Vector inverter for lifts with asynchronous and synchronous motors

ADL500

* Suitable for models ADL530 / ADL550

Description of functions
and parameter list of DS417 application

Language: English

CANopen Lift
(CiA®417)

Information about this manual

This manual contains detailed function information and parameter descriptions.
Information on mechanical installation, safety, electrical connection and quick start-up can be found in the ADL500 HW+QS manual (Hardware and Quick Start Guide).

This manual is available in the Download center of the ADL500 on the WEG website (https://www.weg.net/catalog/weg/IT/en/p/MKT_WDC_GLOBAL_PRODUCT_INVERTER_FOR_ELEVATOR_ADL500).

Note! Within the manual, any information related to the ADL500 series applies to the ADL530 and ADL550 models.

Software version

This manual is updated to:
- software version V 3.0.2
- Lift application, DS417 1.0.0

The firmware version identification number can be read in the data matrix (see section 2.3 of the ADL500 HW+QS manual) or in parameter **Firmware Version** PAR 174 (DRIVE INFO menu).

General informations

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

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

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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 would be glad to receive any possible information which could help us to improve this manual at the e-mail address: techdoc@weg.net

Symbols used in this manual


Warning

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


Caution

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

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


Attention

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

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

Table of contents

A.1 Asynchronous/Synchronous selection

The ADL550 is factory-set to operate in asynchronous motor control mode.
To switch to the synchronous motor control mode, set PAR 540 **Control type** (Menu 04.03 - DRIVE CONFIG).
For information on switching control mode via keypad, reference should be made to the ADL500 HW+QS Guide (see paragraph 8.2.15 Asynchronous/Synchronous selection).

A.2 Menu display modes

The programming menu can be displayed in four modes, which can be selected using the parameter 554 **Access level** (04 - DRIVE CONFIG menu):

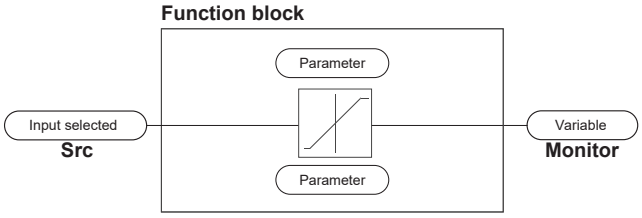
(0) Readonly	The read-only parameters are displayed.
(1) Easy	Only the main parameters required for a basic start up are displayed.
(2) Intermediate	Only the parameters for initial optimization are displayed.
(3) Expert	All parameters are displayed except for the menu and service parameters.
(4) Service	All parameters are displayed. Reserved for service.

A.3 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.: **Fault reset src**, PAR: 4500)
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 (monitor; es.: **Mon ing digitale 1**, PAR: 1210)
The ***variable output to the function block, resulting from the processing carried out in the block itself, is defined by this name***.



A.4 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.

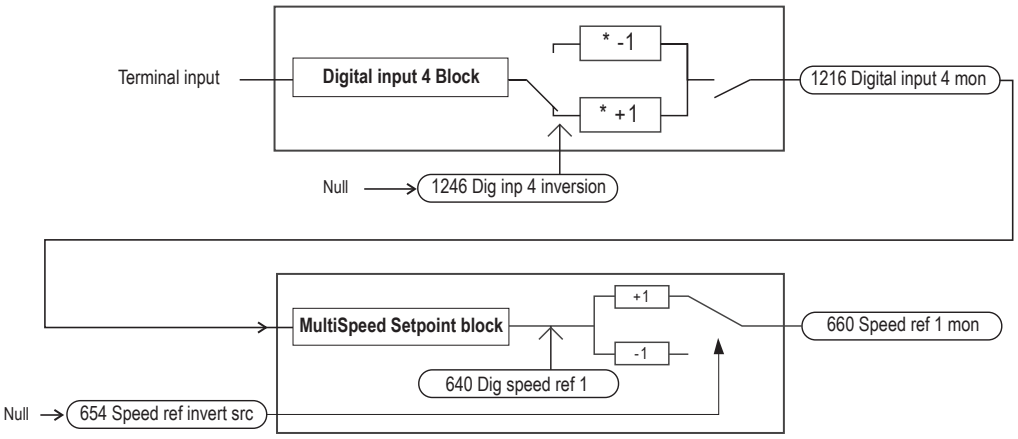
Practical example
The following examples illustrate the philosophies and methods with which more or less complex operations are performed in the single “function blocks”, the results of which represent the output of the block.

• *Example: changing the digital outputs source*

The main drive reference (in the default configuration) **Speed ref 1 mon** (PAR 660) is generated by the output of the function block "**Multispeed selector**". Its default source is the multispeed 1, **Dig input 4 mon** signal (PAR 1216), profrom the output of the function block "**Digital Input 4 Block**", which in this case refers to digital inout 4 of the signal terminal strip.

• *Example: Inverting the digital input signal "Start fwd cmd src"*

To invert the "**Start fwd cmd src**" digital input signal the value of the parameter **Dig inp 4 inversion** (PAR 1246), 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 **Dig inp 4 inversion** (PAR 1246), **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 parameter **Speed ref invert src** (PAR: 654) can be used to select the source for the command to reverse the "**Multispeed selector**" function block output.
The output signal from the "**Speed setpoint**" block is displayed in the parameter **Speed ref 1 mon** (PAR 660).

B - CANopen and CIA417 functionality

This chapter describes the information required to configure the ADL500 series drive from both a hardware and software perspective, so that it can operate in a lift system whose communication between the various control devices is via a CANopen Lift network, i.e. based on the DS417 profile.

Note! The ADL530 or ADL550 version is required to use the CANopen lift.

B.1 Reference standanrds

The application conforms to the CANopen® Cia 417® specification "*Application profile for lift control systems*". Version V 3.x.2, consisting of the 4 parts:

- Part 1: General definitions
- Part 2 Virtual device functionality
- Part 3 Specifications of predefined PDOs
- Part 4 Specification of Application Objects

As an affiliated company (Vendor-ID 00000564) of CAN in Automation (CiA), WEG is constantly updated on new and revised specifications.

B.2 A standard communication protocol

Civil lift systems use a complex system of operating logic and devices. To achieve the required quality and safety levels, all devices must be able to communicate by exchanging information and commands.

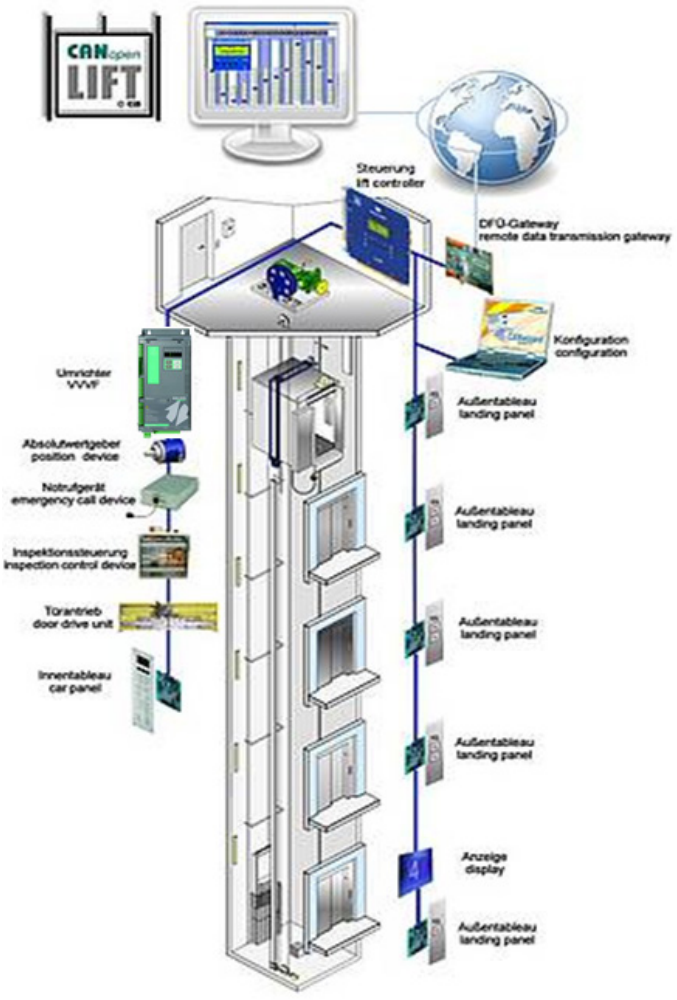


Figure 1: Main Lift Control Systems

Communication must be efficient and based on a Bus architecture. CANopen® Cia 417® profile is a standard communication protocol based on a Bus architecture derived from industrial CANopen version, which allows communication via a shared language among the various control devices in the lift system.

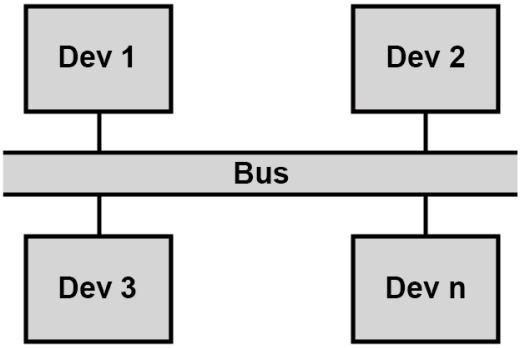


Figure 2: BUS Architecture

Focusing on the part of the system composed of Control Card, Drive and Electric Motor, the Bus architecture can be represented as follows:

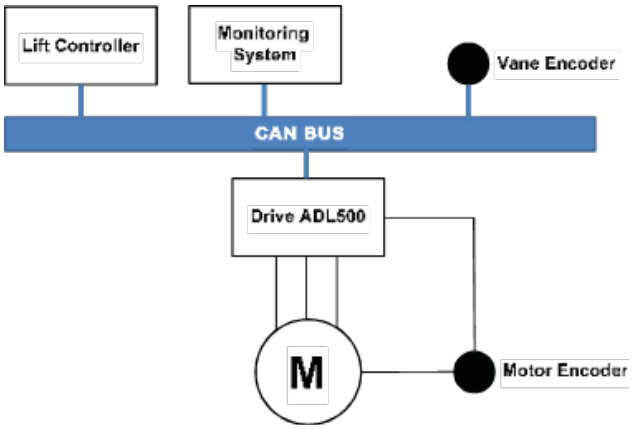


Figure 3: System architecture

B.3 Drive Menu Sharing

The Bus architecture allows direct communication among all devices that are connected to it. The Drive implements the Menu Sharing function, which displays the drive menu on the Lift Controller. Therefore, the drive can also be configured from the Lift Controller and, in general, from any device on the bus that supports reception of information via AO 6404hex (Modes of Operation Display) / RPDO 260.

Figure 4: Optional and standard display (Left) and Lift Controller display (Right)

In Figure 4, the drive menu is shown on the optional Drive keypad and on the Lift Controller display.
At the communication level, see the figure below.

B.4 Functional logic

In a Lift system, the various functions (such as call control, light control, door opening control, overload control, motor control, etc.) are performed by dedicated control devices. In the DS417 profile, the control devices perform these functions by using applications called Application Objects (AO) installed in the device itself. In the lift system, the Application Objects communicate with each other via DS417 with the “homonymous” Application Objects in other devices. These applications are basically data interchange tables.

Communication takes place via PDOs (Process Data Objects), which can be in Reception (RPDO) as well as in transmission (TPDO), in which the specific application object is mapped.

Focusing on the ADL500 drive, the CANopen® Cia 417® protocol defines the ADL500 as the virtual car drive.

This virtual car drive moves the car up and down. The virtual car drive receives the movement commands from the virtual car controller. The virtual car drive is based on the CANopen profile realised for drives and motion controllers in general (see IEC61800-7-201 and IEC61800-7-301). Some specific objects are required for the lift application, which are not covered in IEC61800-7-201.

If no absolute encoder is supported then the drive must be given the speed reference (see object 6430h) using the speed operating mode (see object 6403h).
If an absolute encoder is available then the position reference (see object 6420h) can be indicated to the drive using the position operating mode (see object 6403h).
The objects defined by the two profiles are stored in the drive and can be configured by the controller. For safety reasons, configuration is not possible when the drive is in the Enable operating mode.
The drive states (normal, inspection and return to floor in emergency) are controlled by the control word (see object 6400h).

Drive-specific functions, such as the activation of the motor relays, are controlled locally in the drive. The sending of drive commands via the control word determines the movement of the motor. The sign of the target speed indicates the direction; positive values indicate upward movement of the car. The direction of rotation depends on how the system is mounted.

Depending on the given target speed and the parameters of the speed profile curve, the drive independently controls the motor speed shown in object 6406h. Upon reaching the target plane, the controller will send the final speed (see object 6420h) to the drive as the new target speed. Sending a target speed equal to 0 causes the drive to stop.
The drive will indicate that the target speed has been reached in the 10th bit of the statusword (see object 6401h).

In the case of position drives, the Profile Position Mode must be used. The same parameters as for the speed profile curve are used to configure the profile curve. After setting the new position, the drive calculates the curve and starts movement. While the drive is in motion, the controller can change the target position; usually the controller sends the new target position of the next floor to each floor and when it reaches the target floor it does not renew it any more. If the drive is able to stop at the new target position, this will be indicated in the 12th bit of the statusword. If the drive is unable to stop at the new requested target position, the drive will continue to move to the previous target position. The achievement of the target position will be indicated in the 10th bit of the statusword.

All this information is exchanged with the control system via RPDOs if receiving or TPDOs if transmitting.

This communication takes place continuously at 1ms intervals.
Each application object is then “mapped” in the PDOs (RPDOs or PDOs).

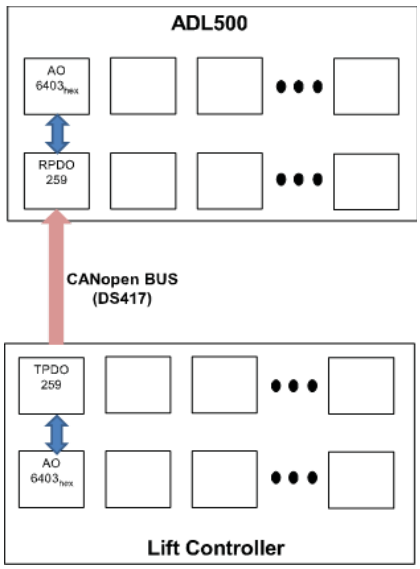


Figure 5: Block diagram for ADL500 - Lift Controller communication

The Lift Controller “commands” the control mode to the drive via AO 6403_{hex}. To do this, the Lift Controller maps the AO in Transmission TPDO 259 and then sends the command to the drive via the Bus. The drive receives the command on the “homonymous” RPDO 259 and sends it to the “homonymous” AO. The drive has now received the command to work in position or in speed because it has been configured by the Lift Controller.

The same Application Objects and related PDOs must be present on the Lift Controller and on the drive for communication to take place.

B.5 Control mode

B.5.1 Speed control

The Lift Controller configures speed control via AO 6403_{hex}. Speed control can be in open loop (no motor encoder) or in closed loop (with encoder on the motor).

Warning

For safety reasons, configuration is not possible when the Drive is in Enable status.

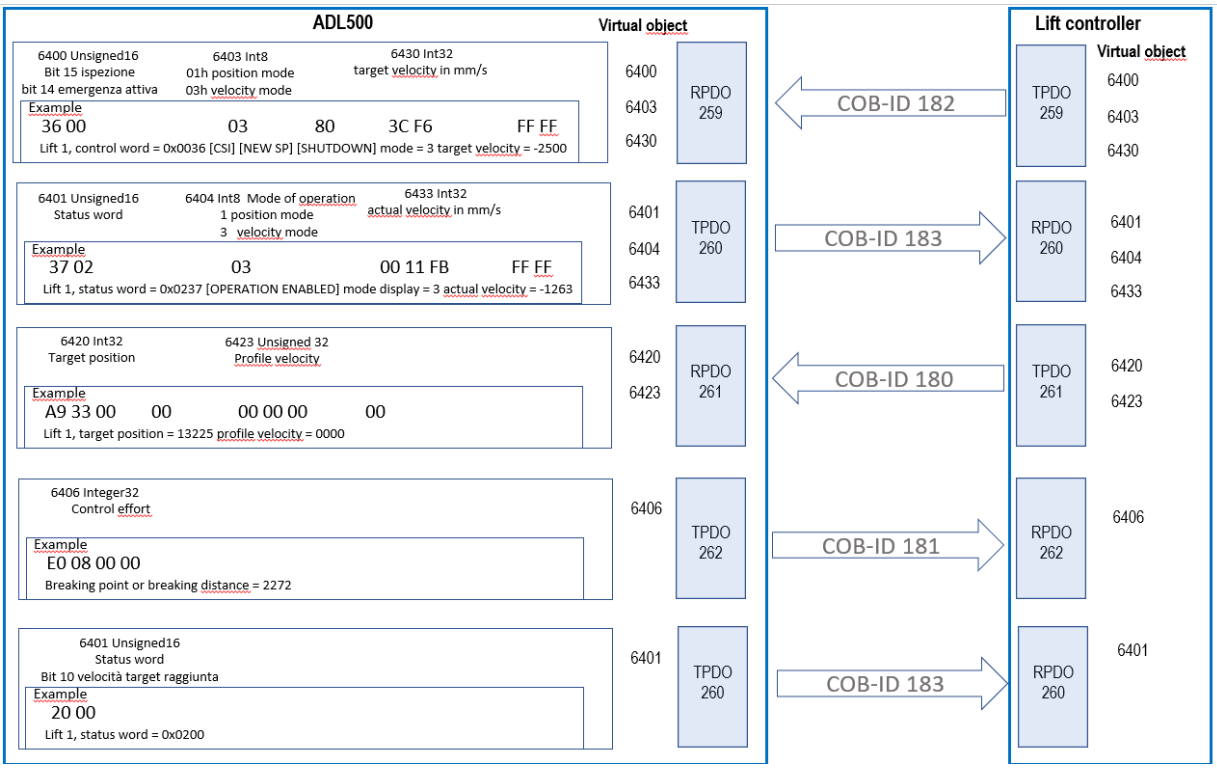


Figure 6: Exchange messages between Drive and Lift Controller for speed control

By appropriately configuring the Lift Controller, direct arrival with speed control is possible by using the sequences described above.

B.5.2 Position control

The Lift Controller configures position control via AO 6403_{hex}. Position control can be **only in closed loop** (with encoder on the motor).

The Lift Controller communicates to the drive the AO 6420_{hex} (Target Position) and the maximum speed that AO 6423_{hex} can reach (Profile Velocity).

Based on the AO 6420_{hex} target position and on the position communicated by the AO 6406_{hex} (Effort Control) drive, the Lift Controller calculates the deceleration point for reaching the destination floor. When the destination floor is reached, the Lift Controller communicates to drive to stop the car. In turn, the drive communicates to the Lift Controller that it has reached the target position via status word AO 6401_{hex}.

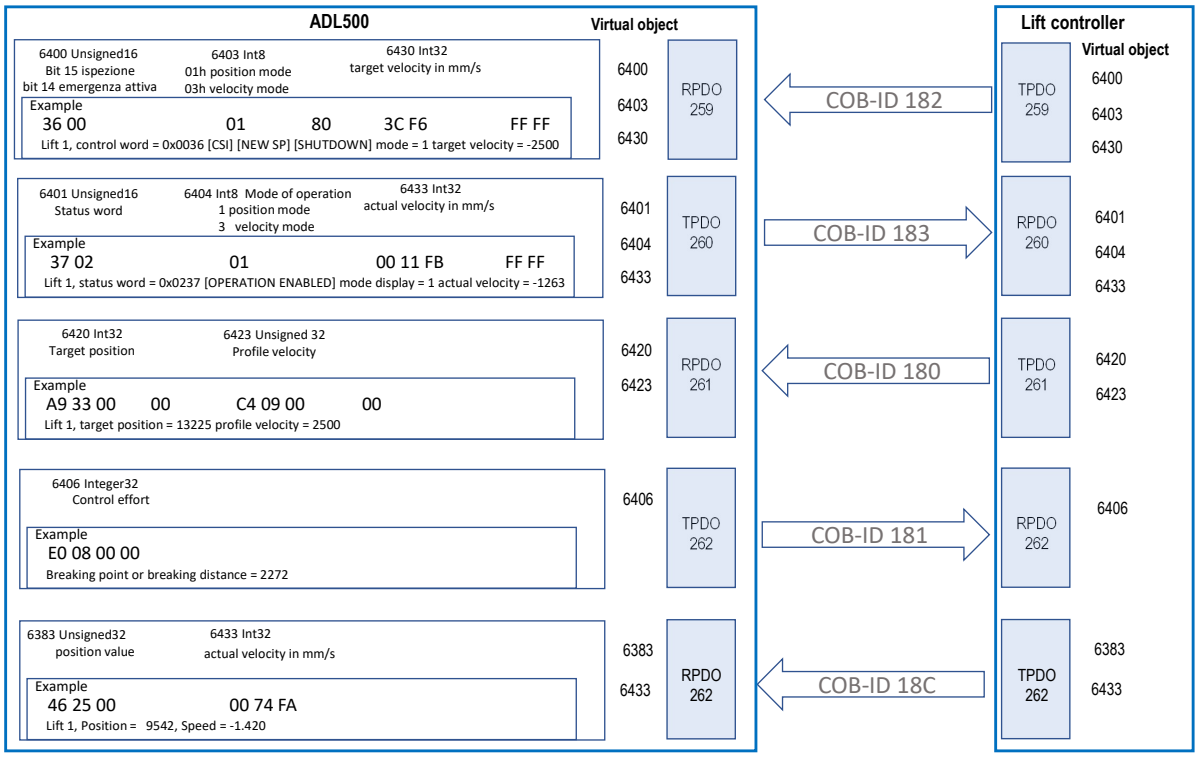
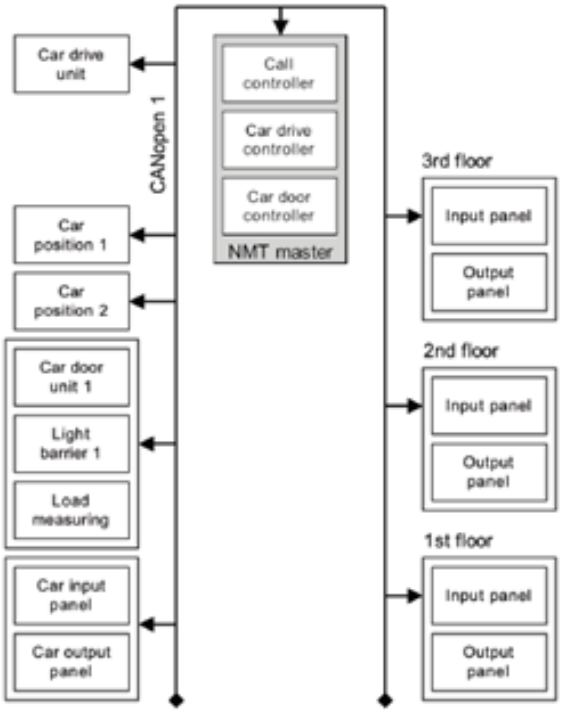


Figure 7: Exchange messages between drive and Lift Controller for position control.

B.6 Supported Architectures

The DS417 profile requires the drive to manage a single car with a single CAN bus. The supported architecture is shown below:



Single network architecture for a single-shaft lift control system

Figure 8: CAN bus architecture with single car.

Both speed and position control are available for the above architectures. In general, architectures requiring a single CAN bus are possible. The current version of ADL500 does not support architectures requiring more than one CAN bus.

B.7 Application Objects and Process Data Objects managed

B.7.1 Process Data Objects

The current version provides the following PDOs supported by the drive:

PDO no.	COB-ID	OBj (hex)	Type
RPDO 259	182	6400 00 6403 00 6430 00	Car Drive Unit
RPDO 261	180	6420 00 6423 00	Car Drive Unit
RPDO 263	18C	6383 01	Car Drive Unit
RPDO 2	501-527	MPDO	Generic
TPDO 260	183	6401 00 6404 00 6433 00	Car Drive Unit
TPDO 262	181	6406 00	Car Drive Unit
TPDO 2	502	MPDO	Generic

B.7.2 Application Objects

The current version provides the following Application Objects supported by the drive:

Index (hex)	Sub-Index (hex)	Name	Access
6383		Position value	rw
6400		Controlword	rw
6401		Statusword	ro
6403		Modes of operation	rw
6404		Modes of operation display	ro
6406		Control effort	ro
641F		Position Conversion	rw
	01	Number of position units	
	02	Total Lenght in Millimeter	
6420 (*)		Target position	rw
6422 (*)		Software position limit	rw
	01	Min position limit	
	02	Max position limit	
6423 (*)		Profile velocity	rw
6430 (**)		Target velocity	rw
6433 (**)		Velocity actual value	ro
600A	1	Virtual Terminal Input	rw
	2	Virtual Terminal Output	ro

(*): Profile Position / (**): Profile Velocity

A) Application Object: 6400h - Control word

This object is based on object 6040h of IEC61800-7-201.
The structure of the object is as follows:

15	14	13 11	10	9	8	7	6 4	3	2	1	0
insp	Rcl	ms	r	oms	h	fr	oms	so	qs	ev	so
MSB											LSB

Insp:
- 1d Car top inspection mode active
- 0d Car top inspection mode inactive

Rcl:
- 1d Emergency recall operation mode active
- 0d Emergency recall operation mode inactive

ms: Manufacturer specific
r: Reserved
oms: Operation mode specific
h: Halt
fr: Fault reset
eo: Enable operation
qs: Quick stop
ev: Enable voltage
so: Switch on

B) Application Object: 6403h - Modes of operation

This object is equivalent to object 60FF0h of IEC61800-7-201. The format is integer8.
The structure of the object is as follows:

8		0
mo		
MSB		LSB

mo:
- 01h Profile position mode
- 03h Profile velocity mode

C) Application Object: 6430h - Target velocity

Questo oggetto si basa sull'oggetto 60FFh della IEC61800-7-201. Il valore intero 32bit è dato in multipli di mm/s.
La struttura dell'oggetto è la seguente:

32		0
Target velocity		
MSB		LSB

D) Application object 6401h Status word

This object is based on object 6041h of IEC61800-7-201. The value is an unsigned16.
The structure of the object is as follows:

15	14	13 12	11	10	9	8	7	6	5	4	3	2	1	0
ms		oms	ila	tr	rm	ms	w	sod	qs	ve	f	oe	so	rtso
MSB														LSB

ms: Manufacturer specific

oms: Operation mode specific

ila: Internal limit active. If this bit=1 then an internal limit has been reached (e.g. reaching a permissible limit of a value). Internal limits are manufacturer-specific.

tr: Target reached. If the value = 1, this indicates that the device has reached the set point. This bit may be set to 1 even if the operation mode has been changed. If the quick stop has code 5,6,7, or 8 this bit must be set to 1 when the quick stop operation terminates and the device is stopped. This bit is also set to 1 if an alt occurs.

rm: Remote. A value = 1 indicates that the control word has been processed. If = 0 then the control word has been processed and the device can accept a COBs reporting new parameters.

w: Warning. Indicates that there is a warning whose identification code can be found in the parameter object 603Fh.

sod: Switch on disabled

qs: Quick stop

ve: Voltage enabled. If = 1, this indicates that a high voltage has been applied to the device.

f: Fault

oe: Operation enabled

so: Switched on

rtso: Ready to switch on

E) Application Object: 6404h - Modes of operation

This object is equivalent to object 6061h of IEC61800-7-201. The format is integer8.
The structure of the object is as follows:

8		0
mo		
MSB		LSB

mo:
- 01h Profile position mode
- 03h Profile velocity mode

F) Application Object: 6430h - Actual velocity

This object is based on the 606Ch object of IEC61800-7-201. The 32bit integer value is given in multiples of mm/s.
The structure of the object is as follows:

32		0
Actual velocity		
MSB		LSB

G) Application Object: 6420h - Target position

This object is based on object 607Ah of IEC61800-7-201. The 32bit integer value.
This value indicates the position to which the drive should move in position mode using the current set of control variables such as speed, profile acceleration, etc. The value of this object must be interpreted as absolute or relative depending on how the ‘abs/rel’ frag in the control word is set.
The structure of the object is as follows:

32		0
Target velocity		
MSB		LSB

H) Application Object: 6423h - Profile velocity

This object is based on object 6081h of IEC61800-7-201. The unsigned32 value is given in multiples of mm/s.
The structure of the object is as follows:

32		0
Profile velocity		
MSB		LSB

I) Application Object: 6406h - Control effort

This 32bit integer type object contains the breaking point or breaking distance depending on whether the target position is given in absolute or relative value respectively. The value is given in position units that are defined by the user.
The structure of the object is as follows:

32		0
Control effort		
MSB		LSB

J) Application Object: 6383h - Position value

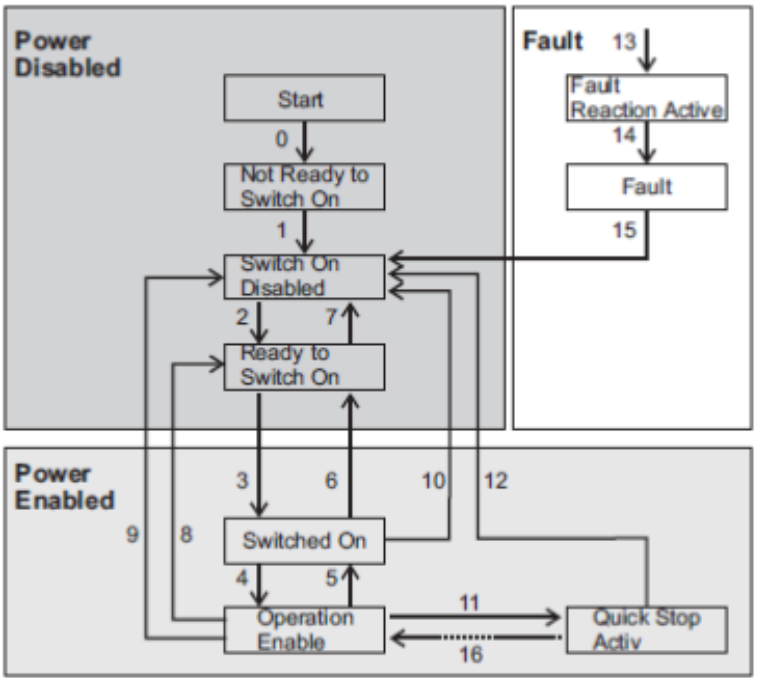
This object contains the position value measured by the car positioning device. The value is a 32bit integer type.
The sub-indexes 01h to 04h are equivalent to those of object 6004h of CiA406.
The structure of the object is as follows:

32		0
Position value		
MSB		LSB

Position value shows the number of encoder counts.

B.8 State machine

The device works according to the following CiA 417 state machine:



B.9 Drive connection

B.9.1 Interface with Master CAN

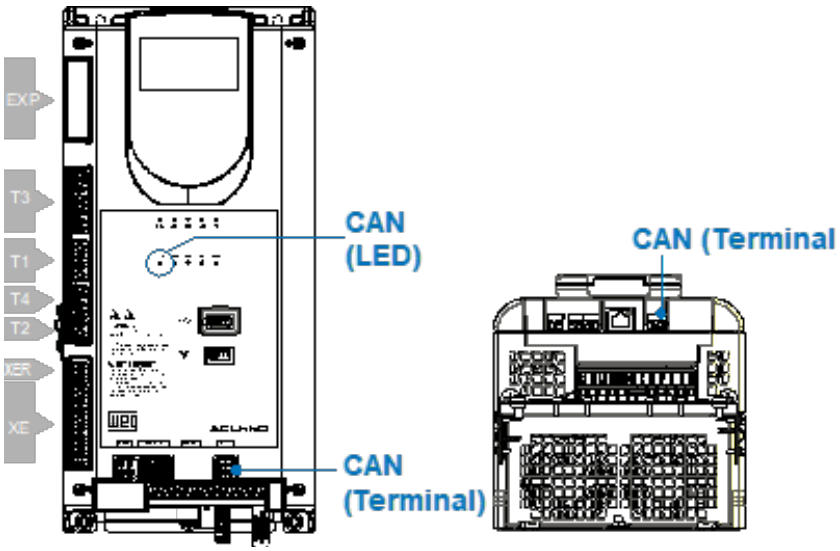


Figure 9: Connector position and CAN LEDs.

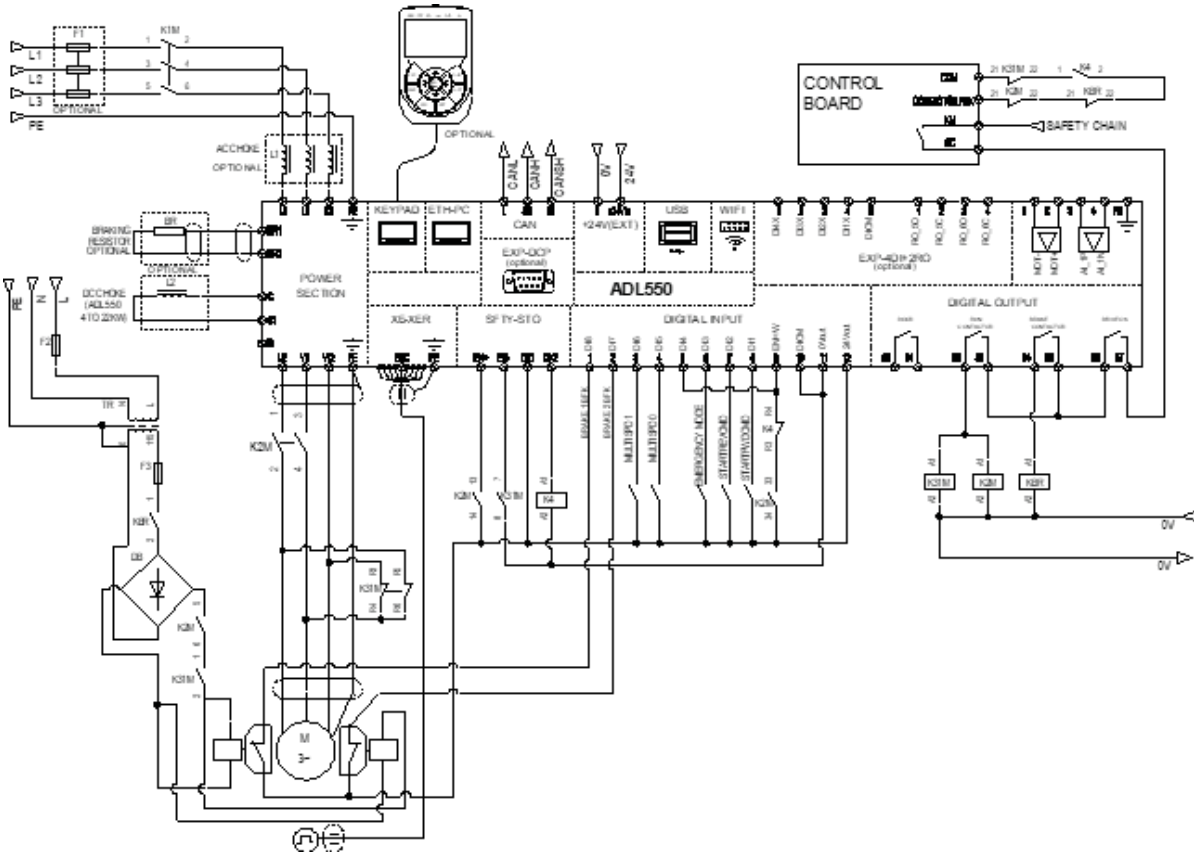


Figure 10: Safety connections for single contactor control.

B.9.2 Wiring

The connection is made on the CAN contactor and does not require a power supply. The interface is functionally isolated (>1kV).

Figure 11: CAN interface.

Terminal	Designation	Function	Cable section
L	CAN_L	CAN_L bus line (low dominant)	0.2 ... 2.5 mm² AWG 26 ... 12
SH	CAN_SHLD	CAN shielding	
H	CAN_H	Linea bus Can_H (dominante alta)	

CAN LED	Meaning
Off	Stop
Flashing (green)	Pre-operative state
On (green)	Operative state

B.9.3 Bus connection

The Bus connection requires a shielded twisted pair (as per the CANopen specification) placed separately from the power cables (minimum distance 20 cm). The cable shielding must be grounded at the two ends. If the cable shieldings are grounded at several points of the system, use unipotential connection cables to reduce the current flow between the Drives and the master CAN bus.

Note! Terminations: the first and last element in the network must have a 120 ohm resistor between pins L and H.

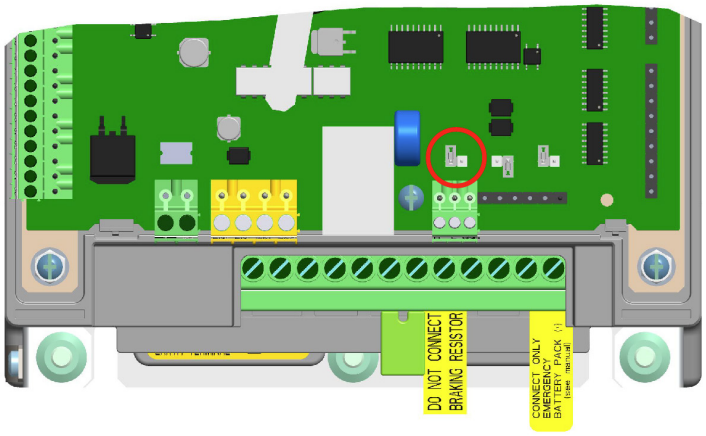


Figura 12: CAN Bus connection.

Maximum cable length is 200 meters (6 meters for peripheral cable sections).

B.9.4 Terminating Resistors

The ADL500 is supplied with an on-board 120Ohm terminating resistor. This termination resistor can be inserted into the circuit via a physical jumper that can be reached by removing the drive cover, or it can be inserted into the circuit via an electronically activated switch using the **PAR 4008 CAN termin. resistor** in the Configuration menu.

If the parameter = ON then the termination resistor is inserted, while if the parameter is = OFF the termination resistor remains switched off.

B.9.5 Supported Bit Rates

The CAN BUS speed is 250kbit/s by default. A speed of 125kb/s is also configurable (menu 6.1 - parameter 4004).

B.9.6 Node IDs

The CAN BUS speed is 250Kb/s as default. Speeds 125Kb/s, 500Kb/s and 1Mb/s are also configurable (menu 6.1 - parameter 4004).

C - Parameters and functions description

Legend

❶	❷	❸	❹	❺	❻	❼	❽	❾	❿	⓫
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4 DRIVE											
4.1 DRIVE MONITOR						*(Menu livello 1)*					
4.1.1	**250**	**Output current**	A	FLOAT	16/32BIT	*(Menu livello 2)* 0	0	0	R		ALL
4.4 ALARM CONFIG											
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.1	**4500**	**Fault reset src**		LINK	16BIT	6000	0	16384	RW		FVY

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.

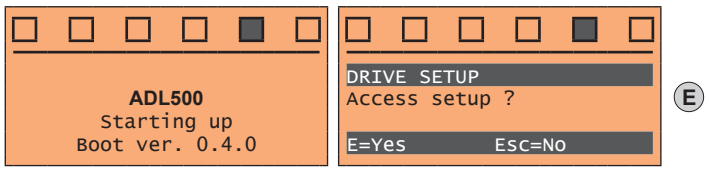
[*]

❶	Indexing of the menu and parameter		
❷	Parameter identifier		
❸	Parameter description		
❹	UM: unit of measure		
❺	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
		STRING16	16 character string
		FBM2SIPA	IPA of the parameter received from the CAN master
		FBF2MIPA	IPA of the parameter sent to the CAN master
❻	Format of data exchanged on Fieldbus		16=16BIT, 32=32BIT, 16/32= 16/32BIT
❼	Default value (1)	CALCF CALCI SIZE	Value calculated as a number with floating point Value calculated as a whole number Value depending on the size of the drive
❽	Minimum value		
❾	Maximum value		
❿	Accessibility	R	Read
		W	Write
		Z	Parameters that can be modified ONLY with the drive disabled
⓫	Level	RO	Read Only
		INT	Intermediate
		EXP	Expert
		SRV	Service
		ESY	Easy
	Visibility	F	Open loop V/f mode control, asynchronous motor (PAR 540 = ASY SSC, Default).
		V	Field oriented vector mode control, asynchronous motor (PAR 540 = ASY FOC).
		Y	Field oriented vector mode control for permanent magnet synchronous motor (PAR 540 = SYN FOC).
[*]	Selection lists: The "Source.../Src..." format parameters are linked to a selection list. The source of the signal that will control the parameter can be selected from the list indicated. The lists are indicated in paragraph D of this manual.		

(1) The default value is usually common for Synchronous and Asynchronous versions. When it is different, the value of the synchronous version is indicated into brackets: e.g.: PAR 11012 Pulley diameter, Def= 0.6 (0.32), 0.6 = default ver. asynchronous, (0.32)= default ver. synchronous.

DRIVE SETUP

The DRIVE SETUP is a procedure that is presented to the user only when the drive is first switched on and allows basic settings to be changed. In the event that you have completed the setup but wish to view it again, it is necessary to run the reset procedure (**Default Parameters**, PAR 580 and **Save Parameters**, PAR 550) then switch the drive off and on again.
All the parameters in the setup are also available within the various drive menus.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1	**578**	**Language select**		ENUM		GB			RW	INT	FVY

Setting of the drive programming language.

0 English
1 Italian
2 French
3 German
4 Spanish
5 Turkish

English and Italian are pre-installed in the drive, to select the Italian language set **1**.

To set a different language download from the WEG site (https:///www.weg.net/..., DRIVE SET-UP folder) the available language file (wizard available in the ADL500 HW+QS manual, section 8.2.8.1 Language selection):

- Unzip and save files on a USB stick in a folder named “ADL500LN”;
- Insert the stick into the USB port of the drive;
- Select parameter 570 Select language and set the new language;
- Start the language loading procedure, when finished the drive will be restarted.

Note! The language file must be aligned to the firmware and application version of the drive, check the match!

The new language will be loaded into the memory of the drive and will replace the Italian language. The English language cannot be replaced by another language.

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
2	**390**	**Load application**		UINT16		-	-	4	RW	INT	FVY

Sets the application used by the drive. Once the memory device has been connected to the drive’s USB port, simply change the parameter to set the application chosen.

0 No application
1 EFC
2 EPC (Under development)
3 DCP (Under development)
4 CAN417 (Under development)

EFC (Elevator Floor Control): application that uses multispeed to reach the floor.

EPC (Elevator Positioning Control): application that uses position references to manage direct access to the floor.

DCP: Application that uses DCP3 protocols for EFC management and the CP4 protocol for EPC management.

CAN417: Application that uses the CANopen CIA 417™ protocol for EFC and EPC management.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3	**594**	**Load from USB**		BIT		0	0	1	RWZ	INT	FVY

Transfers parameters previously stored in the memory connected to the drive’s USB port.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4	**2132**	**Encoder mode**		ENUM		None			RWZ	INT	FVSY

The drive has a built-in encoder card. The encoder mode can be selected according to the following table:

0 None
1 Digital
2 Sinus
3 Sinus SINCOS
4 Sinus ENDAT
5 Sinus BISS
6 ENDAT
7 BiSS
8 Sinus SSI

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5	**392**	**Select motor**		BIT		0	0	1	RWZ	INT	FVY

This parameter is used to load motor data into the drive that are part of a library (.mot file extension).

These files must be saved on a USB memory device in a folder named “ADL500MT”. Once the memory device has been connected to the drive’s USB port, simply select the motor whose parameters are to be imported from the appropriate menu. Contact WEG Technical Assistance for further information or to request the files.

The motor data libraries are already available in the WEG Drivelabs configurator in the **Wizard / Setup-Wizard** menu.

1 STARTUP WIZARD

Following the step-by-step procedure from this menu, the drive can be started up by setting the main parameters relating to communication, feedback, motor, main system mechanical data, speed and motor self-tuning.

1.1 Set comm mode?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.1.1	**4000**	**Communication mode**		ENUM		Parallel			RW	INT	FVSY

Setting the type of communication to be used.

3 CAN417

Setting **3** the DS417 fieldbus profile is selected.

1.2 Set encoder param?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.2.1	**2102**	**Encoder supply**	V	FLOAT		5.2	5.2	20.0	RW	INT	FVY

Setting of the encoder supply voltage. Min and max values are modified according to the selection of parameter 2104 **Encoder input config** as follows:

PAR 2104 Config ingr encoder	Def	Min	Max
[0] HTL	5.2 V	5.2 V	20.0 V
[1] TTL	5.2 V	5.2 V	6.0 V

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.2.2	**2132**	**Encoder mode**		ENUM		None			RWZ	INT	FVSY

The drive has an integrated encoder card. The encoder mode can be selected in accordance with the following table:

0 None
1 Digital
2 Sinus
3 Sinus SINCOS
4 Sinus ENDAT
5 Sinus BISS
6 ENDAT
7 BiSS
8 Sinus SSI

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.2.3	**2100**	**Encoder pulses**	ppr	UINT16		1024	4	16384	RWZ	INT	FVY

Setting of the number of feedback encoder impulses. During setup, for incremental sinusoidal encoders + absolute EnDat, encoder absolute EnDat Full digital and Hiperface encoders this value is set automatically by reading the number of incremental encoder impulses.

With the EnDat Full digital Encoder, the value set automatically may be below the minimum.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.2.4	**2110**	**Encoder signal check**		ENUM		Check A-B			RWZ	EXP	FVY

Configuration of which incremental digital encoder channels are to be controlled in order to process the [22] **Speed fbk loss** alarm signal.

1 Check A-B
2 Check A-B-Z

Set **1** to check for signal on channels A-B

Set **2** to check for signal on channels A-B-Z

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.2.5	**7106**	**BiSS N bit ST**		UINT16		13	0	64	RW	EXP	FVY

This parameter allows setting of bit Number for single turn data. This parameter is automatically setted in case of encoder with EDS. This parameter must be setted manually in case of encoder without EDS.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.2.6	**7108**	**BiSS N bit MT**		UINT16		0	0	64	RW	EXP	FVY

This parameter allows setting of bit Number for multi turn data. This parameter is automatically setted in case of encoder with EDS. This parameter must be setted manually in case of encoder without EDS.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.2.7	**7114**	**BiSS Crc polinomy**		UINT16		67	1	65535	RW	EXP	FVY

This parameter allows setting the BiSS Crc polinomy. This parameter is automatically setted in case of encoder with EDS. This parameter must be setted manually in case of encoder without EDS.

1.3 Set motor data?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.3.1	**540**	**Control type**		ENUM		ASY_VF			RWZ	INT	FVSY

The control mode is displayed.

0 ASY SSC
1 ASY FOC
2 SYN FOC

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.3.2	**2000**	**Rated voltage**	V	FLOAT		SIZE	150	480	RWZ	INT	FVSY

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	Lev.	Vis.
1.3.3	**2002**	**Rated current**	A	FLOAT		SIZE	1	1500	RWZ	INT	FVSY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.3.4	**2004**	**Rated speed**	rpm	FLOAT		SIZE	10	32000	RWZ	INT	FVSY

Rated speed of the motor with full load in rpm. 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	Lev.	Vis.
1.3.5	**2006**	**Rated frequency**	Hz	FLOAT		SIZE	1	1000	RWZ	INT	FVS

Rated frequency of the motor expressed in Hz.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.3.6	**2008**	**Pole pairs**		UINT16		SIZE	1	60	RWZ	INT	FVSY

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)
Vn = motor rated speed (PAR 2004).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.3.7	**2010**	**Rated power**	kW	FLOAT		SIZE	0.1	1500	RWZ	INT	FVS

Rated power of the motor at the rated voltage and frequency. This value represents the mechanical power produced on the motor shaft.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.3.8	**2012**	**Cos phi**		FLOAT		SIZE	0.6	0.95	RWZ	INT	FVS

Motor power factor, as indicated on the data plate (Cos φ). This parameter is not always present on the motor data plate: in that case use the default value present in the drive.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.3.9	**2014**	**Torque constant**	Nm/A	FLOAT		SIZE	0	120	RWZ	INT	Y

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

1.4 Set mechanical data?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.4.2	**11006**	**Cabin speed**	m/s	FLOAT		1	0	10	RWZ	INT	FVY

Sets the maximum speed of system operation. This is also used for the recalculation of the full scale speed (PAR 680, **Full scale speed**).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.4.3	**11010**	**Gearbox ratio**		FLOAT		45 (1)	1	200	RW	INT	FVY

Sets the reduction ratio between motor and pulley.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.4.4	**11164**	**Rope ratio**		FLOAT		1 (2)	1	10	RWZ	INT	FVY

Sets the reduction ratio due to rope windings.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.4.5	**11012**	**Pulley diameter**	m	FLOAT		0.6 (0.32)	0	5	RWZ	INT	FVY

Setting the pulley diameter.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.4.6	**11150**	**Car weight**	kg	FLOAT		400	0	10000	RW	INT	FVY

Setting of the weight of the cabin (intended as the total empty weight of everything hanging from the ropes: frame, walls, door operator, appliances, etc.).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.4.7	**11152**	**Counter weight**	kg	FLOAT		1000	0	10000	RW	INT	FVY

Setting of the weight of the counterweight, including its frame.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.4.8	**11154**	**Load weight**	kg	FLOAT		450	0	10000	RW	INT	FVY

Setting of the weight of the maximum load for system dimensions.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.4.9	**11156**	**Rope weight**	kg	FLOAT		20	0	1000	RW	INT	FVY

Setting of the weight of the cable (intended as the total weight of all car suspension ropes).

1.5 Ramps menu

For a detailed description of the operation of the ramps, see Chapter 5.3.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.5.1	**11040**	**Accel initial jerk**	m/s^3	FLOAT		0.2	0.001	20	RW	ESY	FVY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.5.2	**11042**	**Acceleration**	m/s^2	FLOAT		0.600	0.001	10	RW	ESY	FVY

Setting of the maximum acceleration value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.5.3	**11044**	**Accel end jerk**	m/s^3	FLOAT		0.6	0.001	20	RW	ESY	FVY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.5.4	**11054**	**Percent acc factor**	%	FLOAT		100	10	1000	RW	INT	FVY

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	Lev.	Vis.
1.5.5	**11046**	**Decel initial jerk**	m/s^3	FLOAT		0.6	0.001	20	RW	ESY	FVY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.5.6	**11048**	**Deceleration**	m/s^2	FLOAT		0.600	0.001	10	RW	ESY	FVY

Setting of the maximum deceleration value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.5.7	**11050**	**Decel end jerk**	m/s^3	FLOAT		0.500	0.001	20	RW	ESY	FVY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.5.8	**11056**	**Percent dec factor**	%	FLOAT		100	10	1000	RW	INT	FVY

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.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.5.9	**11052**	**Stop deceleration**	m/s^2	FLOAT		0.600	0.001	10.000	RW	ESY	FVY

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

1.6 EBC (Electronic brake control)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.6.1	**8150**	**EBC Enable**		BIT		0	0	1	RWZ	INT	FVSY

Enabling CAN control of the EBC device. In OFF mode the drive is set up to control a traditional brake. In ON mode the drive is prepared to communicate with the electronic brake EBC. In ON mode, all EBC management menus are activated. In OFF mode, EBC management menus are hidden. In ON mode the next EBC Configuration menu appears.

EBC menus are only available in the ADL550 version.

The following parameters are visible only if the 8150 Enable EBC parameter is in ON mode.

If the parameter 8150 Enable EBC is set to ON, the actual communication between the EBC and the drive occurs when the Drive is restarted. In this case without restarting the drive the following auto-tuning operation cannot be performed. Then, after you have enabled the EBC and set its basic parameters you need to save the data and restart the drives and then make the selftune after retracing the whole wizard or passing directly to the autotuning wizard.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.6.2	**8250**	**Brake Holding V**	V	FLOAT		103.5	1	207	RW	INT	

Value of the maintenance voltage. If the parameter 3008 is set in the holding voltage mode then the output voltage from the inner bridge is adjusted so as to provide the brake output voltage set.

Some manufacturers indicate this voltage on the brake plates together with the power and rated voltage of the brake.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.6.3	**8252**	**Brake Holding P**	W	FLOAT		76	1	350	RW	ESY	

Nominal brake power in maintenance mode indicated by the manufacturer on the brake plate.

If only the nominal power and the nominal voltage of the brake are provided in non-economic mode and you want to use one of the economization modes then you have to enter the values of the voltage that will arrive at the brake in ecomonization mode while for the power to be entered the following formula shall be used:

Maintenance Voltage^2 x Rated Power / Rated Voltage^2.

For example if I have a brake on which the rated voltage 207 Vdc and the rated power are indicated

100 W and you want to use the brake in saving mode at 103.5 Vdc (value indicated by the manufacturer)

power input value is equal to 103.5^2 x 100 / 207^2 = 25 W.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.6.4	**8258**	**Brake Power Mode**		ENUM		Boost_Half_Voltage			RW	ESY	

How to start and maintain the brake.

Full voltage brake is activated with the input voltage straightened both in the initial phase and in the maintenance phase.

Boost/Half voltage brake is activated with the input voltage straightened for the first milliseconds indicated by the parameter 3009 and then the output voltage is halved by cutting inside the EBC a half wave coming out of the bridge.

Boost/Holding voltage 2 brake is activated with the straightened voltage for the first milliseconds indicated by the parameter 3009 and then the output voltage is modulated to keep it equal to the voltage set by the parameter 3000 Holding voltage.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.6.5	**8260**	**Brake Power Boost**	ms	UINT16		1000	0	5000	RW	ESY	

Time for which the output voltage is kept equal to the value of the rectified input voltage (Boost time).

1.7 Run autotune still?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.7.1	**2032**	**Autotune**		BIT		0	0	1	RWZ	INT	FVSY

Performs self-tuning with the motor having ropes already wound on the traction pulley.

The self-tuning procedure may cause limited rotation of the motor shaft. To perform self-tuning, follow the procedure described on parameter PAR 2020 **Take parameters**.

1.8 Save parameters?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.8.1	**550**	**Save parameters**		BIT		0	0	1	RW	INT	FVSY

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 press the **E** key to start the save parameters procedure and press **E** again to confirm.

2 OPTIMIZATION WIZARD (OPTIMIZ. WIZARD)

Through this menu it is possible to immediately optimize the control response in order to maximise cabin comfort.

In addition to the automatic procedure (**Learning Trip** function), three or fives levels of optimization are available for each of the **Rollback**, **Comfort low speed**, **Comfort high speed** parameters.

To avoid possible vibrations, the optimization level should not be increased if not necessary.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
2.1	**9720**	**Learning trip**		BIT		0	0	1	RWZ	INT	VSY

Launch the “Learning Trip” function, an automatic procedure to simplify commissioning and optimise the drive according to the system’s mechanical parameters.

Attention

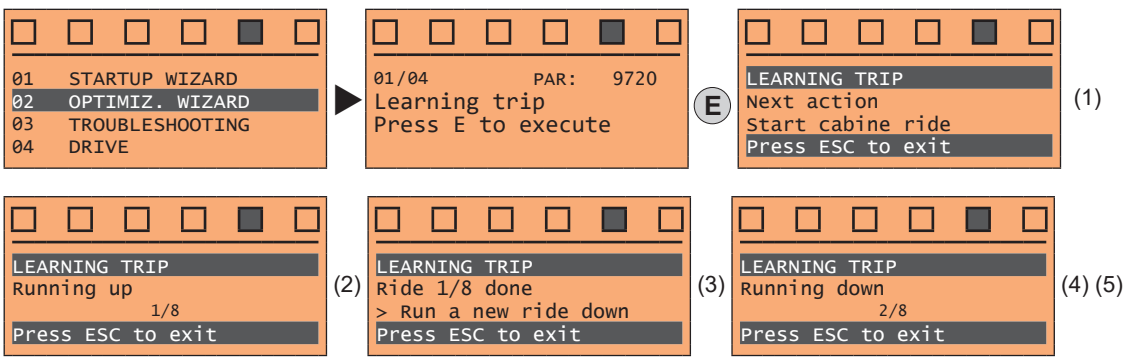
Before enabling the function:

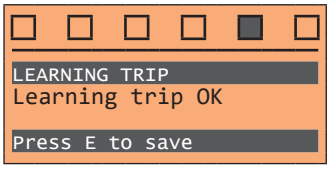
- run the **Startup wizard,**
- check cabin movement in inspection mode to rule out any macroscopic data entry errors.

The function can be performed from the keypad and via the WEG_DriveLabs configurator (Wizard menu / Optimization Wizard).

To facilitate operations, the configurator/keypad suggests what actions are to be performed (e.g. up one floor, down one floor, etc.), intercepting any incorrect actions and communicating them (e.g. call to floor short, calls always in the same direction, etc.) so as to recommend the corrective action.

Once the sequences envisaged by the function have been completed, the basic speed regulator gains are automatically recalculated. Therefore the user can run a test travel to evaluate the improvement in performance obtained and, if still not satisfied, the Learning Trip procedure can be repeated or the deficient aspects improved using the appropriate sections of the optimisation wizard (Rollback, Comfort low speed, Comfort high speed).

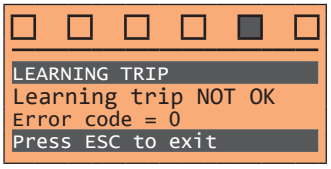




(6)

(1) You are prompted to perform the first run (up or down).
(2) Perform the up run.
(3) You are prompted to perform a down run.
(4) Perform the down run.
(5) Repeat the operations (1) (2) (3) (4) several times.
(6) Procedure successfully completed.

Other possible messages:



Procedure not successfully completed.

Short run error.

Wrong direction error.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
2.2	**12000**	**Rollback at start**		UINT32		1	1	5	RW	ESY	FVY

In some applications, for a short time at the start of the stroke when the locking brake is lifted, the cab may move in the opposite direction to the controlled direction.

Selecting one of the five levels can reduce/eliminate the noise.

1 Basic level pre-selected as default level
2 Intermediate optimization level 2
3 Intermediate optimization level 3
4 Intermediate optimization level 4
5 High optimization level

To avoid possible vibrations, the optimization level should not be increased if not necessary.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
2.3	**12006**	**Rollback at arrival**		UINT32		1	1	3	RW	ESY	FVY

In some applications, an undesired displacement of the cab may occur for a short time at the end of the stroke when the engine is held still while waiting for the brake to close.

Selecting one of the five levels can reduce/eliminate the noise.

1 Basic level pre-selected as default level
2 Intermediate optimization level 2
3 Intermediate optimization level 3
4 Intermediate optimization level 4
5 High optimization level

To avoid possible vibrations, the optimization level should not be increased if not necessary.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
2.4	**12002**	**Comfort high spd**		UINT32		1	1	3	RW	ESY	FVY

During the high speed section there may be oscillations in the cabin or abrupt and sudden movements.

By selecting one of the five levels the disturbance can be reduced or eliminated.

1 Basic level pre-selected as default level
2 Intermediate optimization level 2
3 High optimization level

To avoid possible vibrations, the optimization level should not be increased if not necessary.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
2.5	**12004**	**Comfort low spd**		UINT32		1	1	3	RW	ESY	FVY

During the low speed section there may be oscillations in the cabin or abrupt and sudden movements.

By selecting one of the five levels the disturbance can be reduced or eliminated.

1 Basic level pre-selected as default level
2 Intermediate optimization level 2
3 High optimization level

To avoid possible vibrations, the optimization level should not be increased if not necessary.

3 TROUBLESHOOTING

For each typical problem of a Lift System, the parameter of the drive on which to act to solve the problem, are displayed by selecting the relative action.

3.1 Start

Problem	Solution
The cabin doesn't start smoothly.	Increase the brake opening delay.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.1.1	**11064**	**Brake open delay**	ms	INT16/32		500	0	10000	RW	ESY	FVY

Setting of the brake opening delay time.

3.2 Rollback

Problem	Solution
There is an unwanted movement of the cabin in the opposite direction to the commanded at the start.	Modify the proportional and /or integral speed gain at start.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.2.1	**2200**	**Boost Voltage**	%	FLOAT		3	0	20.0	RW	INT	F

Specifica il valore della tensione supplementare applicata ai morsetti del motore alle basse velocità al fine di incrementare la coppia erogata. Valori eccessivi producono un aumento della corrente assorbita e del riscaldamento del motore a causa delle perdite resistive nell'avvolgimento statorico.

Intervallo di valori possibili : 0…20% della tensione nominale del motore.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.2.2	**2212**	**V/Hz Boost Mode**		ENUM		Auto			RW	INT	F

This parameter can be used to select one of the following two boost voltage generation modes:

0 Fixed
1 Auto

In the "Fixed" mode, the boost voltage is defined by the user through parameter PAR 2200 **Boost voltage.**

At zero speed, the drive applies a voltage to the motor terminals equal to the value defined in parameter PAR 2200.

This additional voltage is gradually reduced for speeds higher than zero until it is eliminated for output frequencies above the threshold equal to half the rated frequency defined in parameter PAR 2204 **Base frequency** (see figure).

In "Auto" mode the boost voltage is dynamically adjusted by the drive.

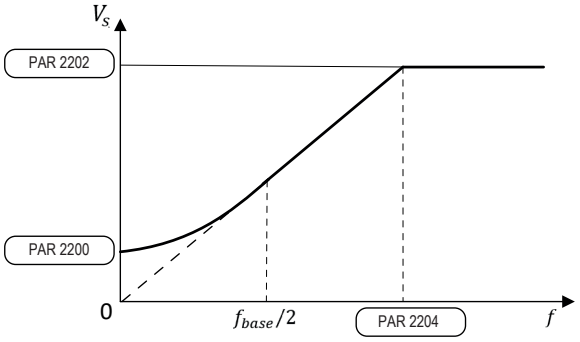


Figure 11.4: V/f characteristic curve profile

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.2.3	**2794**	**SR-P gain at start**	%	FLOAT		150.0	0.0	400.0	RW	INT	VSY

Defines the level of proportional control exercised by the PI regulator during the start phase.

In this initial phase the motor speed control loop must be sufficiently responsive to compensate for any load imbalance and thus counteract the roll-back effect.

An excessive increase of this parameter may generate system vibrations or unstable behaviour.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.2.4	**2796**	**SR-I gain at start**	%	FLOAT		110.0	0.0	400.0	RW	INT	VSY

Defines the level of integral control exercised by the PI regulator during the start phase.

Increasing the value of this parameter improves the speed control response in compensating for any load imbalance when the brake is opened.

3.3 Too fast acceleration (Too fast accel.)

Problem	Solution
The acceleration is too abrupt.	Decrease the value of the initial acceleration jerk and / or acceleration value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.3.1	**11040**	**Accel initial jerk**	m/s^3	FLOAT		0.2	0.001	20	RW	ESY	FVY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.3.2	**11042**	**Acceleration**	m/s^2	FLOAT		0.600	0.001	10	RW	ESY	FVY

Setting of the maximum acceleration value.

3.4 Slow speed vibrations (Slow speed vibr.)

Problem	Solution
There are vibrations during the movement of the cabin at slow speed.	Modify the proportional and integral speed gain.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.4.1	**2752**	**SR-P gain low speed**	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY

Defines the level of the proportional control action exercised by the PI regulator for operating speeds below the minimum threshold defined in parameter PAR 2760 **SR-low speed thrsd**.

For operating speeds above this threshold, the actual level of proportional action becomes a linear combination between the value defined in this parameter and the value defined in parameter PAR 2756 **SR-P gain high speed**.

In the speed range between the thresholds defined in PAR 2760 SR-low speed thrsd and PAR 2762 **SR-high speed thrsd** parameters, the weight of the proportional action varies linearly with the speed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.4.2	**2754**	**SR-I gain low speed**	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY

Defines the level of the integral control action exercised by the PI regulator for operating speeds below the minimum threshold defined in parameter PAR 2760 **SR-low speed thrsd**.

For operating speeds above this threshold, the actual level of integral action becomes a linear combination between the value defined in this parameter and the value defined in parameter PAR 2758 **SR-I gain high speed**.

In the speed range between the thresholds defined in PAR 2760 **SR-low speed thrsd** and PAR 2762 **SR-high speed thrsd** parameters, the weight of the proportional action varies linearly with the speed.

3.5 High speed vibrations (High speed vibr.)

Problem	Solution
There are vibrations during the movement of the cabin at high speed.	Modify the proportional and integral speed gain.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.5.1	**2756**	**SR-P gain high speed**	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY

Defines the level of the proportional control action exercised by the PI regulator for operating speeds above the maximum

threshold defined in parameter PAR 2762 **SR-high speed thrsd**.

For operating speeds lower than this threshold, the actual level of proportional action becomes a linear combination between the value defined in this parameter and the value defined in parameter PAR 2752 **SR-P gain low speed**.

In the speed range between the minimum and maximum thresholds defined in PAR 2760 **SR-low speed thrsd** and PAR 2762 **SR-high speed thrsd** parameters, the weight of the proportional action varies linearly with the speed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.5.2	**2758**	**SR-I gain high speed**	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY

Defines the level of the integral control action exercised by the PI regulator for operating speeds above the maximum threshold defined in parameter PAR 2760 **SR-low speed thrsd**.

For operating speeds lower than this threshold, the actual level of integral action becomes a linear combination between the value defined in this parameter and the value defined in parameter PAR 2754 **SR-I gain low speed.**

In the speed range between the thresholds defined in PAR 2760 **SR-low speed thrsd** and PAR 2762 **SR-high speed thrsd** parameters, the weight of the integral action varies linearly with the speed.

3.6 Too fast deceleration (Too fast dec.)

Problem	Solution
The deceleration with which the cabin approaches the floor is too abrupt.	Decrease the value of the initial deceleration jerk and / or deceleration value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.6.1	**11046**	**Decel initial jerk**	m/s^3	FLOAT		0.6	0.001	20	RW	ESY	FVY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.6.2	**11048**	**Deceleration**	m/s^2	FLOAT		0.600	0.001	10	RW	ESY	FVY

Setting of the maximum deceleration value.

3.7 Floor leveling

Problem	Solution
During the arrival at the floor there is an abrupt stop.	Decrease the brake closing delay.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.7.1	**11068**	**Brake close delay**	ms	INT16/32		500	0	10000	RW	ESY	FVY

Setting of the delay time after closing the brake.

3.8 Brake closing

Problem	Solution
There is a noise when the brake is closed after the arrival at the floor.	Increase the current down delay.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.8.1	**11070**	**Current down delay**	ms	INT16/32		0 (800)	0	10000	RW	INT	Y

The purpose of this function is to avoid that after the brake is closed, the motor torque is removed instantaneously, causing bothersome stress inside the cabin.

To avoid this phenomenon, after closing the brake, the current limits are brought from the active value during travel to zero in the time set here.

Note! Function not active in asynchronous motor control mode.

In synchronous motor control mode the application automatically sets the parameter PAR 2354 Torque curr lim sel to “T limit src” and PAR 2358 Torque limit src to “Ramp down limit”.

3.9 Vibration analyzer

Problem	Solution
Vibration analyzer measures system vibration expressed in two most significant resonant frequiencies.	Values greater than 0 may indicate system vibrations. Typical causes could be intrinsic resonances of the system itself.insufficient guides lubrification, ovalized guide wheels, etc. If you need any advice on vibration damping you can contact after-sale service.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.9.1	**9464**	**Vibratio freq. 1**	Hz	FLOAT		0	0.0	0.0	R	INT	VSY

Indicates the value in Hz of the first measured resonance frequency. If two frequencies have been detected, **Vibration freq. 1** will be the one with the higher amplitude.

A “0” value indicates that no resonance frequency is present in the measurement band.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.9.2	**9466**	**Vibration freq. 2**	Hz	FLOAT		0	0.0	0.0	R	INT	VSY

Indicates the value in Hz of the second measured resonance frequency. If two frequencies have been detected, **Vibration freq. 2** will be the one with the lower amplitude.

A “0” value indicates that no second resonance frequency is present in the measurement band.

4 DRIVE

4.1 DRIVE MONITOR

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.1	**250**	**Output current**	A	FLOAT	16BIT_H	0	0	0	R	ESY	FVSY

The drive output current is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.2	**252**	**Output voltage**	V	FLOAT	16BIT_H	0	0	0	R	ESY	FVSY

The drive line voltage output is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.3	**254**	**Output frequency**	Hz	FLOAT	16BIT_H	0	0	0	R	ESY	FVSY

The drive output frequency is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.4	**664**	**Speed setpoint**	rpm	INT16	16BIT_H	0	0	0	R	ESY	FVSY

The motor speed reference is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.5	**260**	**Motor speed**	rpm	FLOAT	16BIT_H	0	0	0	R	ESY	FVSY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.6	**270**	**DC link voltage**	V	FLOAT	16BIT_H	0	0	0	R	ESY	FVSY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.7	**272**	**Heatsink temperature**	degC	FLOAT	16BIT_L	0	0	0	R	ESY	FVSY

The temperature measured by the linear sensor integrated in the IGBT modules is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.8	**274**	**Motor temp**	degC	INT16		0	0	0	R	ESY	

Motor temperature detected by the KTY external sensor. Parameter displayed only if the sensor is connected.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.9	**280**	**Torque current ref**	A	FLOAT	16BIT_H	0	0	0	R	EXP	FVSY

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	Lev.	Vis.
4.1.10	**282**	**Magnet current ref**	A	FLOAT	16BIT_H	0	0	0	R	EXP	FVSY

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	Lev.	Vis.
4.1.11	**284**	**Torque current**	A	FLOAT	16BIT_H	0	0	0	R	INT	FVSY

The actual torque current value is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.12	**286**	**Magnet current**	A	FLOAT	16BIT_H	0	0	0	R	INT	FVSY

The actual magnetizing current value is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.13	**3212**	**Motor overload**	%	UINT16	16BIT_H	0	0	100	R	ESY	FVSY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.14	**368**	**Drive overload**	%	UINT16	16BIT_H	0	0	100	R	ESY	FVSY

The drive overload level is displayed. An instantaneous overload of 200% of the drive rated current is allowed for 10s. The thermal image I^2t 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** reaches 100%, the output current threshold is reduced to 100% of the rated current, and stays at that value until the I^2t integrator cycle is complete. At this point the instantaneous overload of 200% or 150% (below 3Hz) will be re-activated.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.15	**3260**	**Bres overload**	%	UINT16	16BIT_H	0	0	100	R	ESY	FVSY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.16	**1066**	**Enable state mon**		UINT16	16BIT_L	0	0	1	R	ESY	FVSY

The drive Enable command status is displayed.
Voltage must be present on terminal 9, in the case of ADL550 also at the Safety enable terminals.
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	Lev.	Vis.
4.1.17	**1068**	**Start state mon**		UINT16	16BIT_L	0	0	1	R	ESY	FVSY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.18	**2386**	**Torque ref**	%	FLOAT	16BIT_H	0.0	0.0	0.0	R	EXP	FVSY

The value of the torque reference is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.19	**2388**	**Torque**	%	FLOAT	16BIT_H	0.0	0.0	0.0	R	INT	FVSY

Displays the current torque value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.20	**372**	**In use current limit**	A	FLOAT	16BIT_H	0	0	0	R	EXP	FVSY

Displays the actual current limit.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.21	**1058**	**Safety en mon**		BIT	16BIT_L	0	0	0	R	ESY	

Safety enable input signal status.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.22	**1200**	**Dig input mon**		UINT16	16BIT_L	0	0	0	R	ESY	FVSY

The logic status of the digital inputs 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 high.
0 Input low.

Example:

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.23	**1202**	**Dig input mon x**		UINT16	16BIT_L	0	0	0	R	ESY	

The status of the digital inputs of the EXP-IO1-ADL500 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 high.
0 Input low.

Example:

0 0 0 0 0 0 0 **1** **1** **1** **1**
DI 1X
DI 2X
DI 3X
DI 4X

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.24	**1400**	**Digital output mon**		UINT16		0	0	0	R	ESY	FVSY

The status of the digital outputs 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 the associated output relay is closed.

1 Output enabled.
0 Output disabled.

Example:

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.25	**1402**	**Digital output mon x**		UINT16		0	0	0	R	ESY	

The status of the digital outputs of the EXP-IO1-ADL500 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 the associated output relay is closed.

1 Output enabled.
0 Output disabled.

Example:

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

4.2 DRIVE INFO

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.2.1	**172**	**Drive type**		ENUM		ADL510			R	ESY	FVSY

The drive series identification code is displayed.

2 ADL530
3 ADL550

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.2.2	**482**	**Drive size**		UINT16		0	0	0	R	ESY	FVSY

The drive power size is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.2.3	**484**	**Drive family**		ENUM		No Power			R	INT	FVSY

The mains voltage range accepted by the drive is displayed (e.g. 230V..480V). 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.

0 No power
1 230V..480V

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.2.4	**488**	**Drive cont current**	A	FLOAT		CALCF	0.0	0.0	R	ESY	FVSY

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	Lev.	Vis.
4.2.6	**174**	**Firmware version**		UINT32		0	0	0	R	ESY	FVSY

The HMI firmware version operating in the drive is displayed in the X.X.X format: the first is the (**X**.X.X) firmware version, the second the (X.**X**.X firmware release, and the third is the (X.X.**X)** firmware type.

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	Lev.	Vis.
4.2.7	**176**	**DSP Firmware version**		UINT32		0	0	0	R	ESY	FVSY

The firmware version of the DSP application operating in the drive is displayed in the X.X.X format: the first is the (**X**.X.X) firmware version, the second the (X.**X**.X) firmware release, and the third is the (X.X.**X**) firmware type..

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	Lev.	Vis.
4.2.8	**180**	**DSP Boot version**		UINT32		0	0	0	R	ESY	FVSY

Processor boot version.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.2.9	**182**	**HMI Boot version**		UINT32		0	0	0	R	ESY	FVSY

Processor boot version.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.2.10	**184**	**Application name**		STRING16		0	0	0	R	ESY	FVSY

Displays the name of the installed application.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.2.11	**192**	**Application version**		UINT32		0	0	0	R	ESY	FVSY

The firmware version of the application operating in the drive is displayed in the XX.XX.XX format: the first is the (**XX**.

XX.XX) firmware version, the second the (XX.**XX**.XX) firmware release, and the third is the (XX.XX.**XX**) firmware type.
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	Lev.	Vis.
4.2.12	**198**	**Hardware version**		UINT16		0	0	0	R	ESY	FVSY
		The hardware version of the adjustment board is displayed.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.2.13	**520**	**Product S/N**		UINT32		0	0	0	R	ESY	FVSY
		The drive serial number is displayed.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.2.14	**522**	**Regulation S/N**		UINT32		0	0	0	R	ESY	FVSY
		The drive regulation card serial number is displayed.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.2.15	**524**	**Power S/N**		UINT32		0	0	0	R	ESY	FVSY
		The drive power card serial number is displayed.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.2.16	**526**	**Power file ver.rel**		UINT16		0	0	0	R	ESY	FVSY
		The drive power card configuration release is displayed.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.2.17	**9562**	**IP address**		UINT32		0	0	0	R	ESY	FVSY
		Displays the IP address in use.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.2.18	**9600**	**MAC address**		STRING16		0	0	0	R	EXP	FVSY
		Displays the drive's MAC address.									

4.3 DRIVE CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.1	**550**	**Save parameters**		BIT		0	0	1	RW	ESY	FVSY

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 7 of the **Startup wizard**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.2	**580**	**Load default**		BIT		0	0	1	RWZ	ESY	FVSY

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

This does not apply to the access level and password parameters, for which see the menu “6.6 NETWORK AND ACCESS” on page 83).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.3	**540**	**Control type**		ENUM		ASY_VF			RWZ	INT	FVSY

The ADL550 can operate in different control modes:

0 ASY SSC
1 ASY FOC
2 SYN FOC

ASY SSC: the open loop V/f mode. It is the simplest type of asynchronous motor control, as the only parameters required are the rated voltage, current and frequency of the motor.
The ASY 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 PAR **2214 V/Hz Slip ctrl gain** and **2224 V/Hz slip filter constant.**

ASY FOC: in the **field oriented vector mode** 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.

SYN FOC: in the **field oriented vector mode** for permanent magnet synchronous motor. 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.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.4	**554**	**Access level**		ENUM		Intermediate			RW	ESY	FVSY

Determines the parameters that can be displayed and/or modified to suit the operator’s needs and capabilities.

0 Readonly
1 Easy
2 INT
3 Expert
4 Service

Readonly: read-only level, where a limited number of parameters are displayed.

Easy: level that allows parameters to be displayed and modified for basic commissioning, in V/f control and without tuning.

Intermediate: level that allows parameters to be displayed and modified for complete commissioning and basic optimization.

Expert: level that allows parameters to be displayed and modified for advanced optimization.

Service: reserved for Service.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.5	**568**	**Enable password**		BIT		0	0	1	RW	EXP	FVSY

When this parameter is OFF (default), it is possible to change the selection of PAR 554 **Access level** (parameter access level, excluding Service level) without entering the password.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.7	**560**	**Mains voltage**		ENUM		400 V			RWZ	INT	FVSY

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

1 230 V
2 380 V
3 400 V
4 415 V
5 440 V
6 460 V
7 480 V

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.8	**448**	**Emergency UV**	V	FLOAT		CALCF	0	CALCF	RWZ	INT	FVSY

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

This parameter also identifies the voltage at which it is necessary to send the closing command of the precharge relay (which must take place when the voltage on the DC-link has exceeded approximately 70% of its final value). In the presence of batteries connected to the EM input, parameter 448 must be set manually to 70% of the minimum output voltage of the battery pack (or, more generally, of the power source used).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.9	**450**	**Undervoltage**	V	FLOAT		300.0	0	0	RW	INT	FVSY

Lets you change the Undervoltage value. Minimum and maximum default values depend on line voltage.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.10	**2690**	**Chopper ON**	V	FLOAT		CALCF	0	CALCF	RW	EXP	FVY

Corresponds to the threshold of activation of the braking resistance. It's so possible to increase this value to the level of the overvoltage threshold.

(ADL500-...-4 = 802 Vdc, ADL500-...-2T = 396 Vdc, ADL500-...-2M = 396 Vdc).

The range is defined by the parameter 560 Mains voltage.

Note! If the mains voltage parameter is set to the maximum possible value, the brake resistance activation threshold can only take the maximum value and cannot be changed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.11	**1010**	**Fast Start disable**		BIT		1	0	1	RW	EXP	FVSY

Changes the engine start mode after a drive restart. In ON mode the drive, after switching on, starts only if the direction input is activated after the drive signal Ok. With OFF mode the drive, after switching on, starts after the OK drive signal seeing the status of the direction signal even if this has been activated before the OK drive signal becomes high.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.12	**574**	**Startup display**		INT16		-1	-1	20000	RW	INT	FVSY

It is possible to set the parameter number 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.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.13	**576**	**Display backlight**		BIT		0	0	1	RW	INT	FVSY

Enabling of the backlight on the drive display.
If set to 0 (Off) the display backlight will go off when the drive has been on for three minutes.

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.14	**578**	**Language select**		ENUM		GB			RW	INT	FVSY

Setting of the drive programming language.

0 English
1 Italian
2 French
3 German
4 Spanish
5 Turkish

English and Italian are pre-installed on the drive, to select Italian set **1**.

To set a different language, download the available languages file from the WEG site (https://www.weg.net/..., DRIVE SET-UP folder) (wizard available in manual ADL500 HW+QS, section 8.2.8.1 Language selection):

- Unzip and save the files on a USB flash drive, in a folder called “ADL500LN”.
- Insert the flash drive into the drive’s USB port.
- Select the **Language Select** parameter 570 and set the new language,
- Start the language loading procedure, after which the drive will reboot.

Note! The language file must be aligned with the version of both the drive firmware and application. Check correspondence.

The new language will be loaded into the drive memory and replace the Italian. English cannot be replaced by another language.

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.15	**7200**	**Password recovery**		BIT		0	0	1	RW	ESY	FVSY

If executed, it generates a code in PAR 7210 **Recovery code** to be communicated to WEG to obtain a temporary Expert password. To be used in case the password is lost.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.16	**7210**	**Recovery code**		UINT32		0.0	0	0	R	ESY	FVSY

This parameter is used to write the code to be communicated to WEG to obtain a temporary Expert password (see PAR 7200 **Password recovery**). To be used in case the password is lost.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.17	**7220**	**Alarm time**	min	UINT16		60	0	1092	RW	EXP	FVSY

Sets the drive logout time, in minutes, calculated from the first start-up.

Once the activity time set in this parameter has elapsed the drive will be reset to Readonly level.

If set to 0, automatic logout is disabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.18	**590**	**Save par from keypad**		BIT		0	0	1	RWZ	INT	FVSY

Transfers the parameters currently stored in the drive and saves them in the keypad memory.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.19	**592**	**Load par from keypad**		BIT		0	0	1	RWZ	INT	FVSY

Transfers the parameters from the keypad memory to the drive.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.20	**596**	**Save to USB**		BIT		0	0	1	RWZ	INT	

Transfers the drive parameters to the memory connected to the USB port.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.21	**598**	**Load from USB**		BIT		0	0	1	RWZ	INT	

Transfers parameters previously stored in the memory connected to the drive’s USB port.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.23	**1560**	**App update**		BIT		0	0	1	RWZ	INT	FVSY

Update the app files in the internal drive memory.

To perform this operation, a USB flash drive with the “web” folder containing the files to be uploaded must be present.

If the flash drive is not present, a message is displayed on the keypad.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.24	**9548**	**WiFi safe removal**		BIT		0	0	1	RW	ESY	

To prevent drive malfunctions, this function must be performed before removing the Wi-Fi module.

4.4 ALARM CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.1	**4500**	**Fault reset src**		LINK	16BIT_L	6000			RW	INT	FVSY

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	Lev.	Vis.
4.4.2	**4502**	**ExtFlt src**		LINK	16BIT_L	6000			RW	INT	FVSY

Selection of the origin (source) of the signal to be used as the input for the drive external fault alarm **External fault [21]**. 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	Lev.	Vis.
4.4.3	**4504**	**ExtFlt activity**		ENUM		Disable			RW	INT	FVSY

Setting of the behaviour of the drive in the event of an external fault alarm **External fault [21]**. This alarm indicates the intervention of a drive external protection.

0 Ignore
1 Warning
2 Disable drive
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.4	**4506**	**ExtFlt restart**		ENUM		Disable			RW	EXP	FVSY

Enabling of automatic restart after the **External fault [21]** alarm.

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.5	**4508**	**ExtFlt restart time**	ms	UINT16		1000	120	30000	RW	EXP	FVSY

Setting of the time within which the **External fault [21]** alarm must be reset in order to perform automatic restart.

Menu	PAR	Descrizione	UM	Tipo	FB BIT	Def	Min	Max	Acc	Liv.	Vis.
4.4.6	**4510**	**ExtFlt holdoff**	ms	UINT16		0	0	10000	RW	INT	FVSY

Setting of the delay between the signalling of the external fault alarm **External fault [21]** 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	Lev.	Vis.
4.4.7	**4518**	**MotorOT threshold**	degC	INT16		150	0	200	RW	INT	

Motor overtemperature alarm threshold. Parameter visible only if KTY selection is set using PAR 4530 **Ptc type**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.8	**4520**	**MotorOT src**		LINK	16BIT_L	6000			RW	INT	FVSY

Selection of the origin (source) of the signal to be used for the motor overtemperature alarm **MotorOT [12]**. 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	Lev.	Vis.
4.4.9	**4522**	**MotorOT activity**		ENUM		Warning			RW	INT	FVSY

Setting of the behaviour of the drive in case of a motor overtemperature alarm **MotorOT [12]**. This alarm indicates that the motor temperature is too high.

0 Ignore
1 Warning

2 Disable drive
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.10	**4524**	**MotorOT restart**		ENUM		Disable			RW	EXP	FVSY

Enabling of automatic restart after the motor overtemperature alarm **Motor OT [12]**.

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.11	**4526**	**MotorOT restart time**	ms	UINT16		1000	120	30000	RW	EXP	FVSY

Setting of the time within which the **Motor OT [12]** alarm must be reset in order to perform automatic restart.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.12	**4528**	**MotorOT holdoff**	ms	UINT16		1000	0	30000	RW	EXP	FVSY

Setting of the delay between the signalling of the motor overtemperature alarm **MotorOT [12]** 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	Lev.	Vis.
4.4.13	**4530**	**Ptc type**		ENUM		None			RW	INT	

Selects the sensor type to be used to measure the motor temperature.

0 None
1 PTC
2 KTY84-130

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.14	**4532**	**PtcFail activity**		ENUM		Warning			RW	INT	

PTC sensor activity failure alarm (**PTC failure [11]**).

0 Ignore
1 Warning
2 Disable drive
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.15	**4534**	**PtcFail restart**		ENUM		Disable			RW	EXP	

Enables automatic restart after **PTC failure** [11] alarm.

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.16	**4536**	**PtcFail restart time**	ms	UINT16		1000	120	30000	RW	EXP	

Sets the time within which the **PTC failure** [11] alarm must be reset to perform automatic restart.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.17	**4538**	**PtcFail holdoff**	ms	UINT16		1000	0	30000	RW	EXP	

Sets the delay between the **PTC failure** [11] alarm being signalled and the alarm being tripped.
If an alarm condition arises, the drive waits until the set time has elapsed before tripping the alarm.
If the alarm is eliminated within the set time, the drive does not indicate any alarm condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.18	**4540**	**Overspeed thresold**	rpm	INT16		CALCI	0	16000	RW	INT	FVSY

Setting of the threshold above which the overspeed alarm **Overspeed [23]** is enabled.

Note! The Overspeed threshold value (together with the Full scale speed PAR 680), is automatically recalculated each time the mechanical data parameters are modified.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.19	**4542**	**Overspeed activity**		ENUM		Disable			RW	INT	FVSY

Setting of the behaviour of the drive in case of a motor overspeed alarm **Overspeed [23]**. This alarm indicates that the motor speed has exceeded the threshold set in PAR 4540 **Overspeed threshold.**

0 Ignore
1 Warning
2 Disable drive

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.20	**4544**	**Overspeed holdoff**	ms	UINT16		0	0	5000	RW	INT	FVSY

Setting of the delay between the signalling of the motor overspeed alarm **Overspeed [23]** 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	Lev.	Vis.
4.4.21	**4550**	**SpdRefLoss thresold**	rpm	INT16		100 (*)	0	CALCI	RW	INT	FVSY

Setting of the threshold below which the speed reference loss alarm **Speed ref loss [24]** occurs.
(*) Def: 100 = ASY FOC, 10 = SYN FOC

Note! The Overspeed threshold value (together with the Full scale speed PAR 680), is automatically recalculated each time the mechanical data parameters are modified.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.22	**4552**	**SpdRefLoss activity**		ENUM		Disable			RW	INT	FVSY

Setting of the behaviour of the drive in case of a speed reference loss alarm **Speed ref loss [24]**. 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 **2354** is set to a value other than zero.

0 Ignore
1 Warning
2 Disable drive

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.23	**4554**	**SpdRefLoss holdoff**	ms	UINT16		1000	0	10000	RW	INT	FVSY

The delay between the **Speed ref loss [24]** 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	Lev.	Vis.
4.4.24	**4560**	**SpdFbkLoss activity**		ENUM		Disable			RW	INT	FVSY

Drive behaviour in case of the **Speed ref loss [24]** alarm is displayed. This alarm indicates the loss of the encoder feedback signals. Each type of encoder generates the **Speed ref loss [24]** alarm differently (incremental signal error, absolute signal error, serial error).

0 Ignore
1 Warning
2 Disable drive

For absolute Endat encoders and absolute Hiperface encoders, after the alarm is generated, the encoder reset command must be sent to the encoder: during this procedure the application verifies whether the encoder is signalling an encoder alarm condition to the drive and the alarm is acquired from this.

The causes of the **Speed ref loss [24]** alarm and the information acquired from the encoder are shown in the **SpdFbk-Loss code** parameter 2172.

Note! See menu "8 ENCODER" for further information.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.25	**4562**	**SpdFbkLoss holdoff**	ms	UINT16		200	0	10000	RW	INT	FVSY

Setting of the delay between the signalling of the speed feedback loss alarm condition **Speed fbk loss [22]** 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	Lev.	Vis.
4.4.26	**4564**	**SpdfbkLoss threshold**	rpm	INT16	100	0	CALCI	RW	INT	FVSY	

Setting the minimum speed by which the **Speed fbk loss [22]** is bypassed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.27	**4570**	**Drive ovld activity**		ENUM		Disable			RW	EXP	FVSY

Setting of the behaviour of the drive in case of a drive overload alarm **Drive ovld**. This alarm indicates that the drive overload threshold has been reached.

0 Ignore
1 Warning
2 Disable drive
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.28	**4572**	**Motor ovld activity**		ENUM		Warning			RW	EXP	FVSY

Setting of the behaviour of the drive in case of a motor overload alarm **Motor overload [14]**. This alarm indicates that the motor overload threshold has been reached.

0 Ignore
1 Warning
2 Disable drive
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.29	**4574**	**Bres ovld activity**		ENUM		Disable			RW	EXP	FVSY

Setting of the behaviour of the drive in case of a braking resistor overload alarm **Bres overload [15]**. This alarm indicates that the braking resistor overload threshold has been reached.

0 Ignore
1 Warning
2 Disable drive
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.30	**4582**	**HTsens restart**		ENUM		Disable			RW	EXP	FVSY

Enabling of automatic restart after the drive heatsink overtemperature alarm **Heatsink OT [9]**.

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.31	**4584**	**HTsens restart time**	ms	UINT16		20000	120	60000	RW	EXP	FVSY

Setting of the time within which the **Heatsink OT [9]** alarm must be reset in order to perform automatic restart.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.32	**4610**	**Desat restart**		ENUM		Disable			RW	EXP	FVSY

Enabling of automatic restart after the desaturation alarm **Desaturation [5]**. This alarm indicates a short circuit between the motor phases or on the power bridge.

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.33	**4612**	**Desat restart time**	ms	UINT16		2000	1000	10000	RW	EXP	FVSY

Setting of the time within which the **Desaturation [5]** 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	Lev.	Vis.
4.4.34	**4620**	**IOverC restart**		ENUM		Disable			RW	EXP	FVSY

Enabling of automatic restart after the drive **Overcurrent [4]** alarm. This alarm indicates an overcurrent (or short circuit between phases or towards the ground).

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.35	**4622**	**IOverC restart time**	ms	UINT16		2000	1000	10000	RW	EXP	FVSY

Setting of the time within which the **Overcurrent [4]** 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	Lev.	Vis.
4.4.36	**4630**	**OverV restart**		ENUM		Disable			RW	EXP	FVSY

Enabling of automatic restart after the **Overvoltage [1]** 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	Lev.	Vis.
4.4.37	**4632**	**OverV restart**	ms	UINT16		2000	1000	10000	RW	EXP	FVSY

Setting of the time within which the **Overvoltage [1]** 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	Lev.	Vis.
4.4.38	**4640**	**UnderV restart**		ENUM		Enable			RW	EXP	FVSY

Enabling of automatic restart after the **Undervoltage [2]** 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	Lev.	Vis.
4.4.39	**4642**	**UnderV restart time**	ms	UINT16		1000	120	10000	RW	EXP	FVSY

Setting of the time within which the **Undervoltage [2]** 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	Lev.	Vis.
4.4.40	**4650**	**UVRep attempts**		UINT16		5	0	1000	RW	EXP	FVSY

Setting of the maximum number of attempts at automatic restart after the **Undervoltage [2]** alarm before a **Mult Undervoltage alarm** is generated. If this parameter is set to 1000 an infinite number of attempts are available.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.41	**4652**	**UVRep delay**	s	UINT16		240	0	300	RW	EXP	FVSY

Setting of the time within which, if no automatic restarts are executed after the **Undervoltage [2]** alarm, the attempts counter is reset. In this way the number of attempts set in PAR 4650 **Underv res attempts** are still available.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.42	**4654**	**Phloss mov activity**		ENUM		Warning	0	0	RW	EXP	FVSY

Setting the drive behavior in case of “PhLoss mov” alarm that signals the disconnection of a phase of the engine during running condition. The “PhLoss mov” function detects the disconnection of one or more phases of connection of the drive to the engine. This function is only operational when the motor is rotating. The configuration parameters of this function are IPA 4654, 4656, 4674.

0 Ignore
1 Warning
2 Disable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.43	**4656**	**Phloss mov holdoff**	ms	UINT32		200	0	2000	R	EXP	FVSY

Represents the time for which the alarm condition must remain before the alarm is actually generated.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.44	**4674**	**Phloss mov freq thr**	hz	FLOAT		0.5	0.1	5	RW	EXP	FVSY

It represents the minimum frequency threshold exceeded which the function of PhLoss mov becomes operational. Below this threshold the function of PhLoss mov is inactive.
It may be useful to increase this parameter to avoid false positives at low speeds.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.45	**4678**	**Phloss mov code**				0	0	0	W	EXP	FVSY

The hexadecimal value indicates which engine steps have been disconnected.

0x001 Phase U disconnected
0x002 Phase V disconnected
0x004 Phase W disconnected
0x003 Phase U and V disconnected
0x005 Phase U and W disconnected
0x006 Phase V and W disconnected
0x007 Phase U, V, W disconnected

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.46	**4670**	**Optionbus activity**		ENUM		Disable			RW	EXP	FVSY

Setting of the behaviour of the drive in case of an **Opt Bus Fault [17]** alarm.

0 Ignore
1 Warning
2 Disable drive
3 Stop
4 Fast stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.47	**4660**	**PhLoss in activity**		ENUM		Disable			RW	EXP	FVSY

Setting of the behaviour of the drive in case of a **Phaseloss in [16]** alarm. This alarm indicates the absence of a drive power supply phase

0 Ignore
1 Warning
2 Disable drive

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.48	**4662**	**PhLoss in restart**		ENUM		Disable			RW	EXP	FVSY

Enabling of automatic restart after the **Phaseloss in [16]** alarm.

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.49	**4664**	**PhLoss in rest time**	ms	UINT16		1000	120	10000	RW	EXP	FVSY

Setting of the time within which the **Phaseloss in [16]** 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	Lev.	Vis.
4.4.50	**4668**	**PhLoss output test**		ENUM		Enable			RW	EXP	FVSY

Enabling of the output phase loss test.

0 Disabled
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	Lev.	Vis.
4.4.51	**4680**	**GroundFault thr**	perc	FLOAT	10.0	0.0	150.0	RW	INT	FVSY	

Setting of the threshold for the ground short circuit alarm **Ground fault [3]**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.52	**4700**	**Alarm dig out 1 sel**		ENUM		No alarm			RW	INT	FVSY
4.4.53	**4702**	**Alarm dig out 2 sel**		ENUM		No alarm			RW	INT	FVSY
4.4.54	**4704**	**Alarm dig out 3 sel**		ENUM		No alarm			RW	INT	FVSY
4.4.55	**4706**	**Alarm dig out 4 sel**		ENUM		No alarm			RW	INT	FVSY

Setting of the alarm signal to enable on a digital output. The digital output is selected using parameters **Alarm dig out 1 sel...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 Ptc failure
12 Motor OT
13 Drive overload
14 Motor overload
15 Bres overload
16 Phaseloss in
17 Opt Bus fault
18 Opt 1 IO fault
19 Precharge faul
20 Opt enc fault
21 External fault
22 Speed fbk loss
23 Overspeed
24 Speed ref loss
25 Emg stop alarm
26 Power down
27 Phaseloss out
28 OV safety
29 Safety failure
30 Phaseloss mov
31 Ropes change
32 Enable missing
33 Plc1 fault
34 Plc2 fault
35 Plc3 fault
36 Plc4 fault
37 Plc5 fault
38 Plc6 fault
39 Plc7 fault
40 Plc8 fault
41 Plc9 fault
42 Plc10 fault
43 Plc11 fault
44 Plc12 fault
45 Plc13 fault
46 Plc14 fault
47 Plc15 fault
48 Plc16 fault

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.56	**4720**	**Alm autoreset time**	s	FLOAT		0.0	0.0	60.0	RW	EXP	FVSY

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 parameter **Alm autoreset number** (PAR 4722) 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	Lev.	Vis.
4.4.57	**4722**	**Alm autoreset number**		UINT16		3	0	100	RW	EXP	FVSY

Setting of the maximum number of attempted automatic resets.

4.8 DIGITAL INPUTS

4.8.1	**1240**	**Dig inp 1 inversion**	BIT	0	0	1	RW	INT	FVSY
4.8.2	**1242**	**Dig inp 2 inversion**	BIT	0	0	1	RW	INT	FVSY
4.8.3	**1244**	**Dig inp 3 inversion**	BIT	0	0	1	RW	INT	FVSY
4.8.4	**1246**	**Dig inp 4 inversion**	BIT	0	0	1	RW	INT	FVSY
4.8.5	**1248**	**Dig inp 5 inversion**	BIT	0	0	1	RW	INT	FVSY
4.8.6	**1250**	**Dig inp 6 inversion**	BIT	0	0	1	RW	INT	FVSY
4.8.7	**1252**	**Dig inp 7 inversion**	BIT	0	0	1	RW	INT	FVSY
4.8.8	**1254**	**Dig inp 8 inversion**	BIT	0	0	1	RW	INT	FVSY

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

0 Off
1 On

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.8.9	**1260**	**Dig inp 1x inversion**		BIT		0	0	1	RW	INT	
4.8.10	**1262**	**Dig inp 2x inversion**		BIT		0	0	1	RW	INT	
4.8.11	**1264**	**Dig inp 3x inversion**		BIT		0	0	1	RW	INT	
4.8.12	**1266**	**Dig inp 4x inversion**		BIT		0	0	1	RW	INT	

Inversion of the logic status of the function associated with the digital input of the EXP-IO1-ADL500 expansion card.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.8.13	**1110**	**Dig input E mon**		UINT16	16BIT_L	0	0	0	R	EXP	FVSY

These signals represent the state of the corresponding Enable digital input.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.8.14	**1210**	**Dig input 1 mon**		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.15	**1212**	**Dig input 2 mon**		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.16	**1214**	**Dig input 3 mon**		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.17	**1216**	**Dig input 4 mon**		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.18	**1218**	**Dig input 5 mon**		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.19	**1220**	**Dig input 6 mon**		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.20	**1222**	**Dig input 7 mon**		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.21	**1224**	**Dig input 8 mon**		UINT16	16BIT_L	0	0	0	R	EXP	FVSY

These signals represent the logic state of the corresponding digital input.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.8.22	**1230**	**Dig input 1x mon**		UINT16	16BIT_L	0	0	0	R	EXP	
4.8.23	**1232**	**Dig input 2x mon**		UINT16	16BIT_L	0	0	0	R	EXP	
4.8.24	**1234**	**Dig input 3x mon**		UINT16	16BIT_L	0	0	0	R	EXP	
4.8.25	**1236**	**Dig input 4x mon**		UINT16	16BIT_L	0	0	0	R	EXP	

These signals represent the logic state of the corresponding digital input on the EXP-IO1-ADL500 expansion card.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.8.26	**1268**	**Dig input E dest**		ILINK		0	0	0	R	EXP	FVSY
4.8.27	**1270**	**Dig input 1 dest**		ILINK		0	0	0	R	EXP	FVSY
4.8.28	**1272**	**Dig input 2 dest**		ILINK		0	0	0	R	EXP	FVSY
4.8.29	**1274**	**Dig input 3 dest**		ILINK		0	0	0	R	EXP	FVSY
4.8.30	**1276**	**Dig input 4 dest**		ILINK		0	0	0	R	EXP	FVSY
4.8.31	**1278**	**Dig input 5 dest**		ILINK		0	0	0	R	EXP	FVSY
4.8.32	**1280**	**Dig input 6 dest**		ILINK		0	0	0	R	EXP	FVSY
4.8.33	**1282**	**Dig input 7 dest**		ILINK		0	0	0	R	EXP	FVSY
4.8.34	**1284**	**Dig input 8 dest**		ILINK		0	0	0	R	EXP	FVSY

Selection of the destination of the associated digital input.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.8.35	**1290**	**Dig input 1x dest**		ILINK		0	0	0	R	EXP	
4.8.36	**1292**	**Dig input 2x dest**		ILINK		0	0	0	R	EXP	
4.8.37	**1294**	**Dig input 3x dest**		ILINK		0	0	0	R	EXP	
4.8.38	**1296**	**Dig input 4x dest**		ILINK		0	0	0	R	EXP	

Selection of the destination of the digital input of the associated EXP-IO1-ADL500 expansion card.

4.9 DIGITAL OUTPUTS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.9.1	**1430**	**Dig out 1 inversion**		BIT		0	0	1	RW	INT	FVSY
4.9.2	**1432**	**Dig out 2 inversion**		BIT		0	0	1	RW	INT	FVSY
4.9.3	**1434**	**Dig out 3 inversion**		BIT		0	0	1	RW	INT	FVSY
4.9.4	**1436**	**Dig out 4 inversion**		BIT		0	0	1	RW	INT	FVSY

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

0 Off
1 On

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.9.5	**1440**	**Dig out 1x inversion**		BIT		0	0	1	RW	INT	
4.9.6	**1442**	**Dig out 2x inversion**		BIT		0	0	1	RW	INT	

Inversion of the logic status of the function associated with the digital output of the EXP-IO1-ADL500 expansion card.

0 Off
1 On

4.10 ANALOG INPUTS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.10.1	**1600**	**Analog input mon**	cnt	INT16	16BIT_H	0	0	0	R	ESY	FVSY

The value of the voltage of the analog input is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.10.2	**1602**	**Analog inp type**		ENUM		-10V..+10V			RW	INT	FVSY

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 (± 10V).

0 -10V..+10V
1 0.20mA , 0.10V
2 4..20mA

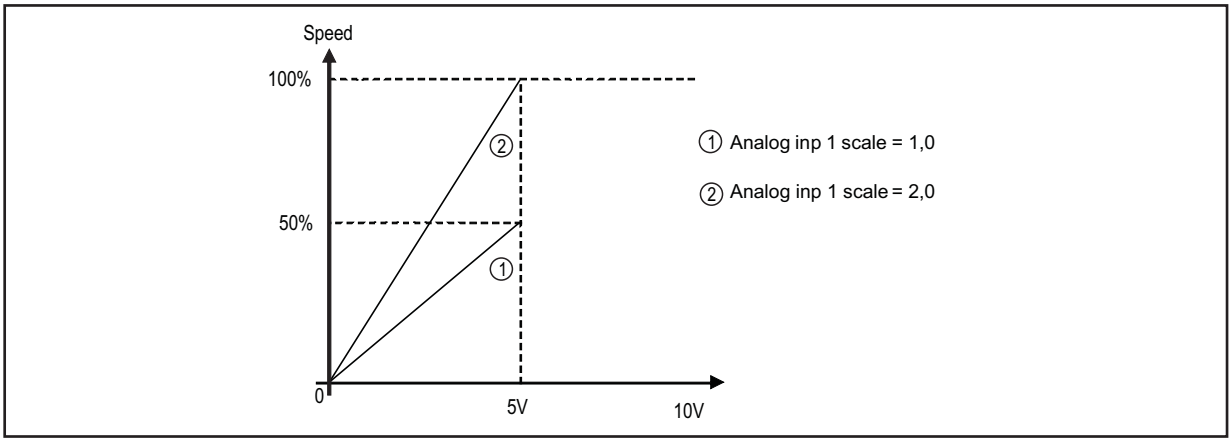
Select option **0** in order to connect a maximum voltage of ±12.5V (typically ±10V/5mA) to the analog input. If the signal is used as a reference, reverse the direction of rotation by inverting the voltage polarity.

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. The signal must be positive.

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.10.3	**1604**	**Analog inp scale**		FLOAT		1.0	-10.0	10.0	RW	INT	FVSY

Setting of a multiplier factor to be applied to the analog input.



Example:

The speed reference of a drive is assigned with a max external voltage of 5V. With this value the drive must reach the maximum speed allowed (set using PAR 680 **Full scale speed**).

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.10.4	**1606**	**An inp offset tune**		BIT		0	0	1	RW	INT	FVSY

Self-tuning command for the offset of the analog input. 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, PAR 1606 **An inp 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 Offset ing an.

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	Lev.	Vis.
4.10.5	**1608**	**An inp gain tune**		BIT		0	0	1	RW	INT	FVSY

Self-tuning command for the analog input gain. Automatic fine tuning of the input. When this command is sent, **An inp 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 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 **An inp gain tune** 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	Lev.	Vis.
4.10.6	**1610**	**Analog inp filter**	ms	FLOAT		10	2	100	RW	EXP	FVSY

Filter on the measurement of the 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	Lev.	Vis.
4.10.7	**1612**	**Analog inp top**	cnt	INT16		16384	-32768	+32767	RW	EXP	FVSY

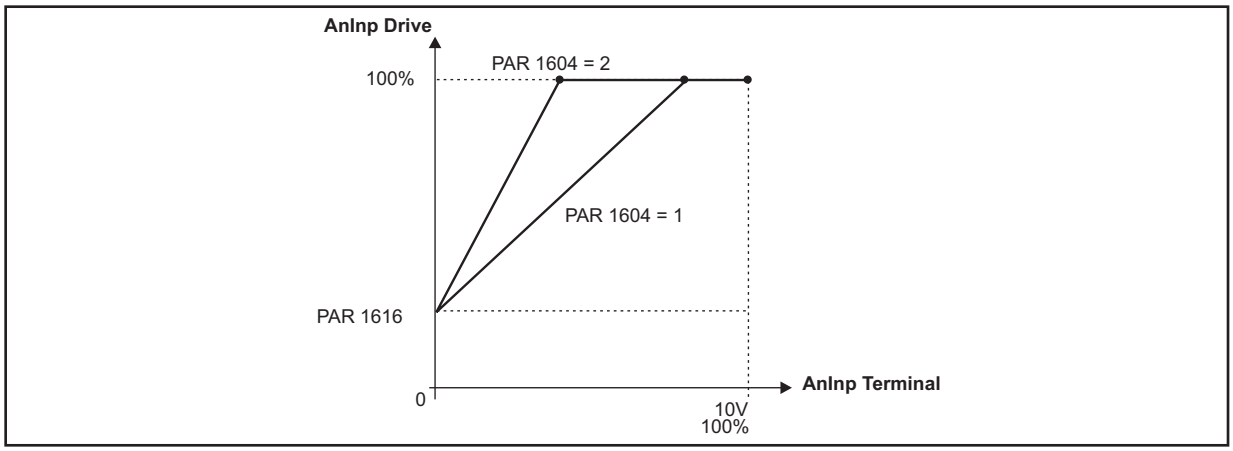
Setting of the upper speed reference limit as a function of the voltage (or current) of the analog reference.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.10.8	**1614**	**Analog inp bottom**	cnt	INT16		-16384	-32768	+32767	RW	EXP	FVSY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.10.9	**1616**	**Analog inp offset**	cnt	INT16		0	-32768	+32767	RW	EXP	FVSY

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



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.10.10	**1618**	**Analog inp gain**		FLOAT		1.0	-10.0	10.0	RW	EXP	FVSY

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

Example :

An external analog reference only reaches a maximum of 9.8V instead of 10V. 1.020 (10V : 9.8V) is entered as the **An inp gain tune** (PAR 1608) parameter.

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	Lev.	Vis.
4.10.11	**1626**	**An inp sign src**		LINK	16BIT_L	6000			RW	INT	FVSY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.10.12	**1632**	**Analog input dest**		ILINK		0	0	0	R	EXP	FVSY

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

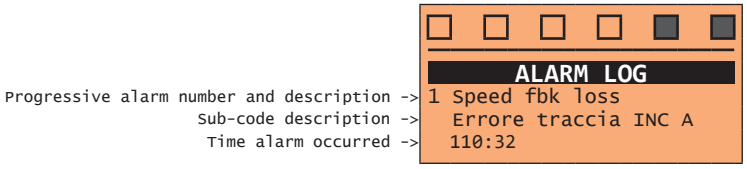
4.11 ALARM LOG

This is the menu in which the log of previous alarms is saved, with the time the alarm occurred (in relation to the PAR 510 **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 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.



4.12 LIFE TIME

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.12.1	**510**	**Time drive power on**	h.min	UINT32		0	0	0	R	ESY	FVSY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.12.2	**512**	**Time drive enable**	h.min	UINT32		0	0	0	R	ESY	FVSY

The time for which the drive has been enabled is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.12.3	**514**	**Number power up**		UINT16		0	0	0	R	ESY	FVSY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.12.4	**516**	**Time fan on**	h.min	UINT32		0	0	0	R	ESY	FVSY

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

5 LIFT

5.1 LIFT MONITOR

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.1.1	**14014**	**Trip number**		UINT32			-	-	R	ESY	FVY

Displays the lift trip counter, which is incremented, when the Start lift signal is active, each time a start is signalled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.1.2	**14016**	**Sequence state**		ENUM					R	ESY	FVY

View the logical state the drive is in.

The sequence of states where the drive can be found is listed below:

0 Idle
1 Cont close
2 Drive ready
3 Brake open
4 Smooth start
5 Multispeed
6 Waiting 0 spd
7 Zero speed
8 Brake close
9 Cont open
10 Not drive ok
91 SC cont mon

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.1.3	**14210**	**Actual speed ref**	m/s	FLOAT			-	-	R	ESY	FVY

Display of set speed reference in m/s.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.1.4	**14242**	**Actual Cabin spd**	m/s	FLOAT			-	-	R	ESY	FVY

Display of car speed in m/s. This speed value tends to follow the current speed reference.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.1.5	**14032**	**Cabin position**	m	FLOAT	-	-	-	-	RW	INT	FVSY

Parameter indicating the deceleration distance required for the car to stop right at the floor based on the set speed and acceleration values. This value is useful for correctly positioning any deceleration magnets.

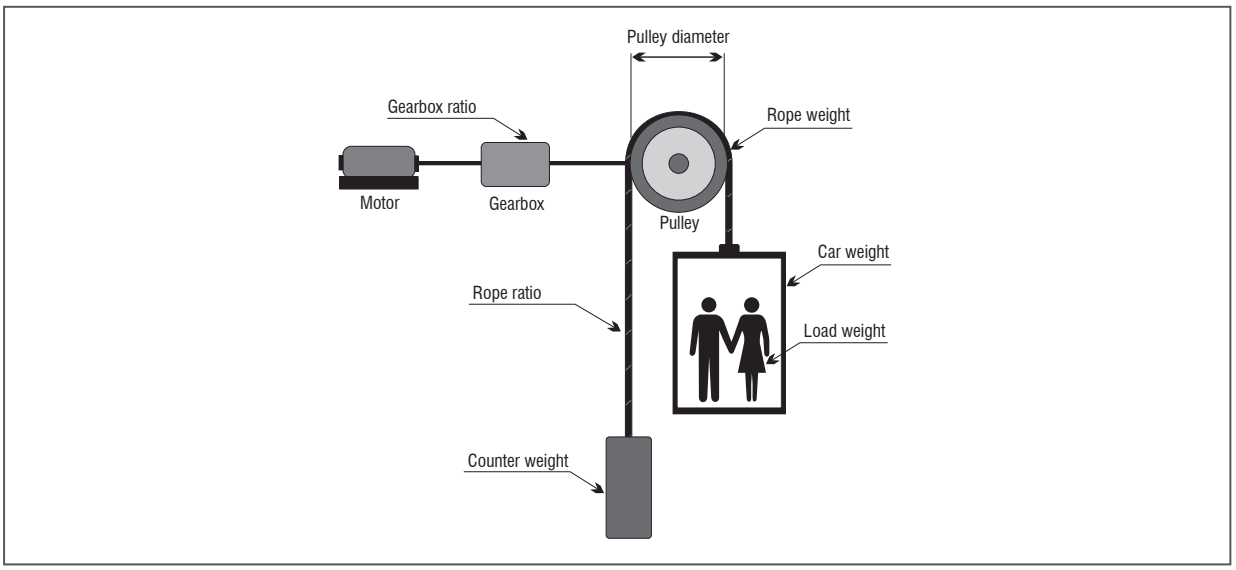
5.2 MECHANICAL DATA

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.

Mechanical constant = (π *Pulley diameter)/Reduction 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 (**Cabin speed, Pulley diameter, Gearbox ratio**).

The rewriting of the mechanical constant determines the recalculation of the full scale speed (PAR 680), which is set using the motor revs required to reach the maximum system speed through the mechanical ratios set.

Weights and inertia

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

The calculated inertia value, is automatically written to the parameter (PAR 2240); this operation allows the basic speed loop gains to be recalculated.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.2.1	**11006**	**Cabin speed**	m/s	FLOAT		1	0	10	RWZ	INT	FVY

Sets the maximum speed of system operation. This is also used for the recalculation of the full scale speed (PAR 680).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.2.2	**11008**	**Mechanical calc mode**		ENUM		0			RW	INT	FVY

Setting the unit calculation method, based on cabin and engine speed (Direct Mode) or based on mechanical ratios (Mechanical Data Mode).

0 Direct mode

1 Mechanical data

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.2.3	**11010**	**Gearbox ratio**		FLOAT		45 (1)	1	200	RW	INT	FVY

Sets the reduction ratio between motor and pulley.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.2.4	**11164**	**Rope ratio**		FLOAT		1 (2)	1	10	RWZ	INT	FVY

Sets the reduction ratio due to rope windings.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.2.5	**11012**	**Pulley diameter**	m	FLOAT		0.6 (0.32)	0	5	RWZ	INT	FVY

Setting of the diameter of the pulley.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.2.6	**11150**	**Car weight**	kg	FLOAT		400	0	10000	RW	INT	FVY

Setting of the weight of the cabin (intended as the total empty weight of everything hanging from the ropes: frame, walls, door operator, appliances, etc.).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.2.7	**11152**	**Counter weight**	kg	FLOAT		1000	0	10000	RW	INT	FVY

Setting of the weight of the counterweight, including its frame.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.2.8	**11154**	**Load weight**	kg	FLOAT		450	0	10000	RW	INT	FVY

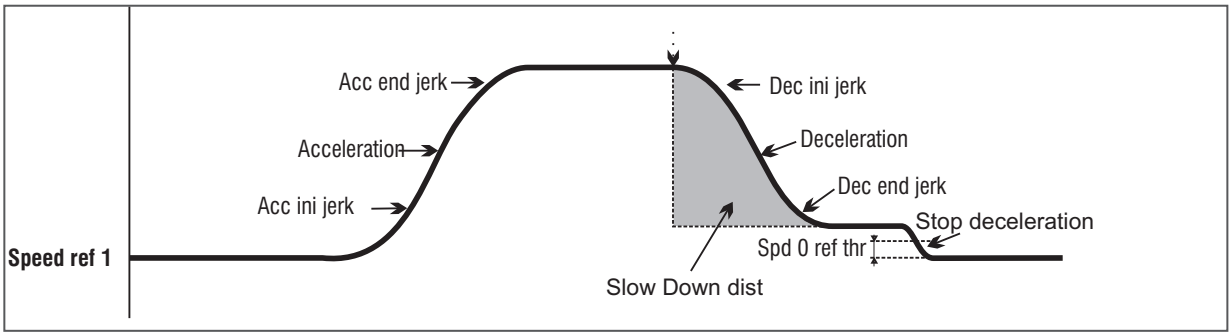
Setting of the weight of the maximum load for system dimensions.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.2.9	**11156**	**Rope weight**	kg	FLOAT		20	0	1000	RW	INT	FVY

Setting of the weight of the cable (intended as the total weight of all car suspension ropes).

5.3 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 PAR 11040 **Accel initial jerk**, PAR 11042 **Acceleration** and PAR 11044 **Accel 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 PAR 11046 **Decel initial jerk**, PAR 11048 **Deceleration** and PAR 11050 **Decel 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	Lev.	Vis.
5.3.1	**11040**	**Accel initial jerk**	m/s^3	FLOAT		0.2	0.001	20	RW	ESY	FVY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.3.2	**11042**	**Acceleration**	m/s^2	FLOAT		0.600	0.001	10	RW	ESY	FVY

Setting of the maximum acceleration value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.3.3	**11044**	**Accel end jerk**	m/s^3	FLOAT		0.6	0.001	20	RW	ESY	FVY

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

Menu	PAR	Descrizione	UM	Tipo	FB BIT	Def	Min	Max	Acc	Liv.	Vis.
5.3.4	**11054**	**Percent acc factor**	%	FLOAT		100	10	1000	RW	INT	FVY

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	Lev.	Vis.
5.3.5	**11046**	**Decel initial jerk**	m/s^3	FLOAT		0.6	0.001	20	RW	ESY	FVY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.3.6	**11048**	**Deceleration**	m/s^2	FLOAT		0.600	0.001	10	RW	ESY	FVY

Setting of the maximum deceleration value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.3.7	**11050**	**Decel end jerk**	m/s^3	FLOAT		0.500	0.001	20	RW	ESY	FVY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.3.8	**11056**	**Percent dec factor**	%	FLOAT		100	10	1000	RW	INT	FVY

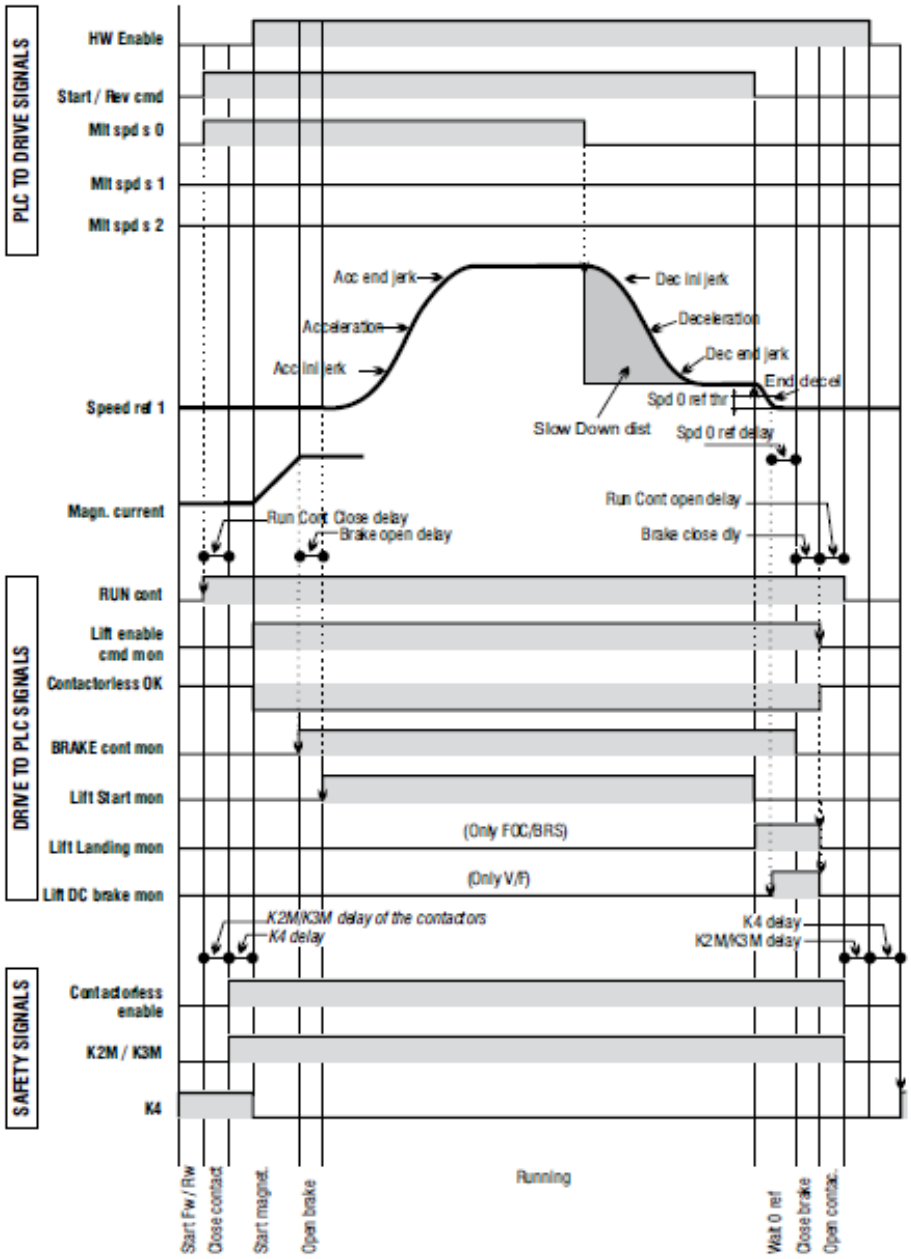
Setting of the deceleration factor multiplier.
If set to 100 the ramp uses the factors entered in the parameters.
If set to a value of less than 100 the lift will tend to decelerate over a longer distance.
If set to a value of more than 100 the lift will tend to decelerate over a shorter distance.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.3.9	**11052**	**Stop deceleration**	m/s^2	FLOAT		0.600	0.001	10.000	RW	ESY	FVY

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

5.4 SEQUENCES

This menu illustrates the parameters used to manage and define the lift travel according to the input status and alarms. Below is summarised the structure of the lift sequences in the case of a floor call command, once the command is received and the floor number to be reached is stored, the internal positioner starts and automatically executes the trajectory until the arrival floor is reached with direct arrival at the floor.
In the case of jog running, the deceleration sequence starts at the moment the jog command is dropped.



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 stop** 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 **Contactor close dly** 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** (PAR 11066).
2 At the end of **Smooth start time** (PAR 11066), movements are managed by the multispeeds and S-shaped ramp
3 When the set speed is exceeded, the **Brake mon** (PAR 3712) 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 (**ASY 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,** PAR 11068) 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 dly** (PAR 11072) 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	Lev.	Vis.
5.4.1	**11060**	**Sequence start stop**		ENUM		Start fwd/rev	-	-	RWZ	ESY	FVY

Setting the PAR 3702 **Run cont mon** command activation mode.

0 Start fwd/rev
1 Enable

When set to 0, output command PAR 3702 **Run cont mon** is activated, giving as input only signal PAR 11222 **Start fwd cmd src** or PAR 11224 **Start rev cmd src**.

When set to 1, output command PAR 3702 **Run cont mon** is activated, giving as input both the enable signal and signal PAR 11222 **Start fwd cmd src** or PAR 11224 **Start rev cmd src**.

Note! The sequence of operation is the same whether you use a traditional brake or the EBC device.

Note! If EBC is used, in the absence of CAN communication between EBC and ADL, if the lack of communication occurs before you exceed the maximum time of the brake open delay then the drive stops in EBC alarm failure if instead the lack of communication CAN occurs after this time the drive tries to carry on the whole sequence until the stop sequence where, The Run Contactor command is also removed at the brake closing command and the EBC failure alarm is activated.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.4.2	**11062**	**Contactor close dly**	ms	INT16/32		200	0	10000	RW	ESY	FVY

Setting of the delay time after closing the contactor.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.4.3	**11064**	**Brake open delay**	ms	INT16/32		500	0	10000	RW	ESY	FVY

Setting of delay time after opening the brake.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.4.4	**11078**	**Speed 0 threshold**	rpm	INT16		30 (1)	0	10000	RW	INT	FVY

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	Lev.	Vis.
5.4.5	**11080**	**Speed 0 delay**	ms	UINT16		400	0	10000	RW	INT	FVY

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	Lev.	Vis.
5.4.6	**11086**	**Door open speed**	m/s	FLOAT		0	-10000	10000	RWZ	EXP	FVY

Setting of the door opening speed.

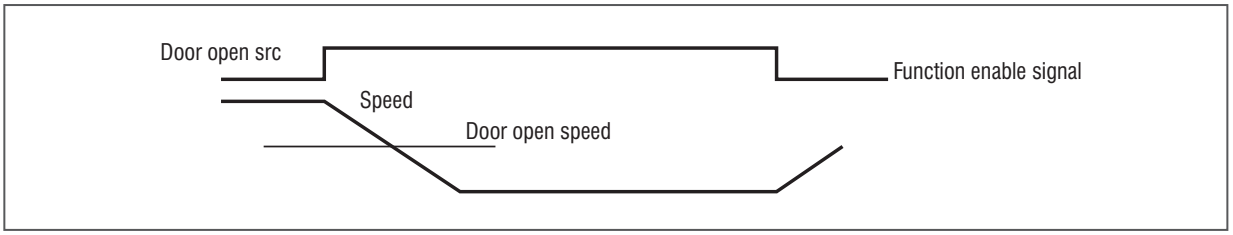
Source to enable brake release through the digital input. In standard sequence brake release is controlled by the drive and therefore this parameter is set to ONE. In case that brake release should be conditioned

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.

Note! Under no circumstances can the drive bypass the safeties. This task is delegated to special safety modules external to the drive.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.4.7	**11070**	**Current down delay**	ms	INT16/32		0 (800)	0	10000	RW	INT	Y

The purpose of this function is to avoid that after the brake is closed, the motor torque is removed instantaneously, causing bothersome stress inside the cabin.

To avoid this phenomenon, after closing the brake, the current limits are brought from the active value during travel to zero in the time set here.

Note! Function not active in asynchronous motor control mode.

In synchronous motor control mode the application automatically sets the parameter PAR 2354 **Torque curr lim** sel to "T limit src" and PAR 2358 **Torque limit src** to "Ramp down limit".

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.4.8	**11068**	**Brake close delay**	ms	INT16/32		500	0	10000	RW	ESY	FVY

Setting of the delay time after closing the brake.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.4.9	**11072**	**Contactor open dly**	ms	INT16/32		200	0	10.000	RW	ESY	FVY

Setting of the contactor opening delay time.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.4.10	**11074**	**SC cont open delay**	ms	INT16/32		0 (500)	0	2000	RW	EXP	Y

Setting of the delay for the opening of the short-circuit contactor between the motor phases.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.4.11	**11244**	**Inversion motor rot**		ENUM		Not inverted	-	-	RWZ	INT	FVY

Reversal of the motor rotation direction.

0 Not inverted

1 Inverted

Setting **0** does not reverse the direction of rotation.

Setting **1** reverses the direction of rotation.

International standards require that a positive reference corresponds to the motor rotating in a clockwise direction as seen from the drive side (shaft).

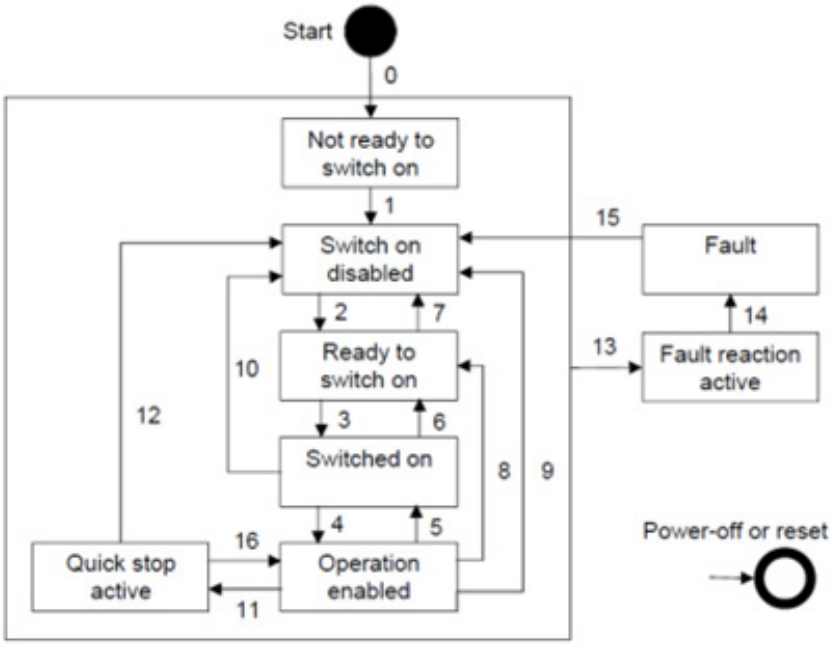
For correct operation, the control algorithms provide that a positive speed reference corresponds to a positive speed measurement.

5.5 417 PROFILO

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.5.1	**14044**	**417 state machine**		ENUM		-	-	-	R	EXP	FVSY

This parameter indicates in which state the drive's state machine with DS417 application is.
The states and their evolution follow the CiA-402 2016 standard (page 24)
The permitted states are:

255 PSTART
0 N_RDY_TO_SW_ON
64 SWITCH_ON_DIS
33 RDY_TO_SWT_ON
35 SWITCHED_ON
39 OPER_ENABLED
7 QUICKSTOP_ACT
15 FLT_REACT_ACT
15 PFAULT



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.5.2	**14024**	**OperationMode**		ENUM		-	-	-	R	INT	FVSY

Parameter indicating which operating mode the drive is in.
The permissible modes are:

1 position
3 speed
0 null

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.5.3	**14028**	**Speed ref in VelMode**	mm/s	INT32		-	-	-	R	INT	FVSY

This parameter reports the speed reference in the velocity profile operating mode.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.5.4	**14026**	**Speed ref in PosMode**	mm/s	INT32		-	-	-	R	INT	FVSY

This parameter reports the position reference in the velocity profile operating mode.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.5.5	**14030**	**Pos ref in PosMode**	mm	INT32		-	-	-	R	INT	FVSY

This parameter reports the position reference in the position profile operating mode and indicates the absolute position to which the drive is to be brought, a position that is updated by the controller from plan to plan.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.5.6	**10124**	**Absolute enc pulses**		FLOAT	-	1024	1	1000000	RW	EXP	FVSY

This parameter shows the number of pulses/revolution of the absolute encoder that tracks the position of the car.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.5.7	**11076**	**Distance for revolut**	mm	FLOAT	-	458	1	10000	RW	EXP	FVSY

This parameter reports the space covered by the car in an encoder revolution. This parameter, together with parameter 10124 absolute encoder pulses and parameter 14030 Ref pos in ModPos allows the drive to calculate the position of the car relative to the 14030 target position.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.5.8	**11140**	**417-pos acq time**	s	INT32	-	0	0	1000	RW	EXP	FVSY

This parameter allows a correction to be made in the calculation of the traveled space if the lift controller is particularly slow. By default, this value is set to zero.

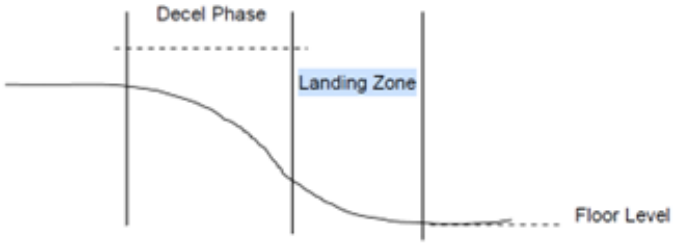
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.5.9	**14096**	**Drv->417 status word**	Hex	INT32	-	-	-	-	R	EXP	FVSY

Parameter reporting in hexadecimal value the status word sent from time to time from the drive to the control board of the lift.

5.6 417 CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.6.1	**11000**	**Landing zone**	m	FLOAT	-	0	0	10	RW	INT	FVSY

This parameter defines the start of the landing zone. The distance between the start of the landing zone and the landing level is expressed in metres.



As soon as the drive finds itself in the landing zone, it recalculates the parameters to ensure correct arrival at the landing. This parameter, together with the recalculation, allows for a more accurate landing arrival by taking into account any previous slips.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.6.2	**11016**	**Final adjust**	mm	FLOAT	-	0	0	1000	RW	INT	FVSY

This parameter defines an offset that is added to the end point calculated by the protocol.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.6.3	**11018**	**Final adjust type**		ENUM		Calc	-	-	RW	INT	FVSY

By enabling (ON) this parameter, the trend in the landing zone assumes a straight line. If this value is OFF, the arrival curve calculated by the protocol, which also benefits from par 11000 and 11016, is used.

OFF Calc
ON Rectilinear

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.6.4	**11276**	**Comp-P gain**		FLOAT	-	0	-	-	RW	EXP	FVSY

Parameter which sets the proportional gain used during deceleration compensation. The parameter is active if enabled via parameter 11256 Enable compensation = ON.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.6.5	**11254**	**Comp-I gain**		FLOAT	-	0	-	-	RW	EXP	FVSY

Parameter setting the integral gain used during deceleration compensation. The parameter is active if enabled via parameter 11256 Enable compensation = ON.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.6.5	**11256**	**Compensation Enable**	BOOL	-	On	-	-	RW	EXP	FVSY	

Parameter enabling compensation during deceleration via specific proportional (par 11276) and integral (par 11254) gain parameters.

5.7 LIFT OUT

Outputs

The lift control output signals are directly accessible from the selection lists used to configure the drive relay outputs, according to the following table:

PAR		Description
3700	**Lift enable**	Enable lift command
3702	**Run cont mon**	Close contactor command
3704	**Up cont mon**	Up contactor command
3706	**Down cont mon**	Down contactor command
3708	**Brake cont mon**	Brake command
3710	**Lift dc brake**	DC brake function command
3712	**Brake mon**	Brake control signal
3714	**Door open mon**	Open door command
3716	**Lift start**	Start lift command
3718	**Safe Brake Test**	Safe Brake Test alarm signal
3720	**Lift statusWord**	Contains pairs of the StatusWord (selectable from SelLiftStatWord)
3722	**Brake mon**	Second brake command
3724	**SC Cont mon**	Control of the contactor of the suicide circuit or short circuit of the motor phases
3726	**Ramp down limit**	Ramp down current limit
3728	**EBC Ok**	Indication of the correct functioning of the EBC feedback (equivalent to the feedback of the brake contactor of a traditional brake supply circuit)
3730	**Lift wdec input**	Connected to the selector for LifWDecomp

The set of lift output signals composes the “Lift statusWord”; below is the meaning of each single bit. This word is then indicated in parameter PAR 3720 **Lift statusWord** and in **DW1 fieldbus Tx**.

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
6	**Brake2**	Brake control signal
7	**DoorOpen**	Open door command
8	**Drive Ok**	Drive not in alarm condition signal
9	**SpeedIsZero**	Speed less than 0 limit signal
10	**SpeedRefIsZero**	Speed reference less than 0 limit signal
11 ... 12		

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.7.1	**1410**	**Dig output 1 src**		LINK	16BIT_L	6000			RW	INT	
5.7.2	**1412**	**Dig output 2 src**		LINK	16BIT_L	6000			RW	INT	
5.7.3	**1414**	**Dig output 3 src**		LINK	16BIT_L	6000			RW	INT	
5.7.4	**1416**	**Dig output 4 src**		LINK	16BIT_L	6000			RW	INT	

Selection of the origin (source) of the destination associated with the digital output. 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	Lev.	Vis.
5.7.5	**1420**	**Dig output 1x src**		LINK	16BIT_L	6000			RW	INT	
5.7.6	**1422**	**Dig output 1x src**		LINK	16BIT_L	6000			RW	INT	

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.7.7	**11016**	**LiftEnable out delay**		FLOAT	0	0	0	5	RW	EXP	FVY

Setting of the delay time of the enable lift output.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.7.8	**14104**	**Command output mon**	Hex		UINT32				R	ESY	FVY

Hexadecimal display of the status of outputs, see description "Lift status word" (table beginning section) for the meaning of individual bits.

5.8 LIFT IN

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.

Bit	Command	Description	Default source
0	**EnableCmd**	Enable command	Dig input enable
1	**StartFwdCmd**	Start forward command	Dig input 1x
2	**StartRevCmd**	Start reverse command	Dig input 2x
3	**MltSpd S0**	Multispeed 0 sel	Dig input 4x
4	**MltSpd S1**	Multispeed 1 sel	Dig input 5x
5	**MltSpd S2**	Multispeed 2 sel	Dig input 6x
6	**ContFbk**	Contactor close contact	Run cont mon
7	**BrakeFbk**	Brake close contact	Brake cont mon
8	**DoorOpenEna**	Source for enabling the door open function	Null
9	**DoorFbk**	Door close contact	Null
10	**Emergency mode**	Emergency operation command	Dig input 3x
11	**InvRampSrc**	Command to invert the speed direction	Null
12	**UpperLimit**	Travel upper limit signal	Null
13	**LowerLimit**	Travel lower limit signal	Null
14	**Brake fbk A3**	Brake failure signal	Null
15	**Brake 2 fbk**	Second brake failure signal	Brake cont mon

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.8.1	**11220**	**Lift enable cmd src**		ENUM		Dig input E mon	-	-	RW	INT	FVY

Setting of the source for the enable command.

The list of functions that can be associated with the digital inputs are in the "**LiftInputAdlCmd**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.8.2	**11232**	**Contactor fbk src**		ENUM		Run cont mon	-	-	RW	INT	FVY

Sets the source of contactor status signal.
The list of functions that can be associated with the digital inputs are in the "**LiftInputAdlCmd**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.8.3	**11236**	**Brake fbk src**		ENUM		Brake cont mon	-	-	RW	INT	FVY

Sets the source of brake status signal.
The list of functions that can be associated with the digital inputs are in the "**LiftInputAdlCmd**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.8.4	**10096**	**Sel conferma 2 freno**		ENUM		Mon cont freno	-	-	RW	INT	FVY

Impostazione della sorgente della seconda segnalazione dello stato del freno.

L'elenco delle funzioni associabili agli ingressi digitali sono nella lista di selezione "**LiftInputAdlCmd**".

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.8.7	**10096**	**Brake 2 fbk src**		ENUM		Brake cont mon	-	-	RW	INT	FVY

Sets the source of the second brake status signal.

The list of functions that can be associated with the digital inputs are in the "**LiftInputAdlCmd**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.8.8	**11272**	**Fast Enable src**		ENUM		Null	-	-	RW	INT	FVY

This parameter enables the Fast Enable command. The selected input must be controlled by the controller.

The enable should be completed with contactorless operation.

0 Null
1 Dig input 1
2 Dig input 2
3 Dig input 3
4 Dig input 4
5 Dig input 5
6 Dig input 6
7 Dig input 7
8 Dig input 8

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.8.9	**11820**	**Brake release src**		ENUM		Null	-	-	RW	EXP	VY

The assignable functions are on the "**LiftInputAdlCmd**" selection list.

Manual emergency manoeuvre. This function allows the cabin to move when there is a power failure in order to bring it to the closest floor by gravity.

- This manoeuvre can be performed only when the drive is in emergency mode, which the control card indicates with the "Emergency Mode" digital input. There must be a Brake Open digital input connected to a "Brake Open" button on the control panel that enables cabin movement. The command can be activated by simultaneous activation of the frw and rev inputs after setting parameter 11820 to the value FWD+REV.
- When the button is pushed the inverter opens the brake contactor via the "Brake Contactor" Relay output. Parameter PAR 11094 set in Brake + Run mode also allows activation of the output of the run contactors located along the brake coil power supply line.
- The operator has to keep pressed the "Brake Open" button to move the cabin.
- PAR 11822 **Em Max spd** sets the maximum speed that the cabin (or the motor) can have during this manoeuvre.
- If the cabin reaches the maximum allowed speed, the drive locks the brake for the time T set by parameter 11824 **Brake lock time**, disabling use of the button (which will not release the brake even if pushed).
- When activating this manoeuvre, the display (both optional and built-in) shows the current cabin speed (or motor speed if set in rpm) and direction (Fwd or rev).
- This manoeuvre is disabled in case of inspection.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.8.10	**11832**	**Safe Brake Test src**		ENUM		Null	-	-	RW	EXP	FVY

Sets the source that enables the Safe Brake Test.
The list of functions that can be associated with the digital inputs are in the "**LiftInputAdlCmd**" selection list.

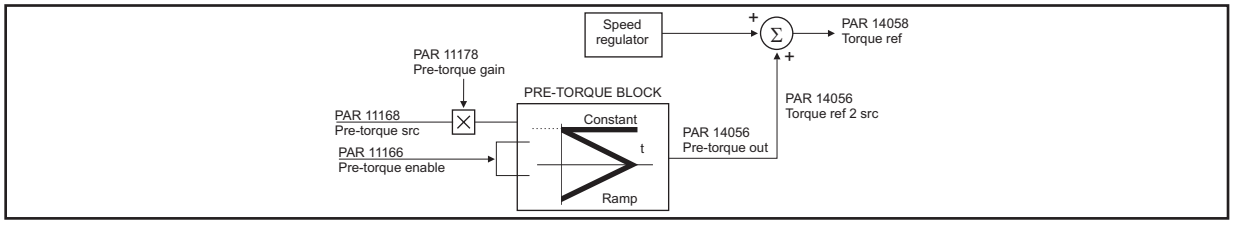
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.8.11	**14102**	**Command input mon**	Hex	UINT32			-	-	R	ESY	FVY

Hexadecimal display of input status, see "Lift control word" description (table at the beginning of this section).

5.9 PRE TORQUE

The Pre-torque function helps to guarantee a linear start without any initial jerk. This is possible by setting a torque value that corresponds to the load before opening the brake.

The initial torque value applied to the motor as well as the direction of the applied torque can be provided through an appropriately scaled analogue input (load cell on the lift cabin) or with a fixed torque value (in this case the value is optimised for one load condition only).



Note! The pre-torque function is active in the SYN FOC motor control mode only.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.9.1	**11166**	**Pre-torque enable**		BIT		Off	-	-	RWZ	EXP	VY

Enabling of the pre-torque function.

0 Off
1 On

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.9.2	**11168**	**Pre-torque source**		ENUM		Init PreTorque	-	-	RW	EXP	VY

Selection of the origin (source) of the signal used for the pre-torque function.

1600 Analog in 1
4034 Fieldbus M->S2
4044 Fieldbus M->S3
4054 Fieldbus M->S4
4064 Fieldbus M->S5
4074 Fieldbus M->S6
4084 Fieldbus M->S7
4094 Fieldbus M->S8
4104 Fieldbus M->S9
4124 FieldbusM->S10
4114 FieldbusM->S11
4134 FieldbusM->S12
4144 FieldbuM->S13
4154 FieldbusM->S14
4164 FieldbusM->S15
4174 FieldbusM->S16
11170 Init pretorque

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.9.3	**11170**	**Init pre-torque**	%	INT16/32		0	-100	100	RWZ	EXP	VY

Setting of the reference value used in the pre-torque function only if the PAR 11168 **Pre-torque source** parameter is set to 11170 **Init pre-torque**.

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	Lev.	Vis.
5.9.4	**11172**	**Pre-torque ramp up**	ms	INT16/32		0	0	10000	RWZ	EXP	VY

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	Lev.	Vis.
5.9.5	**11174**	**Pre-torque ramp down**	ms	INT16/32		0	0	60000	RWZ	EXP	VY

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	Lev.	Vis.
5.9.6	**11176**	**Pre-torque offset**	%	FLOAT		0	-100	100	RWZ	EXP	VY

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	Lev.	Vis.
5.9.7	**11178**	**Pre-torque gain**		FLOAT		1.0	-100	100	RWZ	EXP	VY

Sets the gain to be applied to the source of the torque value to be used in the function.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.9.8	**14040**	**Pre-torque input**	%	INT16/32			-	-	R	EXP	VY

The reference value sampled at start is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.9.9	**14056**	**Pre-torque out**	%	INT16/32			-	-	R	EXP	VY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.9.10	**14058**	**Torque reference**	%	INT16/32			-	-	R	EXP	VY

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

5.10 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 terminal relating to the source PAR 11242 **Emergency mode src,** which, if active, disables the antirollback function (to limit power consumption) and the **Undervoltage [2]** 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 carried out according to the selected mode (PAR 11262 **Autoselect direction**).

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

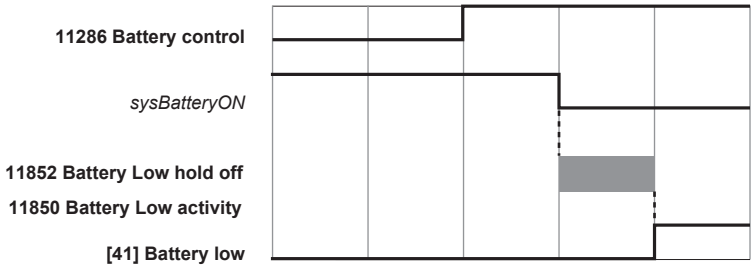
Operation with Emergency Module Supplier (EMS)

If the emergency mode is active, the Undervoltage [2] alarm will be disabled allowing the drive to operate powered on the DC link. See ADL500 HW+QS Manual section 7.3.3 and the EMS manual for the connection.

EMS system management and monitoring function

This function allows the connection of the batteries to be checked.

This function is enabled with parameter PAR 11286 **Battery control**. If the batteries are disconnected for longer than the time set in parameter PAR 11852 **BatteryLow Hold off,** the [41] **No battery** alarm is tripped according to the action defined in parameter PAR 11852 **BatteryLow Activity**.



Battery saving mode of operation

Operation with Uninterruptible Power Supply (UPS) Single-phase

When the emergency is activated, the Drive can be powered with 230V single-phase UPS. For connection see ADL500 HW+QS (Quick Start Guide) section 7.9.3.1.

The function can work with two modes: (3) “Battery Saving” and (4) “BattSav+Rec”.

Depending on how you set the PAR 11262 **Autoselect direction** will be activated the first or the second new function.

The principle of operation of the function of replenishment to the floor in the event of a power outage with battery savings works as follows: with emergency input activated the drive tries to move the engine using only the imbalance as for a manoeuvre for unbalance that opens only the brake (and possibly also the gear switch setting the parameter PAR 11094 **Brake release type** = (1) Brake + Gear), if within a preset time from PAR 11092 **Em min spd time** the car moves and then stops once you reach the emergency speed set by PAR 11822 **Em max speed** (max speed in emergency) then the cabin continues for alternating imbalance to stop (when you reach the maximum speed in emergency). If, however, the cabin does not reach this speed within this time, the manoeuvre for imbalance is interrupted and then continue with the motor powered and with a maximum speed set through the parameter 11014 **Em max speed sav bat**.

Attention: the PAR 11824 **Brake lock time**, which defines the waiting time when the button is pressed between the release of the brake for reached max speed in emergency and the subsequent closing of the brake, must be less than PAR 11092 **Em min spd time** otherwise the maneuver turns into energized maneuver.

In the case of selection “Battery Saving” (3) the direction that the motor takes is that indicated by the input of ascent or descent.

In the case of selection “Battsav+Rec” (4) the direction taken by the motor is independent of the enabled input up or down and follows the reccomended direction previously stored in the drive.

Summing up, in this maneuver first the emergency input must be activated, then the control board must command a movement of ascent or descent also enabling the enable as a normal maneuver (except that the multispeed inputs are not considered and the motor speed is regulated by the PAR 11260 **Emergency mode speed**), then the cabin will move for imbalance or so with energized motor.

Once the car has reached the floor is the control board that controls the engine stop by removing the climb or descent references and then the enable.

Manual emergency mode for imbalance

The purpose of the function is to allow the movement of the cabin when there is no network in order to bring it to the nearest floor by simple gravity.

The maneuver is possible only when the drive is in emergency condition, signaled by the control board through-towards the digital input “Emergency Mode”. A digital input (Brake Open) must be connected to a “Brake Open” button in the control panel that enables the movement of the cab. The command can be activated by simultaneous activation of the inputs frw and rev after setting the parameter 11820 to the value “Av + Ind”.

When the button is pressed, the inverter via the Relay output “Brake Contactor”, will open the brake contactor. The PAR 11094 parameter set in “Brake + Gear” mode allows to activate also the output of the gear contactors located along the supply line of the brake coil.

The operator must press and hold the “Brake Open” button to move the car.

The PAR 11822 **Em max speed** sets the maximum speed that the car (or engine) can have during the maneuver.

If the car reaches the maximum speed allowed the drive locks the brake for the time T set in PAR 11824 **Brake lock time**, disabling the use of the button (even if pressed it does not release the brake).

By activating this operation, the display (both optional and integrated) displays the current cabin speed (or engine if rpm is set) and the Fwd or Rev direction. In case of an inspection, the manoeuvre is disabled.

Automatic emergency manoeuvre for imbalance

The manoeuvre is identical to the manual emergency manoeuvre and differs only in that input 11820 is activated automatically by the lift control board.

Emergency manoeuvre with engine energized by UPS or batteries + EMS module

Selecting in par 11262 the values 0 Off, 1 autosel or 2 Recommended, with emergency input activated, at the first driving control the drive controls a movement to the motor in the direction depending on the value chosen with the speed indicated in parameter 11260 **Emergency mode speed**.

Speed and direction display in case of emergency movement

In comparison to EN 81-20 in case of movement of the engine in emergency controlled by the drive, the keypad is always indicated the speed at which the motor is going and the direction of movement (through the positive or negative sign of speed). Both for closed-loop and open-loop configurations, the management of the arrival to the emergency plan is realized trying to optimize the power demand to the emergency modules.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.10.1	**11286**	**Battery control**		ENUM		Disable	-	-	RWZ	INT	FVY

Enables the continuous monitoring of the EMS system; in the event of a disconnection or low battery charge, the [41] **No battery** alarm is tripped, managed by the PAR 11850 **No battery activity** and the PAR 11852 **No battery hold off** parameters in the 5.10 LIFT ALARMS menu.

0 Disable
1 Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.10.2	**11262**	**Autoselect direction**		ENUM		Recommended	-	-	RWZ	INT	FVY

Enables the automatic selection of the most favourable direction of movement before a start in the emergency mode.

0 OFF
1 AutoSelect
2 Recommended
3 Battery saving
4 BattSav + Rec

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: the drive assesses the most favourable direction based on the current supplied and the DC-Link voltage prior to the emergency. If the drive was in regenerative mode before the emergency, the same direction will be maintained even in an emergency, if the drive was not in regenerative mode but was supplying a current whose value is lower than the threshold set (PAR 11284 Detection Limit), it will maintain the same direction; otherwise, if the current supplied was higher than the threshold, the drive will reverse the direction of movement.

If 3 is selected: The “Battery saving” function allows you to manage the automatic return to the floor in an emergency by exploiting the movement of the car by gravity, and activating the motor only if necessary.
The maneuver is activated by configuring “Battery saving” (PAR 11262) as emergency mode and activating the Emergency function via the configured input.
The function works following this logic: a “manual release brake” maneuver is automatically launched, respecting the settings of the “manual release brake” function; if the car moves, the “manual release brake” maneuver continues, respecting the conditions set by the function. If the car is in an equilibrium position or the car speed remains below the threshold (PAR 11090) for the pre-set time (PAR 11092) then the brake is closed and the electric running in emergency starts.
The electric gear will take place following the commanded direction

If 4 is selected: The “BattSav + Rec” function allows you to manage the automatic return to the floor in an emergency, the maneuver takes place as in selection 3 “Battery saving” the difference is that in electric running in this mode it will take place following the recommended direction.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.10.3	**11278**	**Em DC brk current**	%	FLOAT		75.0	0	150	RW	INT	FV

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	Lev.	Vis.
5.10.4	**11284**	**Detection Limit**	%	UINT32		20	0	100	RWZ	INT	FVY

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	Lev.	Vis.
5.10.5	**14282**	**Chosen direction**		ENUM		-	-	-	R	INT	

Indicates the direction selected by the drive during the emergency.

0 No direction (selected)
1 Forward
2 Reverse

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

See PAR 11092 Em min spd time (def = 6 sec) on menu “9 SAFETY”.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.10.6	**11094**	**Brake release type**		ENUM		Freno	-	-	RW	EXP	VY

Sets the mode by which the brake is released in the event that the emergency movement manoeuvre for imbalance is activated through the activation of the input set by par 11820.

0 Brake

1 Brake + Gear

0: only the brake contactor is controlled.

1: both brake and travel contactors are controlled (the short phase contactor is not controlled if it is wired to a different digital output from the gear contactor).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.10.7	**11090**	**Em min speed**		FLOAT		0.05	0	10000	RW	EXP	VY

Setting of the minimum cabin speed threshold, used in the “battery saving” emergency mode, to the below which, after the time defined in parameter 11092, the manual unlocking is deactivated and a emergency operation in the recommended direction.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.10.8	**11092**	**Em min spd time**	s	INT16/32		6	1	30	RW	EXP	VY

Time setting, used in the emergency mode “battery saver”, after which, if the speed of the cabin remains below the threshold defined in parameter 11090, manual unlocking is deactivated and a gear in emergency in the recommended direction.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.10.9	**11108**	**Delay mot sav bat**	m/s	INT32		1000	0	5000	RW	EXP	VY

Setting the delay time of the motor energization in the battery saving phase from the moment of the brake opening command.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.10.10	**11822**	**Em max speed**		UINT32		0.1	-	-	RW	EXP	VY

Set the maximum speed that the cabin (or engine) can have during the maneuver.

The speed can be expressed in m/s (if related to the cab) or in rpm (if related to the engine).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.10.11	**11014**	**Em max speed sav bat**	Hz	FLOAT		0.09	0.01	1000	RW	EXP	VY

Setting the maximum speed when releasing the brake in battery saving mode.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.10.12	**11824**	**Brake lock time**	**s**	UINT32		4	1	30	RW	EXP	VY

Setting the brake lock time when the car reaches the maximum speed allowed.

5.11 LIFT ALARMS

The drive manages and generates the following alarms:

Index	Error message shown on the display	Description
32	Enable missing	Condition: (ADL550 only) occurs if Enable is not activated within 4 seconds of the Safety Enable signal.
		Solution: • check the Enable signal. • check the SAFETY connector, contacts 1 and 2. • check the electrical level and Safety Enable signal current capacity.
33	Cont feedback	Condition: The contactor feedback signal does not match its command.
		Solution: Check contactor feedback wiring, check logic status of feedback input to drive, increase hold off time (PAR 11202).
34	Brake Feedback	Condition: The brake feedback signal does not match its command.
		Solution: Check brake feedback wiring, check logic status of feedback input to drive, increase hold off time (PAR 11206).
35	Door Feedback	Condition: The door feedback signal does not match its command.
		Solution: Check door feedback wiring, check logic status of feedback input to drive, increase hold off time (PAR 11212).
36	Brake Failure	Condition: Exceeding the Threshold A3 (PAR 11270).
		Solution: Reset alarm using the reset parameter (PAR 11268), check that brake is intact, increase threshold (PAR 11270).
37	Safe Brake Test	Condition: Safe Brake Test failed.
		Solution: Check that brake is intact, increase the maximum deviation threshold (PAR 11840).
38	Speed limit	Condition: Speed limitation warning to ensure stopping, enabling the DISTANCE function.
		Solution: Check multi-speed selected for current distance.
39	Up/low limit	Condition: Speed threshold exceeded in limit switches zone (sensors installed at the top and bottom of the lift/elevator shaft).
		Solution: Check speed set in limit switches zone, change speed limit (PAR 11216).
40	Lift ext fault	Condition: External alarm signal triggered (PAR 11258).
		Solution: Check causes enabling external alarm signal, increase hold off time (PAR 11266).
41	EBC Fault	Condition: Triggering of communication alarm signal with the EBC.
		Solution: Check the physical connection, the presence of the compensation resistors on both sides of the CAN link, and the configuration of the parameters using the alarm sub-codes given in section 12.6.
42	No battery	Condition: Battery monitoring alarm triggered.
		Solution: Check whether battery is properly connected to drive.

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

Ignore 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.

Warning 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.

Disable drive 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.

Fast Stop 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.

Lift Fast stop 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 !

Lift stop 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	Lev.	Vis.
5.11.1	**11200**	**Contactor activity**		ENUM		Disable			RWZ	INT	FVY

Sets the drive behaviour in case the **Cont feedback** alarm is tripped.

This alarm indicates that contactor command and feedback are mismatched.

0 Ignore
1 Warning
2 Disable drive
3 Fast stop
4 Lift fast stop
5 Lift stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.11.2	**11202**	**Cont hold off**	ms	INT32		1000	0	60000	RW	INT	FVY

Sets the allowed delay time if contactor command and feedback are mismatched.

If command and feedback are mismatched, the drive waits until the set time has elapsed before tripping 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	Lev.	Vis.
5.11.3	**11204**	**Brake activity**		ENUM		Disable			RWZ	INT	FVY

Setting of drive behaviour in case of a **Brake Feedback** alarm.

This alarm indicates that brake command and feedback are mismatched.

0 Ignore
1 Warning
2 Disable drive
3 Fast stop
4 Lift fast stop
5 Lift stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.11.4	**11206**	**Brake hold off**	ms	INT32		1000	0	60000	RW	INT	FVY

Sets the delay time if brake command and feedback are mismatched.

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	Lev.	Vis.
5.11.5	**10094**	**Brake 2 hold off**	ms	INT32		1000	0	60000	RW	INT	FVY

Sets the delay time if second brake command and feedback are mismatched. 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	Lev.	Vis.
5.11.6	**11208**	**Brake run hold off**		ENUM		Enable	-	-	RW	INT	FVY

Setting of drive behaviour when a possible **Brake Feedback** 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	Lev.	Vis.
5.11.7	**11210**	**Door activity**		ENUM		Disabile	-	-	RWZ	EXP	FVY

Setting of drive behaviour when a possible **Door Feedback** alarm is detected.

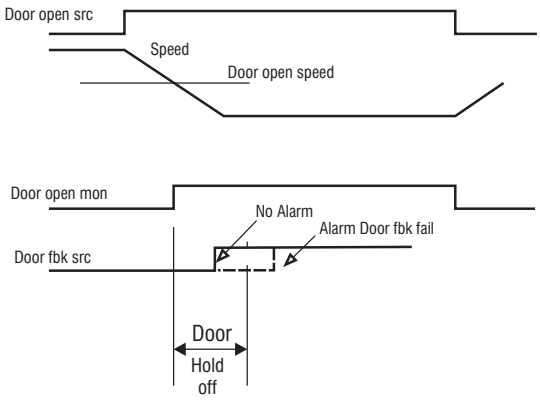
This alarm indicates that door command and feedback are mismatched.

0 Ignore
1 Warning
2 Disable drive
3 Fast stop
4 Lift fast stop
5 Lift stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.11.8	**11212**	**Door hold off**	ms	INT32		1000	0	60000	RW	EXP	FVY

Sets the allowed delay time if contactor command and feedback are mismatched.

If command and feedback are mismatched, 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	Lev.	Vis.
5.11.9	**11258**	**Lift EF alarm src**		ENUM		Null	-	-	RWZ	INT	FVY

Selects the origin of the "**Lift External Fault**" alarm signal; the alarm is intended to put the drive into an alarm condition, for faults detected by external controllers.
The list of functions that can be associated with the digital inputs are in the "**LiftInputAdlCmd**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.11.10	**11264**	**Lift EF al activity**		ENUM		Lift stop	-	-	RWZ	INT	FVY

Setting of "Lift EF alarm set" alarm.

0 Ignore
1 Warning
2 Disable drive
3 Fast stop
4 Lift fast stop
5 Lift stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.11.11	**11266**	**Lift EF hold off**	ms	UINT32		1000	0	60000	RW	INT	FVY

Sets the delay time between when the "**Lift EF alarm**" is received and the execution of the selected activity.

If, within the time set in this parameter, the alarm is eliminated, the drive will not perform the action.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.11.12	**11842**	**SBT activity**		ENUM		Warning	-	-	RWZ	EXP	FVY

Sets the drive behaviour in case the "**SBT**" alarm is tripped.

This alarm indicates that the Safe Brake Test, if active, has had a negative outcome.

The alarm is automatically reset by lowering the **Safe Brake Test src** command (PAR 11832).

0 Ignore
1 Warning
2 Disable drive

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.11.13	**11850**	**No battery activity**		ENUM		Warning	-	-	RWZ	INT	FVY

Sets the drive behaviour in case the [41] **No battery** alarm is tripped.

If the battery management and monitoring function is used (see 5.9 EMERGENCY MODE menu).

0 Ignore
1 Warning
2 Disable drive
3 Fast stop

4 Lift fast stop
5 Lift stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.11.14	**11852**	**No battery hold off**	ms	UINT32		1000	0	10000	RW	INT	FVY

Sets the delay time between when the [41] **No battery** alarm is received and the execution of the selected activity.
If the battery management and monitoring function is used (see 5.9 EMERGENCY MODE menu).
If, within the time set in this parameter, the alarm is eliminated, the drive will not perform the action.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.11.15	**10134**	**EBC activity**		ENUM		Disable	-	-	RWZ	INT	FWY

Setting the behaviour of the drive in the event of an alarm [41] **EBC Fault** (if EBC module is present).

2 Disabil. drive
4 Lift fast stop
5 Arresto lift

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.11.16	**11096**	**EBC hold off**	ms	INT32		100	0	1000	RW	INT	FVY

Setting of the delay time between receipt of alarm [41] **EBC Fault** and execution of the selected task.

If the alarm falls within the time set in this parameter, the drive will not perform the action.

5.12 SAFE BRAKE TEST

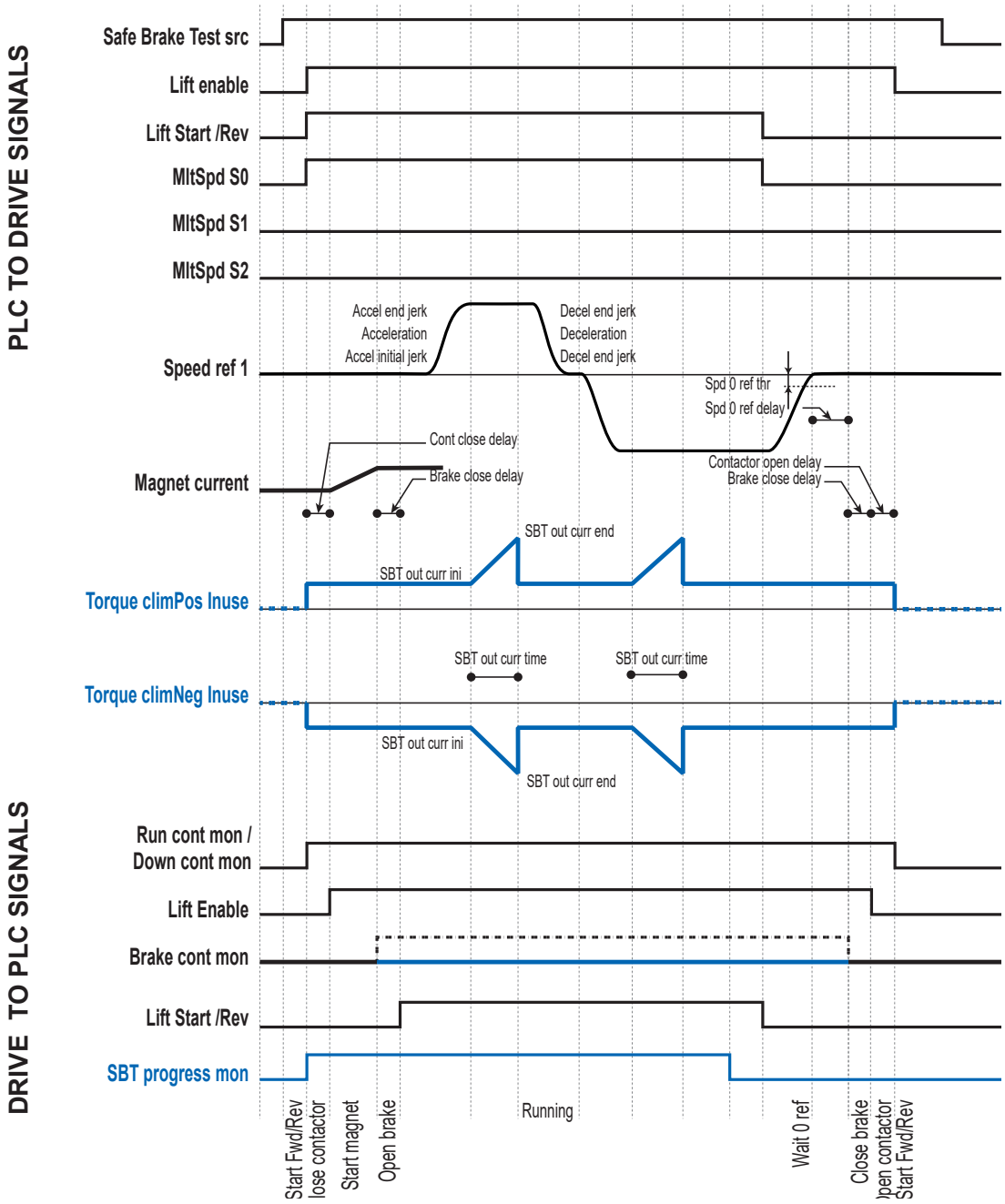
The “Safe Brake Test”, which can only be used in closed loop modes (PAR 540 **Control type** = [1] ASY FOC or [2] SYN FOC), is activated by raising the relevant digital input (**Safe Brake Test src** PAR 11832).

To activate the test:

- Raise the **Enable** and **StartREV** or the **StartFWD** commands and keep them high for the entire duration of the test.
- The line contactors are activated as in a normal manoeuvre.
- The brake is kept closed.
- A linear current ramp is applied to the motor, in both directions; the ramp can be set using the minimum (**SBT out curr ini**, PAR 11834), maximum (**SBT out curr end**, PAR 11836) and duration (**SBT out curr time** PAR 11838) parameters.
- The progress of the test is shown on the display (**SBT progress mon,** PAR 14286) throughout the course of the test.
- At the end of the test, lower the **Enable** and **Start** commands, and then afterwards, lower the **Safe Brake Test src** PAR 11832 command before returning to normal operations.

If, during the test, the rotor revolves beyond an acceptable range (set by parameter **SBT enc pos band**, PAR 11840) the **Safe Brake Test** is enabled, also displayed in the monitor parameter (**SBT progress mon**, PAR 14284), depending on the configuration set (**SBT Activity**, PAR 11842).

Safe Brake Test command sequence



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.12.1	**11832**	**Safe Brake Test src**		ENUM		Null	-	-	RW	EXP	FVY

Sets the source that enables the Safe Brake Test.

The list of functions that can be associated with the digital inputs are in the "**LiftInputAdICmd**" selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.12.2	**11838**	**SBT out current time**	ms	INT16		2000	1	20000	RWZ	EXP	FVY

Sets the time required to vary the output current from its initial value PAR 11834 **SBT out curr ini t**o the final value PAR 11836 **SBT out curr end.**

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.12.3	**11834**	**SBT out curr ini**	%	INT16		75	0	150	RWZ	EXP	FVY

Sets the initial output current level during the "Safe Brake Test".

This parameter is a percentage of PAR 2002 **Rated Current.**

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.12.4	**11836**	**SBT out curr end**	%	INT16		150	0	150	RWZ	EXP	FVY

Sets the final output current level during the "Safe Brake Test".

This parameter is a percentage of PAR 2002 **Rated Current.**

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.12.5	**11840**	**SBT enc pos band**		INT16		5	2	4000	RWZ	EXP	FVY

Sets the maximum motor rotation before activating the "**Safe Brake Test**" alarm, which identifies the inability of the brake to keep the cabin stationary.

The function accumulates the measured encoder pulses in ppr x 4.

I.e:

SBT enc pos band (PAR 11840	Encoder pulses	Mechanical grades for "Std enc pulses".				
		512	1024	2048	4096	8192
4	1	0,7031	0,3515	0,1757	0,0878	0,0439
20	5	3,5156	1,7578	0,8789	0,4394	0,2197
100	25	17,5781	8,789	4,3945	2,1972	1,0986
4000	1000	703,125 1,9 revolutions	351,5625	175,7813	87,8906	43,9453

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.12.6	**10092**	**SBT 2nd brake**		INT16		Off	-	-	RWZ	EXP	FVY

Enables Safe Brake Test on the second brake, by setting the parameter to Enable; the "Safe Brake Test" sequence will be changed as follows.

To activate the test:

- Raise the **Enable** and **StartREV** or the **StartFWD** commands and keep them high for the entire duration of the test.
- The line contactors are activated as in a normal manoeuvre.
- The first brake is kept closed, the second brake is kept open.
- A linear current ramp is applied to the motor, in both directions; the ramp can be set using the minimum (**SBT out curr ini**, PAR 11834), maximum (**SBT out curr end**, PAR 11836) and duration (**SBT out curr time** PAR 11838) parameters.
- At the end of the test on the first brake, both brakes are closed.
- The first brake is kept open, the second brake is kept closed.
- A linear current ramp is applied to the motor in both directions; the ramp can be set through the parameters.
- he progress of the test and its end is indicated in the relevant monitor parameter (**SBT progress mon** , PAR 14286).
- At the end of the test, lower the Enable and Start commands, and then afterwards, lower the **Brake Force src** PAR 11832 command before returning to normal operations.

If, during the test, the rotor revolves beyond an acceptable range (set by parameter **SBT enc pos band**, PAR 11840) the **Safe Brake Test** is launched, also displayed in the monitor parameter (**SBT alarm mon** , PAR 14284), depending on the configuration set **(SBT Activity,** PAR 11842).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.12.7	**14284**	**SBT alarm mon**		INT16					R	EXP	FVY

Displays the result of the test performed on the brake; in the event of a fault, the **SBT progress mon** monitor parameter (PAR 14286) is set to 1, activating the “Brake Fault test”.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.12.8	**14286**	**SBT progress mon**		ENUM					R	EXP	FVY

Test status display:

0	Init	Test ready waiting for movement commands
1	Up	Active test, upward movement
2	Down	Active test, downward movement
3	Test off	Not active test, test completed

5.13 LIFT TEST

The LIFT Test menu is used during some tests. We have seen in chapter 9 details how toperform test.

The parameters concerned are 3:

- the type of particular test selected starting from standstill or with the engine running;
- the parameter asking whether to exclude any feedback errors that may arise during the tests;
- the parameter identifying which brake shoe to test.

When tests are run to test the feedback we leave the parameter set to 0 and when we do tests that we do not want to be interrupted by feedback errors then we put the parameter at 1.

Note! The cust button of the keypad, by default, recalls a list of the last parameters displayed. If we press the cust key of the keypad with the function EBC_Test_Type off the Cust key returns to the list of the last parameters among which there may also be those of the menu Lift test.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis
5.13.1	**10138**	**EBC_Test_Type**		INT16		Off	-	-	RW	EXP	FVY
		Parameter to select the type of test to run.									
		0	off								
		1	at start								
		2	upon arrival								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis
5.13.2	**10140**	**EBC Sel brake**		INT16		Brake1			RW	EXP	FVY
		Parameter to select on which/the brake shoes to simulate the failure.									
		0	Brake1 + Brake2								
		1	Brake1								
		2	Brake2								

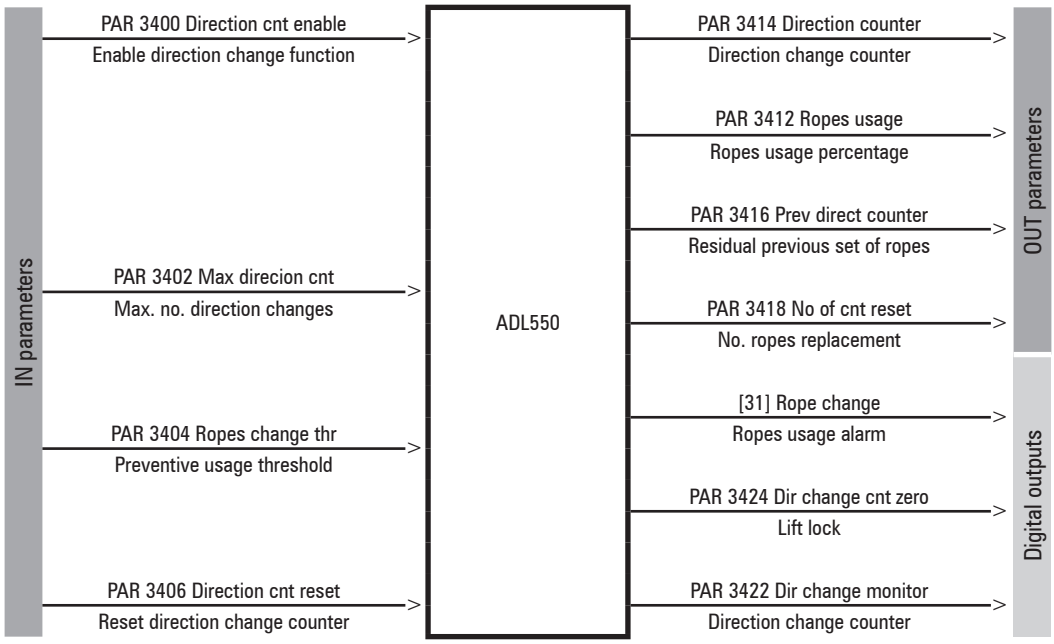
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis
5.13.3	**10142**	**EBC_TEST_FBK**		ENUM		Disable			RW	EXP	FVY
		Parameter that disables the alarm of "Brake fbk" during the test maneuvers.									
		Disable	do not disable brake feedback control during testing								
		Enable	disable brake feedback control during testing								

5.14 DIRECT CNT

The purpose of the “change ride direction count” function is to monitor the wear and tear of the ropes or belts, to indicate when to carry out the necessary maintenance/replacement and to stop the lift if the usage limits are reached. The change of direction counting function for coated ropes or belts is not required by EN 81.20 but it is up to the manufacturers of coated ropes and belts to define the method for indicating when replacement becomes mandatory. The most commonly used method is to count the changes of direction. To ensure that this count cannot be tampered with, the count itself must be protected against deletion. The most commonly used method is to use a password to gain access to data that cannot be deleted by mistake. There are two types of passwords: a password that is always valid until it is changed, and a password that becomes unusable after each use and must be regenerated using a decryption code. Passwords are not compulsory and the manufacturer can use whichever method he prefers to protect against accidental deletion, which is why the change counter can also be used without being put under a password.

A specific counter keeps count of direction changes and can be reset when the ropes are replaced.

The following signals, inserted in the L_DIGSEL1 selection list, can be brought to a digital output: PAR 3420 **Ropes change req mon**, PAR 3422 **Dir change monitor** and PAR 3424 **Dir change cnt zero**.



Attention

Firmware update

To keep them from being overwritten when using WEG_DriveLabs, these parameters are not updated with the **Write all target parameters** operation.

Replacing the drive

If the drive is replaced, you can save the configuration of the “Direction change count” function on a USB device (PAR 3434 **Save rope to USB**) and load it on the new drive (PAR 3436 **Load rope from USB**).

Password

All parameters of this function, reserved for the lift maintenance mechanic, are only accessible at the Expert level, which can be password protected, see “6.6 NETWORK AND ACCESS”).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.1	**3400**	**Direction cnt enable**		ENUM		Disable			RW	EXP	FVSY

0 Disable
1 Enable

Enables the “Direction change count” function.

Menu	PAR	Descrizione	UM	Tipo	FB BIT	Def	Min	Max	Acc	Liv.	Vis.
5.14.2	**3402**	**Max direction cnt**		UINT32		0	0	2147483647	RW	EXP	FVSY

Sets the maximum allowed number of direction changes.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.3	**3404**	**Rope change thr**	%	UINT32		98	0	100	RW	EXP	FVSY

Sets a usage threshold beyond which the “Rope change” alarm is signalled to indicate that the ropes have to be replaced.

When parameter 3412 **Ropes usage** exceeds this threshold, the drive keeps running but the alarm stays on to remind the operator to replace the ropes.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.4	**3406**	**Direction cnt reset**		BIT		0	0	1	RW	EXP	FVSY

0 Disable
1 Enable

Let you run a reset to return the direction change counter to the initial value of parameter 3402 **Max direction cnt** (value set by rope manufacturer).

This operation is password-protected and must be run when the ropes are changed.

Executing this command causes the following:

1. the value of counter 3414 **Direction counter** is copied to parameter 3416 **Prev direct counter**,
2. the value of parameter 3418 **No of cnt reset** is incremented,
3. counter 3414 **Direction counter** is reset to value 3402 **Max direction cnt** and consequently parameter 3412 **Ropes usage** is reset to 0.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.5	**3408**	**Dir cnt password**		UINT32		0	0	999999	RW	EXP	FVSY
5.14.6	**3410**	**Dir cnt new password**		UINT32		0	0	999999	RW	EXP	FVSY

With parameters 3408 and 3410 the modification of parameters 3400, 3402, 3404, 3406, 3410 is protected.

The password is a numeric code of up to 6 digits.

To set a password, it must be entered twice in parameter 3410.

After the first entry, “Confirm password” is signaled, which means that the same value must be entered for confirmation.

If the second value is different from the first, “Password mismatch” is signalled, otherwise the new password becomes operative.

The password is retentive so it will not be necessary to save the parameters after changing it.

To enable changes to the protected parameters, the password must be entered in parameter 3408, which must correspond to what was programmed in parameter 3410.

The current values of parameters 3408 and 3410 are only visible while typing. When you press Enter, 0 is displayed to prevent them from being read by unauthorized persons.

After having modified one of the parameters 3400, 3406 and 3410, the entered password is invalidated therefore if you want to continue with other modifications you have to enter it again.

For one-time password management, see the instructions in the description of par 3440.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.7	**3412**	**Ropes usage**	%	UINT16	16BIT_L	0	0	0	R	EXP	FVSY

Displays the ropes usage counter (as percentage) of parameter 3402 **Max direction cnt**.

When PAR 3412 = 100% (corresponds to PAR 3414 = 0), the ropes have reached their useful life and must be replaced: the drive finishes the current travel and then locks.

By switching the drive off and back on you can run a single travel to bring the car to a better position for the procedure.

To eliminate the lock condition, reset the direction change counter.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.8	**3414**	**Direction counter**		UINT32	32BIT	0	0	0	R	EXP	FVSY

Displays the countdown of direction changes remaining until useful life of the ropes is reached.

When PAR 3414 = “0” the ropes must be replaced (corresponds to PAR 3412 = 100%): the drive finishes the current travel and then locks.

By switching the drive off and back on you can run a single travel to bring the car to a better position for the procedure.

To eliminate the lock condition, reset the direction change counter (see PAR 3406 **Direction cnt reset**).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.9	**3416**	**Prev direct counter**		UINT32	32BIT	0	0	0	R	EXP	FSVY

Displays the number of direction changes remaining on the previous set of ropes (value of PAR 3414 **Direction counter** is copied before reset). This number will remain fixed until the next replacement of the ropes.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.10	**3418**	**No of cnt reset**		UINT32	32BIT	0	0	0	R	EXP	FVSY

Displays the number of rope changes made.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.11	**3420**	**Ropes change req mon**		BIT	16BIT_L	0	0	1	R	EXP	FVSY

Activates when the percentage of rope usage (set in PAR 3412 **Ropes usage**) exceeds the set threshold (PAR 3404 **Ropes change thr**).
This signal is inserted in the L_DIGSEL1 selection list and can be brought to a digital output.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.12	**3422**	**Dir change monitor**		BIT	16BIT_L	0	0	1	R	EXP	FVSY

This signal stays on for one second each time the drive detects a direction change and thus decrements the counter.
This signal is inserted in the L_DIGSEL1 selection list and can be brought to a digital output.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.15.13	**3424**	**Dir change cnt zero**		BIT	16BIT_L	0	0	1	R	EXP	FVSY

This signal activates when the drive is locked because 3414 **Direction counter** has reached 0.
This signal is inserted in the L_DIGSEL1 selection list and can be brought to a digital output.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.14	**3434**	**Save rope to USB**		BIT		0	0	1	RWZ	EXP	

Lets you save the configuration of the “Direction change count” function on the USB.
The set of parameters is saved in a dedicated area on the USB memory.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.15	**3436**	**Load rope from USB**		BIT		0	0	1	RWZ	EXP	

Lets you load the configuration of the “Direction change count” function saved on the USB memory with PAR 3434 **Save rope to USB** on the new drive.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.16	**3440**	**Dircnt password type**		ENUM		Static			RWZ	EXP	FVSY

This parameter allows you to select which type of password to use. By entering the value Static, the password entered does not expire and remains active until it is replaced with another password. By selecting One Time, a One Time password must be requested each time a password-protected value is to be changed.
The One Time password is generated in the following way:
parameter 3442 **Pwd code build** is selected and the value that is highlighted in parameter 3444 **Pwd code** is taken into account. The code must be entered into the application on the PC, which will return a password pair.

1) Password for resetting the counters.
Entering this password in parameter 3408 **Dir cnt password** will only enable resetting of the counters via command 3406 Direction cnt reset. Following this command, the password will be deactivated and can no longer be used.

2) Password for changing parameters.
By entering this password in parameter 3408 **Dir cnt password**, it will be possible to change the following parameters:
3400 **Direction cnt enable**
3402 **Max direction cnt**
3404 **Ropes change thr**
3440 **Dircnt password type**
This password will be disabled and will no longer be usable after the drive has been restarted.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.17	**3442**	**PWD code build**		BIT		0	0	1	RW	EXP	FVSY

Allows a one time code to be generated that is needed to generate the one time password to reset the counters. the value of the generalo code will be visible in parameter 3444.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.18	**3444**	**PWD code**		UINT32		0.0	0	0	R	EXP	

One time code generated by confirmation of parameter 3442 **Pwd code build**.

6 COMMUNICATION

6.1 CONTROL COMMUNICATION (CONTROL COMM)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.1.1	**4000**	**Communication mode**		ENUM		Parallel			RW	INT	FVSY

Setting the type of communication to be used.

3 CAN417

Setting **3** selects the DS417 fieldbus profile.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.1.6	**4004**	**Fieldbus baudrate**		ENUM		250k			RW	EXP	

Setting of the communication network speed (Baud Rate).
Only for PAR **Communication mode** = (3) CAN417.

1 125k
2 250k
3 500k
4 1M

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.1.7	**4006**	**Fieldbus address**		INT16		2	1	127	RW	EXP	

Setting of the node address of the drive when connected to the network.
Only for PAR **Communication mode** = (3) CAN417.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.1.8	**4010**	**Fieldbus M->S enable**		ENUM		Enable			RWZ	EXP	

Setting of fieldbus data updating.
Only for PAR **Communication mode** = (3) CAN417.

0 Disable
1 Enable

If set to **0**, the possibility of sending commands and references from the drive PLC via the fieldbus is disabled.
If set to 1 the possibility of sending commands and references from the drive PLC via the fieldbus is enabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.1.9	**4012**	**Fieldbus alarm mode**		INT32		0	0	1	RWZ	EXP	

Setting of the **Opt Bus Fault** alarm generation mode.
Only for PAR **Communication mode** = (3) CAN417.

0 Disable
1 Enable

If set to 0 the alarm is only generated if the communication with the fieldbus is lost with the drive enabled.
If set to 1 the alarm is generated when the communication with the fieldbus is lost even if the drive is disabled.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.1.10	**4014**	**Fieldbus state**		ENUM		Stop			R	EXP	

The logic status of the fieldbus connection is displayed. The value depends on the type of bus that is used.
Only for PAR **Communication mode** = (3) CAN417.

0 Stop

1 PreOperational
2 Operational

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.1.11	**4338**	**Fieldbus error**		UINT16		0	0	0	R	EXP	

For the correct interpretation of the cause of the "**Opt Bus Fault** [17]" alarm trigger, it is necessary to read the hex code indicated in parameter 4338 **Fieldbus Error** and verify description and cause in the table of chapter "1.5 Alarms".

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.1.12	**4008**	**Can termin.resistor**		ENUM		Off			RW	EXP	

Activation of the internal termination resistor.

0 Off
1 On

6.6 NETWORK AND ACCESS

To enable password protection for access levels, change parameter PAR 568 **Enable password** to “ON”.

The user will then be asked to enter the password for their current access level; if the password has not been changed, its default value must be entered (visible in the DEFAULT column of the parameter description), then the user will be asked to enter a new password, which must be at least 8 characters long and alphanumeric.

For password recovery in the event of loss, see PAR 7200 **Password recovery**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.1	**9610**	**Readonly Username**		STRING16		readonly	0	0	R	EXP	FVSY
		Username assigned to the “Readonly” access level.									
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.2	**9626**	**Easy Username**		STRING16		easy	0	0	R	EXP	FVSY
		Username assigned to the “Easy” access level.									
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.3	**9634**	**Easy Password**		STRING16		easy	0	0	RW	EXP	FVSY
		Password used to access the “Easy” level.									
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.4	**9642**	**Interm Username**		STRING16		interm	0	0	R	EXP	FVSY
		Username assigned to the “INT” (Intermediate) access level.									
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.5	**9650**	**Interm Password**		STRING16		interm	0	0	RW	EXP	FVSY
		Password used to access the “INT” (Intermediate) access level.									
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.6	**9658**	**Expert Username**		STRING16		expert	0	0	RW	EXP	FVSY
		Username assigned to the “Expert” access level.									
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.7	**9666**	**Expert Password**		STRING16		expert	0	0	RW	EXP	FVSY
		Password used to access the “Expert” level.									
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.8	**9544**	**WiFi Fw version**		UINT32		0	0	0	R	EXP	
		The firmware version operating in the WiFi Drive Link module is displayed.									
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.9	**9546**	**WiFi S/N**		UINT32		0	0	0	R	EXP	
		The WiFi Drive Link module serial number is displayed.									
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.10	**9528**	**WiFi Network name**		STRING16		WEG wifi	0	0	R	EXP	
		Name of the WiFi network generated by the Wi-Fi Drive Link dongle.									
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.11	**9536**	**WiFi Network Pass**		STRING16		0123456789	0	0	R	EXP	
		Password used to connect to the network generated by the Wi-Fi Drive Link dongle.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.12	**9554**	**WiFi Network Channel**		UINT16		11	0	12	R	EXP	
		Wi-Fi network channel.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.13	**9556**	**IP Address set**		UINT32		169.254.10.10	0	0	RW	EXP	FVSY
		Enters the network IP address.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.14	**9558**	**IP Netmask set**		UINT32		255.255.0.0	0	0	RW	EXP	FVSY
		Enters the subnet IP address.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.15	**9560**	**IP Gateway set**		UINT32		0.0.0.0	0	0	RW	EXP	FVSY
		Enters the gateway IP address.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.16	**9564**	**IP Netmask**		UINT32		255.255.0.0	0	0	R	EXP	FVSY
		Subnet IP address in use.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.17	**9566**	**IP Gateway**		UINT32		0.0.0.0	0	0	R	EXP	FVSY
		Gateway IP address in use.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.18	**9608**	**IP Assignment**		ENUM		Static	0	0	RW	EXP	FVSY
		IP address assignment.									

0 DHCP
1 Static

DHCP: the drive IP address is assigned by the network DHCP server. If no DHCP server is present, the drive waits for about 3 min, after which it takes the static address configured via parameter (PAR 9556 **IP Address set**, default = 169.254.10.10) as the IP address. Typical use: drive connected to a network with several devices.

Static: The drive IP address is assigned via parameter PAR 9556 **IP Address set**, default = 169.254.10.10. Typical use: drive connected directly to the PC.

7 MOTOR DATA

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.1	**392**	**Select motor**		BIT		0	0	1	RWZ	INT	FVSY

This parameter is used to load motor data into the drive that are part of a library (.mot file extension).

These files must be saved on a USB memory device in a folder named “ADL500MT”. Once the memory device has been connected to the drive’s USB port, simply select the motor whose parameters are to be imported from the appropriate menu. Contact WEG Technical Assistance for further information or to request the files.
The motor data libraries are already available in the WEG DriveLabs configurator in the Wizard / Setup-Wizard menu.

Parameter visible from keypad only.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.2	**2000**	**Rated voltage**	V	FLOAT		SIZE	150	480	RWZ	INT	FVSY

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	Lev.	Vis.
7.3	**2002**	**Rated current**	A	FLOAT		SIZE	1	1500	RWZ	INT	FVSY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.4	**2004**	**Rates speed**	rpm	FLOAT		SIZE	10	32000	RWZ	INT	FVY

Rated speed of the motor with full load in rpm. In some motors the asynchronous 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	Lev.	Vis.
7.5	**2006**	**Rated frequency**	Hz	FLOAT		SIZE	1	1000	RWZ	INT	FVS

Rated frequency of the motor expressed in Hz.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.6	**2008**	**CPole pairs**		UINT16		SIZE	1	60	RWZ	INT	FVSY

Motor pole pairs. The number of motor pole pairs is calculated using the motor plate data and applying the following formula:

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

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	Lev.	Vis.
7.7	**2010**	**Rated power**	kW	FLOAT		SIZE	0.1	1500	RWZ	INT	FVS

Motor power factor, as indicated on the data plate (Cos φ). This parameter is not always present on the motor data plate: in that case use the default value present in the drive.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.8	**2012**	**Rated power factor**		FLOAT		SIZE	0.6	0.95	RWZ	INT	FVS

Motor power factor, as indicated on the data plate (Cos φ). This parameter is not always present on the motor data plate: in that case use the default value present in the drive.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.9	**2014**	**Torque constant**	Nm/A	FLOAT		SIZE	0	120	RWZ	INT	Y

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.10	**2020**	**Take parameters**		BIT		0	0	1	RWZ	INT	FVSY

Saves the set motor data in the drive. This command must be supplied last after entering the appropriate values of all

the parameters listed above. This means calculating the normalization factors (a) and estimated values for the motor parameters (b). The drive cannot be started until the **Take parameters** command has been set.

Use of the Startup wizard is recommended.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.11	**2022**	**Autotune rotation**		BIT		0	0	1	RWZ	INT	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. Selt-tuning can now be performed.

Close the hardware enabling. At the end of the self-tuning procedure, open the hardware enabling.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.12	**2024**	**Autotune still**		BIT		0	0	1	RWZ	INT	FVSY

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.13	**2030**	**Autotune status**		ENUM		Required			R	INT	FVSY

Indication of the status of parameter saving.

0 Required
1 Done

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.14	**2050**	**Measured Rs**	ohm	FLOAT		0	0	200	RW	EXP	FVSY

Measured value of the rotor resistance.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.15	**2052**	**Measured DTL**	V	FLOAT		0	0	100	RW	EXP	FVY

Measured value of dead time compensation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.16	**2054**	**Measured DTS**	V/A	FLOAT		0	0	100	RW	EXP	FVSY

Measured compensation gradient value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.17	**2056**	**Measured Lsig**	mH	FLOAT		0.1	0.1	200	RW	EXP	FVS

Leakage inductance value measured (Only for asynchronous motors).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.18	**2058**	**Measured LsSyn**	mH	FLOAT		0.1	0.1	200	RW	EXP	Y

Stator inductance value measured (Only for synchronous motors).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.19	**2060**	**Measured LsMin Syn**	mH	FLOAT		0.1	0.1	200	RW	EXP	Y

Minimum stator leakage value measured (Only for synchronous motors).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.20	**2062**	**Measured ImN**	A	FLOAT		CALCF	0	1000	RW	EXP	FVS

Measured value of the rated magnetising current.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.21	**2066**	**Measured FlxN**	Wb	FLOAT		CALCF	0	10	RW	EXP	FVS
		Measured flux saturation value.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.22	**2076**	**Measured Rr**	ohm	FLOAT		CALCF	0	200	RW	EXP	FVS
		Measured rotor resistance value.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.23	**2078**	**Take tune paramenters**		BIT		0	0	1	RW	INT	FVSY
		Saves the motor data calculated by the self-tuning procedure in the drive.									

8 ENCODER

Note! The parameters of this menu will be available depending on the selection of parameter 2132 Encoder mode.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.1	**2100**	**Encoder pulses**	ppr	UINT16		1024	4	16384	RWZ	INT	

Setting of the number of feedback encoder impulses. During setup, for incremental sinusoidal encoders + absolute EnDat, encoder absolute EnDat Full digital and BiSS encoders this value is set automatically by reading the number of incremental encoder impulses.

With the EnDat Full digital Encoder, the value set automatically may be below the minimum.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.2	**2102**	**Encoder supply**	V	FLOAT		5.2	5.2	20.0	RW	INT	FVSY

Sets the encoder supply voltage. The min and max values will be changed depending on the selection of parameter 2104 **Encoder input config** as follows:

PAR 2104 Encoder input config	Def	Min	Max
[0] HTL	5.2 V	5.2 V	20.0 V
[1] TTL	5.2 V	5.2 V	6.0 V

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.3	**2104**	**Encoder input config**		ENUM		TTL			RWZ	INT	

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

0 HTL
1 TTL

This parameter is automatically set to HTL when the value set in the **Encoder supply** parameter is more than 6.0V.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.4	**2106**	**Encoder repetition**		ENUM		No division			RWZ	INT	

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

0 No division
1 Divide 2
2 Divide 4
3 Divide 8
4 Divide16
5 Divide 32
6 Divide 64

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.5	**2108**	**Encoder signal Vpp**	V	FLOAT		0.8	0.5	1.2	RWZ	INT	

Setting of the peak-to-peak voltage value of the encoder signal. Incremental sinusoidal encoders and absolute SinCos encoders normally produce signals with a peak-to-peak voltage of 1 Vpp. Due to loss of voltage along the cable, the value of the peak-to-peak voltage signal received by the feedback card could be lower, generating a **Speed fbk loss [22]** alarm. This parameter can be used to set the peak-to-peak voltage value of the incremental sinusoidal encoders and absolute SinCos encoders on the input terminals of the feedback card.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.6	**2110**	**Encoder signal check**		ENUM		Check A-B			RWZ	EXP	

Configuration of which incremental digital encoder channels are to be controlled in order to process the **Speed fbk loss [22]** alarm signal.

1 Check A-B
2 Check A-B-Z

Set **1** to check for signal on channels A-B

Set **2** to check for signal on channels A-B-Z

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.7	**2116**	**ENC signal Vpp inc**	V	FLOAT		0	0	0	R	EXP	

Displays the Vpp signal of the incremental tracks of the connected encoder.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.8	**2118**	**ENC signal Vpp abs**	V	FLOAT		0	0	0	R	EXP	

Displays the Vpp signal of the absolute tracks of the connected encoder (only if a SinCos encoder is connected).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.9	**2130**	**Encoder direction**		ENUM		Not inverted			RWZ	INT	

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 and the absolute encoder Sin+ and Sin- signals on the encoder connections. The absolute part cannot be inverted with Endat and Hiperface absolute encoders.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.10	**2132**	**Encoder mode**		ENUM		None			RWZ	INT	FVSY

The drive has an integrated encoder card. The encoder mode can be selected in accordance with the following table:

0 None
1 Digital
2 Sinus
3 Sinus SINCOS
4 Sinus ENDAT
5 Sinus BISS
6 ENDAT
7 BiSS
8 Sinus SSI

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.11	**2134**	**Encoder speed filter**	ms	FLOAT		1.0	0.1	8.0	RW	EXP	

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** (PAR 2150) parameter.

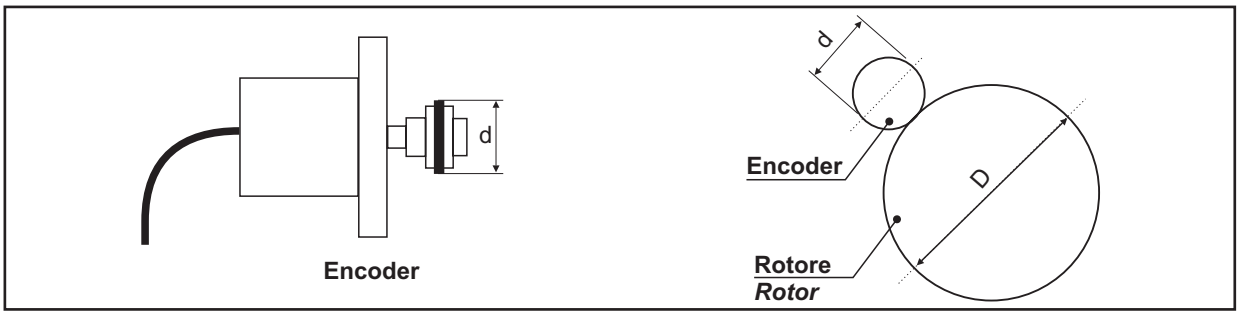
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.12	**2136**	**Peripheral Encoder**		BIT		0	0	1	RW	EXP	

0 No
1 Si

This parameter lets you select if the encoder is positioned on the tangent of the motor rotor

Note! If peripheral encoder (option = 1) is selected, the parameter 4552 (SpdRefLoss activity) in the menu ALARM CONFIG must be set to “Disable drive”. The motor setup uses the same procedure as for a standard brushless motor.

Guidelines for configuring drive parameters in installations with a peripheral encoder, i.e., with the encoder positioned on the tangent of the motor rotor:



Tachometric encoders can be replaced with digital incremental encoders, to be positioned on the tangent, by appropriately configuring the parameters shown below.

Menu	PAR	Descrizione	UM	Tipo	Def	Min	Max	ACC	Llv	Vis.
8.1	2100	Encoder pulses	ppr	UINT16	1024	4	16384	RW	ESY	FVY
Configure the plate value of the incremental encoder used.										
8.9	2130	Encoder direction		ENUM	Not inverted	0	1	RW	INT	FV
The parameter must be configured to 0 or to 1 so that when the rotor turns clockwise the velocity reference value read at parameter 12210 is positive.										
8.10	2132	Encoder mode		ENUM	None	0	8	RW	INT	FVY
The parameter must be configured to “Digital F” (value 2)										
8.12	2136	Peripheral encoder		BIT	0.5	0.1	8.0	R	EXP	FVY
The parameter must be configured to 1.										
8.19	2184	Ext motor diam	mm	UINT16	1	1	65535	RW	EXP	FVY
Configure the value of the external diameter of the motor rotor (D).										
8.20	2186	Enc pulley diam	mm	UINT16	1	1	65535	RW	EXP	FVY
Configure the value of the diameter of the incremental encoder pulley (d).										
4.4.22	4552	SpdRefLoss activity		ENUM	Disable drive	0	4	RW	INT	FVY
The parameter must be set to “Disable drive” (option 2)										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.13	**2150**	**Encoder speed**	rpm	INT16	16BIT_H	0	0	0	R	ESY	

The motor speed measured by the incremental encoder is displayed, filtered by the PAR 2134 **Encoder speed filter** parameter.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.14	**2162**	**Encoder position**	cnt	UINT16	16BIT_L	0	0	0	R	ESY	

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	Lev.	Vis.
8.15	**2164**	**Encoder abs position**	cnt	UINT32	32BIT	0	0	0	R	EXP	

Displays the position of the absolute tracks read by the connected absolute encoder.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.16	**2172**	**SpdFbkLoss code**		UINT16		0	0	0	R	EXP	

The **Speed fbk loss** [22] 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		Encoder-dependent

For further details reference should be made to the description of the **Speed fbk loss [22]** alarm and the chapter 10.2 Speed fbk loss alarm according to the type of feedback (ADL500 HW+QS manual).

Note! For the correct interpretation of the cause of the alarm trigger, it is necessary to transform the hex code indicated in parameter SpdFbkLoss code, PAR 2172 , in the corresponding binary and verify in the encoder table that the active bits and related description are used.

Example with encoder Endat:

PAR 2172 = A0H (hex value)

In the table "Speed fbk loss [22] alarm with absolute encoder EnDat" A0 is not indicated in the value column.
A0 should be contemplated as a bitword with meaning A0 -> 10100000 -> bit 5 and bit 7 . The following causes simultaneously intervene:

Bit 5 = 20H Cause: the SSI signal interferences cause an error in the CKS or parity
Bit 7 = 80H Cause: The encoder has detected an incorrect operation and communicates it to the converter through the Error bit. Bits 16..31 present the type of incorrect encoder operation detected.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.17	**2174**	**Endat error code**		UINT16		0	0	0	R	EXP	

Displays the internal error code of the endat encoder in the event of a **Speed fbk loss** alarm [22] with code "DT1 error". See the ADL500 HW + SW manual, section "10.2 Speed fbk loss alarm according to the type of feedback".

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.18	**2176**	**Encoder sync mode**		UINT16		1	0	3	RWZ	EXP	Y

If set to **0** synchronisation is only performed once at power on.

If set to **1** synchronisation is performed each time the start command is entered.

If set to **2** synchronisation is performed every 128 ms.

If set to **3** synchronisation is always performed, using the absolute section.

This function can only be used with absolute encoders and the default, minimum and maximum values are modified according to the type of encoder.

Type of encoder option	Def	Min	Max
Enc 1	1	0	3
Enc 2	1	0	3
Enc 3	1	0	3
Enc 4	1	0	3
Enc 5	1	0	1

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.19	**2184**	**Ext motor diam**	mm	UINT16		1	1	65535	RWZ	EXP	

This is the diameter D of the motor rotor.

It must be set only if you use a peripheral encoder (PAR 2136).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.20	**2186**	**Enc pulley diam**	mm	UINT16		1	1	65535	RWZ	EXP	

This is the diameter d of the incremental encoder pulley. It must be set only if you use a peripheral encoder (PAR 2136).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.21	**2190**	**Autophase rot**		BIT		0	0	1	RWZ	EXP	Y

This parameter can be set to perform encoder phasing with the motor turning: the motor must be free to turn and with no load applied (the brake must be released). This procedure allows the greatest degree of accuracy.

In order to execute the command:

- open the enable command (Enable).
- set this parameter to 1.
- press Enter to confirm (if sending commands from the keypad).
- when asked to close the enabling contact apply the command to terminal 9 (Enable).
- at the end of the procedure you will be asked to re-open the enabling contact (Enable) to confirm completion.

Note! See section "A.2.1 Rotation phasing" for further information.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.22	**2192**	**Autophase still**		BIT		0	0	1	RWZ	EXP	Y

This parameter can be set to perform encoder phasing without the motor running: the brake must be closed.

In order to execute the command:

- open the enable command (Enable).
- set this parameter to 1.
- press Enter to confirm.
- when prompted to close the enabling contact apply the command to terminal 9 (Enable).
- at the end of the procedure you will be asked to open the enabling contact (Enable) again to confirm completion.

Note! See section "A.2.2 Static phasing" for further information.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.23	**2748**	**Still phasing mode**		ENUM		Mode 1			RW	EXP	Y

You can select two different static phasing methods based on the different characteristics of synchronous motors on the market. We recommend using **Mode 1** as the first option. If **Mode 1** does not run correctly, the motor (due to its constructive characteristics) requires a different mode (i.e., **Mode 2**).

Mode 2 is always required when the magnets are NOT on the rotor surface (immersed).

0	Mode 1	This is the most versatile method and is suitable for most motors.
1	Mode 2	Method developed for motors featuring strong anisotropy.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.24	**2194**	**Phasing repeat**		ENUM		First enable			RW	EXP	Y

The encoder phasing procedure is run as follows (if the encoder is not absolute):

1	First enable	first time enable is received after start
2	Each enable	each time the drive receives an enable signal
3	Periodically	periodically at nth enable signal configurable with PAR 2198.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.25	**9920**	**Autophase still type**		ENUM		Standard			RW	EXP	Y

This parameter affects the parameters used during timing from standstill (still):

Standard	allows timing operation for most engines.
Reserved	is used for specific motors and can be used after communication with the support team of WEG Automation Europe.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.26	**9922**	**Autophase Imax gain**		FLOAT		1	0.01	1.5	RW	EXP	Y

This parameter allows you to change the injected current amplitude during timing from standstill (still).
The parameter's default value allows the timing of most PM motors.
In the case of motors with a high magnetic saturation value, the recognition procedure may be less sensitive and lead to

incorrect recognition of the motor pole direction. In such cases, it is possible to change the value of this parameter, typically by increasing it, to enable correct timing.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.27	**2198**	**Autophase cnt enable**		UINT16		2	2	65535	RWZ	EXP	Y

Defines the number of enable signals (trips) after which encoder phasing must start.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.28	**7100**	**BiSS encoder type**		UINT16		0	0	0	R	EXP	

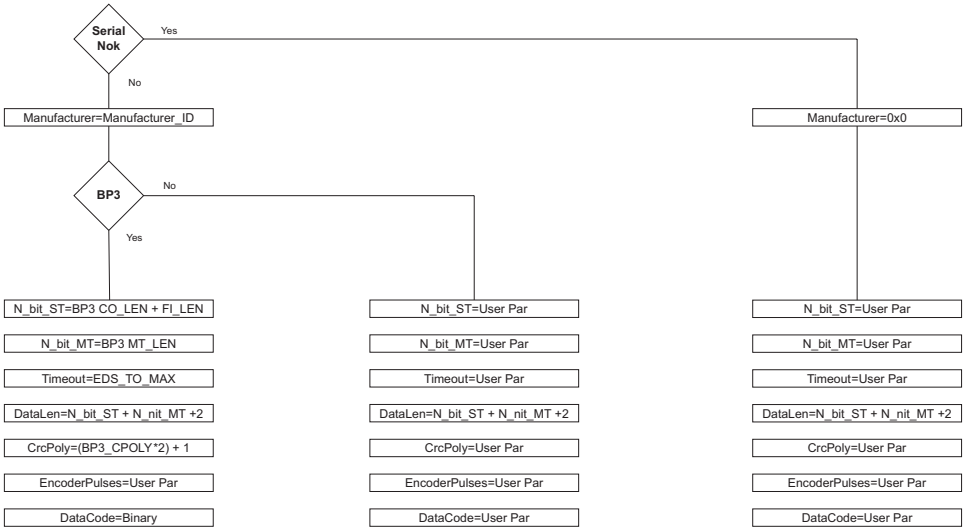
At power-on, it is checked whether the connected encoder has the incremented tracks and if it has an electronic data sheet (EDS).

The result of check is shows inside this parameter. In case of different value you have to perform the procedute to convert the drive.

Code	Description	Serial Error 0 = Serial Ok 1 = Serial Nok	BP3 0 = No BP3 1 = Yes BP3	Incremental signal 0 = No incremental signal 1 = Yes incremental signal
0	Serial Ok - No BP3 – No incremental signal	0	0	0
1	Serial Ok - No BP3 – Yes incremental signal	0	0	1
2	Serial Ok - Yes BP3 – No incremental signal	0	1	0
3	Serial Ok - Yes BP3 – Yes incremental signal	0	1	1
4	Serial Nok - No BP3 – No incremental signal	1	0	0
5	Serial Nok - No BP3 – Yes incremental signal	1	0	1
6	Serial Nok - Yes BP3 – No incremental signal	1	1	0
7	Serial Nok - Yes BP3 – Yes incremental signal	1	1	1

If the connected encodes has EDS than the communication channel is configured automatically.

If the connected encoder does not have EDS than the comminucation channel must be configured manually.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.29	**7102**	**BiSS manufacturer**		UINT16		0	0	0	R	EXP	

This parameter shows the Encoder **BiSS Manufacturer** found. Some possible value are:

Code	Manufacturer
0x0000 (0)	Not available
0x4B55 (19285)	Kuebler
0x4855 (18517)	Hengstler
0x4C69 (19561)	Lika
0x5265 (21093)	Reninshaw
0x4853 (18515)	Hohner
Other	Unknow

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.30	**7104**	**BiSS clock freq**		UINT16		7	0	15	RW	EXP	

This parameter allows setting of the BiSS sensor frequency.

Code	Sensor frequency	Sensor period
1	6,25 MHz	0,160 μsec
2	4,16 MHz	0,240 μsec
3	3,12 MHz	0,320 μsec
4	2,50 MHz	0,400 μsec
5	2,08 MHz	0,480 μsec
6	1,78 MHz	0,560 μsec
7	1,56 MHz	0,640 μsec
8	1,38 MHz	0,724 μsec
9	1,25 MHz	0,800 μsec
10	1,13 MHz	0,884 μsec
11	1,04 MHz	0,961 μsec
12	0,96 MHz	1,041 μsec
13	0,89 MHz	1,123 μsec
14	0,83 MHz	1,204 μsec
15	0,78 MHz	1,282 μsec

The default value should guarantee the correct operating conditions with the most used encoders.
The rule to follow for a correct parameterization is show below.

The frame time is composed of three contributions:

Contributions	Typ Time	Min Time	Max Time
Processing time for single cycle data + Transmission delay	10 μsec	0 μsec	40 μsec
Transmission data time T = N Bit * "Sensor period" N Bit = BiSS data len + Crc(6) + Start(1) + Stop(1)			
Timeout BiSS TO_MAX	13 μsec	0 μsec	40 μsec

The sum of the three contributions must be less than 100 µsec.
If the sum of the three contributions exceeds 100 µsec then the BiSS clock frequency must be increased.

I.e.:
BiSS clock freq = 7 = 0.640 µsec
BiSS data len = 15

Contributions	Typ Time
Processing time for single cycle data + Transmission delay	10.00 μsec
Transmission data time T = N Bit * "Sensor period" N Bit = BiSS data len + Crc(6) + Start(1) + Stop(1)	14.74 μsec
Timeout BiSS TO_MAX	13.00 μsec
Total	37.74 μsec

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.31	**7106**	**BiSS N bit ST**		UINT16		13	0	64	RW	EXP	

This parameter allows setting of bit Number for single turn data. This parameter is automatically setted in case of encoder with EDS. This parameter must be setted manually in case of encoder without EDS.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.32	**7108**	**BiSS N bit MT**		UINT16		0	0	64	RW	EXP	

This parameter allows setting of bit Number for multi turn data. This parameter is automatically setted in case of encoder with EDS. This parameter must bel setted manually in case of encoder without EDS.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.33	**7110**	**BiSS data len**		UINT16		0	0	0	R	EXP	

This parameter shows the frame data length.

This parameter is setted automatically.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.34	**7112**	**BiSS timeout**	us	FLOAT		13	0	65	RW	EXP	

This parameter allows setting the BiSS Timeout. This parameter is automatically setted in case of encoder with EDS.

This parameter must bel setted manually in case of encoder without EDS. This parameter must be taken into account when checking whether the selected BiSS clock frequency guarantees correct timing.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.35	**7114**	**BiSS Crc polinomy**		UINT16		67	1	65535	RW	EXP	

This parameter allows setting the BiSS Crc polinomy. This parameter is automatically setted in case of encoder with EDS.

This parameter must bel setted manually in case of encoder without EDS.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.36	**7116**	**BiSS data code**		ENUM		Binary			RW	EXP	

This parameter allows setting the BiSS data code format.

0 Binary
1 Gray

Typically BiSS encoders use a binary data format.

If you use an encoder with **Gray** data format, set **Gray** in this parameter.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.37	**2178**	**Abs offset memory**		ENUM		Drive memory			RW	EXP	

Only for Endat encoder. Selects the location where the phasing data is saved.

0 Drive memory
1 Encoder memory

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.38	**7150**	**SSI N bit ST**		UINT16		13	0	13	RW	EXP	

This parameter sets the number of position bits of SSI encoder.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.39	**7152**	**SSI N bit MT**		UINT16		0	0	19	RW	EXP	

Number of bits for the single turn data (multiturn encoder only).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.40	**7154**	**SSI N bit TX**		UINT16		13	0	32	RW	EXP	

Setting of the length of the SSI package, defined as the number of clock cycles, in that the packages of the absolute SSI encoders available on the market vary in length from 13 to 25 bits.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.41	**7156**	**SSI data code**		ENUM		Gray			RW	EXP	

Data code.

0 Binary
1 Gray

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.42	**2732**	**Enc position offset**		INT16		0	0	0	RW	EXP	Y

Motor phasing position. This is calculated during the auto phasing procedure.

9 SAFETY

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
9.1	**1058**	**Safety en mon**		BIT	16BIT_L	0	0	0	R	ESY	

Safety enable input signal status.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
9.2	**11088**	**Contactorless Enable**		BOOL		Off	-	-	RW	INT	FVY

This should be configured if the contactorless mode is desired. By enabling this parameter, the Fast enable command is brought to digital Input 4 and the drive indicates the contactorless operation mode to the controller through digital output 4.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
9.3	**11252**	**Brake fbk A3 sel**		ENUM		Null	-	-	RW	INT	FVY

Selection of the **Brake failure** alarm In the default configuration the brake fault alarm function is disabled.

Setting of the source to enable between those available in the "**LiftInputAdlCmd**" selection list.

1110	Dig input E mon
1210	Dig input 1 mon
1212	Dig input 2 mon
1214	Dig input 3 mon
1216	Dig input 4 mon
1218	Dig input 5 mon
1220	Dig input 6 mon
1222	Dig input 7 mon
1224	Dig input 8 mon
1230	Dig input 1x mon
1232	Dig input 2x mon
1234	Dig input 3x mon
1236	Dig input 4x mon
3702	Run cont mon
3706	Down cont mon
3708	Brake cont mon
3714	Door open mon
6000	Null
6002	One
8000	EBC SOK mon
8002	EBC Warning mon
8004	EBC Alarm mon
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	Lev.	Vis.
9.4	**11268**	**Reset Brake Alarm**		INT		0	-	-	RW	INT	FVY

Resets the **Brake feedback** alarm.

Reset procedure:

1. Open menu 5.10 LIFT ALARMS, and check that the **Brake feedback** 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 feedback** alarm has been reset.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
9.5	**11270**	**Threshold A3 A3**	**m**	FLOAT		0.1	0	2	RW	INT	VY

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

10 REGOLATION MENU

10.1 SPEED REGULATION GAINS (SPEED REG GAINS)

Speed Reg Gains

This menu contains the parameters specific to the motor (synchronous or asynchronous) speed control loop illustrated in the figure.

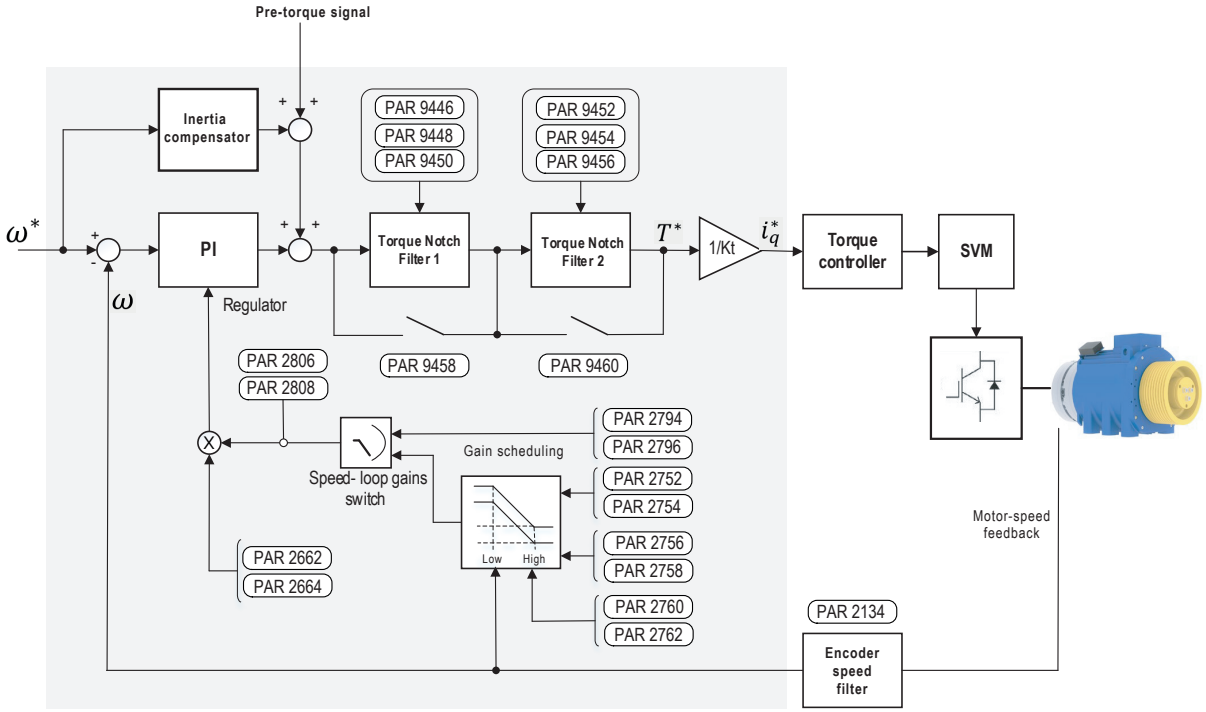
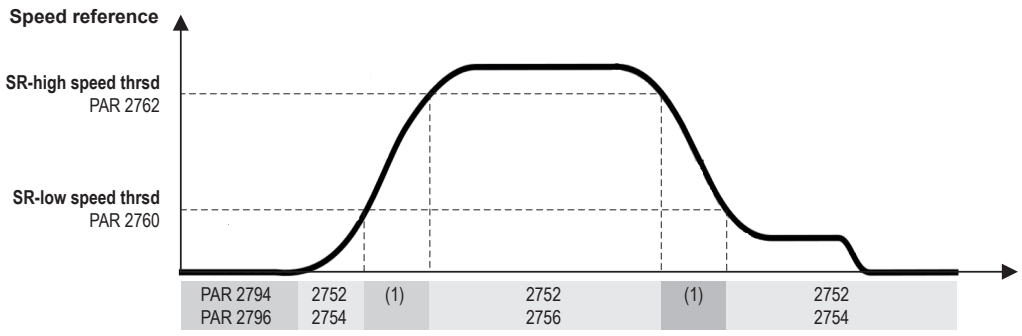


Figure 11.1: Motor speed control loop block diagram



PAR 2794 SR-P gain at start; PAR 2796 SR-I gain at start; PAR 2752 SR-P gain low speed; PAR 2754 SR-I gain low speed; (1) Linear change of gains;

Figure 11.2: Adaptation of the control loop gains as a function of the speed reference

Torque Notch Filters

To attenuate possible resonance frequencies, in the 5...300Hz range, up to two cascade suppressor filters have been provided for. Both can be configured and enabled independently.

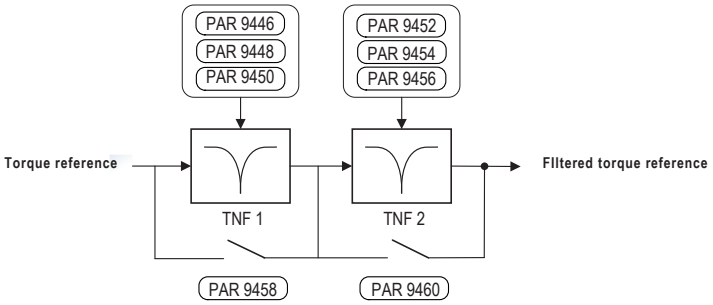


Figure 11.3: Suppressor filters in cascade

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.1	**2240**	**Inerzia**	kgm^2	FLOAT		0.8	0.001	1000	RW	INT	VSY

Specifies the actual value of the moment of inertia on the motor side.

Based on the value defined in this parameter, the drive suitably sets the base gains of the Proportional + Integral controller of the speed control loop (PAR 2662 **SR-high speed thrsd**, PAR 2664 **SR-I time**) to ensure stable operation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.2	**9702**	**Learning trip out**	kgm^2	FLOAT		0	0	0	R	EXP	FVSY

Provides the value calculated by the Learning trip procedure (PAR 9720, menu 2 OPTIMIZ. WIZARD). At the end of the procedure, if successfully ending with the “Learning trip OK” message, this value is copied to parameter 2240 **Inertia**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.3	**2794**	**SR-P gain at start**	%	FLOAT		150.0 (*)	0.0	400.0	RW	INT	VSY

Defines the level of proportional control exercised by the PI regulator during the start phase.

In this initial phase the motor speed control loop must be sufficiently responsive to compensate for any load imbalance and thus counteract the roll-back effect.

An excessive increase of this parameter may generate system vibrations or unstable behaviour.

(*) Def: 150 = ASY FOC, 110 = SYN FOC

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.4	**2796**	**SR-I gain at start**	%	FLOAT		110.0	0.0	400.0	RW	INT	VSY

Defines the level of integral control exercised by the PI regulator during the start phase.

Increasing the value of this parameter improves the speed control response in compensating for any load imbalance when the brake is opened.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.5	**2752**	**SR-P gain low speed**	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY

Defines the level of the proportional control exercised by the PI regulator for operating speeds below the minimum threshold defined in parameter PAR 2760 **SR-low speed thrsd**.

For operating speeds above this threshold, the actual level of proportional action becomes a linear combination between the value defined in this parameter and the value defined in parameter PAR 2756 **SR-P gain high speed.**

In the speed range between the thresholds defined in the PAR 2760 **SR-low speed thrsd** and the PAR 2762 **SR-high speed thrsd** parameters, the weight of the proportional action varies linearly with the speed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.6	**2754**	**SR-I gain low speed**	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY

Defines the level of the integral control exercised by the PI regulator for operating speeds below the minimum threshold defined in parameter PAR 2760 **SR-low speed thrsd**.

For operating speeds above this threshold, the actual level of integral action becomes a linear combination between the value defined in this parameter and the value defined in parameter PAR 2758 **SR-I gain high speed**.

In the speed range between the thresholds defined in the PAR 2760 **SR-low speed thrsd** and the PAR 2762 **SR-high speed thrsd** parameters, the weight of the proportional action varies linearly with the speed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.7	**2756**	**SR-P gain high speed**	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY

Defines the level of the proportional control action exercised by the PI regulator for operating speeds above the maximum threshold defined in parameter PAR 2762 **SR-high speed thrsd**.

For operating speeds lower than this threshold, the actual level of proportional action becomes a linear combination between the value defined in this parameter and the value defined in parameter PAR 2752 **SR-P gain low speed**.

In the speed range between the minimum and maximum thresholds defined in PAR 2760 **SR-low speed thrsd** and PAR 2762 **SR-high speed thrsd** parameters, the weight of the proportional action varies linearly with the speed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.8	**2758**	**SR-I gain high speed**	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY

Defines the level of the integral control action exercised by the PI regulator for operating speeds above the maximum threshold defined in parameter PAR 2760 **SR-low speed thrsd**.

For operating speeds lower than this threshold, the actual level of integral action becomes a linear combination between the value defined in this parameter and the value defined in parameter PAR 2754 **SR-I gain low speed.**

In the speed range between the thresholds defined in PAR 2760 **SR-low speed thrsd** and PAR 2762 **SR-high speed thrsd** parameters, the weight of the integral action varies linearly with the speed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.9	**2760**	**SR-low speed thrsd**	%	UINT16		30	1	100	RW	INT	VSY

Specifies the low speed threshold used for automatic gain adjustment of the speed controller.

The value is expressed as a percentage of the rated speed.

For motor speeds below this threshold, the speed controller uses the gains specified in the PAR 2752 **SR-P gain low speed** and the PAR 2754 **SR-I gain low speed** parameters.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.10	**2762**	**SR-high speed thrsd**	%	UINT16		70	1	100	RW	INT	VSY

Specifies the high speed threshold used for automatic gain adjustment of the speed controller.

The value is expressed as a percentage of the rated speed.

For motor speeds above this threshold, the speed controller uses the gains specified in the PAR 2756 **SR-P gain high speed** and the PAR 2758 **SR-I gain high speed** parameters.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.11	**2662**	**SR-P gain**	N/rpm	FLOAT		1.0	0	0	RW	INT	VSY

Specifies the base value of the speed controller's proportional gain.
Its value is calculated by the drive as a function of the total moment of inertia declared in paramete PAR 2240 **Inertia.**

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.12	**2664**	**SR-I time**	ms	FLOAT		1.0	0	0	RW	INT	VSY

Specifies the base value of the speed controller's integral time. Its default value is 100 ms.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.13	**9446**	**TNF1-frequency**	Hz	FLOAT		100.0	5.0	350.0	RW	EXP	VSY

Specifies the value of the central frequency of the first TNF1 suppressor filter.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.14	**9448**	**TNF1-bandwidth**	Hz	FLOAT		4	1	20	RW	EXP	VSY

Defines the TNF1 suppressor filter's frequency band.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.15	**9450**	**TNF1-depth**		FLOAT		20	3	60	RW	EXP	VSY

Specifies the TNFR1 suppressor filter's attenuation value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.16	**9458**	**Torque Notch Fltr 1**		ENUM		Disable			RW	EXP	VSY

This parameter activates/deactivates the filtering function of the first optional TNF 1 filter applied to the torque reference

generated by the PI speed regulator.

0 - Disable
1 - Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.17	**9452**	**TNF2-frequency**	Hz	FLOAT		100.0	5.0	350.0	RW	EXP	VSY

Specifies the value of the central frequency of the second TNF2 suppressor filter.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.18	**9454**	**TNF2-bandwidth**	Hz	FLOAT		4	1	20	RW	EXP	VSY

Defines the TNF2 suppressor filter's frequency band.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.16	**9456**	**TNF2-depth**		FLOAT		20	3	60	RW	EXP	VSY

Specifies the TNF2 suppressor filter's attenuation value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.20	**9460**	**Torque Notch Fltr 2**		ENUM		Disable			RW	EXP	VSY

This parameter activates/deactivates the filtering function of the second optional TNF 2 filter applied to the torque reference generated by the PI speed regulator.

0 - Disable
1 - Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.21	**2806**	**SR-P gain in use**	%	FLOAT		100.0	0	0	R	INT	VSY

Read-only parameter. Contains the current value of the speed controller's proportional action level.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.22	**2808**	**SR-I gain in use**	%	FLOAT		100.0	0	0	R	INT	VSY

Read-only parameter. Contains the current value of the speed controller's integral action level.

10.3 REGULATOR PARAM

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.3.1	**2250**	**CR-P gain**	V/A	FLOAT		1.0	0	0	RW	EXP	FVSY

Setting of the proportional gain of the current regulator (CR).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.3.2	**2252**	**CR-I time**	ms	FLOAT		1.0	0	0	RW	EXP	FVSY

Sets the integral time constant of the current regulator (CR).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.3.3	**2260**	**FR-P gain**	A/Wb	FLOAT		1.0	0	0	RW	EXP	FVSY

Sets the proportional gain value of the flux regulator (FR) used only in vector control ([1] ASY FOC, PAR 540 **Control type**) for asynchronous motors.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.3.4	**2262**	**FR-I time**	ms	FLOAT		1.0	0	0	RW	EXP	FVSY

Sets the value of the integral time constant of the flux regulator (FR) used only in vector control ([1] ASY FOC, PAR 540 **Control type**) for asynchronous motors.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.3.5	**2272**	**VR-I time**	ms	FLOAT		1.0	0	0	RW	EXP	FVSY

Sets the value of the integral time constant of the output voltage regulator (VR).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.3.6	**2290**	**Deflux voltage**	V	FLOAT		380	0	0	RW	EXP	FVSY

Defines the maximum AC voltage value applicable by the inverter. For speeds greater than the base speed (at the speed for which the applied voltage reaches its maximum value) the drive reduces the magnetic flux of the motor by entering the Flux weakening operating range.

Flux reduction enables higher speeds to be reached at the expense of the maximum deliverable torque, which decreases accordingly.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.3.7	**2292**	**Voltage margin**	perc	FLOAT		5.0	0	30.0	RW	EXP	FVSY

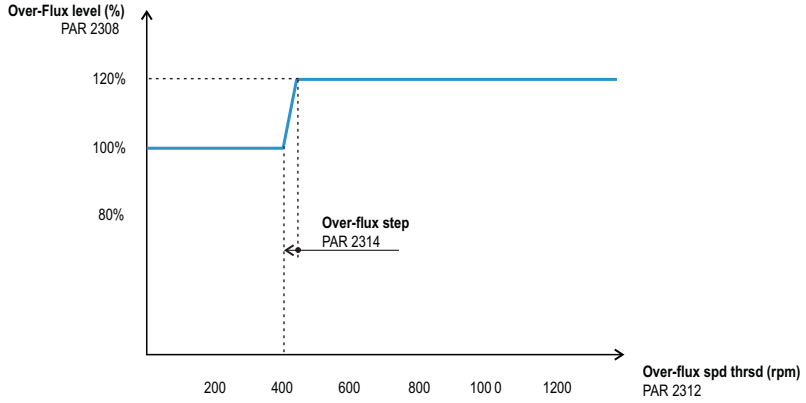
Setting of the voltage regulation margin according to the available voltage. In case of a Deflux voltage setting close to or equal to the actual mains value, **Voltage margin** (PAR 2292) represents the margin allowable by the voltage regulation to perform rapid current variations when load steps are 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	Lev.	Vis.
10.3.8	**2308**	**Over-flux level**	perc	FLOAT		100	100	150	RW	EXP	FVSY

The value is expressed as the percentage in excess of the rated flux.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.3.9	**2312**	**Over-flux spd thrsd**	rpm	FLOAT		400	1	1000	RW	EXP	FVSY

Speed limit below which the overflux value set in PAR 2308 **Over-flux level**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.3.10	**2314**	**Over-flux step**		FLOAT		1	0.01	10	RW	EXP	FVSY

Setting of the ramp time in the transition between the rated flux and the overflux value set in PAR 2308 **Over-Flux level.**

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.3.11	**2724**	**Defluxing curr lim**	A	FLOAT		0.0	0	0	RW	EXP	FVSY

This parameter specifies the maximum defluxing current (direct component of motor current) applicable by the drive in Flux Weakening operating range.

Standard value 30% of the rated current. A null value disables the defluxing function.

10.4 TORQUE CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.4.1	**2350**	**Torque cur lim Pos**	A	FLOAT	16BIT_H	CALCF	0.0	CALCF	RW	EXP	FVSY

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	Lev.	Vis.
10.4.2	**2352**	**Torque curr lim Neg**	A	FLOAT	16BIT_H	CALCF	0.0	CALCF	RW	EXP	FVSY

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

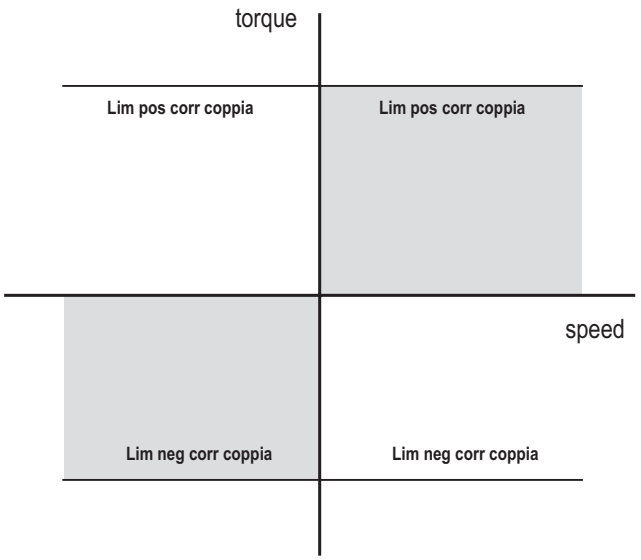
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.4.3	**2354**	**Torque curr lim sel**		ENUM		Off			RWZ	EXP	FVSY

Setting of the type of behaviour of the drive in the current limit condition.

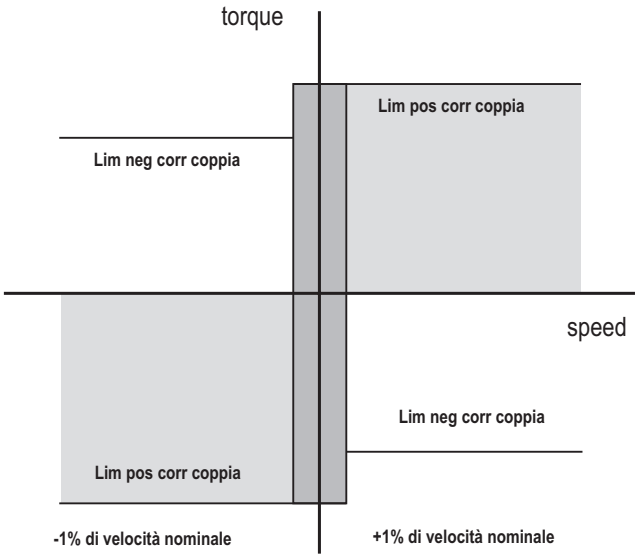
0 Off
1 T clim +/-
2 T clim mot/gen
3 T limit src

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** (PAR 2350) and the active negative torque limit is **Torque curr lim Neg** (PAR 2352).



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** (PAR 2350) and the active negative torque limit is **Torque curr lim Neg** (PAR 2352).

2 – If the motor speed is < -1% of **Rated speed** the active positive torque limit is **Torque curr lim Pos** (PAR 2350) and the active negative torque limit is **Torque curr lim Neg** (PAR 2352).

3– If -1% of Motor non speed < motor speed < + 1% of **Rated speed** the active positive torque limit is **Torque curr lim Pos** (PAR 2350) and the active negative torque limit is **Torque curr lim Neg** (PAR 2352).

If set to **3** the torque limits are symmetrical. The torque limit is the value written in the sorce selected by **Torque limit src (PAR 2358)**. This mode is not managed with ASY SSC control mode.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.4.4	**2358**	**Torque limit src**		LINK	16BIT_H	6000	0	2380	RWZ	EXP	FVSY

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	Lev.	Vis.
10.4.5	**2360**	**Torque climPos Inuse**	A	FLOAT	16BIT_H	0.0	0.0	0.0	R	EXP	FVSY

The positive torque limit value currently being used is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.4.6	**2362**	**Torque climNeg Inuse**	A	FLOAT	16BIT_H	0.0	0.0	0.0	R	EXP	FVSY

The negative torque limit value currently being used is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.4.7	**2380**	**Dig torque ref**	%	FLOAT	16BIT_H	0.0	-300.0	300.0	RW	EXP	FVSY

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	Lev.	Vis.
10.4.8	**2382**	**Torque ref src**		LINK	16BIT_H	65535	2380	2380	RWZ	EXP	FVSY

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 “**L_VREF**” selection list.

11 FUNCTIONS

11.1 DC BRAKING

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.1.1	**3150**	**DC braking cmd src**		LINK	16BIT_L	6000			RW	INT	FVS

Selection of the origin (source) of the signal to be used for the **DC braking command**. The terminal or signal that can be used for this function can be defined from among those available in the "**L_DIGSEL2**" selection list".

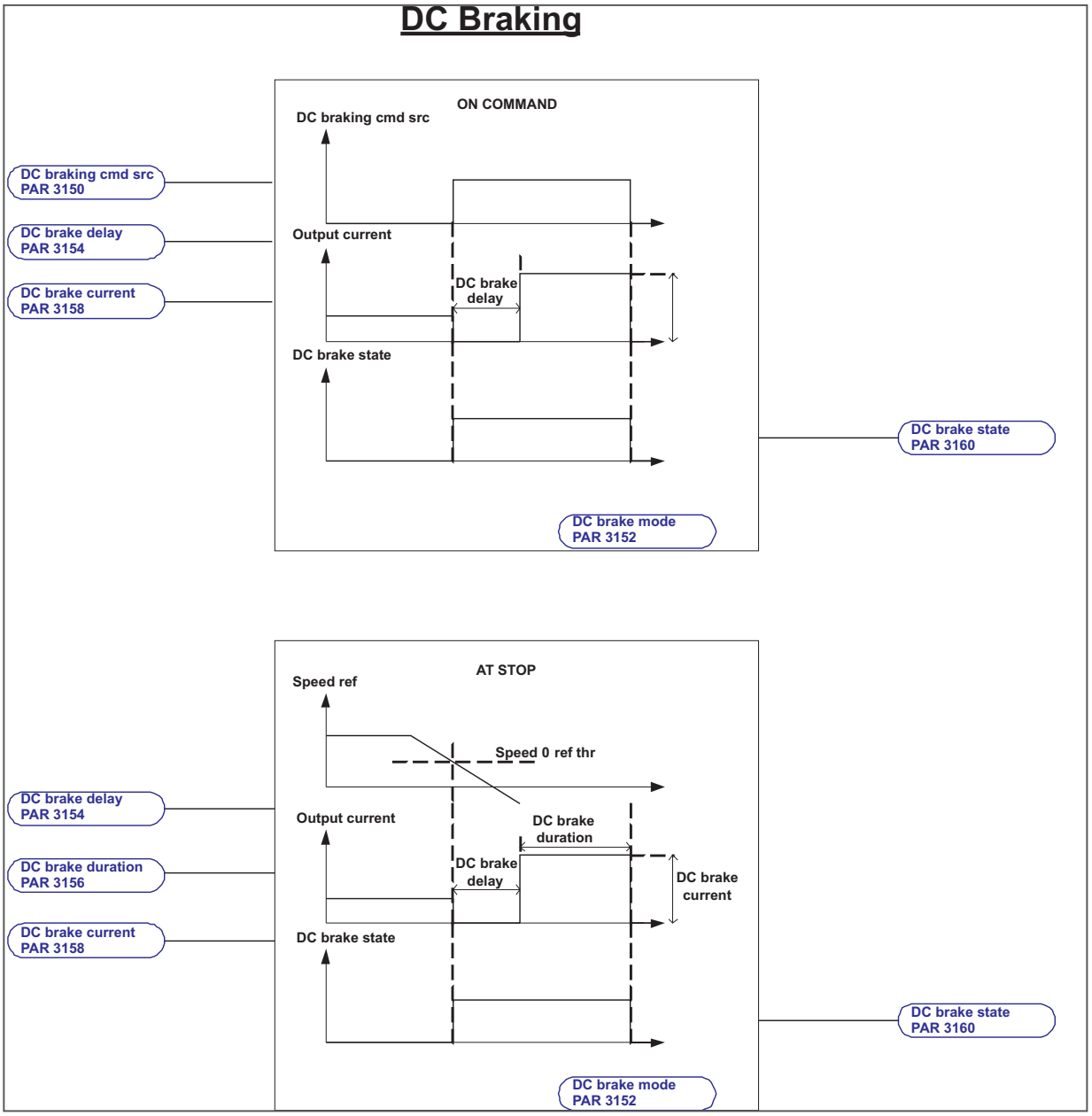
0 DC braking command not enable
1 DC braking command enable

In default conditions the origin of the **DC braking command** signal is 0 (not enable).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.1.2	**3152**	**DC brake mode**		ENUM		Off			RW	INT	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 **Ref is 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	Lev.	Vis.
11.1.3	**3154**	**DC brake delay**	s	FLOAT		0.01	0.01	30.0	RW	INT	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.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.1.4	**3156**	**DC brake duration**	s	FLOAT		1.0	0.01	30.0	RW	INT	FVS

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.1.5	**3158**	**DC brake current**	%	FLOAT		75	0.0	150.0	RW	INT	FVS

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

This is expressed as a percentage of the rated current (PAR 2002 **Rated Current**).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.1.6	**3160**	**DC brake state**		ENUM	16BIT_L	Not active			R	INT	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.

11.2 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 machine inertia.

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.2.1	**3100**	**Inertia comp**	kgm^2	FLOAT		0.1	0	0	RW	EXP	FVSY

Total value of the inertia on the motor shaft in Kgm^2 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	Lev.	Vis.
11.2.2	**3102**	**Inertia comp filter**	ms	FLOAT		4.0	2.0	20.0	RW	EXP	FVSY

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	Lev.	Vis.
11.2.3	**3104**	**Inertia comp mon**	%	FLOAT	16BIT_H	0.0	0.0	0.0	R	EXP	FVSY

The value of inertia compensation on the function block output is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.2.4	**3106**	**Inertia comp fcn**		ENUM		Disable			RW	EXP	FVSY

Enable inertia compensation mode.

0 Disable
1 Enable

11.3 ANTI ROLLBACK

It can only be activated in the synchronous FOC-CL control mode to reduce or eliminate the roll-back effect at start and finish without the need for prior load measurements by means of special sensors.
The anti roll-back function at start-up realises a control action that, when the brake is applied, compensates for the load imbalance by preventing unwanted rotor movements and ensures a smooth and comfortable start.
For satisfactory results, it is advisable to use an encoder with a resolution of at least 2048 sine/cosine periods per revolution.
Similarly, the anti-rollback on arrival function realises a control action that reduces or cancels unwanted movements on arrival at the plane. If the function is activated, the corresponding control action is automatically exercised on arrival at the landing when the speed reference becomes zero. In this way, in the time between reaching zero speed and closing the brake, the rotor is kept locked in torque, ensuring a comfortable and jolt-free stop of the car.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.3.1	**2766**	**PR-P gain**		FLOAT		500	0	20000	RW	EXP	Y

Defines the gain of the anti-rollback action at start.

Possible range of values: 0… 1000. A “0” value cancels the controller’s action. High values improve the position controller’s response in limiting possible rotation of the motor shaft in the opposite direction to that desired when the locking brake is opened (roll-back).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.3.2	**2768**	**PR-enable**		ENUM		Enable			RW	EXP	Y

This parameter enables/disables the anti rollback function at start-up.

0 - Disable
1 - Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.3.3	**2812**	**PR-P End gain**		FLOAT		500	0	20000	RW	EXP	Y

Defines the gain of the anti-rollback action on arrival.

Range of possible values : 0…1000 . The value “0” cancels the action of the function. High values improve the response of the function in limiting any rotation of the motor shaft in the opposite direction to that desired in the stopping phase.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.3.4	**2814**	**PR End enable**		ENUM		Enable			RW	EXP	Y

This parameter enables/disables the arrival anti rollback function.

0 - Disable
1 - Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.3.3	**2810**	**Pos reg limit**	rpm	FLOAT		10.0	-20	20	RW	EXP	Y

Specifies the maximum and minimum value of the positioner control action.

11.4 VIBRATION ANALYSIS (VIBR. ANALYSIS)

This is a measurement tool that can be activated in FOC control modes, whether synchronous or asynchronous, to detect any mechanical vibration that occurs during movement at constant speed disturbing the comfort in the cabin. The measurement system for each movement is able to detect, if present, up to two resonance frequencies in the band between 5...300Hz and returns the values as output in two parameters. Any frequencies found can then be used to configure the notch filters in the SPEED REG GAINS menu.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.4.1	**2288**	**Vibration analyzer**		ENUM		Disable			RW	EXP	VSY

This parameter enables/disables the function for measuring resonance frequencies.

0 - Disable
1 - Enable

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.4.2	**9464**	**Vibration freq. 1**	Hz	FLOAT		0	0.0	0.0	R	EXP	VSY

Indicates the value in Hz of the first measured resonance frequency. If two frequencies have been detected, **Vibration freq. 1** will be the one with the higher amplitude.

A “0” value indicates that no resonance frequency is present in the measurement band.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.4.3	**9466**	**Vibration freq. 2**	Hz	FLOAT		0	0.0	0.0	R	EXP	VSY

Indicates the value in Hz of the second measured resonance frequency. If two frequencies have been detected, **Vibration freq. 2** will be the one with the lower amplitude.

A “0” value indicates that no second resonance frequency is present in the measurement band.

11.5 MOTOR OVERLOAD

The overload control function provides integrator logic to protect the motor against thermal overload.
This protection emulates the thermal relay of the motor controlled by the ADL500 drive.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.5.1	**3200**	**Motor ovld enable**		ENUM		Off			RW	EXP	FVSY

Enabling of the motor overload control.

0 Off
1 On

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.5.2	**3202**	**Motor ovld factor**	%	FLOAT		150	100	300	RW	EXP	FVSY

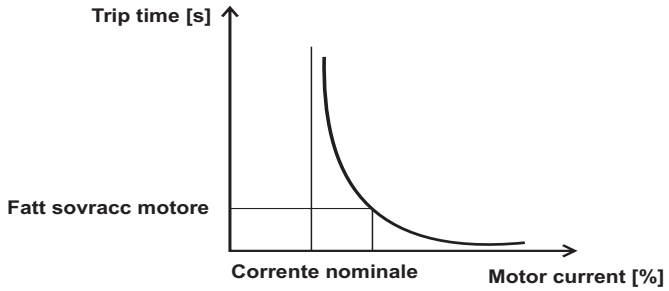
Setting of the motor overload value. Percentage value of the motor rated current (PAR 2002 **Rated current**).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.5.3	**3204**	**Motor ovld time**	s	FLOAT		30	10	300	RW	EXP	FVSY

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 PAR 3202 **Motor ovld factor** parameter.

This alarm can be assigned to a programmable digital output (PAR 3214 **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	Lev.	Vis.
11.5.4	**3206**	**Motor service factor**	%	FLOAT		100	25	200	RW	EXP	FVSY

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	Lev.	Vis.
11.5.5	**3216**	**Motor fan type**		ENUM		Auto fan			RW	EXP	FVSY

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 ovld factor** and is the maximum current that can circulate in the motor. If the MOTOR OVERLOAD function is enabled the drive automatically sets the torque current limit so that Iout max. does not exceed this value.

With the MOTOR OVERLOAD function a current equal to the Overload level is supplied to the motor for the maximum time set in PAR 3204 **Motor ovld time**, The slower the motor speed, the shorter the time allowed (see figure at beginning of chapter).

After the set time, the MOTOR OVERLOAD function automatically sets the torque current limit so that Iout max. does not exceed the direct current of the MOTOR OVERLOAD function.

When the motor current speed exceeds (PAR 2004 **Rated speed** / 2) and PAR 3216 **Motor fan type** = Auto fan, the direct current is not reduced as cooling is sufficient.

When PAR 3216 **Motor fan type** = Servo fan, the direct current is not reduced as cooling is sufficient.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.5.6	**3218**	**Motor derat factor**	%	FLOAT		50	0	100	RW	EXP	FVSY

This parameter is used to set the derating factor. The value is expressed as a percentage of PAR 2002 **Rated current** * PAR 3206 **Motor service factor**.

When the current motor speed is below (PAR 2004 **Rated speed** / 2) and PAR 3216 **Motor fan type** = Auto fan, the protection intervention time must be reduced as cooling is insufficient.

At below (PAR 2004 **Rated speed** / 2) sthe protection intervention time is reduced by reducing the direct current of the MOTOR OVERLOAD function.

When the motor speed is equal to (PAR 2004 **Rated speed** / 2)) the direct current of the MOTOR OVERLOAD function is equal to PAR 2002 **Rated current** * PAR 3206 **Motor service factor**, whereas below that limit it is modified following a linear pattern until PAR 2002 **Rated current** * PAR 3206 **Motor service factor** * PAR 3218 **Motor derat factor** when the motor speed reaches zero.

The overload current of the MOTOR OVERLOAD function is obtained by PAR 2002 **Rated current** * PAR 3206 **Motor service factor** * PAR 3202 **Motor ovld factor** and is the maximum current that can circulate in the motor. If the MOTOR OVERLOAD function is enabled the drive automatically sets the torque current limit so that Iout max. does not exceed this value.

With the MOTOR OVERLOAD function a current equal to the Overload level is supplied to the motor for the maximum time set in PAR 3204 **Motor ovld time**, The slower the motor speed, the shorter the time allowed (see graphs).

After the set time, the MOTOR OVERLOAD function automatically sets the torque current limit so that Iout max. does not exceed the direct current of the MOTOR OVERLOAD function.

When the motor current speed exceeds (PAR 2004 **Rated speed** / 2) and PAR 3216 **Motor fan type** = Auto fan, the direct current is not reduced as cooling is sufficient.

When PAR 3216 **Motor fan type** = Servo fan, the direct current is not reduced as cooling is sufficient.

If the value of parameter 3202 **Motor ovld factor** is 100 % the overload current of the Motor Overload function is equal to the continuous current of the Motor Overload function. In this case the drive behaves as if the overload cycle has been executed and so sets the torque current limit so that Iout max is not more than the continuous current, i.e. **Rated current** (PAR 2002) * **Motor service factor** (PAR 3206) * **Motor derat factor** (PAR 3218).

We recommend setting parameter 3218 **Motor derat factor** to a value so that **Rated current** (PAR 2002) * **Motor service factor** (PAR 3206) * **Motor derat factor** (PAR 3218) produces a result that is more than the motor magnetisation current.

11.6 BRAKING RESISTOR OVERLOAD (BRES OVERLOAD)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.6.1	**3250**	**Bres control**		ENUM		On			RW	INT	FVSY

Enabling of the external braking resistance and relative overload control.

0 Off
1 On

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.6.2	**3252**	**Bres value**	ohm	FLOAT		7.0	7.0	1000.0	RW	INT	FVSY

Setting of the ohm value of the external braking resistor.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.6.3	**3254**	**Bres cont power**	kW	FLOAT		0.1	0.1	100.0	RW	INT	FVY

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	Lev.	Vis.
11.6.4	**3256**	**Bres overload factor**	%	FLOAT		1.5	1.5	10.0	RW	INT	FVSY

Setting of the external resistor overload factor.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.6.5	**3258**	**Bres overload time**	s	FLOAT		0.5	0.5	50.0	RW	INT	FVSY

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

11.7 ENERGY SAVING (ENER. SAVING)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.7.1	**3122**	**Saved energy**	kWh	FLOAT		0	0	0	R	EXP	FVSY

Energy saved, starting from the first switch-on, by using the drive coupled with a regenerative unit. If the drive is not coupled to this product, the parameter calculates how much energy would have been saved.

The displayed value is never reset even when the drive is switch-off.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.7.2	**3124**	**Set energy val**	kWh	FLOAT		0	0	0	RW	EXP	FVSY

Makes it possible to reset parameter 3122 Saved energy by entering “0” or a generic desired value.
(e.g. if 10 kWh is entered, parameter 3122 is automatically updated to 10 kWh and continues to accumulate from this value).

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	Lev.	Vis.
-	**262**	**Motor speed no filter**	rpm	INT16	16BIT_H	0	0	0	R	SRV	
		Indicates the unfiltered motor speed.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**626**	**Ramp ref out mon**	rpm	INT16	16BIT_H	0	0	0	R	SRV	
		Displays the reference value output of the ramp reference function block.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**760**	**Ramp out mon**	rpm	INT16	16BIT_H	0	0	0	RW	SRV	
		Displays the reference value output of the ramp function block.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**764**	**Ramp acc state**		BIT	16BIT_L	2	0	1	R	SRV	
		Indicates whether the acceleration ramp is active.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**766**	**Ramp dec state**		BIT	16BIT_L	0	0	1	R	SRV	
		Indicates whether the deceleration ramp is active.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**934**	**Ref is 0**		BIT	16BIT_L	0	0	1	R	SRV	
		This signal is active when the reference is below the limit set in parameter 930 **Reference 0 threshold**.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**936**	**Ref is 0 delay**		BIT	16BIT_L	0	0	1	R	SRV	
		It is active when the reference is below the threshold set in parameter 930 **Reference 0 threshold**. The signal is enabled after the delay set with parameter 932 **Reference delay 0**.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**944**	**Speed is 0**		BIT	16BIT_L	0	0	1	R	SRV	
		It is active when the speed is below the threshold set in parameter 940 **Speed 0 threshold**.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**946**	**Speed is 0 delay**		BIT	16BIT_L	0	0	1	R	SRV	
		It is active when the reference is below the threshold set in parameter 940 **Speed 0 threshold**. The signal is activated after the delay set in parameter 942 **Speed 0 delay.**									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**1024**	**Enable cmd mon**		BIT	16BIT_L	0	0	1	R	SRV	
		Enable signal monitor.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**1026**	**Start cmd mon**		BIT	16BIT_L	0	0	1	R	SRV	
		Start signal monitor.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**1028**	**FastStop cmd mon**		BIT	16BIT_L	0	0	1	R	SRV	

Fast Stop signal monitor.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**1060**	**SM1 status**		ENUM		PSTART			R	SRV	

Status of DSP machine state.

255 - PSTART
0 - N_RDY_TO_SW_ON
64 - SWITCH_ON_DIS
33 - RDY_TO_SWT_ON
35 - SWITCHED_ON
39 - OPER_ENABLED
7 - QUICKSTOP_ACT
15 - FLT_REACT_ACT
8 - PFAULT

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**1062**	**Drive OK**		UINT16	16BIT_L	0	0	1	R	SRV	

It 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	Lev.	Vis.
-	**1064**	**Drive ready**		UINT16	16BIT_L	0	0	1	R	SRV	

It is active when the drive reference is in the "Ready" to run condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**3214**	**Motor overload trip**		BIT	16BIT_L	0	0	1	R	SRV	

It is active when the drive is in the motor overload alarm condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**3262**	**Bres overload trip**		BIT	16BIT_L	0	0	1	R	SRV	

It is active when the drive is in the braking resistor overload alarm condition.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**4708**	**Alm dig out mon 1**		BIT	16BIT_L	0	0	1	R	SRV	

It 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	Lev.	Vis.
-	**4710**	**Alm dig out mon 2**		BIT	16BIT_L	0	0	1	R	SRV	

It 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	Lev.	Vis.
-	**4712**	**Alm dig out mon 3**		BIT	16BIT_L	0	0	1	R	SRV	

It 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	Lev.	Vis.
-	**4714**	**Alm dig out mon 4**		BIT	16BIT_L	0	0	1	R	SRV	

It 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	Lev.	Vis.
-	**4770**	**First alarm**		ENUM		No Alarms			R	SRV	

Displays the first alarm to be activated.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**6000**	**Null**		UINT32	32BIT	0	0	0	R	SRV	

Forces the variable to the zero level (always disabled).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**6002**	**One**		UINT32	32BIT	1	1	1	R	SRV	

Forces the variable to level one (always active).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
-	**6372**	**DS417 status word**		UINT16	16BIT_L	0	0	65535	R	SRV	

Displays the status word according to the DS417 Profile. For more information reference should be made to the fieldbus manual.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.

- **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**

This signal is derived from the status of bit X (Bit 0 = PAR 12250 B0 Lift decomp ... Bit 15 = PAR 12280 B15 Lift decomp) of the word assigned to **Fieldbus M->S1 ipa** (PAR 4020).

PARAMETERS AND FUNCTIONALITY OF THE EBC500 ON THE ADL550

12 EBC

12.1 MONITOR

In the monitoring menu dedicated to the EBC we find all the parameters necessary to perform an initial rough monitoring as in the monitoring menu of the ADL500.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.1.1	**8000**	**EBC SOK mon**		BIT		0	0	0	R	ESY	
		Status word image bit 3. Indicates the status of the SOK output.									
		Bit = 0 (OFF)	open								
		Bit = 1 (ON)	close								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.1.2	**8002**	**EBC Warning mon**		BIT	0	0	0	0	R	ESY	
		Status word image bit 6 (Pwr Bridge temperature over 85°C).									
		Bit = 1 (ON)	EBC in overtemperature								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.1.3	**8004**	**EBC Alarm mon**		BIT	0	0	0	0	R	ESY	
		Status word image bit 7.									
		Bit = 1 (ON)	EBC blocked in alarm.								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.1.4	**8006**	**Brake 1 state mon**		ENUM		Brake_ OFF_SAFE			R	ESY	
		Status word image bit 16-19.									
		0	Brake OFF safe								
		1	Brake OFF								
		2	Brake ON								
		3	Fail								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.1.5	**8008**	**Brake 2 state mon**		ENUM		Brake_ OFF_SAFE			R	ESY	
		Status word image bit 24-27.									
		0	Brake OFF safe								
		1	Brake OFF								
		2	Brake ON								
		3	Fail								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.1.6	**8010**	**Brake 1 Out mon**		BIT	0	0	0	0	R	ESY	
		Status word image bit 21.									
		Bit = 1 (ON)	Brake output 1 energised								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.1.7	**8012**	**Brake 2 Out mon**		BIT	0	0	0	0	R	ESY	
		Status word image bit 29.									
		Bit = 1 (ON)	Brake output 2 energised								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.1.8	**8014**	**Brake 1 Fbk mon**		BIT	0	0	0	0	R	ESY	
		Status word image bit 22.									
		Bit = 1 (ON)	Input ex A3 brake 1 active								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.1.9	**8016**	**Brake 2 Fbk mon**		BIT	0	0	0	0	R	ESY	
		Status word image bit 30.									
		Bit = 1 (ON)	Input ex A3 brake 2 active								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.1.10	**8018**	**Brake 1 Current avg mon**	A	FLOAT	0	0	0	0	R	ESY	
		Value of current supplied at brake output 1.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.1.11	**8020**	**Brake 2 Current avg mon**	A	FLOAT	0	0	0	0	R	ESY	
		Value of current supplied at brake output 2.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.1.12	**8022**	**Vline rms mon**	V	FLOAT	0	0	0	0	R	ESY	
		Value of supply voltage.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.1.13	**8024**	**Vline frequency mon**	Hz	FLOAT	0	0	0	0	R	ESY	
		Power frequency value.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.1.14	**8026**	**Pwr Bridge Temp mon**	degC	FLOAT	0	0	0	0	R	ESY	
		Rectifier bridge temperature value.									

12.2 INFO

In the info menu we find the identification parameters of the EBC we have connected; these are also read-only parameters.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.2.1	**8100**	**Product type**		ENUM		EBC501			R	ESY	
		Product type.									
		1	EBC501								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.2.2	**8102**	**Product version**		UINT32		0	0	0	R	ESY	
		Product version.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.2.3	**8104**	**Product conf**		ENUM		Brake _1_2			R	ESY	
		Monitor indicating the type of output configuration.									
		Brake 1-2	Currently the only type provided.								

12.3 CONFIGURATION

In the EBC Configuration menu we find the EBC activation parameter in the wizard menu and the parameter describing the behaviour of the EBC when operating in local mode. In practice, it is necessary to decide whether in local mode the brake must act instantaneously by directly opening the “run-mossfet contactors” or whether a delay of a few milliseconds is allowed with a soft opening by opening the “Kbr-controlled bridge contactor”.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.3.1	**8150**	**EBC enable**		BIT		0	0	1	RWZ	ESY	
		If I activate the brake I have to save the parameter to make it effective. If I deactivate it, it is saved automatically with the deactivation.									
		On	Detects and requires the presence of the EBC.								
		Off	Does not detect the presence of the EBC and brake management is done in the traditional way.								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.3.2	**8152**	**EBC Local mode**		ENUM		Emergency stop			RW	ESY	
		Defines how the brake should behave in local mode: soft braking or emergency braking.									
		0	emergency stop								
		1	smooth stop								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.3.3	**8154**	**EBC Local mon**		BIT		0	0	1	R	ESY	
		Indicates whether the selector switch on the EBC is set to Local mode.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.3.4	**4008**	**CAN termin resistor.**		ENUM		Off			RW	EXP	
		Activation of the internal terminating resistor.									
		0	On								
		1	Off								

12.4 COMMUNICATION

The Communication menu contains the parameters needed to reprogram the EBC's CAN port with a different ID number or baud rate, and there are also parameters displaying status and control words.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.4.1	**8200**	**EBC Comm Address**		UINT16		119	1	127	RW	ESY	
		CAN port ID address.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.4.2	**8202**	**EBC Comm Format**		ENUM		Frm_29_ bit_ID			RW	ESY	
		Communication format.									
		0	11 bit ID								
		1	29 bit ID								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.4.3	**4004**	**Fieldbus baudrate**		ENUM		250k			RW	ESY	
		Baud rate, default is 250kb/s standard Canopen. Only visible when IPA 4000 is set as CANopen.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.4.4	**8204**	**EBC Command mon**		UINT16		0	0	0	R	ESY	
		Command word monitor.									
		1	125 K								
		2	250 K								
		3	500 K								
		4	1 M								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.4.5	**8206**	**EBC Status mon**		UINT32		0	0	0	R	ESY	
		Status word monitor.									

12.5 BRAKE DATA

In the Brake menu we find the necessary configuration parameters already present in the start-up wizard menu.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.5.1	**8250**	**Brake Holding V**	V	FLOAT		103.5	1	207	RW	ESY	
		Holding voltage value. If parameter 3008 is set to holding voltage mode, then the output voltage from the internal bridge is adjusted so that the set holding voltage is supplied to the brakes. Some manufacturers indicate this voltage on the brake nameplates together with the rated power and voltage of the brake.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.5.2	**8252**	**Brake Holding P**	W	FLOAT		76	1	350	RW	ESY	

Rated power of the brake in economy mode stated by the manufacturer on the brake's name plate.

If only the nominal power and nominal voltage of the brake in non-economisation mode are given and one of the economisation modes is to be used, then the values for the voltage that will reach the brake in ecomonisation mode must be entered, and the following formula must be used for the power to be entered: V maintenance^2 x Pnominal / Vnominal^2.
For example, if I have a brake on which the nominal voltage is indicated as 207 Vdc and the nominal power is indicated as 100 W, and I want to use the brake in economisation mode at 103.5 Vdc (value indicated by the manufacturer), the value of the power to be entered is equal to 103.5^2 x 100 / 207^2 = 25 W

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.5.3	**8254**	**Brake ON Holding I**	%	FLOAT		80	0	200	RW	ESY	
		Value as a percentage of the rated current. Threshold current below which EBC considers the brake to be correctly energised (i.e. open).									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.5.4	**8256**	**Brake OFF Holding I**	%	FLOAT		20	0	200	RW	ESY	
		Value as a percentage of the rated current. Threshold current above which EBC considers the brake not energised (i.e. closed).									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.5.5	**8258**	**Brake Power Mode**		ENUM		Boost_ Half_ Voltage			RW	ESY	
		Turning on and holding the brake.									
		Full voltage	The brake is applied with the input voltage rectified both in the initial phase and in the holding phase.								
		Boost/Half voltage	The brake is activated with the input voltage rectified for the first milliseconds indicated by parameter 3009 and then the output voltage is halved by cutting a half-wave output from the bridge into the EBC.								
		Boost/Holding voltage	The brake is activated with the input voltage rectified for the first milliseconds indicated by parameter 3009 and then the output voltage is modulated to keep it equal to the voltage set by parameter 3000 Holding voltage.								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.5.6	**8260**	**Brake Power Boost**	ms	UINT16		1000	0	5000	RW	ESY	
		Time for which the output voltage is maintained equal to the value of the rectified input voltage (Boost time).									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.5.7	**8262**	**Brake Holding I mon**	A	FLOAT		0	0	0	RW	ESY	
		Display of the current calculated by the EBC as a value corresponding to the threshold in % indicated by parameter 8254.									

12.6 DIAGNOSTIC

In the Diagnostics menu we find a few parameters needed to diagnose the status of the CAN port: in fact the communication status of the EBC. These are read-only parameters.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
12.6.1	**8300**	**Pwr SCR On Time**	h:min	UINT32		0	0	0	R	ESY	
		Indicates the turn-on time of the SCR.									

DRIVE SETUP

Access setup?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
0.1	578	Language select		ENUM 0 - English 1 - Italian 2 - French 3 - German 4 - Spanish 5 - Turkish		GB			RW	INT	FVSY
0.2	390	Load Application		UINT16 0 - No applicat. 1 - EFC 2 - EPC 3 - DCP 4 - CAN417		- (Under development) (Under development)	-	4	RW	INT	FVY
0.3	598	Load from USB		BIT		0	0	1	RWZ	INT	
0.4	2132	Encoder mode		ENUM 0 - None 1 - Digital 2 - Sinus 3 - Sinus SINCOS 4 - Sinus ENDAT 5 - Sinus BISS 6 - ENDAT 7 - BiSS 8 - Sinus SSI		None			RWZ	INT	
0.5	392	Select motor		BIT		0	0	1	RWZ	INT	

Leave setup?

1 STARTUP WIZARD

1.1 Set comm mode?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.1.1	4000	Communication mode		ENUM 3 - CAN417		Parallel			RW	INT	FVSY

1.2 Set encoder param?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.2.1	2102	Alimentaz encoder	V	FLOAT		5.2	5.2	20.0	RW	INT	FVSY
1.2.2	2132	Modalità encoder		ENUM 0 - Nessuna 1 - Digital 2 - Sinus 3 - Sinus SINCOS 4 - Sinus ENDAT 5 - Sinus BISS 6 - ENDAT 7 - BiSS 8 - Sinus SSI		None			RWZ	INT	
1.2.3	2100	Impulsi encoder	ppr	UINT16		1024	4	16384	RWZ	INT	
1.2.4	2110	Errore segnali enc		ENUM 1 - Controll A-B 2 - Controll A-B-Z		Controll A-B			RWZ	EXP	
1.2.5	7106	BiSS N bit ST		UINT16		13	0	64	RW	EXP	
1.2.6	7108	BiSS N bit MT		UINT16		0	0	64	RW	EXP	
1.2.7	7114	BiSS Crc polinomio		UINT16		67	1	65535	RW	EXP	

1.3 Set motor data?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.3.1	540	Control type		ENUM 0 - ASY SSC 1 - ASY FOC 2 - SYN FOC		ASY_VF			RWZ	INT	FVSY
1.3.2	2000	Rated voltage	V	FLOAT		SIZE	150	480	RWZ	INT	FVSY
1.3.3	2002	Rated current	A	FLOAT		SIZE	1	1500	RWZ	INT	FVSY
1.3.4	2004	Rated speed	rpm	FLOAT		SIZE	10	32000	RWZ	INT	FVSY
1.3.5	2006	Rated frequency	Hz	FLOAT		SIZE	1	1000	RWZ	INT	FVS
1.3.6	2008	Pole pairs		UINT16		SIZE	1	60	RWZ	INT	FVSY
1.3.7	2010	Rated power	kW	FLOAT		SIZE	0.1	1500	RWZ	INT	FVS
1.3.8	2012	Rated power factor		FLOAT		SIZE	0.6	0.95	RWZ	INT	FVS
1.3.9	2014	Torque constant	Nm/A	FLOAT		SIZE	0	120	RWZ	INT	Y

1.4 Set mechanical data?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.4.1	11006	Cabin speed	m/s	FLOAT		1	0	10	RWZ	INT	FVY
1.4.2	11010	Gearbox ratio		FLOAT		45 (1)	1	200	RW	INT	FVY
1.4.3	11164	Rope ratio		FLOAT		1 (2)	1	10	RWZ	INT	FVY
1.4.4	11012	Pulley diameter	m	FLOAT		0.6 (0.32)	0	5	RWZ	INT	FVY
1.4.5	11150	Car weight	kg	FLOAT		400	0	10000	RW	INT	FVY
1.4.6	11152	Counter weight	kg	FLOAT		1000	0	10000	RW	INT	FVY
1.4.7	11154	Load weight	kg	FLOAT		450	0	10000	RW	INT	FVY
1.4.8	11156	Rope weight	kg	FLOAT		20	0	1000	RW	INT	FVY

1.5 Ramps menu

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.5.1	11040	Jerk iniziale acc	m/s^3	FLOAT		0.2	0.001	20	RW	ESY	FVY
1.5.2	11042	Acceleration	m/s^2	FLOAT		0.600	0.001	10	RW	ESY	FVY
1.5.3	11044	Accel end jerk	m/s^3	FLOAT		0.6	0.001	20	RW	ESY	FVY
1.5.4	11054	Percent acc factor	%	FLOAT		100	10	1000	RW	INT	FVY
1.5.5	11046	Decel initial jerk	m/s^3	FLOAT		0.6	0.001	20	RW	ESY	FVY
1.5.6	11048	Deceleration	m/s^2	FLOAT		0.600	0.001	10	RW	ESY	FVY
1.5.7	11050	Decel end jerk	m/s^3	FLOAT		0.600	0.001	20	RW	ESY	FVY
1.5.8	11056	Percent dec factor	%	FLOAT		100	10	1000	RW	INT	FVY
1.5.9	11052	Stop deceleration	m/s^2	FLOAT		0.6	0.001	10000	RW	ESY	FVY

1.6 EBC (Electronic brake control)?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.6.1	8150	EBC Enable		BIT		0	0	1	RWZ	INT	FVSY
1.6.2	8250	Brake Holding V	V	FLOAT		103.5	1	207	RW	INT	
1.6.3	8252	Brake Holding P	W	FLOAT		76	1	350	RW	INT	
1.6.4	8258	Brake Power mode		ENUM		Boost_Half_Voltage	0	0	RW	INT	
1.6.5	8260	Brake Power Boost	ms	UINT16		1000	0	5000	RW	INT	
1.6.6	4008	CAN termin resistor.		ENUM		Off			RW	EXP	

1.7 Run autotune still?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.7.1	2032	Autotune		BIT		0	0	1	RWZ	INT	FVSY

1.8 Save parameters?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
1.8.1	550	Save parameters		BIT		0	0	1	RW	ESY	FVSY

2 OPTIMIZATION WIZARD

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
2.1	9720	Learning trip		BIT		0	0	1	RWZ	INT	VSY
2.2	12000	RollBack at start		UINT32		1	1	5	RW	ESY	FVY
2.3	12006	RollBack at arrival		UINT32		1	1	3	RW	ESY	FVY
2.4	12002	Comfort high spd		UINT32		1	1	3	RW	ESY	FVY
2.5	12004	Comfort low spd		UINT32		1	1	3	RW	INT	FVY

3 TROUBLESHOOTING

3.1 Start

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.1.1	11064	Brake open delay	ms	INT16/32		500	0	10000	RW	ESY	FVY

3.2 Rollback

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.2.1	2200	Boost voltage	%	FLOAT		3	0	20.0	RW	INT	F
3.2.2	2212	V/Hz Boost mode		ENUM 0 - Fisso 1 - Auto		Auto			RW	INT	F
3.2.3	2794	SR-P gain at start	%	FLOAT		150.0	0.0	400.0	RW	INT	VSY
3.2.4	2796	SR-I gain at start	%	FLOAT		110.0	0.0	400.0	RW	INT	VSY

3.3 Too fast acceleration (Too fast accel.)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.3.1	11040	Accel initial jerk	m/s^3	FLOAT		0.2	0.001	20	RW	ESY	FVY
3.3.2	11042	Acceleration	m/s^2	FLOAT		0.600	0.001	10	RW	ESY	FVY

3.4 Slow speed vibrations (Slow speed vibr.)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.4.1	2752	SR-P gain low speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY
3.4.2	2754	SR-I gain low speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY

3.5 High speed vibrations (High speed vibr.)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.5.1	2756	SR-P gain high speed	%	FLOAT		100	0.0	400.0	RW	INT	VSY
3.5.2	2758	SR-I gain high speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY

3.6 Too fast deceleration (Too fast dec.)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.6.1	11046	Decel initial jerk	m/s^3	FLOAT		0.6	0.001	20	RW	ESY	FVY
3.6.2	11048	Deceleration	m/s^2	FLOAT		0.600	0.001	10	RW	ESY	FVY

3.7 Floor leveling

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.7.1	11068	Brake close delay	ms	INT16/32		500	0	10000	RW	ESY	FVY

3.8 Brake closing

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.8.1	11070	Current down delay	ms	INT16/32		0 (800)	0	10000	RW	INT	Y

3.9 Vibrator analyzer

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
3.9.1	9464	Vibration freq. 1	Hz	FLOAT		0	0.0	0.0	R	INT	VSY
3.9.2	9466	Vibration freq. 2	Hz	FLOAT		0	0.0	0.0	R	INT	VSY

4 DRIVE

4.1 DRIVE MONITOR

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.1.1	250	Output current	A	FLOAT	16BIT_H	0	0	0	R	ESY	FVSY
4.1.2	252	Output voltage	V	FLOAT	16BIT_H	0	0	0	R	ESY	FVSY
4.1.3	254	Output frequency	Hz	FLOAT	16BIT_H	0	0	0	R	ESY	FVSY
4.1.4	664	Speed setpoint	rpm	INT16	16BIT_H	0	0	0	R	ESY	FVSY
4.1.5	260	Motor speed	rpm	FLOAT	16BIT_H	0	0	0	R	ESY	FVSY
4.1.6	270	DC link voltage	V	FLOAT	16BIT_H	0	0	0	R	ESY	FVSY
4.1.7	272	Heatsink temperature	degC	FLOAT	16BIT_L	0	0	0	R	ESY	FVSY
4.1.8	274	Motor temp	degC	INT16		0	0	0	R	ESY	
4.1.9	280	Torque current ref	A	FLOAT	16BIT_H	0	0	0	R	EXP	FVSY
4.1.10	282	Magnet current ref	A	FLOAT	16BIT_H	0	0	0	R	EXP	FVSY
4.1.11	284	Torque current	A	FLOAT	16BIT_H	0	0	0	R	INT	FVSY
4.1.12	286	Magnet current	A	FLOAT	16BIT_H	0	0	0	R	INT	FVSY
4.1.13	3212	Motor overload	%	UINT16	16BIT_H	0	0	100	R	ESY	FVSY
4.1.14	368	Drive overload	%	UINT16	16BIT_H	0	0	100	R	ESY	FVSY
4.1.15	3260	Bres overload	%	UINT16	16BIT_H	0	0	100	R	ESY	FVSY
4.1.16	1066	Enable state mon		UINT16	16BIT_L	0	0	1	R	ESY	FVSY
4.1.17	1068	Start state mon		UINT16	16BIT_L	0	0	1	R	ESY	FVSY
4.1.18	1070	FastStop state mon		UINT16	16BIT_L	0	0	1	R	ESY	FVSY
4.1.19	2386	Torque ref	%	FLOAT	16BIT_H	0.0	0.0	0.0	R	EXP	FVSY
4.1.20	2388	Torque	%	FLOAT	16BIT_H	0.0	0.0	0.0	R	INT	FVSY
4.1.21	372	In use current limit	A	FLOAT	16BIT_H	0	0	0	R	EXP	FVSY
4.1.22	1058	Safety en mon		BIT	16BIT_L	0	0	0	R	ESY	
4.1.23	1200	Dig input mon		UINT16	16BIT_L	0	0	0	R	ESY	FVSY
4.1.24	1202	Dig input mon x		UINT16	16BIT_L	0	0	0	R	ESY	
4.1.25	1400	Digital output mon		UINT16		0	0	0	R	ESY	FVSY
4.1.26	1402	Digital output mon x		UINT16		0	0	0	R	ESY	

4.2 DRIVE INFO

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.2.1	172	Drive type		ENUM 2 - ADL530 3 - ADL550					R	ESY	FVSY
4.2.2	482	Drive Size		UINT16		0	0	0	R	ESY	FVSY
4.2.3	484	Drive Family		ENUM 0 - Ness Potenza 1 - 230V..480V		No power			R	INT	FVSY
4.2.4	488	Drive cont current	A	FLOAT		CALCF	0.0	0.0	R	ESY	FVSY
4.2.6	174	Firmware version		UINT32		0	0	0	R	ESY	FVSY
4.2.7	176	DSP Firmware version		UINT32		0	0	0	R	ESY	FVSY
4.2.8	180	DSP Boot version		UINT32		0	0	0	R	ESY	FVSY
4.2.9	182	HMI Boot version		UINT32		0	0	0	R	ESY	FVSY
4.2.10	184	Application name		STRING16		0	0	0	R	ESY	FVSY
4.2.11	192	Application version		UINT32		0	0	0	R	ESY	FVSY
4.2.12	198	Versione Hardware		UINT16		0	0	0	R	ESY	FVSY
4.2.13	520	Product S/N		UINT32		0	0	0	R	ESY	FVSY
4.2.14	522	Regulation S/N		UINT32		0	0	0	R	ESY	FVSY
4.2.15	524	Power S/N		UINT32		0	0	0	R	ESY	FVSY
4.2.16	526	Power file ver.rel		UINT16		0	0	0	R	ESY	FVSY
4.2.17	9562	IP address		UINT32		0	0	0	R	ESY	FVSY
4.2.18	9600	Mac address		STRING16		0	0	0	R	EXP	FVSY

4.3 DRIVE CONFIG *

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.3.1	550	Save parameters		BIT		0	0	1	RWZ	ESY	FVSY
4.3.2	580	Load default		BIT		0	0	1	RWZ	ESY	FVSY
4.3.3	540	Control type		ENUM 0 - ASY SSC 1 - ASY FOC 2 - SYN FOC		ASY_VF			RWZ	INT	FVSY
4.3.4	554	Access level		ENUM 0 - Readonly 1 - Easy 2 - INT 3 - Expert 4 - Service		Intermediate			RW	ESY	FVSY
4.3.5	568	Enable Passwords		BIT		0	0	1	RW	EXP	FVSY
4.3.7	560	Mains voltage		ENUM 1 - 230 V 2 - 380 V 3 - 400 V 4 - 415 V 5 - 440 V 6 - 460 V 7 - 480 V		400 V			RWZ	INT	FVSY
4.3.8	448	Emergency UV	V	FLOAT		CALCF	0	CALCF	RWZ	INT	FVSY
4.3.9	450	Undervoltage	V	FLOAT		300.0	0	0	RW	INT	FVSY
4.3.10	2690	Chopper ON	V	FLOAT		CALCF	0	CALCF	RWZ	EXP	FVSY
4.3.11	1010	Fast start disable		BIT		1	0	1	RW	EXP	FVSY
4.3.12	574	Startup display		INT16		-1	-1	20000	RW	INT	FVSY
4.3.13	576	Display backlight		BIT		0	0	1	RW	INT	FVSY
4.3.14	578	Language select		ENUM 0 - English 1 - Italian 2 - French 3 - German 4 - Spanish 5 - Turkish		GB			RW	INT	FVSY
4.3.15	7200	Password recovery		BIT		0	0	1	RW	ESY	FVSY
4.3.16	7210	Recovery code		UINT32		0.0	0	0	R	ESY	FVSY
4.3.17	7220	Logout time	min	UINT16		60	0	1092	RW	EXP	FVSY
4.3.18	590	Save par to keypad		BIT		0	0	1	RWZ	INT	FVSY
4.3.19	592	Load par from keypad		BIT		0	0	1	RWZ	INT	FVSY
4.3.20	596	Save to USB		BIT		0	0	1	RWZ	INT	
4.3.21	598	Load from USB		BIT		0	0	1	RWZ	INT	
4.3.23	1560	App Update		BIT		0	0	1	RWZ	INT	
4.3.24	9548	WiFi safe removal		BIT		0	0	1	RW	ESY	

* Parameters 578, 590, 592, 596, 598,1560, 9548 are only visible on keypad.

4.4 ALARM CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.1	4500	Fault reset src		LINK L_DIGSEL2	16BIT_L	6000			RW	INT	FVSY
4.4.2	4502	ExtFlt src		LINK L_DIGSEL2	16BIT_L	6000			RW	INT	FVSY
4.4.3	4504	ExtFlt activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive 3 - Stop 4 - Fast stop		Disable			RW	INT	FVSY
4.4.4	4506	ExtFlt restart		ENUM 0 - Disable 1 - Enable		Disable			RW	EXP	FVSY
4.4.5	4508	ExtFlt restart time	ms	UINT16		1000	120	30000	RW	EXP	FVSY

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.4.6	4510	ExtFlt holdoff	ms	UINT16		0	0	10000	RW	INT	FVSY
4.4.7	4518	MotorOT threshold	degC	INT16		150	0	200	RW	INT	
4.4.8	4520	MotorOT src		LINK	16BIT_LL_DIGSEL2	6000			RW	INT	FVSY
4.4.9	4522	MotorOT activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive 3 - Stop 4 - Fast stop		Warning			RW	INT	FVSY
4.4.10	4524	MotorOT restart		ENUM 0 - Disable 1 - Enable		Disable			RW	EXP	FVSY
4.4.11	4526	MotorOT restart time	ms	UINT16		1000	120	30000	RW	EXP	FVSY
4.4.12	4528	MotorOT holdoff	ms	UINT16		1000	0	30000	RW	EXP	FVSY
4.4.13	4530	Ptc type		ENUM 0 - None 1 - PTC 2 - KTY84-130		None			RW	INT	
4.4.14	4532	PtcFail activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive 3 - Stop 4 - Fast stop		Warning			RW	INT	
4.4.15	4534	PtcFail restart		ENUM 0 - Disable 1 - Enable		Disable			RW	EXP	
4.4.16	4536	PtcFail restart time	ms	UINT16		1000	120	30000	RW	EXP	
4.4.17	4538	PtcFail holdoff	ms	UINT16		1000	0	30000	RW	EXP	
4.4.18	4540	Overspeed threshold	rpm	INT16		CALCI	0	16000	RW	INT	FVSY
4.4.19	4542	Overspeed activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive		Disable			RW	INT	FVSY
4.4.20	4544	Overspeed holdoff	ms	UINT16		0	0	5000	RW	INT	FVSY
4.4.21	4550	SpdRefLoss threshold	rpm	INT16		100	0	CALCI	RW	INT	FVSY
4.4.22	4552	SpdRefLoss activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive9		Disable			RW	INT	FVSY
4.4.23	4554	SpdRefLoss holdoff	ms	UINT16		1000	0	10000	RW	INT	FVSY
4.4.24	4560	SpdFbkLoss activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive		Disable			RW	INT	FVSY
4.4.25	4562	SpdFbkLoss holdoff	ms	UINT16		200	0	10000	RW	INT	FVSY
4.4.26	4564	SpdFbkLoss Threshold	rpm	INT16		100	0	CALCI	RW	INT	FVSY
4.4.27	4570	Drive ovld activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive 3 - Stop 4 - Fast stop		Disable			RW	EXP	FVSY
4.4.28	4572	Motor ovld activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive 3 - Stop 4 - Fast stop		Warning			RW	EXP	FVSY
4.4.29	4574	Bres ovld activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive 3 - Stop 4 - Fast stop		Disable			RW	EXP	FVSY
4.4.30	4582	HTsens restart		ENUM 0 - Disable		Disable			RW	EXP	FVSY

Menu	PAR	Description	UM	Type FB BIT	Def	Min	Max	Acc	Lev.	Vis.
				1 - Enable						
4.4.31	4584	HTsens restart time	ms	UINT16	20000	120	60000	RW	EXP	FVSY
4.4.32	4610	Riavvio desat		ENUM	Disabilita			RW	EXP	FVSY
				0 - Disabilita						
				1 - Abilita						
4.4.33	4612	Tempo riavvio desat	ms	UINT16	2000	1000	10000	RW	EXP	FVSY
4.4.34	4620	Ravvio OC ist		ENUM	Disabilita			RW	EXP	FVSY
				0 - Disabilita						
				1 - Abilita						
4.4.35	4622	Tempo riavvio OC ist	ms	UINT16	2000	1000	10000	RW	EXP	FVSY
4.4.36	4630	Riavvio OV		ENUM	Disabilita			RW	EXP	FVSY
				0 - Disabilita						
				1 - Abilita						
4.4.37	4632	Tempo riavvio OV	ms	UINT16	2000	1000	10000	RW	EXP	FVSY
4.4.38	4640	Riavvio UV		ENUM	Abilita			RW	EXP	FVSY
				0 - Disabilita						
				1 - Abilita						
4.4.39	4642	Tempo riavvio UV	ms	UINT16	1000	120	10000	RW	EXP	FVSY
4.4.40	4650	Tentativi riavvio UV		UINT16	5	0	1000	RW	EXP	FVSY
4.4.41	4652	Ritardo tentativi UV	s	UINT16	240	0	300	RW	EXP	FVSY
4.4.42	4654	Azione PhLoss mov		ENUM	Avvisa			RW	EXP	FVSY
				0 - Ignora						
				1- Avvisa						
				2 - Disabilita						
4.4.43	4656	Filtro PhLoss mov	ms	UINT	200	0	2000	RW	EXP	FVSY
				0 - Ignora						
				1- Avvisa						
				2 - Disabilita						
4.4.44	4674	Soglia fr PhLoss mov freq	Hz	FLOAT	0.5	0.1	5	RW	EXP	FVSY
4.4.45	4678	Codice PhLoss mov	Hz	FLOAT	0	0	0	R	EXP	FVSY
4.4.46	4670	Azione opzione bus		ENUM	Disabilita			RW	EXP	FVSY
				0 - Ignora						
				1 - Avvisa						
				2 - Disabil.drive						
				3 - Arresto						
				4 - Arresto rapido						
4.4.47	4660	Azione manca fase in		ENUM	Disabilita			RW	EXP	FVSY
				0 - Ignora						
				1 - Avvisa						
				2 - Disabil.drive						
4.4.48	4662	Riavv manca fase in		ENUM	Disabilita			RW	EXP	FVSY
				0 - Disabilita						
				1 - Abilita						
4.4.49	4664	T riav manca fase in	ms	UINT16	1000	120	10000	RW	EXP	FVSY
4.4.50	4668	Test manc. fase usc.		ENUM	Abilita			RW	EXP	FVSY
				0 - Disabilita						
				1 - Abilita						
				2 - Accensione						
4.4.51	4680	Soglia guasto terra	%	FLOAT	10.0	0.0	150.0	RW	INT	FVSY
4.4.52	4700	Alarm dig out 1 sel		ENUM	No alarm			RW	INT	FVSY
4.4.52	4702	Alarm dig out 2 sel		ENUM	No alarm			RW	INT	FVSY
4.4.53	4704	Alarm dig out 3 sel		ENUM	No alarm			RW	INT	FVSY
4.4.54	4706	Alarm dig out 4 sel		ENUM	No alarm			RW	INT	FVSY
				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 - Ptc failure						
				12 - Motor OT						
				13 - Drive overload						
				14 - Motor overload						

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
				15 - Bres overload 16 - Phaseloss in 17 - Opt Bus fault 18 - Opt 1 IO fault 19 - Precharge faul 20 - Opt enc fault 21 - External fault 22 - Speed fbk loss 23 - Overspeed 24 - Speed ref loss 25 - Emg stop alarm 26 - Power down 27 - Phaseloss out 28 - OV safety 29 - Safety failure 30 - Phaseloss mov 31 - Ropes change 32 - Enable missing 33 - Plc1 fault 34 - Plc2 fault 35 - Plc3 fault 36 - Plc4 fault 37 - Plc5 fault 38 - Plc6 fault 39 - Plc7 fault 40 - Plc8 fault 41 - Plc9 fault 42 - Plc10 fault 43 - Plc11 fault 44 - Plc12 fault 45 - Plc13 fault 46 - Plc14 fault 47 - Plc15 fault 48 - Plc16 fault 49 - Watchdog 50 - Trap error 51 - System error 52 - User error 53 - Param error 54 - Load def par 55 - Plc cfg error 56 - Load def plc 57 - Key failed 58 - Encoder error 59 - Recovery mode						
4.4.55	4720	Alm autoreset time	s	FLOAT		0.0	0.0	60.0	RW	EXP	FVSY
4.4.57	4722	Alm autoreset number		UINT16		3	0	100	RW	EXP	FVSY

4.8 DIGITAL INPUTS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.8.1	1240	Dig inp 1 inversion		BIT		0	0	1	RW	INT	FVSY
4.8.2	1242	Dig inp 2 inversion		BIT		0	0	1	RW	INT	FVSY
4.8.3	1244	Dig inp 3 inversion		BIT		0	0	1	RW	INT	FVSY
4.8.4	1246	Dig inp 4 inversion		BIT		0	0	1	RW	INT	FVSY
4.8.5	1248	Dig inp 5 inversion		BIT		0	0	1	RW	INT	FVSY
4.8.6	1250	Dig inp 6 inversion		BIT		0	0	1	RW	INT	FVSY
4.8.7	1252	Dig inp 7 inversion		BIT		0	0	1	RW	INT	FVSY
4.8.8	1254	Dig inp 8 inversion		BIT		0	0	1	RW	INT	FVSY
4.8.9	1260	Dig inp 1x inversion		BIT		0	0	1	RW	INT	
4.8.10	1262	Dig inp 2x inversion		BIT		0	0	1	RW	INT	
4.8.11	1264	Dig inp 3x inversion		BIT		0	0	1	RW	INT	
4.8.12	1266	Dig inp 4x inversion		BIT		0	0	1	RW	INT	
4.8.13	1110	Dig input E mon		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.14	1210	Dig input 1 mon		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.15	1212	Dig input 2 mon		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.16	1214	Dig input 3 mon		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.17	1216	Dig input 4 mon		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.18	1218	Dig input 5 mon		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.19	1220	Dig input 6 mon		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.20	1222	Dig input 7 mon		UINT16	16BIT_L	0	0	0	R	EXP	FVSY

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.8.21	1224	Dig input 8 mon		UINT16	16BIT_L	0	0	0	R	EXP	FVSY
4.8.22	1230	Dig input 1x mon		UINT16	16BIT_L	0	0	0	R	EXP	
4.8.23	1232	Dig input 2x mon		UINT16	16BIT_L	0	0	0	R	EXP	
4.8.24	1234	Dig input 3x mon		UINT16	16BIT_L	0	0	0	R	EXP	
4.8.25	1236	Dig input 4x mon		UINT16	16BIT_L	0	0	0	R	EXP	
4.8.26	1268	Dig input E dest		ILINK		0	0	0	R	EXP	FVSY
4.8.27	1270	Dig input 1 dest		ILINK		0	0	0	R	EXP	FVSY
4.8.28	1272	Dig input 2 dest		ILINK		0	0	0	R	EXP	FVSY
4.8.29	1274	Dig input 3 dest		ILINK		0	0	0	R	EXP	FVSY
4.8.30	1276	Dig input 4 dest		ILINK		0	0	0	R	EXP	FVSY
4.8.31	1278	Dig input 5 dest		ILINK		0	0	0	R	EXP	FVSY
4.8.32	1280	Dig input 6 dest		ILINK		0	0	0	R	EXP	FVSY
4.8.33	1282	Dig input 7 dest		ILINK		0	0	0	R	EXP	FVSY
4.8.34	1284	Dig input 8 dest		ILINK		0	0	0	R	EXP	FVSY
4.8.35	1290	Dig input 1x dest		ILINK		0	0	0	R	EXP	
4.8.36	1292	Dig input 2x dest		ILINK		0	0	0	R	EXP	
4.8.37	1294	Dig input 3x dest		ILINK		0	0	0	R	EXP	
4.8.38	1296	Dig input 4x dest		ILINK		0	0	0	R	EXP	

4.9 DIGITAL OUTPUTS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.9.1	1430	Dig out 1 inversion		BIT		0	0	1	RW	INT	FVSY
4.9.2	1432	Dig out 2 inversion		BIT		0	0	1	RW	INT	FVSY
4.9.3	1434	Dig out 3 inversion		BIT		0	0	1	RW	INT	FVSY
4.9.4	1436	Dig out 4 inversion		BIT		0	0	1	RW	INT	FVSY
4.9.5	1440	Dig out 1x inversion		BIT		0	0	1	RW	INT	
4.9.6	1442	Dig out 2x inversion		BIT		0	0	1	RW	INT	

4.10 ANALOG INPUTS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.10.1	1600	Analog input mon	cnt	INT16	16BIT_H	0	0	0	R	ESY	FVSY
4.10.2	1602	Analog inp type		ENUM 0 - -10V..+10V 1 - 0.20mA , 0.10V 2 - 4..20mA		-10V..+10V			RW	INT	FVSY
4.10.3	1604	Analog inp scale		FLOAT		1.0	-10.0	10.0	RW	INT	FVSY
4.10.4	1606	An inp offset tune		BIT		0	0	1	RW	INT	FVSY
4.10.5	1608	An inp gain tune		BIT		0	0	1	RW	INT	FVSY
4.10.6	1610	Analog inp filter	ms	FLOAT		10	2	100	RW	EXP	FVSY
4.10.7	1612	Analog inp top	cnt	INT16		16384	-32768	+32767	RW	EXP	FVSY
4.10.8	1614	Analog inp bottom	cnt	INT16		-16384	-32768	+32767	RW	EXP	FVSY
4.10.9	1616	Analog inp offset	cnt	INT16		0	-32768	+32767	RW	EXP	FVSY
4.10.10	1618	Analog inp gain		FLOAT		1.0	-10.0	10.0	RW	EXP	FVSY
4.10.11	1626	An inp sign src		LINK L_DIGSEL2	16BIT_L	6000			RW	INT	FVSY
4.10.12	1632	Analog input dest		ILINK		0	0	0	R	EXP	FVSY

4.11 ALARM LOG

4.12 LIFE TIME

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
4.12.1	510	Time drive power on	h.min	UINT32		0	0	0	R	ESY	FVSY
4.12.2	512	Time drive enable	h.min	UINT32		0	0	0	R	ESY	FVSY
4.12.3	514	Number power up		UINT16		0	0	0	R	ESY	FVSY
4.12.4	516	Time fan on	h.min	UINT32		0	0	0	R	ESY	FVSY

5 LIFT

5.1 MONITOR

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.1.1	14014	Trip number		UINT32			-	-	R	ESY	FVY
5.1.2	14016	Sequence state		ENUM 0 - Idle 1 - Cont close 2 - Drive ready 3 - Brake open 4 - Smooth start 5 - Multispeed 6 - Waiting 0 spd 7 - Zero speed 8 - Brake close 9 - Cont open 10 - Not drive ok 91- SC cont mon			-	-	R	ESY	FVY
5.1.3	14210	Actual speed ref	m/s	FLOAT			-	-	R	ESY	FVY
5.1.4	14242	Actual cabin spd	m/s	FLOAT			-	-	R	ESY	FVY
5.1.5	14032	Deceleration space	m	FLOAT			-	-	R	ESY	FVY

5.2 MECHANICAL DATA

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.2.1	11006	Cabin speed	m/s	FLOAT		1	0	10	RWZ	INT	FVY
5.2.2	11008	Mechanical calc mode		ENUM		-	-	-	RW	INT	FVY
5.2.3	11010	Gearbox ratio		FLOAT		45 (1)	1	200	RW	INT	FVY
5.2.4	11164	Rope ratio		FLOAT		1 (2)	1	10	RWZ	INT	FVY
5.2.5	11012	Pulley diameter	m	FLOAT		0.6 (0.32)	0	5	RWZ	INT	FVY
5.2.6	11150	Car weight	kg	FLOAT		400	0	10000	RW	INT	FVY
5.2.7	11152	Counter weight	kg	FLOAT		1000	0	10000	RW	INT	FVY
5.2.8	11154	Load weight	kg	FLOAT		450	0	10000	RW	INT	FVY
5.2.9	11156	Rope weight	kg	FLOAT		20	0	1000	RW	INT	FVY

5.3 RAMPS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.3.1	11040	Accel initial jerk	m/s^3	FLOAT		0.2	0.001	20	RW	ESY	FVY
5.3.2	11042	Acceleration	m/s^2	FLOAT		0.600	0.001	10	RW	ESY	FVY
5.3.3	11044	Accel end jerk	m/s^3	FLOAT		0.6	0.001	20	RW	ESY	FVY
5.3.4	11054	Percent acc factor	%	FLOAT		100	10	1000	RW	INT	FVY
5.3.5	11046	Decel initial jerk	m/s^3	FLOAT		0.6	0.001	20	RW	ESY	FVY
5.3.6	11048	Deceleration	m/s^2	FLOAT		0.600	0.001	10	RW	ESY	FVY
5.3.7	11050	Decel end jerk	m/s^3	FLOAT		0.600	0.001	20	RW	ESY	FVY
5.3.8	11056	Percent dec factor	%	FLOAT		100	10	1000	RW	INT	FVY
5.3.9	11052	Stop deceleration	m/s^2	FLOAT		0.6	0.001	10000	RW	ESY	FVY

5.4 SEQUENCES

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.4.1	11060	Sequence start stop		ENUM 0 - Start fwd/rev 1 - Enable 2 - Mltspd out !=0		Start fwd/rev	-	-	RWZ	ESY	FVY
5.5.2	11062	Contactor close dly	ms	INT16/32		200	0	10000	RW	ESY	FVY
5.5.3	11064	Brake open delay	ms	INT16/32		500	0	10000	RW	ESY	FVY
5.5.4	11078	Speed 0 threshold	rpm	INT16		30 (1)	0	10000	RW	INT	FVY
5.5.5	11080	Speed 0 delay	ms	UINT16		400	0	10000	RW	INT	FVY
5.5.6	11086	Door open speed	m/s	FLOAT		0	-10000	10000	RWZ	EXP	FVY
5.5.7	11070	Current down delay	ms	INT16/32		0 (800)	0	10000	RW	INT	Y
5.5.8	11068	Brake close delay	ms	INT16/32		500	0	10000	RW	ESY	FVY
5.5.9	11072	Contactor open dly	ms	INT16/32		200	0	10.000	RW	ESY	FVY
5.5.10	11074	SC cont open delay	ms	INT16/32		0 (500)	0	2000	RW	EXP	Y
5.4.11	11244	Inversion motor rot		LINK 0 - Not inverted		Not inverted			RWZ	INT	FVY

1 - Inverted

5.5 417 PROFILO

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.5.1	14044	417 state machine		ENUM		-	-	-	R	EXP	FVSY
5.5.2	14024	OperationMode		ENUM		-	-	-	R	INT	FVSY
5.5.3	14028	Speed ref in VelMode	mm/s	INT32		-	-	-	R	INT	FVSY
5.5.4	14026	Speed ref in PosMode	mm/s	INT32		-	-	-	R	INT	FVSY
5.5.5	14030	Pos ref in PosMode	mm	INT32		-	-	-	R	INT	FVSY
5.5.6	10124	Absolute enc pulses		FLOAT		1024	1	1000000	RW	EXP	FVSY
5.5.7	11076	Distance for revolut	mm	FLOAT	-	458	1	10000	RW	EXP	FVSY
5.5.8	11140	417-pos acq time	s	INT32	-	0	0	1000	RW	EXP	FVSY
5.5.9	14096	Drv->417 status word	Hex	INT32	-	-	-	-	R	EXP	FVSY

5.6 417 CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.6.1	11000	Landing zone	m	FLOAT		0	0	10	RW	INT	FVSY
5.6.2	11016	Final adjust	mm	FLOAT		0	0	1000	RW	INT	FVSY
5.6.3	11018	Final adjust type		ENUM		Calc	-	-	RW	INT	FVSY
5.6.4	11276	Comp-P gain		FLOAT		-	0	-	RW	EXP	FVSY
5.6.5	11254	Comp-I gain		FLOAT		-	0	-	RW	EXP	FVSY
5.6.6	11256	Compensation Enable		BOOL		-	On	-	RW	EXP	FVSY

5.7 LIFT OUT

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.7.1	1410	Dig output 1 src		LINK L_DIGSEL1	16BIT_L	6000			RW	INT	FVSY
5.7.2	1412	Dig output 2 src		LINK L_DIGSEL1	16BIT_L	6000			RW	INT	FVSY
5.7.3	1414	Dig output 3 src		LINK L_DIGSEL1	16BIT_L	6000			RW	INT	FVSY
5.7.4	1416	Dig output 4 src		ENUM L_DIGSEL1	16BIT_L	6000			RW	INT	FVSY
5.7.5	1420	Dig output 1x src		ENUM L_DIGSEL1	16BIT_L	6000			RW	INT	
5.7.6	1422	Dig output 2x src		ENUM L_DIGSEL1	16BIT_L	6000			RW	INT	
5.7.7	14104	Mon usc comandi	Hex	UINT32					R	ESY	FVY

5.8 LIFT IN

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.8.1	11220	Lift enable cmd src		ENUM LiftInputAdlCmd		Dig input E mon	-	-	RW	INT	FVY
5.8.2	11232	Contactor fbk src		ENUM LiftInputAdlCmd		Run cont mon	-	-	RW	INT	FVY
5.8.3	11236	Brake fbk src		ENUM LiftInputAdlCmd		Brake cont mon	-	-	RW	INT	FVY
5.8.4	10096	Brake 2 fbk src		ENUM LiftInputAdlCmd		Brake cont mon	-	-	RW	INT	FVY
5.8.5	11238	Door open src		ENUM LiftInputDoorCmd		Null	-	-	RW	EXP	FVY
5.8.6	11240	Door feedback src		ENUM LiftInputAdlCmd		Null	-	-	RW	EXP	FVY
5.8.7	11242	Emergency mode src		ENUM LiftInputAdlCmd		Dig input 3 mon	-	-	RW	INT	FVY
5.8.8	11272	Fast Enable src		ENUM 0 Null 1 Dig input 1		Null	-	-	RW	INT	FVY

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
				2 Dig input 2 3 Dig input 3 4 Dig input 4 5 Dig input 5 6 Dig input 6 7 Dig input 7 8 Dig input 8							
5.8.9	11820	Brake release src		LINK		Null LiftInputAdlCmd	-	-	RW	EXP	VY
5.8.10	11832	Safe Brake Test src		ENUM		Null LiftInputAdlCmd	-	-	RW	EXP	FVY
5.8.11	14102	Command input mon	Hex	UINT32			-	-	R	ESY	FVY

5.9 PRE TORQUE

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.9.1	11166	Pre-torque enable		BIT		Off	-	-	RWZ	EXP	VY
5.9.2	11168	Pre-torque source		ENUM 1600 - Analog in 1 4034 - Fieldbus M->S2 4044 - Fieldbus M->S3 4054 - Fieldbus M->S4 4064 - Fieldbus M->S5 4074 - Fieldbus M->S6 4084 - Fieldbus M->S7 4094 - Fieldbus M->S8 4104 - Fieldbus M->S9 4114 - Fieldbus M->S10 4124 - Fieldbus M->S11 4134 - Fieldbus M->S12 4144 - Fieldbus M->S13 4154 - Fieldbus M->S14 4164 - Fieldbus M->S15 4174 - Fieldbus M->S16 11170 - Init pretorque		Init pretorque	-	-	RW	EXP	VY
5.9.3	11170	Init pre-torque	%	INT16/32		0	-100	100	RWZ	EXP	VY
5.9.4	11172	Pre-torque ramp up	ms	INT16/32		0	0	10000	RWZ	EXP	VY
5.9.5	11174	Pre-torque ramp down	ms	INT16/32		0	0	60000	RWZ	EXP	VY
5.9.6	11176	Pre-torque offset	%	FLOAT		0	-100	100	RWZ	EXP	VY
5.9.7	11178	Pre-torque gain		FLOAT		1.0	-100	100	RWZ	EXP	VY
5.9.8	14040	Pre-torque input	%	INT16/32			-	-	R	EXP	VY
5.9.9	14056	Pre-torque out	%	INT16/32			-	-	R	EXP	VY
5.9.10	14058	Torque reference	%	INT16/32			-	-	R	EXP	VY

5.10 LIFT EMERGENCY

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.10.1	11286	Battery control		ENUM 0 - Disable 1 - Enable		Disable	-	-	RWZ	INT	FVY
5.10.2	11260	Emergency mode speed		FLOAT		4.77 (0.1)	-10000	10000	RW	INT	FVY
5.10.3	11262	Autoselect direction		ENUM 0 - OFF 1 - AutoSelect 2 - Recommended 3 - Battery saving 4 - BattSav + Rec		Recommended			RWZ	INT	FVY
5.10.4	11278	Em DC brk current	%	FLOAT		75.0	0	150	RW	INT	FV
5.10.5	11284	Detection limit	%	UINT32		20	0	100	RWZ	INT	FVY
5.10.6	14282	Chosen Direction		ENUM 0 - No direction 1 - Forward 2 - Reverse		-	-	-	R	INT	
5.10.7	11094	Brake release type		ENUM 0 - Brake 1 - Brake+Gear		Brake+Gear	-	-	RW	EXP	VY

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.10.8	11090	Em min speed		FLOAT		0.05	0	10000	RW	EXP	VY
5.10.9	11092	Em min spd time	s	INT16/32		6	1	30	RW	EXP	VY
5.10.10	11108	Delay mot sav bat	m/s	INT32		1000	0	5000	RW	EXP	VY
5.10.11	11822	Max vel em		UINT32		0.1	-	-	RW	EXP	VY
5.10.12	11014	Em mac speed sav bat	Hz	FLOAT		0.09	0.01	1000	RW	EXP	VY
5.10.13	11824	Brake lock time	s	UINT32		4	1	30	RW	EXP	VY

5.11 LIFT ALARMS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.11.1	11200	Contactor activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive 3 - Fast stop 4 - Lift fast stop 5 - Lift stop		Disable			RWZ	INT	FVY
5.11.2	11202	Cont hold off	ms	INT32		1000	0	60000	RW	INT	FVY
5.11.3	11204	Brake activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive 3 - Fast stop 4 - Lift fast stop 5 - Lift stop		Disable			RWZ	INT	FVY
5.11.4	11206	Brake hold off	ms	INT32		1000	0	60000	RW	INT	FVY
5.11.5	10094	Brake 2 hold off	ms	INT32		1000	0	60000	RW	INT	FVY
5.11.6	11208	Brake run hold off		ENUM 0 - Disable 1 - Enable		Enable	-	-	RW	INT	FVY
5.11.7	11210	Door activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive 3 - Fast stop 4 - Lift fast stop 5 - Lift stop		Disable	-	-	RWZ	EXP	FVY
5.11.8	11212	Door hold off	ms	INT32		1000	0	60000	RW	EXP	FVY
5.11.9	11258	Lift EF alarm src		ENUM 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 decom 1110 - Dig input E mon 1210 - Dig input 1 mon 1212 - Dig input 2 mon 1214 - Dig input 3 mon 1216 - Dig input 4 mon 1218 - Dig input 5 mon 1220 - Dig input 6 mon 1222 - Dig input 7 mon 1224 - Dig input 8 mon 1230 - Dig input 1x mon 1232 - Dig input 2x mon 1234 - Dig input 3x mon		Null	-	-	RWZ	INT	FVY

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
				1236 - Dig input 4x mon 3702 - Run cont mon 3706 - Down cont mon 3708 - Brake cont mon 3714 - Door open mon						
5.11.10	11264	Lift EF al activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive 3 - Fast stop 4 - Lift fast stop 5 - Lift stop		Lift stop	-	-	RWZ	INT	FVY
5.11.11	11266	Lift EF hold off	ms	UINT32		1000	0	60000	RW	INT	FVY
5.11.12	11842	SBT Activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive		Warning	-	-	RWZ	EXP	FVY
5.11.13	11850	No battery activity		ENUM 0 - Ignore 1 - Warning 2 - Disable drive 3 - Fast stop 4 - Lift fast stop 5 - Lift stop		Warning	-	-	RWZ	INT	FVY
5.11.14	11852	No battery hold off	ms	UINT32		1000	0	10000	RW	INT	FVY
5.11.15	10134	AEBC activity		ENUM		Disable	-	-	RWZ	INT	FVY
5.11.16	11096	EBC holdoff	ms	INT32		100	0	1000	RW	INT	FVY

5.12 SAFE BRAKE TEST

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.12.1	11832	Safe Brake Test src		ENUM LiftInputAdlCmd		Null			RW	EXP	FVY
5.12.2	11838	SBT out curr time	ms	INT16		2000	1	20000	RWZ	EXP	FVY
5.12.3	11834	SBT out curr ini	%	INT16		75	0	150	RWZ	EXP	FVY
5.12.4	11836	SBT out curr end	%	INT16		150	0	150	RWZ	EXP	FVY
5.12.5	11840	SBT enc pos band		INT16		5	2	4000	RWZ	EXP	FVY
5.12.6	10092	SBT 2nd brake		INT16		Off	-	-	RWZ	EXP	FVY
5.12.7	14284	SBT alarm mon		INT16			-	-	R	EXP	FVY
5.12.8	14286	SBT progress mon		ENUM 0 - Init 1 - Up 2 - Down 3 - Test off			-	-	R	EXP	FVY

5.13 LIFT TEST

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.13.1	10138	EBC_Test_Type		INT16		Off	-	-	RW	EXP	FVY
5.13.2	10140	EBC Sel brake		INT16		Brake1			RW	EXP	FVY
5.13.3	10142	EBC_TEST_FBK		ENUM		Disabilita			RW	EXP	FVY

5.14 DIRECTION CNT

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.1	3400	Direction cnt enable		ENUM 0 - Off 1 - On		Disable			RW	EXP	FVSY
5.14.2	3402	Max direcion cnt		UINT32		0	0	2147483647	RW	EXP	FVSY
5.14.3	3404	Ropes change thr	%	UINT32		98	0	100	RW	EXP	FVSY
5.14.4	3406	Direction cnt reset		BIT 0 - Off 1 - On		0	0	1	RW	EXP	FVSY
5.14.5	3408	Inser pssw dir cnt		UINT32		0	0	999999	RW	EXP	FVSY
5.14.6	3410	Nuova pssw dir cnt		UINT32		0	0	999999	RW	EXP	FVSY

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
5.14.7	3412	Ropes usage	%	UINT16	16BIT_L	0	0	0	R	EXP	FVSY
5.14.8	3414	Direction counter		UINT32	32BIT	0	0	0	R	EXP	FVSY
5.14.9	3416	Prev direct counter		UINT32	32BIT	0	0	0	R	EXP	FVSY
5.14.10	3418	No of cnt reset		UINT32	32BIT	0	0	0	R	EXP	FVSY
5.14.11	3420	Ropes change req mon		BIT	16BIT_L	0	0	1	R	EXP	FVSY
5.14.12	3422	Dir change monitor		BIT	16BIT_L	0	0	1	R	EXP	FVSY
5.14.13	3424	Dir change cnt zero		BIT	16BIT_L	0	0	1	R	EXP	FVSY
5.14.14	3434	Save rope to USB		BIT		0	0	1	RWZ	EXP	
5.14.15	3436	Load rope from USB		BIT		0	0	1	RWZ	EXP	
5.14.16	3440	Dircnt password type		ENUM		Static	-	-	RW	EXP	FVSY
5.14.17	3442	Pwd code build		BIT		0	0	1	RW	EXP	FVSY
5.14.18	3444	Pwd code		UINT32		0.0	0	0	R	EXP	

6 COMMUNICATION

6.1 CONTROL COMMUNICATION (CONTROL COMM)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.1.1	4000	Communication mode		ENUM 3 - CAN417		Parallel			RW	INT	FVSY
6.1.6	4004	Fieldbus baudrate		ENUM 1 - 125k 2 - 250k 3 - 500k 4 - 1M		250k	0	4	RW	EXP	
6.1.7	4006	Fieldbus address		INT16		2	1	127	RW	EXP	
6.1.8	4010	Fieldbus M->S enable		ENUM 0 - Disable 1 - Enable		Enable			RWZ	EXP	
6.1.9	4012	Fieldbus alarm mode		INT32		0	0	1	RWZ	EXP	
6.1.10	4014	Fieldbus state		ENUM 0 - Stop 1 - PreOperational 2 - Operational		Stop			R	EXP	
6.1.11	4338	Fieldbus error		UINT16		0	0	0	R	EXP	
6.1.12	4008	Can termin.resistor		ENUM 0 - Off 1 - On		Off			RW	EXP	

6.6 NETWORK AND ACCESS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
6.6.1	9610	Readonly Username		STRING16		readonly	0	0	R	EXP	FVSY
6.6.2	9626	Easy Username		STRING16		easy	0	0	RW	EXP	FVSY
6.6.3	9634	Easy Password		STRING16		easy	0	0	RW	EXP	FVSY
6.6.4	9642	Interm Username		STRING16		interm	0	0	R	EXP	FVSY
6.6.5	9650	Interm Password		STRING16		interm	0	0	RW	EXP	FVSY
6.6.6	9658	Expert Username		STRING16		expert	0	0	R	EXP	FVSY
6.6.7	9666	Expert Password		STRING16		expert	0	0	RW	EXP	FVSY
6.6.8	9544	WiFi Fw version		UINT32		0	0	0	R	EXP	
6.6.9	9546	WiFi S/N		UINT32		0	0	0	R	EXP	
6.6.10	9528	WiFi Network Name		STRING16		WEG wifi	0	0	R	EXP	
6.6.11	9536	WiFi Network Pass		STRING16		0123456789	0	0	R	EXP	
6.6.12	9554	WiFi Network Channel		UINT16		11	0	12	R	EXP	
6.6.13	9556	IP Address set		UINT32		169.254.10.10	0	0	RW	EXP	FVSY
6.6.14	9558	IP Netmask set		UINT32		255.255.0.0	0	0	RW	EXP	FVSY
6.6.15	9560	IP Gateway set		UINT32		0.0.0.0	0	0	RW	EXP	FVSY
6.6.16	9564	IP Netmask		UINT32		255.255.0.0	0	0	R	EXP	FVSY
6.6.17	9566	IP Gateway		UINT32		0.0.0.0	0	0	R	EXP	FVSY
6.6.18	9608	Ip Assignment		ENUM 0 - DHCP 1 - Static		Static	0	0	RW	EXP	FVSY

7 MOTOR DATA

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
7.1	392	Select motor		BIT		0	0	1	RWZ	INT	FVSY
7.2	2000	Rated voltage	V	FLOAT		SIZE	150	480	RWZ	INT	FVSY
7.3	2002	Rated current	A	FLOAT		SIZE	1	1500	RWZ	INT	FVSY
7.4	2004	Rated speed	rpm	FLOAT		SIZE	10	32000	RWZ	INT	FVSY
7.5	2006	Rated frequency	Hz	FLOAT		SIZE	1	1000	RWZ	INT	FVS
7.6	2008	Pole pairs		UINT16		SIZE	1	60	RWZ	INT	FVSY
7.7	2010	Rated power	kW	FLOAT		SIZE	0.1	1500	RWZ	INT	FVS
7.8	2012	Rated power factor		FLOAT		SIZE	0.6	0.95	RWZ	INT	FVS
7.9	2014	Torque constant	Nm/A	FLOAT		SIZE	0	120	RWZ	INT	Y
7.10	2020	Take parameters		BIT		0	0	1	RWZ	INT	FVSY
7.11	2022	Autotune rotation		BIT		0	0	1	RWZ	INT	FVS
7.12	2024	Autotune still		BIT		0	0	1	RWZ	INT	FVSY
7.13	2030	Autotune status		ENUM 0 - Required 1 - Done		Required			R	INT	FVSY
7.14	2050	Measured Rs	ohm	FLOAT		0	0	200	RW	EXP	FVSY
7.15	2052	Measured DTL	V	FLOAT		0	0	100	RW	EXP	FVSY
7.16	2054	Measured DTS	V/A	FLOAT		0	0	100	RW	EXP	FVSY
7.17	2056	Measured Lsig	mH	FLOAT		0.1	0.1	200	RW	EXP	FVS
7.18	2058	Measured LsSyn	mH	FLOAT		0.1	0.1	200	RW	EXP	Y
7.19	2060	Measured LsMin Syn	mH	FLOAT		0.1	0.1	200	RW	EXP	Y
7.20	2062	Measured ImN	A	FLOAT		CALCF	0	1000	RW	EXP	FVS
7.21	2066	Measured FlxN	Wb	FLOAT		CALCF	0	10	RW	EXP	FVS
7.22	2076	Measured Rr	ohm	FLOAT		CALCF	0	200	RW	EXP	FVS
7.23	2078	Take tune parameters		BIT		0	0	1	RW	INT	FVSY

8 ENCODER

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.1	2100	Encoder pulses	ppr	UINT16		1024	4	16384	RWZ	INT	
8.2	2102	Encoder supply	V	FLOAT		5.2	5.2	20.0	RW	INT	FVSY
8.3	2104	Encoder input config		ENUM 0 - HTL 1 - TTL		TTL			RWZ	INT	
8.4	2106	Encoder repetition		ENUM 0 - No division 1 - Divide 2 2 - Divide 4 3 - Divide 8 4 - Divide 16 5 - Divide 32 6 - Divide 64		No division			RWZ	INT	
8.5	2108	Encoder signal Vpp	V	FLOAT		0.8	0.5	1.2	RWZ	INT	
8.6	2110	Encoder signal check		ENUM 1 - Check A-B 2 - Check A-B-Z		Check A-B			RWZ	EXP	
8.7	2116	ENC signal Vpp inc	V	FLOAT		0	0	0	R	EXP	
8.8	2118	ENC signal Vpp abs	V	FLOAT		0	0	0	R	EXP	
8.9	2130	Encoder direction		ENUM 0 - Not inverted 1 - Inverted		Not inverted			RWZ	INT	
8.10	2132	Encoder mode		ENUM 0 - None 1 - Digital 2 - Sinus 3 - Sinus SINCOS 4 - Sinus ENDAT 5 - Sinus BISS 6 - ENDAT 7 - BiSS 8 - Sinus SSI		None			RWZ	INT	FVSY
8.11	2134	Encoder speed filter	ms	FLOAT		1.0	0.1	8.0	RW	EXP	

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
8.12	2136	Peripheral encoder		BIT		0	0	1	RW	EXP	
8.13	2150	Encoder speed	rpm	INT16	16BIT_H	0	0	0	R	ESY	
8.14	2162	Encoder position	cnt	UINT16	16BIT_L	0	0	0	R	ESY	
8.15	2164	Encoder abs position	cnt	UINT32	32BIT	0	0	0	R	EXP	
8.16	2172	SpdFbkLoss code		UINT16		0	0	0	R	EXP	
8.17	2174	Endat error code		UINT16		0	0	0	R	EXP	
8.18	2176	Encoder sync mode		UINT16		1	0	3	RWZ	EXP	Y
8.19	2184	Ext motor diam	mm	UINT16		1	1	65535	RWZ	EXP	
8.20	2186	Enc pulley diam	mm	UINT16		1	1	65535	RWZ	EXP	
8.21	2190	Autophase rot		BIT		0	0	1	RWZ	EXP	Y
8.22	2192	Autophase still		BIT		0	0	1	RWZ	EXP	Y
8.23	2748	Phasing mode		ENUM 0 - Mode 1 1 - Mode 2		Mode 1			RW	EXP	Y
8.24	2194	Autophase mode		ENUM 0 - First enable 1 - Each enable 2 - Count Enable		First Enable			RW	EXP	Y
8.25	9920	Autophase still type		ENUM		Standard			RW	EXP	Y
8.26	9922	Autophase Imax gain		FLOAT		1	0.01	1.5	RW	EXP	Y
8.27	2198	Autophase cnt enable		UINT16		2	2	65535	RWZ	EXP	Y
8.28	7100	BiSS encoder type		UINT16		0	0	0	R	EXP	
8.29	7102	BiSS manufacturer		UINT16		0	0	0	R	EXP	
8.30	7104	BiSS clock freq		UINT16		7	0	15	RW	EXP	
8.31	7106	BiSS N bit ST		UINT16		13	0	64	RW	EXP	
8.32	7108	BiSS N bit MT		UINT16		0	0	64	RW	EXP	
8.33	7110	BiSS data len		UINT16		0	0	0	R	EXP	
8.34	7112	BiSS timeout	us	FLOAT		13	0	65	RW	EXP	
8.35	7114	BiSS Crc polinomy		UINT16		67	1	65535	RW	EXP	
8.36	7116	BiSS data code		ENUM 0 - Binario 1 - Gray		Binario			RW	EXP	
8.37	2178	Abs Offset memory		ENUM 0 - Drive memory 1 - Encoder memory		Drive memory			RW	EXP	
8.38	7150	SSI N bit ST		UINT16		13	0	13	RW	EXP	
8.39	7152	SSI N bit MT		UINT16		0	0	19	RW	EXP	
8.40	7154	SSI N bit TX		UINT16		13	0	32	RW	EXP	
8.41	7156	SSI data code		ENUM 0 - Binary 1 - Gray		Gray			RW	EXP	
8.42	2732	Enc position offset		INT16		0	0	0	RW	EXP	Y

9 SAFETY

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
9.1	1058	Safety en mon		BIT	16BIT_L	0	0	0	R	ESY	
9.2	11088	ContactorLess Enable		BOOL		Off	-	-	RW	INT	FVY
9.3	11252	Brake fbk A3 sel		ENUM		Null	-	-	RW	INT	FVY
9.4	11268	Reset Brake Alarm		INT		0	-	-	RW	INT	FVY
9.5	11270	Threshold A3	m	FLOAT		0.1	0	2	RW	INT	VY

10 REGULATION MENU

10.1 SPEED REGULATION GAINS (SPEED REG GAINS)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.1	2240	Inertia	kgm^2	FLOAT		0.8	0.001	1000	RW	INT	VSY
10.1.2	9702	Learning trip out	kgm^2	FLOAT		0	0	0	R	EXP	FVSY
10.1.3	2794	SR-P gain at start	%	FLOAT		150.0	0.0	400.0	RW	INT	VSY
10.1.4	2796	SR-I gain at start	%	FLOAT		110.0	0.0	400.0	RW	INT	VSY
10.1.5	2752	SR-P gain low speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.1.6	2754	SR-I gain low speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY
10.1.7	2756	SR-P gain high speed	%	FLOAT		80.0	0.0	400.0	RW	INT	VSY
10.1.8	2758	SR-I gain high speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY
10.1.9	2760	SR-low speed thrsd	%	UINT16		30	1	100	RW	INT	VSY
10.1.10	2762	SR-high speed thrsd	%	UINT16		70	1	100	RW	INT	VSY
10.1.11	2662	SR-P gain	N/rpm	FLOAT		1.0	0	0	RW	INT	VSY
10.1.12	2664	SR-I time	ms	FLOAT		1.0	0	0	RW	INT	VSY
10.1.13	9446	TNF1-frequency	Hz	FLOAT		100.0	5.0	350.0	RW	EXP	VSY
10.1.14	9448	TNF1-bandwidth	Hz	FLOAT		4	1	20	RW	EXP	VSY
10.1.15	9450	TNF1-depth		FLOAT		20	3	60	RW	EXP	VSY
10.1.16	9458	Torque Notch Fltr 1		ENUM 0 - Disable 1 - Enable		Disable			RW	EXP	VSY
10.1.17	9452	TNF2-frequency	Hz	FLOAT		100.0	5.0	350.0	RW	EXP	VSY
10.1.18	9454	TNF2-bandwidth	Hz	FLOAT		4	1	20	RW	EXP	VSY
10.1.19	9456	TNF2-depth		FLOAT		20	3	60	RW	EXP	VSY
10.1.20	9460	Torque Notch Fltr 2		ENUM 0 - Disable 1 - Enable		Disable			RW	EXP	VSY
10.1.21	2806	SR-P gain in use	%	FLOAT		100.0	0	0	R	INT	VSY
10.1.22	2808	SR-I gain in use	%	FLOAT		100.0	0	0	R	INT	VSY

10.3 REGULATOR PARAM

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.3.1	2250	CR-P gain	V/A	FLOAT		1.0	0	0	RW	EXP	FVSY
10.3.2	2252	CR-I time	ms	FLOAT		1.0	0	0	RW	EXP	FVSY
10.3.3	2260	FR-P gain	A/Wb	FLOAT		1.0	0	0	RW	EXP	FVSY
10.3.4	2262	FR-I time	ms	FLOAT		1.0	0	0	RW	EXP	FVSY
10.3.5	2272	VR-I time	ms	FLOAT		1.0	0	0	RW	EXP	FVSY
10.3.6	2290	Deflux voltage	V	FLOAT		380	0	0	RW	EXP	FVSY
10.3.7	2292	Voltage margin	%	FLOAT		5.0	0	30.0	RW	EXP	FVSY
10.3.8	2308	Over-flux level	%	FLOAT		100	100	150	RW	EXP	FVSY
10.3.9	2312	Over-flux spd thrsd	rpm	FLOAT		400	1	1000	RW	EXP	FVSY
10.3.10	2314	Over-flux step		FLOAT		1	0,01	10	RW	EXP	FVSY
10.3.11	2724	Defluxing curr lim	A	FLOAT		0.0	0	0	RW	EXP	FVSY

10.4 TORQUE CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
10.4.1	2350	Torque curr lim Pos	A	FLOAT	16BIT_H	CALCF	0.0	CALCF	RW	EXP	FVSY
10.4.2	2352	Torque curr lim Neg	A	FLOAT	16BIT_H	CALCF	0.0	CALCF	RW	EXP	FVSY
10.4.3 0 - Off	2354	Torque curr lim sel		ENUM 1 - T clim +/- 2 - T clim mot/gen 3 - T limit src		Off			RWZ	EXP	FVSY
10.4.4	2358	Torque limit src		LINK L_LIM	16BIT_H	6000			RWZ	EXP	FVSY
10.4.5	2360	Torque climPos Inuse	A	FLOAT	16BIT_H	0.0	0.0	0.0	R	EXP	FVSY
10.4.6	2362	Torque climNeg Inuse	A	FLOAT	16BIT_H	0.0	0.0	0.0	R	EXP	FVSY
10.4.7	2380	Dig torque ref	%	FLOAT	16BIT_H	0.0	-300.0	300.0	RW	EXP	FVSY
10.4.8	2382	Torque ref src		LINK L_VREF	16BIT_H	65535			RWZ	EXP	FVSY

11 FUNCTIONS

11.1 DC BRAKING

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.1.1	3150	DC braking cmd src		LINK L_DIGSEL2	16BIT_L	6000			RW	INT	FVS
11.1.2	3152	DC brake mode		ENUM 0 - Off 1 - At Stop 2 - On Command 3 - OnCmd & AtStop		Off			RW	INT	FVS
11.1.3	3154	DC brake delay	s	FLOAT		0.01	0.01	30.0	RW	INT	FVS
11.1.4	3156	DC brake duration	s	FLOAT		1.0	0.01	30.0	RW	INT	FVS
11.1.5	3158	DC brake current	%	FLOAT		75.0	0.0	150.0	RW	INT	FVS
11.1.6	3160	DC brake state		ENUM 0 - Not active 1 - Active	16BIT_L	Not active			R	INT	FVS

11.2 INERTIA COMP

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.2.1	3100	Inertia comp	kgm^2	FLOAT		0.1	0	0	RW	EXP	FVSY
11.2.2	3102	Inertia comp filter	ms	FLOAT		4.0	2.0	20.0	RW	EXP	FVSY
11.2.3	3104	Inertia comp mon	%	FLOAT	16BIT_H	0.0	0.0	0.0	R	EXP	FVSY
11.2.4	3106	Inertia comp fcn		ENUM 0 - Disable 1 - Enable		Disable			RW	EXP	FVSY

11.3 ANTI ROLLBACK

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.3.1	2766	PR-P gain		FLOAT		500	0	20000	RW	EXP	Y
11.3.2	2768	PR-enable		ENUM		Enable			RW	EXP	Y
11.3.3	2812	PR-P End gain		FLOAT		500	0	20000	RW	EXP	Y
11.3.4	2814	PR End enable		ENUM 0 - Disable 1 - Enable		Enable			RW	EXP	Y
11.3.5	2810	Pos reg limit	rpm	FLOAT		10.0	-20	20	RW	EXP	Y

11.4 VIBRATION ANALYSIS (VIBR. ANALYSIS)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.4.1	2288	Vibrations analyzer		ENUM 0 - Disable 1 - Enable		Disable			RW	EXP	VSY
11.4.2	9464	Vibration freq. 1	Hz	FLOAT		0	0.0	0.0	R	EXP	VSY
11.4.3	9466	Vibration freq. 2	Hz	FLOAT		0	0.0	0.0	R	EXP	VSY

11.5 MOTOR OVERLOAD

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.5.1	3200	Motor ovld enable		ENUM 0 - Off 1 - On		Off			RW	EXP	FVSY
11.5.2	3202	Motor ovld factor	%	FLOAT		150	100	300	RW	EXP	FVSY
11.5.3	3204	Motor ovld time	s	FLOAT		30	10	300	RW	EXP	FVSY
11.5.4	3206	Motor service factor	%	FLOAT		100	25	200	RW	EXP	FVSY
11.5.5	3216	Motor fan type		ENUM 0 - Auto fan 1 - Servo fan		Servo fan			RW	EXP	FVY
11.5.6	3218	Motor derat factor	%	FLOAT		50	0	100	RW	EXP	FVSY

11.6 BRAKING RESISTOR OVERLOAD (BRES OVERLOAD)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.6.1	3250	Bres control		ENUM 0 - Off 1 - On		On			RW	INT	FVSY
11.6.2	3252	Bres value	ohm	FLOAT		7.0	7.0	1000.0	RW	INT	FVSY
11.6.3	3254	Bres cont power	kW	FLOAT		0.1	0.1	100.0	RW	INT	FVSY
11.6.4	3256	Bres overload factor		FLOAT		1.5	1.5	10.0	RW	INT	FVSY
11.6.5	3258	Bres overload time	s	FLOAT		0.5	0.5	50.0	RW	INT	FVSY

11.7 ENERGY SAVING (ENER. SAVING)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.
11.7.1	3122	Energia recuperata	kWh	FLOAT		0	0	0	R	EXP	FVSY
11.7.2	3124	Set val. energia	kWh	FLOAT		0	0	0	RW	EXP	FVSY

12 EBC

12.1 MONITOR

Menu	PAR	Descrizione	UM	Tipo	FB BIT	Def	Min	Max	Acc	Liv.	Vis.
12.1.1	8000	EBC SOK mon		BIT		0	0	0	R	ESY	
12.1.2	8002	EBC Warning mon		BIT	0	0	0	0	R	ESY	
12.1.3	8004	EBC Alarm mon		BIT	0	0	0	0	R	ESY	
12.1.4	8006	Brake 1 state mon		ENUM		Brake_OFF_SAFE			R	ESY	
12.1.5	8008	Brake 2 state mon		ENUM		Brake_OFF_SAFE			R	ESY	
12.1.6	8010	Brake 1 out mon		BIT	0	0	0	0	R	ESY	
12.1.7	8012	Brake 2 out mon		BIT	0	0	0	0	R	ESY	
12.1.8	8014	Brake 1 Fbk mon		BIT	0	0	0	0	R	ESY	
12.1.9	8016	Brake 2 Fbk mon		BIT	0	0	0	0	R	ESY	
12.1.10	8018	Brake 1 Current avg mon	A	FLOAT	0	0	0	0	R	ESY	
12.1.11	8020	Brake 2 Current avg mon	A	FLOAT	0	0	0	0	R	ESY	
12.1.12	8022	Vline rms mon	V	FLOAT	0	0	0	0	R	ESY	
12.1.13	8024	Vline frequency mon	Hz	FLOAT	0	0	0	0	R	ESY	
12.1.14	8026	Pwr Bridge Temperature mon	decG	FLOAT	0	0	0	0	R	ESY	

12.2 INFO

Menu	PAR	Descrizione	UM	Tipo	FB BIT	Def	Min	Max	Acc	Liv.	Vis.
12.2.1	8100	Product Type		ENUM		EBC501			R	ESY	
12.2.2	8102	Product Version		UINT32		0	0	0	R	ESY	
12.2.3	8104	Proct Conf		ENUM		Brake_1_2			R	ESY	

12.3 CONFIGURATION

Menu	PAR	Descrizione	UM	Tipo	FB BIT	Def	Min	Max	Acc	Liv.	Vis.
12.3.1	8150	EBC enable		BIT		0	0	1	RWZ	ESY	
12.3.2	8152	EBC Local mode		ENUM		Emergency stop			RW	ESY	
12.3.3	8154	EBC Local mon		BIT		0	0	1	R	ESY	

12.4 COMMUNICATION

Menu	PAR	Descrizione	UM	Tipo	FB BIT	Def	Min	Max	Acc	Liv.	Vis.
12.4.1	8200	EBC Comm Address		UINT16		119	1	127	RW	ESY	
12.4.2	8202	EBC Comm Format		ENUM		Frm_29_bit_ID			RW	ESY	
12.4.3	4004	Fieldbus Baudrate		ENUM		250k			RW	ESY	
12.4.4	8204	EBC Command mon		UINT16		0	0	0	R	ESY	
12.4.5	8206	EBC Status mon		UINT32		0	0	0	R	ESY	

12.5 BRAKE DATA

Menu	PAR	Descrizione	UM	Tipo	FB BIT	Def	Min	Max	Acc	Liv.	Vis.
12.5.1	8250	Brake Holding V	V	FLOAT		103.5	1	207	RW	ESY	
12.5.2	8252	Brake Holding P	W	FLOAT		76	1	350	RW	ESY	
12.5.3	8254	Brake ON Holding I	%	FLOAT		80	0	200	RW	ESY	
12.5.4	8256	Brake OFF Holding I	%	FLOAT		20	0	200	RW	ESY	
12.5.5	8258	Brake Power Mode		ENUM		Boost_Half_Voltage			RW	ESY	
12.5.6	8260	Brake Power Boost	ms	UINT16		1000	0	5000	RW	ESY	
12.5.7	8262	Brake Holding I mon	A	FLOAT		0	0	0	R	ESY	

12.6 DIAGNOSTIC

Menu	PAR	Descrizione	UM	Tipo	FB BIT	Def	Min	Max	Acc	Liv.	Vis.
12.6.1	8300	Pwr SCR On Time	h:min	UINT32		0	0	0	R	ESY	

L_DIGSEL1

PAR	Description	Menu
6000	Null	(*)
6002	One	(*)
1110	Dig input E mon	4.8.13
1210	Dig input 1 mon	4.8.14
1212	Dig input 2 mon	4.8.15
1214	Dig input 3 mon	4.8.16
1216	Dig input 4 mon	4.8.17
1218	Dig input 5 mon	4.8.18
1220	Dig input 6 mon	4.8.19
1222	Dig input 7 mon	4.8.20
1224	Dig input 8 mon	4.8.21
1230	Dig input 1x mon	4.8.22
1232	Dig input 2x mon	4.8.23
1234	Dig input 3x mon	4.8.24
1236	Dig input 4x mon	4.8.25
1062	Drive OK	4.7.14
1064	Drive ready	4.7.15
934	Ref is 0	(*)
936	Ref is 0 delay	(*)
944	Speed is 0	(*)
946	Speed is 0 delay	(*)
1066	Enable state mon	4.1.16
1068	Start state mon	4.1.17
1070	FastStop cmd mon	4.1.18
1024	Enable cmd mon	4.7.10
1026	Start cmd mon	4.7.11
1028	FastStop cmd mon	(*)
4708	Alm dig out mon 1	(*)
4710	Alm dig out mon 2	(*)
4712	Alm dig out mon 3	(*)
4714	Alm dig out mon 4	(*)
362	Drive overload trip	13.4.8
3214	Motor overload trip	(*)
3262	Bres overload trip	(*)
366	Drive overload 80%	13.4.9
4454	Bit0 decomp mon	6.5.3
4456	Bit1 decomp mon	6.5.4
4458	Bit2 decomp mon	6.5.5
4460	Bit3 decomp mon	6.5.6
4462	Bit4 decomp mon	6.5.7
4464	Bit5 decomp mon	6.5.8
4466	Bit6 decomp mon	6.5.9
4468	Bit7 decomp mon	6.5.10
4470	Bit8 decomp mon	6.5.11
4472	Bit9 decomp mon	6.5.12
4474	Bit10 decomp mon	6.5.13
4476	Bit11 decomp mon	6.5.14
4478	Bit12 decomp mon	6.5.15
4480	Bit13 decomp mon	6.5.16
4482	Bit14 decomp mon	6.5.17
4484	Bit15 decomp mon	6.5.18
3700	Lift enable	13.7.1
3702	Run cont mon	13.7.2
3704	Up cont mon	13.7.3
3706	Down cont mon	13.7.4
3708	Brake cont mon	13.7.5
3710	Lift dc brake	13.7.6
3712	Brake mon	13.7.7
3714	Door open mon	13.7.8
3716	Lift start	13.7.9
3718	Safe brake test	13.7.10
3720	Lift statusWord	13.7.11
3722	Brake mon	13.7.12
3724	SC Cont mon	13.7.13
3726	Ramp down limit	13.7.14
3728	EBC OK	13.7.15
3730	Lift wdec input	13.7.16
3732	Activation delay enable	13.7.17
764	Ramp acc state	4.6.6
766	Ramp dec state	4.6.7
3420	Ropes change req mon	5.2.11
3422	Dir change monitor	5.2.12
3424	Dir change cnt zero	5.2.13

L_DIGSEL2

PAR	Description	Menu
6000	Null	(*)
6002	One	(*)
1110	Dig input E mon	4.8.13
1210	Dig input 1 mon	4.8.14
1212	Dig input 2 mon	4.8.15
1214	Dig input 3 mon	4.8.16
1216	Dig input 4 mon	4.8.17
1218	Dig input 5 mon	4.8.18
1220	Dig input 6 mon	4.8.19
1222	Dig input 7 mon	4.8.20
1224	Dig input 8 mon	4.8.21
1230	Dig input 1x mon	4.8.22
1232	Dig input 2x mon	4.8.23
1234	Dig input 3x mon	4.8.24
1236	Dig input 4x mon	4.8.25
4454	Bit0 decomp mon	6.5.3
4456	Bit1 decomp mon	6.5.4
4458	Bit2 decomp mon	6.5.5
4460	Bit3 decomp mon	6.5.6
4462	Bit4 decomp mon	6.5.7
4464	Bit5 decomp mon	6.5.8
4466	Bit6 decomp mon	6.5.9
4468	Bit7 decomp mon	6.5.10
4470	Bit8 decomp mon	6.5.11
4472	Bit9 decomp mon	6.5.12
4474	Bit10 decomp mon	6.5.13
4476	Bit11 decomp mon	6.5.14
4478	Bit12 decomp mon	6.5.15
4480	Bit13 decomp mon	6.5.16
4482	Bit14 decomp mon	6.5.17
4484	Bit15 decomp mon	6.5.18
3700	Lift enable	13.7.1
3702	Run cont mon	13.7.2
3704	Up cont mon	13.7.3
3706	Down cont mon	13.7.4
3708	Brake cont mon	13.7.5
3710	Lift dc brake	13.7.6
3712	Brake mon	13.7.7
3714	Door open mon	13.7.8
3716	Lift start	13.7.9
3718	Safe Brake Test	13.7.10
3720	Lift statusWord	13.7.11
3722	Brake mon	13.7.12
3724	SC Cont mon	13.7.13
3726	Ramp down limit	13.7.14
3728	EBC OK	13.7.15
3730	Lift wdec input	13.7.16
3732	Activation delay enable	13.7.17

L_DIGSEL3

PAR	Description	Menu
XXXX	[2]	
6000	Null	(*)
1218	Dig input 5 mon	4.8.18
1220	Dig input 6 mon	4.8.19
1222	Dig input 7 mon	4.8.20
1224	Dig input 8 mon	4.8.21
1230	Dig input 1x mon	4.8.22
1232	Dig input 2x mon	4.8.23
1234	Dig input 3x mon	4.8.24
1236	Dig input 4x mon	4.8.25
1062	Drive OK	4.7.14
1064	Drive ready	4.7.15
934	Ref is 0	(*)
936	Ref is 0 delay	(*)
944	Speed is 0	(*)
946	Speed is 0 delay	(*)
1066	Enable state mon	4.1.16
1068	Start state mon	4.1.17
1070	FastStop state mon	4.1.18
1024	Enable cmd mon	4.7.10
1026	Start cmd mon	4.7.11
1028	FastStop cmd mon	(*)
4708	Alm dig out mon 1	(*)
4710	Alm dig out mon 2	(*)
4712	Alm dig out mon 3	(*)
4714	Alm dig out mon 4	(*)
362	Drive overload trip	13.4.8
3214	Motor overload trip	(*)
3262	Bres overload trip	(*)
366	Drive overload 80%	13.4.9
4454	Bit0 decomp mon	6.5.3
4456	Bit1 decomp mon	6.5.4
4458	Bit2 decomp mon	6.5.5
4460	Bit3 decomp mon	6.5.6
4462	Bit4 decomp mon	6.5.7
4464	Bit5 decomp mon	6.5.8
4466	Bit6 decomp mon	6.5.9
4468	Bit7 decomp mon	6.5.10
4470	Bit8 decomp mon	6.5.11
4472	Bit9 decomp mon	6.5.12
4474	Bit10 decomp mon	6.5.13
4476	Bit11 decomp mon	6.5.14
4478	Bit12 decomp mon	6.5.15
4480	Bit13 decomp mon	6.5.16
4482	Bit14 decomp mon	6.5.17
4484	Bit15 decomp mon	6.5.18
3700	Lift enable	13.7.1
3702	Run cont mon	13.7.2
3704	Up cont mon	13.7.3
3706	Down cont mon	13.7.4
3708	Brake cont mon	13.7.5
3710	Lift dc brake	13.7.6
3712	Brake mon	13.7.7
3714	Door open mon	13.7.8
3716	Lift start	13.7.9
3718	Safe Brake Test	13.7.10
3720	Lift statusWord	13.7.11
3722	Brake mon	13.7.12
3724	SC Cont mon	13.7.13
3726	Ramp down limit	13.7.14
3728	EBC OK	13.7.15
3730	Lift wdec input	13.7.16
764	Ramp acc state	4.6.6
766	Ramp dec state	4.6.7

[2] the XXXX parameter changes according to the src parameter used:

1014 Local/remote src	4.7.6
[2] = 1012 Dig local/remote	4.7.5

L_LIM

PAR	Description	Menu
6000	Null	(*)
1600	Analog input mon	4.10.1
4024	Fieldbus M->S1 mon	6.2.3
4034	Fieldbus M->S2 mon	6.2.7
4044	Fieldbus M->S3 mon	6.2.11
4054	Fieldbus M->S4 mon	6.2.15
4064	Fieldbus M->S5 mon	6.2.19
4074	Fieldbus M->S6 mon	6.2.23
4084	Fieldbus M->S7 mon	6.2.27
4094	Fieldbus M->S8 mon	6.2.31
4104	Fieldbus M->S9 mon	6.2.35
4114	Fieldbus M->S10 mon	6.2.39
4124	Fieldbus M->S11 mon	6.2.43
4134	Fieldbus M->S12 mon	6.2.47
4144	Fieldbus M->S13 mon	6.2.51
4154	Fieldbus M->S14 mon	6.2.55
4164	Fieldbus M->S15 mon	6.2.59
4174	Fieldbus M->S16 mon	6.2.63
3700	Lift enable	13.7.1
3702	Run cont mon	13.7.2
3704	Up cont mon	13.7.3
3706	Down cont mon	13.7.4
3708	Brake cont mon	13.7.5
3710	Lift dc brake	13.7.6
3712	Brake mon	13.7.7
3714	Door open mon	13.7.8
3716	Lift start	13.7.9
3718	Safe Brake Test	13.7.10
3720	Lift statusWord	13.7.11
3722	Brake mon	13.7.12
3724	SC Cont mon	13.7.13
3726	Ramp down limit	13.7.14
3728	EBC OK	13.7.15
3730	Lift wdec input	13.7.16

L_MLTREF

PAR	Description	Menu
XXXX	(4)	
1600	Analog input mon	4.10.1
2150	Encoder speed	8.13
4024	Fieldbus M->S1 mon	6.2.3
4034	Fieldbus M->S2 mon	6.2.7
4044	Fieldbus M->S3 mon	6.2.11
4054	Fieldbus M->S4 mon	6.2.15
4064	Fieldbus M->S5 mon	6.2.19
4074	Fieldbus M->S6 mon	6.2.23
4084	Fieldbus M->S7 mon	6.2.27
4094	Fieldbus M->S8 mon	6.2.31
4104	Fieldbus M->S9 mon	6.2.35
4114	Fieldbus M->S10 mon	6.2.39
4124	Fieldbus M->S11 mon	6.2.43
4134	Fieldbus M->S12 mon	6.2.47
4144	Fieldbus M->S13 mon	6.2.51
4154	Fieldbus M->S14 mon	6.2.55
4164	Fieldbus M->S15 mon	6.2.59
4174	Fieldbus M->S16 mon	6.2.63
3700	Lift enable	13.7.1
3702	Run cont mon	13.7.2
3704	Up cont mon	13.7.3
3706	Down cont mon	13.7.4
3708	Brake cont mon	13.7.5
3710	Lift dc brake	13.7.6
3712	Brake mon	13.7.7
3714	Door open mon	13.7.8
3716	Lift start	13.7.9
3718	Safe Brake Test	13.7.10
3720	Lift statusWord	13.7.11
3722	Brake mon	13.7.12
3724	SC Cont mon	13.7.13
3726	Ramp down limit	13.7.14
3728	EBC OK	13.7.15
3730	Lift wdec input	13.7.16

(4) the XXXX parameter changes according to the src parameter used:

610	Ramp ref 1 src	4.5.3
(4) = 600	Dig ramp ref 1	4.5.1
612	Ramp ref 2 src	4.5.4
(4) = 602	Dig ramp ref 2	4.5.2
650	Speed ref 1 src	4.5.12
(4) = 640	Multispeed	4.5.11
652	Speed ref 2 src	4.5.13
(4) = 642	Dig speed ref 2	4.5.15

L_SCOPE

PAR	Description	Menu
6000	Null	(*)

L_VREF

PAR	Description	Menu
XXXX	(6)	
1600	Analog input mon	4.10.1
4024	Fieldbus M->S1 mon	6.2.3
4034	Fieldbus M->S2 mon	6.2.7
4044	Fieldbus M->S3 mon	6.2.11
4054	Fieldbus M->S4 mon	6.2.15
4064	Fieldbus M->S5 mon	6.2.19
4074	Fieldbus M->S6 mon	6.2.23
4084	Fieldbus M->S7 mon	6.2.27
4094	Fieldbus M->S8 mon	6.2.31
4104	Fieldbus M->S9 mon	6.2.35
4114	Fieldbus M->S10 mon	6.2.39
4124	Fieldbus M->S11 mon	6.2.43
4134	Fieldbus M->S12 mon	6.2.47
4144	Fieldbus M->S13 mon	6.2.51
4154	Fieldbus M->S14 mon	6.2.55
4164	Fieldbus M->S15 mon	6.2.59
4174	Fieldbus M->S16 mon	6.2.63
3700	Lift enable	13.7.1
3702	Run cont mon	13.7.2
3704	Up cont mon	13.7.3
3706	Down cont mon	13.7.4
3708	Brake cont mon	13.7.5
3710	Lift dc brake	13.7.6
3712	Brake mon	13.7.7
3714	Door open mon	13.7.8
3716	Lift start	13.7.9
3718	Safe Brake Test	13.7.10
3720	Lift statusWord	13.7.11
3722	Brake mon	13.7.12
3724	SC Cont mon	13.7.13
3726	Ramp down limit	13.7.14
3728	EBC OK	13.7.15
3730	Lift wdec input	13.7.16
6000	Null	(*)

(6) the XXXX parameter changes according to the src parameter used:

4452	Word decomp src	6.5.2
(6) = 4450	Dig word decomp	6.5.1

L_WDECOMP

PAR	Descrizione	Menu
XXXX	(6)	
6000	Null	(*)
6002	One	(*)
4432	Word comp mon	6.4.17
4024	Fieldbus M->S1 mon	6.2.3
4034	Fieldbus M->S2 mon	6.2.7
4044	Fieldbus M->S3 mon	6.2.11
4054	Fieldbus M->S4 mon	6.2.15
4064	Fieldbus M->S5 mon	6.2.19
4074	Fieldbus M->S6 mon	6.2.23
4084	Fieldbus M->S7 mon	6.2.27
4094	Fieldbus M->S8 mon	6.2.31
4104	Fieldbus M->S9 mon	6.2.35
4114	Fieldbus M->S10 mon	6.2.39
4124	Fieldbus M->S11 mon	6.2.43
4134	Fieldbus M->S12 mon	6.2.47
4144	Fieldbus M->S13 mon	6.2.51
4154	Fieldbus M->S14 mon	6.2.55
4164	Fieldbus M->S15 mon	6.2.59
4174	Fieldbus M->S16 mon	6.2.63
3700	Lift enable	13.7.1
3702	Run cont mon	13.7.2
3704	Up cont mon	13.7.3
3706	Down cont mon	13.7.4
3708	Brake cont mon	13.7.5
3710	Lift dc brake	13.7.6
3712	Brake mon	13.7.7
3714	Door open mon	13.7.8
3716	Lift start	13.7.9
3718	Safe Brake Test	13.7.10
3720	Lift statusWord	13.7.11
3722	Brake mon	13.7.12
3724	SC Cont mon	13.7.13
3726	Ramp down limit	13.7.14
3728	EBC OK	13.7.15
3730	Lift wdec input	13.7.16

(6) the XXXX parameter changes according to the src parameter used:

4452	Word decomp src	6.5.2
(6) = 4450	Dig word decomp	6.5.1

LIFTINPUTADLCMD

PAR	Description	Menu
1110	Dig input E	4.8.13
1210	Dig input 1	4.8.14
1212	Dig input 2	4.8.15
1214	Dig input 3	4.8.16
1216	Dig input 4	4.8.17
1218	Dig input 5	4.8.18
1220	Dig input 6	4.8.19
1222	Dig input 7	4.8.20
1224	Dig input 8	4.8.21
1230	Dig input 1x	4.8.22
1232	Dig input 2x	4.8.23
1234	Dig input 3x	4.8.24

PAR	Description	Menu
1236	Dig input 4x	4.8.25
3702	Run cont mon	12.7.2
3706	Down cont mon	12.7.4
3708	Brake cont mon	12.7.5
3714	Door open mon	12.7.8
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 dcomp	(*)
12272	B11 Lift dcomp	(*)
12274	B12 Lift dcomp	(*)
12276	B13 Lift dcomp	(*)
12278	B14 Lift dcomp	(*)
12280	B15 Lift dcomp	(*)

LIFTINPUTDOORCMD

PAR	Description	Menu
1110	Dig input E mon	4.8.13
1210	Dig input 1 mon	4.8.14
1212	Dig input 2 mon	4.8.15
1214	Dig input 3 mon	4.8.16
1216	Dig input 4 mon	4.8.17
1218	Dig input 5 mon	4.8.18
1220	Dig input 6 mon	4.8.19
1222	Dig input 7 mon	4.8.20
1224	Dig input 8 mon	4.8.21
1230	Dig input 1x mon	4.8.22
1232	Dig input 2x mon	4.8.23
1234	Dig input 3x mon	4.8.24
1236	Dig input 4x mon	4.8.25
3702	Run cont mon	13.7.2
3706	Down cont mon	13.7.4
3708	Brake cont mon	13.7.5
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 dcomp	(*)
12272	B11 Lift dcomp	(*)
12274	B12 Lift dcomp	(*)
12276	B13 Lift dcomp	(*)
12278	B14 Lift dcomp	(*)
12280	B15 Lift dcomp	(*)

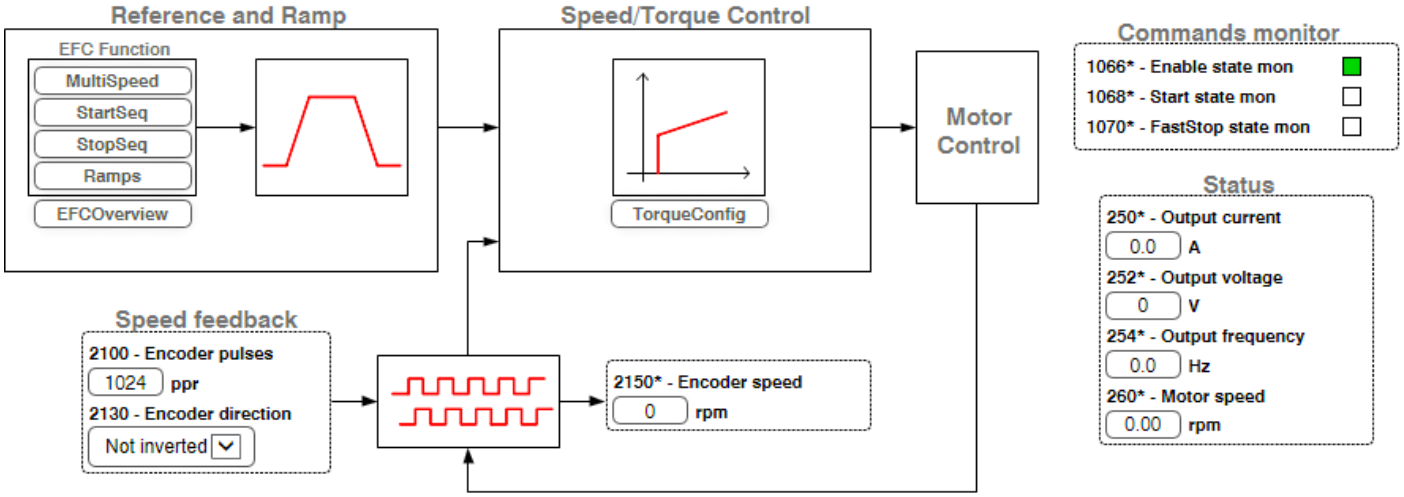
LIFTINPUTADLCMDEBC

PAR	Description	Menu
1110	Dig input E mon	4.8.13
1210	Dig input 1 mon	4.8.14
1212	Dig input 2 mon	4.8.15
1214	Dig input 3 mon	4.8.16
1216	Dig input 4 mon	4.8.17
1218	Dig input 5 mon	4.8.18
1220	Dig input 6 mon	4.8.19
1222	Dig input 7 mon	4.8.20
1224	Dig input 8 mon	4.8.21
1230	Dig input 1x mon	4.8.22
1232	Dig input 2x mon	4.8.23
1234	Dig input 3x mon	4.8.24
1236	Dig input 4x mon	4.8.25
3702	Run cont mon	13.7.2
3706	Down cont mon	13.7.4
3708	Brake cont mon	13.7.5
3714	Door open mon	13.7.8
8000	EBC SOK mon	12.1.1
8002	EBC Warning mon	12.1.2
8004	EBC Alarm mon	12.1.3
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 dcomp	(*)
12272	B11 Lift dcomp	(*)
12274	B12 Lift dcomp	(*)
12276	B13 Lift dcomp	(*)
12278	B14 Lift dcomp	(*)
12280	B15 Lift dcomp	(*)

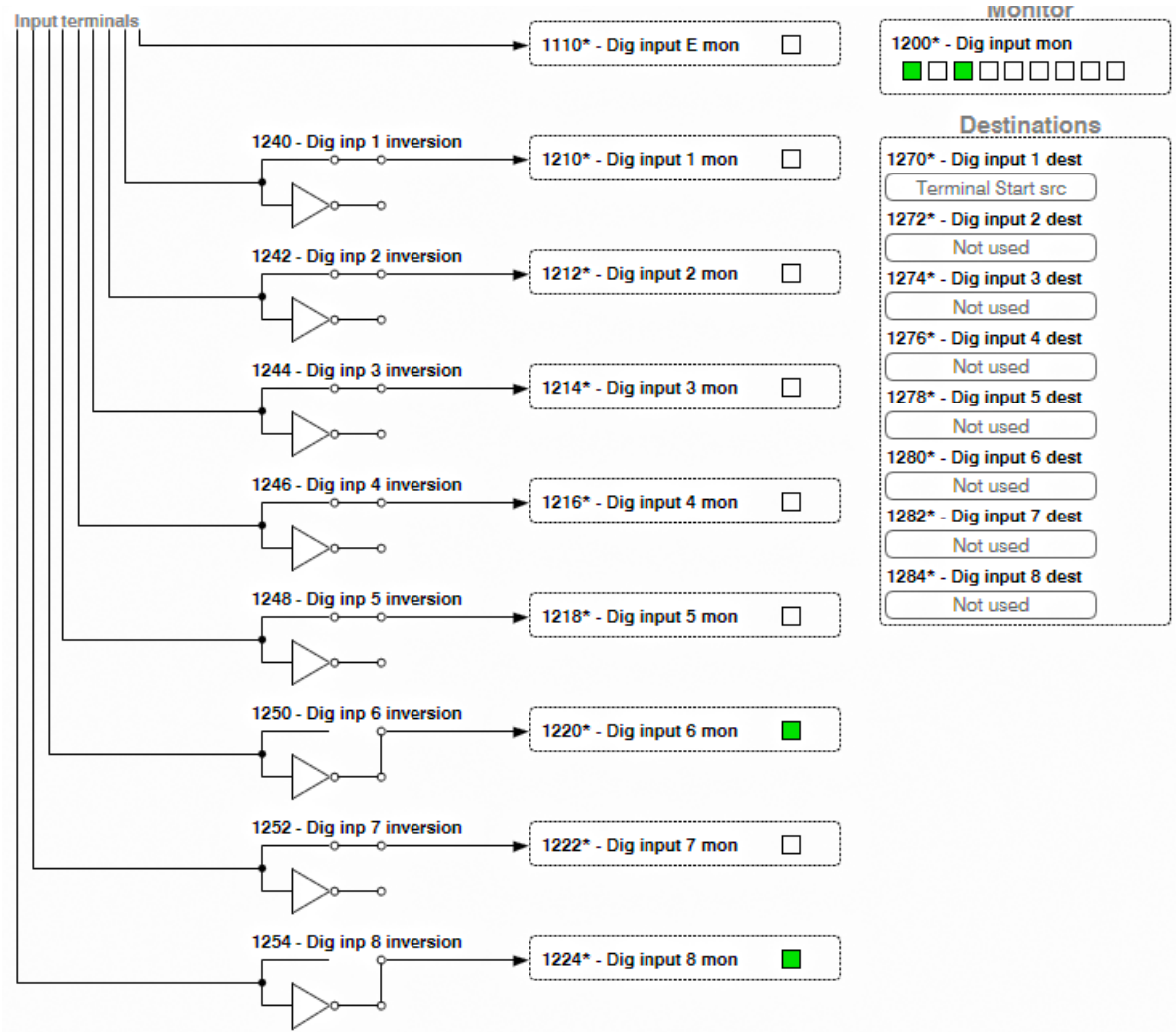
(*) Parameter not shown on the keypad. For information see the “PARAMETERS INCLUDED IN SELECTION LISTS BUT NOT SHOWN ON THE KEYPAD” section.

DRIVE

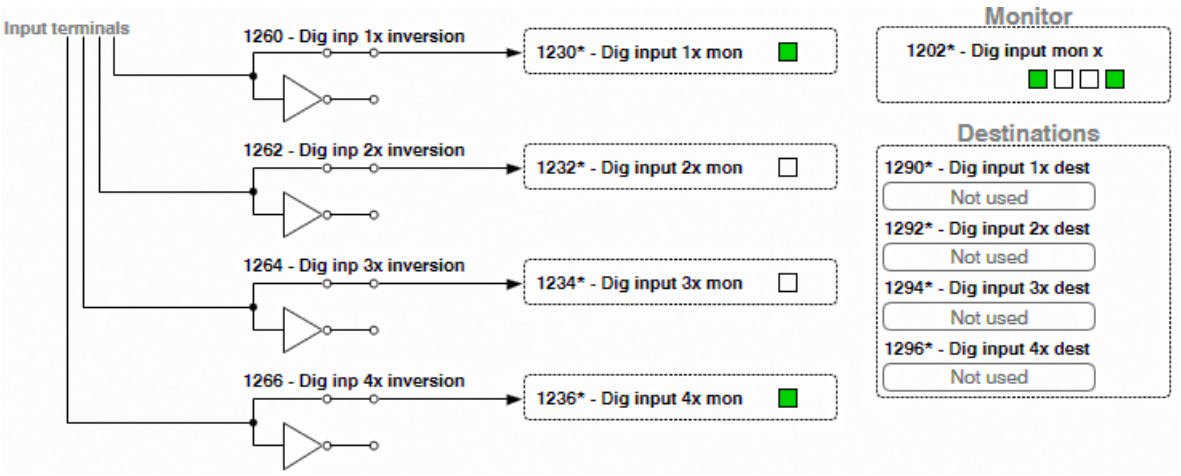
DRIVE OVERVIEW



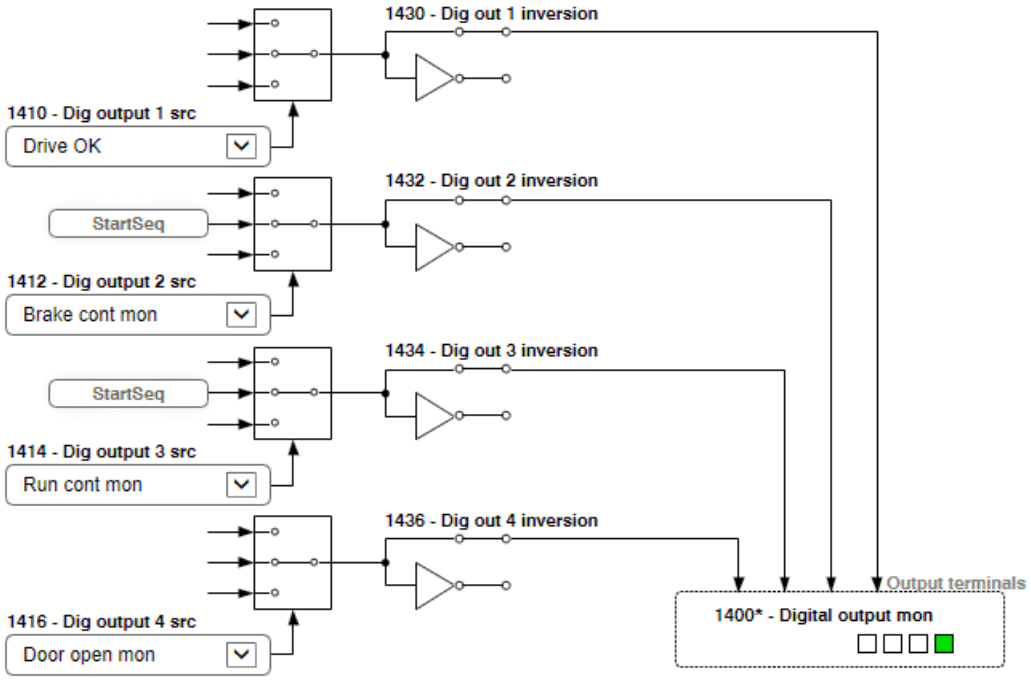
DIGITAL INPUTS



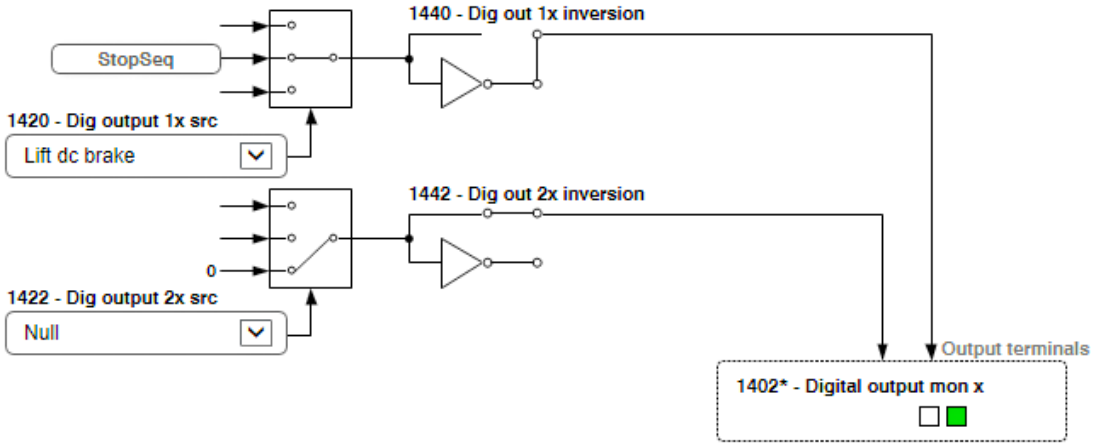
EXPANSION DIGITAL INPUTS



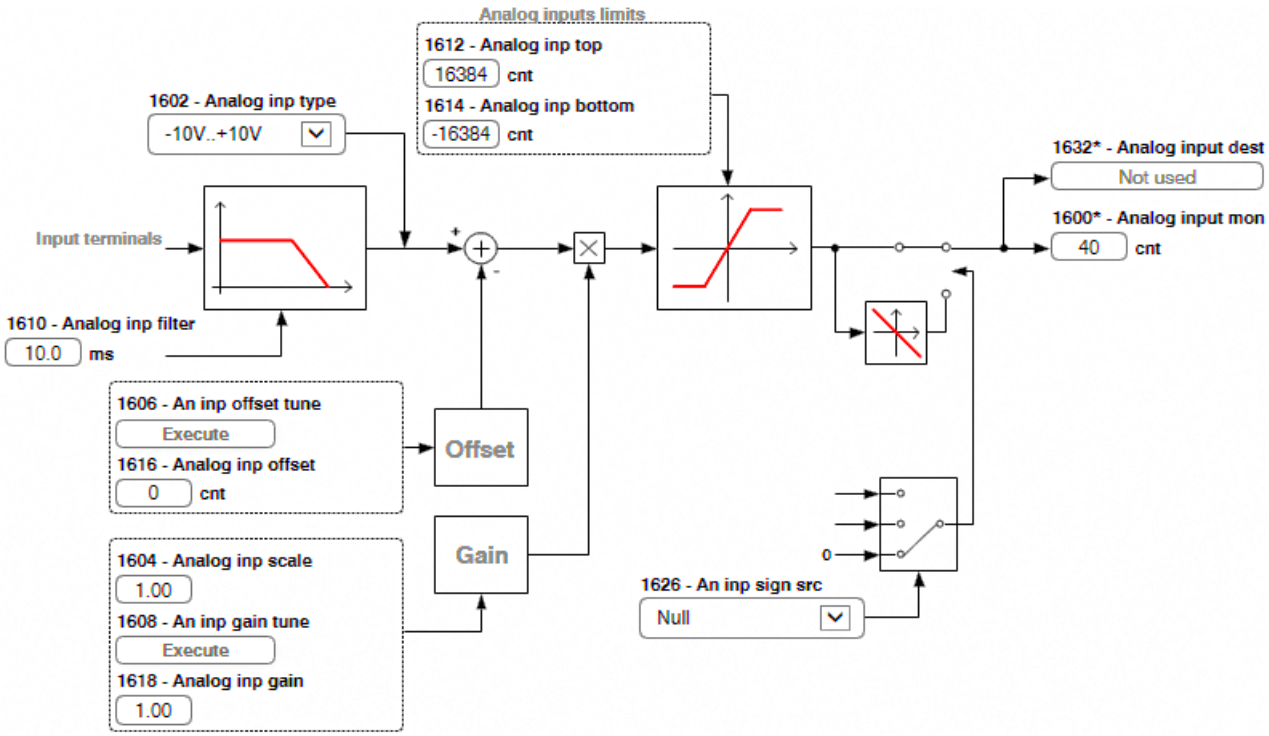
DIGITAL OUTPUTS



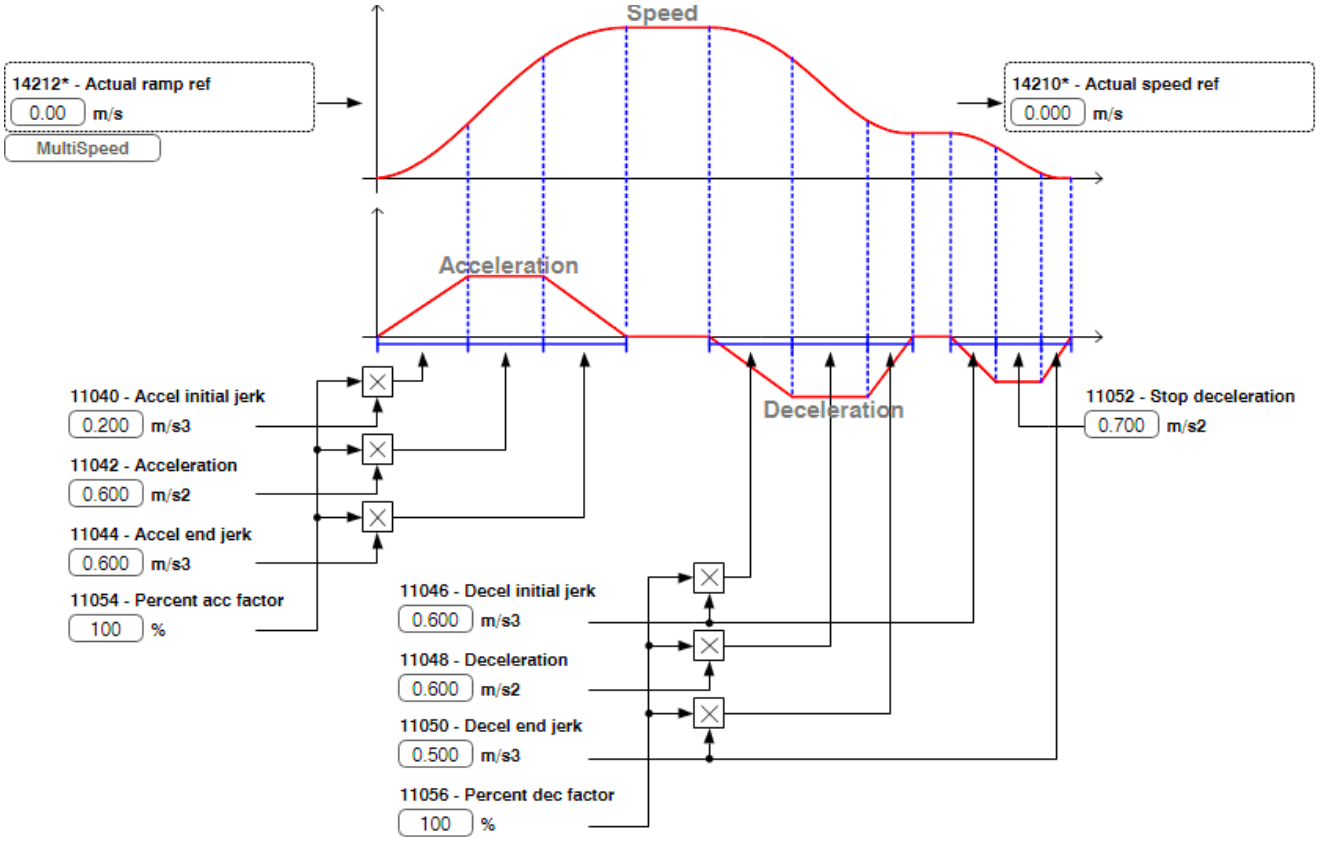
EXPANSION DIGITAL OUTPUTS



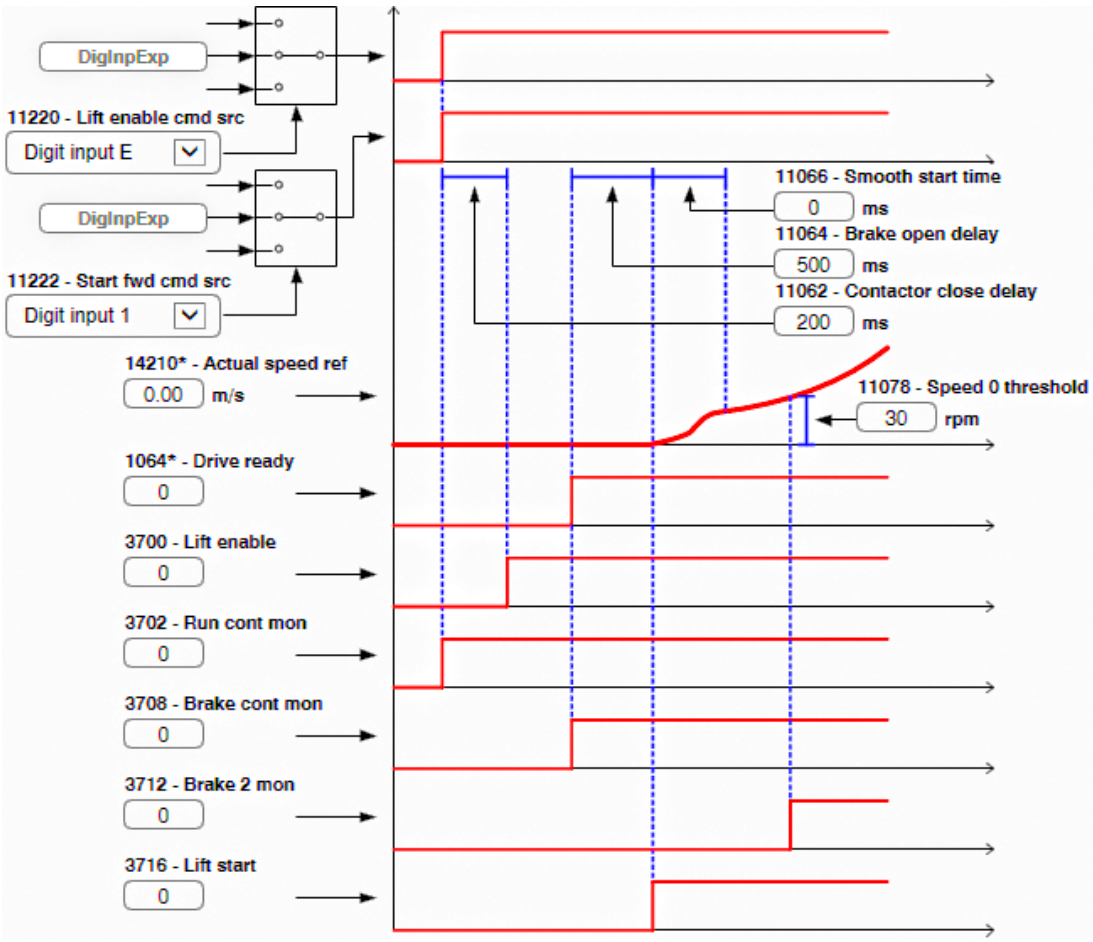
ANALOG INPUTS



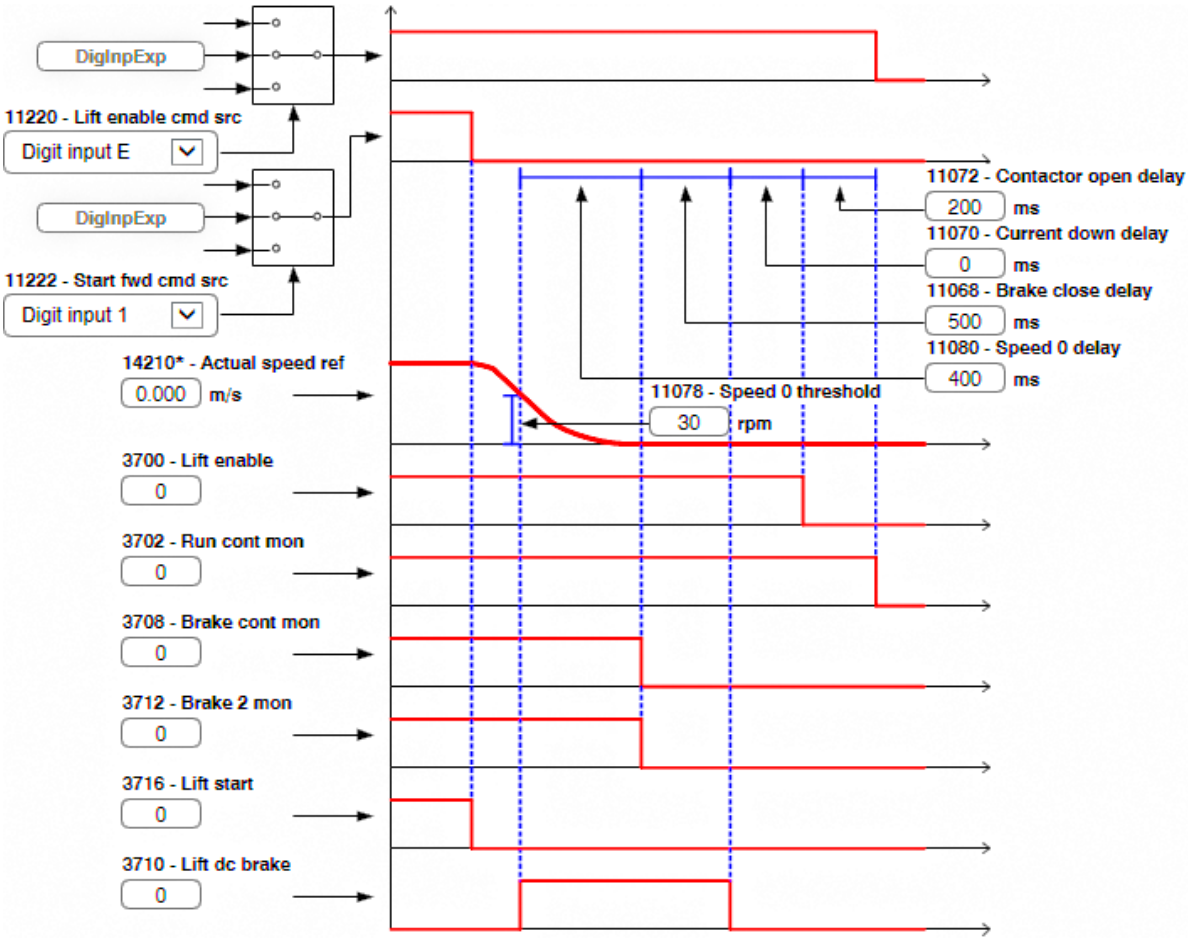
RAMPS



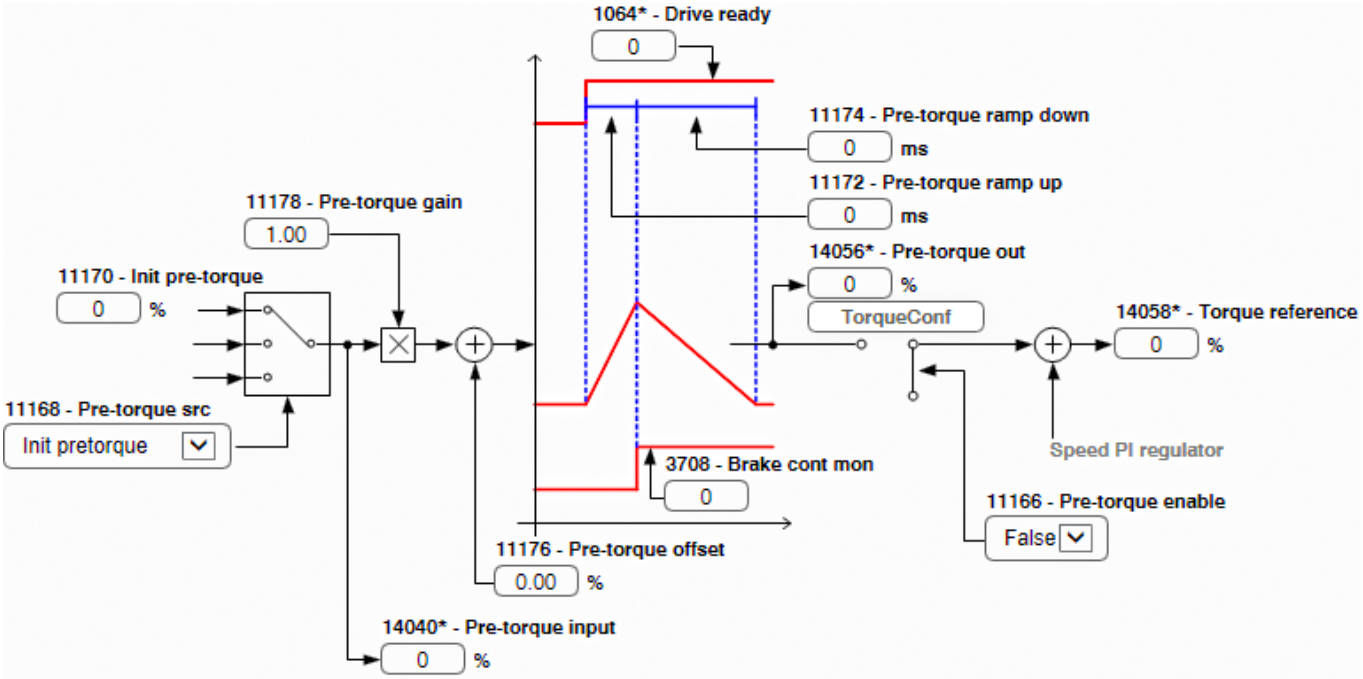
START SEQUENCES



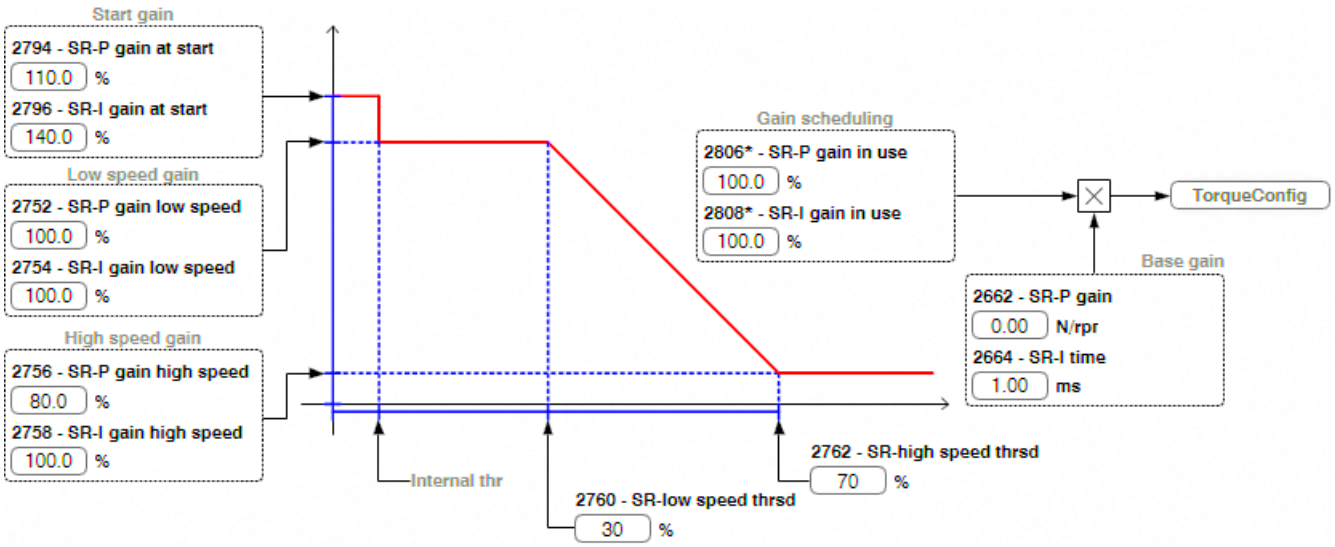
STOP SEQUENCES



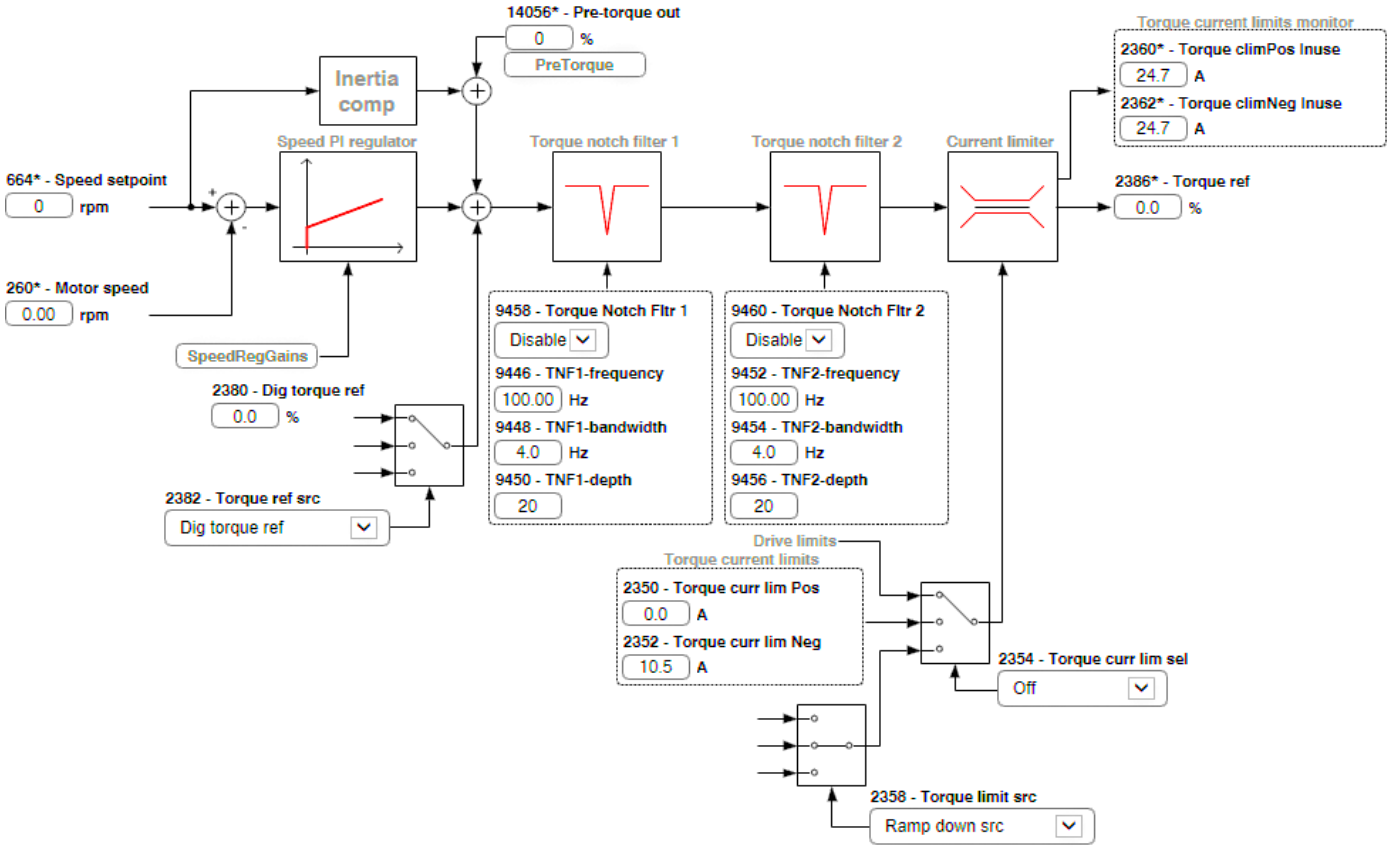
PRE-TORQUE



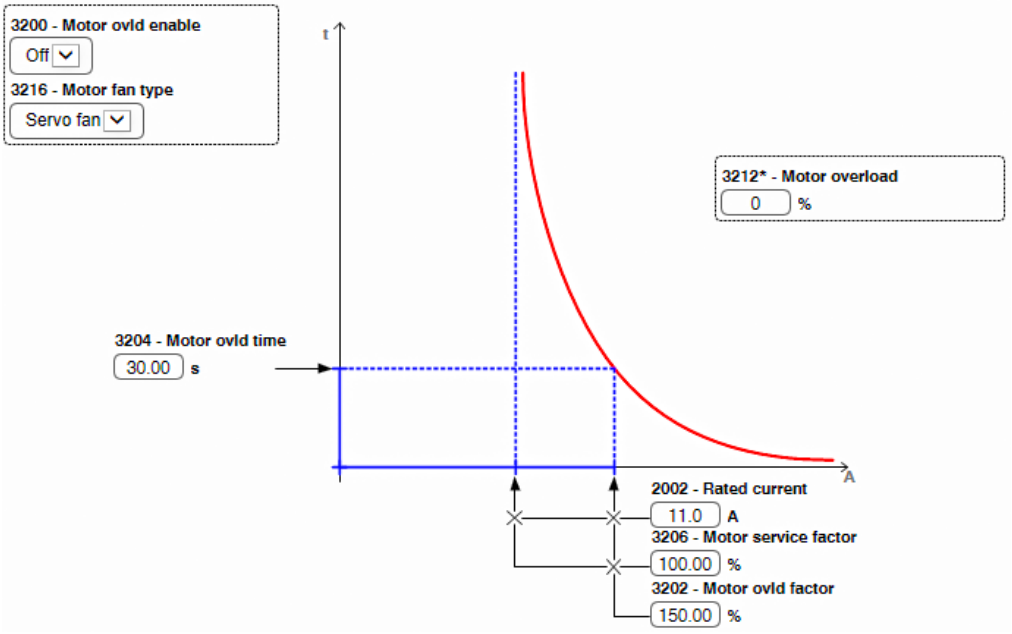
SPEED REG GAINS



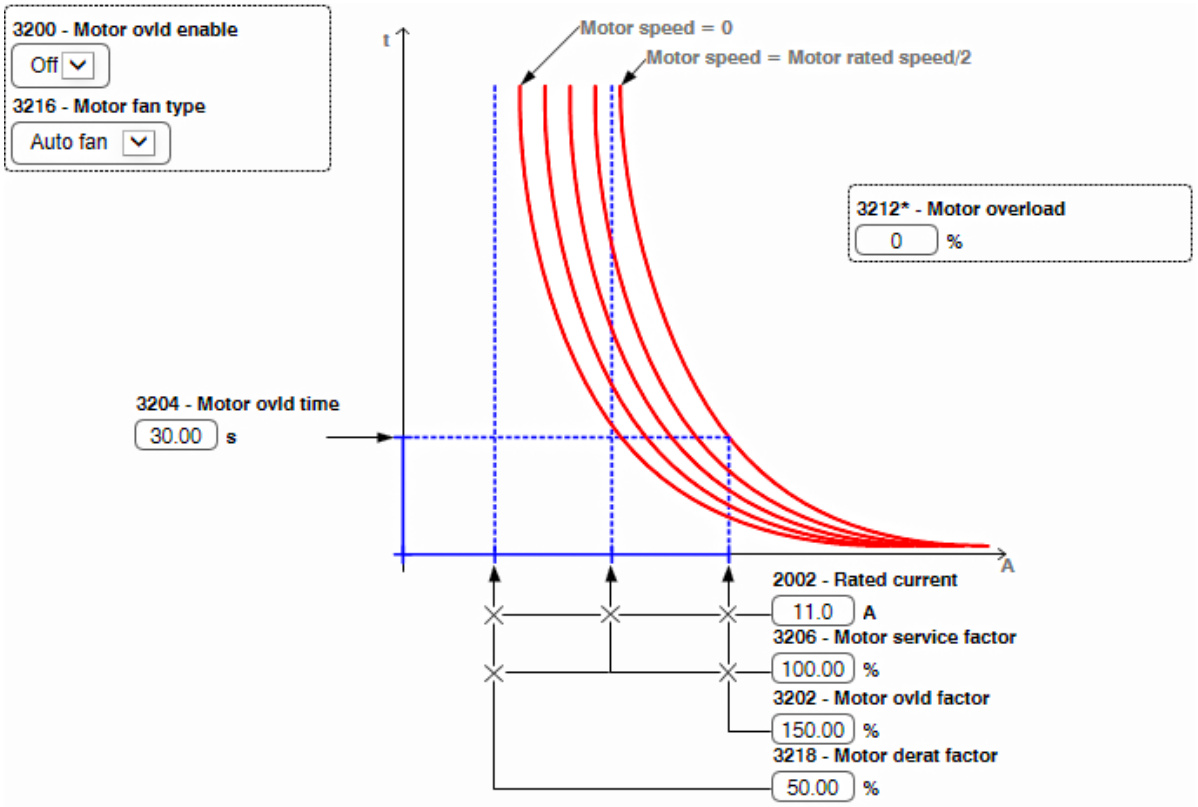
TORQUE CONFIG



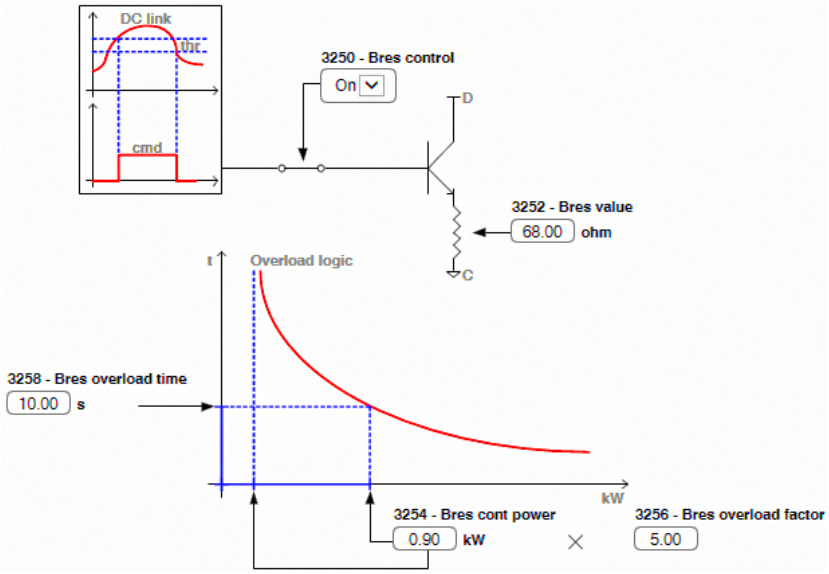
MOTOR OVERLOAD SERVOFAN



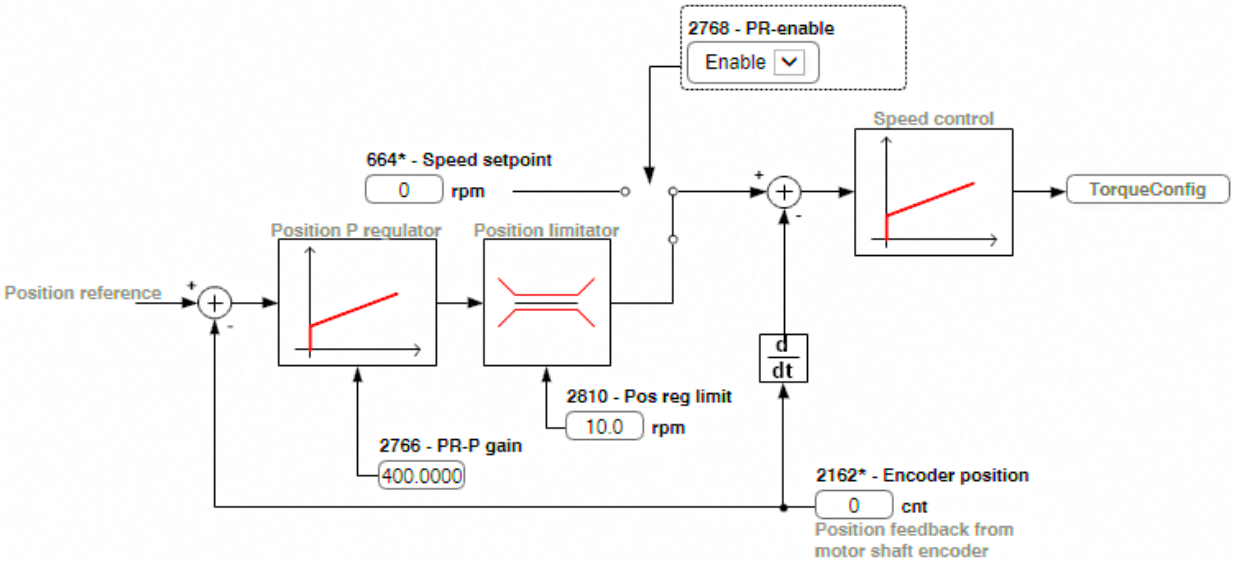
MOTOR OVERLOAD AUTO FAN



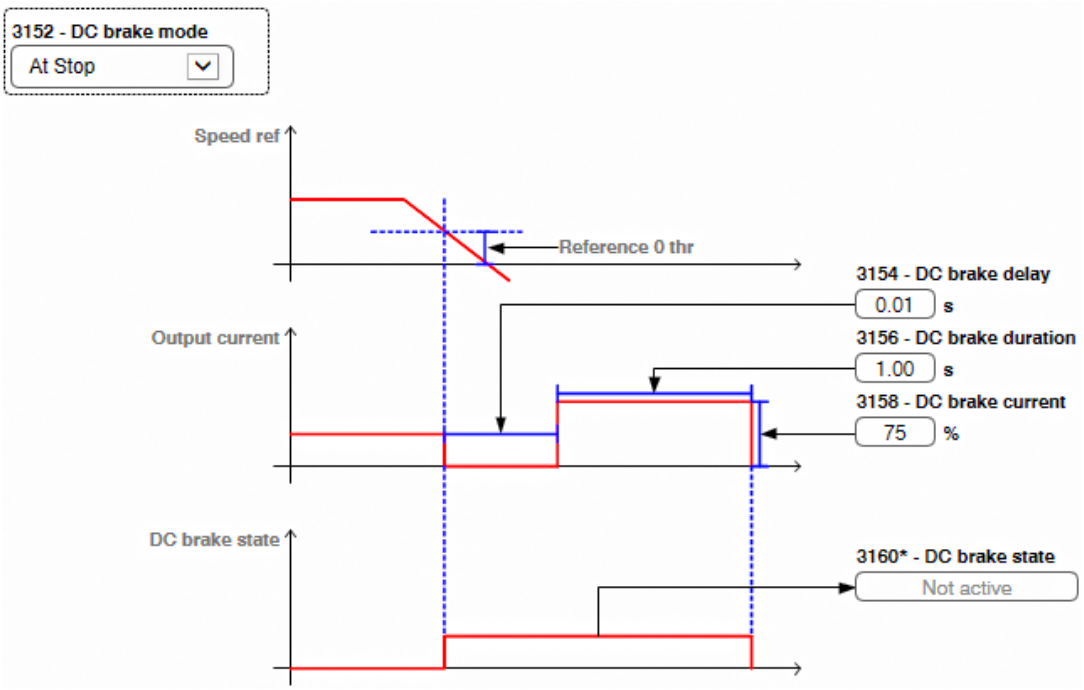
BRES OVERLOAD



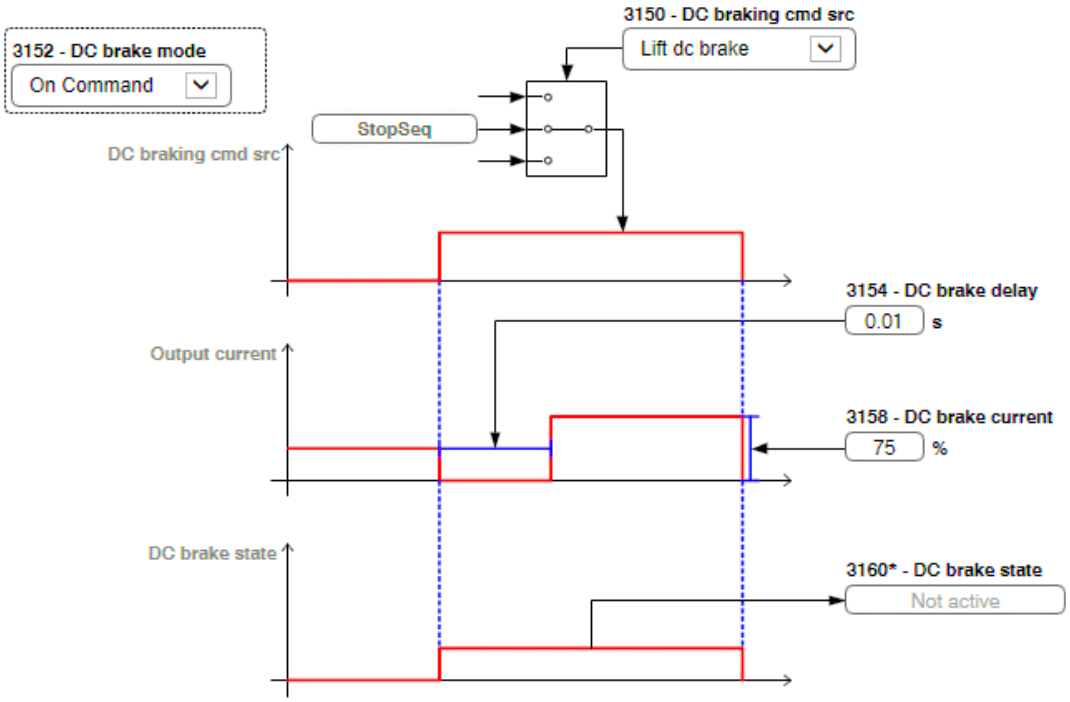
ANTI ROLLBACK



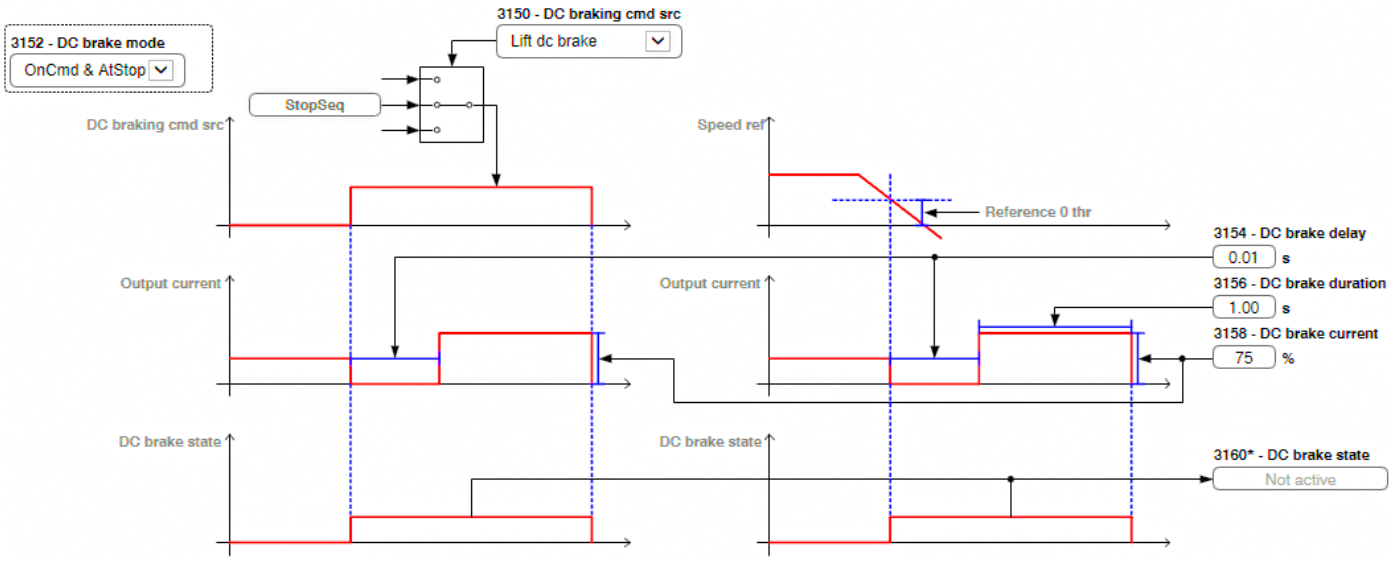
DC BRAKING AT STOP



DC BRAKING ON COMMAND



DC BRAKING ON CMD & AT STOP



F.1.1 CANopen management

The user interface of the CANopen protocol is performed via the drive parameters. The parameters are controlled via hierarchical menus. All the writing parameters referring to the field bus are active only after the drive reset. Here following is a list of drive parameters useful to control the CANopen protocol.

To enable CANopen, set parameter PAR 4000 **Fieldbus type** to CANopen or DS417.

The following parameters are available in the COMMUNICATION->CONTROL COMM menu:

PAR	Par Name	Type	Default value	Attr
4004	Fieldbus baudrate	Enum	None	Write
4006	Fieldbus address	2 byte unsigned	0	Write
4010	Fieldbus M->S enable	Enum	On	Write
4012	Fieldbus alarm mode	2 byte unsigned	0	Write
4014	Fieldbus state	Enum	Stop	Read only

- Fieldbus baudrate = Sets the network baud rate. Values available for CANopen: 125k, 250k, 500k, 1M
- Fieldbus address = address of this slave node in the network, accepted values from 1 to 127
- Fieldbus M->S enable = if set to Off data in the RPDOs are not processed by the drive
- Fieldbus alarm mode = if set to 1 the drive generates Opt Bus Fault errors relating to the loss of communication (Bus Loss) even when the drive is not enabled.
- Fieldbus state = state of the communication for this node on the CANopen network: Stop, Pre-Operational, Operational.

F.1.2 Process Data Channel Control

This function allows to allocate the drive parameters or application variables to the Process Data Channel data.

As for the CANopen protocol, the PDC is performed via the PDO messages (Process data Object).

The CANopen protocol uses a number of words for the Process Data Channel (abbr. PDC Process Data Channel), which can always be set.

The fieldbus Process Data Channel configuration is the following:

Data 0 Data... Data n

The drive can both read and write the Process Data Channel data.

A datum can be made both of 2 and 4 bytes. The word “data” refers to any quantity of bytes included between 0 and 16, if the byte total number required is not higher than 32.

Example:

It is possible to have:

- from 0 to 16 data with 2 bytes
- 1 datum with 4 bytes + from 0 to 14 data with 2 bytes
- 2 data with 4 bytes + from 0 to 12 data with 2 bytes

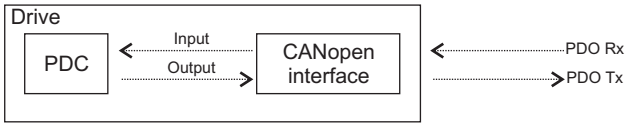
...

- 8 data with 4 bytes

The data exchanged via the PDC can be of two types:

- drive parameters
- variables of an MDPlc application. The use of the MDPlc variables is described in par. 1.3.1 and 1.3.2.

The master writes the data defined as PDC input and reads the data defined as PDC output.



F.1.2.1 PDC Input Configuration (FB XXX MS Parameter)

Data exchanged in RPDOs are configured using the parameters in the COMMUNICATION->FIELDBUS M2S menu.

PAR 4030 **Fieldbus M->S1 ipa** = IPA of the parameter to be exchanged.

Must contain a valid IPA corresponding to the parameter to be written or 0 if sys (PAR 4032...4172 **Fieldbus M->Sn sys**) is Fill or Mdplc; the parameter PAR 4020 **Fieldbus M->S1 ipa** must be assigned to the Lift Wdef Input, while the parameter PAR 4022 **Fieldbus M->S1 sys** must be set on Mdplc16

By selecting the corresponding enum PAR 4034 **Fieldbus M->S2 mon** for src type parameters (Source), the value of the parameter 4030 is automatically set at the IPA of the src.

For src type parameters with an FB type different from 0, the data arriving on the fieldbus is not written in the enum selection, but directly in the mon associated with the src.

If it contains a valid IPA and is forced to 0, the corresponding sys parameter takes on the Fill value (16 or 32 in relation to that shown before), ensuring that the structure of the exchanged data area is not modified.

PAR 4032 **Fieldbus M->S2 sys** = format of the data to be exchanged

This parameter is automatically changed to the recommended value when the corresponding PAR 4030...4170 **Fieldbus M->Sn ipa** is changed. The automatic value can be changed by the user, however, the permitted values depend on the parameter.

Data mapping in PDOs is performed on the basis of the data format set in Fieldbus M->Sn sys according to the following rules:

– PDOs are filled starting from RPDO1

– When the PDO contains 4 words it is full and the next RPDO is filled with a maximum of 4 PDOs

– 32-bit data (long or float) cannot be split among PDOs, they must be placed inside the PDO (an alarm is generated)

– PDOs containing fewer than 4 words can be created, using **Fieldbus M->Sn dest**= None but assigned (**Fieldbus M->Sn sys** other than Not Assigned, Fill16 or Fill32) after an assigned datum.

  (N.B.: if assigned as Fill16 or Fill32, the datum is included in the PDO anyway)

– At the first **Fieldbus M->Sn sys** = Not Assigned parameter the PDOs are complete. The size of the last PDO thus depends on the data that have been assigned.

– ***Example : RPDO1 di 2 word and RPDO2 di 2 word:***

  Fieldbus M->S1 dest = Ramp ref 1 src

  Fieldbus M->S1 sys = EU

  Fieldbus M->S2 dest = Word decomp src

  Fieldbus M->S2 sys = Count 16

  Fieldbus M->S3 dest = None

  Fieldbus M->S3 sys = Count 32

  Fieldbus M->S4 dest = Compare 1 src

  Fieldbus M->S4 sys = Count32

  Fieldbus M->S5 sys = Not Assigned

F.1.2.2 PDC Output Configuration (FB XXX SM Parameter)

Data exchanged in RPDOs are configured using the parameters in the COMMUNICATION->FIELDBUS S2M menu (refer to the drive manual).

Data mapping in PDOs is performed on the basis of the data format set in **Fieldbus M->Sn sys** according to the following rules:

– PDOs are filled starting from TPDO1

– When the PDO contains 4 words it is full and the next TPDO is filled with a maximum of 4 PDOs.

– 32-bit data (long or float) cannot be split among PDOs, they must be placed inside the PDO (an alarm is generated).

– PDOs with fewer than 4 words can be created, using Fieldbus S->Mn src= None Used but assigned (**Fieldbus M->Sn sys** other than Not Assigned, Fill16 or Fill32) after an assigned datum.

– At the first **Fieldbus S->Mn sys** = Not Assigned parameter the PDOs are complete. The size of the last PDO thus depends on the data that have been assigned.

F.1.2.3 Use of the PDC in MDPlc Applications

It is possible to configure both the PDC input and output data in order to allow the data direct access via the MDPlc application code.

For read data simply set **Fieldbus M->Sn sys** to MDPLC16 or MDPLC32, leaving **Fieldbus M->Sn dest** = None.

The MDPLC application can now read the incoming datum directly from the **Fieldbus M->Sn mon** parameter.

Write data are configured by setting **Fieldbus S->Mn src** = Dig Fieldbus S->Mn.

Fieldbus S->Mn sys is automatically set to MDPLC. The application writes the datum in the **Dig Fieldbus S->Mn** parameter to send it to the bus.

F.1.3 SDO management

The SDO service is always available.
The drive parameters can be accessed via the “MSPA” Manufacturer Specific Profile Area (2000hex< index <5FFFhex).
The index to be shown in the SDO command to access a drive parameter is obtained via the following rules:
SDO index = PAR + 2000h
SDO subindex = 1
The Data field must contain the value of the drive parameter.

Example:
Writing the value 1m/s in the PAR 11020 **Multi speed 0 (**2B0C hex).

The following information is required:

1) The SDO index resulting from the formula is
   2000hex + 258hex = 2258h
2) The value to be written is 1, corresponding to 1 hex.
3) Parameter writing code = 22h
4) Parameter reading code = 40h
5) Sub-index = 01h

The ipaCan parameter and relative value is written by first inserting the lower part of the address in hexadecimal and then the higher part (Value to be written LL-LH-HL-HH).

Example of value 1 writing:

MessageID	Writing Code	Lower part IpaCan	Higher part IpaCan	Subindex	Value of parameter LL	Value of parameter LH	Value of parameter HL	Value of parameter HH
601h	22h	0Ch	43h	01h	01h	00h	00h	00h
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7

In the event of success the following message is received:

MessageID	Writing Code	Lower part IpaCan	Higher part IpaCan	Subindex	Value of parameter LL	Value of parameter LH	Value of parameter HL	Value of parameter HH
601h	60h	0Ch	43h	01h	01h	00h	00h	00h
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7

Example of reading: with value 1

MessageID	Writing Code	Lower part IpaCan	Higher part IpaCan	Subindex	Not significant	Not significant	Not significant	Not significant
601h	40h	0Ch	43h	01h	00h	00h	00h	00h
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7

In the event of success the following message is received:

MessageID	Reading code	Lower part IpaCan	Higher part IpaCan	Subindex	Value of data			
601h	43h	0Ch	43h	01h	01h	00h	00h	00h
	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7

Index		Subindex				
0Ch	4Bh	01h	01h	00h	00h	00h
Drive parameter index		Subindex	Drive parameter value to be assigned to SDO			

In case an error occurs during the parameter reading or setting, the CANopen interface sends an Abort domain transfer message; the value of Application-error-codes has the following meanings:

Error class	Error code	Additional code (hex)	Meaning
6	0	0	Parameter doesn't exist
8	0	22	Acces failed because of present device state
6	1	2	Read/Write only error
8	0	0	Generic error
6	9	32	Minimum value
6	9	31	Maximum value
5	4	0	SDO time_out
5	4	1	Invalid command
3	9	30	Invalid value

F.1.4 Alarms

Fieldbus alarms

The bus failure is signaled via the **Opt Bus Fault [17]** alarm. As for CANopen, the possible failure causes are:

- "Bus-off" condition of the CAN line;
- the drive has not been enabled in the "Operational" mode;
- the "Life Guarding" threshold has been overcome.

This alarm becomes active only when the drive is enabled.

If 1 (Enabled), the PAR 4012 **Fieldbus alarm mode** parameter enables the generation of the "Field bus failure" alarm also when the drive is disabled.

Codice	Cfg	Description	Actions
0		Bus Loss	Check line for noise, terminations , problems with cabling
FF01	*	Fieldbus type does not match expansion card	Please contact Technical Assistance.
FF02	*	Wrong baudrate selected	Check "Fieldbus baudrate" is one of 125k, 250k, 500k, 1M
FF03	*	Invalid address for node	Check "Fieldbus address"
FF04	*	Error initializing CAN interface	Internal error, contact manufacturer
FF14..FF23	*	Wrong object selected for mapping in channel M2S n	Check "Fieldbus M->Sn Dest
FF24..FF33	*	More than 1 Src pointing to M2S Channel n	Check for multiple destinations on "Fieldbus M->Sn Dest"
FF34..FF43	*	M2S Channel n , data size is wrong (16 bits on 32 bits or 32 bits on 16 bits parameter)	Check "Fieldbus M->Sn sys"
FF44..FF53	*	Invalid parameter in channel S2M n	Check "Fieldbus S->Mn src"
FF54..FF63	*	S2M Channel n , data size is wrong (16 bits on 32 bits or 32 bits on 16 bits parameter)	Check "Fieldbus S->Mn sys"
FF64..FF73	*	Wrong object selected for mapping in channel S2M n	Check "Fieldbus S->Mn src"
FF74..FF83	*	M2S Channel n : too many words in PDC	"Fieldbus M-Sn dest" & "Fieldubs M->Sn sys" address more than 16 words in PDC
FF84..FF93	*	S2M Channel n : too many words in PDC	"Fieldbus S->Mn src" & "Fieldubs S->Mn sys" address more than 16 words in PDC
FFB4..FFC3	*	Internal database error on channel n	Internal error, contact manufacturer
8110		CAN msg overflow	Too many packets for selected baudrate
8130		LifeGuard/HeartBeat error	Software timeout from master
FFC5		Wrong NMT message length	Check NMT packets
FFC6		Invalid NMT command	Check NMT packets
FFC7		CAN bus off	Check line state for problems

Drive alarm handling

Drive alarms are managed by means of an Emergency message containing the error code relating to the alarm that is generated, according to the table below:

Selezione	Codice
No alarm	0
Overvoltage	1
Undervoltage	2
Ground fault	3
Overcurrent	4
Desaturation	5
MultiUndervolt	6
MultiOvercurr	7
MultiDesat	8
Heatsink OT	9
HeatsinkS OTUT	10
PTC failure	11
Motor OT	12
Drive overload	13
Motor overload	14
Bres overload	15
Phaseloss	16
Opt Bus fault	17
Opt 1 IO fault	18
Precharge fault	19
Not used	20

Selezione	Codice
External fault	21
Speed fbk loss	22
Overspeed	23
Speed ref loss	24
Not used	25
Power down	26
Phaseloss out	27
OV safety	28
Safety failure	29
Mot phase loss	30
Ropes change	31
Enable missing	32
Cont feedback	33
Brake Feedback	34
Door Feedback	35
Brake Failure	36
Safe Brake Test	37
Speed limit	38
Up/low limit	39
Lift ext fault	40
EBC fault	41

Selezione	Codice
No battery	42
Plc10 fault	42
Plc11 fault	43
Plc12 fault	44
Plc13 fault	45
Plc14 fault	46
Plc15 fault	47
Plc16 fault	48
Watchdog	49
Trap error	50
System error	51
User error	52
Param error	53
Load def par	54
Plc cfg error	55
Load def plc	56
Key failed	57
Encoder error	58
Recovery mode	59

Allarmi EBC fault

I malfunzionamenti del bus tra EBC e ADL sono segnalati mediante l'allarme EBC fault (41).

Questo allarme si attivo solo quando è abilitato il parametro 8150 EBC enable che attiva al comunicazione con un EBC.

CODE	LABEL	DESCRIPTION
0x0000	ALM_no_alarms	No communication alarm
0x0001	ALM_ng_err_timeout	NodeGuarding time expired (canopen line interrupted)
0x0002	ALM_ng_err_generic	Unexpected error in NG management
0x0003	ALM_ng_err_toggle	NG toggle bit misaligned (serious problems on canopen communication line)
0x0004	ALM_fail_reset_node	NMT command to reset communication to EBC failed
0x0005	ALM_ebc_missing	"Device-type" request to EBC failed too many times. EBC NOT PRESENT on canopen line
0x0006	ALM_badline_ebc	"Device-type" request to EBC failed. Recovery test in progress
0x0007	ALM_ebc_preop_missing	EBC node in timeout when NG and PLC started
0x0008	ALM_ebc_product_error	EBC product information reading by SDO failed or EBC PRODUCT_ TYPE and PROD-UCT_CONFIG are inconsistent
0x0009	ALM_ebc_config_error	Parameters were not transferred correctly from the ADL to the EBC
0x000a	ALM_ebc_initpdo1	PDO initialization failed
0x000b	ALM_ebc_initpdo2	PDO like SDO initialization failed
0x000c	ALM_ebc_startnode	Start remote node failed
0x000d	ALM_ebc_pdoNo_operative	EBC OPERATION did not cut in
0x000e	ALM_ebc_pdos_missing	No PDOs received from the EBC
0x000f	ALM_ebc_sys_fault	EBC node restart. Deleting old PDOs failed
0x0010	ALM_fail_stop_node	Stop mode command was sent to EBC, but transmission failed
0x0011	ALM_ebc_local_ON	EBC local switch set to local
0x0012	ALM_ebc_crypt_error	CRYPT sequence failed
0x0013	ALM_ebc_relocked_error	EBC passed the CRYPT phase but, during resetting or with EBC ready, it repeats the request for CRYPT sequence
0x0014	ALM_ebc_pdoReset_error	EBC final reset command failed.
0x0015	ALM_ebc_NowRemote	EBC with switch in local mode... If it is set to remote, it issues an alarm and stops the EBC

G - Appendix 2 - Phasing

In order for the ADL550 Brushless regulation algorithm to function correctly, it is necessary to know the position of the rotor with respect to the stator power phases. Therefore the 0° position provided by the absolute encoder must be known with respect to the position of a motor pole and the encoder count direction must match the motor power phases.

This is called phasing. Phasing can be performed manually, directly by means of the mechanical encoder assembly position on the motor shaft and on the phases, or using the STARTUP WIZARD FOR BRUSHLESS MOTORS an automatic procedures available in the drive (see Step 6 – Autotune with motor at stand-still and encoder phasing), ch. 9.3, ADL500 HW+QS manual).

Phasing must always be repeated whenever:

- the encoder assembly position is changed
- the phase sequence of the motor power supply connection is changed
- the encoder incremental signal connection is changed
- the encoder absolute signal connection is changed
- the value of the PAR 2008 **Pole pairs** parameter is changed
- the value of the PAR 2100 **Encoder pulses** parameter is changed
- the drive is replaced (alternatively, download parameters taken from previous drive)

There are two different procedures that can be launched by writing two different parameters:

- PAR 2190 **Autophase rotation** -> rotation phasing:
  this procedure must be performed with the motor free to turn and with no load applied.
- PAR 2192 **Autophase still** -> static phasing:
  this procedure must be performed with the motor still and brake applied.

G.2.1 Rotation phasing

This procedure is based on the possibility of moving the motor, by a maximum angle of two pole pairs, to find correct encoder phasing, cross-check the available encoder and motor data and, if the encoder count direction does not match the phase sequence of the motor power supply, correct it by automatically modifying PAR 2130 **Encoder direction**.

Note! In the case described above, a positive speed reference could generate a rotation in reverse with respect to that defined as positive for the encoder (usually clockwise), while still ensuring good motor control.

The encoder direction defined as positive can be stored as the positive reference direction by inverting two motor power phases and repeating the rotation phasing procedure.

If the procedure is terminated without any errors, code 0 is shown on the keypad, otherwise if any differences have been detected that cannot be corrected by the drive, one of the codes listed in Autotune (phasing) is shown, **see chapter 10.3 Messages on** ADL500 HW+QS manual.

- faults in electric signals not detected with a “**Speed fbk loss [22]**” alarm
- error in the PAR 2008 **Pole pairs** parameter setting
- error in the PAR 2100 **Encoder pulses** parameter setting

G.2.2 Static phasing

Using this method, in which the motor cannot move, the encoder and motor data cannot be cross-checked to verify the matching of parameters or count direction.

This condition must therefore be checked before launching the procedure.

Manuale DS417
Serie: ADL500 (only for models ADL530 / ADL550)
Revisione: 1.0
Data: 18/03/2024
Codice: 1S95DSEN

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