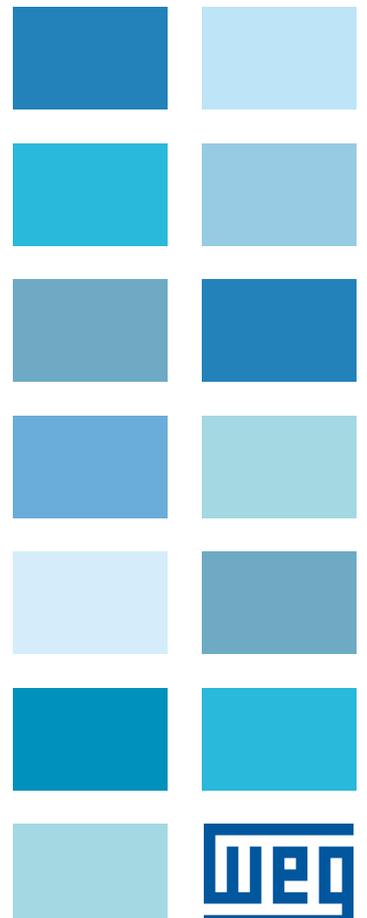


# Vector inverter for lifts with asynchronous motor

## VDL200

### Functions description and parameters list

Language: English



## Information about this manual

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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 VDL200 Quick start guide.

The whole set of manuals can be found on the WEG website, Downloads section ([https://www.weg.net/...](https://www.weg.net/)).

### Software version

This manual is updated according the software version V 4.8.12.

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 PAR 490 **Firmware ver.rel** parameter, menu 2.4.

### 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](mailto:techdoc@weg.net).

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## 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 pas strictement 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.*



**Attention**

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 être rigoureusement 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.*

## A - Programming

### 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.

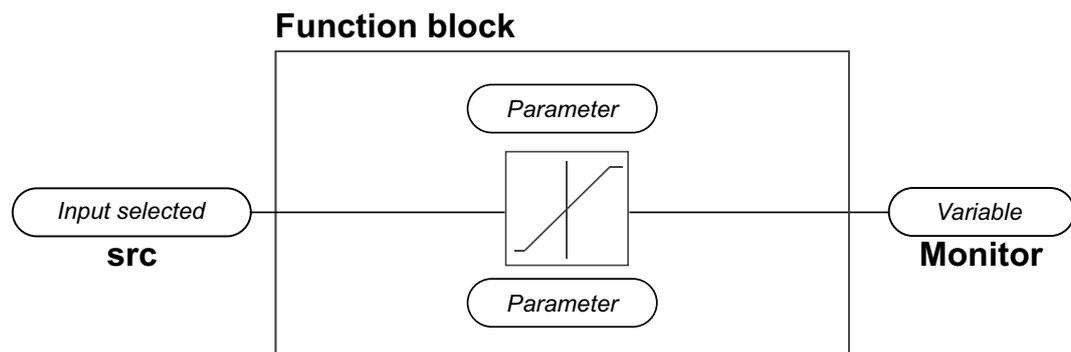
### A.2 Programming of “function block” analog and digital input signals

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**.
- 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 1 mon** signal, from the output of the function block “**Analog input 1 Block**”, which in

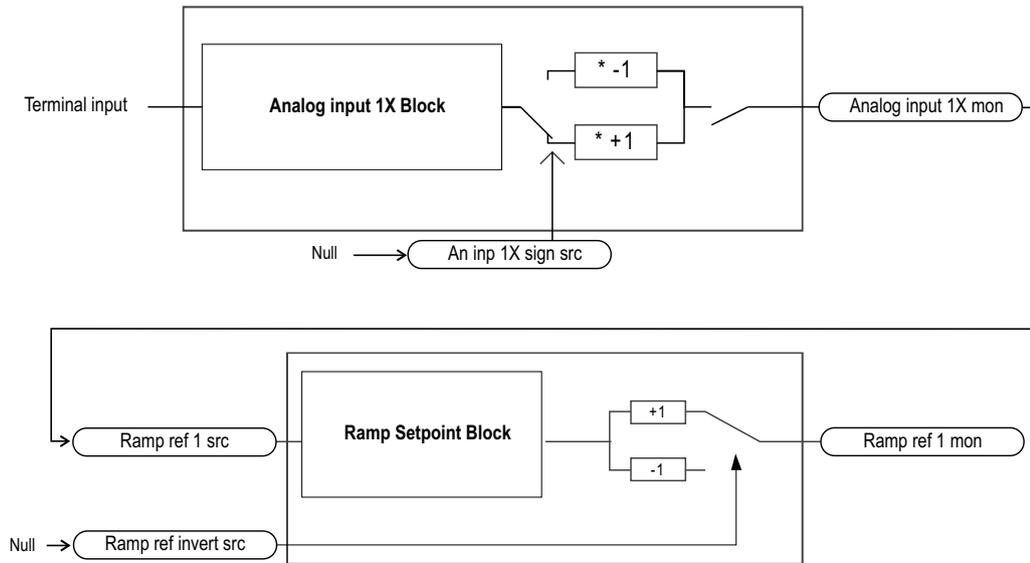
this case refers to analog input 1 of the signal terminal strip.

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\_ML-TREF 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 X 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).

## B - Parameters and functions description (Expert list)

### Legend

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>1 - MONITOR</b>						<i>( Level 1 menu )</i>				
1.1	250	Output current	A	FLOAT	16/32	0.0	0.0	0.0	R	FVS
1.2	252	Output voltage	V	FLOAT	16/32	0.0	0.0	0.0	R	FVS
<b>5.2 – RAMPS</b>						<i>( Level 2 menu )</i>				
<b>11 - DIGITAL OUTPUTS</b>										
11.01	1410	Dig output 1X src		LINK	16BIT	1062	0	16384	ERW	FVS
				L_DIGSEL1		<i>( Selection List ) [*]</i>				

①	Indexing of the menu and parameter	
②	Parameter identifier	
③	Parameter description	
④	UM: unit of measure	
⑤	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
	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
⑥	Format of data exchanged on Fieldbus (16BIT, 32BIT)	
⑦	Default value	CALCF Value calculated as a number with floating point
⑧	Minimum value	CALCI Value calculated as a whole number
⑨	Maximum value	SIZE Value depending on the size of the drive

⑨	Accessibility :
	E Expert
	R Read
	S Size (set value depending on the size of the device)
	W Write (scrittura)
	Z parameters that can be modified ONLY with the drive disabled
⑩	Available in regulation mode:
	V = V/f Control (open loop)
	S = Vect Flux OL
	F = Vect Flux CL (closed loop)
[*]	<b>Selection lists:</b> The "Sorgente.../Sorg..." 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.

# 1 - MONITOR

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.1	250	<b>Output current</b>	A	FLOAT	16/32BIT	0.0	0.0	0.0	R	FVS

The drive output current is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.2	252	<b>Output voltage</b>	V	FLOAT	16/32BIT	0.0	0.0	0.0	R	FVS

The drive line voltage output is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.3	254	<b>Output frequency</b>	Hz	FLOAT	16/32BIT	0.0	0.0	0.0	R	FVS

The drive output frequency is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.4	628	<b>Ramp setpoint</b>	rpm	INT16	16/32BIT	0	0	0	R	FVS

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
1.5	664	<b>Speed setpoint</b>	rpm	INT16	16/32BIT	0	0	0	R	FVS

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
1.6	260	<b>Motor speed</b>	rpm	INT16	16/32BIT	0	0	0	R	FVS

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
1.7	270	<b>DC link voltage</b>	V	FLOAT	16/32BIT	0.0	0.0	0.0	ER	FVS

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.8	272	<b>Heatsink temperature</b>	°C	INT16	16BIT	0	0	0	ER	F_S

The temperature measured on the drive heatsink is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.9	280	<b>Torque current ref</b>	A	FLOAT	16/32BIT	0.0	0.0	0.0	ER	F_S

The current reference used for torque control is displayed (in the sensorless vector and field-oriented vector modes).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.10	282	<b>Magnet current ref</b>	A	FLOAT	16/32BIT	0.0	0.0	0.0	ER	FVS

The magnetizing current reference is displayed (in the sensorless vector and field-oriented vector modes).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.11	284	<b>Torque current</b>	A	FLOAT	16/32BIT	0.0	0.0	0.0	ER	FVS

The actual torque current value is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.12	286	<b>Magnet current</b>	A	FLOAT	16/32BIT	0.0	0.0	0.0	ER	FVS

The actual magnetizing current value is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.13	3212	<b>Motor overload accum</b>		UINT16	16/32BIT	0	0	100	ER	FVS

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.14	368	<b>Drive overload accum</b>		UINT16	16/32BIT	0	0	100	ER	FVS

The drive overload level is displayed. An instantaneous overload of 200% of the drive rated current is allowed for 10s. The thermal image I<sup>2</sup>t adjusts the drive output current thresholds. During normal operation, the instantaneous output current value can reach 200% of the drive rated current. 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<sup>2</sup>t integrator cycle is complete. At this point the instantaneous overload of 200% or 150% (below 3Hz) will be re-activated.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.15	3260	<b>Bres overload accum</b>		UINT16	16/32BIT	0	0	100	ER	FVS

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.16	1066	<b>Enable state mon</b>		BIT	16BIT	0	0	1	R	FVS

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

**1 Enabled** drive enabled  
**0 Disabled** drive disabled

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.17	1068	<b>Start state mon</b>		BIT	16BIT	0	0	1	R	FVS

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.18	1070	<b>FastStop state mon</b>		BIT	16BIT	0	0	1	R	FVS

The drive FastStop command status is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
1.19	1200	<b>Digital input X mon</b>		UINT16	16BIT	0	0	0	R	FVS

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.

**1** Input enabled.  
**0** Input disabled.

Example:

0 0 0 0 0 0 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
1.20	1400	<b>Digital output X mon</b>		UINT16		0	0	0	R	FVS

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 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	482	<b>Drive size</b>		UINT16		0	0	0	RS	FVS

The drive size identification code is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.2	484	<b>Drive family</b>		ENUM		No Power	0	0	RS	FVS

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
- 2 500V..575V
- 3 690V
- 4 230V

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.3	488	<b>Drive cont current</b>	A	FLOAT		CALCF	0.0	0.0	RZS	FVS

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
2.4	490	<b>Firmware ver.rel</b>		UINT16		0	0	0	R	FVS

The version number and release number of the drive firmware are displayed. On the keypad these are displayed in the version.release format. The parameter reading from the serial communication device or fieldbus returns the version in the high byte and the release in the low byte.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.5	496	<b>Firmware type</b>		UINT16		0	0	0	R	FVS

Identifies the version of the special firmware installed in the drive

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.6	504	<b>Application ver.rel</b>		UINT16		0	0	0	ER	FVS

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
2.7	510	<b>Time drive power on</b>	h.min	UINT32		0	0.0	0.0	ER	FVS

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.8	512	<b>Time drive enable</b>	h.min	UINT32		0	0.0	0.0	ER	FVS

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
2.9	514	<b>Number power up</b>		UINT16		0	0	0	ER	FVS

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
2.10	516	<b>Time fan on</b>	h.min	UINT32		0	0.0	0.0	ER	FVS

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>2.11</b>	<b>520</b>	<b>Product S/N</b>		UINT32		0	0	0	R	FVS
		The drive serial number is displayed.								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>2.12</b>	<b>522</b>	<b>Regulation S/N</b>		UINT32		0	0	0	R	FVS
		The drive regulation card serial number is displayed.								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>2.13</b>	<b>524</b>	<b>Power S/N</b>		UINT32		0	0	0	R	FVS
		The drive power card serial number is displayed.								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>2.14</b>	<b>526</b>	<b>Power file ver.rel</b>		UINT16		0	0	0	ER	FVS
		The drive power card configuration release 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. Refer to the procedure described in chapter 9 **Commissioning via keypad** in the Quick start-up guide.

## 4 - DRIVE CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.1	550	<b>Save parameters</b>		BIT		0	0	1	RW	FVS

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 9 of the **Startup wizard**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.2	552	<b>Regulation mode</b>		ENUM		SSC	0	3	RWZ	FVS

The VDL200 is capable of operating with different control modes:

**0** SSC (Sensorless Scalar Control)

**1** Flux vector OL

**2** Flux vector CL

**3** Autotune

The open loop **SSC** mode is the simplest type of asynchronous motor control, as the only parameters required are the rated voltage, current and frequency of the motor.

The open loop **SSC** control mode is factory-set and does not require any speed feedback. The natural variation in speed generated by machine load induction (slippage) can be compensated using **Slip comp** and **Slip comp filter**.

In V/f mode a single drive can be used to control several asynchronous motors, even of different sizes, connected in parallel, provided the sum of the currents of the single motors is less than the drive rated current. If using several motors connected in parallel, be sure to provide adequate thermal protection for each single motor.

Closed loop control is also possible in the **SSC** mode. It requires a speed reading by a digital encoder on the motor shaft; to enable encoder feedback, you must set parameter **2444 Slip comp mode =1**.

An optional card is necessary in order to acquire the encoder signals. The speed feedback supplied by the encoder is used to compensate motor slippage in the different load conditions, to achieve accurate control and greater precision of the actual motor speed.

With the **sensorless vector control (Flux vector OL)** mode, high speed and torque precision can be achieved at low motor rpm. The drive has a powerful algorithm that uses a self-tuning procedure to obtain all the electric measurements of the motor. This allows the speed and position of the motor shaft to be estimated, enabling operation similar to that of a drive with feedback, both in terms of the response in torque to load variations, and of the regularity of rotation even at very low rpm.

In the **field oriented vector mode (Flux vector CL)** 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..

### Note!

When the drive is set to **Flux vector CL** mode you must set PAR 2132 **Encoder mode** = "DIGITAL FP" or "DIGITAL F" (15 - ENCODER CONFIG menu).

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
4.3	554	<b>Access mode</b>		ENUM		Easy	0	1	RW	FVS

**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 VDL200 to the full.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.4	558	<b>Application select</b>		ENUM		Enable	0	2	ERWZ	FVS

Selection of which IEC 61131-3-compliant application to make operational.

**0** Disable

**1** Enable

The drive is supplied already incorporating a number of applications developed in the IEC 61331-3 environment. To use these, configure the desired application, run save parameter, switch the drive off and then on again. In the default configuration the drive starts with the EFC lift application (see menu 5 - LIFT 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
4.5	560	<b>Mains voltage</b>	V	ENUM		400 V	SIZE	SIZE	ERWZS	FVS

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

0	200 V
1	230 V
2	380 V
3	400 V
4	415 V
5	440 V
6	460 V
7	480 V
8	575 V
9	690 V

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.6	448	<b>Emergency UV</b>	V	FLOAT		CALCF	0.0	CALCF	ERWZ	FVS

This parameter enables for the undervoltage threshold to be configured during emergency conditions.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.7	570	<b>Password</b>		UINT32		0	0	99999	ERW	FVS

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**.

entering the password, press the E key, then enter the password and press the E key again to enable it (a password enabled message (**Enabled**) is displayed).

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 (**570**) 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
4.8	572	<b>Application key</b>		UINT32		0	0	4294967295	ERW	FVS

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.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.9	574	<b>Startup display</b>		INT16		-1	-1	20000	ERW	FVS

It is possible to set the parameter that will automatically be displayed when the drive is switched on.

If set to -1 the main menu is automatically displayed when the drive is turned on.

If set to 0 the display page is automatically displayed when the drive is turned on.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.10	576	<b>Display backlight</b>		BIT		0	0	1	ERW	FVS
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
4.11	578	<b>Language select</b>		ENUM		English	0	4	RWZ	FVS
Setting of the drive programming language.  <b>0</b> English <b>1</b> Italian <b>2</b> French <b>3</b> German <b>4</b> Spanish <b>8</b> Turkish										

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.12	580	<b>Load default</b>		BIT		0	0	1	RWZ	FVS
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
4.13	590	<b>Save par to keypad</b>		BIT		0	0	1	RW	FVS
Transfers the parameters currently stored in the drive and saves them in the keypad memory (See VDL200 Quick Start manual, chapter 8.3.13).										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.14	592	<b>Load par from keypad</b>		BIT		0	0	1	RWZ	FVS
Transfers the parameters from the keypad memory to the drive (See VDL200 Quick Start manual, chapter 8.3.13).										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
4.15	594	<b>Keypad memory select</b>		UINT16		1	1	5	ERW	FVS
Selection of the area of the keypad memory to which to transfer and save the parameters stored in the drive.										

# 5 - LIFT

## 5.1 – SPEED



Attention

### Multi speed selection

Through the combination of “MtlSpd S0” (Digital input 4), “MtlSpd S1” (Digital input 5) and “MtlSpd S2” (Digital input 6) commands, is possible to select Multi speed desired, according to next table:

MtlSpd S2	MtlSpd S1	MtlSpd S0	ACTIVE SPEED
0	0	0	Multispeed 0, PAR 11020
0	0	1	Multispeed 1, PAR 11022
0	1	0	Multispeed 2, PAR 11024
0	1	1	Multispeed 3, PAR 11026
1	0	0	Multispeed 4, PAR 11028
1	0	1	Multispeed 5, PAR 11030
1	1	0	Multispeed 6, PAR 11032
1	1	1	Multispeed 7, PAR 11034

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.1	11002	<b>Travel units sel</b>	Hz	ENUM		0	0	2	RW	FVS

Selection of the unit of measure for speed references.

- 0 Hz (output frequency)
- 1 m/s (cabin speed and depends on the mechanical constant)
- 2 Rpm (speed of the motor shaft)
- 3 USCS (US units: fpm, ft/s<sup>2</sup>, ft/s<sup>3</sup>)

When the unit of measure is modified the conversion constants are re-calculated, the units of measure are changed in the parameter list and the multispeed values are converted into the new unit of measure (the result may contain approximations due to the conversion calculations).

A variable representing the speed of the cabin in m/s (fpm) is always available (PAR 12210).

There are fixed units of measure for the acceleration and deceleration parameters m/s<sup>2</sup> (ft/s<sup>2</sup>), and for jerks m/s<sup>3</sup> (ft/s<sup>3</sup>).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.2	11020	<b>Multi speed 0</b>	Hz	FLOAT		5.00	CALCF	CALCF	RW	FVS

Setting of the multispeed 0 value. Can be selected via digital input, fieldbus, etc.

The selected value is the reference for the S-shaped lift ramp.

This setting is taken as the default low speed value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.3	11022	<b>Multi speed 1</b>	Hz	FLOAT		50.00	CALCF	CALCF	RW	FVS

Setting of the multispeed 1 value. Can be selected via digital input, fieldbus, etc.

The selected value is the reference for the S-shaped lift ramp.

This setting is taken as the default high speed value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.4	11024	<b>Multi speed 2</b>	Hz	FLOAT		20.00	CALCF	CALCF	RW	FVS

Setting of the multispeed 2 value. Can be selected via digital input, fieldbus, etc.

The selected value is the reference for the S-shaped lift ramp.

This setting is taken as the default maintenance speed value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.5	11026	<b>Multi speed 3</b>	Hz	FLOAT		0.00	CALCF	CALCF	RW	FVS

Setting of the multispeed 3 value. Can be selected via digital input, fieldbus, etc.

The selected value is the reference for the S-shaped lift ramp.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.6	11028	<b>Multi speed 4</b>	Hz	FLOAT		0.00	CALCF	CALCF	RW	FVS

Setting of the multispeed 4 value. Can be selected via digital input, fieldbus, etc.  
The selected value is the reference for the S-shaped lift ramp.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.7	11030	<b>Multi speed 5</b>	Hz	FLOAT		0.00	CALCF	CALCF	RW	FVS

Setting of the multispeed 5 value. Can be selected via digital input, fieldbus, etc.  
The selected value is the reference for the S-shaped lift ramp.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.8	11032	<b>Multi speed 6</b>	Hz	FLOAT		0.00	CALCF	CALCF	RW	FVS

Setting of the multispeed 6 value. Can be selected via digital input, fieldbus, etc.  
The selected value is the reference for the S-shaped lift ramp.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.9	11034	<b>Multi speed 7</b>	Hz	FLOAT		0.00	CALCF	CALCF	RW	FVS

Setting of the multispeed 7 value. Can be selected via digital input, fieldbus, etc.  
The selected value is the reference for the S-shaped lift ramp.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.10	12010	<b>Actual multi spd sel</b>		ENUM					R	FVS

The currently selected speed is displayed.

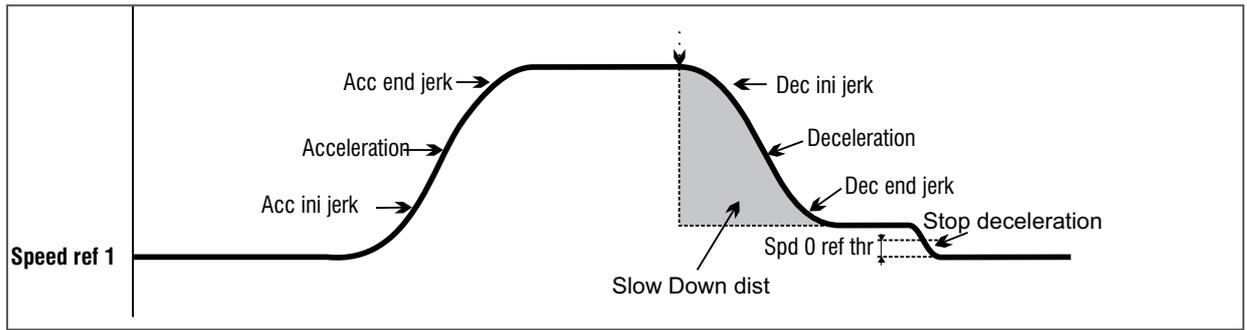
- 0 Multi speed 0
- 1 Multi speed 1
- 2 Multi speed 2
- 3 Multi speed 3
- 4 Multi speed 4
- 5 Multi speed 5
- 6 Multi speed 6
- 7 Multi speed 7
- 8 Null

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.1.11	12210	<b>Actual speed ref</b>	m/s	FLOAT					R	FVS

The speed of the cabin is displayed in m/s.

## 5.2 – RAMPS

The lift application envisages an S-shaped ramp function with the possibility of setting 4 independent jerks and linear acceleration and deceleration factors, as in the standard profile illustrated in the figure below.



The Acc ini Jerk, Acceleration and Acc end jerk values used to execute the acceleration ramp are calculated by multiplying the corresponding parameters by the acceleration ramp factor (Percent acc factor), while the Dec ini jerk, Deceleration and Dec end jerk values used to execute the deceleration ramp are calculated by multiplying the corresponding parameters by the deceleration ramp factor (**Percent dec factor**, PAR 11056).

When the **Start** command is removed, the reference speed is zero regardless of the reference selected in the multispeeds. In this final part of the profile the jerk deceleration values are used directly (not multiplied by **Percent dec factor**, PAR 11056) with the **Stop deceleration** parameter as the linear deceleration. The factors for the final section of the profile are also used in case of a Stop lift emergency condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.1	11040	<b>Acc ini Jerk</b>	m/s <sup>3</sup>	FLOAT		0.50	0.01	20	RW	FVS

Setting of the jerk value for the first part of the acceleration.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.2	11042	<b>Acceleration</b>	m/s <sup>2</sup>	FLOAT		0.60	0.01	10	RW	FVS

Setting of the maximum acceleration value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.3	11044	<b>Acc end jerk</b>	m/s <sup>3</sup>	FLOAT		1.40	0.01	20	RW	FVS

Setting of the jerk value for the last part of the acceleration.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.4	11046	<b>Dec ini jerk</b>	m/s <sup>3</sup>	FLOAT		1.40	0.01	20	RW	FVS

Setting of the jerk value for the first part of the deceleration.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.5	11048	<b>Deceleration</b>	m/s <sup>2</sup>	FLOAT		0.60	0.01	10	RW	FVS

Setting of the maximum deceleration value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.6	11050	<b>Dec end jerk</b>	m/s <sup>3</sup>	FLOAT		0.50	0.01	20	RW	FVS

Setting of the jerk value for the last part of the deceleration.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.7	11052	<b>Stop deceleration</b>	m/s <sup>2</sup>	FLOAT		0.70	0.01	10	RW	FVS

Setting of the maximum deceleration value used when the start command is removed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.8	11054	<b>Percent acc factor</b>	Perc	FLOAT		100.00	10	10000	RW	FVS

Setting of the acceleration factor multiplier.

If set to 100 the ramp uses the factors entered in the parameters.

If set to a value of less than 100 the lift will tend to accelerate over a longer distance.  
If set to a value of more than 100 the lift will tend to accelerate over a shorter distance.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.2.9	11056	<b>Percent dec factor</b>	Perc	FLOAT		100.00	10	10000	RW	FVS

Setting of the deceleration factor multiplier.

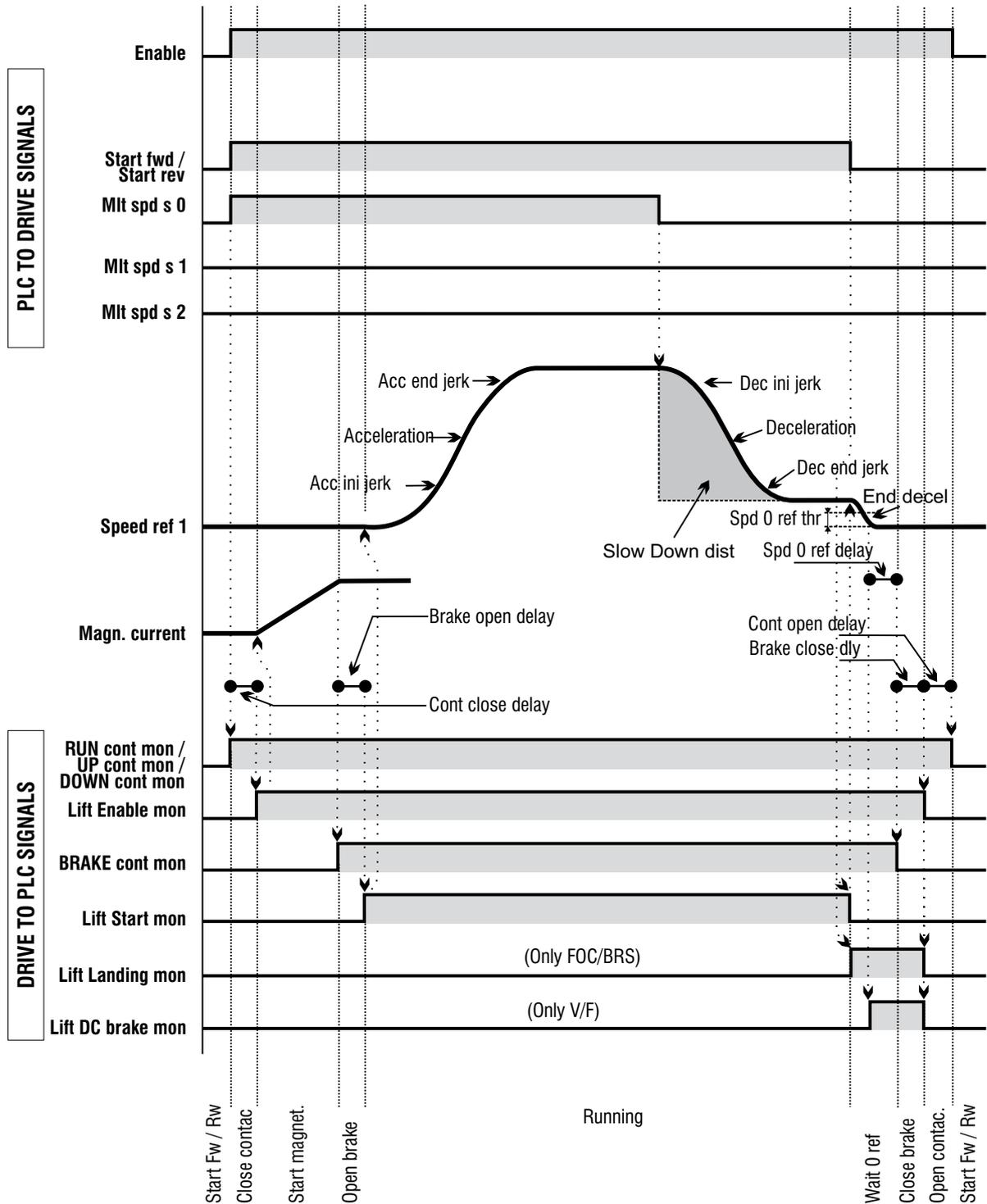
If set to 100 the ramp uses the factors entered in the parameters.

If set to a value of less than 100 the lift will tend to decelerate over a longer distance.

If set to a value of more than 100 the lift will tend to decelerate over a shorter distance.

## 5.3 – LIFT SEQUENCES

This menu shows the parameters used to manage and define the travel of the lift depending on the status of the inputs and alarms. The structure of the lift sequences is summarised below.



### Starting sequence:

- 1 Reading of the enable hardware input and checking for alarms (enabling is aborted in case of an alarm)
- 2 Detection of the **Enable** and **Start** commands as set in the **Sequence start mode** parameter
- 3 When the **Start forward/reverse** command is received, a command is sent to close the contactors, depending on the direction of travel
- 4 When the time set in **Cont close delay** has elapsed the internal **Enable** lift signal is activated
- 5 The system waits for the magnetisation signal from the drive (**Drive ready**)
- 6 At the end of magnetisation the open brake signal is activated

- 7 The system waits for the brake to be opened (**Brake open delay**)
- 8 When the delay before opening the brake has elapsed the **Start** lift command is sent and movement is enabled.

**Sequence of movement:**

- 1 The motor is started and moves slowly at the speed set in Smooth start speed for the time indicated in **Smooth start delay**
- 2 At the end of **Smooth start delay**, movements are managed by the multispeeds and S-shaped ramp
- 3 When the set speed is exceeded, the **Brake 2 mon** output signal can be used to check that the brake has actually been opened
- 4 The EFC function with space control can be used to change to a slower speed
- 5 When the **Start forward/reverse** signal is lowered the signal indicating arrival at the floor is enabled and the start lift signal is disabled
- 6 The start command can be sent again until the drive reaches zero speed: the operating conditions are restored.

**Stopping sequence:**

- 1 When zero speed is reached the DC stop command is enabled (**SSC** control)
- 2 The application waits the time needed to reach zero speed and sends the command to close brakes 1 and 2
- 3 It waits the time necessary for the brakes to close (Brake close delay) and, if the current is to be reduced with a ramp, it waits for the current limit to reach zero. The internal Enable lift, arrival zone and DC brake signals are then lowered.
- 4 The application waits the time set in **Contactor open delay** and checks that the current supplied is zero, before sending a command to open the contactors.

It is essential to make sure that whenever a drive alarm condition is generated or the drive is disabled, the drive is stopped and a command is sent to open the contactors.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.1	11060	<b>Sequence start mode</b>		ENUM		0	0	2	RW	FVS
Setting of the procedure to start the contactor command sequence.										
0 Start forward/reverse										
1 Enable										
2 Multispeed != 0										
If set to 0 the contactor sequences can be enabled without the Enable command (Enable is only required for motor operation). The Enable signal can be sent by an auxiliary contact of the output contactors.										
If set to 1 the contactor sequences can only be enabled if the Enable command is active.										
If set to 2 the contactor sequences can be enabled using the multispeed values. Multispeed values other than 0 cause the sequence to start. The start command must also be enabled.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.2	11062	<b>Cont close delay</b>	ms	INT32		200.00	0	10000	RW	FVS
Setting of the delay time for closing the contactor.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.3	11064	<b>Brake open delay</b>	ms	INT32		0	0	10000	RW	FVS
Setting of the brake opening delay time.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.4	11066	<b>Smooth start delay</b>	ms	INT32		0	0	10000	RW	FVS
Setting of the time for which the <b>Smooth start speed</b> speed is enabled. If this parameter is set to zero, the S-shaped profile is executed directly at the start, and the soft start function is excluded.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.5	11068	<b>Brake close delay</b>	ms	INT32		200.00	0	10000	RW	FVS
Setting of the brake closing delay time.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.6	11070	<b>Current down delay</b>	ms	INT32		0	0	10000	RW	FVS

Setting of the time necessary to lower the torque from the limit value enabled during travel to 0. It defines the inclination of the down ramp in the “Current down ramp” function. The purpose of this function is to prevent the immediate removal of motor torque when the brake is closed, which would cause mechanical strain in the cabin.

To avoid this phenomenon when the brake is closed the current limits are brought to the current value in use and then lowered on the ramp.

To enable the function the **Current down delay** parameter must be set to a value other than zero.

This is only possible when **Torque curr lim sel** has a value other than “OFF”, otherwise **Current down delay** is forced to zero.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.7	11072	<b>Contactor open delay</b>	ms	INT32		200.00	0	10000	RW	FVS

Setting of the contactor opening delay time.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.8	11078	<b>Speed 0 threshold</b>	rpm	INT16		30.00			RW	FVS

Setting of the zero speed threshold, below which the zero speed signal is activated.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.9	11080	<b>Speed 0 delay</b>	ms	UINT16		400.00	0	10000	RW	FVS

Setting of the zero speed delay. After the zero speed signal and after the time set in this parameter the zero speed signal is activated. These parameters are used to know the cabin stop.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.10	11082	<b>Smooth start speed</b>	Hz	FLOAT		0.00	0.00	10000.0	RW	FVS

Setting of the speed in the smooth start phase.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.11	11084	<b>Smooth start mode</b>		ENUM		2	1	2	RW	FVS

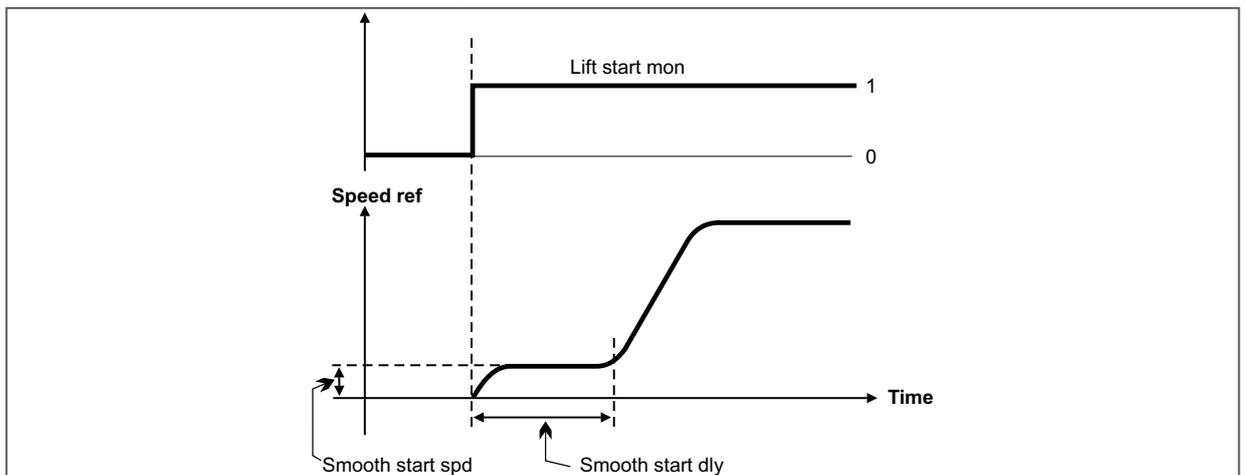
Setting of the soft start mode.

- 1 Speed constant
- 2 Jerk variable

If set to 1 the soft speed is automatically selected after the start command regardless of the selected multispeed. The duration of the smooth speed depends on the **Smooth start delay** parameter: if this parameter is set to zero the selected multispeed is used and not the soft speed. This setting is used in systems with a reducer, as it helps to overcome initial friction before starting with the profile.

If set to 2 an even slower starting mode is set, which uses the start jerk of the variable acceleration in the smooth start phase. Depending on the values set in **Smooth start speed** and **Smooth start delay** the jerk value is calculated at the end of the soft start phase with a linear ramp that changes this jerk from 0 to the calculated value.

The use of a variable value jerk obtains a variable start acceleration that follows a parabolic trajectory, enabling extremely reduced variations in initial speed. This setting is mainly used in systems with gearless motors.



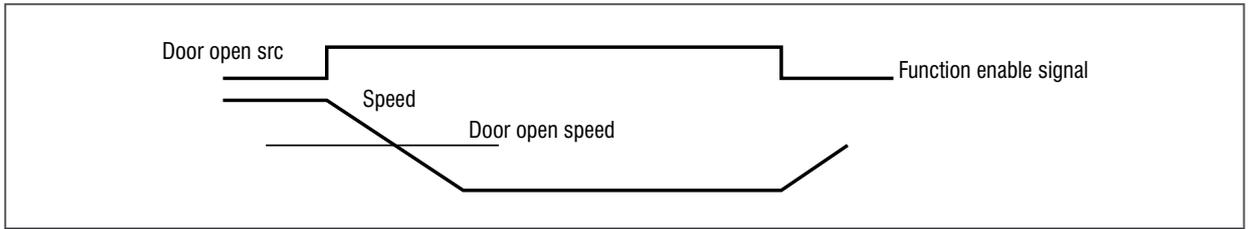
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.12	11086	<b>Door open speed</b>	m/s	FLOAT		0.00			RW	FVS

Setting of the door opening speed.

Source to enable brake release through the digital input. In standard sequence brake release is controlled by the drive and therefore this parameter is set to ONE. In case that brake release should be conditioned by some external control (e.g. PLC), set this parameter to digital input controlled by PLC.

Internal sequence for brake release will wait until this input is asserted.

During run brake will be closed whenever this input becomes not asserted.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.13	12014	<b>Trip number</b>		INT32		0			R	FVS
The lift journey counter is displayed. The counter increases each time the Start lift signal is activated.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.3.14	12016	<b>Sequence state</b>		UINT16		0			R	FVS
The lift sequence status is displayed. (see graph)										

## 5.4 – MECHANICAL DATA

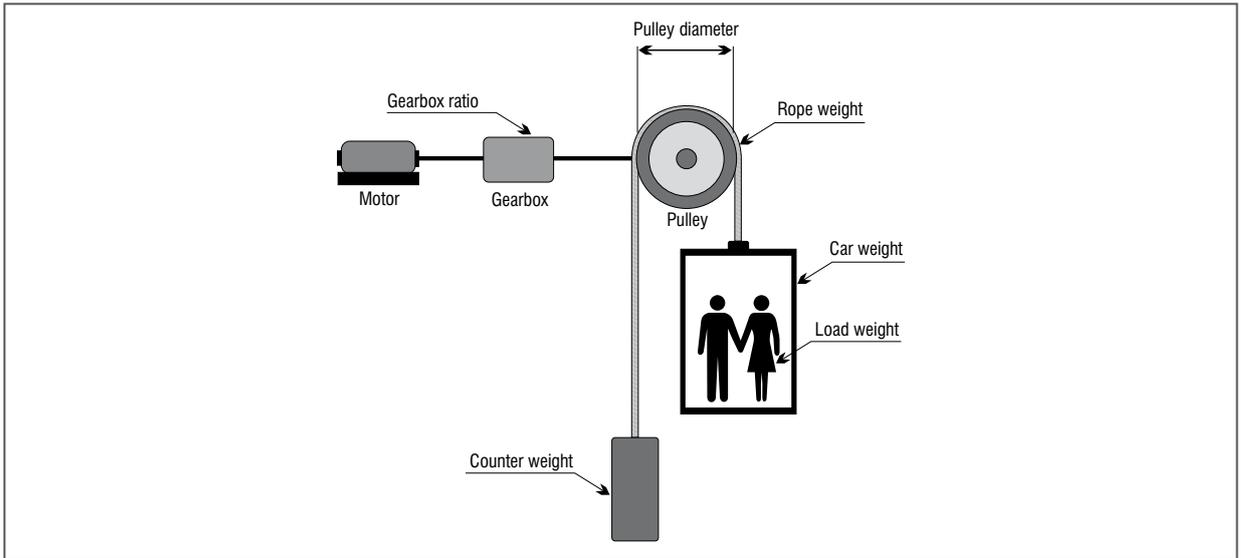
The parameters described in this menu are used to define the mechanical and physical features of the system.

### Mechanical constants

The mechanical constant defines the ratio between motor rpm and distance travelled by the cabin.

The **ConstMech** can be calculated in two ways, depending on which conversion method is used.

- **Directly:**                    **Mechanical constant** = System speed/(Full scale speed/60)
- **Mechanical data:**        **Mechanical constant** = ( $\pi$  \*Pulley diameter)/Reduction gear ratio



The mechanical constant is calculated when the drive is turned on and re-calculated each time one of the parameters used to determine this value is modified (**Mechanical calc mode**, **Full scale speed**, **Contract speed**, **Pulley diameter**, **Gearbox ratio**).

The method used to calculate the mechanical constant can be selected regardless of the control mode (**SSC**, **Flux vector OL**, **Flux vector CL**) or the unit of measure to be used.

### Weights and inertia

Entering the mechanical features of the system makes it possible to calculate the total inertia applied to the motor.

After modifying these parameters the calculated inertia value is automatically saved in the "**Inertia comp**" parameter to enable correct inertia compensation.

The value of the inertia that can be entered in the "**Inertia**" parameter in the "16 - SPEED REG GAINS" menu is displayed to calculate the speed loop parameters more accurately. This operation is performed automatically when PAR 11162 Calc spd reg gain is enabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.1	11006	<b>Contract speed</b>	m/s	FLOAT		0.5	0	10	RW	FVS

Represents the speed of the system. It is also used to calculate the mechanical constant. The cabin speed in m/s is associated with the full scale speed (par. 628) to obtain the conversion factor (m/rpm).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.2	11008	<b>Mechanical calc mode</b>		INT16		0	0	1	ERW	FVS

Setting of the method for calculating the unit of measure, depending on the speed of the cabin and of the motor (Direct method) or according to the mechanical ratios (Mechanical data method).

- 0 Direct method
- 1 Mechanical data

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.3	11010	<b>Gearbox ratio</b>		FLOAT		90			ERW	FVS

Setting of the ratio between the speed of the motor and of the pulley.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.4.4	11012	<b>Pulley diameter</b>	m	FLOAT		0.60			ERW	FVS
		Setting of the diameter of the pulley.								
5.4.5	11150	<b>Car weight</b>	kg	FLOAT		0.00			RW	FVS
		Setting of the weight of the cabin.								
5.4.6	11152	<b>Counter weight</b>	kg	FLOAT		0.00			RW	FVS
		Setting of the weight of the counterweight.								
5.4.7	11154	<b>Load weight</b>	kg	FLOAT		0.00			RW	FVS
		Setting of the weight of the maximum load for system dimensions.								
5.4.8	11156	<b>Rope weight</b>	kg	FLOAT		0.00			RW	FVS
		Setting of the weight of the cable.								
5.4.9	11158	<b>Gearbox inertia</b>	kgm <sup>2</sup>	FLOAT		0.00			RW	FVS
		Setting of the inertia of the mechanical reducer.								
5.4.10	11160	<b>Motor inertia</b>	kgm <sup>2</sup>	FLOAT		0.00			RW	FVS
		Setting of the motor inertia.								
5.4.11	11162	<b>Calc spd reg gains</b>		ENUM	INT	0	0	1	RW	F__
		If enabled this writes the inertia value in parameter 2240 <b>Inertia</b> , calculates the gains of the speed loop, sets parameters 2200 to 2210 to 100% and writes the calculated values in parameters 2236 <b>Speed reg P gain</b> , 2238 <b>Speed reg I time</b> and 2242 <b>Bandwidth</b> . The value of the parameter is automatically reset to 0 once calculation starts.								
5.4.12	12020	<b>Inertia calculated</b>	kgm <sup>2</sup>	FLOAT		0			R	FVS
		The inertia of the system with half load applied to the motor is displayed. This value can be entered in the Inertia parameter in the "16 - SPEED REG GAINS" menu.								
5.4.13	12022	<b>SpeedLineCalc</b>	m/s	FLOAT		0			R	FVS
		linear speed in m/s calculated using the 11010 <b>Gearbox ratio</b> and 11012 <b>Pulley diameter</b> parameters is displayed.								

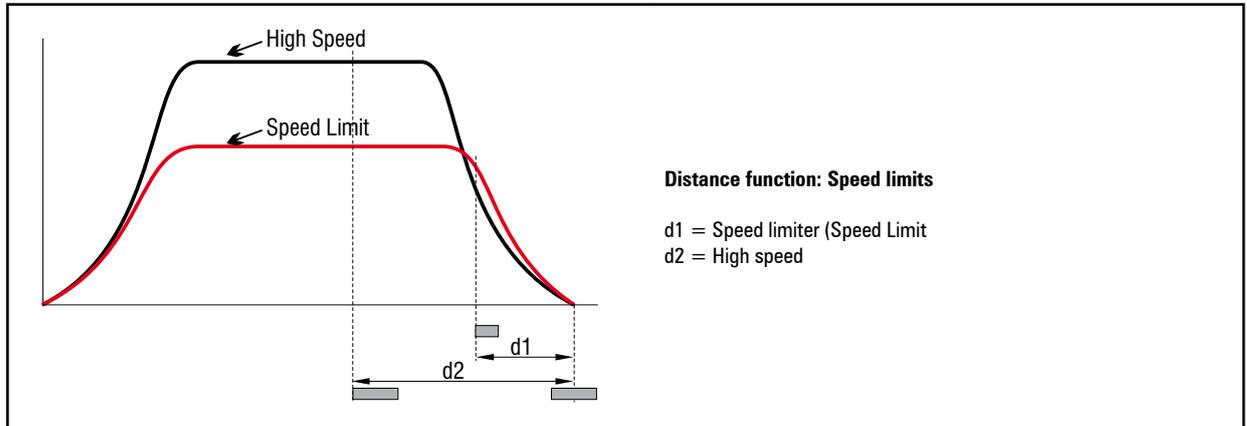
## 5.5 – DISTANCE

Use of the distances facilitates positioning of the deceleration sensors and is helpful for managing short floors.

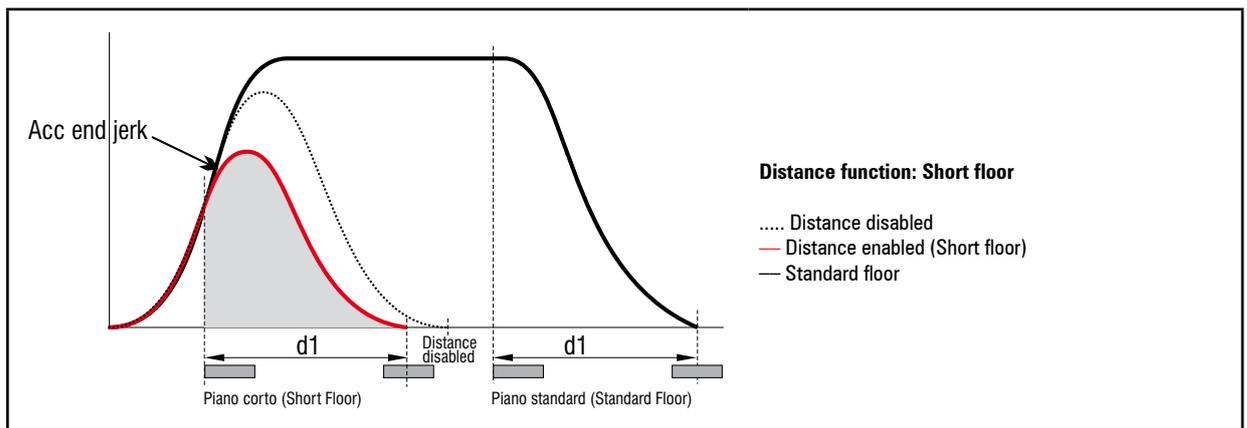
The aim of the function that considers distances is to start decelerating from high speed in order to reach the approach speed in proximity to the landing zone.

Up to a maximum of 8 different slow down distances can be managed (real distance between the start of the sensor and the floor) associated with the different multispeeds. The distance to be used is selected after enabling the drive, before the cabin starts to move. Different distances cannot be selected while the cabin is travelling.

If the slow down distance is shorter than the real deceleration distance for the selected target speed, the speed is automatically limited so that the stop is always correct. When this speed limiter is enabled a **Speed target** alarm (warning) is generated.



If the slow down sensor is met during acceleration, the distance required to terminate the acceleration and deceleration phases may be greater than the distance available: in that case the last acceleration jerk is increased to enable correct landing.



Also note that when the position sensor is not enabled in the landing zone, its exact length is not known. To ensure correct deceleration this distance is estimated on the basis of the value entered in the **Landing zone dist** parameter.

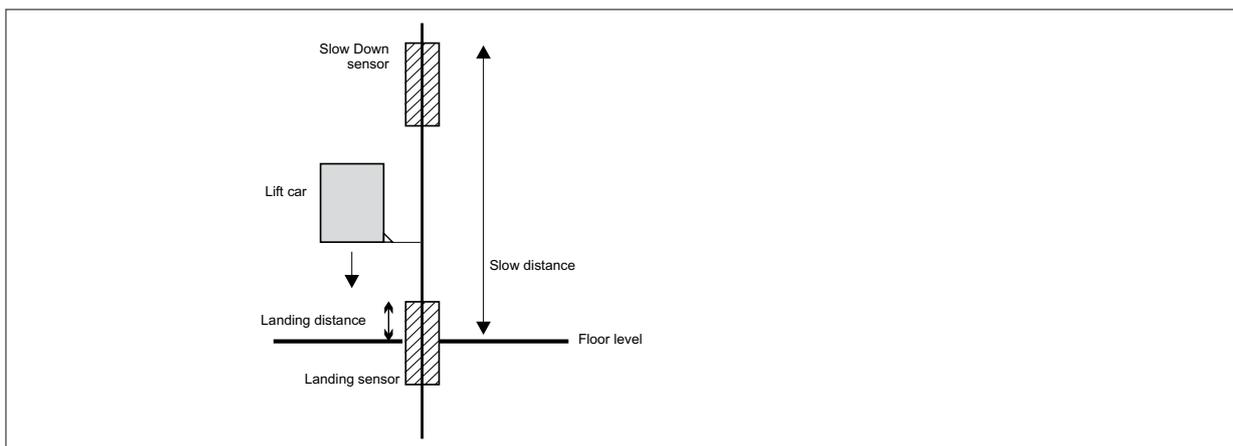
When this is equal to zero the distance is calculated on the basis of the value of the low speed and deceleration parameters and shown in the **Landing zone space** parameter. The user should make sure this distance is approximately the real length of the landing zone.

In FOC mode the distance is calculated by reading the encoder position.

In the SSC and SLS modes the distance is estimated ( $\text{SpdRef} \times \text{Time}$ ) and is thus subject to errors due to the difference between the real speed of the motor and the speed reference.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.1	11102	Distance multispeed0	m	FLOAT		0.00	0.00	10.00	RW	FVS

Setting of the value of the distance associated with **multispeed 0**.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.2	11104	<b>Distance multispeed1</b>	m	FLOAT		0.00	0.00	10.00	RW	FVS

Setting of the value of the distance associated with **multispeed 1**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.3	11106	<b>Distance multispeed2</b>	m	FLOAT		0.00	0.00	10.00	RW	FVS

Setting of the value of the distance associated with **multispeed 2**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.4	11110	<b>Distance multispeed3</b>	m	FLOAT		0.00	0.00	10.00	RW	FVS

Setting of the value of the distance associated with **multispeed 3**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.5	11112	<b>Distance multispeed4</b>	m	FLOAT		0.00	0.00	10.00	RW	FVS

Setting of the value of the distance associated with **multispeed 4**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.6	11114	<b>Distance multispeed5</b>	m	FLOAT		0.00	0.00	10.00	RW	FVS

Setting of the value of the distance associated with **multispeed 5**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.7	11116	<b>Distance multispeed6</b>	m	FLOAT		0.00	0.00	10.00	RW	FVS

Setting of the value of the distance associated with **multispeed 6**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.8	11118	<b>Distance multispeed7</b>	m	FLOAT		0.00	0.00	10.00	RW	FVS

Setting of the value of the distance associated with **multispeed 7**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.9	11120	<b>Slow speed</b>		UINT16		0	0	9	RW	FVS

Setting of the floor approach speed.

The **Slow speed** is the speed of approach to the landing zone. When the multispeed associated with the **Slow speed** is selected the slow down space is checked in order to reach this speed in proximity to the landing zone.

- 0 Autoselect
- 1 Multispeed 0
- 2 Multispeed 1
- 3 Multispeed 2
- 4 Multispeed 3
- 5 Multispeed 4
- 6 Multispeed 5
- 7 Multispeed 6

- 8 Multispeed 7
- 9 Null

When mode **0 (Autoselect)** is selected, **Slow speed** is automatically connected to the multispeed with absolute value of less and other than zero. If repositioning speeds with a value of less than the **Slow speed** are used, the multispeed corresponding to the floor approach speed must be set.

When mode **9 (Null)** is selected the floor approach spaces are never controlled. In this case the profile depends exclusively on the multispeed selected.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.10	11130	Enable landing sel		INT16		0	0	1	RW	FVS

Setting for enabling space control in the landing zone.

This function enables the cabin to arrive exactly at floor level by controlling the position of the encoder in the landing zone sensor. Position control is only possible if an encoder is used (normally in FOC-BRS). SSC and SLS modes simply generate an appropriate profile on the position reference.

When the function is enabled, the **Slow speed**, PAR 11120 (speed at which the cabin enters the landing zone) no longer depends on the relative multispeed but is calculated automatically according to the jerk and deceleration values to enable stopping without exceeding the set limits.

The value of **Slow speed** (PAR 11120 = 1...8) is calculated using the jerk and deceleration values not multiplied by the ramp factor.

During the landing procedure the speed profile is calculated using the fifth-degree polynomial method.

Direct arrival at floor level is also possible, without using the **Slow speed**. This is done by setting the **Slow speed** multispeed value to zero.

- 0 Off
- 1 On

Given the solution that has been selected to calculate the speed profile, before enabling the landing zone function it is important to verify the exactness of the spaces that have been entered (for both slow down and landing), and of the mechanical constants. Incorrect spaces could result in sudden decelerations and errors in arrival at floor level.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.11	11132	Landing zone dist	m	FLOAT		0.12	0	10.00	RW	FVS

Setting of the landing zone distance.

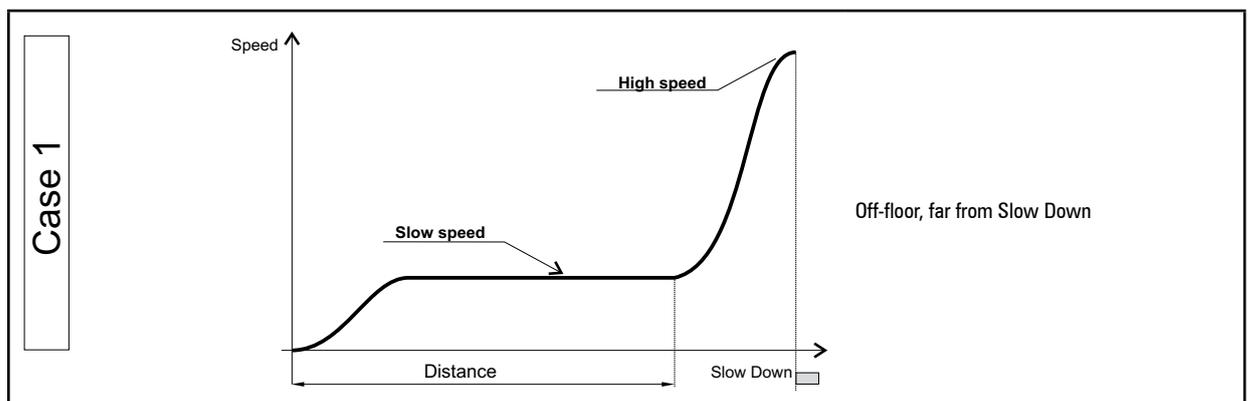
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.12	11138	Out floor function		BIT		0	0	1	RW	FVS

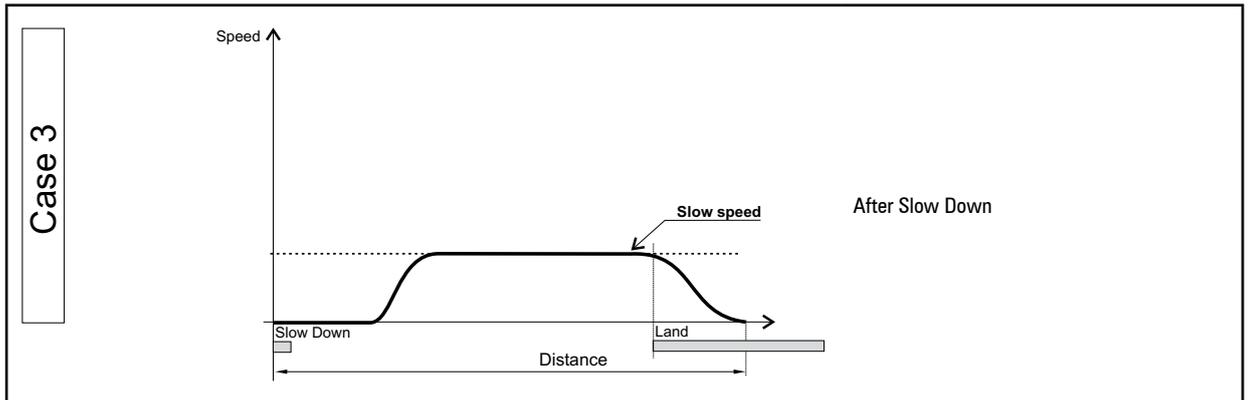
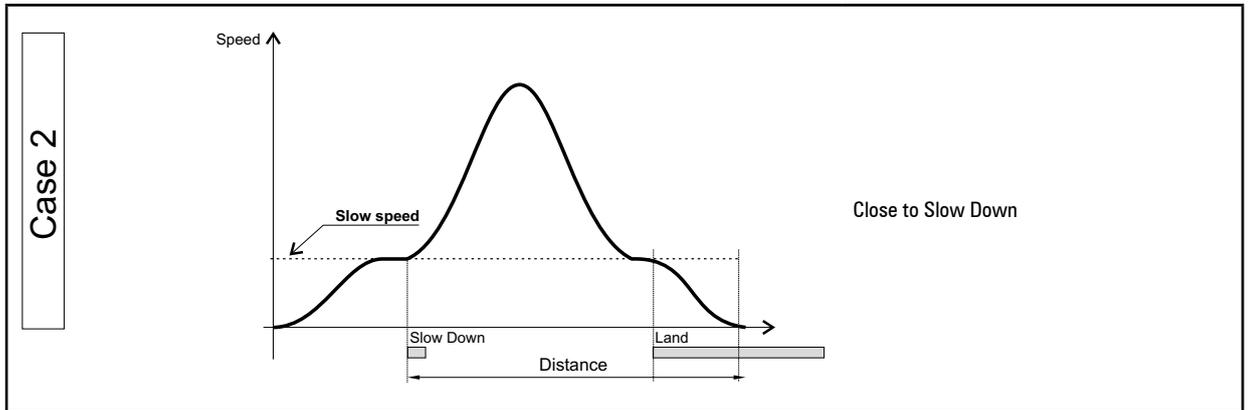
Enabling of the safe start function when not at floor level. This function enables recognition of arrival at floor level, which is assumed to be correct if the landing zone phase is performed.

If a correct stopping sequence is not recognised this means an emergency stop command has been sent, after which a low speed start is generated.

The restart procedure depends on the stop position as shown in the figure.

- 0 OFF
- 1 ON





Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.13	11140	<b>Delay acq time</b>	m	FLOAT		15	0.00	10.00	RW	FVS

Setting of the delay time for sending the slow down signal.

The value of this parameter is used to compensate for the distance covered during the delay time between the passage of the cabin on the slow down sensor and receipt of the decelerate command by the drive. At high speeds this distance can have significant values: e.g. with a cabin travelling at 2 m/s and a delay time of 30 ms, the distance covered and to be taken into consideration during the deceleration phase is 6 cm.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.14	11142	<b>Calc space hi-speed</b>		UINT16		1	0	8	RW	FVS

Setting of the high speed to be used to calculate distances.

- 0 Multispeed 0
- 1 Multispeed 1
- 2 Multispeed 2
- 3 Multispeed 3
- 4 Multispeed 4
- 5 Multispeed 5
- 6 Multispeed 6
- 7 Multispeed 7
- 8 Null

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.15	11276	<b>Kp Landing</b>		Float		0.0000	0	100	RW	FVS

Lets you configure proportional gain to control the landing curve.

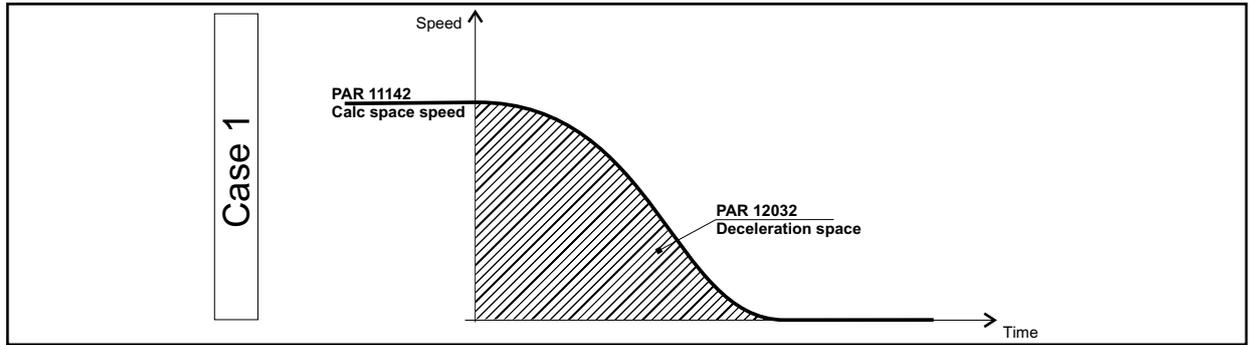
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.16	12030	<b>Acceleration space</b>	m	FLOAT		0			R	FVS

The distance necessary to accelerate from zero speed to the high speed selected in the previous parameter is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.17	12032	<b>Deceleration space</b>	m	FLOAT		0			R	FVS

The distance necessary to stop from the high speed is displayed.

Different methods are used to calculate this distance, depending on the value of the relative parameters:

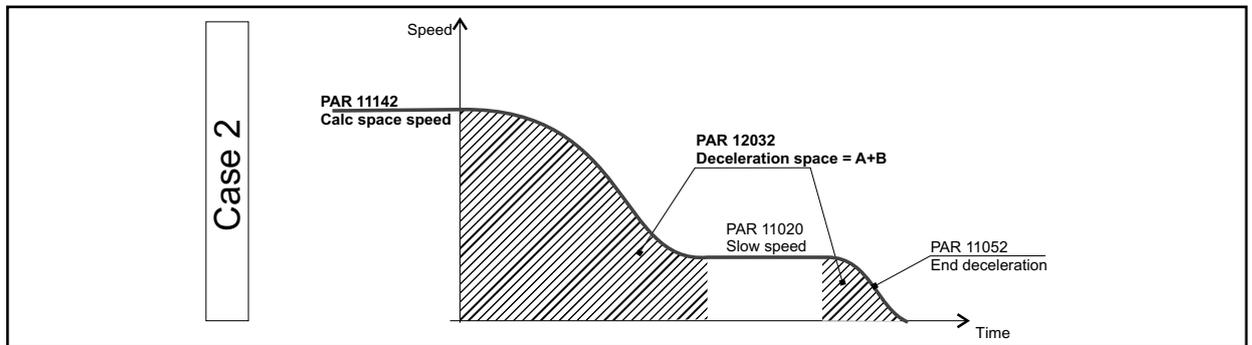


- **Case 1:** -shaped ramp from high speed to zero speed

**Distance multispeed0** (PAR 11102) = 0, **Enable landing sel** (PAR 11130) = Disabled, **Slow speed** (PAR 11120) = Zero.

**Deceleration space** (PAR 12032) the distance covered during the stop ramp from **Calc space hi-speed** (PAR 11142) (high speed) to zero speed.

The parameters that influence the calculation of this distance are: **Calc space hi-speed** (PAR 11142), **Percent dec factor** (PAR 11056), **Dec ini jerk** (PAR 11046), **Deceleration** (PAR 11048) and **Dec end jerk** (PAR 11050).

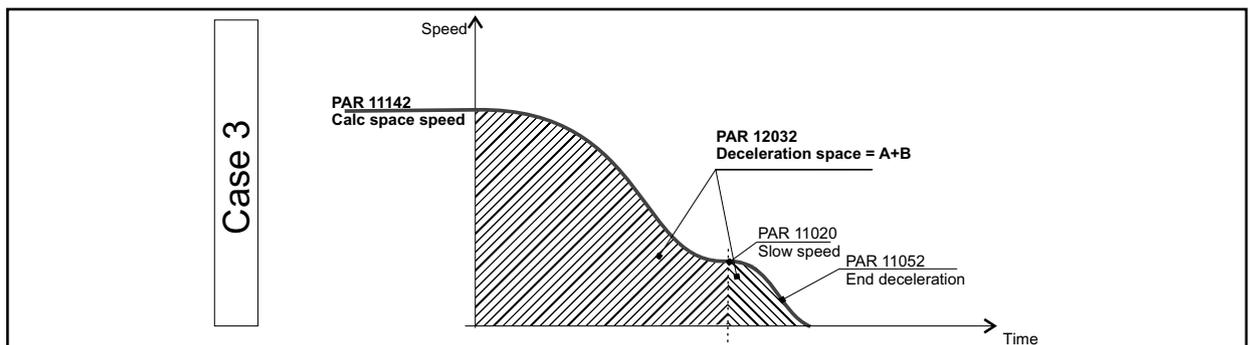


- **Case 2:** S-shaped ramp from high to low speed, low speed zone and subsequent stop

**Distance multispeed0** (PAR 11102) = 0, **Enable landing sel** (PAR 11130) = Disabled, **Slow speed** (PAR 11120) = Multispeed 0.

**Deceleration space** (PAR 12032) is the distance covered during the slow down ramp from **Calc space hi-speed** (PAR 11142) (high speed) to **Multispeed 0** and during the stop ramp from **Calc space hi-speed** (PAR 11142) to zero speed. It does not include the distance covered at constant speed (Low speed).

The parameters that influence the calculation of this distance are: **Calc space hi-speed** (PAR 11142), **[11022] Multispeed 0** (PAR 11020), **Percent dec factor** (PAR 11056), **Dec ini jerk** (PAR 11046), **Deceleration** (PAR 11048), **Dec end jerk** (PAR 11050) and **Stop deceleration** (PAR 11052).

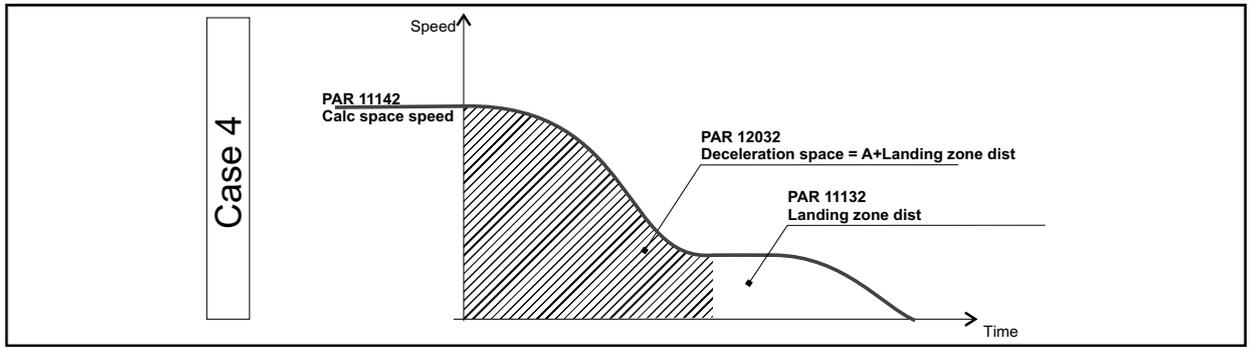


- **Case 3:** S-shaped ramp from high to low speed, low speed zone and subsequent stop

**Distance multispeed0** (PAR 11102)  $\neq 0$  (es.0.5m), **Enable landing sel** (PAR 11130) = Disabled, **Slow speed** (PAR 11120) = Multispeed 0.

**Deceleration space** (PAR 12032) is the distance covered during the slow down ramp from **Calc space hi-speed** (PAR 11142) to **Multispeed 0** and during the stop ramp from **Calc space hi-speed** (PAR 11142) to zero speed. It does not include the distance covered at constant speed (Low speed).

The parameters that influence the calculation of this distance are: **Calc space hi-speed** (PAR 11142), **[11022] Multispeed 0** (11020), **Percent dec factor** (PAR 11056), **Dec ini jerk** (PAR 11046), **Deceleration** (PAR 11048) and **Dec end jerk** (PAR 11050).



- **Case 4:** S-shaped ramp from high to low speed, low speed zone and subsequent stop with “landing control”

**Distance multispeed0** (PAR 11102)  $\neq 0$  (es.0.5m), **Enable landing sel** (PAR 11130) = Enabled, **Slow speed** (PAR 11120) = Multispeed 0.

**Deceleration space** (PAR 12032) is the distance covered during the slow down ramp from **Calc space hi-speed** (PAR 11142) (high speed) to **Multispeed 0** plus **Landing zone dist** (PAR 11132).

The parameters that influence the calculation of this distance are: **Calc space hi-speed** (PAR 11142), [11022] **Multispeed 0** (PAR 11020), **Percent dec factor** (PAR 11056), **Dec ini jerk** (PAR 11046), **Deceleration** (PAR 11048) and **Dec end jerk** (PAR 11050)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.5.18	12034	Landing zone space	m	FLOAT		0			R	FVS

The landing zone space is displayed. If this parameter is set to a value other than zero, this variable has the same value as the parameter, if **Landing zone space** = 0 this variable assumes the value of the distance necessary to decelerate from the speed set in **Slow speed** to zero using the ramp values not multiplied by the **Percent dec factor**.

## 5.6 – EMERGENCY MODE

The possibility of operating on an emergency module power supply has been implemented in the drive, to overcome the problem of sudden power failures.

The emergency operation condition signal must be connected to the **Emergency** command input (digital input 3 as default) which, if active, disables the **undervoltage** alarm so that the drive can operate powered on the DC link by the EMS emergency module (which is in turn powered by a buffer battery pack).

In order to use batteries with a lower power rating, a function has been implemented to allow the desired direction of travel to be selected before starting an emergency start procedure.

The direction is selected after testing the movement in both directions, choosing the one that requires less current (for more details see EMS manual).

In case of a blackout the drive can be powered by an Emergency Module Supplier (EMS) or by an Uninterruptible Power Supply (UPS).

The emergency function signal must be connected to the input of the Emergency Mode command (default digital input DI3).

### Operation with Emergency Module Supplier (EMS)

If digital input 3 DI3 is active, the Undervoltage (UV) alarm refers to the value set in parameter 448 (menu 4), allowing the drive to run powered on the DC link. See the VDL200 Quick Start manual (paragraph 7.3.3) and the EMS Manual for the connection.

### Operation with Single-phase Uninterruptible Power Supply (UPS)

When the emergency is activated by digital input DI3, the Drive can be powered by a 230V single-phase UPS. See the VDL200 Quick Start manual (paragraph 7.3.3) for the connection.

### Arrival at floor in Emergency

For both closed-loop and open-loop configurations, arrival at the floor in an emergency is managed by trying to optimize the request for current to the emergency modules.

The drive can select the more favorable direction for arriving at the floor without forward/reverse movements, thereby protecting the parts in emergency.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.1	11260	<b>Speed emergency mode</b>	Hz	FLOAT		5.00	3.40E+94	3.40E+94	RW	FVS

Setting of the speed during movements in the emergency operation condition. Given the low voltage, high speeds cannot be reached with the drive powered by battery (or emergency module). The speed selected in the multispeed parameter is therefore ignored and this value is used instead.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.2	11262	<b>Autoselect direction</b>		BIT		0	0	2	ERW	FVS

Enabling of automatic selection of preferred direction before an emergency start.

- 0 OFF
- 1 ON
- 2 Recommended

This parameter lets you select how the drive calculates the more favorable riding direction of the cabin when it is in emergency mode.

If 0 is selected, the drive does not calculate the more favorable direction, which is commanded manually.

If 1 is selected, as soon as the drive is in emergency condition it moves the motor with alternating forward and reverse movements, calculating the value of the current delivered in each direction, and selects the more favorable one (less current requested).

If 2 is selected (recommended mode), the drive evaluates the more favorable direction without making alternating forward and reverse movements (avoiding requests for current from the EMS or UPS), already knowing the more favorable direction because it had already calculated it based on the value of current delivered and on the DC-Link voltage. If the drive was in regeneration before the emergency, it keeps the same riding direction in emergency; if the drive was not in regeneration but was delivering current at a value below the value set in parameter PAR 11284 **Detection Limit**, it keeps the same riding direction. Otherwise, the drive changes riding direction and considers the previous one unfavorable.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.3	11278	<b>Em Dc brk current</b>		FLOAT		75.0	0	150	RW	FVS

The parameter lets you set the braking current value by injecting DC in the motor windings. You can limit this value and avoid overloading the emergency batteries.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.4	11284	<b>Detection Limit</b>	PERC	LONG		50	0	100	RW	FVS

This is the current limit value delivered by the drive (expressed as a percentage of nominal current) to select the more favorable riding direction in **Recommended** mode (see PAR 11262).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.6.5	12282	<b>Chosen Direction</b>		INT		0	***	***	R	FVS

Indicates the direction selected by the drive during the emergency.

- 0 **No direction selected**
- 1 **Forward**
- 2 **Reverse**

The association Forward/Reverse and Up/Down depends on how the connection to the motor was made.

## 5.7 – INPUT/OUTPUT

### Inputs

The lift application input commands can be connected to a signal via a selector in order to choose from a series of possibilities available in the input list.

Generally speaking a signal can be connected to a digital input, to certain internal signals and to a bit of the Decomp word bit. This word is connected to a fieldbus processing channel (**PDC FieldBus M->S1**).

The set of digital inputs in a word is displayed in the Lift control word.

The commands used in the lift application are listed below

Command	Description	Default Source
EnableCmd	Enable command	Dig input enable
StartFwdCmd	Start forward command	Dig input 1x
StartRevCmd	Start reverse command	Dig input 2x
MltSpd S0	Multispeed 0 sel	Dig input 4x
MltSpd S1	Multispeed 1 sel	Dig input 5x
MltSpd S2	Multispeed 2 sel	Dig input 6x
ContFbk	Contacteur close contact	Run cont mon
BrakeFbk	Brake close contact	Brake cont mon
DoorOpenEna	Source for enabling the door open function	Null
DoorFbk	Door close contact	Null
Emergency mode	Emergency operation command	Dig input 3x
InvRampSrc	Command to invert the speed direction	Null
UpperLimit	Travel upper limit signal	Null
LowerLimit	Travel lower limit signal	Null

### Outputs

The output signals of the lift control are connected directly to the PAD parameters as shown in the table below:

PAR	Signal	Description
3700	Lift enable	LiftEnable
3702	Run cont mon	RunCont
3704	Up cont mon	UpCont
3706	Down cont mon	DownCont
3708	Brake cont mon	BrakeCont
3710	Lift dc brake	LiftDcBrake
3712	Brake 2 mon	Brake2
3714	Door open mon	DoorOpen
3716	Lift start	LiftStart
3718	PAD10	-----
3720	Lift status word	Lift status word
3722	PAD12	-----
3724	PAD13	-----
3726	Ramp down limit	-----
3728	PAD15	-----
3730	Lift wdec input	LiftWdeclnp

These can be accessed from the selection lists and can thus easily be used to configure the relay and digital outputs of the drive. (refer to the PADS menu for configuration).

The set of lift output signals is contained in the LiftStatusWord, connected to PAR 3720 **Lift status word** and fieldbus Tx DW1:

Bit	Description	Notes
0	LiftEnable	Enable lift command.
1	RunCont	Run command contactor
2	UpCont	Up command contactor
3	DownCont	Down command contactor
4	BrakeCont	Brake command contactor
5	LiftDcBrake	DC brake function command (firmware)
6	Brake2	Brake control signal (see sequences)
7	DoorOpen	Open door command
8	Drive Ok	Drive not in alarm condition signal
9	SpeedIsZero	Speed less than 0 limit signal
10	SpeedRefsZero	Speed reference less than 0 limit signal
11 ... 12		

## Multi speed configuration table

Multi speed S2 sel	Multi speed S1 sel	Multi speed S0 sel	ACTIVE RAMP REF
0	0	0	Multi speed 0
0	0	1	Multi speed 1
0	1	0	Multi speed 2
0	1	1	Multi speed 3
1	0	0	Multi speed 4
1	0	1	Multi speed 5
1	1	0	Multi speed 6
1	1	1	Multi speed 7

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.1	11220	<b>Lift enable cmd sel</b>		ENUM		1110			ERW	FVS

Setting of the source for the enable command.

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
3728	PAD 15
6000	Null
6002	One
12250	B0 Lift decomp
12252	B1 Lift decomp
12254	B2 Lift decomp
12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.2	11222	<b>Start fwd cmd sel</b>		ENUM		1210			ERW	FVS

Setting of the source for the start forward command.

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
3728	PAD 15
6000	Null
6002	One
12250	B0 Lift decomp
12252	B1 Lift decomp
12254	B2 Lift decomp

12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.3	11224	Start rev cmd sel		ENUM		1212			ERW	FVS

Setting of the source for the start reverse command.

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
3728	PAD 15
6000	Null
6002	One
12250	B0 Lift decomp
12252	B1 Lift decomp
12254	B2 Lift decomp
12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.4	11226	Multi speed S0 sel		ENUM		1216			ERW	FVS

Setting of the source for the first multispeed selection bit.

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
3728	PAD 15
6000	Null
6002	One
12250	B0 Lift decomp
12252	B1 Lift decomp

12254	B2 Lift decomp
12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.5	11228	<b>Multi speed S1 sel</b>		ENUM		1218			ERW	FVS

Setting of the source for the second multispeed selection bit.

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
3728	PAD 15
6000	Null
6002	One
12250	B0 Lift decomp
12252	B1 Lift decomp
12254	B2 Lift decomp
12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.6	11230	<b>Multi speed S2 sel</b>		ENUM		1220			ERW	FVS

Setting of the source for the third multispeed selection bit.

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
3728	PAD 15
6000	Null
6002	One
12250	B0 Lift decomp

12252	B1 Lift decomp
12254	B2 Lift decomp
12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.7	11232	<b>Contactork fbk sel</b>		ENUM		3702			ERW	FVS

Setting of the source of the contactor status signal.

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
3728	PAD 15
6000	Null
6002	One
12250	B0 Lift decomp
12252	B1 Lift decomp
12254	B2 Lift decomp
12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.8	11236	<b>Brake fbk sel</b>		ENUM		3708		ERW	FVS	

Setting of the source of the brake status signal.

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
3728	PAD 15
6000	Null
6002	One
12250	B0 Lift decomp

12252	B1 Lift decomp
12254	B2 Lift decomp
12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.9	11238	Door open sel		ENUM		6000			ERW	FVS

Setting of the source to enable door closing control.

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
3728	PAD 15
6000	Null
6002	One
12250	B0 Lift decomp
12252	B1 Lift decomp
12254	B2 Lift decomp
12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.10	11240	Door feedback sel		ENUM		6000			ERW	FVS

Setting of the source of the door status signal.

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
3728	PAD 15
6000	Null
6002	One

12250	B0 Lift decomp
12252	B1 Lift decomp
12254	B2 Lift decomp
12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.11	11242	<b>Emergency mode sel</b>		ENUM		1214			ERW	FVS

Setting of the source of the emergency operation signal.

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
3728	PAD 15
6000	Null
6002	One
12250	B0 Lift decomp
12252	B1 Lift decomp
12254	B2 Lift decomp
12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.12	11244	<b>Inversion ramp sel</b>		ENUM		6000			ERW	FVS

Setting of the source of the command that inverts the direction of the output speed.

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
3728	PAD 15
6000	Null
6002	One

12250	B0 Lift decomp
12252	B1 Lift decomp
12254	B2 Lift decomp
12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.13	11246	<b>Upper limit sel</b>		ENUM		6000			ERW	FVS

Setting of the source of the upper limit enabling signal.

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
3728	PAD 15
6000	Null
6002	One
12250	B0 Lift decomp
12252	B1 Lift decomp
12254	B2 Lift decomp
12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.14	11248	<b>Lower limit sel</b>		ENUM		6000			ERW	FVS

Setting of the source of the lower limit enabling signal.

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
3728	PAD 15
6000	Null

6002	One
12250	B0 Lift decomp
12252	B1 Lift decomp
12254	B2 Lift decomp
12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.15	11252	Brake fbk A3 sel		ENUM		0			RW	FVS

Selection of the brake fault alarm In the default configuration the brake fault alarm function is disabled.  
Setting of the source to enable:

1110	Digit input E
1210	Digit input 1x
1212	Digit input 2x
1214	Digit input 3x
1216	Digit input 4x
1218	Digit input 5x
1220	Digit input 6x
1222	Digit input 7x
1224	Digit input 8x
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
6000	Null
6002	One
12250	B0 Lift decomp
12252	B1 Lift decomp
12254	B2 Lift decomp
12256	B3 Lift decomp
12258	B4 Lift decomp
12260	B5 Lift decomp
12262	B6 Lift decomp
12264	B7 Lift decomp
12266	B8 Lift decomp
12268	B9 Lift decomp
12270	B10 Lift decomp
12272	B11 Lift decomp
12274	B12 Lift decomp
12276	B13 Lift decomp
12278	B14 Lift decomp
12280	B15 Lift decomp
13000	F0 Rising
13001	F0 Falling
13002	F1 Rising
13003	F1 Falling

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.16	11256	SpeedRefSrc		ENUM		0	0	1	RW	FVS

Selection of the origin (source) of the signal to be used for the speed reference. The signals that can be used are multi-speed, analog input.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.17	11258	Lift EF alarm sel		ENUM		0	0	1	RW	FVS

Selection of the origin (source) of "Lift external fault".

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
------	-----	-------------	----	------	--------	-----	-----	-----	-----	-----

**5.7.18 11274 Landing Cmd src** ENUM NULL RW FVS

You can enable the Landing command with the Start signal as well as from Digital Inputs and Freeze inputs. If you select Freeze inputs, the command is activated on the encoder inputs (see the VDL200 Quick Start manual to identify the encode Freeze inputs).

Rising (rising/positive edge) means active on the rising edge of the signal; Falling (falling/negative edge) active on the falling edge.

- 1110 Digit input E
- 1210 Digit input 1x
- 1212 Digit input 2x
- 1214 Digit input 3x
- 1216 Digit input 4x
- 1218 Digit input 5x
- 1220 Digit input 6x
- 1222 Digit input 7x
- 1224 Digit input 8x
- 3702 Run cont mon
- 3706 Down cont mon
- 3708 Brake cont mon
- 3714 Door open mon
- 6000 Null
- 6002 One
- 12250 B0 Lift decomp
- 12252 B1 Lift decomp
- 12254 B2 Lift decomp
- 12256 B3 Lift decomp
- 12258 B4 Lift decomp
- 12260 B5 Lift decomp
- 12262 B6 Lift decomp
- 12264 B7 Lift decomp
- 12266 B8 Lift decomp
- 12268 B9 Lift decomp
- 12270 B10 Lift decomp
- 12272 B11 Lift decomp
- 12274 B12 Lift decomp
- 12276 B13 Lift decomp
- 12278 B14 Lift decomp
- 12280 B15 Lift decomp
- 13000 F0 Rising
- 13001 F0 Falling
- 13002 F1 Rising
- 13003 F1 Falling

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.19	12102	Command input mon		UINT32		0			ER	FVS

The hexadecimal value of the input status is displayed, refer to the "lift control word" for a description of the meaning of each bit.

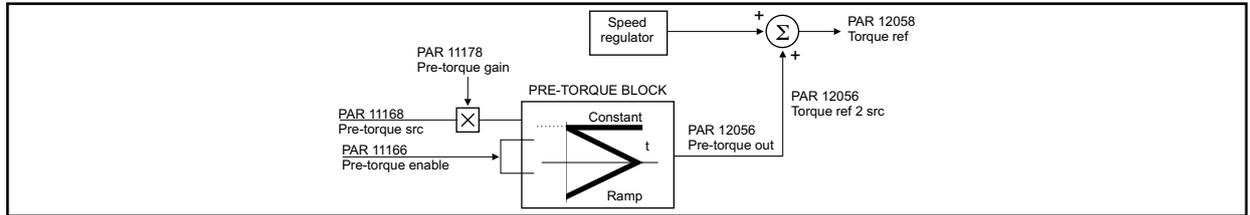
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.7.20	12104	Command output mon		UINT32		0			ER	FVS

The hexadecimal value of the input status is displayed, refer to the "lift status word" for a description of the meaning of each bit.

## 5.8 –PRE - TORQUE

The Pre-torque function helps to guarantee a linear start without any initial acceleration. This is possible by setting a torque value that corresponds to the load before opening the brake. The value of the initial torque applied to the motor and the direction of the torque applied can be supplied by installing a load cell on the lift cabin. The load cell signal is acquired via the analog input and appropriately scaled if using the Pre-torque function.

If a load cell is not installed, a fixed torque value can be used, only supplying the direction of torque. In that case the fixed torque value is only optimised for one load condition.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod	
<b>5.8.1</b>	<b>11166</b>	<b>Pre-torque enable</b>		BIT		0	0	1	RW	F	
		Enabling of the pre-torque function									
		0	OFF								
		1	ON								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>5.8.2</b>	<b>11168</b>	<b>Pre-torque source</b>		INT16		11170	0	2	RW	F
		Selection of the origin (source) of the signal used for the pre-torque function.								
	<b>1600</b>	Analog inp 1								
	<b>4034</b>	FieldbusM->S2								
	<b>4044</b>	FieldbusM->S3								
	<b>4054</b>	FieldbusM->S4								
	<b>4064</b>	FieldbusM->S5								
	<b>4074</b>	FieldbusM->S6								
	<b>4084</b>	FieldbusM->S7								
	<b>4094</b>	FieldbusM->S8								
	<b>4104</b>	FieldbusM->S9								
	<b>4114</b>	FieldbusM->S10								
	<b>4124</b>	FieldbusM->S11								
	<b>4134</b>	FieldbusM->S12								
	<b>4144</b>	FieldbusM->S13								
	<b>4154</b>	FieldbusM->S14								
	<b>4164</b>	FieldbusM->S15								
	<b>4174</b>	FieldbusM->S16								
	<b>11170</b>	Int pretorque								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>5.8.3</b>	<b>11170</b>	<b>Init pre-torque</b>		INT32		1000			RW	F
		Setting of the reference value used in the pre-torque function only if the Pre-torque source parameter is set to 0. The value set in this parameter only enables the pre-torque function to be optimised for one load condition. The pre-torque function can also be optimised for different load conditions by using the fieldbus to modify the setting of this parameter.								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>5.8.4</b>	<b>11172</b>	<b>Pre-torque ramp up</b>	ms	INT32		0	0	10000	RW	F
		Setting of the ramp time for the rising edge of the torque value (before opening the brake): if this parameter is set to zero the constant feed-forward torque value is maintained during travel.								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>5.8.5</b>	<b>11174</b>	<b>Pre-torque ramp down</b>	ms	INT32		0	0	60000	RW	F
		Setting of the ramp time for the falling edge of the torque value: if this parameter is set to zero the constant feed-forward torque value is maintained during travel.								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>5.8.6</b>	<b>11176</b>	<b>Pre-torque offset</b>		FLOAT		0			RW	F

Setting of the offset value applied to the input reference of the pre-torque function.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>5.8.7</b>	<b>11178</b>	<b>Pre torque gain</b>		FLOAT		1			RW	F

Setting of the gain value used to convert the value applied to the analog input in the torque value to be used in the function. This gain is calculated automatically according to the weights and inertia values entered. Ideally, the reference must be set so that the minimum value corresponds to the empty cabin and the maximum value to the full load.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>5.8.8</b>	<b>12040</b>	<b>Pre-torque input</b>	cnt	INT32		0			ER	F

The reference value sampled at start is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>5.8.9</b>	<b>12056</b>	<b>Pre-torque out</b>	cnt	INT32		0			ER	F

The feed forward torque value output of the pre-torque function is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>5.8.10</b>	<b>12058</b>	<b>Torque reference</b>	cnt	INT32		0			ER	F

The torque reference value is displayed, given by the sum of the speed loop output and the torque feed forward.

## 5.9 – LIFT ALARMS

The MdPlc application for VDL200 manages and generates the following alarms:

Alarm	Alarm type	Description
Plc1 fault	Cont feedback	Contactors feedback signal error
Plc2 fault	Brake feedback	Brake feedback signal error
Plc3 fault	Door feedback	Door feedback signal error
Plc6 fault	Speed limited	Warning of speed limit to guarantee stop
Plc7 fault	Up/low limit	Speed limit exceeded in power factor regulation zone

All alarms are associated with a parameter to configure the action taken when the alarm is activated.

Activity: used to set the action to be performed after activation of the alarm, as follows.

### Action

<b>Ignore</b>	The alarm is not included in the alarm list, it is not included in the alarm log, it is not signalled on the digital outputs, commands to the drive are not modified.
<b>Warning</b>	The alarm is included in the alarm list, it is included in the alarm log, it is signalled on the digital outputs, First alarm information is updated, Enabled alarms information is updated, commands to the drive are not modified.
<b>Disable</b>	The alarm is included in the alarm list, it is included in the alarm log, it is signalled on the digital outputs, First alarm information is updated, Enabled alarms information is updated, a stop command is sent, the motor is disabled and stops due to inertia.
<b>Fast Stop</b>	The alarm is included in the alarm list, it is included in the alarm log, it is signalled on the digital outputs, First alarm information is updated, Enabled alarms information is updated, a Stop command is sent. The drive is set to zero speed with the maximum available current; when the Speed 0 delay signal is activated the drive is disabled.
<b>Lift Fast stop</b>	When there is an alarm occurrence, lift will be stopped (ramp reference is set to zero) immediately with fast ramp, after that it will remain in alarm state. Attention: this will cause the cabin to stop out of floor !
<b>Lift stop</b>	When there is an alarm occurrence, lift will continue to run until next stop condition, after that it will remain in alarm state.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.1	11058	<b>Lift fast stop fact</b>		FLOAT		10.00	1.00	50.00	RW	FVS
<p>This parameter is applied to all ramps when a "Quick stop" alarm occurs.                      The default setting is 10 = 1000% (standard ramps multiplied by 10).                      To use standard ramps with no multiplication, set 1 = 100%.</p>										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.2	11200	<b>Contactors activity</b>		INT16		1	0	5	RW	FVS
<p>Setting of drive behaviour in case of a Cont fbk fail alarm. This alarm indicates that the feedback confirming closing of the contactors has not been received.</p> <p>0 Ignore                      1 Warning                      2 Disable                      3 Fast Stop                      4 Lift Fast stop                      5 Lift stop</p>										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.3	11202	<b>Cont hold off</b>	ms	INT32		3000			RW	FVS
<p>Setting of the delay time between activation of the Cont fbk fail alarm condition signal and the actual alarm. In case of an alarm condition, the drive waits for the set time to elapse before activating the alarm. If the alarm is removed within the set time, the drive will not activate the alarm.</p>										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.4	11204	<b>Brake activity</b>		INT16		1	0	5	RW	FVS
<p>Setting of drive behaviour in case of a Brake fbk fail alarm. This alarm indicates that the feedback confirming opening/closing of the brake has not been received.</p>										

- 0 Ignore
- 1 Warning
- 2 Disable
- 3 Fast Stop
- 4 Lift Fast stop
- 5 Lift stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.5	11206	<b>Brake hold off</b>	ms	INT32		3000.00			RW	FVS

Setting of the delay time between activation of the Brake fbk fail alarm condition signal and the actual alarm. In case of an alarm condition, the drive waits for the set time to elapse before activating the alarm. If the alarm is removed within the set time, the drive will not activate the alarm.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.6	11208	<b>Brake run hold off</b>		INT16		1	0	1	RW	FVS

Setting of drive behaviour when a possible Brake fbk fail alarm is detected.

- 0 Disable
- 1 Enable

If set to 0 the brake feedback alarm is indicated immediately

If set to 1 the possible brake feedback alarm is indicated at the end of travel: this allows the cabin to reach the floor in case of a faulty brake status signal.

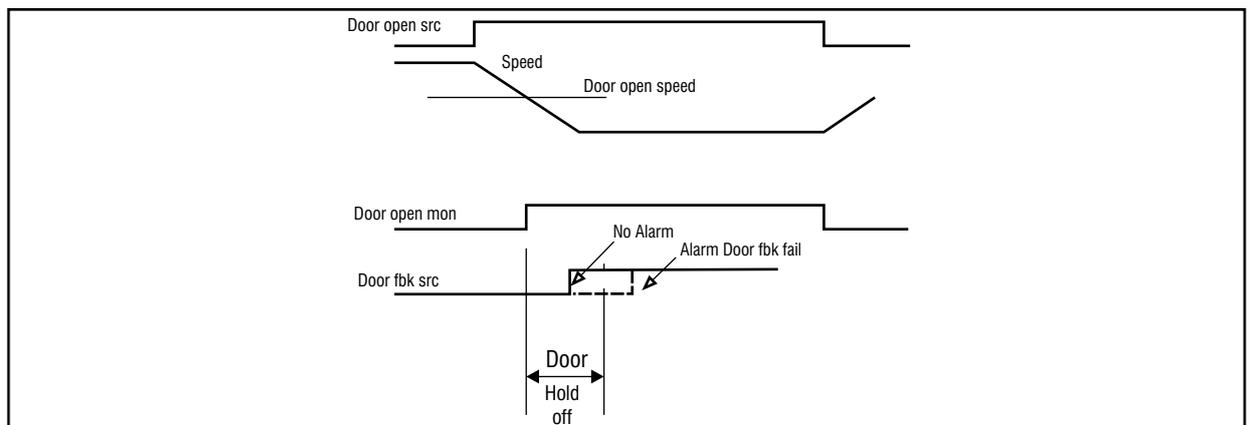
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.7	11210	<b>Door activity</b>		INT16		1	0	5	RW	FVS

Setting of drive behaviour in case of a **Door fbk fail** alarm. This alarm indicates that the feedback confirming opening of the door has not been received.

- 0 Ignore
- 1 Warning
- 2 Disable
- 3 Fast Stop
- 4 Lift Fast stop
- 5 Lift stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.8	11212	<b>Door hold off</b>	ms	INT32		1000			RW	FVS

Setting of the delay time between activation of the **Door fbk fail** alarm condition signal and the actual alarm. In case of an alarm condition, the drive waits for the set time to elapse before activating the alarm. If the alarm is removed within the set time, the drive will not activate the alarm.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.9	11214	<b>Limit activity</b>		INT16		5	0	5	RW	FVS

Setting of drive behaviour in case of the **Upper/Lower limit**. This alarm occurs when the speed is greater than PAR 11216 **Limit speed thr** and are active sensors installed at the beginning and end of the space. This function implemented in the drive provides an additional control to avoid overtravel.

The alarm condition is generated, when the set speed limit is exceeded.

The UpperLimit or LowerLimit inputs must be set to enable speed limit control. The **UpperLimit** must always correspond to the upper limit signal and the **LowerLimit** must always correspond to the lower limit signal.

- 0 Ignore
- 1 Warning
- 2 Disable
- 3 Fast Stop
- 4 Lift Fast stop
- 5 Lift stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.10	11216	<b>Limit speed thr</b>	ms	INT32		1.000			RW	FVS

Setting of the speed threshold in the upper or lower limit zone.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.11	11218	<b>Spd target activity</b>		INT16		1	0	5	RW	FVS

Setting of drive behaviour in case of the **Speed limit** alarm. This alarm is activated if, using the EFC function, the slow down distance is less than the real deceleration distance, thus enabling the speed limiter to ensure correct stopping.

- 0 Ignore
- 1 Warning
- 2 Disable
- 3 Fast Stop
- 4 Lift Fast stop
- 5 Lift stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.12	11264	<b>Lift EF al activity</b>		ENUM		5	0	5	RW	FVS

Setting of the "Lift external fault" alarm.

- 0 Ignore
- 1 Warning
- 2 Disable
- 3 Fast Stop
- 4 Lift Fast stop
- 5 Lift stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.13	11266	<b>Lift EF hold off</b>	ms	LONG		1000	0	60000	RW	FVS

Maintaining the "Lift external fault" alarm.  
"Lift EF" is displayed when a "Lift external fault" alarm occurs.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.14	11268	<b>Reset Brake Alarm</b>		Short		0	-	-	RW	FVS

Resets the **Brake Alarm**.

1. Open menu 5.9 LIFT ALARMS, and check that the **Brake Alarm** is on.
2. In the lift alarm menu, select parameter 11268 **Reset Brake Alarm** (default 0).
3. The system asks for a code, enter release code 5313.
4. Check again to see whether the **Brake Alarm** has been reset.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
5.9.15	11270	<b>Threshold A3</b>		Float		0.100	0.000	2.000	RW	FVS

When the brake is connected, the Brake fault alarm is activated if the movement (in metres) is more than the value set in parameter 11270 **Threshold A3**.

6 - [Redacted]

7 - [Redacted]

8 - [Redacted]

9 - [Redacted]

**Note !** These menus are not available.

## 10 - DIGITAL INPUTS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.01	1240	Dig inp 1X inversion			BIT	0	0	1	ERW	FVS
10.02	1242	Dig inp 2X inversion			BIT	0	0	1	ERW	FVS
10.03	1244	Dig inp 3X inversion			BIT	0	0	1	ERW	FVS
10.04	1246	Dig inp 4X inversion			BIT	0	0	1	ERW	FVS
10.05	1248	Dig inp 5X inversion			BIT	0	0	1	ERW	FVS
10.06	1250	Dig inp 6X inversion			BIT	0	0	1	ERW	FVS
10.07	1252	Dig inp 7X inversion			BIT	0	0	1	ERW	FVS
10.08	1254	Dig inp 8X inversion			BIT	0	0	1	ERW	FVS
10.09	1256	Dig inp 9X inversion			BIT	0	0	1	ERW	F V S
10.10	1258	Dig inp 10X inversion			BIT	0	0	1	ERW	FVS
10.11	1260	Dig inp 11X inversion			BIT	0	0	1	ERW	FVS
10.12	1262	Dig inp 12X inversion			BIT	0	0	1	ERW	FVS

Inversion of the logic status of the function associated with the digital input of the expansion card.

0 Off  
1 On

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
10.13	1268	Dig input E dest			ILINK	0	0	0	ER	FVS
10.14	1270	Dig input 1X dest			ILINK	0	0	0	ER	FVS
10.15	1272	Dig input 2X dest			ILINK	0	0	0	ER	FVS
10.16	1274	Dig input 3X dest			ILINK	0	0	0	ER	FVS
10.17	1276	Dig input 4X dest			ILINK	0	0	0	ER	FVS
10.18	1278	Dig input 5X dest			ILINK	0	0	0	ER	FVS
10.19	1280	Dig input 6X dest			ILINK	0	0	0	ER	FVS
10.20	1282	Dig input 7X dest			ILINK	0	0	0	ER	FVS
10.21	1284	Dig input 8X dest			ILINK	0	0	0	ER	FVS
10.22	1286	Dig input 9X dest			ILINK	0	0	0	ER	FVS
10.23	1288	Dig input 10X dest			ILINK	0	0	0	ER	FVS
10.24	1290	Dig input 11X dest			ILINK	0	0	0	ER	FVS
10.25	1292	Dig input 12X dest			ILINK	0	0	0	ER	FVS

Selection of the destination of the digital input of the associated expansion card.

## 11 - DIGITAL OUTPUTS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
11.01	1410	Dig output 1X src		LINK	16BIT	1062	0	16384	ERW	FVS
11.02	1412	Dig output 2X src		LINK	16BIT	3708	0	16384	ERW	FVS
11.03	1414	Dig output 3X src		LINK	16BIT	3702	0	16384	ERW	FVS
11.04	1416	Dig output 4X src		LINK	16BIT	3714	0	16384	ERW	FVS
11.05	1418	Dig output 5X src		LINK	16BIT	1062	0	16384	ERW	FVS
11.06	1420	Dig output 6X src		LINK	16BIT	3708	0	16384	ERW	FVS
11.07	1422	Dig output 7X src		LINK	16BIT	3702	0	16384	ERW	FVS
11.08	1424	Dig output 8X src		LINK	16BIT	3714	0	16384	ERW	FVS

The destination associated with the digital input of the expansion card is displayed. 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
11.09	1430	Dig out 1X inversion			BIT	0	0	1	ERW	FVS
11.10	1432	Dig out 2X inversion			BIT	0	0	1	ERW	FVS
11.11	1434	Dig out 3X inversion			BIT	0	0	1	ERW	FVS
11.12	1436	Dig out 4X inversion			BIT	0	0	1	ERW	FVS
11.13	1438	Dig out 5X inversion			BIT	0	0	1	ERW	FVS
11.14	1440	Dig out 6X inversion			BIT	0	0	1	ERW	FVS
11.15	1442	Dig out 7X inversion			BIT	0	0	1	ERW	FVS
11.16	1444	Dig out 8X inversion			BIT	0	0	1	ERW	FVS

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

0 Off  
1 On

## 12 - ANALOG INPUTS

**Note !** These parameters are only available with cards provided with analog inputs.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
12.1	1600	<b>Analog input 1X mon</b>	cnt	INT16	16/32BIT	0	0	0	ER	FVS

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
12.2	1602	<b>Analog inp 1X type</b>		ENUM		-10V..+10V	0	2	ERW	FVS

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 ( $\pm 10V$ ).

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

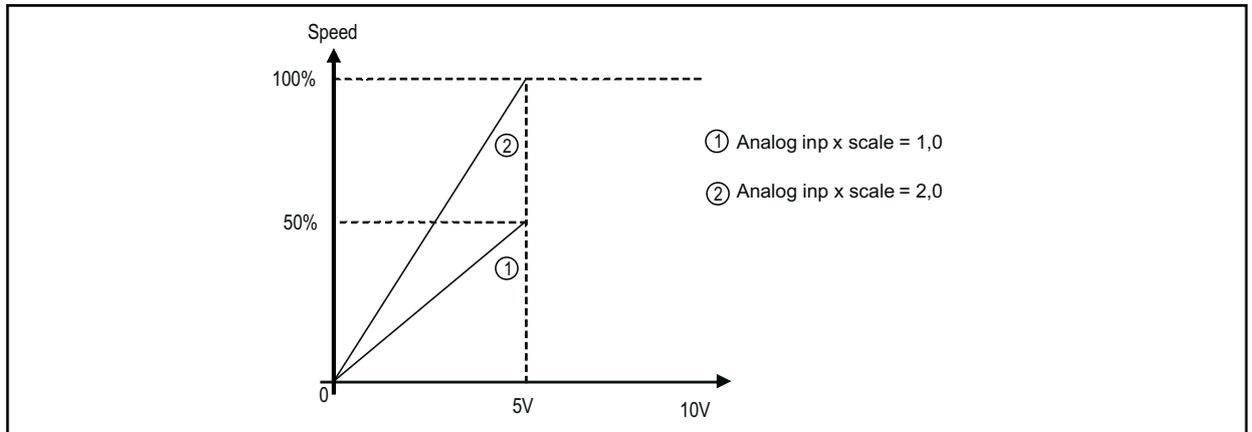
Select option 0 in order to connect a maximum voltage of  $\pm 12.5V$  (typically  $\pm 10V/5mA$ ) to the analog input concerned. If the signal is used as a reference, reverse the direction of rotation by inverting the voltage polarity.

Select option 1 to connect a max voltage of 12.5V (typically 10V/5mA) or a signal in current from 0 ... 20 mA to the analog input concerned. The signal must be positive.

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
12.3	1604	<b>Analog inp 1X scale</b>		FLOAT		1.0	-10.0	10.0	ERW	FVS

Setting of a multiplier factor to be applied 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 XX scale** parameter the scale factor of 2 is entered (10V : 5V)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
12.4	1606	<b>An inp 1Xoffset tune</b>		BIT		0	0	1	ERW	FVS

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 more than 1V the “Input value too high” message is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
12.5	1608	An inp 1X gain tune			BIT	0	0	1	ERW	FVS

Self-tuning command for the relative analog input gain. Automatic fine tuning of the input. When this command is sent, **An inp XX gain tune** 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 **An inp XX gain tune**.

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 “Input value too low” message is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
12.6	1610	Analog inp 1X filter	ms		UINT16	10	2	100	ERW	FVS

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.

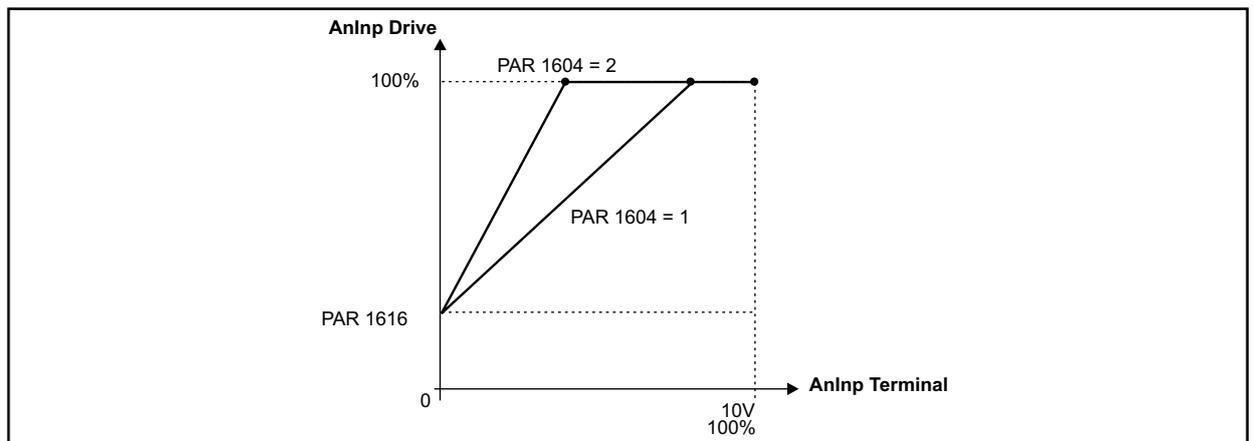
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
12.7	1612	Analog inp 1X top	cnt		INT16	16384	-32768	+32767	ERW	FVS

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
12.8	1614	Analog inp 1X bottom	cnt		INT16	-16384	-32768	+32767	ERW	FVS

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
12.9	1616	Analog inp 1X offset	cnt		INT16	0	-32768	+32767	ERW	FVS



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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
12.10	1618	Analog inp 1X gain			FLOAT	1.0	-10.0	10.0	ERW	FVS

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
12.11	1626	<b>An inp 1X sign src</b>		LINK	16BIT	6000	0	16384	ERW	FVS
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 " <b>L_DIG-SEL2</b> " selection list".										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
12.12	1632	<b>Analog input 1X dest</b>		ILINK		0	0	0	ER	FVS
The function for which the relative analog input of the expansion card has been programmed and on which it acts is displayed.										

**Note !**

.....  
This menu is not available.  
.....

# 14 - 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 frequency, Rated current, Cos phi, Basic voltage and Basic frequency must be entered (the Cos phi default value can be used if this value is not present on the plate). After entering these parameters, send a **Take parameters** command to calculate (a) and (b) above. The motor cannot be enabled until the **Take parameters** 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.

Example of kW and HP motor data plates

Motor & Co.		IEC 34-1 / VDE 0530	
Type: ABCDE		Nr	12345-91
Motor: 3 phase	50 Hz	I nom	6.7 A
Rated voltage	400 V	Power factor	0.8
Rated power	3 kW		
Rated speed (n <sub>n</sub> )	1420 rpm		
IP54	Iso KI F	S1	
Made in .....			

Motor & Co.		IEC 34-1 / VDE 0530	
Type: ABCDE		Nr	12345-91
Motor: 3 phase	60 Hz	I nom	2 A
Rated voltage	575 V	Power factor	0.83
Rated power	2 Hp	Efficiency	86.5
Rated speed (n <sub>n</sub> )	1750 rpm		
IP54	Iso KI F	S1	
Made in .....			

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.1	2000	<b>Rated voltage</b>	V	FLOAT		SIZE	50.0	690.0	RWZS	FVS
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
14.2	2002	<b>Rated current</b>	A	FLOAT		SIZE	1.0	1500.0	RWZS	FVS
he 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 SSC 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
14.3	2004	<b>Rated speed</b>	rpm	FLOAT		SIZE	10.0	18000	RWZS	FVS
Rated speed of the motor with full load in rpm (rpm = m-1). In some motors the synchronous speed (e.g. 1500 rpm for a 4-pole motor) and slippage, i.e. the loss of revolutions between the motor idling condition and the rated load condition (e.g. 80 rpm), is indicated. Enter the following: synchronous speed - slippage.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.4	2006	<b>Rated frequency</b>	Hz	FLOAT		SIZE	10.0	1000.0	RWZS	FVS
Rated frequency of the motor expressed in Hz, at which the flux weakening range starts.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.5	2008	<b>Pole pairs</b>		UINT16		SIZE	1	20	RWZS	FVS
Motor pole pairs. The number of motor pole pairs is calculated using the motor plate data and applying the following formula:										

$$p = \frac{60 [s] \times f [Hz]}{nN [rpm]}$$

Where: p = motor pole pairs; f = motor rated frequency (PAR 2006)  
nN = motor rated speed (PAR 2004)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.6	2010	<b>Rated power</b>	kW	FLOAT		SIZE	0.1	1500.0	RWZS	FVS
Rated power of the motor at the rated voltage and frequency. This value represents the mechanical power produced on the motor shaft.										
14.7	2012	<b>Rated power factor</b>		FLOAT		SIZE	0.6	0.95	RWZS	FVS
Motor power factor, as indicated on the data plate (Cos j). This parameter is not always present on the motor data plate: in that case use the default value present in the drive.										
14.8	2020	<b>Take parameters</b>		BIT		0	0	1	RWZ	FVS
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 <b>Take parameters</b> command has been set.										
14.9	2022	<b>Autotune rotation</b>		BIT		0	0	1	RWZ	FVS
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 9 and DICM. Self-tuning can now be performed. At the end of the self-tuning procedure, open the contact between terminals 9 and DICM again and reset the parameters that were modified.										
14.10	2024	<b>Autotune still</b>		BIT		0	0	1	RWZ	FVS
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.										
14.11	2026	<b>Autotune mode</b>		ENUM		Reduced	0	1	ERWZ	FVS
Selection of the motor parameter self-tuning mode <b>0</b> Reduced <b>1</b> Extended  If set to <b>0</b> 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 <b>1</b> all the motor parameters are measured. Use this mode to obtain maximum efficiency: this procedure may take a few minutes.										
14.12	2028	<b>Take status</b>		ENUM		Required	0	0	R	FVS
Indication of the status of parameter saving. <b>0</b> Required <b>1</b> Done  The parameter displays the <b>Required</b> message when the motor parameters that have been entered need to be saved. When they have been saved the parameter indicates <b>Done</b> .										
14.13	2030	<b>Autotune status</b>		ENUM		Required	0	0	R	FVS
Indication of the status of execution of motor parameter self-tuning. <b>0</b> Required <b>1</b> Done  The parameter displays the <b>Required</b> message when motor parameter self-tuning is required. When self-tuning is complete the parameter indicates <b>Done</b> .										
14.14	2050	<b>Measured Rs</b>	ohm	FLOAT		CALCF	0.001	200.0	ERWS	FVS
Measured value of the rotor resistance.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.15	2052	<b>Measured DTL</b>	V	FLOAT		0.0	0.0	100.0	ERWS	FVS
Measured value of dead time compensation.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.16	2054	<b>Measured DTS</b>	V/A	FLOAT		0.0	0.0	100.0	ERWS	FVS
Measured compensation gradient value.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.17	2056	<b>Measured Lsig</b>	mH	FLOAT		CALCF	0.1	200.0	ERWS	FVS
Measured leakage inductance value.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.18	2058	<b>Measured ImN</b>	A	FLOAT		CALCF	0.1	1000.0	ERWS	FVS
Measured rated magnetizing current value.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.19	2060	<b>Measured ImX</b>	A	FLOAT		CALCF	0.0	0.0	ERWS	FVS
Measured magnetizing current saturation value.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.20	2062	<b>Measured FlxN</b>	Wb	FLOAT		CALCF	0.05	10.0	ERWS	FVS
Measured rated flux value.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.21	2064	<b>Measured FlxX</b>	Wb	FLOAT		CALCF	0.0	0.0	ERWS	FVS
Measured flux saturation value.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.22	2066	<b>Measured P1</b>		FLOAT		0.5	0.0	1.0	ERWS	FVS
Measured value of the first parameter to define the motor magnetization curve.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.23	2068	<b>Measured P2</b>		FLOAT		9.0	3.0	18.0	ERWS	FVS
Measured value of the second parameter to define the motor magnetization curve.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.24	2070	<b>Measured P3</b>		FLOAT		0.87	0.0	1.0	ERWS	FVS
Measured value of the third parameter to define the motor magnetization curve.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.25	2072	<b>Measured Rr</b>	ohm	FLOAT		CALCF	0.001	200.0	ERWS	FVS
Measured rotor resistance value.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
14.26	2078	<b>Take tune parameters</b>		BIT		0	0	1	ERWZ	FVS
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.  
 .....

# 15 - ENCODER CONFIG

The closed-loop control mode requires a speed reading by a digital encoder on the motor shaft. The natural variation in speed generated by machine load induction, known as slippage, can be compensated by the speed feedback supplied by the encoder in SSC mode. In the field oriented vector mode, closed-loop encoder feedback is essential for correct drive operation.

**Note !** This menu is only displayed if a feedback card is installed

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.1	2100	<b>Encoder pulses</b>	ppr	UINT16		1024	128	16384	RWZ	FVS

Setting of the number of feedback encoder impulses. During setup this value is set automatically by reading the number of incremental encoder impulses.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.2	2102	<b>Encoder supply</b>	V	FLOAT		-	-	CALCF	R	FVS

Reading of the encoder supply voltage supplied by the relative optional card.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.3	2110	<b>Encoder signal check</b>		ENUM		Check A-B	0	3	ERWZ	FVS

Configuration of which incremental digital encoder channels are to be controlled in order to process the **Speed fbk loss** alarm signal.

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

Set 1 to check for signal on channels A-B  
 Set 2 to check for signal on channels A-B-Z  
 If set to 4 the encoder signals A and B are controlled in single-ended mode (single channel)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.4	2130	<b>Encoder direction</b>		ENUM		Not inverted	0	1	RWZ	FVS

Setting of the sign of the information obtained from the incremental or absolute encoder.

- 0 Not inverted
- 1 Inverted

By setting 0 the encoder feedback signals are not inverted.  
 By setting 1 the encoder feedback signals are inverted

According to international standards, positive references are associated with clockwise motor rotation, seen from the control side (shaft). To ensure correct operation, the regulation algorithms ensure that positive speed references correspond to positive speed measurements.

If the motor pulley is mounted on the side opposite the command side, it will turn in an anticlockwise direction when the speed is positive: to make the pulley turn in a clockwise direction, the motor phase sequence is modified, which inverts the speed measurement sign. To restore the correct speed measurement sign, invert the incremental encoder A+ and A- signals.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.5	2132	<b>Encoder mode</b>		ENUM		None	CALCI	CALCI	ERWZ	FVS

Setting of the method for measuring the speed of the encoder connected to the integrated card.

- 0 None (Default)
- 1 Digital FP
- 2 Digital F

Setting 1 (Digital FP) selects the method for measuring frequency and period. **Selecting preferred.**  
 Setting 2 (Digital F) selects the method for measuring frequency.

**Note:** There is no need to restart the drive when the mode is changed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.6	2134	<b>Encoder speed filter</b>	ms	FLOAT		2.0	0.1	20.0	ERW	FVS

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. 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. The filter is applied to the speed reported in the **Encoder speed** parameter.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.7	2150	<b>Encoder speed</b>	rpm	INT16	16/32BIT	0	0	0	ER	FVS

The motor speed measured by the incremental encoder is displayed, filtered by the **Encoder speed filter** parameter.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.8	2162	<b>Encoder position</b>	cnt	UINT16	16BIT	0	0	0	ER	FVS

The impulse count obtained from the incremental encoder reading is displayed: 1 encoder turn is equal to the value entered in Encoder pulses multiplied by 4.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
15.9	2172	<b>SpdFbkLoss code</b>		UINT32		0	0	0	ER	FVS

The **Speed fbk loss** alarm generated by an encoder fault is displayed. Each type of encoder generates the alarm differently (incremental signal error, absolute signal error, serial error), so this parameter is used to display information about the alarm that has been activated. In case of several concurrent 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	Setup error
10..15		Free
16..31		Depends on the encoder

For further details reference should be made to the description of the **Speed fbk loss** alarm and to the SFL alarms chapter 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 15.13 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 digital incremental encoder:

PAR 2172 = 3 (hex value)

In the table "**Speed fbk loss [22] alarm with digital incremental encoder**" 0x03 is not indicated in the value column. 0x03 should be contemplated as a bitword with meaning 00011 -> bit 0 and bit 1. The following causes simultaneously intervene:

- Bit 0 = 0x01 Cause: no impulses or disturbance on incremental channel A.
- Bit 1 = 0x02 Cause: no impulses or disturbance on incremental channel B.

# 16 - 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, which must not be modified by the user). The speed regulator must be tuned manually. Gains are usually adjusted according to the drive speed.

Total gains used by the speed regulator are calculated as shown in the following examples. Results are in engineering units:

$$\text{Total proportional gain} = \frac{\text{Speed reg P1 gain (PAR 2200)}}{100\%} * \text{Speed reg P gain (PAR 2236)}$$

$$\text{Total integral gain} = \frac{\text{Speed reg I1 gain (PAR 2202)}}{100\%} * \text{Total proportional gain} * \frac{1}{\text{Speed reg I time (PAR 2238)}}$$

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.1	2200	<b>Speed reg P1 gain</b>	perc	INT16		100	0	1000	RW	F_S
Setting of the proportional gain of the speed regulator, set 1.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.2	2202	<b>Speed reg I1 gain</b>	perc	INT16		100	0	1000	RW	F_S
Setting of the integral gain of the speed regulator, set 1. Increasing the proportional gain value increases the proportional action of the regulator										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.3	2204	<b>Speed reg P2 gain</b>	perc	INT16		100	0	1000	RW	F_S
Setting of the proportional gain of the speed regulator, set 2.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.4	2206	<b>Speed reg I2 gain</b>	perc	INT16		100	0	1000	RW	F_S
Setting of the integral gain of the speed regulator, set 2. Increasing the proportional gain value increases the proportional action of the regulator										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.5	2208	<b>Speed reg P3 gain</b>	perc	INT16		100	0	1000	ERW	F_S
Setting of the proportional gain of the speed regulator, set 3.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.6	2210	<b>Speed reg I3 gain</b>	perc	INT16		100	0	1000	ERW	F_S
Setting of the integral gain of the speed regulator, set 3. Increasing the proportional gain value increases the proportional action of the regulator.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.7	2228	<b>Speed reg P0 gain</b>	perc	INT16		100	0	1000	ERW	F_S
Setting of the proportional gain of the speed regulator at zero speed.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.8	2230	<b>Speed reg I0 gain</b>	perc	INT16		100	0	1000	ERW	F_S
Setting of the integral gain of the speed regulator at zero speed. Increasing the proportional gain value increases the proportional action of the regulator										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.9	2218	<b>Gain adp spd thr2_1</b>	perc	FLOAT		10.0	0.0	100.0	ERW	F_S
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
16.10	2220	<b>Gain adp spd band2_1</b>	perc	FLOAT		5.0	0.0	100.0	ERW	F_S
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
16.11	2222	<b>Gain adp spd thr3_2</b>	perc	FLOAT		0.0	0.0	100.0	ERW	F_S
Setting of the speed threshold for changing gains from set 3 to set 2.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.12	2224	<b>Gain adp spd band3_2</b>	perc	FLOAT		0.0	0.0	100.0	ERW	F_S
Setting of the band within which gains vary between set 3 and set 2. The use of this parameter ensures a smooth transition between the two parameter sets.										

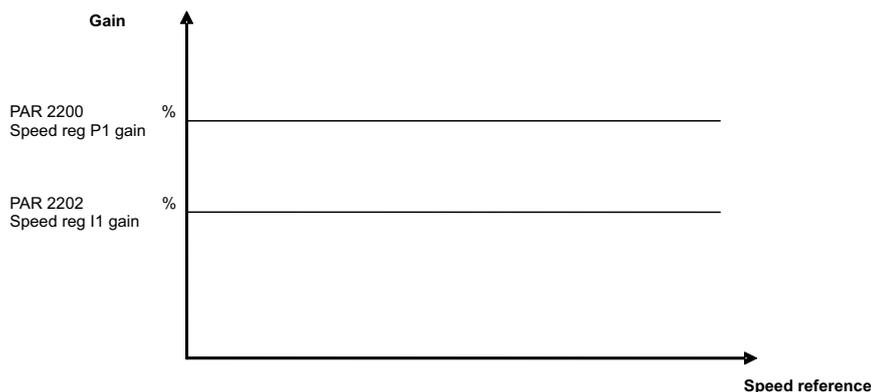
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.13	2246	<b>Gain adp spd thr0_2</b>	perc	FLOAT		0.0	0.0	100.0	ERW	F_S
Setting of the speed threshold for changing gains from set 0 to set 2.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.14	2248	<b>Gain adp spd band0_2</b>	perc	FLOAT		0.0	0.0	100.0	ERW	F_S
Setting of the band within which gains vary between set 0 and set 2. The use of this parameter ensures a smooth transition between the two parameter sets.										

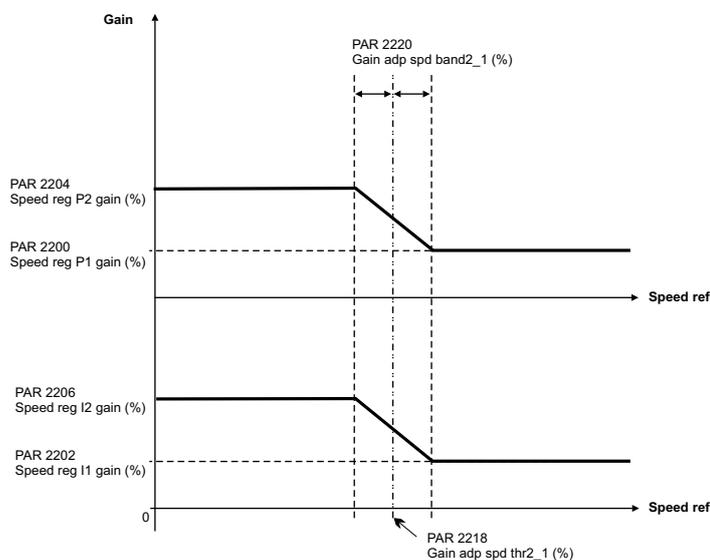
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.15	2244	<b>Gain profile mode</b>		ENUM		Profilo 21	0	3	ERW	F_S
Gain profile modes.										

- 0 Profile 1
- 1 Profile 21
- 2 Profile 321
- 3 Profile 0213

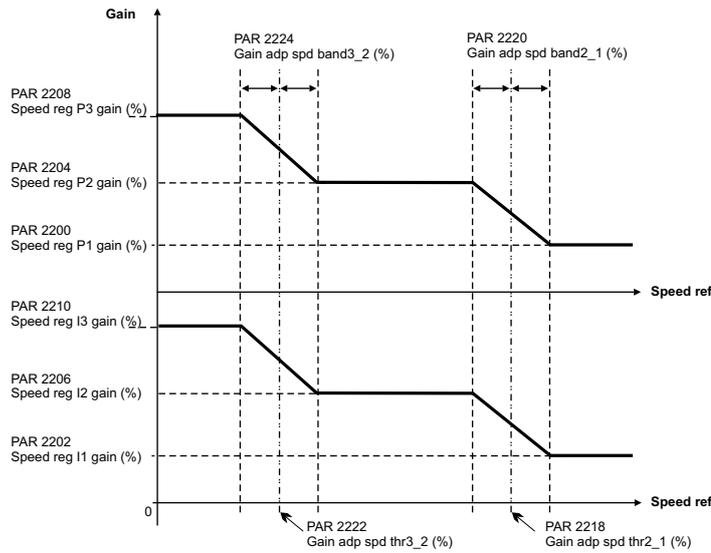
- If set to 0 the profile used is that shown in the figure below:



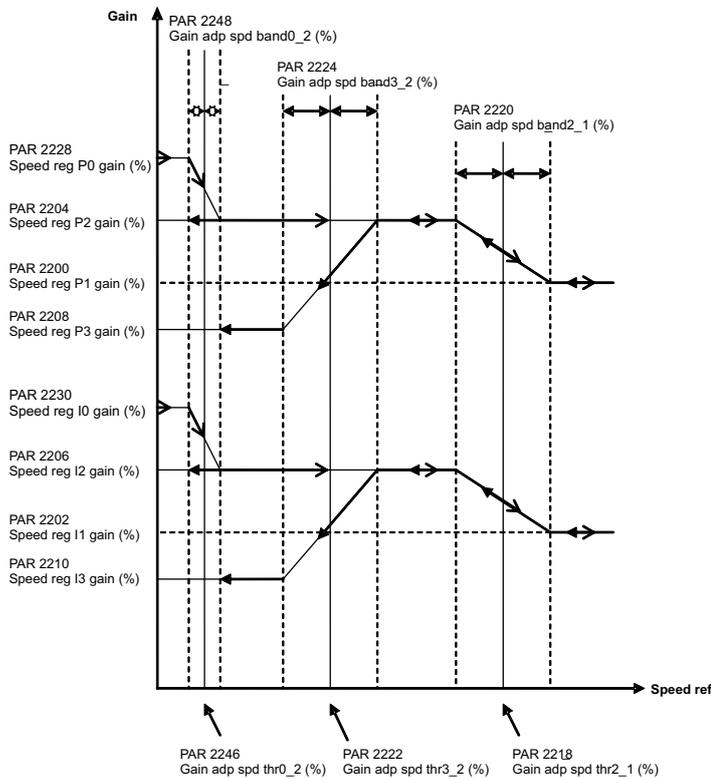
- If set to 1 the profile used is that shown in the figure below:



- If set to 2 the profile used is that shown in the figure below:



- If set to 3 the profile used is that shown in the figure below:



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.16	2232	Spd reg P gain Inuse	perc	INT16	16/32BIT	100	0	1000	ER	F_S

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
16.17	2234	Spd reg I gain Inuse	perc	INT16	16/32BIT	100	0	1000	ER	F_S

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
16.18	2236	Speed reg P gain	N/rpm	FLOAT		CALCF	0.0	500.0	ERWS	F_S

Setting of the proportional coefficient of the speed regulator.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.19	2238	<b>Speed reg I time</b>	ms	FLOAT		CALCF	1.0	5000.0	ERWS	F_S
<p>Setting of the integral coefficient of the speed regulator. Reducing the integral time value increases the integral action of the regulator.</p>										
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.20	2240	<b>Inertia</b>	kgm2	FLOAT		SIZE	0.001	100.0	RWZS	F_S
<p>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.</p>										
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
16.21	2242	<b>Bandwidth</b>	rad/s	FLOAT		SIZE	1.0	500.0	RWZS	F_S
<p>Setting of the bandwidth. Increasing the setting of this parameter increases the dynamic response and makes the system more rigid.</p>										

## 17 - REGULATOR PARAM

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.1	2250	<b>Current reg P gain</b>	V/A	FLOAT		CALCF	0.0	0.0	ERWS	F_S
		Setting of the proportional coefficient of the current regulator.								
17.2	2252	<b>Current reg I time</b>	ms	FLOAT		CALCF	0.01	10000.0	ERWS	F_S
		Setting of the integral coefficient of the current regulator.								
17.3	2260	<b>Flux reg P gain</b>	A/Wb	FLOAT		CALCF	0.0	0.0	ERWS	F__
		Setting of the proportional coefficient of the flux regulator.								
17.4	2262	<b>Flux reg I time</b>	ms	FLOAT		CALCF	0.01	10000.0	ERWS	F__
		Setting of the integral coefficient of the flux regulator.								
17.5	2264	<b>Flux reg P gain OL</b>	A/Wb	FLOAT		CALCF	0.0	0.0	ERWS	__S
		Setting of the flux regulator proportional gain when the drive is used in open loop sensorless vector control mode. This parameter is set automatically by the self-tuning procedure.								
17.6	2266	<b>Flux reg I time OL</b>	ms	FLOAT		CALCF	0.01	10000.0	ERWS	__S
		Setting of the flux regulator integral time when the drive is used in open loop sensorless vector control mode. This parameter is set automatically by the self-tuning procedure.								
17.7	2270	<b>Voltage reg P gain</b>	Wb/V	FLOAT		CALCF	0.0	0.0	ERWS	F_S
		Setting of the proportional coefficient of the voltage regulator.								
17.8	2272	<b>Voltage reg I time</b>	s	FLOAT		CALCF	0.1	100.0	ERWS	F_S
		Setting of the integral coefficient of the voltage regulator.								
17.9	2280	<b>Dead time limit</b>	V	FLOAT		SIZE	0.0	50.0	ERWS	FVS
		Setting of the dead time voltage compensation value. The dead time compensation function ( <b>Dead time compensation</b> ), compensates the distortion of output voltage caused by the voltage drop on the IGBT devices and their switching characteristics. Distortion of output voltage could cause irregular motor rotation.								
17.10	2282	<b>Dead time slope</b>	V/A	FLOAT		SIZE	0.0	200.0	ERWS	FVS
		Setting of the dead time compensation slope value.								
17.11	2290	<b>Voltage base</b>	V	FLOAT		CALCF	50.0	690.0	ERWS	F_S
		Setting of the basic voltage of the motor. This parameter is calculated automatically by the self-tuning procedure.								
17.12	2292	<b>Voltage margin</b>	perc	FLOAT		5.0	0.0	10.0	ERWS	F_S

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
17.13	2300	<b>Minimum speed OL</b>	rpm	INT16		15	0	CALCI	ERW	__S
Setting of the minimum speed threshold in the sensorless vector control mode. Below this limit the sensorless regulator is disabled.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.14	2302	<b>Min speed delay OL</b>	ms	UINT16		800	0	5000	ERW	__S
Setting of the delay for disabling the sensorless regulator.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.15	2304	<b>Speed filter OL</b>	ms	FLOAT		5.0	0.1	20.0	ERWZ	__S
Setting of the time constant for the estimated speed in sensorless vector mode. By increasing this parameter it is possible to reduce the level of disturbance of the estimated speed, but the speed control dynamics are also lowered.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.16	2306	<b>Flux observe gain OL</b>		FLOAT		500.0	10.0	5000.0	ERW	__S
Flux observer gain in open-loop flux vector control mode. In case of instability, try changing the value and setting half or twice the default value.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
17.17	2310	<b>Flux weakening OL</b>		ENUM		Disable	0	1	ERWZ	__S
Enables or disables flux reduction in the open-loop flux vector control mode. If set to Disable, the flux is not reduced when the speed of the motor exceeds the nominal speed. This results in loss of control and instability. This problem can be prevented by setting the parameter to Enable. In the open-loop mode a flux value of less than the nominal speed of the motor is advantageous in terms of stability.										
<b>0</b> Disable <b>1</b> Enable										

## 18 - TORQUE CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.1	2350	<b>Torque curr lim Pos</b>	A	FLOAT	16/32BIT	CALCF	0.0	CALCF	ERWS	FVS

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
18.2	2352	<b>Torque curr lim Neg</b>	A	FLOAT	16/32BIT	CALCF	0.0	CALCF	ERWS	FVS

Setting of the active torque limit of the drive for the negative current direction (anti-clockwise rotation and clockwise braking).

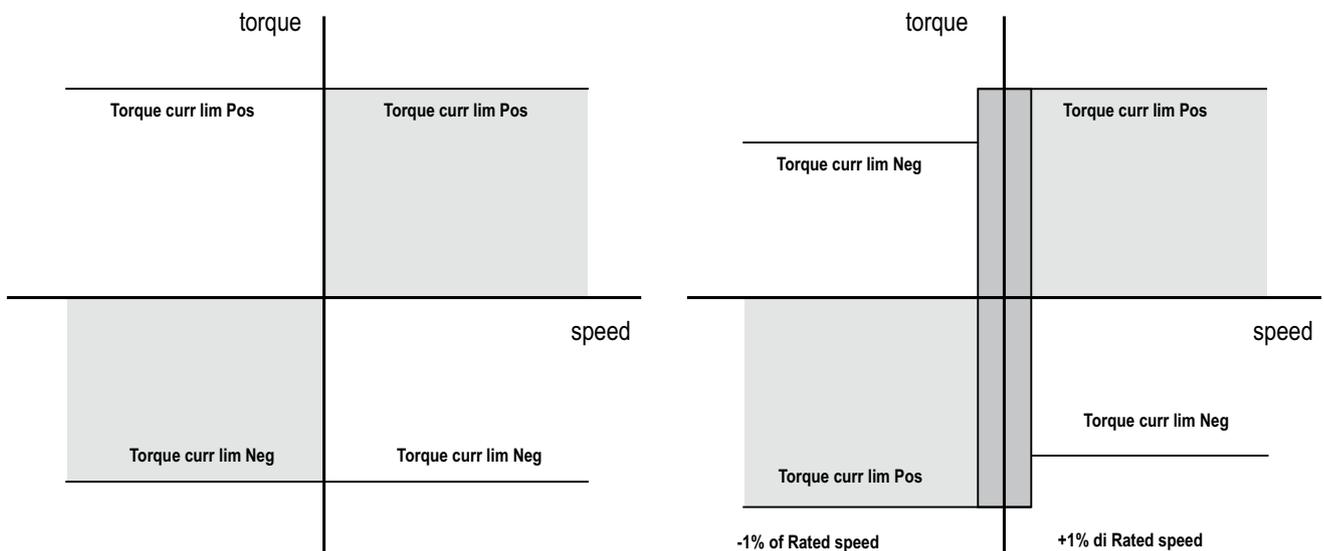
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.3	2354	<b>Torque curr lim sel</b>		ENUM		Sorg limcoppia	0	3	ERWZ	FVS

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 limit src

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**.



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 **Torque curr lim Pos**. This mode is not managed with SSC control mode.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.4	2358	<b>Torque limit src</b>		LINK	16/32BIT	3726	0	16384	ERWZ	F_S

Selection of the origin (source) of the signal to be used for the torque current limit. The signals that can be associated with the function are listed in the "**L\_LIM**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
18.5	2360	<b>Torque climPos Inuse</b>	A	FLOAT	16/32BIT	0.0	0.0	0.0	ER	FVS

The positive torque limit value currently being used is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>18.6</b>	<b>2362</b>	<b>Torque climNeg lnuse</b>	A	FLOAT	16/32BIT	0.0	0.0	0.0	ER	FVS
The negative torque limit value currently being used is displayed.										
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>18.7</b>	<b>2380</b>	<b>Dig torque ref 1</b>	perc	FLOAT	16/32BIT	0.0	-300.0	300.0	ERW	FVS
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
<b>18.8</b>	<b>2382</b>	<b>Torque ref 1 src</b>		LINK	16/32BIT	3104	0	16384	ERWZ	F_S
Selection of the origin (source) of the signal to be used for the torque reference. The signals that can be associated with the function are listed in the " <b>L_VREF</b> " selection list.										
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>18.9</b>	<b>2384</b>	<b>Torque ref filter</b>	ms	FLOAT		1.0	0.1	10.0	ERW	F_S
Setting of a filter on the torque reference.										
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
<b>18.10</b>	<b>2386</b>	<b>Torque ref</b>	perc	FLOAT	16/32BIT	0.0	0.0	0.0	ER	F_S
The value of the torque reference is displayed.										

# 19 - VF PARAMETERS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.1	2400	<b>Voltage flux boost</b>	perc	FLOAT		CALCF	0.0	15.0	RWS	_V_

Fixed voltage boost level. Value defined during self-tuning.  
 The motor flux level is controlled in vector mode. For pure V/f control, set this parameter to zero.  
 Increase the value slightly in case of low torque at low speed.  
 Increase the value slightly in case of high current with motor saturation or very long motor cables.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.2	2402	<b>Voltage boost gain</b>	V/A	FLOAT		CALCF	0.0	0.0	ERWS	_V_

Setting of the boost flux magnetising current regulator gain.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.3	2404	<b>Voltage torque boost</b>		ENUM		Enable	0	1	ERWZ	_V_

Enables vector torque compensation. For pure V/f control, disable this parameter.  
 0 Disable  
 1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.4	2406	<b>Vf voltage</b>	V	FLOAT		CALCF	10.0	690.0	ERWZS	_V_

Setting of the maximum voltage value to be applied at the motor terminals (usually set according to the motor data plate).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.5	2408	<b>Vf frequency</b>	Hz	FLOAT		CALCF	10.0	2000.0	ERWZS	_V_

Setting of the motor rated frequency (indicated on the motor data plate)  
 This is the frequency at which the drive output voltage reaches the maximum output voltage (**Vf voltage**) on the motor.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.6	2410	<b>Vf voltage 1</b>	V	FLOAT		CALCF	CALCF	CALCF	ERWZS	_V_

Setting of an intermediate voltage value for the custom V/f characteristic curve.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.7	2412	<b>Vf frequency 1</b>	Hz	FLOAT		CALCF	0.0	CALCF	ERWZS	_V_

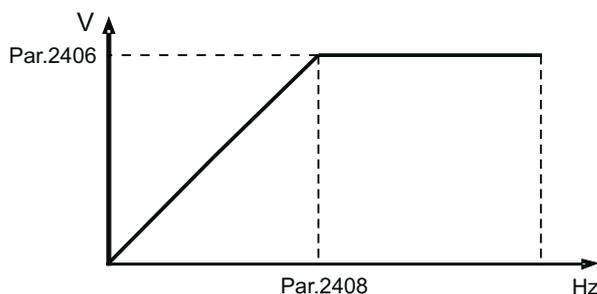
Setting of an intermediate frequency value for the custom V/f characteristic curve.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.8	2414	<b>Vf voltage 0</b>	V	FLOAT		0.0	0.0	CALCF	ERWZS	_V_

Compensation of IR voltage drop at 0 Hz. This parameter must be increased in case of pure V/f control. The increase depends on the size of the motor. Values that are too high could cause an overcurrent and motor saturation.

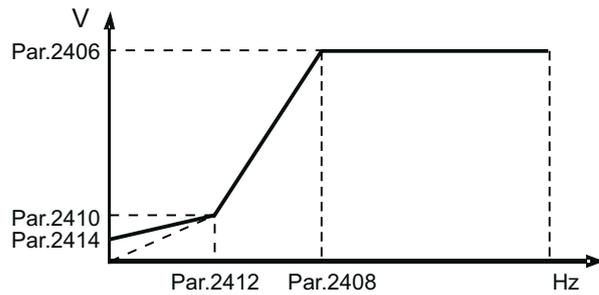
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.9	2430	<b>Vf shape</b>		ENUM		Linear	0	1	ERWZS	_V_

Selection of the type of V/f characteristic curve  
 0 Linear  
 1 Custom



Set **0 (Linear)** to obtain a linear V/f characteristic curve, on which the intermediate points are reset to a value that is equal to half those of parameters **2406** and **2408**.

The Boost joins the curve automatically.



Set **1 (Custom)** to obtain a customized V/f characteristic curve, in which the intermediate voltage and frequency values are defined by parameters **2410** and **2412**, as is the point at which the Boost joins the characteristic curve.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.10	2440	Slip comp	Hz	FLOAT		CALCF	0.0	10.0	RWS	_V_

Setting of the slip compensation. When the asynchronous motor is loaded, the mechanical speed of the motor shaft varies according to the electric slippage, which affects torque generation. The slip compensation function can be used to maintain a constant motor shaft speed. Compensation is performed by varying the drive output frequency as a function of its output current and the motor parameters. Thus, to obtain the best effect, the motor plate data must be set appropriately, and the correct stator resistance value (Par.2050) must be set or measured using the self-tuning function. The slip compensation value is calculated automatically during the self-tuning procedure or set manually in this parameter.

During slip compensation tuning the drive must not be in the current limit condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.11	2442	Slip comp filter	ms	UINT16		200	50	5000	ERW	_V_

Setting of the slip compensation filter. The value set in this parameter determines the slip compensation function reaction time. The lower this parameter is set, the greater the slip compensation reaction. If this parameter is too low, it could cause undesirable oscillations in speed after sudden variations to the applied load.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.12	2444	Slip comp mode		ENUM		Open loop lift	0	2	ERWZ	_V_

- 0 Open loop
- 1 Closed loop
- 2 Open loop lift

When set to **0 (Open loop)** the slip compensation value is that set manually in parameter 5210 or calculated by the self-tuning procedure.

If set to **1 (Closed loop)** the slip compensation value is measured by the reading of the signals by a digital encoder keyed to the motor shaft. The relative expansion card must be installed in the drive to acquire the encoder signals. For best results increase the value of PAR 2444 by 5 times.

If set to 2 (lift open loop) the slip compensation value is that set for lift cycle operation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.13	2446	Slip P gain	perc	FLOAT		1.0	0.0	100.0	ERWS	_V_

Setting of the slip compensation proportional gain.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.14	2448	Slip I gain	perc	FLOAT		1.5	0.0	100.0	ERWS	_V_

Setting of the slip compensation integral gain.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.15	2460	Vfcurrent lim P gain	Hz/A	FLOAT		CALCF	0.0	1000.0	ERWS	_V_

Setting of the proportional gain limit in SSC mode. This is calculated automatically if the self-tuning procedure is performed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.16	2462	Vfcurrent lim I time	ms	FLOAT		CALCF	1.0	50.0	ERWS	_V_

Setting of the proportional gain limit in SSC mode. This is calculated automatically if the self-tuning procedure is performed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.17	2470	<b>Damping gain</b>	perc	UINT16		0	0	100	ERW	_V_
<p>Setting of the damping gain. The parameter is used to eliminate any oscillations or faults in the drive output current, deriving from configurations capable of generating oscillations in the drive/cable/motor system. If oscillations occur, gradually increase the value of this parameter, until they disappear.</p>										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.18	2472	<b>Damping threshold 1</b>	Hz	INT16		20	5	100	ERW	_V_
<p>Setting of the first damping gain regulation threshold. These settings are usually effective for intermediate frequencies and make it possible to limit motor oscillations.</p>										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.19	2474	<b>Damping threshold 2</b>	Hz	INT16		30	5	100	ERW	_V_
<p>Setting of the second damping gain regulation threshold. These settings are usually effective for intermediate frequencies and make it possible to limit motor oscillations.</p>										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.20	2480	<b>Vf min frequency</b>	Hz	FLOAT		0.5	0.2	5.0	ERW	_V_
<p>Setting of the minimum frequency in the SSC control mode. This represents the minimum output frequency, below which frequency regulations are ineffective. It is not possible to go below this value, regardless of the reference that has been set.</p>										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.21	2482	<b>Vf min freq delay</b>	ms	UINT16		800	0	5000	ERW	_V_
<p>Setting of the delay for the minimum frequency signal in the SSC control mode.</p>										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.22	2490	<b>Dig Vf scale</b>		FLOAT	16/32BIT	1.0	0.0	1.0	ERWZ	_V_
<p>Setting of a digital multiplier factor for the drive output voltage in the SSC mode.</p>										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
19.23	2492	<b>Vf scale src</b>		LINK	16/32BIT	2490	0	16384	ERW	_V_
<p>Selection of the origin (source) of the signal to be used to set a multiplier factor for the drive output voltage. The associate functions are listed in the “<b>L_VREF</b>” selection list.</p>										

## 20 - FUNCTIONS

### 20.1 - FUNCTIONS/INERTIA COMP

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.

These parameters are calculated by the speed loop autotuning procedure but can also be set manually by the user.

**Nota !** This menu is not displayed if the lift application is active.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.1.1	3100	<b>Inertia comp</b>	kgm2	FLOAT		0.0	0.0	100.0	ERWS	F_S
Total value of the inertia on the motor shaft in Kgm <sup>2</sup> identified during the self-tuning procedure. If known, this value can also be set manually by the user.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.1.2	3102	<b>Inertia comp filter</b>	ms	UINT16		30	1	100	ERW	F_S
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
20.1.3	3104	<b>Inertia comp mon</b>	perc	FLOAT	16/32BIT	0.0	0.0	0.0	ER	F_S
The value of inertia compensation on the function block output is displayed.										

### 20.2 - FUNCTIONS/DC BRAKING

The drive is capable of managing a direct current injection phase. During this phase a braking torque is generated that can be used to stop the motor or block the rotor.

The following characteristics can be configured:

- signal used to activate the direct current injection phase
- direct current injection phase activation mode
- delay between activation of request for DC braking and start of direct current injection
- duration of direct current injection phase
- intensity of injected direct current

This function is useful for:

- slowing the motor running at any speed to zero speed
- slowing a motor driven by the load before applying the start command
- keeping the rotor blocked at the end of a deceleration ramp following a stop command.

This function cannot be used for intermediate braking as the motor speed must be brought to zero.

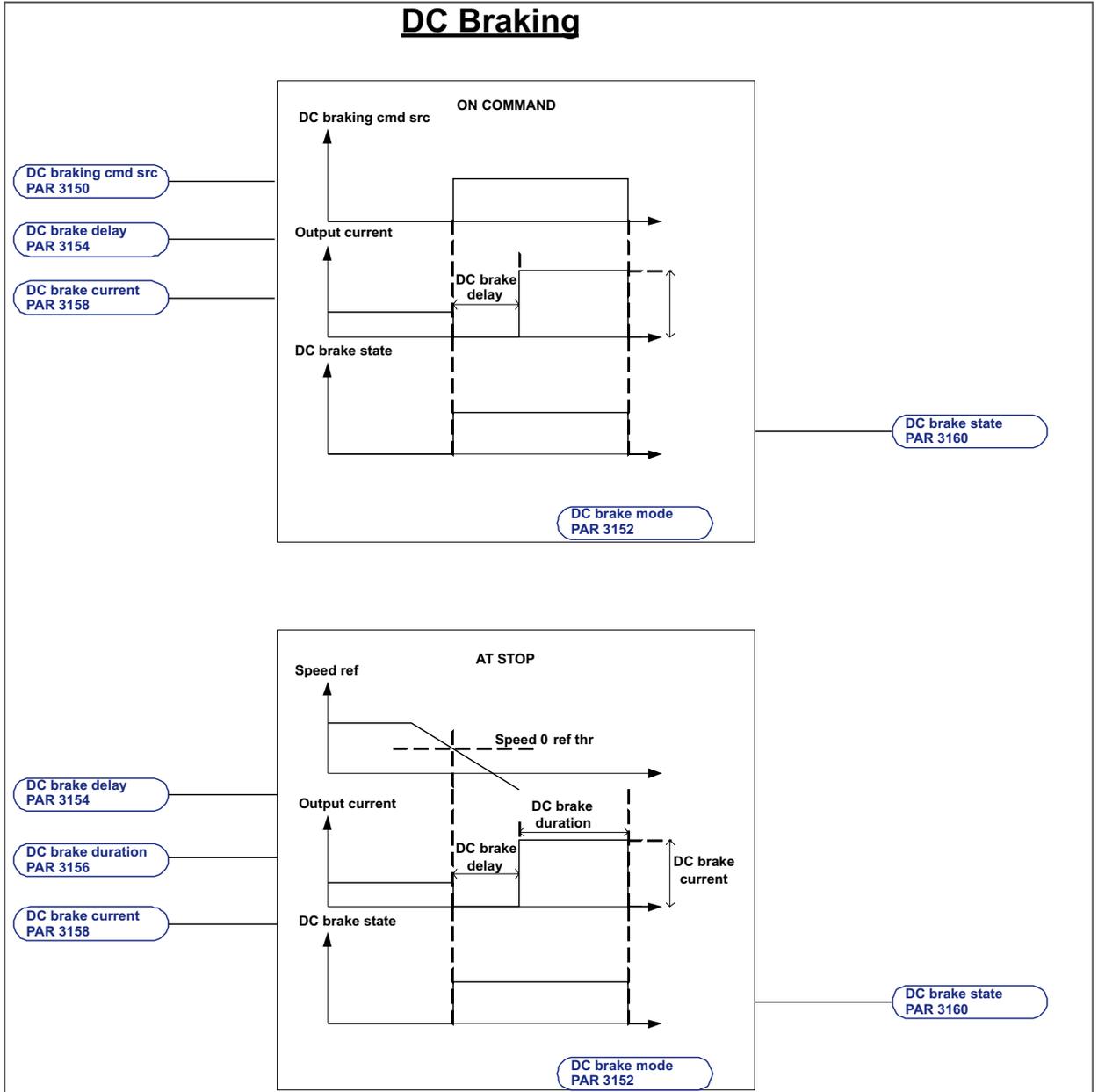
During the direct current injection phase the kinetic energy of the motor is dissipated as heat in the motor.

The following parameters allow complete control of the function.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.2.1	3150	<b>DC braking cmd src</b>		LINK	16BIT	3710	0	16384	ERW	FVS
Selection of the origin (source) of the signal to be used for the <b>DC braking command</b> . The terminal or signal that can be used for this function can be defined from among those available in the "L_DIGSEL2" selection list".										
0 DC braking command not enable										
1 DC braking command enable										
In default conditions the origin of the <b>DC braking command</b> signal is 0 .										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.2.2	3152	<b>DC brake mode</b>		ENUM		Spento	0	3	ERW	FVS
This parameter can be used to configure the DC braking activation modes.										
0 Off										
1 At Stop										

- 2 On Command
- 3 OnCmd & AtStop



In "Off" mode the direct current injection phase is never executed.

In "At stop" mode the direct current injection phase is executed when the stop command is sent and the speed reference threshold = zero has been reached.

Example:

With the motor running at any speed, when the stop command is enabled the ramp output decreases according to the selected ramp time, when the speed reference threshold = zero is reached PAR 934 **Reference = 0** the direct current injection phase is enabled. When the command is enabled after the delay configured in PAR 3154 **DC brake delay** direct current injection starts. PAR 3156 **DC brake time** is used to configure the duration of the injection phase and PAR 3158 **DC brake curr** is used to configure the intensity of the injection phase current.

In "At command" mode the direct current injection phase is executed when the **DC braking command** configured using parameter PAR 3150 **DC braking command src** is sent.

Example:

Motor running driven by load. When the drive is enabled and the **DC braking command** is sent the direct current injection phase is activated. When the command is enabled after the delay configured in PAR 3154 **DC brake delay** direct current injection starts. PAR 3156 **DC brake time** is used to configure the duration of the injection phase and PAR 3158 **DC brake curr** is used to configure the intensity of the injection phase current.

If the command is an impulse shorter than the time programmed with PAR 3156 **DC brake time**, the direct current injection

phase continues at least for the time set in parameter **DC brake time**.

If the command is an impulse longer than the time programmed with **3156 DC brake time**, the direct current injection phase continues for as long as the command is present.

In “**OnCmd & AtStop**” modes the direct current injection phase is executed when one of the two conditions described in the “**At stop**” or “**On command**” modes is present

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.2.3	3154	<b>DC brake delay</b>	s	FLOAT		0.0	0.00	30.0	ERW	FVS

This parameter is used to configure the delay in seconds between the moment DC braking is requested and the moment direct current injection starts.

This delay enables the motor to demagnetize, and thus avoid an overcurrent due to the electromotive force of the motor (e.f.m.).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.2.4	3156	<b>DC brake duration</b>	s	FLOAT		1.0	0.01	30.0	ERW	FVS

This parameter is used to configure the duration of direct current injection in the stator windings.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.2.5	3158	<b>DC brake current</b>	perc	FLOAT		75.0	0.0	150.0	ERW	FVS

This parameter is used to configure the value of the injected direct current.

This is expressed as a percentage of the rated current of the motor at full load (par. 488 **Drive cont current**).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.2.6	3160	<b>DC brake state</b>		ENUM	16BIT	Non attivo	0	1	ER	FVS

The status of direct current braking is displayed.

**0** Not active

**1** Active

**Note!**

During braking the **Enable** command must be enabled. If this command is not present or is removed during the braking process, the drive blocks the inverter bridge and the motor stops due to inertia, without braking.

During the direct current injection phase the **Run** command should not be enabled. If the **Run** command is sent to the drive, the ramp output starts following the set reference; direct current output is produced in any case. The moment the **DC braking command** is removed there is immediately a speed step without performing a change in the ramp.

During the direct current injection phase, for the Jog command follow the instructions provided for the Run command.

## 20.3 - FUNCTIONS/MOTOR OVERLOAD

The overload control function provides integrator logic to protect the motor against thermal overload. This protection presents the characteristic I<sup>2</sup>t behaviour and is an emulation of the thermal relay of the motor controlled by the VDL200 drive.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.3.1	3200	<b>Motor ovid enable</b>		BIT		0	0	1	ERW	FVS

Enabling of the motor overload control.

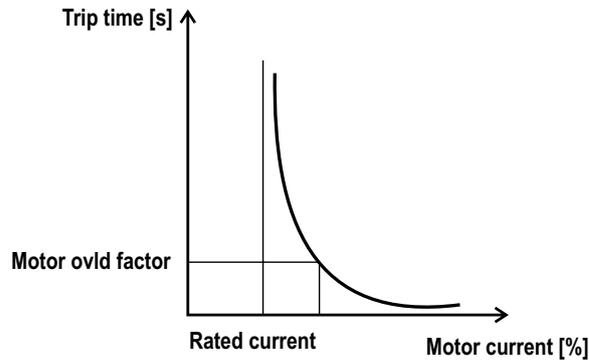
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.3.2	3202	<b>Motor ovid factor</b>	perc	FLOAT		150.0	100.0	300.0	ERWS	FVS

Setting of the motor overload value. Percentage value of the motor rated current (par. **2002 Rated current**).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.3.3	3204	<b>Motor ovid time</b>	s	FLOAT		30.0	10.0	300.0	ERWS	FVS

Setting of the motor overload duration in seconds. It represents the moment in which the protection (“Motor Overload”) is enabled, if the motor current value is above the overload set in the **Motor ovid factor** parameter. This alarm can be assigned to a programmable digital output (**Motor overload trip**).

The trip time depends on the motor current value and is as follows:



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.3.4	3206	<b>Motor service factor</b>	perc	FLOAT		100.0	25.0	200.0	ERWS	FVS

Setting of the motor service factor. This is the difference between the peak current and rated current. It is used to calculate the thermal image of the motor.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.3.5	3216	<b>Motor fan type</b>		ENUM		Servo fan	0	1	ERW	FVS

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 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** \* 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 ovid 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 I<sub>out max.</sub> 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 ovid 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 I<sub>out max.</sub> 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
20.3.6	3218	<b>Motor derat factor</b>	perc	FLOAT		50.0	0.0	100.0	ERWS	FVS

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) 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 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 ovoid 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 I<sub>out max</sub> 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 ovoid 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 I<sub>out max</sub> 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 ovoid 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 I<sub>out max</sub> 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.

## 20.4 - FUNCTIONS/BRES OVERLOAD

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.4.1	3250	<b>Bres control</b>		BIT		1	0	1	ERWZ	FVS

Enabling of the external braking resistance and relative overload control.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.4.2	3252	<b>Bres value</b>	ohm	FLOAT		SIZE	7.0	1000.0	ERWS	FVS

Setting of the ohm value of the external braking resistor

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.4.3	3254	<b>Bres cont power</b>	kW	FLOAT		SIZE	0.1	100.0	ERWS	FVS

Setting of the power that can be continuously dissipated by the external braking resistor.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.4.4	3256	<b>Bres overload factor</b>		FLOAT		SIZE	1.5	10.0	ERWS	FVS

Setting of the external resistor overload factor.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.4.5	3258	<b>Bres overload time</b>	s	FLOAT		SIZE	0.5	50.0	ERWS	FVS

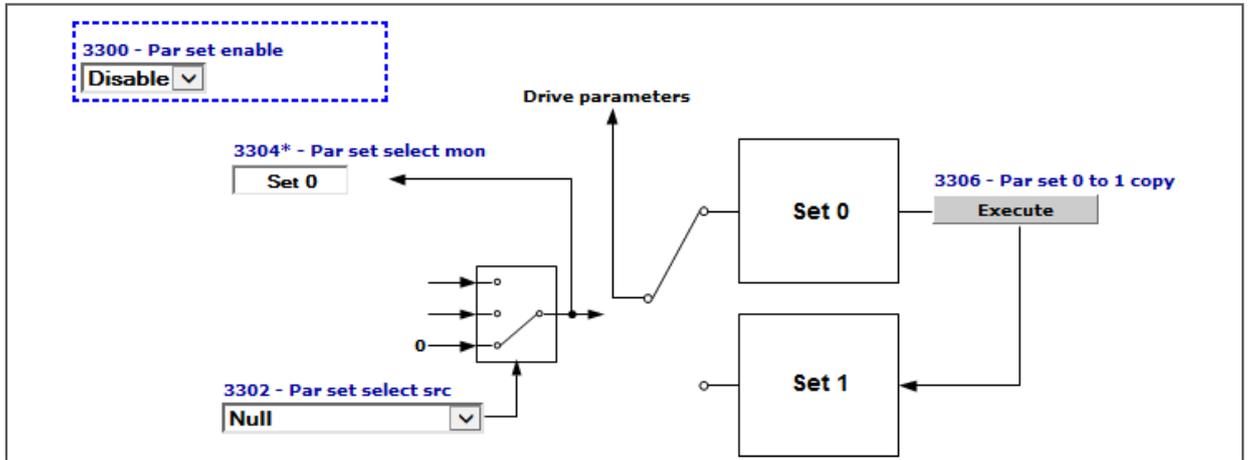
Setting of the intervention time of the external braking resistor overload.

## 20.5 - FUNCTIONS/DOUBLE PAR SET

Two independent sets of parameters can be stored in the VDL200 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.

**Lift 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.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.5.1	3300	Par set enable		ENUM		Disable	0	1	ERW	FVS

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
20.5.2	3302	Par set select src		LINK	16BIT	6000	0	16384	ERWZ	FVS

Selection of the origin (source) of the signal to be used to select the parameter set to be used. The terminal or digital command that can be associated with this function can be selected from among those available in the "L\_DIGSEL2" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.5.3	3304	Par set select mon		ENUM	16BIT	Set 0	0	0	ER	FVS

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
20.5.4	3306	Par set 0 to 1 copy		BIT		0	0	1	ERWZ	FVS

### 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).

## 20.6 - FUNCTIONS/SPEED CAPTURE

**Note!**

This menu is not displayed if the lift application is enabled

## 20.7 - FUNCTIONS/COMPARE

This function allows the comparison among two signals or values.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.7.1	3650	<b>Dig compare input 1</b>	perc	FLOAT	32BIT	0.0	-100.0	100.0	ERW	FVS

Setting of the digital value of the first element of comparison.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.7.2	3652	<b>Dig compare input 2</b>	perc	FLOAT	32BIT	0.0	-100.0	100.0	ERW	FVS

Setting of the digital value of the second element of comparison.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.7.3	3660	<b>Compare input 1 src</b>		LINK	32BIT	3650	0	16384	ERW	FVS

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
20.7.4	3662	<b>Compare input 2 src</b>		LINK	32BIT	3652	0	16384	ERW	FVS

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
20.7.5	3670	<b>Compare function</b>		ENUM		Nessuna	0	8	ERW	FVS

Setting of the compare function between **Compare input 2** and **Compare input 1** to enable **Cmp output**.

- 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
20.7.6	3672	<b>Compare window</b>	perc	FLOAT		0.0	0.0	100.0	ERW	FVS

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
20.7.7	3674	<b>Compare delay</b>	s	FLOAT		0.0	0.0	30.0	ERW	FVS

Setting of the delay for signalling the result of the comparison.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.7.8	3676	<b>Compare output</b>		BIT	16BIT	0	0	1	ER	FVS

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

## 20.8 - 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. Pads can be used, for example, to send information from a fieldbus to an optional card. All Pads can be read and written.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
20.8.1	3700	<b>Lift enable</b>		INT32	32BIT	0	0	0	ERW	FVS
20.8.2	3702	<b>Run cont mon</b>		INT32	32BIT	0	0	0	ERW	FVS
20.8.3	3704	<b>Up cont mon</b>		INT32	32BIT	0	0	0	ERW	FVS
20.8.4	3706	<b>Down cont mon</b>		INT32	32BIT	0	0	0	ERW	FVS
20.8.5	3708	<b>Brake cont mon</b>		INT32	32BIT	0	0	0	ERW	FVS
20.8.6	3710	<b>Lift dc brake</b>		INT32	32BIT	0	0	0	ERW	FVS
20.8.7	3712	<b>Brake 2 mon</b>		INT32	32BIT	0	0	0	ERW	FVS
20.8.8	3714	<b>Door open mon</b>		INT32	32BIT	0	0	0	ERW	FVS
20.8.9	3716	<b>Lift start</b>		INT32	32BIT	0	0	0	ERW	FVS
20.8.10	3718	<b>Pad 10</b>		INT32	32BIT	0	0	0	ERW	FVS
20.8.11	3720	<b>Lift status word</b>		INT32	32BIT	0	0	0	ERW	FVS
20.8.12	3722	<b>Pad 12</b>		INT32	32BIT	0	0	0	ERW	FVS
20.8.13	3724	<b>Pad 13</b>		INT32	32BIT	0	0	0	ERW	FVS
20.8.14	3726	<b>Ramp down limit</b>		INT32	32BIT	0	0	0	ERW	FVS
20.8.15	3728	<b>PAD 15</b>		INT32	32BIT	0	0	0	ERW	FVS

**20.8.16 3730 Lift wdec input** INT32 32BIT 0 0 0 ERW FVS

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 digital outputs.

# 21 - COMMUNICATION

## 21.1 - COMMUNICATION/RS232

The VDL200 drive is provided with a standard port (9 pole sub-D connector: XS) for connecting the RS232 serial line used for drive-PC point-to-point communication (via the WEG-eXpress configuration software).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
21.1.1	3800	<b>Drive address</b>		UINT16		1	1	255	ERW	FVS

Setting of the address to which the drive responds when connected to the RS232 serial line.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
21.1.2	3802	<b>Serial baudrate</b>		ENUM		38400	0	2	ERW	FVS

Setting of the RS232 serial communication speed (Baud Rate).

- 0 9600
- 1 19200
- 2 38400

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
21.1.3	3810	<b>Serial parameter</b>		ENUM		None,8,1	0	3	ERW	FVS

Setting of the format of the RS232 serial line.

- 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
21.1.4	3804	<b>Serial protocol</b>		ENUM		Modbus	0	1	ERW	FVS

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
21.1.5	3806	<b>Serial delay</b>	ms	UINT16		0	0	1000	ERW	FVS

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 RS232 interface that is used has not been pre-set for automatic Tx/Rx switching. The parameter only concerns the use of the standard RS232 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
21.1.6	3808	<b>Serial swap data</b>		BIT		0	0	1	ERW	FVS

This parameter enables the exchange of the reading of the High and Low parts of the words for FLOAT type parameters when using the Modbus protocol.

## 21.2 -

## 21.3 -

## 21.4 -

## 21.5 -

## 21.6 -

**Note !** Those menus are not available.

## 22 - 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.

<b>Activity</b>	<b>Ignore</b>	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.
	<b>Warning</b>	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.
	<b>Disable Drive</b>	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.
	<b>Stop</b>	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 <b>Ramp</b> control mode is enabled, the drive moves to the zero speed with the set ramp time; when the <b>Speed delay 0</b> signal is activated the drive is disabled. If <b>Speed</b> control mode is enabled, the drive moves to the zero speed with the maximum current possible; when the <b>Speed delay 0</b> signal is activated the drive is disabled. If <b>Torque</b> control mode is enabled, the drive moves to the zero speed with the time set by the load; when the <b>Speed delay 0</b> signal is activated the drive is disabled.
	<b>Fast stop</b>	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 <b>Ramp</b> control mode is enabled, the drive moves to the zero speed with the set fast stop ramp time (deceleration time 3); when the <b>Speed delay 0</b> signal is activated the drive is disabled. If <b>Speed</b> control mode is enabled, the drive moves to the zero speed with the maximum current possible; when the <b>Speed delay 0</b> signal is activated the drive is disabled. If <b>Torque</b> control mode is enabled, the drive moves to the zero speed with the set load time; when the <b>Speed delay 0</b> 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	✓	✓	✓	✓	✓
Overspeed	✓	✓	✓	✓	✓
SpdRefLoss	✓	✓	✓	✓	✓
SpdFbkLoss	✓	✓	✓	✓	✓
Drive ovld	✓	✓	✓	✓	✓
Motor ovld	✓	✓	✓	✓	✓

Alarm	Ignore	Warning	Disable drive	Stop	Fast stop
Bres ovld	✓	✓	✓	✓	✓
InAir	✓	✓	✓	✓	✓
PhLoss	✓	✓	✓	✓	✓
Opt Bus	✓	✓	✓	✓	✓

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.1	4500	<b>Fault reset src</b>		LINK	16BIT	6000	0	16384	RW	FVS

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
22.2	4502	<b>ExtFlt src</b>		LINK	16BIT	6000	0	16384	RW	FVS

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
22.3	4504	<b>ExtFlt activity</b>		ENUM		Disable	0	4	RW	FVS

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
22.4	4506	<b>ExtFlt restart</b>		ENUM		Disable	0	1	RW	FVS

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
22.5	4508	<b>ExtFlt restart time</b>	ms	UUINT16		1000	120	30000	RW	FVS

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
22.6	4510	<b>ExtFlt holdoff</b>	ms	UUINT16		0	0	10000	RW	FVS

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
22.7	4520	<b>MotorOT src</b>		LINK	16BIT	6000	0	16384	RW	FVS

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
22.8	4522	<b>MotorOT activity</b>		ENUM		Warning	0	4	RW	FVS

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
22.9	4524	<b>MotorOT restart</b>		ENUM		Disable	0	1	RW	FVS
		Enabling of automatic restart after the motor overtemperature alarm <b>MotorOT</b> .								
		0 Disable								
		1 Enable								
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.10	4526	<b>MotorOT restart time</b>	ms	UINT16		1000	120	30000	RW	FVS
		Setting of the time within which the <b>Motor Overtemperature</b> alarm must be reset in order to perform automatic restart.								
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.11	4528	<b>MotorOT holdoff</b>	ms	UINT16		1000	0	30000	RW	FVS
		Setting of the delay between the signalling of the motor overtemperature alarm <b>MotorOT</b> 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
22.12	4540	<b>Overspeed threshold</b>	rpm	INT16	INT32	CALCI	0	CALCI	RW	FVS
		Setting of the threshold above which the overspeed alarm <b>Overspeed</b> is enabled.								
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.13	4542	<b>Overspeed activity</b>		ENUM		Disable	0	4	RW	FVS
		Setting of the behaviour of the drive in case of a motor overspeed alarm <b>Overspeed</b> . This alarm indicates that the motor speed has exceeded the threshold set in the <b>Speed ref top lim</b> and <b>Speed ref bottom lim</b> parameters in the COM-MANDS menu.								
		0 Ignore								
		1 Warning								
		2 Disable								
		3 Stop								
		4 Fast stop								
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.14	4544	<b>Overspeed holdoff</b>	ms	UINT16		0	0	5000	RW	FVS
		Setting of the delay between the signalling of the motor overspeed alarm <b>Overspeed</b> 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
22.15	4550	<b>SpdRefLoss threshold</b>	rpm	INT16		100	0	CALCI	RW	FVS
		Setting of the threshold below which the speed reference loss alarm <b>SpdRefLoss</b> occurs .								
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.16	4552	<b>SpdRefLoss activity</b>		ENUM		Warning	0	4	RW	FVS
		Setting of the behaviour of the drive in case of a speed reference loss alarm <b>SpdRefLoss</b> . 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 <b>2354</b> 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
22.17	4554	<b>SpdRefLoss holdoff</b>	ms	UINT16		1000	0	10000	RW	FVS
		The delay between the <b>Speed ref loss</b> alarm condition signal and activation of the actual 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
22.18	4560	<b>SpdFbkLoss activity</b>		ENUM		Disable	0	4	RW	FVS
		Drive behaviour in case of the <b>Speed fbk loss</b> alarm is displayed. This alarm indicates the loss of the encoder feedback signals. Each type of encoder generates the <b>Speed fbk loss</b> alarm differently (incremental signal error, absolute signal error, serial error).								
		0	Ignore							
		1	Warning							
		2	Disable							
		3	Stop							
		4	Fast stop							

The causes of the **Speed fbk loss** alarm and the information acquired from the encoder are shown in the **SpdFbkLoss code** parameter 2172.

**Note!** See menu 15.13 for further information.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.19	4562	<b>SpdFbkLoss holdoff</b>	ms	UINT16		200	0	10000	RW	FVS
		Setting of the delay between the signalling of the speed feedback loss alarm condition <b>SpdFbkLoss</b> 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
22.20	4564	<b>SpdFbkLoss threshold</b>	rpm	INT16		100	5	CALCI	RW	FV_
		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 <b>SpdFbkLoss activity</b> .								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.21	4570	<b>Drive ovlid activity</b>		ENUM		Ignore	0	4	ERW	FVS
		Setting of the behaviour of the drive in case of a drive overload alarm <b>Drive ovlid</b> . 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
22.22	4572	<b>Motor ovlid activity</b>		ENUM		Warning	0	4	ERW	FVS
		Setting of the behaviour of the drive in case of a motor overload alarm <b>Motor ovlid</b> . 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
22.23	4574	<b>Bres ovlid activity</b>		ENUM		Disable	0	4	ERW	FVS
		Setting of the behaviour of the drive in case of a braking resistor overload alarm <b>Bres ovlid</b> . 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
22.24	4582	<b>HTsens restart</b>		ENUM		Disable	0	1	ERW	FVS
Enabling of automatic restart after the drive heatsink overtemperature alarm <b>HTsens</b> . <b>0</b> Disable <b>1</b> Enable										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.25	4584	<b>HTsens restart time</b>	ms	UINT16		20000	120	60000	ERW	FVS
Setting of the time within which the <b>HT sensor</b> alarm must be reset in order to perform automatic restart.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.26	4600	<b>InAir activity</b>		ENUM		Stop	0	4	ERW	FVS
Setting of the behaviour of the drive in case of an intake air overtemperature alarm <b>InAir</b> . This alarm indicates that the temperature of the intake cooling air is too high. <b>0</b> Ignore <b>1</b> Warning <b>2</b> Disable <b>3</b> Stop <b>4</b> Fast stop										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.27	4602	<b>InAir restart</b>		ENUM		Disable	0	1	ERW	FVS
Enabling of automatic restart after the intake air overtemperature alarm <b>InAir</b> . <b>0</b> Disable <b>1</b> Enable										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.28	4604	<b>InAir restart time</b>	ms	UINT16		1000	120	30000	ERW	FVS
Setting of the time within which the <b>Intakeair OT</b> alarm must be reset in order to perform automatic restart.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.29	4606	<b>InAir holdoff</b>	ms	UINT16		10000	0	30000	ERW	FVS
Setting of the delay between the signalling of the intake air overtemperature alarm <b>InAir</b> 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
22.30	4610	<b>Desat restart</b>		ENUM		Disable	0	1	ERW	FVS
Enabling of automatic restart after the desaturation alarm <b>Desat</b> . This alarm indicates a short circuit between the motor phases or on the power bridge. <b>0</b> Disable <b>1</b> Enable										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.31	4612	<b>Desat restart time</b>	ms	UINT16		2000	1000	10000	ERW	FVS
Setting of the time within which the <b>Desaturation</b> 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
22.32	4620	<b>IOverC restart</b>		ENUM		Disable	0	1	ERW	FVS
Enabling of automatic restart after the drive <b>Overcurrent</b> alarm. This alarm indicates an overcurrent (or short circuit between phases or towards the ground). <b>0</b> Disable <b>1</b> Enable										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.33	4622	<b>IOverC restart time</b>	ms	UINT16		2000	1000	10000	ERW	FVS

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	
22.34	4630	<b>OverV restart</b>		ENUM		Disable	0	1	ERW	FVS	
		Enabling of automatic restart after the <b>Overvoltage</b> 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
22.35	4632	<b>OverV restart time</b>	ms	UINT16		2000	1000	10000	ERW	FVS
		Setting of the time within which the <b>Overvoltage</b> 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	
22.36	4640	<b>UnderV restart</b>		ENUM		Enable	0	1	ERW	FVS	
		Enabling of automatic restart after the <b>Undervoltage</b> 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
22.37	4642	<b>UnderV restart time</b>	ms	UINT16		1000	120	10000	ERW	FVS
		Setting of the time within which the <b>Undervoltage</b> 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
22.38	4650	<b>UVRep attempts</b>		UINT16		5	0	1000	ERW	FVS
		Setting of the maximum number of attempts at automatic restart after the <b>Undervoltage</b> alarm before a <b>Mult Undervoltage alarm</b> 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
22.39	4652	<b>UVRep delay</b>	s	UINT16		240	0	300	ERW	FVS
		Setting of the time within which, if no automatic restarts are executed after the <b>Undervoltage</b> alarm, the attempts counter is reset. In this way the number of attempts set in <b>Underv res attempts</b> are still available.								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod	
22.40	4660	<b>PhLoss activity</b>		ENUM		Disable	0	4	ERW	FVS	
		Setting of the behaviour of the drive in case of a <b>no phase</b> 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	
22.41	4662	<b>PhLoss restart</b>		ENUM		Disable	0	1	ERW	FVS	
		Enabling of automatic restart after the <b>no phase</b> alarm.									
		0	Disable								
		1	Enable								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.42	4664	<b>PhLoss restart time</b>	ms	UINT16		1000	120	10000	ERW	FVS
		Setting of the time within which the <b>Phase loss</b> 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
22.43	4668	<b>PhLoss output test</b>		ENUM		Enable	0	2	ERWZ	FVS

Enabling of the output phase loss test.

- 0 Disable
- 1 Enable
- 2 Powerup

If set to **0** the test is disable

If set to **1** the drive verifies the presence of all the output phases each time it receives the enable command.

If set to **2** the drive only verifies the presence of all the output phases the first time the enable command is sent after powering

**Note!**

The motor brake must be closed while running this test!

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.44	4680	<b>GroundFault thr</b>	perc	FLOAT		10.0	0.0	150.0	ERWS	FVS

Setting of the threshold for the ground short circuit alarm **Ground Fault**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.45	4700	<b>Alarm dig sel 1</b>		ENUM		No alarm	0	40	ERW	FVS
22.46	4702	<b>Alarm dig sel 2</b>		ENUM		No alarm	0	40	ERW	FVS
22.47	4704	<b>Alarm dig sel 3</b>		ENUM		No alarm	0	40	ERW	FVS
22.48	4706	<b>Alarm dig sel 4</b>		ENUM		No alarm	0	40	ERW	FVS

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 Not Used
- 18 Not Used
- 19 Not Used
- 20 Not Used
- 21 External fault
- 22 Speed fbk loss
- 23 Overspeed
- 24 Speed ref loss
- 25 Not Used
- 26 Power down
- 27 Phaseloss out
- 28 Not Used
- 29 Not Used
- 30 Not Used
- 31 Not Used
- 32 Not Used
- 33 Plc1 fault
- 34 Plc2 fault
- 35 Plc3 fault
- 36 Plc4 fault
- 37 Plc5 fault

- 38 Plc6 fault
- 39 Plc7 fault
- 40 Plc8 fault

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.49	4720	<b>Alm autoreset time</b>	s	FLOAT		0.0	0.0	60.0	ERW	FVS

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.

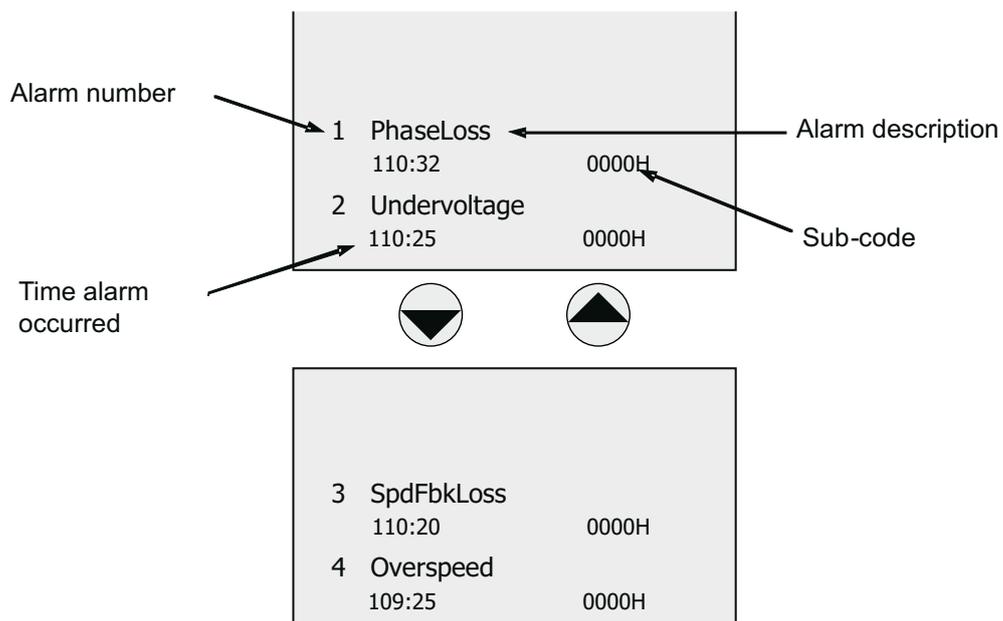
If the parameter is 0 the function is disabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
22.50	4722	<b>Alm autoreset number</b>		UINT16		20	0	100	ERW	FVS

Setting of the maximum number of attempted automatic resets.

## 23 - 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.



## PARAMETERS ON SELECTION LISTS, BUT NOT DISPLAYED ON KEYPAD

This list reports the parameters that are not displayed in the keyboard while they are part of the selection lists. These parameters can be used as SOURCE of the input signals for the function block. (Refer to section A – Programming).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>262</b>	<b>Motor speed nofilter</b>	rpm	INT16	16BIT	0	0	0	ER	FVS
This parameter indicates the unfiltered motor speed.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>362</b>	<b>Drive overload trip</b>		BIT	16BIT	0	0	1	ER	FVS
This signal indicates that the drive is in the overload alarm condition.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>366</b>	<b>Drive overload 80%</b>		BIT	16BIT	0	0	1	ER	FVS
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
-	<b>626</b>	<b>Ramp ref out mon</b>	rpm	INT16	16BIT	0	0	0	ER	FVS
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
-	<b>760</b>	<b>Ramp out mon</b>	rpm	INT16	16BIT	0	0	0	ER	FVS
This parameter displays the reference value output of the ramp function block.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>764</b>	<b>Ramp acc state</b>		BIT	16BIT	0	0	1	ER	FVS
This signal indicates whether the acceleration ramp is active.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>766</b>	<b>Ramp dec state</b>		BIT	16BIT	0	0	1	ER	FVS
This signal indicates whether the deceleration ramp is active.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>934</b>	<b>Ref is 0</b>		BIT	16BIT	0	0	1	ER	FVS
This signal is active when the reference is below the limit set in parameter <b>930 Reference 0 threshold</b> .										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>936</b>	<b>Ref is 0 delay</b>		BIT	16BIT	0	0	1	ER	FVS
This parameter is active when the reference is below the threshold set in parameter <b>930 Reference 0 threshold</b> . The signal is enabled after the delay set with parameter <b>932 Reference delay 0</b> .										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>944</b>	<b>Speed is 0</b>		BIT	16BIT	0	0	1	ER	FVS
This parameter is active when the speed is below the threshold set in parameter <b>940 Speed 0 threshold</b> .										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>946</b>	<b>Speed is 0 delay</b>		BIT	16BIT	0	0	1	ER	FVS
This signal is active when the reference is below the threshold set in parameter <b>940 Speed 0 threshold</b> . The signal is activated after the delay set in parameter <b>942 Speed 0 delay</b> .										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>1060</b>	<b>Sequencer status</b>		UINT16	16BIT	0	0	0	ER	FVS

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
-	<b>1062</b>	<b>Drive OK</b>		BIT	16BIT	0	0	1	ER	FVS

This signal is active when the drive is in the “OK” condition and no alarms are present.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>1064</b>	<b>Drive ready</b>		BIT	16BIT	0	0	1	ER	FVS

This signal is active when the drive reference is in the “Ready” to run condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>1110</b>	<b>Digital input E mon</b>		BIT	16BIT	0	0	1	ER	FVS

These signals represent the state of the corresponding digital input.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>1210</b>	<b>Digital input 1X mon</b>		BIT	16BIT	0	0	1	ER	FVS
-	<b>1212</b>	<b>Digital input 2X mon</b>		BIT	16BIT	0	0	1	ER	FVS
-	<b>1214</b>	<b>Digital input 3X mon</b>		BIT	16BIT	0	0	1	ER	FVS
-	<b>1216</b>	<b>Digital input 4X mon</b>		BIT	16BIT	0	0	1	ER	FVS
-	<b>1218</b>	<b>Digital input 5X mon</b>		BIT	16BIT	0	0	1	ER	FVS
-	<b>1220</b>	<b>Digital input 6X mon</b>		BIT	16BIT	0	0	1	ER	FVS
-	<b>1222</b>	<b>Digital input 7X mon</b>		BIT	16BIT	0	0	1	ER	FVS
-	<b>1224</b>	<b>Digital input 8X mon</b>		BIT	16BIT	0	0	1	ER	FVS

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
-	<b>2388</b>	<b>Torque ref nofilter</b>	perc	FLOAT	16BIT	0.0	0.0	0.0	ER	FVS

The torque control reference current without filter is displayed (in sensorless vector and field-oriented vector mode).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>3214</b>	<b>Motor overload trip</b>		BIT	16BIT	0	0	1	ER	FVS

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 16BIT 0 0 1 ER FVS

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
------	-----	-------------	----	------	--------	-----	-----	-----	-----	-----

- **4708 Alm dig out mon 1** BIT 16BIT 0 0 1 ER FVS

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 16BIT 0 0 1 ER FVS

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 16BIT 0 0 1 ER FVS

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 16BIT 0 0 1 ER FVS

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 16BIT 0 0 0 ERW FVS

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 Not Used
- 18 Not Used
- 19 Not Used
- 20 Not Used
- 21 External fault
- 22 Speed fbk loss
- 23 Overspeed
- 24 Speed ref loss
- 25 Not Used
- 26 Power down
- 27 Phaseloss out
- 28 Not Used
- 29 Not Used
- 30 Not Used
- 31 Not Used
- 32 Not Used
- 33 Plc1 fault
- 34 Plc2 fault
- 35 Plc3 fault
- 36 Plc4 fault
- 37 Plc5 fault
- 38 Plc6 fault
- 39 Plc7 fault
- 40 Plc8 fault

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>4780</b>	<b>Alarm PLC</b>		UINT16		0	0	0	ER	FVS

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
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
-	<b>6000</b>	<b>Null</b>		UINT32	32BIT	0	0	0	ER	FVS

This signal forces the variable to the zero level (always disabled).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>6002</b>	<b>One</b>		UINT32	32BIT	1	1	1	ER	FVS

This signal forces the variable to level one (always active).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Mod
-	<b>6006</b>	<b>Current limit state</b>		BIT	16BIT	0	0	1	ER	FVS

This signal is activated when the drive is in the current limit condition.



PAR	Description	Menu	PAR	Description	Menu	PAR	Description	Menu
3718	Pad 10	20.8.10						
3720	Lift status word	20.8.11						
3722	Pad 12	20.8.12						
3724	Pad 13	20.8.13						
3726	Ramp down limit	20.8.14						
3728	PAD 15	20.8.15						
3730	Lift wdec input	20.8.16						
5008	Test gen out	24.1.5						

## L\_SCOPE

6000	Null	(*)
------	------	-----

## L\_WDECOMP

6000	Null	(*)
6002	One	(*)
3700	Lift enable	20.8.1
3702	Run cont mon	20.8.2
3704	Up cont mon	20.8.3
3706	Down cont mon	20.8.4
3708	Brake cont mon	20.8.5
3710	Lift dc brake	20.8.6
3712	Brake 2 mon	20.8.7
3714	Door open mon	20.8.8
3716	Lift start	20.8.9
3718	Pad 10	20.8.10
3720	Lift status word	20.8.11
3722	Pad 12	20.8.12
3724	Pad 13	20.8.13
3726	Ramp down limit	20.8.14
3728	PAD 15	20.8.15
3730	Lift wdec input	20.8.16

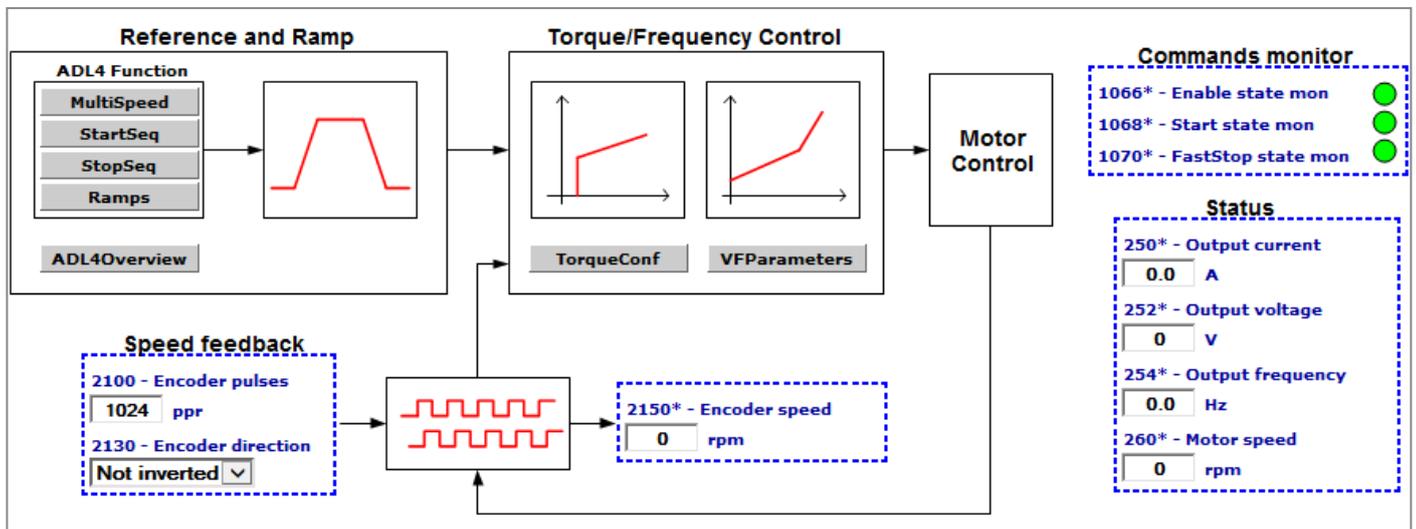
(\*)  
 Parameter not shown on the keypad. For information see the "PARAMETERS INCLUDED IN SELECTION LISTS BUT NOT SHOWN ON THE KEYPAD" section.

## D - Block Diagrams

### System diagram index

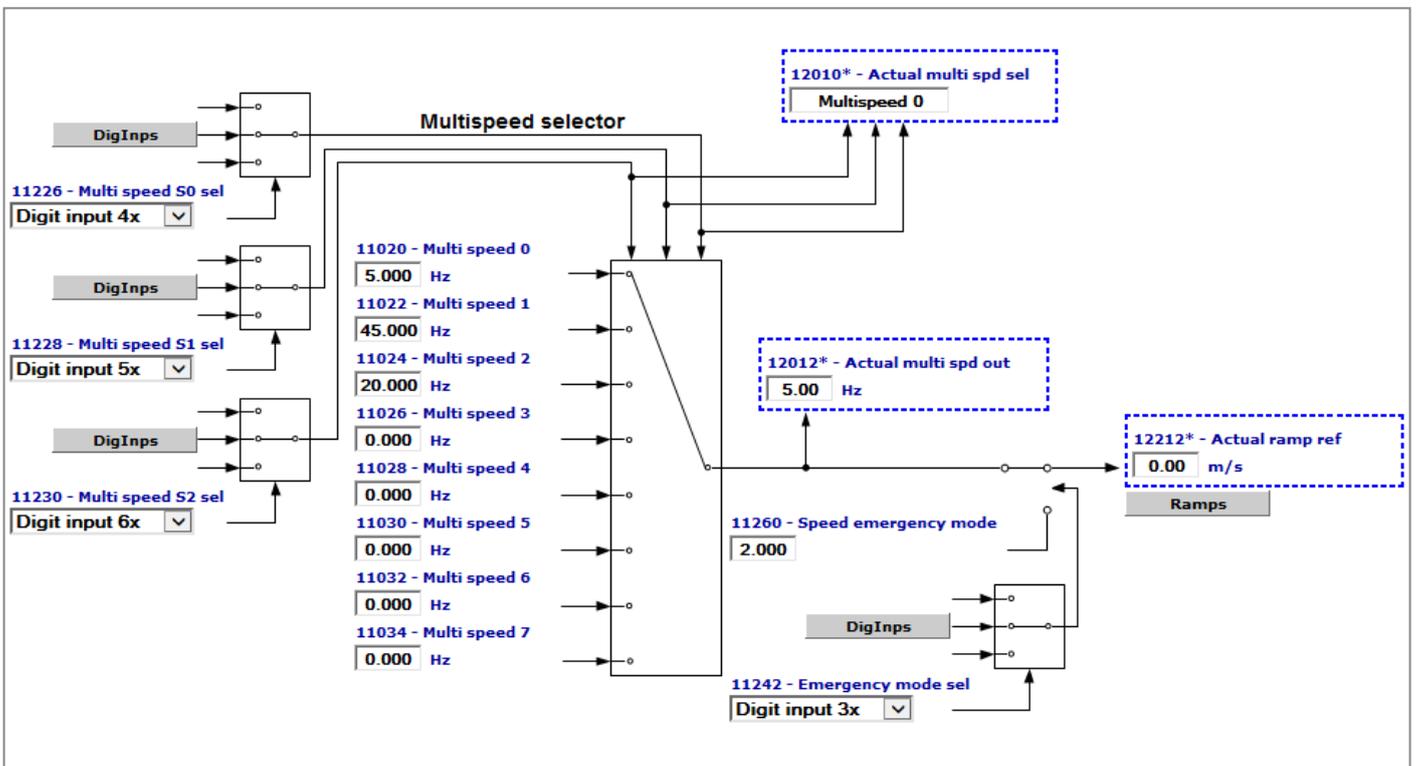
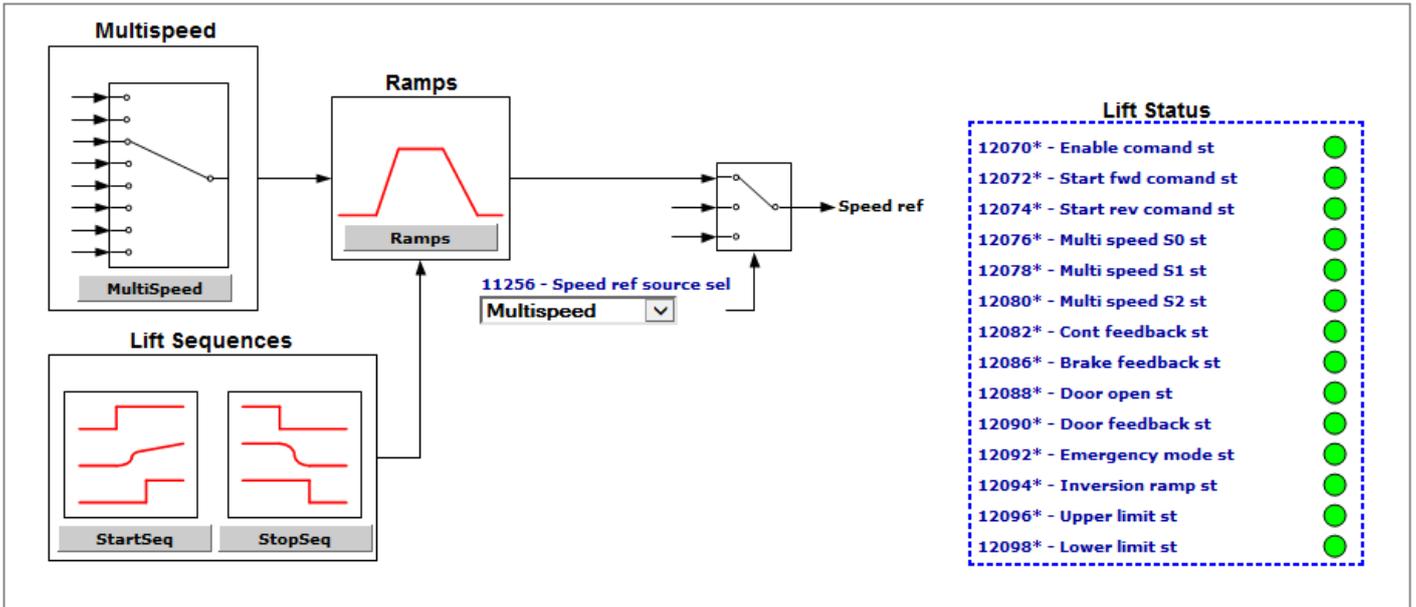
<b>DRIVE OVERVIEW</b>	DrvOverview	Encoder	ENCODER CONFIG
<b>LIFT</b>	Lift	SpeedRegGains	SPEED REG GAINS
<b>DIGITAL INPUTS</b>	DigInps	TorqueConf	TORQUE CONFIG
<b>DIGITAL OUTPUTS</b>	DigOuts	VFParameters	VF PARAMETERS
<b>ANALOG INPUT</b>	AnInp	Functions	FUNCTIONS

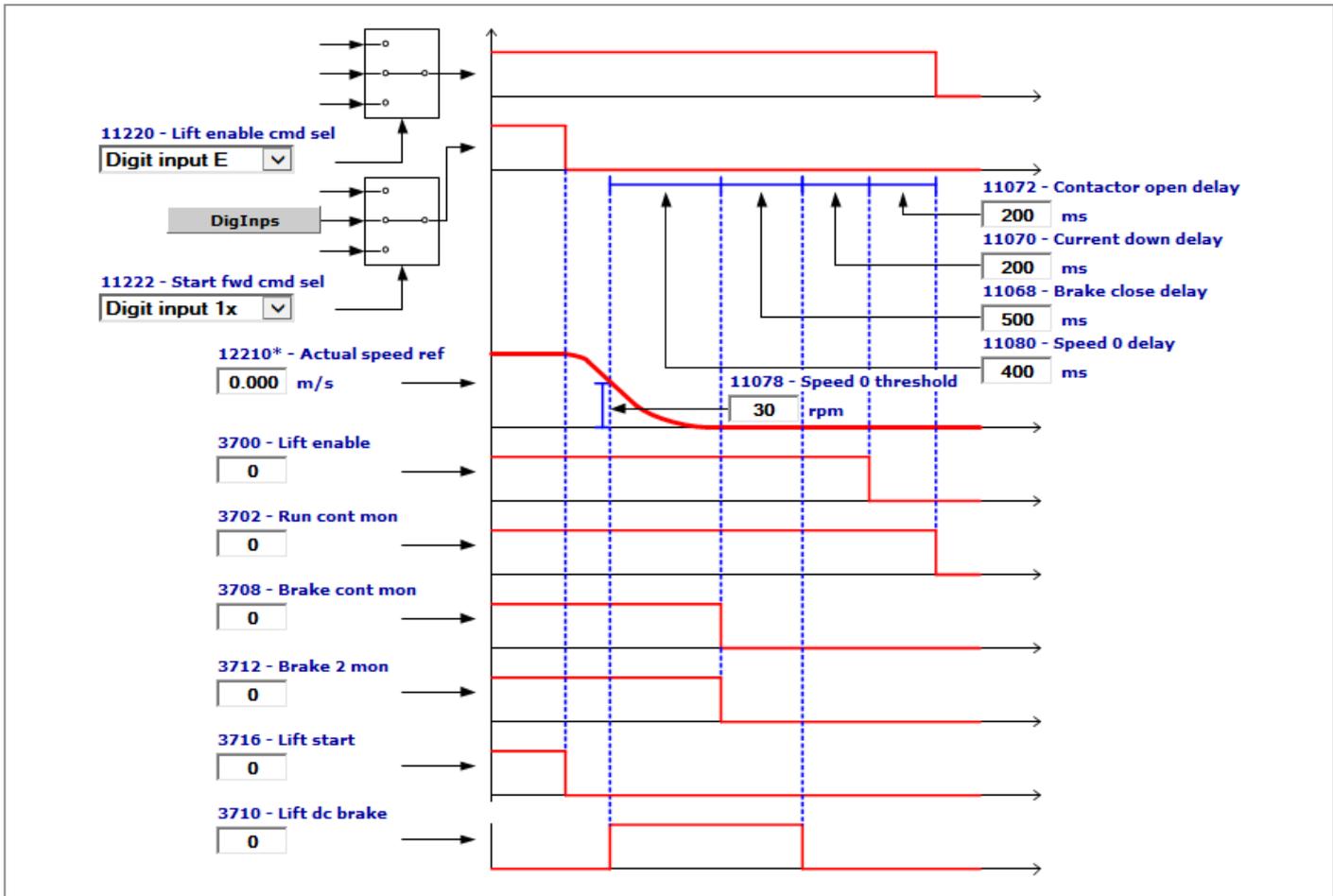
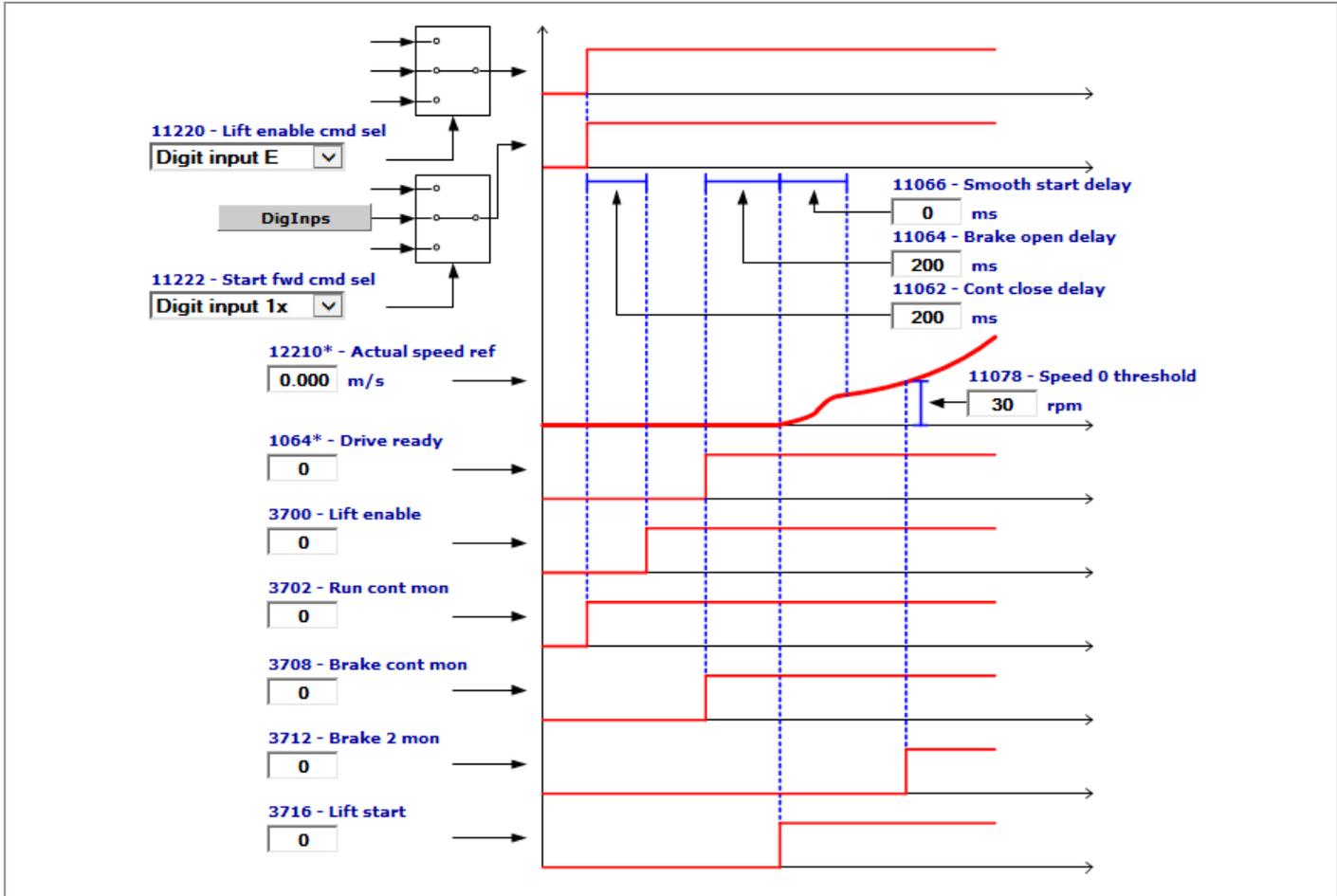
### Drive overview (DrvOverview)

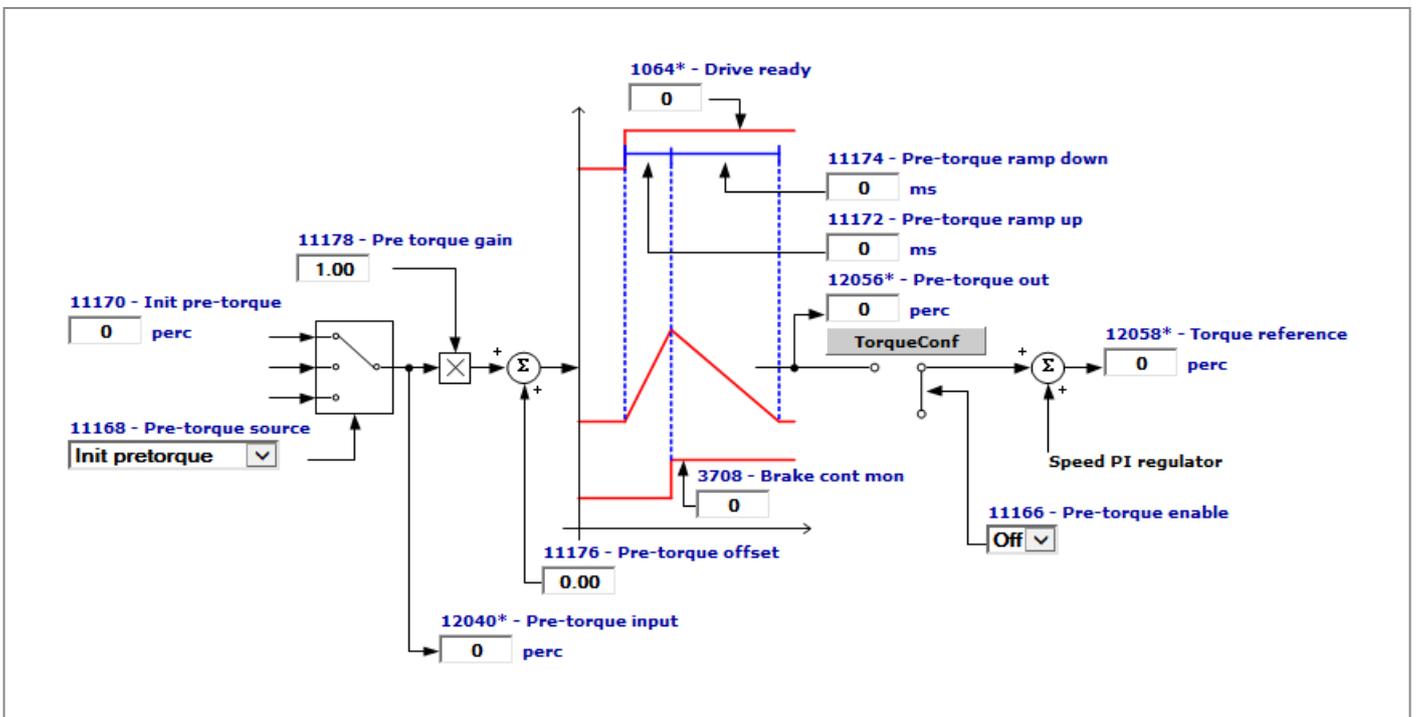
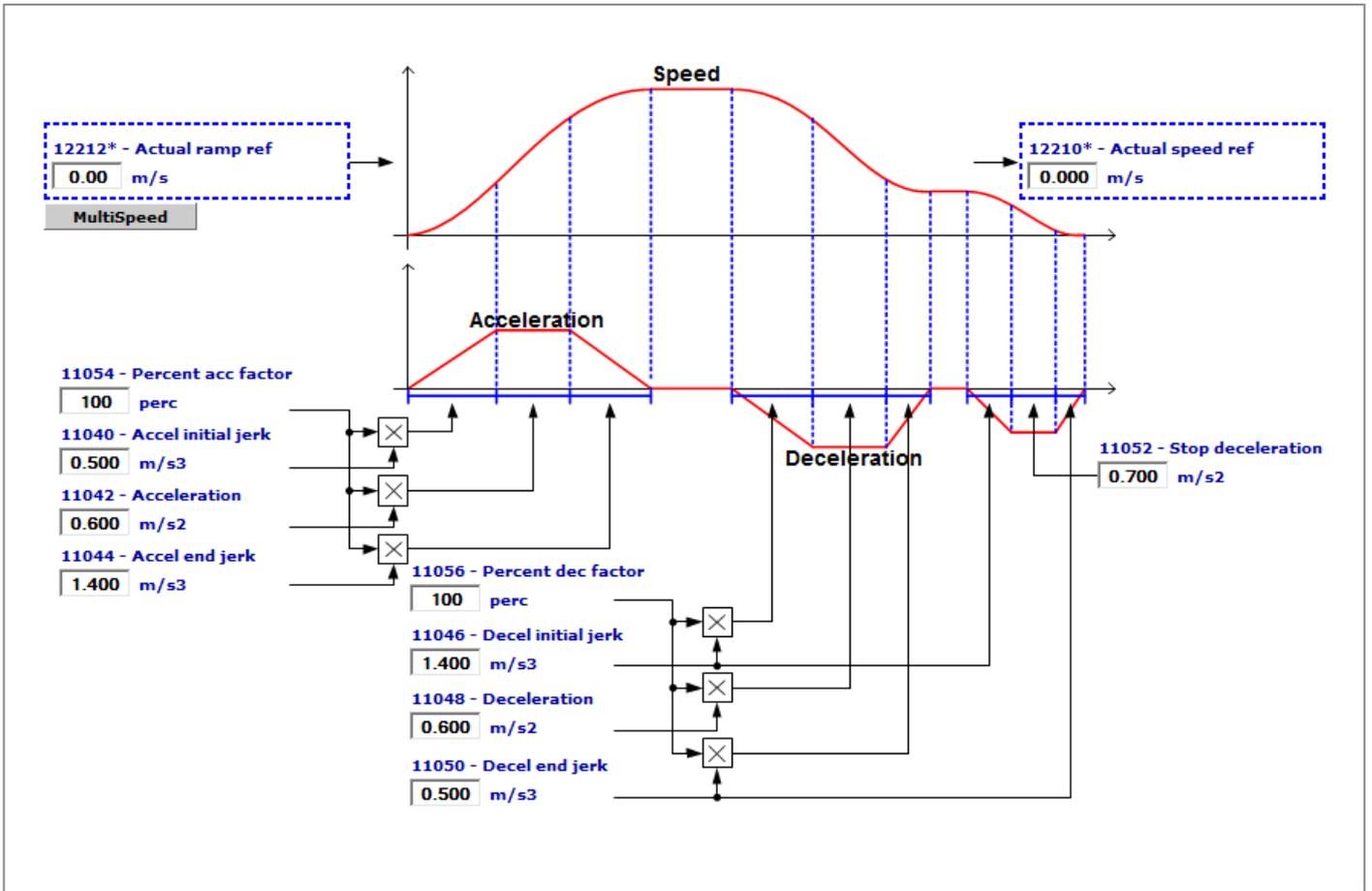


# ADL1 application index (ADL1FuncIndex)

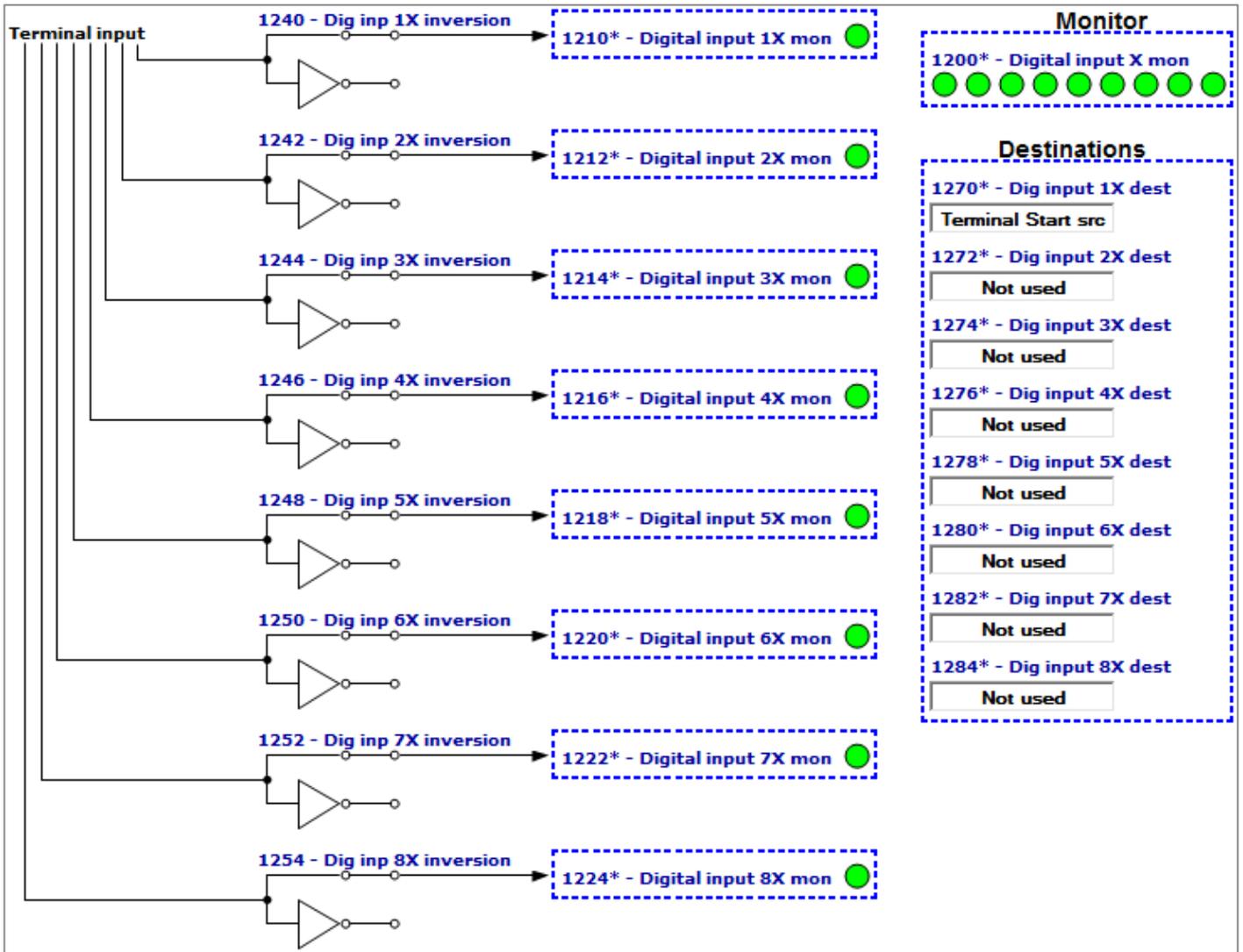
ADL4 OVERVIEW	ADL4Overview
MULTISPEED	MultiSpeed
START SEQUENCES	StartSeq
STOP SEQUENCES	StopSeq
RAMPS	Ramps
PRE TORQUE	PreTorque



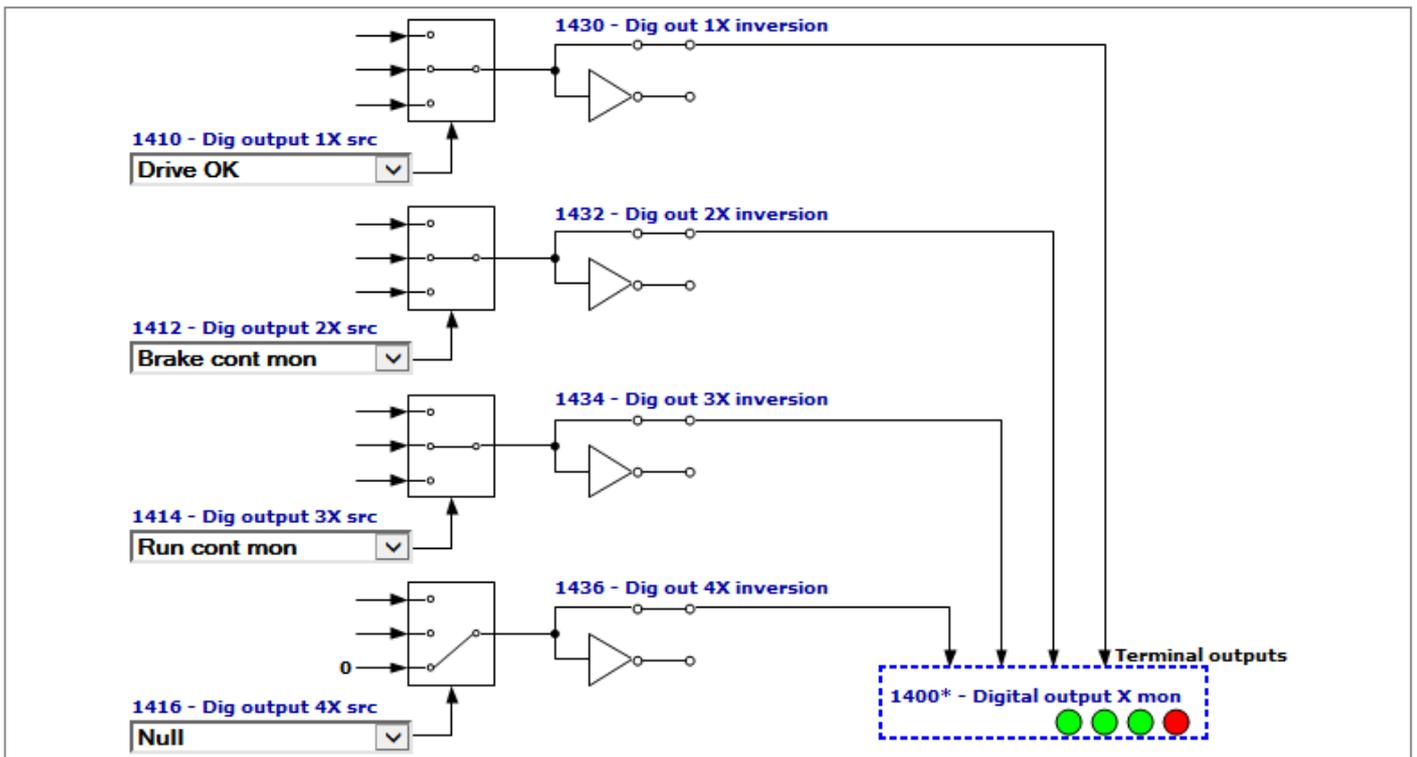




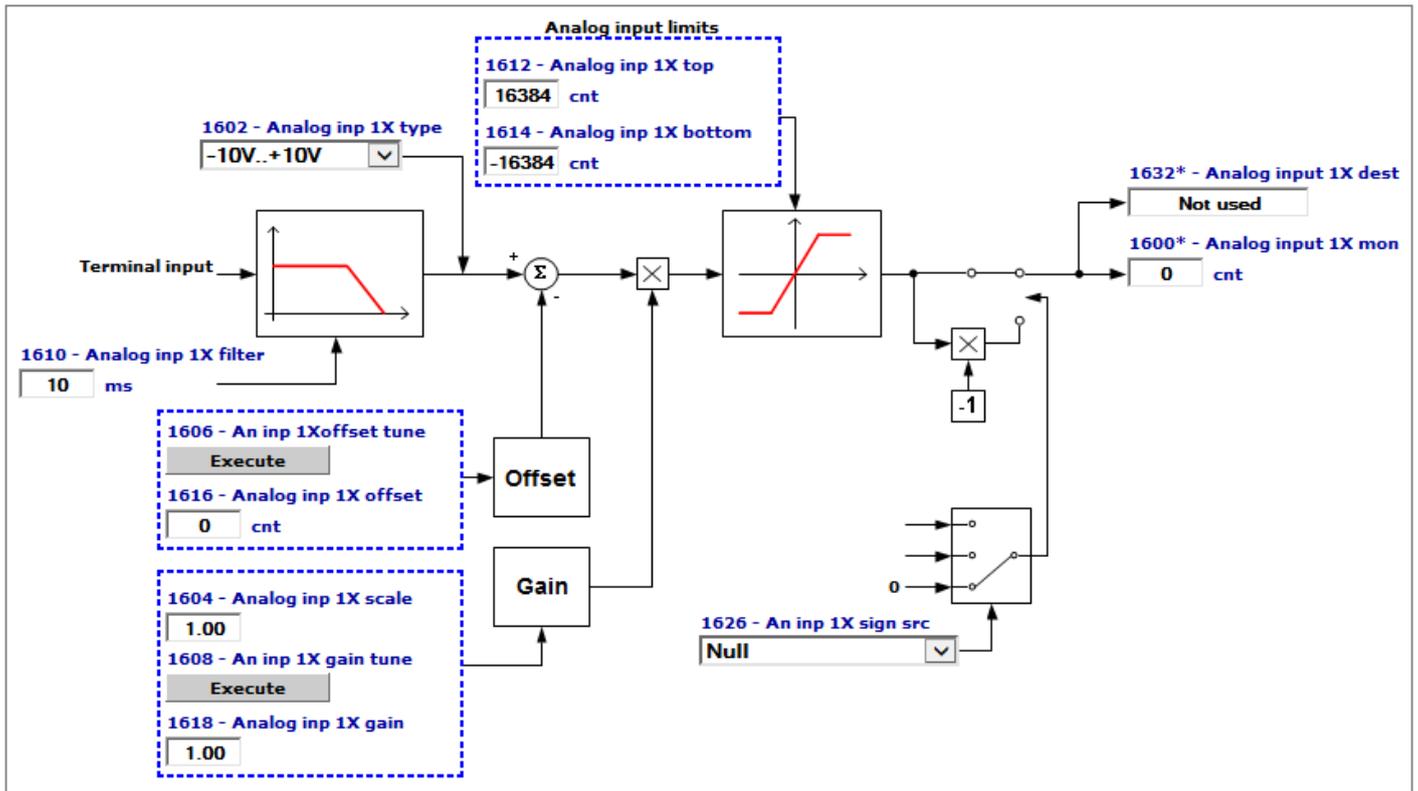
## Expansion card digital inputs (DigImpExp)



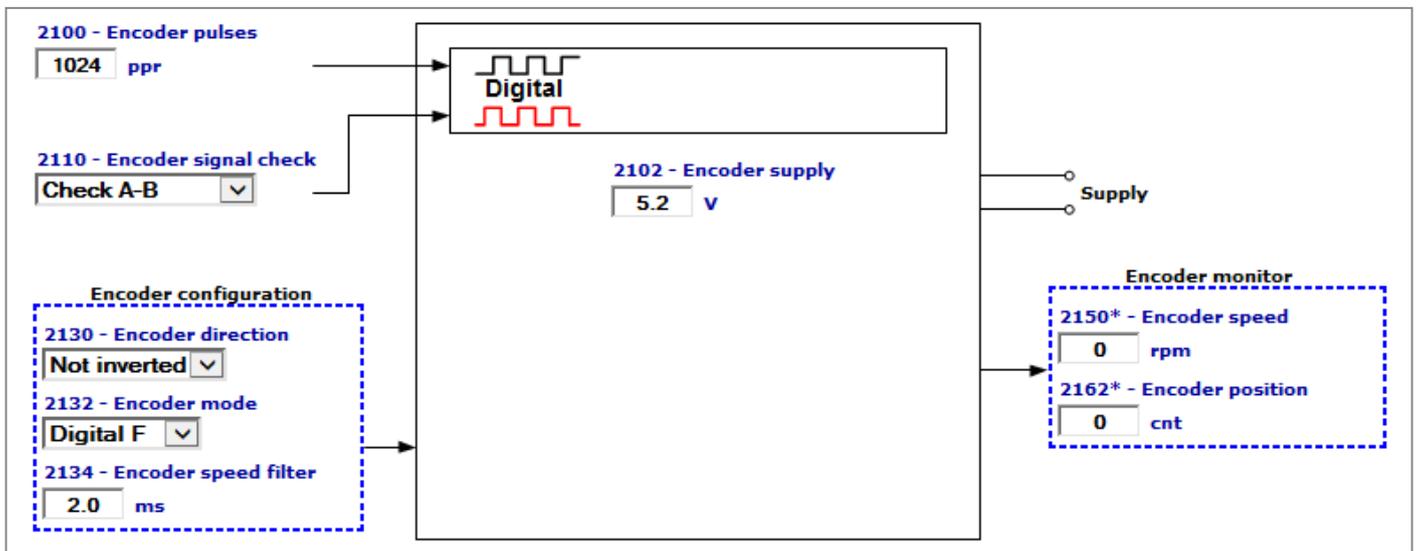
## Expansion card digital outputs (DigOutExp)



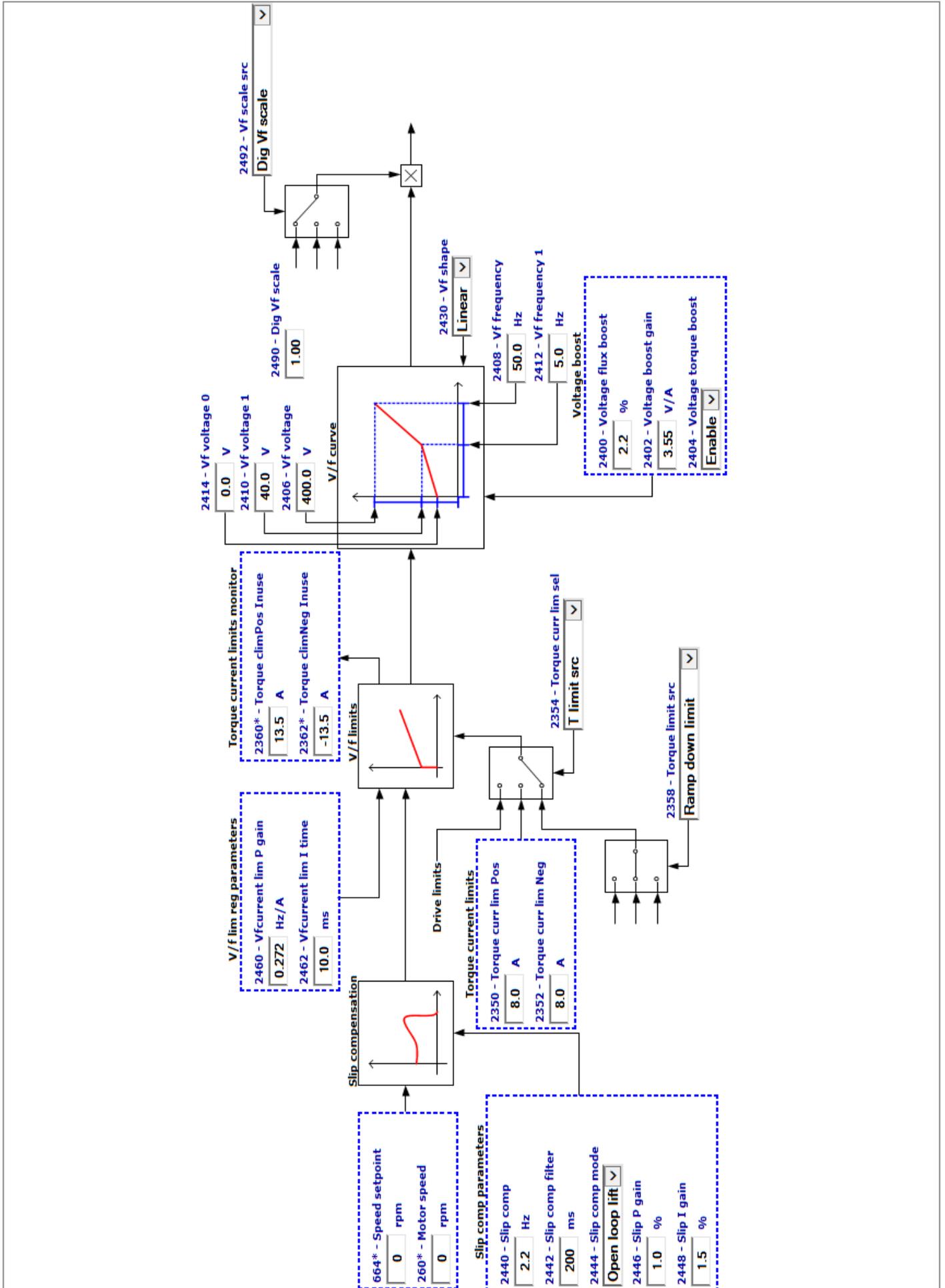
## Analog inputs



## Encoder config

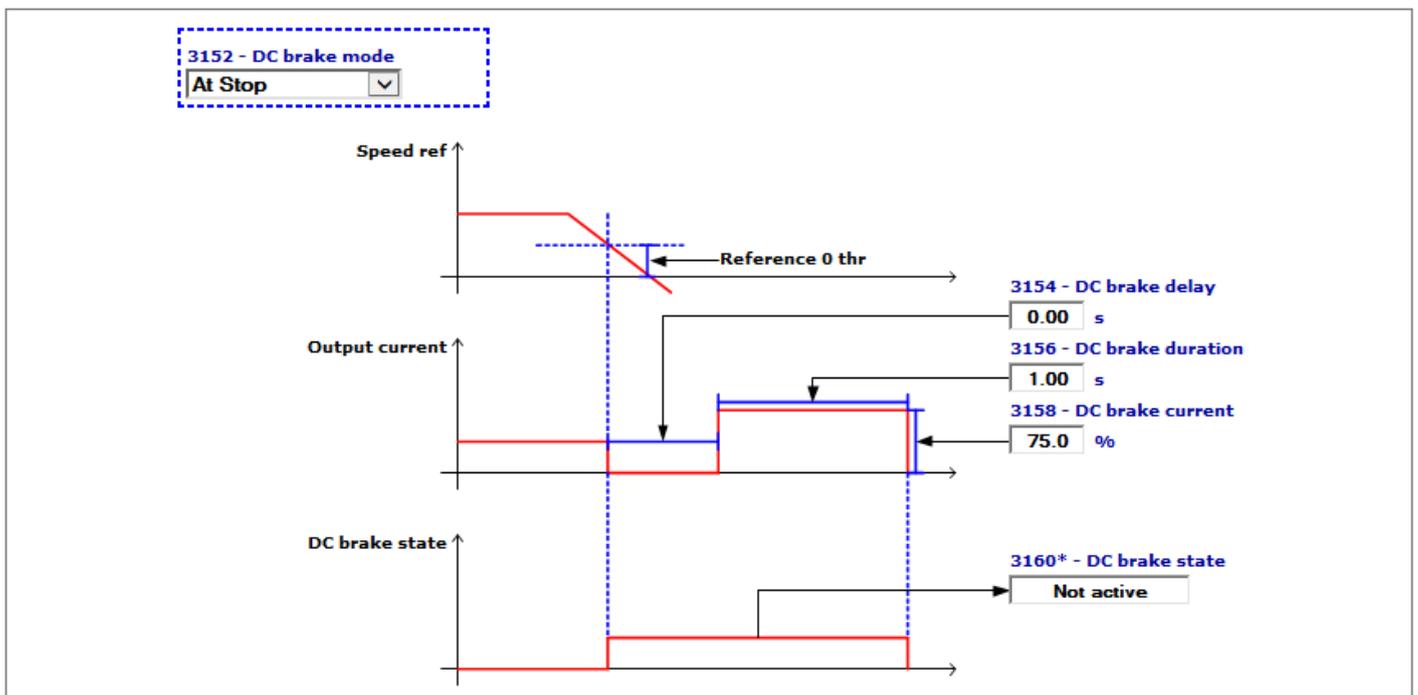
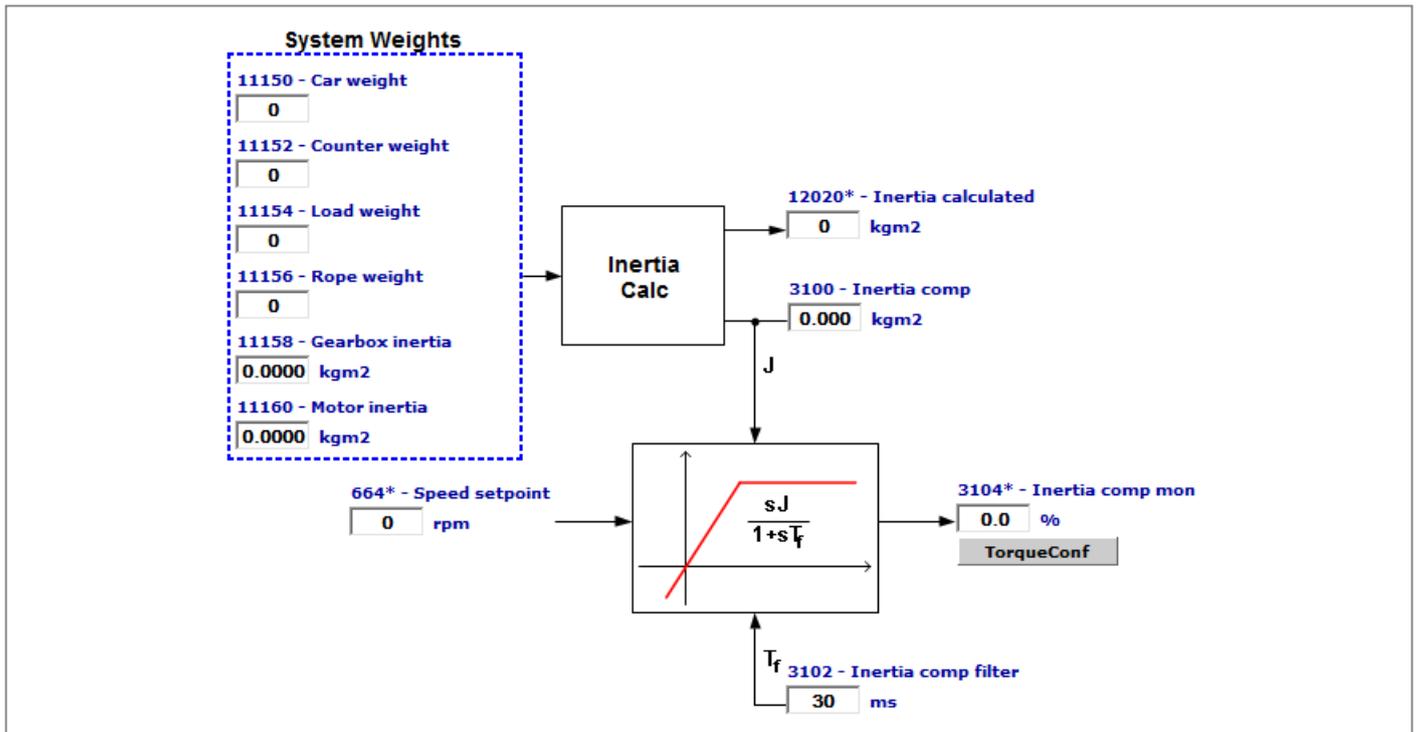


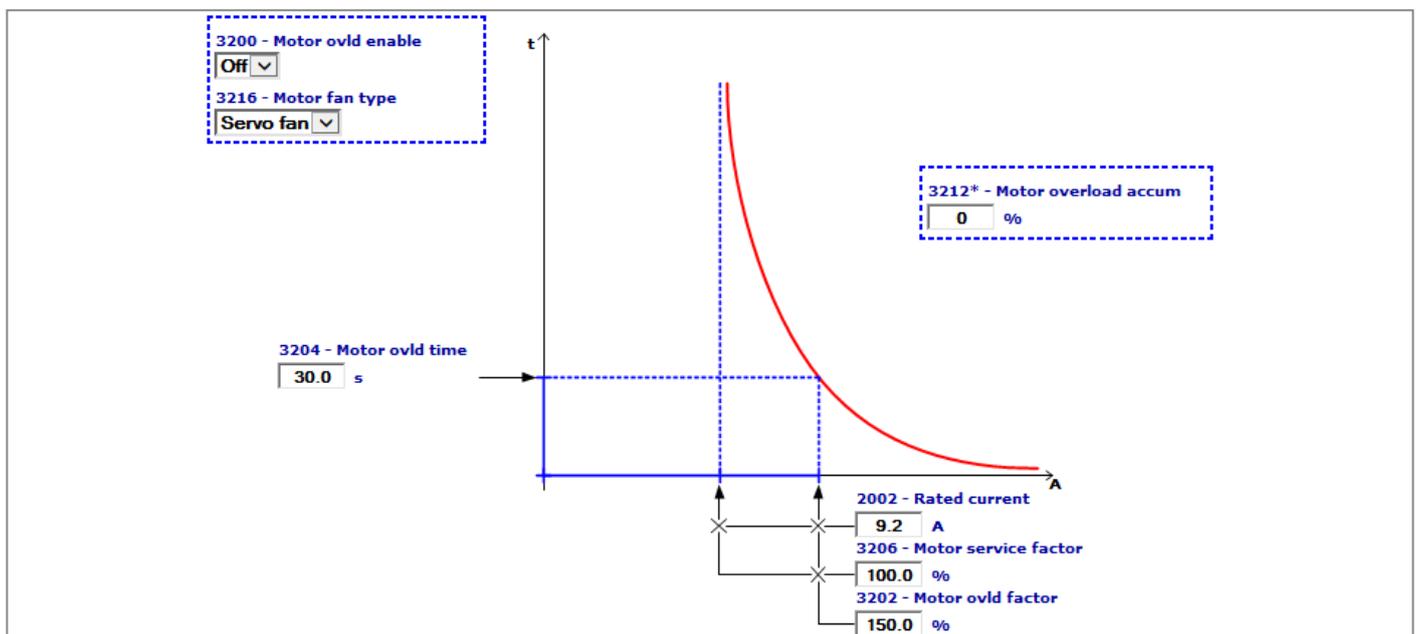
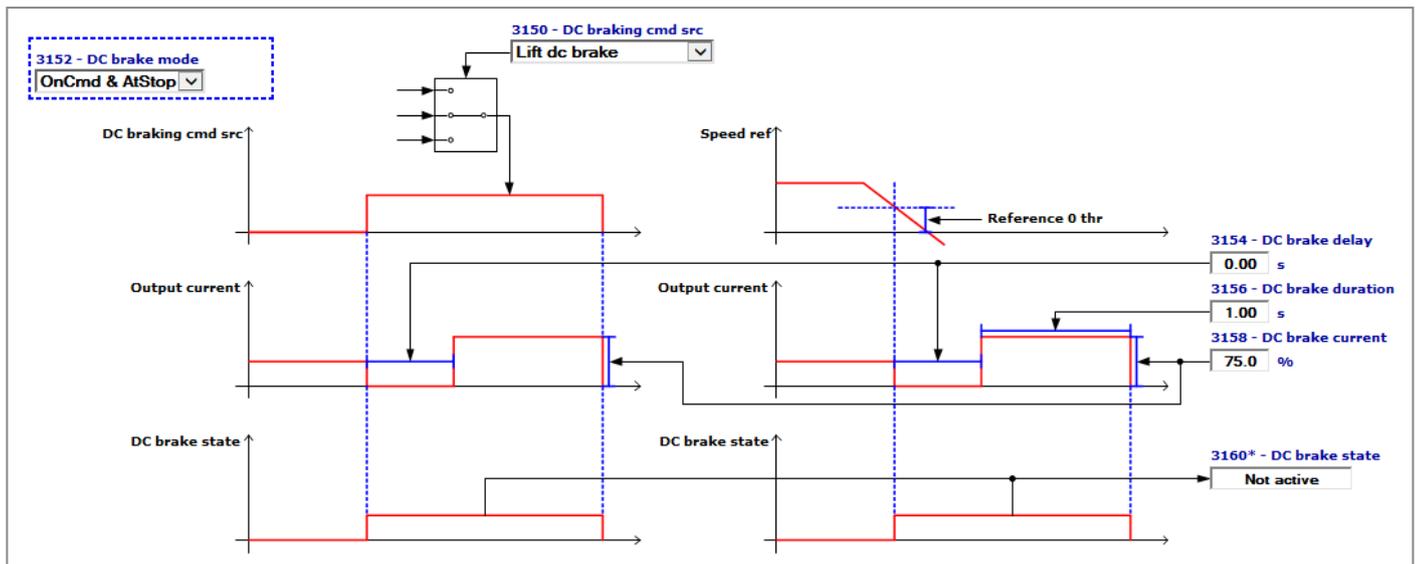
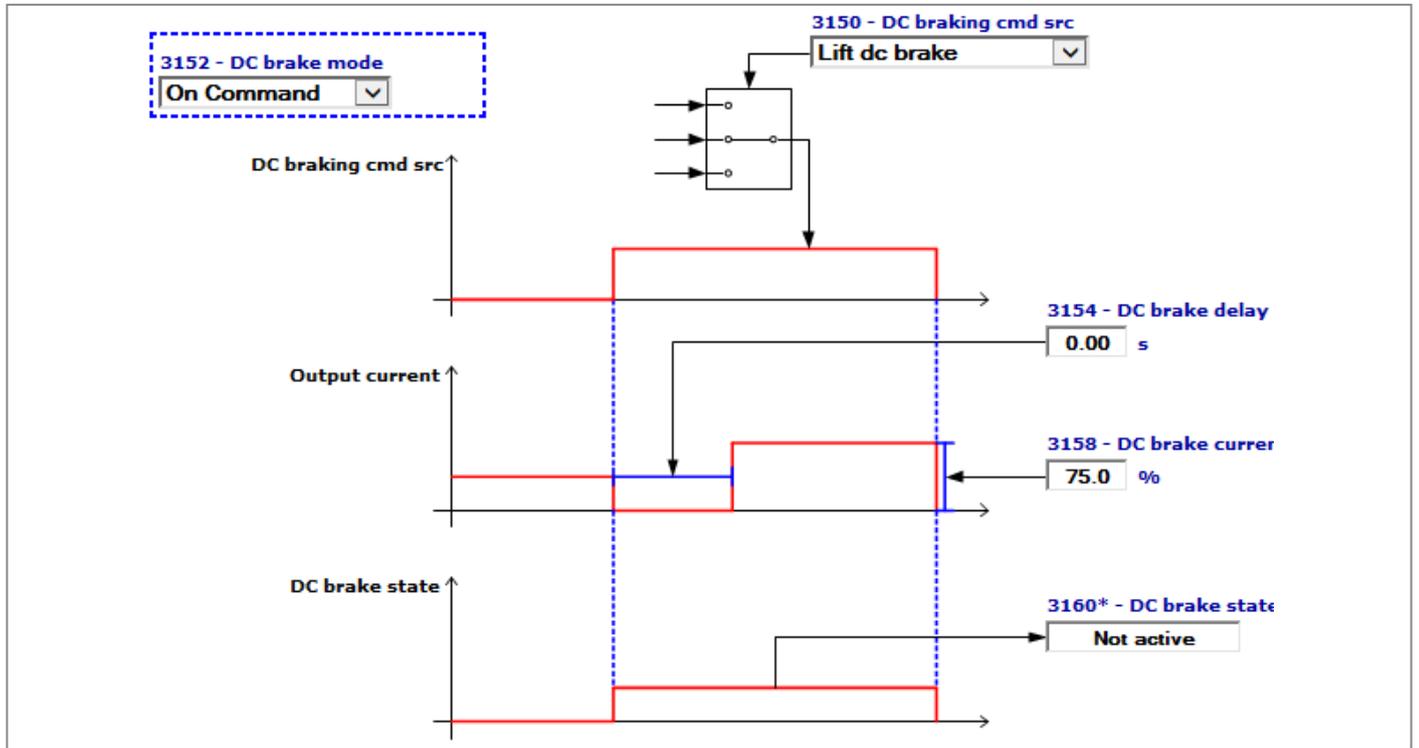
# SLS control (ControlVf)

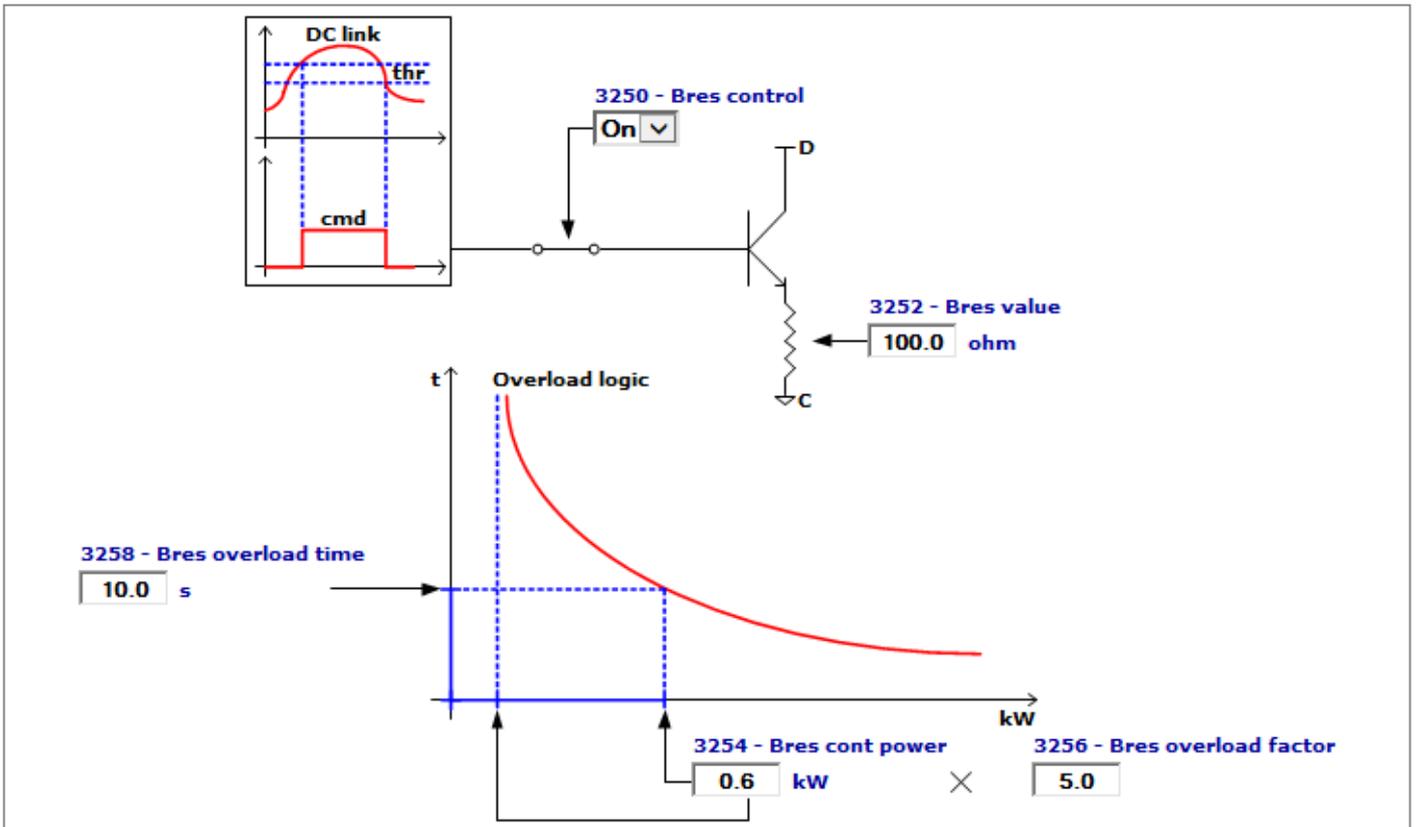
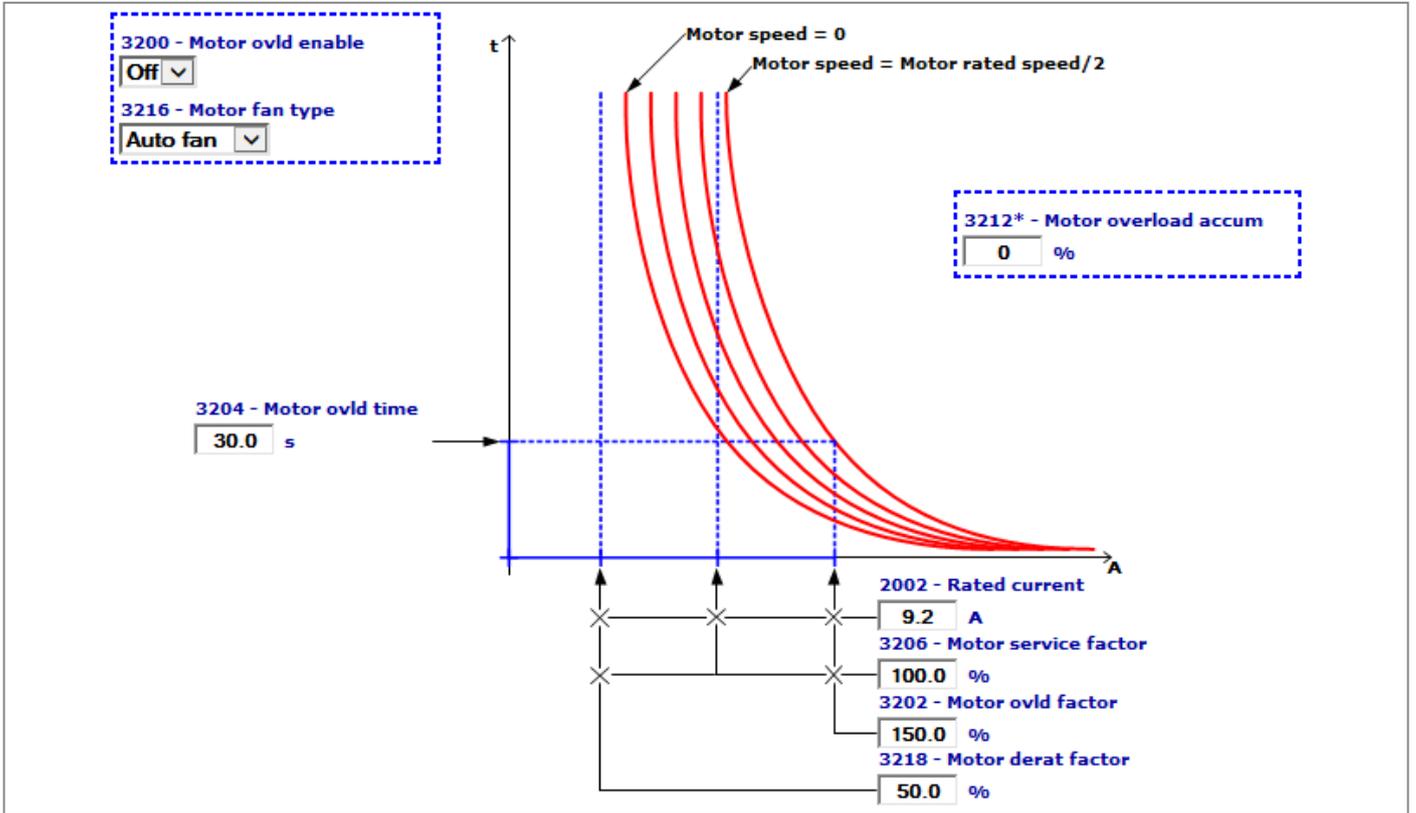


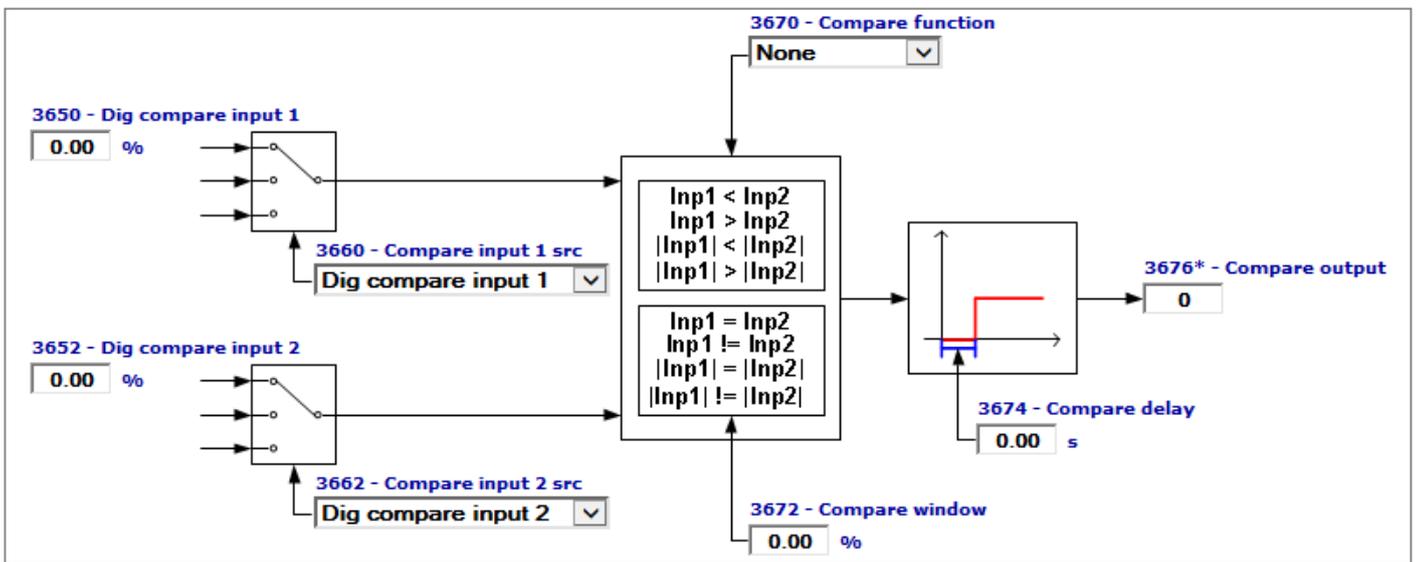
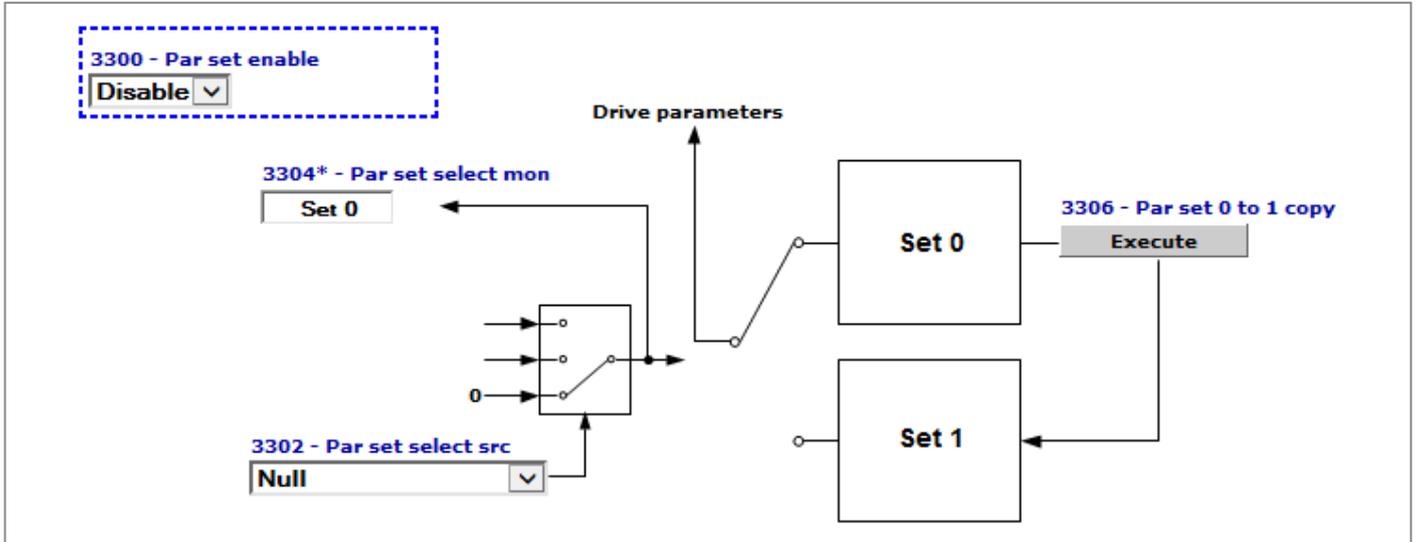
# Functions

INERTIA COMP	InertiaComp
DC BRAKING	DCBraking
MOTOR OVERLOAD	MotOvld
BRES OVERLOAD	BresOvld
DOUBLE PAR SET	DoubleParSet
COMPARE	Compare

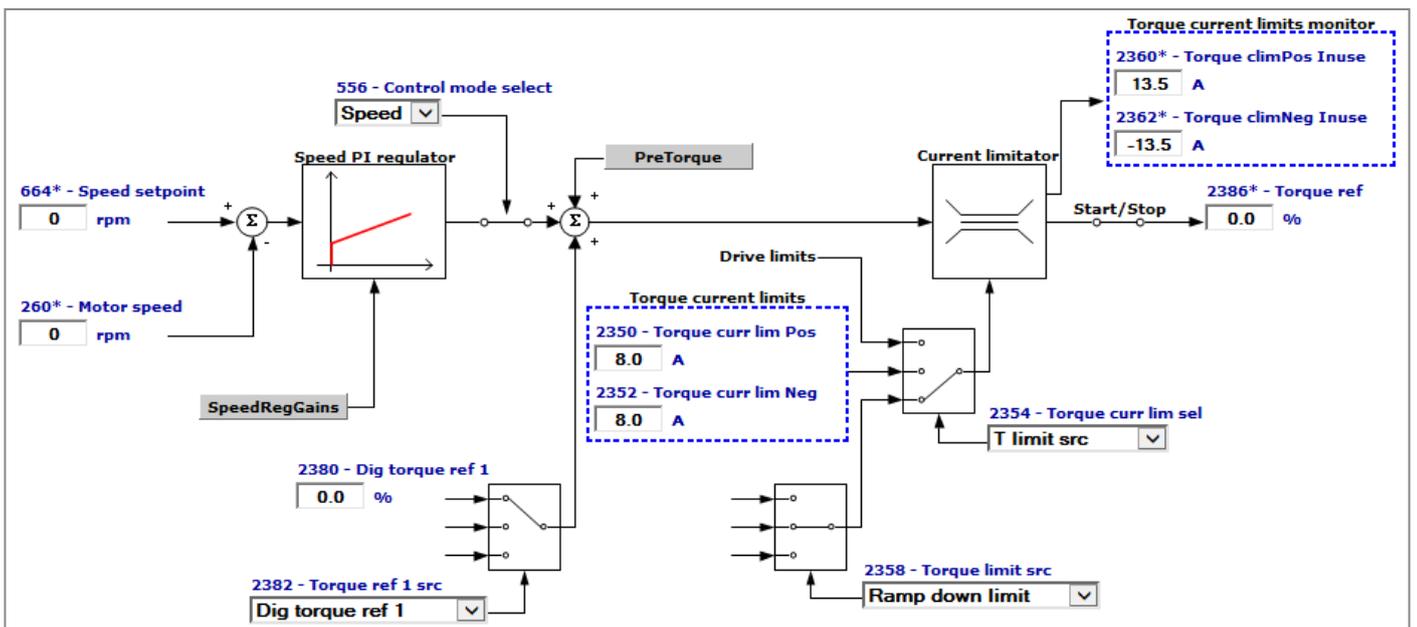




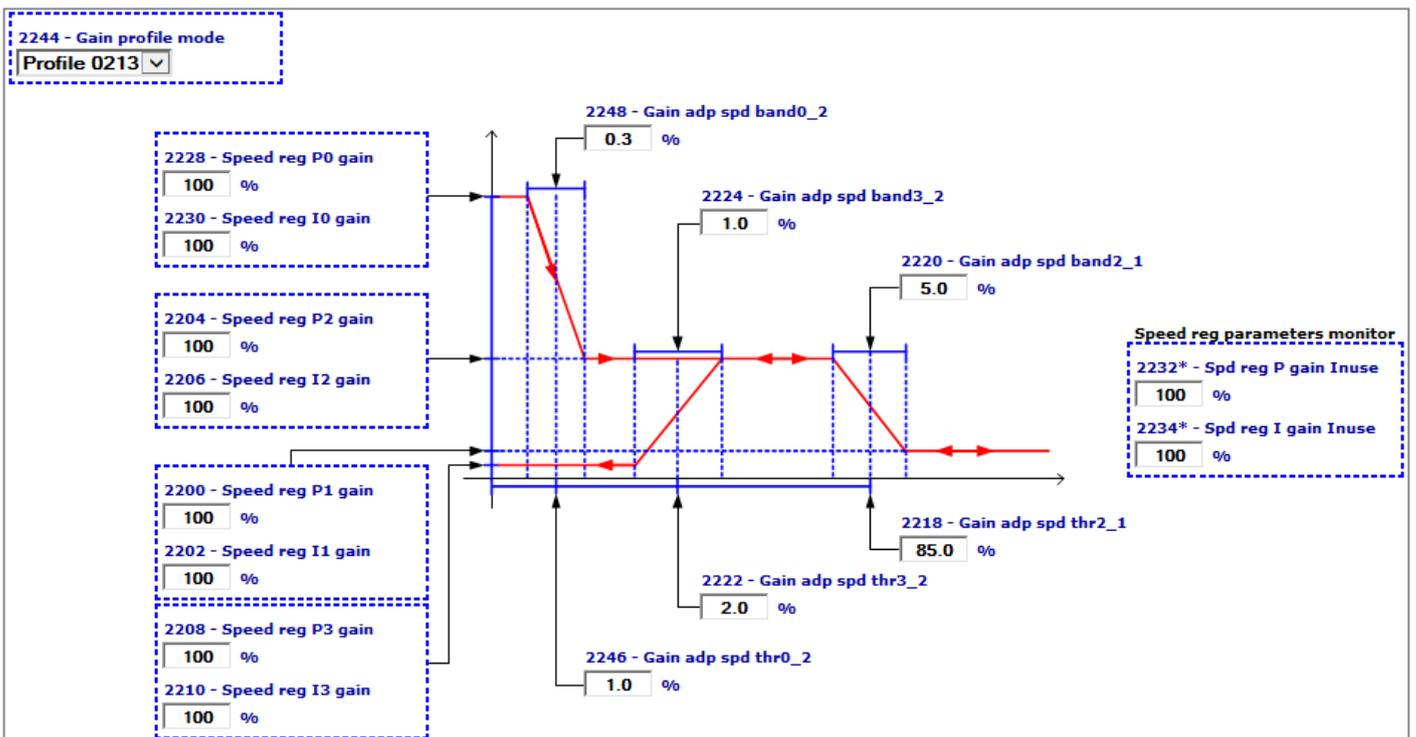
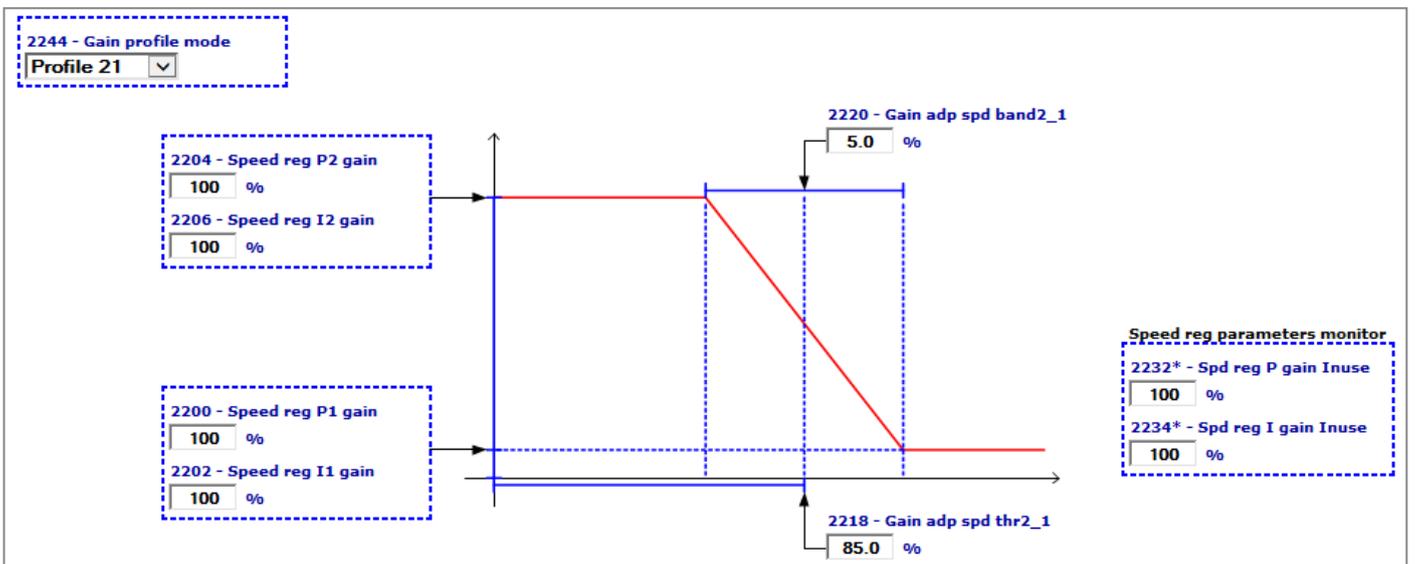
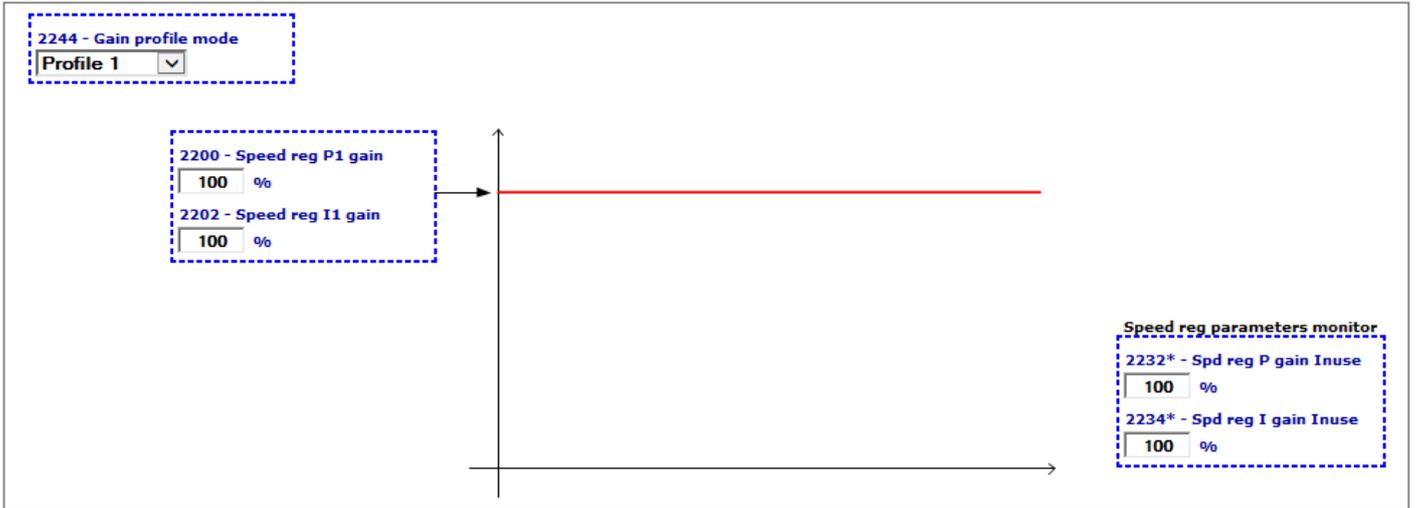


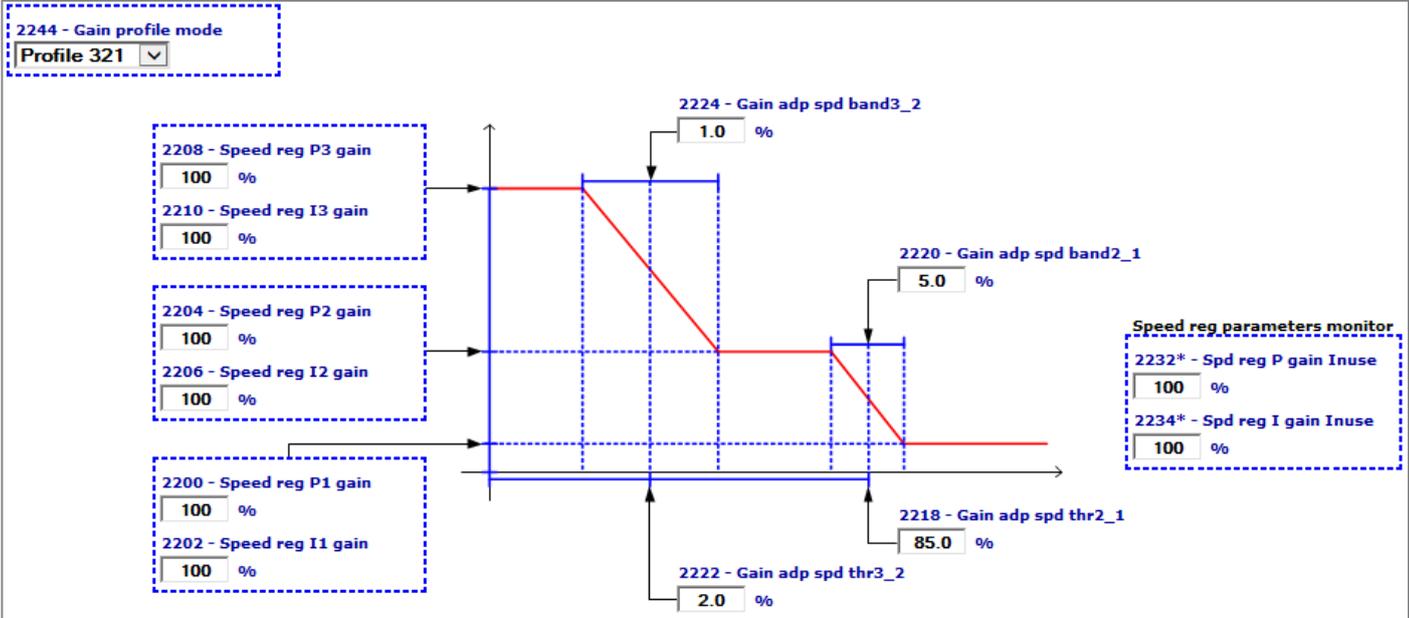


## Torque control (TorqueCtrl)



## Gains adaptive (GainAdapt)





**ASY FP + Functions description  
and parameters list**

Series: VDL200

Revision: 0.5

Date: 15-12-2022

Code: 1S9VDFEN

WEG Automation Europe S.r.l.  
Via Giosuè Carducci, 24 21040  
Gerenzano (VA) · Italy

**ASY FP + Functions**  
**description and parameters list**

Series: VDL200

Revision: 0.6

Date: 23/01/2026

Code: 1S9VDFEN

**WEG Automation Europe S.r.l.**

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