLOAT		1.0	0.8	1.2	ERWZ	F__
17.6	2110	Encoder1signal check		ENUM		Check A-B			ERWZ	F__
				0	Check disabled					
				1	Check A-B					
				2	Check A-B-Z					
				4	Check A-B-Z-P					
17.7	2112	Encoder SSI clocks		UINT16		13	8	31	ERWZ	F__
17.8	2114	Encoder SSI pos bits		UINT16		13	8	31	ERWZ	F__
17.9	2182	Encoder ENDAT clock		ENUM		1 MHz			ERWZ	F__
				0	1 MHz					
				1	500 kHz					
17.10	2116	Resolver pole pairs		UINT16		1	1	5	ERWZ	F__
17.11	2118	Resolver frequency	Hz	UINT16		5000	2000.0	10000.0	ERWZ	F__
17.12	2122	Resolver repetition		ENUM		16384 ppr			ERWZ	F__
				0	256 ppr					
				1	1024 ppr					
				2	4096 ppr					
				3	16384 ppr					
17.13	2124	Resolver LOS thr	V	FLOAT		2.200	0.000	4.820	ERWZ	F__
17.14	2126	Resolver OVR thr	V	FLOAT		4.100	0.000	4.820	ERWZ	F__
17.15	2128	Resolver MIS thr	V	FLOAT		0.380	0.000	4.820	ERWZ	F__
17.16	2130	Encoder 1 direction		ENUM		Not inverted			RWZ	F__
				0	Not inverted					
				1	Inverted					
17.17	2132	Encoder 1 mode		ENUM		None			ERWZ	F__
				0	None					
				1	Digital FP					
				2	Digital F					
				3	Sinus					
				4	Sinus SINCOS					
				5	Sinus ENDAT					
				6	Sinus SSI					
				7	Sinus HIPER					
				8	Resolver					
				9	Abs SINCOS					
17.18	2134	Encoder1speed filter	ms	FLOAT		2.0	0.125	20.0	ERW	F__
17.19	2150	Encoder 1 speed	rpm	INT16	16/32	0	0	0	ER	F__
17.20	2162	Encoder 1 position	cnt	UINT16	16BIT	0	0	0	ER	F__
17.21	2172	SpdFbkLoss code		UINT32		0	0	0	ER	F__
17.22	2176	Encoder sync mode		UINT16		1	0	3	ERWZ	F__
17.23	2190	Autophase rotation		BIT		0	0	1	RWZ	F__
17.24	2192	Autophase still		BIT		0	0	1	RWZ	F__
17.25	2194	Autophase still mode		ENUM		Mode 1			ERWZ	F__
				0	Mode 1					
				1	Mode 2					
17.26	2196	Autophase still run		ENUM		First enable			ERWZ	F__
				1	First enable					
				2	Each enable					
17.27	2186	Poles/EncRev - 0=Off		UINT16		0	0	65535	ERWZ	F__
17.28	2188	Enc ratio		FLOAT		0.0	0.0	0.0	ER	F__

18 - SPEED REG GAINS

18.1	2200	Speed reg P1 gain	perc	INT16		100	0	1000	RW	F__
18.2	2202	Speed reg I1 gain	perc	INT16		100	0	1000	RW	F__
18.3	2204	Speed reg P2 gain	perc	INT16		100	0	1000	ERW	F__
18.4	2206	Speed reg I2 gain	perc	INT16		100	0	1000	ERW	F__
18.5	2216	Gain adapt src		LINK	16/32	664	0	16384	ERW	F__
				L_REF						
18.6	2218	Gain adp spd thr1_2	perc	FLOAT		0.0	0.0	100.0	ERW	F__
18.7	2220	Gain adp spd band1_2	perc	FLOAT		0.0	0.0	100.0	ERW	F__
18.8	2226	Gain 0 enable		ENUM		Disable			ERW	F__
				0	Disable					
				1	Enable					
18.9	2228	Speed reg P0 gain	perc	INT16		100	0	1000	ERW	F__

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.10	2230	Speed reg I0 gain	perc	INT16		100	0	1000	ERW	F__
18.11	2232	Spd reg P gain Inuse	perc	INT16	16/32	100	0	1000	ER	F__
18.12	2234	Spd reg I gain Inuse	perc	INT16	16/32	100	0	1000	ER	F__
18.13	2236	Speed reg P gain	N/rpm	FLOAT		CALCF	0.0	500.0	ERWS	F__
18.14	2238	Speed reg I time	ms	FLOAT		CALCF	1.0	5000.0	ERWS	F__
18.15	2244	Speed reg I dis src		LINK L_DIGSEL2	16/32	6000	0	16384	ERW	F__
18.16	2246	Speed reg P factor	perc	FLOAT	16/32	0.0	0.0	0.0	ER	F__
18.17	2248	Speed reg I factor	perc	FLOAT	16/32	0.0	0.0	0.0	ER	F__
18.18	2240	Inertia	kgm2	FLOAT		SIZE	0.0001	100.0	RWZS	F__
18.19	2242	Bandwidth	rad/s	FLOAT		SIZE	1.0	500.0	RWZS	F__

19 - REGULATOR PARAM

19.1	2250	Current reg P gain	V/A	FLOAT		CALCF	0.0	0.0	ERWS	F__
19.2	2252	Current reg I time	ms	FLOAT		CALCF	0.01	10000.0	ERWS	F__
19.3	2270	Voltage reg P gain	Wb/V	FLOAT		CALCF	0.0	0.0	ERWS	F__
19.4	2272	Voltage reg I time	s	FLOAT		CALCF	0.01	100.0	ERWS	F__
19.5	2280	Dead time limit	V	FLOAT		SIZE	0.0	50.0	ERWS	F__
19.6	2282	Dead time slope	V/A	FLOAT		SIZE	0.0	200.0	ERWS	F__
19.7	2290	Voltage base	V	FLOAT		CALCF	50.0	690.0	ERWS	F__
19.8	2292	Voltage margin	perc	FLOAT		5.0	0.0	10.0	ERWS	F__
19.9	132	Magnet current lim	A	FLOAT		CALCF	0.0	CALCF	ERWZS	F__

20 - TORQUE CONFIG

20.1	2350	Torque curr lim Pos	A	FLOAT	16/32	CALCF	0.0	CALCF	ERWS	F__
20.2	2352	Torque curr lim Neg	A	FLOAT	16/32	CALCF	0.0	CALCF	ERWS	F__
20.3	2354	Torque curr lim sel		ENUM 0 1 2 3 4		Off Off T clim +/- T clim mot/gen T lim sym T lim pos/neg			ERWZ	F__
20.4	2358	Torque lim pos src		LINK L_PLIM	16/32	6000	0	16384	ERWZ	F__
20.5	2370	Torque lim neg src		LINK L_NLIM	16/32	6000	0	16384	ERWZ	F__
20.6	2372	Torque limit pos	perc	FLOAT	16/32	CALCF	0.0	CALCF	ERW	F__
20.7	2374	Torque limit neg	perc	FLOAT	16/32	CALCF	0.0	CALCF	ERW	F__
20.8	2376	Torque lim unit sel		ENUM 0 1		Perc % Nm			ERW	F__
20.9	2360	Torque lim Pos Inuse	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__
20.10	2362	Torque lim Neg Inuse	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__
20.11	2378	Torque ref 1 filter	ms	FLOAT		0.0	0.0	1000.0	ERW	F__
20.12	2380	Dig torque ref 1	perc	FLOAT	16/32	0.0	-300.0	300.0	ERW	F__
20.13	2382	Torque ref 1 src		LINK L_VREF	16/32	3104	0	16384	ERWZ	F__
20.14	2392	Torque ref 1 mon %	perc	FLOAT	16/32	0.0	0.0	0.0	ER	F__
20.15	2346	Torque current ref 1	A	FLOAT	16/32	0.0	0.0	0.0	ER	F__
20.16	2348	Torque ref 1 mon	Nm	FLOAT		0.0	0.0	0.0	ER	F__
20.17	2384	Torque ref filter	ms	FLOAT		1.0	0.125	10.0	ERW	F__
20.18	2386	Torque ref %	perc	FLOAT	16/32	0.0	0.0	0.0	ER	F__
20.19	2390	Torque ref	Nm	FLOAT	16/32	0.0	0.0	0.0	ER	F__
20.20	2394	Torque %	perc	FLOAT	16/32	0.0	0.0	0.0	ER	F__
20.21	2398	Torque	Nm	FLOAT		0.0	0.0	0.0	ER	F__
20.22	2366	Torque curr lim Red	A	FLOAT	16/32	CALCF	0.0	CALCF	ERWS	F__
20.23	2368	Torque clim Red src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERW	F__

21 -

22 - FUNCTIONS

22.1 -

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.2 - FUNCTIONS/DROOP										
22.2.1	3052	Droop ref src		LINK L_LIM	16/32	6000	0	16384	ERW	F__
22.2.2	3060	Droop gain	perc	FLOAT		0.0	0.0	100.0	ERW	F__
22.2.3	3062	Droop filter	ms	UINT16		10	1	100	ERW	F__
22.2.4	3064	Droop limit	rpm	INT16	16/32	30	0	CALCI	ERWZ	F__
22.2.5	3070	Droop out mon	rpm	INT16	16/32	0	0	0	ER	F__
22.3 - FUNCTIONS/INERTIA COMP										
22.3.1	3100	Inertia comp	kgm2	FLOAT		0.0	0.0	100.0	ERWS	F__
22.3.2	3102	Inertia comp filter	ms	UINT16		30	1	100	ERW	F__
22.3.3	3104	Inertia comp mon	perc	FLOAT	16/32	0.0	0.0	0.0	ER	F__
22.4 - FUNCTIONS/MOTOR OVERLOAD										
22.4.1	3200	Motor ovld enable		BIT		0	0	1	ERW	F__
22.4.2	3202	Motor ovld factor	perc	FLOAT		150.0	100.0	300.0	ERWS	F__
22.4.3	3204	Motor ovld time	s	FLOAT		30.0	10.0	300.0	ERWS	F__
22.4.4	3206	Motor service factor	perc	FLOAT		100.0	25.0	200.0	ERWS	F__
22.4.5	3216	Motor fan type		ENUM		Servo fan			ERW	F__
				0	Auto fan					
				1	Servo fan					
22.4.6	3218	Motor derat factor	perc	FLOAT		50.0	0.0	100.0	ERWS	F__
22.5 - FUNCTIONS/BRES OVERLOAD										
22.5.1	3250	Bres control		BIT		0	0	1	ERWZS	F__
22.5.2	3252	Bres value	ohm	FLOAT		SIZE	5.0	1000.0	ERWS	F__
22.5.3	3254	Bres cont power	kW	FLOAT		SIZE	0.1	100.0	ERWS	F__
22.5.4	3256	Bres overload factor		FLOAT		SIZE	1.5	10.0	ERWS	F__
22.5.5	3258	Bres overload time	s	FLOAT		SIZE	0.5	50.0	ERWS	F__
22.6 - FUNCTIONS/DOUBLE PAR SET										
22.6.1	3300	Par set enable		ENUM		Disable			ERW	F__
				0	Disable					
				1	Enable					
22.6.2	3302	Par set select src		LINK L_DIGSEL2	16BIT	6000	0	16384	ERWZ	F__
22.6.3	3304	Par set select mon		ENUM	16BIT	Set 0			ER	F__
				0	Set 0					
				1	Set 1					
22.6.4	3306	Par set 0 to 1 copy		BIT		0	0	1	ERW	F__
22.7 -										
22.8 -										
22.9 - FUNCTIONS/COMPARE										
22.9.1	3650	Dig compare input 1	perc	FLOAT	32BIT	0.0	-100.0	100.0	ERW	F__
22.9.2	3652	Dig compare input 2	perc	FLOAT	32BIT	0.0	-100.0	100.0	ERW	F__
22.9.3	3660	Compare input 1 src		LINK L_CMP	32BIT	3650	0	16384	ERW	F__
22.9.4	3662	Compare input 2 src		LINK L_CMP	32BIT	3652	0	16384	ERW	F__
22.9.5	3670	Compare function		ENUM		None			ERW	F__
				0	None					
				1	Inp1=Inp2					
				2	Inp1!=Inp2					
				3	Inp1<Inp2					
				4	Inp1>Inp2					
				5	|Inp1|=|Inp2|					
				6	|Inp1|!=|Inp2|					
				7	|Inp1|<|Inp2|					
				8	|Inp1|>|Inp2|					
22.9.6	3672	Compare window	perc	FLOAT		0.0	0.0	100.0	ERW	F__

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.9.7	3674	Compare delay	s	FLOAT		0.0	0.0	30.0	ERW	F__
22.9.8	3676	Compare output		BIT	16BIT	0	0	1	ER	F__

22.10 - FUNCTIONS/PADS

22.10.1	3700	Pad 1		INT32	32BIT	0	0	0	ERW	F__
22.10.2	3702	Pad 2		INT32	32BIT	0	0	0	ERW	F__
22.10.3	3704	Pad 3		INT32	32BIT	0	0	0	ERW	F__
22.10.4	3706	Pad 4		INT32	32BIT	0	0	0	ERW	F__
22.10.5	3708	Pad 5		INT32	32BIT	0	0	0	ERW	F__
22.10.6	3710	Pad 6		INT32	32BIT	0	0	0	ERW	F__
22.10.7	3712	Pad 7		INT32	32BIT	0	0	0	ERW	F__
22.10.8	3714	Pad 8		INT32	32BIT	0	0	0	ERW	F__
22.10.9	3716	Pad 9		INT32	32BIT	0	0	0	ERW	F__
22.10.10	3718	Pad 10		INT32	32BIT	0	0	0	ERW	F__
22.10.11	3720	Pad 11		INT32	32BIT	0	0	0	ERW	F__
22.10.12	3722	Pad 12		INT32	32BIT	0	0	0	ERW	F__
22.10.13	3724	Pad 13		INT32	32BIT	0	0	0	ERW	F__
22.10.14	3726	Pad 14		INT32	32BIT	0	0	0	ERW	F__
22.10.15	3728	Pad 15		INT32	32BIT	0	0	0	ERW	F__
22.10.16	3730	Pad 16		INT32	32BIT	0	0	0	ERW	F__

22.11 - FUNCTIONS/VDC CONTROL

22.11.1	3450	Vdc control function		ENUM		Disable			ERWZ	F__
				0	Disable					
				1	Enable					
22.11.2	3470	Vdc control P gain	A/V	FLOAT		CALCF	0.0	100.000	ERWS	F__
22.11.3	3472	Vdc control I time	ms	FLOAT		CALCF	1.0	1000.0	ERWS	F__

22.12 -

22.13 - FUNCTIONS/DIMENSION FACT

22.13.1	3900	Dim factor num		UINT16		1	1	65535	ERW	F__
22.13.2	3902	Dim factor den		UINT16		1	1	65535	ERW	F__
22.13.3	3904	Dim factor text		UINT32		7172210	0	0	ERW	F__

22.14 - FUNCTIONS/CONTROL MODE

22.14.1	556	Control mode select		ENUM		Ramp			ERWZ	F__
				0	Torque					
				1	Speed					
				2	Ramp					
22.14.2	6200	Ctrl mode src		LINK	16BIT	556	0	16384	ERWZ	F__
				L_CTRLMODE						
22.14.3	6202	Ctrl mode sel 0 src		LINK	16BIT	6000	0	16384	ERWZ	F__
				L_DIGSEL2						
22.14.4	6204	Ctrl mode sel 1 src		LINK	16BIT	6000	0	16384	ERWZ	F__
				L_DIGSEL2						
22.14.5	6206	Ctrl mode sel mon		UINT32		0	0	3	ER	F__
22.14.6	6208	Ctrl mode mon		ENUM		Torque			ER	F__
				0	Torque					
				1	Speed					
				2	Ramp					

22.15 - FUNCTIONS/TEMP CONTROL

22.15.1	3500	Drv temp src		LINK	32BIT	6000	0	16384	ERW	F__
				L_TEMPCTRL						
22.15.2	3504	Drv temp thr	degC	INT32		45	1	100	ERW	F__
22.15.3	3508	Drv temp hys	degC	INT32		2	0	CALCI	ERW	F__
22.15.4	3502	Mot temp src		LINK	32BIT	6000	0	16384	ERW	F__
				L_TEMPCTRL						
22.15.5	3506	Mot temp thr	degC	INT32		45	1	100	ERW	F__
22.15.6	3510	Mot temp hys	degC	INT32		2	0	CALCI	ERW	F__

23 - COMMUNICATION

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.1 - COMMUNICATION/RS485										
23.1.1	3800	Drive address		UINT16		1	1	255	ERW	F__
23.1.2	3802	Serial baudrate		ENUM		38400			ERW	F__
				0	9600					
				1	19200					
				2	38400					
23.1.3	3810	Serial parameter		ENUM		N_8_1			ERW	F__
				0	None,8,1					
				1	None,8,2					
				2	Even,8,1					
				3	Odd,8,1					
23.1.4	3804	Serial protocol		ENUM		Modbus			ERW	F__
				0	Modbus					
				1	Jbus					
23.1.5	3806	Serial delay	ms	UINT16		0	0	1000	ERW	F__
23.1.6	3808	Serial swap data		BIT		0	0	1	ERW	F__
23.2 - COMMUNICATION/FIELDBUS CONFIG										
23.2.1	4000	Fieldbus type		ENUM		Off			RW	F__
				0	Off					
				1	CANopen					
23.2.2	4004	Fieldbus baudrate		ENUM		500k			RW	F__
				0	Auto					
				1	125k					
				2	250k					
				3	500k					
				4	1M					
23.2.3	4006	Fieldbus address		INT16		3	0	255	RW	F__
23.2.4	4010	Fieldbus M->S enable		ENUM		Enable			ERWZ	F__
				0	Disable					
				1	Enable					
23.2.5	4012	Fieldbus alarm mode		INT32		0	0	1	ERWZ	F__
23.2.6	4014	Fieldbus state		ENUM		Stop			R	F__
				0	Stop					
				1	PreOperational					
				2	Operational					
23.3 - COMMUNICATION/FIELDBUS M->S										
23.3.1	4020	Fieldbus M->S1 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.2	4022	Fieldbus M->S1 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.3	4024	Fieldbus M->S1 mon		INT32	32BIT	0	0	0	ER	F__
23.3.4	4026	Fieldbus M->S1 div		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.5	4030	Fieldbus M->S2 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.6	4032	Fieldbus M->S2 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.7	4034	Fieldbus M->S2 mon		INT32	32BIT	0	0	0	ER	F__
23.3.8	4036	Fieldbus M->S2 div		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.9	4040	Fieldbus M->S3 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.10	4042	Fieldbus M->S3 sys		ENUM		Not assigned			RW	F__

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.11	4044	Fieldbus M->S3 mon		INT32	32BIT	0	0	0	ER	F__
23.3.12	4046	Fieldbus M->S3 div		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.13	4050	Fieldbus M->S4 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.14	4052	Fieldbus M->S4 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.15	4054	Fieldbus M->S4 mon		INT32	32BIT	0	0	0	ER	F__
23.3.16	4056	Fieldbus M->S4 div		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.17	4060	Fieldbus M->S5 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.18	4062	Fieldbus M->S5 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.19	4064	Fieldbus M->S5 mon		INT32	32BIT	0	0	0	ER	F__
23.3.20	4066	Fieldbus M->S5 div		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.21	4070	Fieldbus M->S6 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.22	4072	Fieldbus M->S6 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.23	4074	Fieldbus M->S6 mon		INT32	32BIT	0	0	0	ER	F__
23.3.24	4076	Fieldbus M->S6 div		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.25	4080	Fieldbus M->S7 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.26	4082	Fieldbus M->S7 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.27	4084	Fieldbus M->S7 mon		INT32	32BIT	0	0	0	ER	F__
23.3.28	4086	Fieldbus M->S7 div		FLOAT		1.0	1.0	1000.0	ERW	F__

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.3.29	4090	Fieldbus M->S8 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.30	4092	Fieldbus M->S8 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.31	4094	Fieldbus M->S8 mon		INT32	32BIT	0	0	0	ER	F__
23.3.32	4096	Fieldbus M->S8 div		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.33	4100	Fieldbus M->S9 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.34	4102	Fieldbus M->S9 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.35	4104	Fieldbus M->S9 mon		INT32	32BIT	0	0	0	ER	F__
23.3.36	4106	Fieldbus M->S9 div		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.37	4110	Fieldbus M->S10 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.38	4112	Fieldbus M->S10 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.39	4114	Fieldbus M->S10 mon		INT32	32BIT	0	0	0	ER	F__
23.3.40	4116	Fieldbus M->S10 div		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.41	4120	Fieldbus M->S11 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.42	4122	Fieldbus M->S11 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.43	4124	Fieldbus M->S11 mon		INT32	32BIT	0	0	0	ER	F__
23.3.44	4126	Fieldbus M->S11 div		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.45	4130	Fieldbus M->S12 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.46	4132	Fieldbus M->S12 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.47	4134	Fieldbus M->S12 mon		INT32	32BIT	0	0	0	ER	F__

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
23.3.48	4136	Fieldbus M->S12 div		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.49	4140	Fieldbus M->S13 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.50	4142	Fieldbus M->S13 sys		ENUM		Not assigned			RW	
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.51	4144	Fieldbus M->S13 mon		INT32	32BIT	0	0	0	ER	F__
23.3.52	4146	Fieldbus M->S13 div		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.53	4150	Fieldbus M->S14 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.54	4152	Fieldbus M->S14 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.55	4154	Fieldbus M->S14 mon		INT32	32BIT	0	0	0	ER	F__
23.3.56	4156	Fieldbus M->S14 div		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.57	4160	Fieldbus M->S15 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.58	4162	Fieldbus M->S15 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.59	4164	Fieldbus M->S15 mon		INT32	32BIT	0	0	0	ER	F__
23.3.60	4166	Fieldbus M->S15 div		FLOAT		1.0	1.0	1000.0	ERW	F__
23.3.61	4170	Fieldbus M->S16 ipa		FBM2SIPA		0	0	20000	RW	F__
23.3.62	4172	Fieldbus M->S16 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.3.63	4174	Fieldbus M->S16 mon		INT32	32BIT	0	0	0	ER	F__
23.3.64	4176	Fieldbus M->S16 div		FLOAT		1.0	1.0	1000.0	ERW	F__

23.4 - COMMUNICATION/FIELDBUS S->M

23.4.1	4180	Fieldbus S->M1 ipa		FBS2MIPA		0	0	20000	RW	
23.4.2	4182	Fieldbus S->M1 sys		ENUM		Not assigned			RW	
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.3	4184	Dig Fieldbus S->M1		INT32	16BIT	0	0	0	ERW	F__
23.4.4	4186	Fieldbus S->M1 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.5	4190	Fieldbus S->M2 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.6	4192	Fieldbus S->M2 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.7	4194	Dig Fieldbus S->M2		INT32	16BIT	0	0	0	ERW	F__
23.4.8	4196	Fieldbus S->M2 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.9	4200	Fieldbus S->M3 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.10	4202	Fieldbus S->M3 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.11	4204	Dig Fieldbus S->M3		INT32	16BIT	0	0	0	ERW	F__
23.4.12	4206	Fieldbus S->M3 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.13	4210	Fieldbus S->M4 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.14	4212	Fieldbus S->M4 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.15	4214	Dig Fieldbus S->M4		INT32	16BIT	0	0	0	ERW	F__
23.4.16	4216	Fieldbus S->M4 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.17	4220	Fieldbus S->M5 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.18	4222	Fieldbus S->M5 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.19	4224	Dig Fieldbus S->M5		INT32	16BIT	0	0	0	ERW	F__
23.4.20	4226	Fieldbus S->M5 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.21	4230	Fieldbus S->M6 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.22	4232	Fieldbus S->M6 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.23	4234	Dig Fieldbus S->M6		INT32	16BIT	0	0	0	ERW	F__
23.4.24	4236	Fieldbus S->M6 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.25	4240	Fieldbus S->M7 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.26	4242	Fieldbus S->M7 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.27	4244	Dig Fieldbus S->M7		INT32	16BIT	0	0	0	ERW	F__
23.4.28	4246	Fieldbus S->M7 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.29	4250	Fieldbus S->M8 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.30	4252	Fieldbus S->M8 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.31	4254	Dig Fieldbus S->M8		INT32	16BIT	0	0	0	ERW	F__
23.4.32	4256	Fieldbus S->M8 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.33	4260	Fieldbus S->M9 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.34	4262	Fieldbus S->M9 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.35	4264	Dig Fieldbus S->M9		INT32	16BIT	0	0	0	ERW	F__
23.4.36	4266	Fieldbus S->M9 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.37	4270	Fieldbus S->M10 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.38	4272	Fieldbus S->M10 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.39	4274	Dig Fieldbus S->M10		INT32	16BIT	0	0	0	ERW	F__
23.4.40	4276	Fieldbus S->M10 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.41	4280	Fieldbus S->M11 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.42	4282	Fieldbus S->M11 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.43	4284	Dig Fieldbus S->M11		INT32	16BIT	0	0	0	ERW	F__
23.4.44	4286	Fieldbus S->M11 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.45	4290	Fieldbus S->M12 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.46	4292	Fieldbus S->M12 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.47	4294	Dig Fieldbus S->M12		INT32	16BIT	0	0	0	ERW	F__
23.4.48	4296	Fieldbus S->M12 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.49	4300	Fieldbus S->M13 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.50	4302	Fieldbus S->M13 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.51	4304	Dig Fieldbus S->M13		INT32	16BIT	0	0	0	ERW	F__
23.4.52	4306	Fieldbus S->M13 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.53	4310	Fieldbus S->M14 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.54	4312	Fieldbus S->M14 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.55	4314	Dig Fieldbus S->M14		INT32	16BIT	0	0	0	ERW	F__
23.4.56	4316	Fieldbus S->M14 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.57	4320	Fieldbus S->M15 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.58	4322	Fieldbus S->M15 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.59	4324	Dig Fieldbus S->M15		INT32	16BIT	0	0	0	ERW	F__
23.4.60	4326	Fieldbus S->M15 mul		FLOAT		1.0	1.0	1000.0	ERW	F__
23.4.61	4330	Fieldbus S->M16 ipa		FBS2MIPA		0	0	20000	RW	F__
23.4.62	4332	Fieldbus S->M16 sys		ENUM		Not assigned			RW	F__
				0	Not assigned					
				1	Count 16					

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
				2	Count 32					
				3	Fill 16					
				4	Fill 32					
				5	Mdplc 16					
				6	Mdplc 32					
				7	Eu					
				8	Eu float					
				9	Par 16					
				10	Par 32					
23.4.63	4334	Dig Fieldbus S->M16		INT32	16BIT	0	0	0	ERW	F__
23.4.64	4336	Fieldbus S->M16 mul		FLOAT		1.0	1.0	1000.0	ERW	F__

23.5 - COMMUNICATION/WORD COMP

23.5.1	4400	Word bit0 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.2	4402	Word bit1 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.3	4404	Word bit2 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.4	4406	Word bit3 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.5	4408	Word bit4 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.6	4410	Word bit5 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.7	4412	Word bit6 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.8	4414	Word bit7 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.9	4416	Word bit8 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.10	4418	Word bit9 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.11	4420	Word bit10 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.12	4422	Word bit11 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.13	4424	Word bit12 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.14	4426	Word bit13 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.15	4428	Word bit14 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.16	4430	Word bit15 src		LINK L_DIGSEL1	16BIT	6000	0	16384	ERW	F__
23.5.17	4432	Word comp mon		UINT32	16BIT	0	0	0	ER	F__

23.6 - COMMUNICATION/WORD DECOMP

23.6.1	4450	Dig word decomp		UINT32	16BIT	0	0	0	ERW	F__
23.6.2	4452	Word decomp src		LINK L_WDECOMP	16BIT	4450	0	16384	ERW	F__
23.6.3	4454	Bit0 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.4	4456	Bit1 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.5	4458	Bit2 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.6	4460	Bit3 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.7	4462	Bit4 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.8	4464	Bit5 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.9	4466	Bit6 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.10	4468	Bit7 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.11	4470	Bit8 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.12	4472	Bit9 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.13	4474	Bit10 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.14	4476	Bit11 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.15	4478	Bit12 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.16	4480	Bit13 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.17	4482	Bit14 decomp mon		BIT	16BIT	0	0	1	ER	F__
23.6.18	4484	Bit15 decomp mon		BIT	16BIT	0	0	1	ER	F__

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24 - ALARM CONFIG										
24.1	4500	Fault reset src		LINK	16BIT	1218	0	16384	RW	F__
				L_DIGSEL2						
24.2	4502	ExtFlt src		LINK	16BIT	6000	0	16384	RW	F__
				L_DIGSEL2						
24.3	4504	ExtFlt activity		ENUM		Disable			RW	F__
				0	Ignore					
				1	Warning					
				2	Disable					
				3	Stop					
				4	Fast stop					
24.4	4506	ExtFlt restart		ENUM		Disable			RW	F__
				0	Disable					
				1	Enable					
24.5	4508	ExtFlt restart time	ms	UINT16		1000	120	30000	RW	F__
24.6	4510	ExtFlt holdoff	ms	UINT16		0	0	10000	RW	F__
24.7	4516	MotorOT pre activity		ENUM		Ignore			ERW	F__
				0	Ignore					
				1	Warning					
				2	Disable					
				3	Stop					
				4	Fast stop					
24.8	4518	MotorOT pre thr	perc	UINT16		60	0	100	ERW	F__
24.9	4520	MotorOT src		LINK	16BIT	6000	0	16384	RW	F__
				L_DIGSEL2						
24.10	4522	MotorOT activity		ENUM		Disable			RW	F__
				0	Ignore					
				1	Warning					
				2	Disable					
				3	Stop					
				4	Fast stop					
24.11	4524	MotorOT restart		ENUM		Disable			RW	F__
				0	Disable					
				1	Enable					
24.12	4526	MotorOT restart time	ms	UINT16		1000	120	30000	RW	F__
24.13	4528	MotorOT holdoff	ms	UINT16		1000	0	30000	RW	F__
24.14	4530	MotorOT probe		ENUM		MotorOT Sensor			ERW	F__
				0	SRC					
				9	MotorOT Sensor					
24.15	4532	MotorOT thr	cnt	UINT16		0	0	32767	ERW	F__
24.16	4536	MotorOT mon	cnt	INT16		0	0	32767	ER	F__
24.17	4538	MotorOT Sensor		ENUM		NC contact	0	4	ERW	F__
				0	None					
				1	PTC					
				2	NC contact					
				3	KTY84					
				4	PT1000					
24.18	4540	Overspeed threshold	rpm	INT32		CALCI	0	CALCI	RW	F__
24.19	4542	Overspeed activity		ENUM		Disable			RW	F__
				0	Ignore					
				1	Warning					
				2	Disable					
				3	Stop					
				4	Fast stop					
24.20	4544	Overspeed holdoff	ms	UINT16		0	0	5000	RW	F__
24.21	4550	SpdRefLoss threshold	rpm	INT16		100	0	CALCI	RW	F__
24.22	4552	SpdRefLoss activity		ENUM		Ignore			RW	F__
				0	Ignore					
				1	Warning					
				2	Disable					
				3	Stop					
				4	Fast stop					
24.23	4554	SpdRefLoss holdoff	ms	UINT16		1000	0	10000	RW	F__
24.24	4556	SpdRefLoss max spdOL	rpm	INT16		CALCI	0	CALCI	RW	F__
24.25	4560	SpdFbkLoss activity		ENUM		Disable			RW	F__
				0	Ignore					
				1	Warning					
				2	Disable					
				3	Stop					
				4	Fast stop					
24.26	4562	SpdFbkLoss holdoff	ms	UINT16		200	0	10000	RW	F__
24.27	4564	SpdFbkLoss threshold	rpm	INT16		100	5	CALCI	RW	F__

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
24.28	4570	Drive ovld activity		ENUM		Ignore			ERW	F__
				0	Ignore					
				1	Warning					
				2	Disable					
				3	Stop					
				4	Fast stop					
24.29	4572	Motor ovld activity		ENUM		Warning			ERW	F__
				0	Ignore					
				1	Warning					
				2	Disable					
				3	Stop					
				4	Fast stop					
24.30	4574	Bres ovld activity		ENUM		Disable			ERW	F__
				0	Ignore					
				1	Warning					
				2	Disable					
				3	Stop					
				4	Fast stop					
24.31	4582	HTsens restart		ENUM		Disable			ERW	F__
				0	Disable					
				1	Enable					
24.32	4584	HTsens restart time	ms	UINT16		20000	120	60000	ERW	F__
24.33	4600	InAir activity		ENUM		Stop			ERW	F__
				0	Ignore					
				1	Warning					
				2	Disable					
				3	Stop					
				4	Fast stop					
24.34	4602	InAir restart		ENUM		Disable			ERW	F__
				0	Disable					
				1	Enable					
24.35	4604	InAir restart time	ms	UINT16		1000	120	30000	ERW	F__
24.36	4606	InAir holdoff	ms	UINT16		10000	0	30000	ERW	F__
24.37	4610	Desat restart		ENUM		Disable			ERW	F__
				0	Disable					
				1	Enable					
24.38	4612	Desat restart time	ms	UINT16		2000	1000	10000	ERW	F__
24.39	4620	IOverC restart		ENUM		Disable			ERW	F__
				0	Disable					
				1	Enable					
24.40	4622	IOverC restart time	ms	UINT16		2000	1000	10000	ERW	F__
24.41	4630	OverV restart		ENUM		Disable			ERW	F__
				0	Disable					
				1	Enable					
24.42	4632	OverV restart time	ms	UINT16		2000	1000	10000	ERW	F__
24.43	4640	UnderV restart		ENUM		Enable			ERW	F__
				0	Disable					
				1	Enable					
24.44	4642	UnderV restart time	ms	UINT16		1000	120	10000	ERW	F__
24.45	4650	UVRep attempts		UINT16		5	0	1000	ERW	F__
24.46	4652	UVRep delay	s	UINT16		240	0	300	ERW	F__
24.47	4660	PhLoss activity		ENUM		Disable			ERW	F__
				0	Ignore					
				1	Warning					
				2	Disable					
				3	Stop					
				4	Fast stop					
24.48	4662	PhLoss restart		ENUM		Disable			ERW	F__
				0	Disable					
				1	Enable					
24.49	4664	PhLoss restart time	ms	UINT16		1000	120	10000	ERW	F__
24.50	4670	Optionbus activity		ENUM		Disable			ERW	F__
				0	Ignore					
				1	Warning					
				2	Disable					
				3	Stop					
				4	Fast stop					
24.51	4672	Optbus fault en src		LINK	16BIT	6002	0	16384	ERW	F__
				L_DIGSEL1						
24.52	4680	GroundFault thr	perc	FLOAT		10.0	0.0	150.0	ERWS	F__
24.53	4654	Mot PhLoss activity		ENUM		Ignore			ERW	F__
				0	Ignore					
				1	Warning					

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
				2	Disable					
				3	Stop					
				4	Fast stop					
24.54	4656	Mot PhLoss holdoff	ms	UINT16		800	800	10000	ERW	F__
24.55	4658	Mot PhLoss threshold	A	FLOAT		CALCF	0.0	CALCF	ERW	F__
24.56	4674	Mot PhLoss min speed	rpm	INT16		30	10	32000	ERW	F__
24.57	4700	Alarm dig sel 1		ENUM		No alarm			ERW	F__
				0	No alarm					
				1	Overvoltage					
				2	Undervoltage					
				3	Ground fault					
				4	Overcurrent					
				5	Desaturation					
				6	MultiUndervolt					
				7	MultiOvercurr					
				8	MultiDesat					
				9	Heatsink OT					
				10	HeatsinkS OTUT					
				11	Intakeair OT					
				12	Motor OT					
				13	Drive overload					
				14	Motor overload					
				15	Bres overload					
				16	Phaseloss					
				17	Opt Bus fault					
				18	Opt 1 IO fault					
				19	Opt 2 IO fault					
				20	Opt Enc fault					
				21	External fault					
				22	Speed fbk loss					
				23	Overspeed					
				24	Speed ref loss					
				25	Emg stop alarm					
				26	Power down					
				27	ExtIO fault					
				28	FastLink fault					
				29	Brake fault					
				30	Motor pre OT					
				31	Mot phase loss					
				32	Not Used2					
				33	Plc1 fault					
				34	Plc2 fault					
				35	Plc3 fault					
				36	Plc4 fault					
				37	Plc5 fault					
				38	Plc6 fault					
				39	Plc7 fault					
				40	Plc8 fault					
				41	Watchdog					
				42	Trap error					
				43	System error					
				44	User error					
				45	Param error					
				46	Load def par					
				47	Plc cfg error					
				48	Load def plc					
				49	Key failed					
				50	Encoder error					
				51	Opt cfg change					
				52	Power config					
				53	Plc9 fault					
				54	Plc10 fault					
				55	Plc11 fault					
				56	Plc12 fault					
				57	Plc13 fault					
				58	Plc14 fault					
				59	Plc15 fault					
				60	Plc16 fault					
24.58	4702	Alarm dig sel 2		ENUM		No alarm			ERW	F__
				0	No alarm					
				1	Overvoltage					
				2	Undervoltage					
				3	Ground fault					
				4	Overcurrent					
				5	Desaturation					
				6	MultiUndervolt					

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
				7	MultiOvercurr					
				8	MultiDesat					
				9	Heatsink OT					
				10	HeatsinkS OTUT					
				11	Intakeair OT					
				12	Motor OT					
				13	Drive overload					
				14	Motor overload					
				15	Bres overload					
				16	Phaseloss					
				17	Opt Bus fault					
				18	Opt 1 IO fault					
				19	Opt 2 IO fault					
				20	Opt Enc fault					
				21	External fault					
				22	Speed fbk loss					
				23	Overspeed					
				24	Speed ref loss					
				25	Emg stop alarm					
				26	Power down					
				27	ExtIO fault					
				28	FastLink fault					
				29	Brake fault					
				30	Motor pre OT					
				31	Mot phase loss					
				32	Not Used2					
				33	Plc1 fault					
				34	Plc2 fault					
				35	Plc3 fault					
				36	Plc4 fault					
				37	Plc5 fault					
				38	Plc6 fault					
				39	Plc7 fault					
				40	Plc8 fault					
				41	Watchdog					
				42	Trap error					
				43	System error					
				44	User error					
				45	Param error					
				46	Load def par					
				47	Plc cfg error					
				48	Load def plc					
				49	Key failed					
				50	Encoder error					
				51	Opt cfg change					
				52	Power config					
				53	Plc9 fault					
				54	Plc10 fault					
				55	Plc11 fault					
				56	Plc12 fault					
				57	Plc13 fault					
				58	Plc14 fault					
				59	Plc15 fault					
				60	Plc16 fault					
24.59	4704	Alarm dig sel 3		ENUM		No alarm			ERW	F__
				0	No alarm					
				1	Overvoltage					
				2	Undervoltage					
				3	Ground fault					
				4	Overcurrent					
				5	Desaturation					
				6	MultiUndervolt					
				7	MultiOvercurr					
				8	MultiDesat					
				9	Heatsink OT					
				10	HeatsinkS OTUT					
				11	Intakeair OT					
				12	Motor OT					
				13	Drive overload					
				14	Motor overload					
				15	Bres overload					
				16	Phaseloss					
				17	Opt Bus fault					
				18	Opt 1 IO fault					
				19	Opt 2 IO fault					
				20	Opt Enc fault					

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
				21	External fault					
				22	Speed fbk loss					
				23	Overspeed					
				24	Speed ref loss					
				25	Emg stop alarm					
				26	Power down					
				27	ExtIO fault					
				28	FastLink fault					
				29	Brake fault					
				30	Motor pre OT					
				31	Mot phase loss					
				32	Not Used2					
				33	Plc1 fault					
				34	Plc2 fault					
				35	Plc3 fault					
				36	Plc4 fault					
				37	Plc5 fault					
				38	Plc6 fault					
				39	Plc7 fault					
				40	Plc8 fault					
				41	Watchdog					
				42	Trap error					
				43	System error					
				44	User error					
				45	Param error					
				46	Load def par					
				47	Plc cfg error					
				48	Load def plc					
				49	Key failed					
				50	Encoder error					
				51	Opt cfg change					
				52	Power config					
				53	Plc9 fault					
				54	Plc10 fault					
				55	Plc11 fault					
				56	Plc12 fault					
				57	Plc13 fault					
				58	Plc14 fault					
				59	Plc15 fault					
				60	Plc16 fault					
24.60	4706	Alarm dig sel 4		ENUM		No alarm			ERW	F__
				0	No alarm					
				1	Overvoltage					
				2	Undervoltage					
				3	Ground fault					
				4	Overcurrent					
				5	Desaturation					
				6	MultiUndervolt					
				7	MultiOvercurr					
				8	MultiDesat					
				9	Heatsink OT					
				10	HeatsinkS OTUT					
				11	Intakeair OT					
				12	Motor OT					
				13	Drive overload					
				14	Motor overload					
				15	Bres overload					
				16	Phaseloss					
				17	Opt Bus fault					
				18	Opt 1 IO fault					
				19	Opt 2 IO fault					
				20	Opt Enc fault					
				21	External fault					
				22	Speed fbk loss					
				23	Overspeed					
				24	Speed ref loss					
				25	Emg stop alarm					
				26	Power down					
				27	ExtIO fault					
				28	FastLink fault					
				29	Brake fault					
				30	Motor pre OT					
				31	Mot phase loss					
				32	Not Used2					
				33	Plc1 fault					
				34	Plc2 fault					

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
					35	Plc3 fault				
					36	Plc4 fault				
					37	Plc5 fault				
					38	Plc6 fault				
					39	Plc7 fault				
					40	Plc8 fault				
					41	Watchdog				
					42	Trap error				
					43	System error				
					44	User error				
					45	Param error				
					46	Load def par				
					47	Plc cfg error				
					48	Load def plc				
					49	Key failed				
					50	Encoder error				
					51	Opt cfg change				
					52	Power config				
					53	Plc9 fault				
					54	Plc10 fault				
					55	Plc11 fault				
					56	Plc12 fault				
					57	Plc13 fault				
					58	Plc14 fault				
					59	Plc15 fault				
					60	Plc16 fault				
24.61	4720	Alm autoreset time	s	FLOAT		0.0	0.0	60.0	ERW	F__
24.62	4722	Alm autoreset number		UINT16		20	0	100	ERW	F__

25 - ALARM LOG

26 - APPLICATION

27 - SERVICE

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
PARAMETERS NOT PRESENT ON MENU										
-	262	Motor speed nofilter	FF	INT16	16BIT	0	0	0	ER	
-	362	Drive overload trip		BIT	16BIT	0	0	1	ER	
-	366	Drive overload 80%		BIT	16BIT	0	0	1	ER	
-	626	Ramp ref out mon	FF	INT16	16BIT	0	0	0	ER	
-	760	Ramp out mon	FF	INT16	16BIT	0	0	0	ER	
-	764	Ramp acc state		BIT	16BIT	0	0	1	ER	
-	766	Ramp dec state		BIT	16BIT	0	0	1	ER	
-	934	Ref is 0		BIT	16BIT	0	0	1	ER	
-	936	Ref is 0 delay		BIT	16BIT	0	0	1	ER	
-	944	Speed is 0		BIT	16BIT	0	0	1	ER	
-	946	Speed is 0 delay		BIT	16BIT	0	0	1	ER	
-	956	Speed thr 1_2 mon		BIT	16BIT	0	0	1	ER	
-	966	Set speed		BIT	16BIT	0	0	1	ER	
-	976	Speed thr 3 mon		BIT	16BIT	0	0	1	ER	
-	986	Current thr mon		BIT	16BIT	0	0	1	ER	
-	1030	Local/remote mon		BIT	16BIT	0	0	1	ER	
-	1060	Sequencer status		UINT16	16BIT	0	0	0	ER	
-	1062	Drive OK		BIT	16BIT	0	0	1	ER	
-	1064	Drive ready		BIT	16BIT	0	0	1	ER	
-	1110	Digital input E mon		BIT	16BIT	0	0	1	ER	
-	1210	Digital input 1X mon		BIT	16BIT	0	0	1	ER	
-	1212	Digital input 2X mon		BIT	16BIT	0	0	1	ER	
-	1214	Digital input 3X mon		BIT	16BIT	0	0	1	ER	
-	1216	Digital input 4X mon		BIT	16BIT	0	0	1	ER	
-	1218	Digital input 5X mon		BIT	16BIT	0	0	1	ER	
-	1220	Digital input 6X mon		BIT	16BIT	0	0	1	ER	
-	1222	Digital input 7X mon		BIT	16BIT	0	0	1	ER	
-	1224	Digital input 8X mon		BIT	16BIT	0	0	1	ER	
-	1530	Analog inp1		BIT	16BIT	0	0	1	ER	
-	2388	Torque ref nofilter	perc	FLOAT	16BIT	0.0	0.0	0.0	ER	
-	2396	Torque nofilter	perc	FLOAT	16BIT	0.0	0.0	0.0	ER	
-	3006	Speed ratio out mon	rpm	INT16	16BIT	0	0	0	ER	
-	3180	Brake control mon		BIT	16BIT	0	0	1	ER	
-	3192	Brake open thr mon	perc	FLOAT		0.0	0.0	0.0	ERS	
-	3214	Motor overload trip		BIT	16BIT	0	0	1	ER	
-	3262	Bres overload trip		BIT	16BIT	0	0	1	ER	
-	3442	Powerloss rampdown		BIT	16BIT	0	0	1	ER	
-	3446	Powerloss nextratio		INT32	32BIT	0	0	0	ER	
-	3448	Powerloss nextactive		BIT	16BIT	0	0	1	ER	
-	3480	Vdc ctrl ramp freeze		BIT	16BIT	0	0	1	ER	
-	3512	Drv thr overtemp mon		UINT32		0	0	0	ER	
-	3514	Mot thr overtemp mon		UINT32		0	0	0	ER	
-	4708	Alm dig out mon 1		BIT	16BIT	0	0	1	ER	
-	4710	Alm dig out mon 2		BIT	16BIT	0	0	1	ER	
-	4712	Alm dig out mon 3		BIT	16BIT	0	0	1	ER	
-	4714	Alm dig out mon 4		BIT	16BIT	0	0	1	ER	
-	4770	First alarm		UINT32	16BIT	0	0	0	ERW	
-	4780	Alarm PLC		UINT16		0	0	0	ER	
-	4840	Alarm lo state		UINT32	32BIT	0	0	0	ER	
-	4842	Alarm hi state		UINT32	32BIT	0	0	0	ER	
-	5510	Digital input 9X mon		BIT	16BIT	0	0	1	ER	
-	5512	Digital input10X mon		BIT	16BIT	0	0	1	ER	
-	5514	Digital input11X mon		BIT	16BIT	0	0	1	ER	
-	5516	Digital input12X mon		BIT	16BIT	0	0	1	ER	
-	5518	Digital input13X mon		BIT	16BIT	0	0	1	ER	
-	5520	Digital input14X mon		BIT	16BIT	0	0	1	ER	
-	5522	Digital input15X mon		BIT	16BIT	0	0	1	ER	
-	5524	Digital input16X mon		BIT	16BIT	0	0	1	ER	
-	6000	Null		UINT32	32BIT	0	0	0	ER	
-	6002	One		UINT32	32BIT	1	1	1	ER	
-	6004	Speed limit state		BIT	16BIT	0	0	1	ER	
-	6006	Current limit state		BIT	16BIT	0	0	1	ER	

L_ANOUT

PAR	Description	Menu
6000	Null	(*)
626	Ramp ref out mon	(*)
628	Ramp setpoint	1.5
760	Ramp out mon	(*)
664	Speed setpoint	1.6
260	Motor speed	1.7
262	Motor speed nofilter	(*)
2150	Encoder 1 speed	17.19
250	Output current	1.1
252	Output voltage	1.2
254	Output frequency	1.3
256	Output power	1.4
280	Torque current ref	1.11
282	Magnet current ref	1.12
284	Torque current	1.13
286	Magnet current	1.14
2360	Torque lim Pos Inuse	20.9
2362	Torque lim Neg Inuse	20.10
2386	Torque ref %	20.18
2388	Torque ref nofilter	(*)
2394	Torque %	20.20
2396	Torque nofilter	(*)
270	DC link voltage	1.8
3006	Speed ratio out mon	(*)
3070	Droop out mon	22.2.5
852	Multi ref out mon	7.24
870	Mpot setpoint	8.1
894	Mpot output mon	8.13
920	Jog output mon	9.6
3104	Inertia comp mon	22.3.3
1500	Analog input 1 mon	14.1
1544	An inp 1 der mon	(*)
1600	Analog input 1X mon	14.19
1650	Analog input 2X mon	14.32
368	Drive overload accum	1.16
370	Drive ovl fst accum	1.17
372	Drive overload limit	1.18
3212	Motor overload accum	1.15
3260	Bres overload accum	1.19
2232	Spd reg P gain Inuse	18.11
2234	Spd reg I gain Inuse	18.12
2246	Speed reg P factor	18.16
2248	Speed reg I factor	18.17
3446	Powerloss nextratio	(*)
4024	Fieldbus M->S1 mon	23.3.3
4034	Fieldbus M->S2 mon	23.3.7
4044	Fieldbus M->S3 mon	23.3.11
4054	Fieldbus M->S4 mon	23.3.15
4064	Fieldbus M->S5 mon	23.3.19
4074	Fieldbus M->S6 mon	23.3.23
4084	Fieldbus M->S7 mon	23.3.27
4094	Fieldbus M->S8 mon	23.3.31
4104	Fieldbus M->S9 mon	23.3.35
4114	Fieldbus M->S10 mon	23.3.39
4124	Fieldbus M->S11 mon	23.3.43
4134	Fieldbus M->S12 mon	23.3.47
4144	Fieldbus M->S13 mon	23.3.51
4154	Fieldbus M->S14 mon	23.3.55
4164	Fieldbus M->S15 mon	23.3.59
4174	Fieldbus M->S16 mon	23.3.63
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
5008	Test gen out	27.2.5
2346	Torque current ref 1	20.15

L_CMP

XXXX	*(1)*	
626	Ramp ref out mon	(*)
628	Ramp setpoint	1.5
760	Ramp out mon	(*)
664	Speed setpoint	1.6
260	Motor speed	1.7
262	Motor speed nofilter	(*)
2150	Encoder 1 speed	17.19
250	Output current	1.1
252	Output voltage	1.2
254	Output frequency	1.3
256	Output power	1.4
280	Torque current ref	1.11
282	Magnet current ref	1.12
284	Torque current	1.13
286	Magnet current	1.14
2386	Torque ref %	20.18
2388	Torque ref nofilter	(*)
2394	Torque %	20.20
2396	Torque nofilter	(*)
270	DC link voltage	1.8
3006	Speed ratio out mon	(*)
3070	Droop out mon	22.2.5
852	Multi ref out mon	7.24
870	Mpot setpoint	8.1
894	Mpot output mon	8.13
920	Jog output mon	9.6
1500	Analog input 1 mon	14.1
1544	An inp 1 der mon	(*)
1600	Analog input 1X mon	14.19
1650	Analog input 2X mon	14.32
368	Drive overload accum	1.16
370	Drive ovl fst accum	1.17
372	Drive overload limit	1.18
3212	Motor overload accum	1.15
3260	Bres overload accum	1.19
4024	Fieldbus M->S1 mon	23.3.3
4034	Fieldbus M->S2 mon	23.3.7
4044	Fieldbus M->S3 mon	23.3.11
4054	Fieldbus M->S4 mon	23.3.15
4064	Fieldbus M->S5 mon	23.3.19
4074	Fieldbus M->S6 mon	23.3.23
4084	Fieldbus M->S7 mon	23.3.27
4094	Fieldbus M->S8 mon	23.3.31
4104	Fieldbus M->S9 mon	23.3.35
4114	Fieldbus M->S10 mon	23.3.39
4124	Fieldbus M->S11 mon	23.3.43
4134	Fieldbus M->S12 mon	23.3.47
4144	Fieldbus M->S13 mon	23.3.51
4154	Fieldbus M->S14 mon	23.3.55
4164	Fieldbus M->S15 mon	23.3.59
4174	Fieldbus M->S16 mon	23.3.63
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
2346	Torque current ref 1	20.15

(1) the XXXX parameter changes according to the src parameter used:

960 Set speed ref src
(1) = 968 Dig set speed ref 10.11

3660 Compare input 1 src
(1) = 3650 Dig compare input 1 22.9.1

3662 Compare input 2 src
(1) = 3652 Dig compare input 2 22.9.2

L_CTRLMODE

XXXX	*(2)*	
6206	Ctrl mode sel mon	22.14.5
4024	Fieldbus M->S1 mon	23.3.3
4034	Fieldbus M->S2 mon	23.3.7
4044	Fieldbus M->S3 mon	23.3.11
4054	Fieldbus M->S4 mon	23.3.15
4064	Fieldbus M->S5 mon	23.3.19
4074	Fieldbus M->S6 mon	23.3.23
4084	Fieldbus M->S7 mon	23.3.27
4094	Fieldbus M->S8 mon	23.3.31
4104	Fieldbus M->S9 mon	23.3.35
4114	Fieldbus M->S10 mon	23.3.39
4124	Fieldbus M->S11 mon	23.3.43
4134	Fieldbus M->S12 mon	23.3.47
4144	Fieldbus M->S13 mon	23.3.51
4154	Fieldbus M->S14 mon	23.3.55
4164	Fieldbus M->S15 mon	23.3.59
4174	Fieldbus M->S16 mon	23.3.63
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4

PAR	Description	Menu
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16

(2) the XXXX parameter changes according to the src parameter used:

6200 Ctrl mode src
(2) = 556 Control mode select 22.14.1

L_DIGSEL1

6000	Null	(*)
6002	One	(*)
1110	Digital input E mon	(*)
1210	Digital input 1X mon	(*)
1212	Digital input 2X mon	(*)
1214	Digital input 3X mon	(*)
1216	Digital input 4X mon	(*)
1218	Digital input 5X mon	(*)
1220	Digital input 6X mon	(*)
1222	Digital input 7X mon	(*)
1224	Digital input 8X mon	(*)
5510	Digital input 9X mon	(*)
5512	Digital input10X mon	(*)
5514	Digital input11X mon	(*)
5516	Digital input12X mon	(*)
5518	Digital input13X mon	(*)
5520	Digital input14X mon	(*)
5522	Digital input15X mon	(*)
5524	Digital input16X mon	(*)
1062	Drive OK	(*)
1064	Drive ready	(*)
934	Ref is 0	(*)
936	Ref is 0 delay	(*)
944	Speed is 0	(*)
946	Speed is 0 delay	(*)
956	Speed thr 1_2 mon	(*)
966	Set speed	(*)
976	Speed thr 3 mon	(*)
986	Current thr mon	(*)
1066	Enable state mon	1.20
1068	Start state mon	1.21
1070	FastStop state mon	1.22
1024	Enable cmd mon	11.13
1026	Start cmd mon	11.14
1028	FastStop cmd mon	11.15
1034	Drv interlock mon	11.24
4708	Alm dig out mon 1	(*)
4710	Alm dig out mon 2	(*)
4712	Alm dig out mon 3	(*)
4714	Alm dig out mon 4	(*)
1530	Analog inp1<thr	(*)
1540	An inp 1 err mon	14.18
362	Drive overload trip	(*)
3214	Motor overload trip	(*)
3262	Bres overload trip	(*)
366	Drive overload 80%	(*)
1048	FR start mon	11.20
1050	FR reverse mon	11.21
4454	Bit0 decomp mon	23.6.3
4456	Bit1 decomp mon	23.6.4
4458	Bit2 decomp mon	23.6.5
4460	Bit3 decomp mon	23.6.6
4462	Bit4 decomp mon	23.6.7
4464	Bit5 decomp mon	23.6.8
4466	Bit6 decomp mon	23.6.9
4468	Bit7 decomp mon	23.6.10
4470	Bit8 decomp mon	23.6.11
4472	Bit9 decomp mon	23.6.12
4474	Bit10 decomp mon	23.6.13
4476	Bit11 decomp mon	23.6.14
4478	Bit12 decomp mon	23.6.15
4480	Bit13 decomp mon	23.6.16
4482	Bit14 decomp mon	23.6.17
4484	Bit15 decomp mon	23.6.18
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
6004	Speed limit state	(*)
6006	Current limit state	(*)
764	Ramp acc state	(*)
766	Ramp dec state	(*)
1640	An inp 1X err mon	14.31
1690	An inp 2X err mon	14.44
1030	Local/remote mon	(*)
4780	Alarm PLC	(*)
3676	Compare output	22.9.8
3442	Powerloss rampdown	(*)
3448	Powerloss nextactive	(*)
3180	Brake control mon	(*)
3304	Par set select mon	22.6.3
3512	Drv thr overtemp mon	(*)
3514	Mot thr overtemp mon	(*)

L_DIGSEL2

6000	Null	(*)
6002	One	(*)
1110	Digital input E mon	(*)
1210	Digital input 1X mon	(*)
1212	Digital input 2X mon	(*)
1214	Digital input 3X mon	(*)
1216	Digital input 4X mon	(*)
1218	Digital input 5X mon	(*)
1220	Digital input 6X mon	(*)
1222	Digital input 7X mon	(*)
1224	Digital input 8X mon	(*)
5510	Digital input 9X mon	(*)
5512	Digital input10X mon	(*)
5514	Digital input11X mon	(*)
5516	Digital input12X mon	(*)
5518	Digital input13X mon	(*)
5520	Digital input14X mon	(*)
5522	Digital input15X mon	(*)
5524	Digital input16X mon	(*)
4454	Bit0 decomp mon	23.6.3
4456	Bit1 decomp mon	23.6.4
4458	Bit2 decomp mon	23.6.5
4460	Bit3 decomp mon	23.6.6
4462	Bit4 decomp mon	23.6.7
4464	Bit5 decomp mon	23.6.8
4466	Bit6 decomp mon	23.6.9
4468	Bit7 decomp mon	23.6.10
4470	Bit8 decomp mon	23.6.11
4472	Bit9 decomp mon	23.6.12
4474	Bit10 decomp mon	23.6.13
4476	Bit11 decomp mon	23.6.14
4478	Bit12 decomp mon	23.6.15
4480	Bit13 decomp mon	23.6.16
4482	Bit14 decomp mon	23.6.17
4484	Bit15 decomp mon	23.6.18
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
1530	Analog inp1<thr	(*)
1540	An inp 1 err mon	14.18
1048	FR start mon	11.20
1050	FR reverse mon	11.21
1640	An inp 1X err mon	14.31
1690	An inp 2X err mon	14.44
3676	Compare output	22.9.8
3480	Vdc ctrl ramp freeze	(*)

L_DIGSEL3

XXXX (3)

6000	Null	(*)
6002	One	(*)
1110	Digital input E mon	(*)
1210	Digital input 1X mon	(*)
1212	Digital input 2X mon	(*)
1214	Digital input 3X mon	(*)
1216	Digital input 4X mon	(*)

PAR	Description	Menu
1218	Digital input 5X mon	(*)
1220	Digital input 6X mon	(*)
1222	Digital input 7X mon	(*)
1224	Digital input 8X mon	(*)
5510	Digital input 9X mon	(*)
5512	Digital input10X mon	(*)
5514	Digital input11X mon	(*)
5516	Digital input12X mon	(*)
5518	Digital input13X mon	(*)
5520	Digital input14X mon	(*)
5522	Digital input15X mon	(*)
5524	Digital input16X mon	(*)
1062	Drive OK	(*)
1064	Drive ready	(*)
934	Ref is 0	(*)
936	Ref is 0 delay	(*)
944	Speed is 0	(*)
946	Speed is 0 delay	(*)
956	Speed thr 1_2 mon	(*)
966	Set speed	(*)
976	Speed thr 3 mon	(*)
986	Current thr mon	(*)
1066	Enable state mon	1.20
1068	Start state mon	1.21
1070	FastStop state mon	1.22
1024	Enable cmd mon	11.13
1026	Start cmd mon	11.14
1028	FastStop cmd mon	11.15
1034	Drv interlock mon	11.24
4708	Alm dig out mon 1	(*)
4710	Alm dig out mon 2	(*)
4712	Alm dig out mon 3	(*)
4714	Alm dig out mon 4	(*)
1530	Analog inp1<thr	(*)
1540	An inp 1 err mon	14.18
362	Drive overload trip	(*)
3214	Motor overload trip	(*)
3262	Bres overload trip	(*)
366	Drive overload 80%	(*)
1048	FR start mon	11.20
1050	FR reverse mon	11.21
4454	Bit0 decomp mon	23.6.3
4456	Bit1 decomp mon	23.6.4
4458	Bit2 decomp mon	23.6.5
4460	Bit3 decomp mon	23.6.6
4462	Bit4 decomp mon	23.6.7
4464	Bit5 decomp mon	23.6.8
4466	Bit6 decomp mon	23.6.9
4468	Bit7 decomp mon	23.6.10
4470	Bit8 decomp mon	23.6.11
4472	Bit9 decomp mon	23.6.12
4474	Bit10 decomp mon	23.6.13
4476	Bit11 decomp mon	23.6.14
4478	Bit12 decomp mon	23.6.15
4480	Bit13 decomp mon	23.6.16
4482	Bit14 decomp mon	23.6.17
4484	Bit15 decomp mon	23.6.18
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
6004	Speed limit state	(*)
6006	Current limit state	(*)
764	Ramp acc state	(*)
766	Ramp dec state	(*)
1640	An inp 1X err mon	14.31
1690	An inp 2X err mon	14.44
4780	Alarm PLC	(*)
3676	Compare output	22.9.8

(3) the XXXX parameter changes according to the src parameter used:

1014 Local/remote src
(3) = 1012 Dig local/remote 11.7

L_FBS2M

XXXX (4)

6000	Null	(*)
6002	One	(*)
626	Ramp ref out mon	(*)
628	Ramp setpoint	1.5
760	Ramp out mon	(*)
664	Speed setpoint	1.6
260	Motor speed	1.7
262	Motor speed nofilter	(*)
2150	Encoder 1 speed	17.19
250	Output current	1.1
252	Output voltage	1.2
254	Output frequency	1.3
280	Torque current ref	1.11
282	Magnet current ref	1.12
284	Torque current	1.13
286	Magnet current	1.14
2360	Torque lim Pos Inuse	20.9
2362	Torque lim Neg Inuse	20.10
2386	Torque ref %	20.18
2388	Torque ref nofilter	(*)
2394	Torque %	20.20
2396	Torque nofilter	(*)
270	DC link voltage	1.8
2162	Encoder 1 position	17.20
2154	E1 Virtual position	27.3.2
2156	E1 Revolutions	27.3.3
3006	Speed ratio out mon	(*)
3070	Droop out mon	22.2.5
852	Multi ref out mon	7.24
870	Mpot setpoint	8.1
894	Mpot output mon	8.13
920	Jog output mon	9.6
3104	Inertia comp mon	22.3.3
1500	Analog input 1 mon	14.1
1544	An inp 1 der mon	(*)
1600	Analog input 1X mon	14.19
1650	Analog input 2X mon	14.32
368	Drive overload accum	1.16
370	Drive ovl fst accum	1.17
372	Drive overload limit	1.18
3212	Motor overload accum	1.15
3260	Bres overload accum	1.19
272	Heatsink temperature	1.9
1060	Sequencer status	(*)
4432	Word comp mon	23.5.17
3446	Powerloss nextratio	(*)
2246	Speed reg P factor	18.16
2248	Speed reg I factor	18.17
4024	Fieldbus M->S1 mon	23.3.3
4034	Fieldbus M->S2 mon	23.3.7
4044	Fieldbus M->S3 mon	23.3.11
4054	Fieldbus M->S4 mon	23.3.15
4064	Fieldbus M->S5 mon	23.3.19
4074	Fieldbus M->S6 mon	23.3.23
4084	Fieldbus M->S7 mon	23.3.27
4094	Fieldbus M->S8 mon	23.3.31
4104	Fieldbus M->S9 mon	23.3.35
4114	Fieldbus M->S10 mon	23.3.39
4124	Fieldbus M->S11 mon	23.3.43
4134	Fieldbus M->S12 mon	23.3.47
4144	Fieldbus M->S13 mon	23.3.51
4154	Fieldbus M->S14 mon	23.3.55
4164	Fieldbus M->S15 mon	23.3.59
4174	Fieldbus M->S16 mon	23.3.63
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
4770	First alarm	(*)
4840	Alarm lo state	(*)
4842	Alarm hi state	(*)
1200	Digital input X mon	1.23
5008	Test gen out	27.2.5

(4) the XXXX parameter changes according to the src parameter used:

4340 DS402 cw src
(4) = 4024 Fieldbus M->S1 mon 23.3.3

4346 PFdrv cw 1 src
(4) = 4024 Fieldbus M->S1 mon 23.3.3

4348 PFdrv cw 2 src
(4) = 4034 Fieldbus M->S2 mon 23.3.7

L_FL_REV

PAR	Description	Menu
1600	Analog input 1X mon	14.19
1650	Analog input 2X mon	14.32
368	Drive overload accum	1.16
3212	Motor overload accum	1.15
286	Magnet current	1.14
2386	Torque ref %	20.18
3260	Bres overload accum	1.19
2360	Torque lim Pos Inuse	20.9
920	Jog output mon	9.6
1060	Sequencer status	(*)
4432	Word comp mon	23.5.17
3446	Powerloss nextratio	(*)
4372	DS402 status word	(*)
4394	PFdrv status word 1	(*)
4396	PFdrv status word 2	(*)
2246	Speed reg P factor	18.16
2248	Speed reg I factor	18.17
272	Heatsink temperature	1.9
2388	Torque ref nofilter	(*)
2156	E1 Revolutions	27.3.3
2162	Encoder 1 position	17.20
252	Output voltage	1.2
2154	E1 Virtual position	27.3.2
4024	Fieldbus M->S1 mon	23.3.3
250	Output current	1.1
3006	Speed ratio out mon	(*)
270	DC link voltage	1.8
1500	Analog input 1 mon	14.1
2394	Torque %	20.20
3104	Inertia comp mon	22.3.3
3070	Droop out mon	22.2.5
852	Multi ref out mon	7.24
254	Output frequency	1.3
280	Torque current ref	1.11
282	Magnet current ref	1.12
870	Mpot setpoint	8.1
894	Mpot output mon	8.13
284	Torque current	1.13
2396	Torque nofilter	(*)
3724	Pad 13	22.10.13
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
2362	Torque lim Neg Inuse	20.10
3714	Pad 8	22.10.8
4034	Fieldbus M->S2 mon	23.3.7
3704	Pad 3	22.10.3
3722	Pad 12	22.10.12
3716	Pad 9	22.10.9
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
4770	First alarm	(*)
4840	Alarm lo state	(*)
4842	Alarm hi state	(*)
1110	Digital input E mon	(*)
1200	Digital input X mon	1.23
3718	Pad 10	22.10.10
372	Drive overload limit	1.18
4074	Fieldbus M->S6 mon	23.3.23
4064	Fieldbus M->S5 mon	23.3.19
4094	Fieldbus M->S8 mon	23.3.31
4104	Fieldbus M->S9 mon	23.3.35
3720	Pad 11	22.10.11
4054	Fieldbus M->S4 mon	23.3.15
5008	Test gen out	27.2.5
4084	Fieldbus M->S7 mon	23.3.27
4114	Fieldbus M->S10 mon	23.3.39
370	Drive ovl fst accum	1.17
4044	Fieldbus M->S3 mon	23.3.11
4124	Fieldbus M->S11 mon	23.3.43
4134	Fieldbus M->S12 mon	23.3.47
4144	Fieldbus M->S13 mon	23.3.51
4154	Fieldbus M->S14 mon	23.3.55
4164	Fieldbus M->S15 mon	23.3.59
4174	Fieldbus M->S16 mon	23.3.63
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
6000	Null	(*)
6002	One	(*)
626	Ramp ref out mon	(*)
628	Ramp setpoint	1.5
760	Ramp out mon	(*)
664	Speed setpoint	1.6
260	Motor speed	1.7
262	Motor speed nofilter	(*)
2150	Encoder 1 speed	17.19

L_FLWORD

6000	Null	(*)
6002	One	(*)
626	Ramp ref out mon	(*)
628	Ramp setpoint	1.5
760	Ramp out mon	(*)
664	Speed setpoint	1.6
260	Motor speed	1.7
262	Motor speed nofilter	(*)
2150	Encoder 1 speed	17.19
250	Output current	1.1
252	Output voltage	1.2
254	Output frequency	1.3
280	Torque current ref	1.11
282	Magnet current ref	1.12
284	Torque current	1.13
286	Magnet current	1.14
2360	Torque lim Pos Inuse	20.9
2362	Torque lim Neg Inuse	20.10
2386	Torque ref %	20.18
2388	Torque ref nofilter	(*)
2394	Torque %	20.20
2396	Torque nofilter	(*)
270	DC link voltage	1.8
2162	Encoder 1 position	17.20
2154	E1 Virtual position	27.3.2
2156	E1 Revolutions	27.3.3
3006	Speed ratio out mon	(*)
3070	Droop out mon	22.2.5
852	Multi ref out mon	7.24
870	Mpot setpoint	8.1
894	Mpot output mon	8.13
920	Jog output mon	9.6
3104	Inertia comp mon	22.3.3
1500	Analog input 1 mon	14.1
1600	Analog input 1X mon	14.19
1650	Analog input 2X mon	14.32
368	Drive overload accum	1.16
370	Drive ovl fst accum	1.17
372	Drive overload limit	1.18
3212	Motor overload accum	1.15
3260	Bres overload accum	1.19
272	Heatsink temperature	1.9
1060	Sequencer status	(*)
4432	Word comp mon	23.5.17
3446	Powerloss nextratio	(*)
2246	Speed reg P factor	18.16
2248	Speed reg I factor	18.17
4024	Fieldbus M->S1 mon	23.3.3
4034	Fieldbus M->S2 mon	23.3.7
4044	Fieldbus M->S3 mon	23.3.11
4054	Fieldbus M->S4 mon	23.3.15
4064	Fieldbus M->S5 mon	23.3.19
4074	Fieldbus M->S6 mon	23.3.23
4084	Fieldbus M->S7 mon	23.3.27
4094	Fieldbus M->S8 mon	23.3.31
4104	Fieldbus M->S9 mon	23.3.35
4114	Fieldbus M->S10 mon	23.3.39
4124	Fieldbus M->S11 mon	23.3.43
4134	Fieldbus M->S12 mon	23.3.47
4144	Fieldbus M->S13 mon	23.3.51
4154	Fieldbus M->S14 mon	23.3.55
4164	Fieldbus M->S15 mon	23.3.59
4174	Fieldbus M->S16 mon	23.3.63
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
4770	First alarm	(*)
4840	Alarm lo state	(*)
4842	Alarm hi state	(*)
1200	Digital input X mon	1.23
5008	Test gen out	27.2.5

L_LIM

6000	Null	(*)
1500	Analog input 1 mon	14.1
2380	Dig torque ref 1	20.12
1600	Analog input 1X mon	14.19
1650	Analog input 2X mon	14.32
4024	Fieldbus M->S1 mon	23.3.3
4034	Fieldbus M->S2 mon	23.3.7

PAR	Description	Menu
4044	Fieldbus M->S3 mon	23.3.11
4054	Fieldbus M->S4 mon	23.3.15
4064	Fieldbus M->S5 mon	23.3.19
4074	Fieldbus M->S6 mon	23.3.23
4084	Fieldbus M->S7 mon	23.3.27
4094	Fieldbus M->S8 mon	23.3.31
4104	Fieldbus M->S9 mon	23.3.35
4114	Fieldbus M->S10 mon	23.3.39
4124	Fieldbus M->S11 mon	23.3.43
4134	Fieldbus M->S12 mon	23.3.47
4144	Fieldbus M->S13 mon	23.3.51
4154	Fieldbus M->S14 mon	23.3.55
4164	Fieldbus M->S15 mon	23.3.59
4174	Fieldbus M->S16 mon	23.3.63
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
5008	Test gen out	27.2.5

L_MLTREF

XXXX	*(5)*	
1500	Analog input 1 mon	14.1
852	Multi ref out mon	7.24
894	Mpot output mon	8.13
2150	Encoder 1 speed	17.19
1600	Analog input 1X mon	14.19
1650	Analog input 2X mon	14.32
3070	Droop out mon	22.2.5
4024	Fieldbus M->S1 mon	23.3.3
4034	Fieldbus M->S2 mon	23.3.7
4044	Fieldbus M->S3 mon	23.3.11
4054	Fieldbus M->S4 mon	23.3.15
4064	Fieldbus M->S5 mon	23.3.19
4074	Fieldbus M->S6 mon	23.3.23
4084	Fieldbus M->S7 mon	23.3.27
4094	Fieldbus M->S8 mon	23.3.31
4104	Fieldbus M->S9 mon	23.3.35
4114	Fieldbus M->S10 mon	23.3.39
4124	Fieldbus M->S11 mon	23.3.43
4134	Fieldbus M->S12 mon	23.3.47
4144	Fieldbus M->S13 mon	23.3.51
4154	Fieldbus M->S14 mon	23.3.55
4164	Fieldbus M->S15 mon	23.3.59
4174	Fieldbus M->S16 mon	23.3.63
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
5008	Test gen out	27.2.5

(5) the XXXX parameter changes according to the src parameter used:

610 Ramp ref 1 src
(5) = 600 Dig ramp ref 1 *5.1*

612 Ramp ref 2 src
(5) = 602 Dig ramp ref 2 *5.2*

614 Ramp ref 3 src
(5) = 604 Dig ramp ref 3 *5.3*

650 Speed ref 1 src
(5) = 640 Dig speed ref 1 *5.15*

652 Speed ref 2 src
(5) = 642 Dig speed ref 2 *5.16*

832 Multi ref 0 src
(5) = 800 Multi reference 0 *7.1*

834 Multi ref 1 src
(5) = 802 Multi reference 1 *7.2*

L_NLIM

6000	Null	(*)
1500	Analog input 1 mon	14.1
2380	Dig torque ref 1	20.12
2374	Torque limit neg	20.7
1600	Analog input 1X mon	14.19
1650	Analog input 2X mon	14.32
4024	Fieldbus M->S1 mon	23.3.3
4034	Fieldbus M->S2 mon	23.3.7
4044	Fieldbus M->S3 mon	23.3.11
4054	Fieldbus M->S4 mon	23.3.15
4064	Fieldbus M->S5 mon	23.3.19
4074	Fieldbus M->S6 mon	23.3.23
4084	Fieldbus M->S7 mon	23.3.27
4094	Fieldbus M->S8 mon	23.3.31
4104	Fieldbus M->S9 mon	23.3.35
4114	Fieldbus M->S10 mon	23.3.39
4124	Fieldbus M->S11 mon	23.3.43
4134	Fieldbus M->S12 mon	23.3.47
4144	Fieldbus M->S13 mon	23.3.51
4154	Fieldbus M->S14 mon	23.3.55
4164	Fieldbus M->S15 mon	23.3.59
4174	Fieldbus M->S16 mon	23.3.63
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
5008	Test gen out	27.2.5

L_PLIM

6000	Null	(*)
1500	Analog input 1 mon	14.1
2380	Dig torque ref 1	20.12
2372	Torque limit pos	20.6
1600	Analog input 1X mon	14.19
1650	Analog input 2X mon	14.32
4024	Fieldbus M->S1 mon	23.3.3
4034	Fieldbus M->S2 mon	23.3.7
4044	Fieldbus M->S3 mon	23.3.11
4054	Fieldbus M->S4 mon	23.3.15
4064	Fieldbus M->S5 mon	23.3.19
4074	Fieldbus M->S6 mon	23.3.23
4084	Fieldbus M->S7 mon	23.3.27
4094	Fieldbus M->S8 mon	23.3.31
4104	Fieldbus M->S9 mon	23.3.35
4114	Fieldbus M->S10 mon	23.3.39
4124	Fieldbus M->S11 mon	23.3.43
4134	Fieldbus M->S12 mon	23.3.47
4144	Fieldbus M->S13 mon	23.3.51
4154	Fieldbus M->S14 mon	23.3.55
4164	Fieldbus M->S15 mon	23.3.59
4174	Fieldbus M->S16 mon	23.3.63
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
5008	Test gen out	27.2.5

L_REF

PAR	Description	Menu
1500	Analog input 1 mon	14.1
626	Ramp ref out mon	(*)
664	Speed setpoint	1.6
262	Motor speed nofilter	(*)
2150	Encoder 1 speed	17.19
1600	Analog input 1X mon	14.19
1650	Analog input 2X mon	14.32
4024	Fieldbus M->S1 mon	23.3.3
4034	Fieldbus M->S2 mon	23.3.7
4044	Fieldbus M->S3 mon	23.3.11
4054	Fieldbus M->S4 mon	23.3.15
4064	Fieldbus M->S5 mon	23.3.19
4074	Fieldbus M->S6 mon	23.3.23
4084	Fieldbus M->S7 mon	23.3.27
4094	Fieldbus M->S8 mon	23.3.31
4104	Fieldbus M->S9 mon	23.3.35
4114	Fieldbus M->S10 mon	23.3.39
4124	Fieldbus M->S11 mon	23.3.43
4134	Fieldbus M->S12 mon	23.3.47
4144	Fieldbus M->S13 mon	23.3.51
4154	Fieldbus M->S14 mon	23.3.55
4164	Fieldbus M->S15 mon	23.3.59
4174	Fieldbus M->S16 mon	23.3.63
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
5008	Test gen out	27.2.5

L_RESFREEZE

66000	Null	(*)
1110	Digital input E mon	(*)
1210	Digital input 1X mon	(*)
1212	Digital input 2X mon	(*)
1214	Digital input 3X mon	(*)
1216	Digital input 4X mon	(*)
1218	Digital input 5X mon	(*)
1220	Digital input 6X mon	(*)
1222	Digital input 7X mon	(*)
1224	Digital input 8X mon	(*)

L_SCOPE

6000	Null	(*)

L_TCREF

PAR	Description	Menu
XXXX	*(6)*	
1500	Analog input 1 mon	14.1
1600	Analog input 1X mon	14.19
1650	Analog input 2X mon	14.32
4024	Fieldbus M->S1 mon	23.3.3
4034	Fieldbus M->S2 mon	23.3.7
4044	Fieldbus M->S3 mon	23.3.11
4054	Fieldbus M->S4 mon	23.3.15
4064	Fieldbus M->S5 mon	23.3.19
4074	Fieldbus M->S6 mon	23.3.23
4084	Fieldbus M->S7 mon	23.3.27
4094	Fieldbus M->S8 mon	23.3.31
4104	Fieldbus M->S9 mon	23.3.35
4114	Fieldbus M->S10 mon	23.3.39
4124	Fieldbus M->S11 mon	23.3.43
4134	Fieldbus M->S12 mon	23.3.47
4144	Fieldbus M->S13 mon	23.3.51
4154	Fieldbus M->S14 mon	23.3.55
4164	Fieldbus M->S15 mon	23.3.59
4174	Fieldbus M->S16 mon	23.3.63
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
6000	Null	(*)
5008	Test gen out	27.2.5

(6) the XXXX parameter changes according to the src parameter used:

3186 Brake open thr src
(6) 3184 Brake open thr 22.12.8

L_TEMPCTRL

6000	*Null*	*(*)*
272	*Heatsink temperature*	*1.9*
290	*Motor temperature*	*1.10*
3700	*Pad 1*	*22.10.1*
3702	*Pad 2*	*22.10.2*
3704	*Pad 3*	*22.10.3*
3706	*Pad 4*	*22.10.4*
3708	*Pad 5*	*22.10.5*
3710	*Pad 6*	*22.10.6*
3712	*Pad 7*	*22.10.7*
3714	*Pad 8*	*22.10.8*
3716	*Pad 9*	*22.10.9*
3718	*Pad 10*	*22.10.10*
3720	*Pad 11*	*22.10.11*
3722	*Pad 12*	*22.10.12*
3724	*Pad 13*	*22.10.13*
3726	*Pad 14*	*22.10.14*
3728	*Pad 15*	*22.10.15*
3730	*Pad 16*	*22.10.16*

L_VREF

XXXX	*(7)*	
3104	Inertia comp mon	22.3.3
1500	Analog input 1 mon	14.1
1600	Analog input 1X mon	14.19
1650	Analog input 2X mon	14.32
4024	Fieldbus M->S1 mon	23.3.3
4034	Fieldbus M->S2 mon	23.3.7
4044	Fieldbus M->S3 mon	23.3.11
4054	Fieldbus M->S4 mon	23.3.15
4064	Fieldbus M->S5 mon	23.3.19
4074	Fieldbus M->S6 mon	23.3.23
4084	Fieldbus M->S7 mon	23.3.27
4094	Fieldbus M->S8 mon	23.3.31
4104	Fieldbus M->S9 mon	23.3.35
4114	Fieldbus M->S10 mon	23.3.39
4124	Fieldbus M->S11 mon	23.3.43
4134	Fieldbus M->S12 mon	23.3.47
4144	Fieldbus M->S13 mon	23.3.51
4154	Fieldbus M->S14 mon	23.3.55
4164	Fieldbus M->S15 mon	23.3.59
4174	Fieldbus M->S16 mon	23.3.63
3700	Pad 1	22.10.1
3702	Pad 2	22.10.2
3704	Pad 3	22.10.3
3706	Pad 4	22.10.4
3708	Pad 5	22.10.5
3710	Pad 6	22.10.6
3712	Pad 7	22.10.7
3714	Pad 8	22.10.8
3716	Pad 9	22.10.9
3718	Pad 10	22.10.10
3720	Pad 11	22.10.11
3722	Pad 12	22.10.12
3724	Pad 13	22.10.13
3726	Pad 14	22.10.14
3728	Pad 15	22.10.15
3730	Pad 16	22.10.16
6000	Null	(*)
5008	Test gen out	27.2.5
3192	Brake open thr mon	(*)

(7) the XXXX parameter changes according to the src parameter used:

2382 Torque ref 1 src
(7) = 2380 Dig torque ref 1 20.12

3002 Speed ratio src
(7) = 3000 Dig speed ratio 22.1.1

L_WDECOMP

XXXX	*(8)*	
6000	Null	(*)
6002	One	(*)

PAR	Description	Menu	PAR	Description	Menu	PAR	Description	Menu
4432	Word comp mon	23.5.17						
4024	Fieldbus M->S1 mon	23.3.3						
4034	Fieldbus M->S2 mon	23.3.7						
4044	Fieldbus M->S3 mon	23.3.11						
4054	Fieldbus M->S4 mon	23.3.15						
4064	Fieldbus M->S5 mon	23.3.19						
4074	Fieldbus M->S6 mon	23.3.23						
4084	Fieldbus M->S7 mon	23.3.27						
4094	Fieldbus M->S8 mon	23.3.31						
4104	Fieldbus M->S9 mon	23.3.35						
4114	Fieldbus M->S10 mon	23.3.39						
4124	Fieldbus M->S11 mon	23.3.43						
4134	Fieldbus M->S12 mon	23.3.47						
4144	Fieldbus M->S13 mon	23.3.51						
4154	Fieldbus M->S14 mon	23.3.55						
4164	Fieldbus M->S15 mon	23.3.59						
4174	Fieldbus M->S16 mon	23.3.63						
3700	Pad 1	22.10.1						
3702	Pad 2	22.10.2						
3704	Pad 3	22.10.3						
3706	Pad 4	22.10.4						
3708	Pad 5	22.10.5						
3710	Pad 6	22.10.6						
3712	Pad 7	22.10.7						
3714	Pad 8	22.10.8						
3716	Pad 9	22.10.9						
3718	Pad 10	22.10.10						
3720	Pad 11	22.10.11						
3722	Pad 12	22.10.12						
3724	Pad 13	22.10.13						
3726	Pad 14	22.10.14						
3728	Pad 15	22.10.15						
3730	Pad 16	22.10.16						

(8) the XXXX parameter changes according to the src parameter used:

4452 Word decomp src
(8) = 4450 Dig word decomp 23.6.1

(*) Parameter not shown on the keypad. For information see the “PARAMETERS INCLUDED IN SELECTION LISTS BUT NOT SHOWN ON THE KEYPAD” section.

Appendix - 1 CANopen interface

CANopen is a communication profile for CanApplicationLayer-based industrial systems.

The reference document is the "CANopen application layer and communication profile" CiA 301 Version 4.2.0 21 February 2011 by CAN in Automation e. V.

The CAN protocol (ISO 11898) is CAN2.0A with an 11-bit identifier.

The integrated CANopen interface is developed as a "Minimum Field Device".

The data exchange is cyclic; the Master unit reads the Slave input data and writes the Slave output data.

1.1 CANopen functions

This chapter describes the controlled functions of the CANopen communication profile.

Main features:

1) The "Mandatory Protocol boot-up" is managed.
2) The SYNC function is implemented.
3) The PDO asynchronous assignment is managed.
4) The Node Guarding and HearthBeat protocols are managed.
5) The emergency message is managed ("EMERGENCY").
6) The Dynamic ID distribution function (DBT slave) is not managed.
7) A "Generic Pre-Defined Master/Slave connection" is implemented to simplify the Master tasks during the initialization phase.
8) "Inhibit-Times" (in units of 100 uS) can be modified.
9) The high-resolution synchronization is not supported.
10) "TIME STAMP" is not managed.
11) On the access of the structured parameters, the OFFhex option subindex (access to the whole object) is not managed.
12) In order to obtain a higher efficiency level, only the "Expedited" data transfer (max. 4 Bytes) of the SDO services is managed.
13) The "communication profile area" parameters are not saved by a save command, which on the other hand works on the "manufacturer-specific" and "profile" areas.

1.1.1 Pre-defined Master/Slave Connection

The "Generic Pre-defined Master/Slave connection" allows a peer-to-peer communication between one Master and 127 Slaves; the Broadcast address is zero.

1.1.2 NMT Services (Network Management)

The NMT "mandatory" services are:

- Enter_Pre-Operational_State CS = 128 (80h)
- Reset_Node CS = 129 (81h)

Performs an adjustment software reset command.

- Reset_Communication CS = 130 (82h)

Also the following NMT services are managed:

- Start_Remote_Mode CS = 1
- Stop_Remote_Mode CS = 2

The COB-ID * of an initialization NMT service is always at 0; CS is the Command Specifier defining the NMT service.

1.1.3 Monitoring

The ADP200 drive supports the Node Guarding and HeartBeat mechanism. The Node Guarding configuration can be performed through the master via the standard Object Dictionary elements (1006h, 100Ch, 100Dh).

The Node Guarding threshold (maximum time between two NodeGuarding messages received from ADP200) is calculated as:

“Guard time” x “LifeTime Factor”

The HeartBeat is configured by means of the objects 1016h and 1017h. The threshold in this case is calculated as:

“HeartBeat Time” x “LifeTime Factor”.

Monitoring via NodeGuarding excludes monitoring via HeartBeat and vice versa: only one of the two systems can be active. The master must set the objects involved correctly.

The drive also checks the master’s operation via the arrival of the Sync message (only if the “Communication Cycle period” is different from 0). The threshold (maximum time between two Sync messages received from ADP200) is:

“Communication Cycle period” * “LifeTime Factor”

If one of the thresholds is exceeded, the drive changes the Operational status to Pre-Operational status, consequently generating the BusLoss alarm if it is also enabled.

Index	Name	Default value
1006h	Communication Cycle Period	64ms
100Ch	Guard Time	100ms
100D	Life time factor	3 (N.B.: this must always be different from 0)
1016h	Consumer heartbeat time	NodeId = 0 , time = 0
1017h	Producer heartbeat time	0

The default settings shown therefore correspond to the use of the NodeGuarding protocol with a threshold of 100ms x 3 and a threshold control even on Sync at 64ms x 3. The HeartBeat is disabled.

1.1.4 Communication objects

This chapter describes the communication objects of the CANopen protocol; they are managed by the interface card.

The managed communication objects are:

1) 1 SDO reception Server.
2) 1 SDO transmission Server.
3) reception PDOs.
4) transmission PDOs.
5) 1 Emergency Object.
6) 1 Node Guarding - Life Guarding.
7) 1 SYNC object.

The following table lists the used communication objects with their priority level and the Message Identifier; the “Resulting COB-ID” is obtained by adding the Node-ID (card address) to the number.

OBJECT	PRIORITY	MESSAGE ID
1st SDO rx	6	1792 700h+NodeId
1st SDO tx	6	1536 600h+NodeId
1st PDO rx	2	1408 580h+NodeId
1st PDO tx	2	512 200h+NodeId
2nd PDO rx	2	384 180h+NodeId
2nd PDO tx	2	768 300h+NodeId
3st PDO rx	2	640 280h+NodeId
3st PDO tx	2	512 400h+NodeId
4th PDO rx	2	384 380h+NodeId
4th PDO tx	2	768 500h+NodeId
EMERGENCY	1	640 480h+NodeId
NODE GUARDING & HB	not used	220 600h+NodeId
SYNC	0	128 80h

Table 1.4.1: Communication Objects

The master NodeGuarding message is a remote type (remote RTR bit set in COB-ID). All other messages used by this implementation of the CANopen are not RTR.

1.1.5 Object Dictionary Elements

The Object Dictionary is accessible from a master CANopen and represents the set of objects used to configure, send and monitor size.

The following table shows the communication objects used and accessibility with master CANopen.

Index (hex)	Name
1000	Device Type
1001	Error Register
1002	Manufacturer status register
1005	COB-ID SYNC Message
1006	Communication cycle period
1008	Manufacterer Device Name
1010	Store parameter
1009	Manufacturer Hardware Version
100A	Manufacturer Software Version
100C	Guard Time
100D	Life Time Factor
1014	COB-ID Emergency
1016	HeartBeat time consumer
1017	HeartBeat time producer
1018	Identity object
1400	1st Receive PDO
1401	2nd Receive PDO
1402	3rd Receive PDO
1403	4th Receive PDO
1600	Receive PDO1 mapping parameter
1601	Receive PDO2 mapping parameter
1602	Receive PDO3 mapping parameter
1603	Receive PDO4 mapping parameter
1A00	Transmit PDO1 mapping parameter
1A01	Transmit PDO2 mapping parameter
1A02	Transmit PDO3 mapping parameter
1A03	Transmit PDO4 mapping parameter
1800	1st Transmit PDO
1801	2nd Transmit PDO
1802	3rd Transmit PDO
1803	4th Transmit PDO

Table1.5.1: Objects used by the CANopen communication profile

The objects shown in bold in the table allow writing of the parameters assigned with the exchange of data in the PDO.

The allocation criterion is variable, and depends on the size (in bytes) of the parameter exchanged.

1.1.6 RX PDO Entries

The structure of the PDO Communication Parameter (index 1400h, 1401h) is:

1) Subindex 0 (Number of supported entries) = 2
2) The structure of Subindex 1 (COB-ID used by the PDO) is:

- Bit 31 (valid/invalid PDO) can be set via SDO.
- Bit 30 (RTR Remote Transmission Request) = 0 because this function is not supported.
- Bit 29 = 0 because the 11-bit ID is used (CAN 2.0A).
- Bits 11-28 are not used.
- Bit 0-10 COB-ID (see table 1.4.1).

3) Cyclic-synchronous Subindex 2 (Transmission Type), or synchronous according to the master performed setting (1 if SYNC has been foreseen, 254...255 if asynchronous). If not stated, the synchronous mode is active.

1.1.7 TX PDO Entries

The structure of the PDO Communication Parameter (index 1800h, 1801h) is:

1) Subindex 0 (Number of supported entries) = 3

2) The structure of Subindex 1 (COB-ID used by the PDO) is:

- Bit 31 (valid/invalid PDO) can be set via SDO.
- Bit 30 (RTR Remote Transmission Request) = 0 because this function is not supported.
- Bit 29 = 0 because the 11-bit ID is used (CAN 2.0A).
- Bits 11-28 are not used.
- Bit 0-10 COB-ID (see table 1.4.1).

3) Cyclic-synchronous Subindex 2 (Transmission Type), or synchronous according to the master performed setting (1 if SYNC has been foreseen, 254...255 if asynchronous). If not stated, the synchronous mode is active.

4) Inhibit time.

1.1.8 SDO Entries

Only the “Expedited” data transfer mode (max. 4 Bytes) is used.

1) Subindex 0 (Number of supported entries) = 3 because the device is a Server of the SDO service.
2) The structure of the Subindex 1 and 2 (COB-ID used by the SDO) is:

- Bit 31 (valid/invalid SDO); it is equal to 1 because just the Default SDOs are used.
- Bit 30 reserved = 0.
- Bit 29 = 0 because the 11-bit ID is used (CAN 2.0A).
- Bits 11-28 are not used.
- Bit 0-10 COB-ID (see table 1.4.1).

The element “node ID of SDO’s client resp. server” is not supported because just the Default SDOs are used.

1.1.9 COB-ID SYNC Entries

The structure of the 32 bits contained in the COB-ID SYNC communication parameter is:

- Bit 31 = 1 because the CANopen interface card is a “consumer” of SYNC messages.
- Bit 30 = 0 because the interface card does not create SYNC messages.
- Bit 29 = 0 because the 11-bit ID is used (CAN 2.0A).
- Bits 11-28 are not used.
- Bit 0-10 COB-ID (see table 1.4.1).

1.1.10 COB-ID Emergency

The structure of the 32 bits contained in the COB-ID Emergency Message communication parameter is:

- Bit 31 = 0 because the CANopen interface card is not a “consumer” of Emergency messages.
- Bit 30 = 0 because the interface card creates Emergency messages.
- Bit 29 = 0 because the 11-bit ID is used (CAN 2.0A).
- Bits 11-28 are not used.
- Bit 0-10 COB-ID (see table 1.4.1).

1.2 CANopen management

The user interface of the CANopen protocol is performed via the drive parameters. The parameters are controlled via hierarchical menus. All the writing parameters referring to the field bus are active only after the drive reset. Here following is a list of drive parameters useful to control the CANopen protocol.

To enable CANopen, set parameter PAR 4000 **Fieldbus type** to CANopen

The following parameters are available in the COMMUNICATION->FIELDBUS CONFIG menu:

PAR	Par Name	Type	Default value	Attr
4004	Fieldbus baudrate	Enum	None	Write
4006	Fieldbus address	2 byte unsigned	0	Write
4010	Fieldbus M->S enable	Enum	On	Write

4012	Fieldbus alarm mode	2 byte unsigned	0	Write
4014	Fieldbus state	Enum	Stop	Read only

- Fieldbus baudrate = Sets the network baud rate. Values available for CANopen: 125k, 250k, 500k, 1M
- Fieldbus address = address of this slave node in the network, accepted values from 1 to 127
- Fieldbus M->S enable = if set to Off data in the RPDOs are not processed by the drive
- Fieldbus alarm mode = if set to 1 the drive generates Opt Bus Fault errors relating to the loss of communication (Bus Loss) even when the drive is not enabled.
- Fieldbus state = state of the communication for this node on the CANopen network: Stop, Pre-Operational, Operational.

1.3 Process Data Channel Control

This function allows to allocate the drive parameters or application variables to the Process Data Channel data.

As for the CANopen protocol, the PDC is performed via the PDO messages (Process data Object).

The CANopen protocol uses a number of words for the Process Data Channel (abbr. PDC Process Data Channel), which can always be set.

The fieldbus Process Data Channel configuration is the following:

Data 0 Data... Data n

The drive can both read and write the Process Data Channel data.

A datum can be made both of 2 and 4 bytes. The word “data” refers to any quantity of bytes included between 0 and 16, if the byte total number required is not higher than 32.

Example:

It is possible to have:

- from 0 to 16 data with 2 bytes
- 1 datum with 4 bytes + from 0 to 14 data with 2 bytes
- 2 data with 4 bytes + from 0 to 12 data with 2 bytes

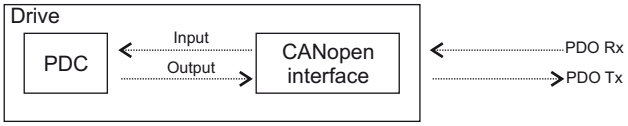
...

- 8 data with 4 bytes

The data exchanged via the PDC can be of two types:

- drive parameters
- variables of an MDPlc application. The use of the MDPlc variables is described in par. 1.3.1 and 1.3.2.

The master writes the data defined as PDC input and reads the data defined as PDC output.



1.3.1 PDC Input Configuration (FB XXX MS Parameter)

Data exchanged in RPDOs are configured using the parameters in the COMMUNICATION->FIELDBUS M2S menu.

PAR 4030 **Fieldbus M->S2 ipa** = IPA of the parameter to be exchanged

Must contain a valid IPA corresponding to the parameter to be written or 0 if sys (PAR 4032...4172 **Fieldbus M->Sn sys**) is Fill or Mdplc; the parameter PAR 4020 **Fieldbus M->S1 ipa** must be assigned to the Lift Wdef Input, while the parameter PAR 4022 **Fieldbus M->S1 sys** must be set on Mdplc16

By selecting the corresponding enum PAR 4034 **Fieldbus M->S2 mon** for src type parameters (Source), the value of the parameter 4030 is automatically set at the IPA of the src.

For src type parameters with an FB type different from 0, the data arriving on the fieldbus is not written in the enum selection, but directly in the mon associated with the src.

If it contains a valid IPA and is forced to 0, the corresponding sys parameter takes on the Fill value (16 or 32 in relation to that shown before), ensuring that the structure of the exchanged data area is not modified.

PAR 4032 **Fieldbus M->S2 sys** = format of the data to be exchanged

This parameter is automatically changed to the recommended value when the corresponding PAR 4030...4170 **Fieldbus M->Sn ipa** is changed. The automatic value can be changed by the user, however, the permitted values depend on the parameter.

Data mapping in PDOs is performed on the basis of the data format set in Fieldbus M->Sn sys according to the following rules:

- PDOs are filled starting from RPDO1
- When the PDO contains 4 words it is full and the next RPDO is filled with a maximum of 4 PDOs
- 32-bit data (long or float) cannot be split among PDOs, they must be placed inside the PDO (an alarm is generated)
- PDOs containing fewer than 4 words can be created, using **Fieldbus M->Sn dest**= None but assigned (**Fieldbus M->Sn sys** other than Not Assigned, Fill16 or Fill32) after an assigned datum.

  (N.B.: if assigned as Fill16 or Fill32, the datum is included in the PDO anyway)
- At the first **Fieldbus M->Sn sys** = Not Assigned parameter the PDOs are complete. The size of the last PDO thus depends on the data that have been assigned.
- ***Example : RPDO1 di 2 word and RPDO2 di 2 word:***

  Fieldbus M->S1 dest = Ramp ref 1 src

  Fieldbus M->S1 sys = EU

  Fieldbus M->S2 dest = Word decomp src

  Fieldbus M->S2 sys = Count 16

  Fieldbus M->S3 dest = None

  Fieldbus M->S3 sys = Count 32

  Fieldbus M->S4 dest = Compare 1 src

  Fieldbus M->S4 sys = Count32

  Fieldbus M->S5 sys = Not Assigned

1.3.2 PDC Output Configuration (FB XXX SM Parameter)

Data exchanged in RPDOs are configured using the parameters in the COMMUNICATION->FIELDBUS S2M menu.

Data mapping in PDOs is performed on the basis of the data format set in **Fieldbus M->Sn sys** according to the following rules:

- PDOs are filled starting from TPDO1
- When the PDO contains 4 words it is full and the next TPDO is filled with a maximum of 4 PDOs.
- 32-bit data (long or float) cannot be split among PDOs, they must be placed inside the PDO (an alarm is generated).
- PDOs with fewer than 4 words can be created, using Fieldbus S->Mn src= None Used but assigned (**Fieldbus M->Sn sys** other than Not Assigned, Fill16 or Fill32) after an assigned datum.
- At the first **Fieldbus S->Mn sys** = Not Assigned parameter the PDOs are complete. The size of the last PDO thus depends on the data that have been assigned.

1.3.3 Use of the PDC in MDPlc Applications

It is possible to configure both the PDC input and output data in order to allow the data direct access via the MDPlc application code.

For read data simply set **Fieldbus M->Sn sys** to MDPLC16 or MDPLC32, leaving **Fieldbus M->Sn dest** = None.

The MDPLC application can now read the incoming datum directly from the **Fieldbus M->Sn mon** parameter.

Write data are configured by setting **Fieldbus S->Mn src** = Dig Fieldbus S->Mn.

Fieldbus S->Mn sys is automatically set to MDPLC. The application writes the datum in the **Dig Fieldbus S->Mn** parameter to send it to the bus.

1.4 Alarms

Fieldbus alarms

The bus failure is signaled via the “Opt Bus Fault” alarm. As for CANopen, the possible failure causes are:

- “Bus-off” condition of the CAN line;
- the drive has not been enabled in the “Operational” mode;
- the “Life Guarding” threshold has been overcome.

This alarm becomes active only when the drive is enabled.

If ON, the PAR 4014 **Fieldbus alarm mode** parameter enables the generation of the “Field bus failure” alarm also when the drive is disabled.

Codice	Cfg	Description	Actions
0		Bus Loss	Check line for noise, terminations , problems with cabling
FF01	*	Fieldbus type does not match expansion card	Please contact Technical Assistance.
FF02	*	Wrong baudrate selected	Check “Fieldbus baudrate” is one of 125k, 250k, 500k, 1M
FF03	*	Invalid address for node	Check “Fieldbus address”
FF04	*	Error initializing CAN interface	Internal error, contact manufacturer
FF14..FF23	*	Wrong object selected for mapping in channel M2S n	Check “Fieldbus M->Sn Dest
FF24..FF33	*	More than 1 Src pointing to M2S Channel n	Check for multiple destinations on “Fieldbus M->Sn Dest”
FF34..FF43	*	M2S Channel n , data size is wrong (16 bits on 32 bits or 32 bits on 16 bits parameter)	Check “Fieldbus M->Sn sys”
FF44..FF53	*	Invalid parameter in channel S2M n	Check “Fieldbus S->Mn src”
FF54..FF63	*	S2M Channel n , data size is wrong (16 bits on 32 bits or 32 bits on 16 bits parameter)	Check “Fieldbus S->Mn sys”
FF64..FF73	*	Wrong object selected for mapping in channel S2M n	Check “Fieldbus S->Mn src”
FF74..FF83	*	M2S Channel n : too many words in PDC	“Fieldbus M-Sn dest” & “Fieldubs M->Sn sys” address more than 16 words in PDC
FF84..FF93	*	S2M Channel n : too many words in PDC	“Fieldbus S->Mn src” & “Fieldubs S->Mn sys” address more than 16 words in PDC
FFB4..FFC3	*	Internal database error on channel n	Internal error, contact manufacturer
8110		CAN msg overflow	Too many packets for selected baudrate
8130		LifeGuard/HeartBeat error	Software timeout from master
FFC5		Wrong NMT message length	Check NMT packets
FFC6		Invalid NMT command	Check NMT packets
FFC7		CAN bus off	Check line state for problems

Drive alarm handling

Drive alarms are managed by means of an Emergency message containing the error code relating to the alarm that is generated, according to the table below:

Selection	Code
No alarm	0x0000
Overvoltage	0x3210
Undervoltage	0x3220
Ground fault	0x2110
Overcurrent	0x2310
Desaturation	0x2130
MultiUndervolt	0xFF06
MultiOvercurr	0xFF07
TechnMultiDesat	0xFF08
Heatsink OT	0x4210
HeatsinkS OTUT	0x4310
Intakeair OT	0x4130
Motor OT	0xFF0C
Drive overload	0x8311
Motor overload	0x7121
Bres overload	0x7112
Phaseloss	0xFF10
Opt Bus fault	0xFF11
Opt 1 IO fault	0xFF12
Opt Enc fault	0x3130
External fault	0x9000
Speed fbk loss	0x7310
Overspeed	0x8400

FP-SYNC + Functions description and parameters list

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