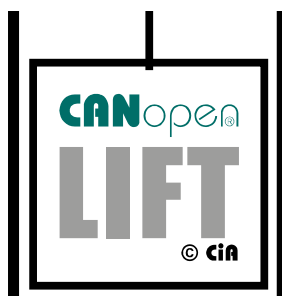
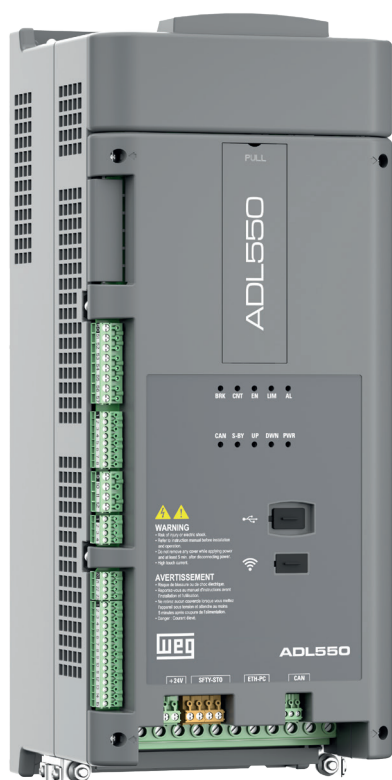


Vector inverter for lifts with synchronous/asynchronous motors

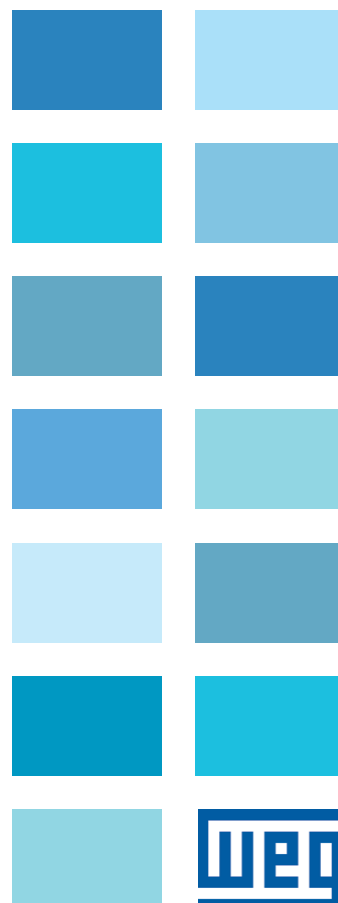
ADL530, ADL550

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 Startup User Manual).

The Function and parameter description manual (**code 1S95SWEN**) can be found on the WEG website, in the product page **Download Center** to the link below:

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.

Firmware version

This manual is updated according to:

- Firmware version V 3.x.10
- Lift application, DS417 1.1.2

Firmware compatibility / Regulation board version

Software Version	Regulation board	
	...-5	...-9
Before V 3.1.5	Ok	No
From V 3.1.5	Ok	Ok

The identification number of the firmware version can be read in the datamatrix (see section 2.3 of this manual) or on parameter PAR 174 **Firmware Version** (**DRIVE INFO** menu).

The identification number of the regulation board can be read out in parameter PAR 198 **Hardware version** (**DRIVE INFO** menu).

General information

NOTE!

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

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

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

Thank you for choosing this WEG product.

We will be glad to receive any possible information which could help us improving this manual.

The e-mail address is the following: techdoc@weg.net

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Summary

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1 - Safety Precautions

1.1 Symbols used in the 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.



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.

Qualified personnel

For the purpose of this Instruction Manual, a "Qualified person" is someone who is skilled to the installation, mounting, start-up and operation of the equipment and the hazards involved.

This operator must have the following qualifications:

- trained and authorized to install, clear, ground and tag circuits and equipment in accordance with established safety procedures.

Use for intended purpose only

The power drive system (electrical drive) may be used only for the application stated in the manual and only together with devices and components recommended and authorized by **WEG**.

1.2 Safety precaution

The following instructions are provided for your safety and as a means of preventing damage to the product or components in the machines connected. This section lists instructions, which apply generally when handling electrical drives.

Specific instructions that apply to particular actions are listed at the beginning of each chapter.

Read the information carefully, since it is provided for your personal safety and will also help prolong the service life of your electrical drive and the plant you connect to it.

1.3 General warnings



WARNING!

This equipment contains dangerous voltages and controls potentially dangerous rotating mechanical parts. Non-compliance with warnings or failure to follow the instructions contained in this manual can result in loss of life, severe personal injury or serious damage to property.

The manufacturer's safety locks and operating limits shall not be bypassed or modified.

Only suitable qualified personnel should work on this equipment, and only after becoming familiar with all safety notices, installation, operation and maintenance procedures contained in this manual. The successful and safe operation of this equipment is dependent upon its proper handling, installation, operation and maintenance.

In the case of faults, the drive cannot ensure that the motor it drives does not move, so it must be ensured that the system is disconnected in the event of a fault from the mains supply.

Electrical Shock:

The DC link capacitors remain charged at a hazardous voltage even after cutting off the power supply.

Never open the device or covers while the AC Input power supply is switched on. Minimum time to wait before working on the terminals or inside the device is listed in section "4.7 Voltage level of the inverter for safe operations" on page 16.

Electrical Shock and Burn Hazard:

When using instruments such as oscilloscopes to work on live equipment, the oscilloscope's chassis should be grounded and a differential probe input should be used.

Fire and Explosion Hazard:

Drives may not be installed in areas classified as areas of increased risk in the event of fire or explosion and must therefore be installed outside these areas even if they are used with motors suitable for use in these areas.



The drive, in addition to the main power supply, depending on the configuration chosen to manage the elevator operation in the event of an emergency or blackout, is repowered through batteries or UPS. Therefore, make sure that before working on the drive, all other power supplies in addition to the main one have been disconnected, respecting the times imposed to ensure that the capacitors have discharged.

1.4 Instructions on compliance with US and Canadian safety regulations

Short circuit ratings

ADL500 inverters must be connected to a mains capable of supplying a symmetrical short-circuit power of less than or equal to “xxxx” Arms.

The values of the “xxxx” Arms short-circuit current, in accordance with UL / EN 61800-5-1 requirements, for each motor power rating (Pn mot in the manual) are shown in the table below.

Short current rating	
Pn mot (kW)	SCCR (A)
1,1...37,3	5000
39....149	10000

NOTE!

Drive must be protected by semiconductor Fuse type as specified in the instruction manual.

Branch circuit protection

In order to protect drive against over-current use fuses specified in section “5.1 - External fuses”.

Environmental condition

The drive has to be considered “Open type equipment”. Max surrounding air temperature equal to 40°C.

Pollution degree 2. Additional details on operating temperatures can be found in section “4.1 - Environmental conditions”.

Wiring of the input and output terminals

Use cables with a minimum temperature of 75°C and crimp terminals (if necessary). If you choose to crimp terminals, use a tool recommended by the terminal manufacturer. Fasten the terminals with the tightening torque specified in section “7.2.2 - Cable cross-sections”.

All cables must be certified for use according to the Canadian Electrical Code, Part I (CSA C22.1) and the National Electrical Code (ANSI/NFPA 70), whichever is applicable.

Over-voltage control

For Canadian installations only (CSA requirements), the use of a COOPER BUSSMANN model SPP40SP3480PNG DIN rail snubber (or equivalent) is recommended on the power supply line, upstream of the drive.

Minimum time required for safe DC-link voltage

Before removing drive cover in order to access internal parts, after mains disconnection wait for time as follow:

Drive size	Safe time (sec)
1 - 2 - 3 - 4	300

Over-speed, over-load/current limit, motor overload

Drive incorporate over-speed, over-current/current limit, motor overload protection. Instruction manual specify degree of protection and detailed installation instruction.

1.5 Disclaimer

Any remote connection functions shall be used only under adequate security conditions, in compliance with current regulatory provisions and only by properly trained personnel. The evaluation of such conditions is up to the user.

A - Programming

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 (04.03 - DRIVE CONFIG menu)**.

For information on switching control mode via keypad, reference should be made to the **ADL500 HW+QS** manual (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.

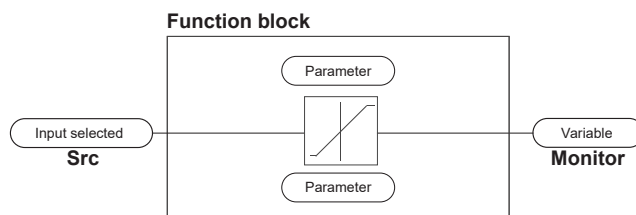
A.3 Programming of “function block” analog and digital input signals

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.: PAR 4500 Fault reset <u>src</u>) 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.: PAR 1210 <u>Mon</u> ing digitale 1) 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

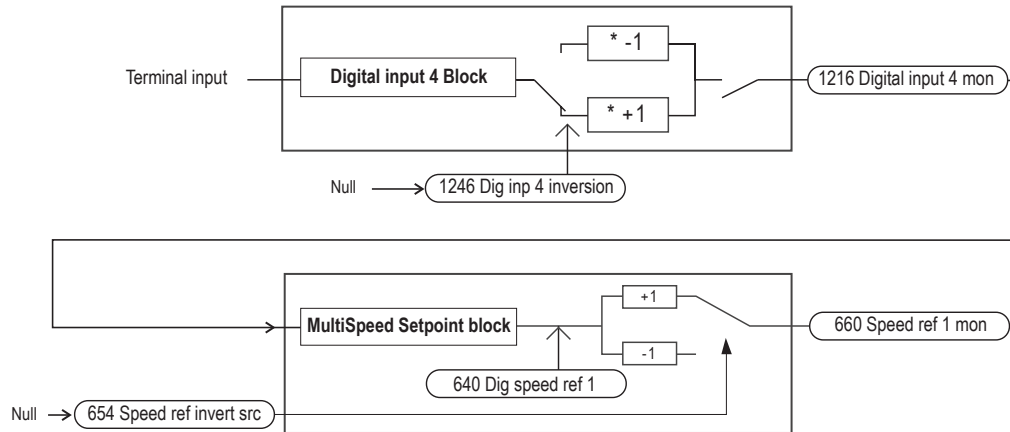
The following examples illustrate the philosophies and methods with which more or less complex operations are performed in the single “function blocks”, the results of which represent the output of the block.

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 CiA 417® 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 standards

The application conforms to the CANopen® CiA 417® specification “*Application profile for lift control systems*”.

Version V 3.x.10, 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.

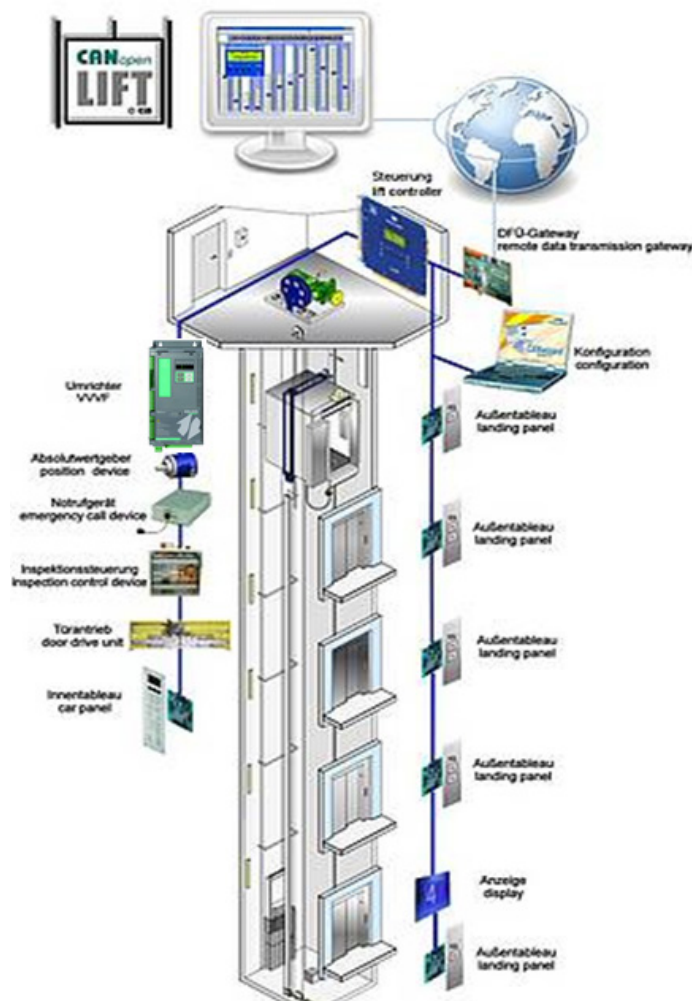


Figure 1: Main Lift Control Systems

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.

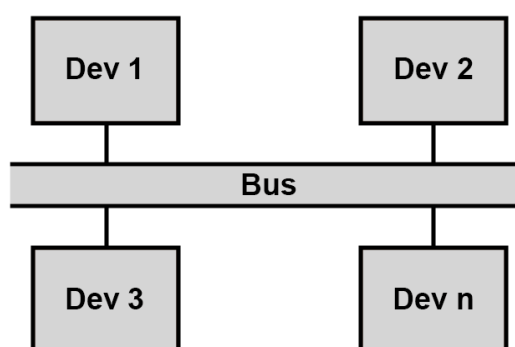


Figure 2: BUS Architecture

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

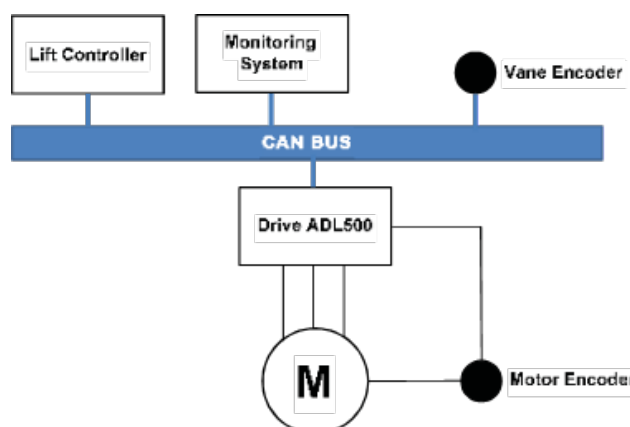


Figure 3: System architecture

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 TPDOs).

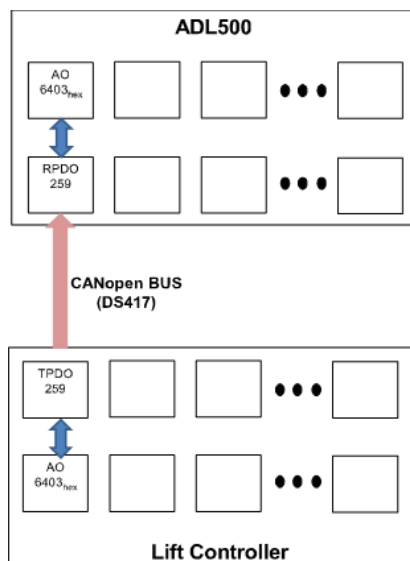


Figure 5: Block diagram for ADL500 - Lift Controller communication

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).



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

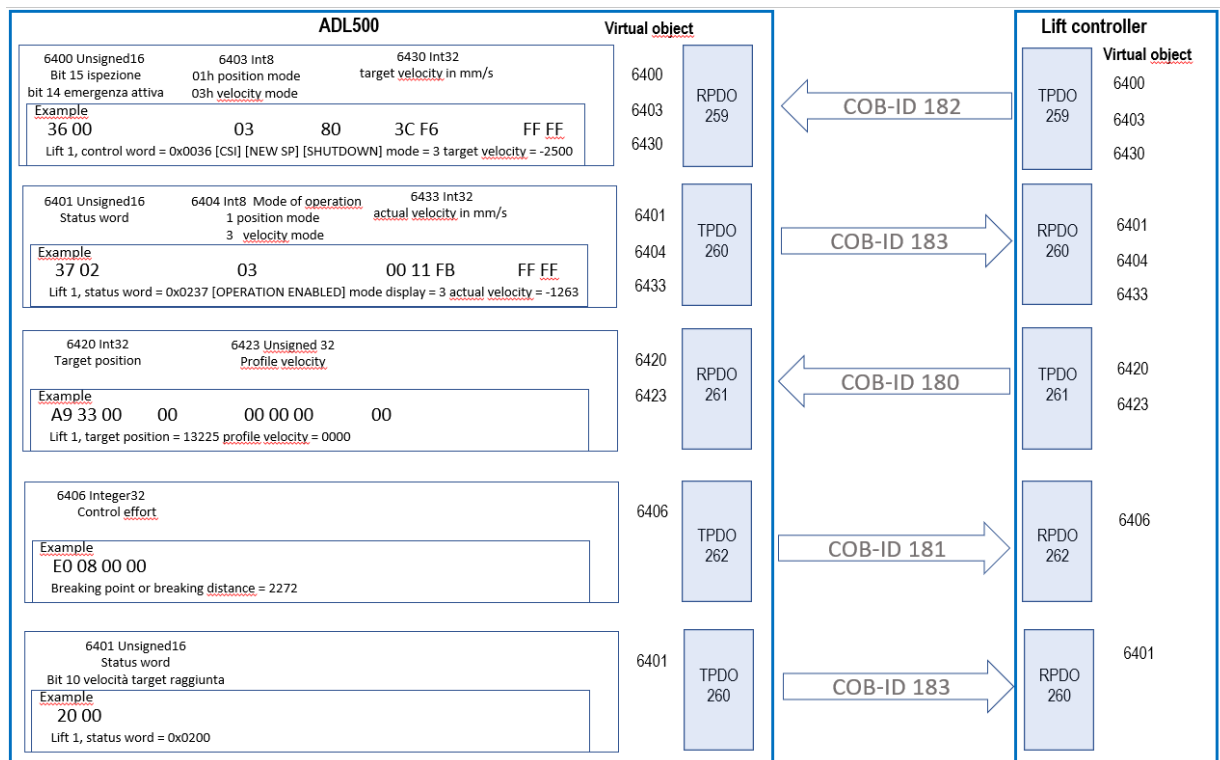


Figure 6: Exchange messages between Drive and Lift Controller for speed control

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}.

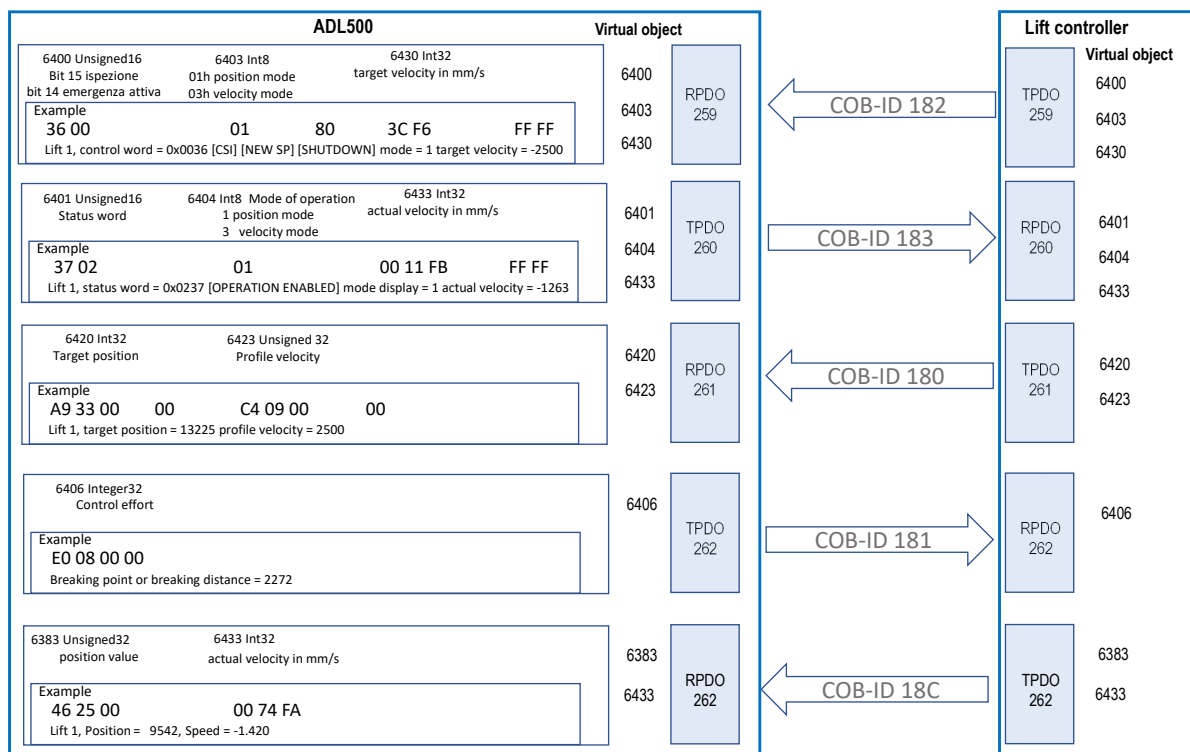
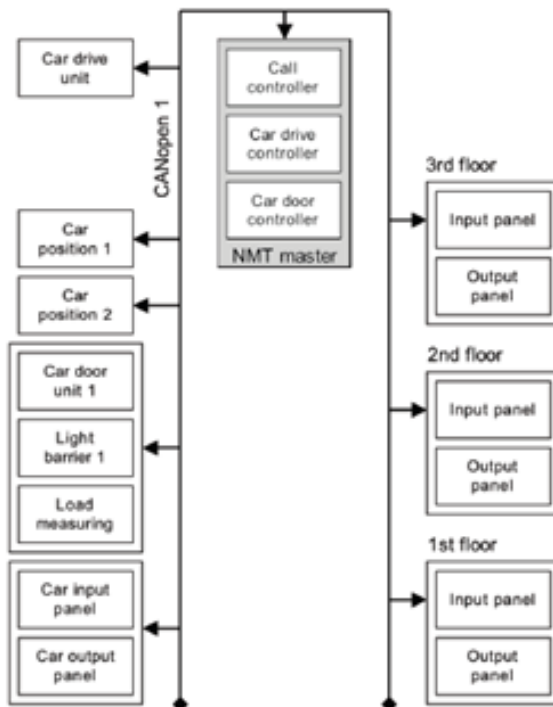


Figure 7: Exchange messages between drive and Lift Controller for position control.

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 Length 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

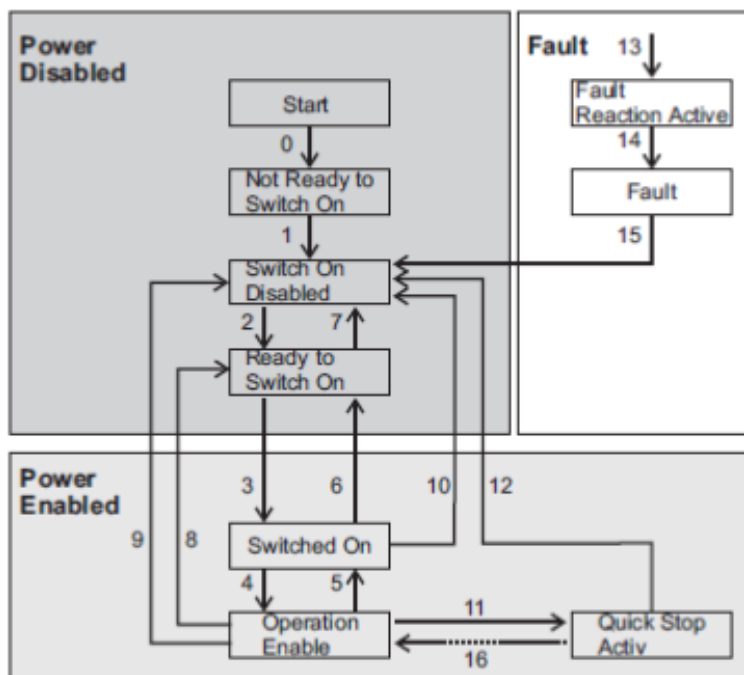
This object contains the position value measured by the car positioning device. The value is a 32bit integer type. The sub-indexes 01h to 04h are equivalent to those of object 6004h of CiA406. The structure of the object is as follows:

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

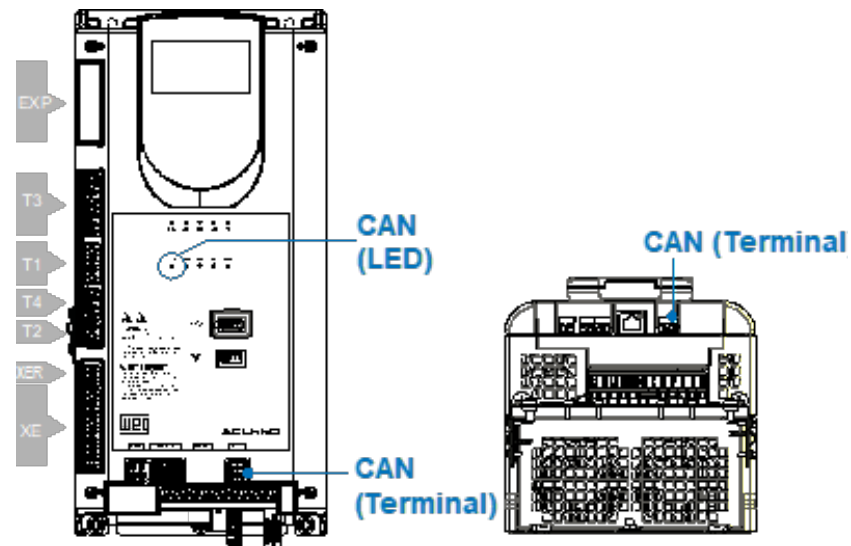


Figure 9: Connector position and CAN LEDs.

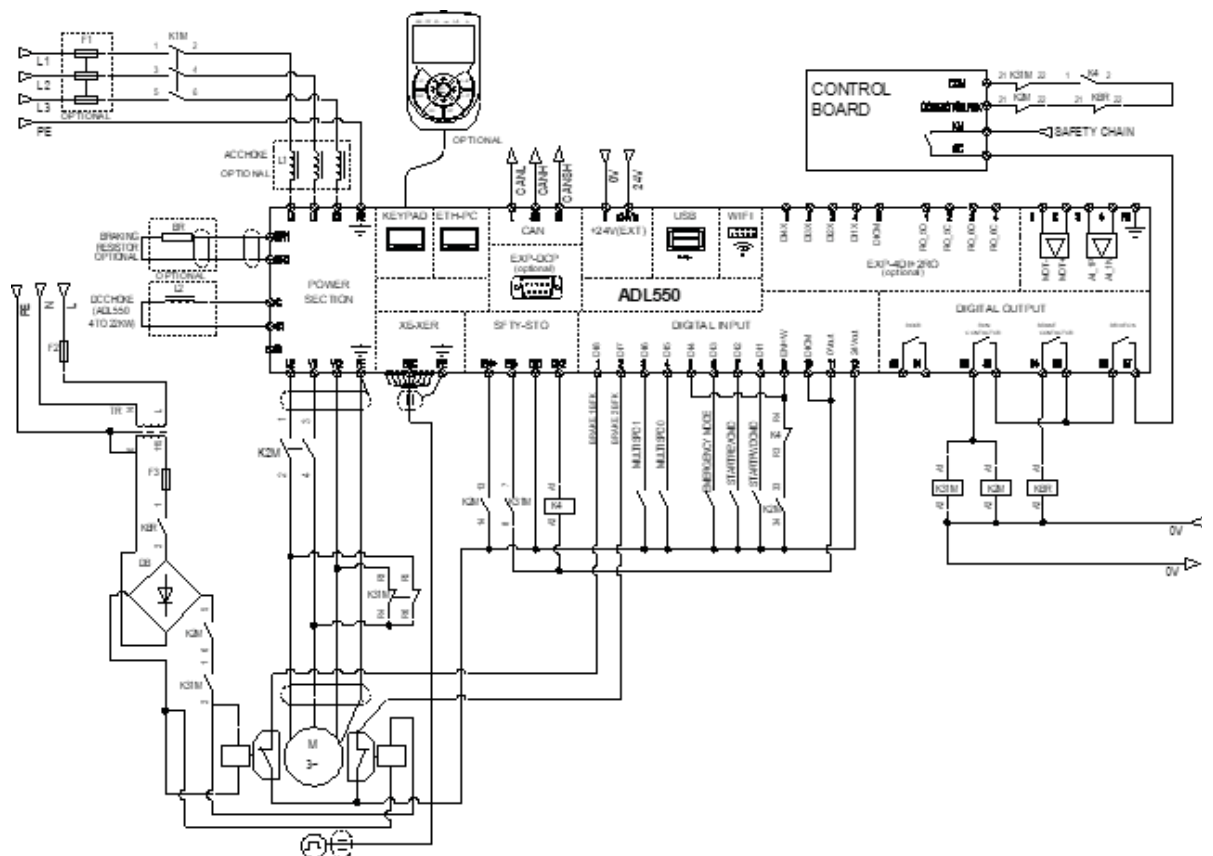


Figure 10: Safety connections for single contactor control.

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 mm ² 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.

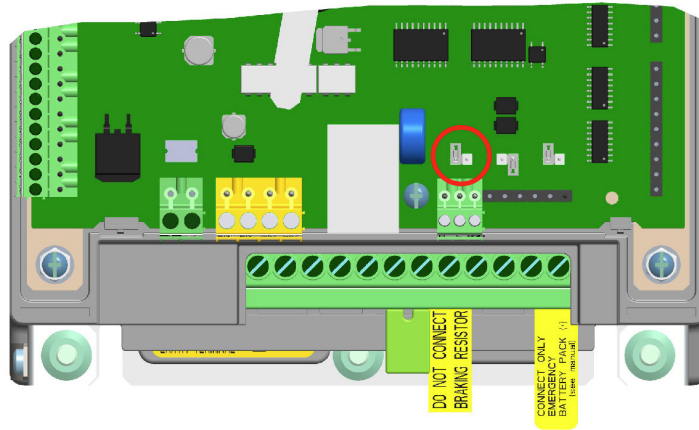


Figura 12: CAN Bus connection.

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

4 DRIVE

(Menu livello 1)

4.1 DRIVE MONITOR

(Menu livello 2)

0	1	2	3	4	5	6	7	8	9	10	11	12
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev.	Vis.	ADL
4.4.1	4500	Fault reset src		LINK	16BIT	6000	0	16384	RW	ESY	FVSY	1,3,5
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. [*]												

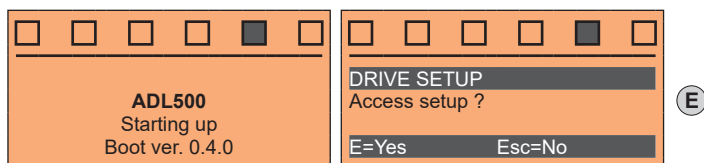
0	Indexing of the menu and parameter		
1	Parameter identifier		
2	Parameter description		
3	UM: unit of measure		
4	Type of parameter	BIT	Boolean, from modbus seen as 16 bits
		ENUM	Selection list, from modbus seen as 16 bits
		FLOAT	Real, from modbus seen as 32 bits
		INT16	Integer with sign 16 bits, 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
5	Format of data exchanged on Fieldbus		16=16BIT, 32=32BIT, 16/32= 16/32BIT
6	Default value (1)	CALCF CALCI SIZE --- or blank	Value calculated as a number with floating point Value calculated as a whole number Value depending on the size of the drive Value not expected, for example of read-only values
7	Minimum value		
8	Maximum value		
9	Accessibility	R	Read
		W	Write
		Z	Parameters that can be modified ONLY with the drive disabled
10	Level	RO	Read Only
		INT	Intermediate
		EXP	Expert
		SRV	Service
		ESY	Easy
11	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)
		S	Sensorless vector mode control asynchronous motor (PAR 540 = ASY SLS)
		Y	Field oriented vector mode control for permanent magnet synchronous motor (PAR 540 = SYN FOC)
12	Drive models for which the specific parameter is provided.	1	Parameter for ADL510
		3	Parameter for ADL530
		5	Parameter for ADL550
		1,3,5	Parameter applies to all drives
[*]	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

SETUPDRIVE is a procedure that is only presented to the user the first time the drive is switched on and allows the basic settings to be changed. If you have completed the setup but wish to display it again, you need to carry out the reset procedure (PAR 580 **Default parameters**, PAR 550 **Save parameters**) and then turn the drive off and on again.

All the parameters present in the setup are also available in the various drive menus.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1	578	Language select		ENUM		0			RW	INT	FVSY	3,5

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).

For ADL530 and ADL550:

- 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.

For ADL510:

- connect drive to WEG_DriveLabs
- use setup wizard from WEG_DriveLabs and when requested by configurator select language and on the end of setup procedure new language will be installed on drive. At the end of procedure drive will restart and after that is possible to enter in configuration menu and change the language selecting the new language downloaded. Remember after language change to save parameters.

NOTE!

The language file must be aligned with the firmware and application versions of the drive, check the correspondence! The new language will be loaded into the drive memory 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	ADL
2	390	Load application		ENUM					RW	INT	FVSY	3,5

This functionality allows you to load different versions of applications or update those already installed. The other way to update applications is to update them directly along with the entire fw through the function upload files from USB or update fw from APP or WEG_DriveLabs. To load a new application, once the memory device is connected to the USB port of the drive, simply change the parameter to set the chosen application.

- 1 EFC
- 2 EPC
- 3 DCP
- 4 CAN417 (only for ADL530 and ADL550)

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.

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	ADL
3	598	Load from USB		BIT					RWZ	INT		3,5
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	ADL
4	2132	Encoder mode		ENUM		None			RWZ	INT	FVSY	3,5
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 (only for ADL530 & ADL550) 4 Sinus ENDAT (only for ADL530 & ADL550) 5 Sinus BISS (only for ADL530 & ADL550) 6 ENDAT (only for ADL530 & ADL550) 7 BiSS (only for ADL530 & ADL550) 8 Sinus SSI (only for ADL530 & ADL550)												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5	392	Select motor		BIT					RWZ	INT		3,5
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 control type?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.1.1	540	Control type		ENUM		ASY SSC			RW	INT	FVSY	3,5
The ADL500 can operate in different control modes:												
0 ASY SSC 1 ASY FOC 2 SYN FOC (only ADL530 & ADL550) 3 ASY SSL												
ASY SSC: V/F operating mode to be used when, with asynchronous motors, a motor encoder is not available. 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: field-oriented mode to be used with asynchronous motors when you have a motor encoder that allows for more precise feedback and arrival at the floor than the ASY SSC mode. 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: only for ADL530 and ADL550 field-oriented mode with synchronous motors equipped with encoders. 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.												
ASY SLS: open loop sensorless vector oriented with asynchronous motor. This functionality implement both advantages of ASY SSC and ASY FOC technique with motor slippage compensation.												

1.2 Set comm mode?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.2.1	4000	Communication mode		ENUM		Parallel			RW	INT	FVSY	3,5

Setting the type of communication to be used.

- 0** Parallel I/O
- 1** CanOpen (only for ADL530 & ADL550)
- 2** DCP (only for ADL550)
- 3** CAN417 (only for ADL530 & ADL550)

Setting **0** the drive communicates with the Controller through the **Parallel I/O** (digital/analogue inputs and digital outputs).

If set **1** the CANopen fieldbus is selected.

If set to **2** the DCP communication is selected.

If set to **3** the DS417 fieldbus profile is selected.

Depending on the application loaded, only the communication types listed in the table can be selected:

Application	Selections
EFC	Parallel I/O CANopen
EPC	Parallel I/O CANopen
DCP	DCP
417	Can417

1.3 Set encoder param?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.3.1	2102	Encoder supply	V	FLOAT		5.2	5.2	20.0	RW	INT	FVSY	3,5

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 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

Setting regulation board -9 onward (for regulation board version see PAR 198), activating the HTL mode involves activating the internal divider (for more details about the wiring, see the encoder chapter in the QS manual).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.3.2	2132	Encoder mode		ENUM		None			RWZ	INT	FVSY	3,5

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 (only for ADL530 & ADL550)
- 4** Sinus ENDAT (only for ADL530 & ADL550)
- 5** Sinus BISS (only for ADL530 & ADL550)
- 6** ENDAT (only for ADL530 & ADL550)
- 7** BiSS (only for ADL530 & ADL550)
- 8** Sinus SSI (only for ADL530 & ADL550)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.3.3	2100	Encoder pulses	ppr	UINT16		1024	4	16384	RWZ	INT	FVSY	3,5

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	ADL
1.3.4	2110	Encoder signal check		ENUM		Check A-B			RWZ	EXP	FVSY	3,5

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	ADL
1.3.5	7106	BiSS N bit ST		UINT16		13	0	64	RW	EXP	FVSY	3,5

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.3.6	7108	BiSS N bit MT		UINT16		0	0	64	RW	EXP	FVSY	3,5

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.3.7	7114	BiSS Crc polinomy		UINT16		67	1	65535	RW	EXP	FVSY	3,5

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

1.4 Set motor data?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.4.1	2000	Rated voltage	V	FLOAT		SIZE	150	480	RWZ	INT	FVSY	3,5

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	ADL
1.4.2	2002	Rated current	A	FLOAT		SIZE	1	1500	RWZ	INT	FVSY	3,5

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	ADL
1.4.3	2004	Rated speed	rpm	FLOAT		SIZE	10	32000	RWZ	INT	FVSY	3,5

Rated asynchronous speed of the motor with full load in rpm. In some motors, on plate, are indicated the synchronous speed (e.g. 1500 rpm for a 4-pole motor) and slippage, i.e. the loss of revolutions between the motor idling load condition and the rated load condition (e.g. 80 rpm); in this case enter in parameter 2004 the following: synchronous speed - slippage.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.4.4	2006	Rated frequency	Hz	FLOAT		SIZE	1	1000	RWZ	INT	FVS	3,5

Rated frequency of the motor expressed in Hz.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.4.5	2008	Pole pairs		UINT16		SIZE	1	60	RWZ	INT	FVSY	3,5

Motor pole pairs. The number of motor pole pairs is calculated using the motor plate data and applying the following formula:

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

Where: p = motor pole pairs;

f = motor rated frequency (PAR 2006)

nN = motor synchronous rated speed (Attention: it's =PAR 2004+slippage). For 4-pole motors (2 pole pairs) the synchronous speed with a 50 Hz mains frequency is 1500 rpm while with a 60 Hz frequency it is 1800 rpm.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.4.6	2010	Rated power	kW	FLOAT		SIZE	0.1	1500	RWZ	INT	FVS	3,5
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	ADL
1.4.7	2012	Rated power factor		FLOAT		SIZE	0.6	0.95	RWZ	INT	FVS	3,5
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	ADL
1.4.8	2014	Torque constant	Nm/A	FLOAT		SIZE	0	120	RWZ	INT	Y	3,5
Setting of the ratio between the torque generated and the rated current of the motor, if this data is not present on the motor plate, it can be recovered by dividing the nominal torque value of the motor by the nominal current of the motor. Torque constant = (Nominal torque Nm)/(Nominal current A).												

1.5 Set mechanical data?

NOTE!

By default, the multispeed 0, 1 and 2 have the values of 10%, 100% and 45% of the cabin speed each time the mechanical data is changed. If you do not wish to keep the first three multispeeds at the preset percentage of the car speed, you must keep disabled parameter IPA 1104, which can be found in the mechanical data menu.

In addition, each time mechanical data within the respective menu is changed, the drive performs a multispeed congruity check that works as follows:

- a) where a multispeed is greater than the nominal speed, it shall be limited to that speed with a 10% surcharge;
 - b) if the mechanical values are changed further and the previously limited speeds are now lower than the nominal speed, these multispeeds are not changed (bearing in mind that the first 3 multispeeds always take the values in % if parameter IPA 1104 is not disabled).
- By manually entering the multi-speed values, these are limited to the cabin speed with a 10% surcharge, while following a modification of the mechanical parameters that modify the cabin speed, only if the IPA 1104 is left in auto mode, they will be reset to the default percentage values.

NOTE!

The drive, after having modified a mechanical parameter, recalculates the inertia even if this has been previously modified following a learning trip or if it has been entered manually. The inertia recalculation is also performed if I enter a mechanical parameter even if I do not make any changes or I exit the parameter with an ESC command.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.5.1	11006	Cabin speed	m/s	FLOAT		SIZE	0	10	RWZ	INT	FVSY	3,5
Setting the maximum operating speed of the system. It is also used for recalculating the full scale speed (PAR 680, Full scale speed).												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.5.2	11010	Gearbox ratio		FLOAT		SIZE	1	200	RW	INT	FVSY	3,5
Sets the reduction ratio between motor and pulley.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.5.3	11164	Rope ratio		FLOAT		SIZE	1	10	RWZ	INT	FVSY	3,5
Setting the reduction ratio due to the rope rotation in the shaft between the various pulleys; not to be confused with the number of ropes in the system.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.5.4	11012	Pulley diameter	m	FLOAT		SIZE	0	5	RWZ	INT	FVSY	3,5
Sets the pulley diameter. Setting the diameter of the motor traction pulley (in case of synchronous motors without reduction) or of the gearbox traction pulley in case of asynchronous motors with gear box.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.5.5	11150	Car weight	kg	FLOAT		SIZE	0	10000	RW	INT	FVSY	3,5
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	ADL
1.5.6	11152	Counter weight	kg	FLOAT		SIZE	0	10000	RW	INT	FVSY	3,5
Setting of the weight of the counterweight, including its frame.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.5.7	11154	Load weight	kg	FLOAT		SIZE	0	10000	RW	INT	FVSY	3,5
Setting the maximum load weight in the cabin (cabin capacity) for which the system is sized.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.5.8	11156	Rope weight	kg	FLOAT		SIZE	0	1000	RW	INT	FVSY	3,5
Setting of the weight of the cable (intended as the total weight of all car suspension ropes).												

1.6 Set EBC param? Only for ADL550

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.6.1	8150	EBC Enable		BIT		0	0	1	RWZ	INT	FVSY	5
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	ADL
1.6.2	8250	Brake Holding V	V	FLOAT		103.5	1	207	RW	INT	FVSY	5
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	ADL
1.6.3	8252	Brake Holding P	W	FLOAT		76	1	350	RW	INT	FVSY	5
<p>Nominal brake power in maintenance mode indicated by the manufacturer on the brake plate.</p> <p>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 economization mode while for the power to be entered the following formula shall be used:</p> <p>Brake Holding P = maintenance Voltage² x Rated Power / Rated Voltage².</p> <p>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 $103.5^2 \times 100 / 207^2 = 25$ W.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.6.4	8258	Brake Power Mode		ENUM		Boost_ Half_ Voltage			RW	INT	FVSY	5
<p>Modality of energizing and maintaining brakes power mode:</p> <p>Full voltage brake is activated with the input voltage straightened both in the initial phase and in the maintenance phase.</p> <p>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.</p> <p>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.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.6.5	8260	Brake Power Boost	ms	UINT16		1000	0	5000	RW	INT	FVSY	5
Time for which the output voltage is kept equal to the value of the rectified input voltage (Boost time).												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.6.6	4008	Can termin.resistor		ENUM		Off			RW	INT	FVSY	3,5
<p>Activation of the internal CANBUS termination resistor.</p> <p>0 Off</p> <p>1 On</p>												

1.7 Run autotune still?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.7.1	2032	Autotune		BIT		0	0	1	RWZ	INT	FVSY	3,5
<p>Performs self-tuning with the motor having ropes already wound on the traction pulley.</p> <p>The self-tuning procedure may cause limited rotation of the motor shaft. To perform self-tuning, follow the procedure described on parameter PAR 2022 Autotune rotation or in PAR 2024 Autotune still into the startup wizard (see in Quick Start manual) on keypad or WEG_DriveLabs.</p>												

1.8 Save parameters?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.8.1	550	Save parameters		BIT		0	0	1	RW	INT	FVSY	3,5
<p>Any changes to parameter values immediately affect drive operations, but are not automatically saved in the permanent memory.</p> <p>The "Save Parameters" command is used to save current parameter values in the permanent memory.</p> <p>Any changes that are not saved will be lost when the drive is switched off.</p> <p>To save parameters press the E key to start the save parameters procedure and press E again to confirm.</p>												

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 five 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	ADL
2.1	9720	Learning trip		BIT		0	0	1	RW	INT	FVSY	1,3,5

Launch the "Learning Trip" function, an automatic procedure to simplify commissioning and optimise the drive according to the system's mechanical parameters; this wizard is not available in ASY SSC mode.

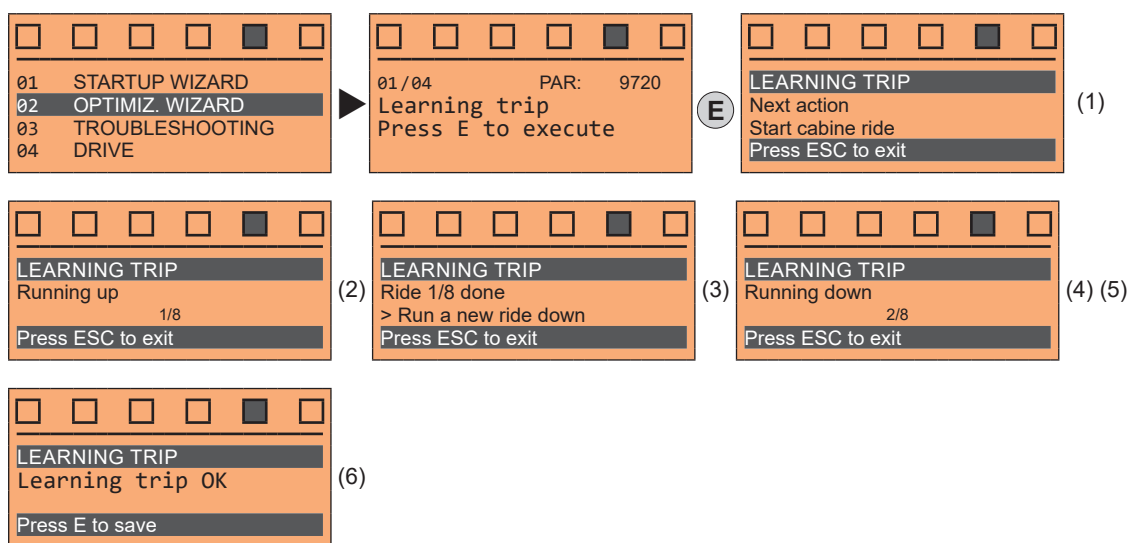


Before enabling the function:

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

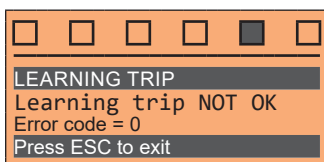
The function can be performed from the keypad and via the WEG_DriveLabs configurator (Wizard menu / Optimization Wizard). To facilitate operations, the configurator/keypad suggests what actions are to be performed (e.g. up one floor, down one floor, etc.), intercepting any incorrect actions and communicating 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). The learning trip require to reach high speed for few seconds, so, before this procedure, it's recommended to do a travel from top to bottom and vice versa.

If the learning trip result is between 0.1 and 3 times the inertia value in the inertia parameter (IPA 2240), the inertia parameter is rewritten. Otherwise, the inertia value is not updated and error code 0 is displayed at the end of the learning trip procedure.

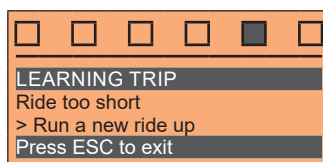


- (1) You are prompted to perform the first run (up or down).
- (2) Perform the up run.
- (3) You are prompted to perform a down run.
- (4) Perform the down run.
- (5) Repeat the operations (1) (2) (3) (4) several times.
- (6) Procedure successfully completed.

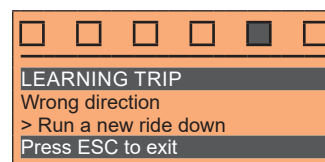
Other possible messages:



Procedure not successfully completed.



Short run error



Wrong direction error

The learning trip function is designed to automatically calculate the real inertia of the system that the drive calculates in advance through the mechanical data entered.

The inertia of the system also varies with the variation of friction, therefore it is recommended to repeat the learning trip also at the end of the commissioning of the system at the end of the running-in period.



Each modification of a mechanical parameter (even just opening without variation) involves a recalculation of the inertia calculated from the mechanical data, consequently eliminating the inertia obtained from the learning trip. In case of doubt, it is recommended to note the inertia calculated at the end of the learning trip.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
2.2	12000	RollBack at start		UINT32		1	1	5	RW	INT	FVSY	3,5

In some installations, an unwanted movement of the cabin in the opposite or opposite direction to that commanded may occur for a brief moment at the start of the trip immediately after the brake opens.

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	ADL
2.3	12006	RollBack at arrival		UINT32		1	1	3	RW	INT	FVSY	3,5

In some applications, the cabin may move unintentionally for a short moment at the end of the trip when the motor is held still while waiting for the brake to re-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	ADL
2.4	12002	Comfort high spd		UINT32		1	1	3	RW	INT	FVSY	3,5

During the high-speed section, there may be oscillations or vibration in the cabin.

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	ADL
2.5	12004	Comfort low spd		UINT32		1	1	3	RW	INT	FVSY	3,5

During the low-speed section, there may be oscillations or vibration in the cabin.

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	ADL
3.1.1	11064	Brake open delay	ms	INT16/32		500	0	10000	RW	INT	FVSY	3,5
Setting of the brake opening delay time.												

3.2 Rollback

Problem	Solution
There is an unwanted movement of the cabin in the opposite or same 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	ADL
3.2.1	2200	Boost Voltage	%	FLOAT		3	0	20.0	RW	INT	F	3,5
Specifies the value of the additional voltage applied to the motor terminals at low speeds in order to increase the torque output. Excessive values result in increased current consumption and motor heating due to resistive losses in the stator winding. Possible value range: 0...20% of the rated motor voltage.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
3.2.2	2212	V/Hz Boost Mode		ENUM		Auto			RW	INT	F	3,5
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.

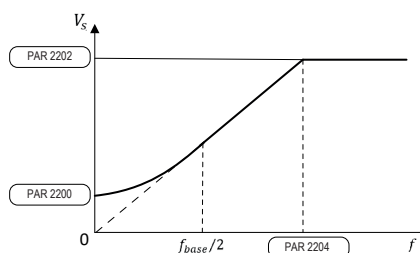


Figure 11.4: V/f characteristic curve profile

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
3.2.3	2794	SR-P gain at start	%	FLOAT		150.0	0.0	400.0	RW	INT	VSY	3,5

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	ADL
3.2.4	2796	SR-I gain at start	%	FLOAT		110.0	0.0	400.0	RW	INT	VSY	3,5

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	ADL
3.3.1	11040	Accel initial jerk	m/s ³	FLOAT		0.2	0.001	20	RW	INT	FVSY	3,5

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	ADL
3.3.2	11042	Acceleration	m/s ²	FLOAT		0.600	0.001	10	RW	INT	FVSY	3,5

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	ADL
3.4.1	2752	SR-P gain low speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY	3,5

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	ADL
3.4.2	2754	SR-I gain low speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY	3,5

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	ADL
3.5.1	2756	SR-P gain high speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSYS	3,5
<p>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.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
3.5.2	2758	SR-I gain high speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSYS	3,5
<p>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.</p> <p>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.</p> <p>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.</p>												

3.7 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	ADL
3.7.1	11046	Decel initial jerk	m/s ³	FLOAT		0.6	0.001	20	RW	INT	FVSYS	3,5
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	ADL
3.7.2	11048	Deceleration	m/s ²	FLOAT		0.600	0.001	10	RW	INT	FVSYS	3,5
Setting of the maximum deceleration value.												

3.8 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	ADL
3.8.1	11068	Brake close delay	ms	INT16/32		500	0	10000	RW	INT	FVSYS	3,5
Setting of the delay time after closing the brake.												

3.9 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	ADL
3.9.1	11070	Current down delay	ms	INT16/32		0 (800)	0	10000	RW	INT	Y	3,5

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".

3.10 Vibration analyzer

Problem	Solution
Vibration analyzer measures system vibration expressed in two most significant resonant frequencies.	Values greater than 0 may indicate system vibrations. Typical causes could be intrinsic resonances of the system itself, insufficient guides lubrication, 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	ADL
3.10.1	9464	Vibration freq. 1	Hz	FLOAT		0	0.0	0.0	R	INT	VSY	3,5
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	ADL
3.10.2	9466	Vibration freq. 2	Hz	FLOAT		0	0.0	0.0	R	INT	VSY	3,5
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.												

3.11 Suspension slip

Suspension slippage test procedure:

- note the values of parameters 4550 and 4554.
- modify the parameter 4554 SpdRefLoss threshold by lowering them so that when moving the cabin in inspection the SpdRefLoss alarm is at the limit intervention but without intervening.
- bring the cabin to the uppermost floor.
- safety bypass the limit switch safety devices.
- command the ascent using the inspection button panel.
- verify that as soon as the counterweight rests on the fixed stop in the pit the drive stops with the SpdRefLoss error which means that the motor has had a sudden slippage with respect to the programmed movement.
- The suspension slippage is this tested without damagin them.
- At the end of the test reprogram parameters 4550 and 4554 with their initial values.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
3.11.1	4540	SpdRefLoss threshold	rpm	INT16		CALCI	0	16000	RW	INT	FVSY	3,5
Setting of the threshold below which the speed reference loss alarm Overspeed [23] occurs.												

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	ADL
3.11.2	4554	SpdRefLoss holdoff	ms	UINT16		1000	0	10000	RW	INT	FVSY	3,5
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.												

4. DRIVE

4.1 DRIVE MONITOR

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.1	250	Output current	A	FLOAT	16BIT_H				R	ESY	FVSY	3,5
The drive output current is displayed.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.2	252	Output voltage	V	FLOAT	16BIT_H				R	ESY	FVSY	3,5
The drive line voltage output is displayed.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.3	254	Output frequency	Hz	FLOAT	16BIT_H				R	ESY	FVSY	3,5
The drive output frequency is displayed.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.4	664	Speed setpoint	rpm	INT16	16BIT_H				R	ESY	FVSY	3,5
The motor speed reference is displayed.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.5	260	Motor speed	rpm	FLOAT	16BIT_H				R	ESY	FVSY	3,5
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	ADL
4.1.6	270	DC link voltage	V	FLOAT	16BIT_H				R	ESY	FVSY	3,5
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	ADL
4.1.7	272	Heatsink temperature	degC	FLOAT	16BIT_L				R	ESY	FVSY	3,5
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	ADL
4.1.8	274	Motor temp	degC	INT16					R	ESY	FVY	3,5
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	ADL
4.1.9	280	Torque current ref	A	FLOAT	16BIT_H				R	EXP	FVSY	3,5
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	ADL
4.1.10	282	Magnet current ref	A	FLOAT	16BIT_H				R	EXP	FVSY	3,5
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	ADL
4.1.11	284	Torque current	A	FLOAT	16BIT_H				R	INT	FVSY	3,5
The actual torque current value is displayed.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.12	286	Magnet current	A	FLOAT	16BIT_H				R	INT	FVSY	3,5
The actual magnetizing current value is displayed.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.13	3212	Motor overload	%	UINT16	16BIT_H				R	ESY	FVSY	3,5
The motor overload level is displayed (100% = alarm threshold).												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.14	368	Drive overload	%	UINT16	16BIT_H				R	ESY	FVSY	3,5
The drive overload level is displayed. An instantaneous overload of xxx% (depending of drive type see QS manuale) of the drive rated current is allowed for 10s. The thermal image I ² t adjusts the drive output current thresholds. During normal operation, the instantaneous output current value can reachxxx% 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 ² t integrator cycle is complete. At this point the instantaneous overload of xxx% or 150% (below 3Hz) will be re-activated.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.15	3260	Bres overload	%	UINT16	16BIT_H				R	ESY	FVSY	3,5
The braking resistor overload is displayed (100% = alarm threshold).												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.16	1066	Enable state mon		UINT16	16BIT_L				R	ESY	FVSY	3,5
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 FW o REV start command 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	ADL
4.1.17	1068	Start state mon		UINT16	16BIT_L				R	ESY	FVSY	3,5
The drive Start command status is displayed.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.18	2386	Torque ref	%	FLOAT	16BIT_H				R	EXP	VSY	3,5
The value of the torque reference is displayed.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.19	2388	Torque	%	FLOAT	16BIT_H				R	INT	VSY	3,5
Displays the current torque value.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.20	372	In use current limit	A	FLOAT	16BIT_H				R	EXP	FVSY	3,5
Displays the actual current limit.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.21	1058	Safety en mon		BIT	16BIT_L				R	ESY	FVSY	5
Safety enable input signal status.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.22	1200	Dig input mon		UINT16	16BIT_L				R	ESY	FVSY	3,5

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 - digital input pin 9
DI1 - digital input pin 8

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.23	1202	Dig input mon x		UINT16	16BIT_L				R	ESY	FVSY	5

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 - EXP-IO1-ADL500 digital input pin 4
DI 2X - EXP-IO1-ADL500 digital input pin 3
DI 3X - EXP-IO1-ADL500 digital input pin 2
DI 4X - EXP-IO1-ADL500 digital input pin 1

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.24	1400	Digital output mon		UINT16					R	ESY	FVSY	3,5

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**

DO1 - digital output pin 57-56
DO2 - digital output pin 55-45

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.25	1402	Digital output mon x		UINT16					R	ESY	FVSY	5

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 - EXP-IO1-ADL500 digital output pins R6-R6com
DO 2x - EXP-IO1-ADL500 digital output pins R5-R5com

4.2 DRIVE INFO

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.1	172	Drive type		ENUM		ADL510			R	ESY	FVSY	3,5
The drive series identification code is displayed.												
1 ADL510 2 ADL530 3 ADL550												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.2	482	Drive size		UINT16					R	ESY	FVSY	3,5
The drive power size is displayed.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.3	484	Drive family		ENUM		No Power			R	INT	FVSY	3,5
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 2 500V ... 575V 3 690V 4 230V												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.4	488	Drive cont current	A	FLOAT		CALCF			R	ESY	FVSY	3,5
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	ADL
4.2.6	174	Firmware version		UINT32					R	ESY	FVSY	3,5
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	ADL
4.2.7	176	DSP Firmware version		UINT32					R	ESY	FVSY	3,5
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	ADL
4.2.8	180	DSP Boot version		UINT32					R	ESY	FVSY	3,5
Processor boot version.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.9	182	HMI Boot version		UINT32					R	ESY	FVSY	3,5
Processor boot version.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.10	184	Application name		STRING16					R	ESY	FVSY	3,5

Displays the name of the installed application.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.11	192	Application version		UINT32					R	ESY	FVSY	3,5
<p>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.</p> <p>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.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.12	198	Hardware version		UINT16					R	ESY	FVSY	3,5
<p>The hardware version of the regulation board is displayed.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.13	520	Product S/N		UINT32					R	ESY	FVSY	3,5
<p>The drive serial number is displayed.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.14	522	Regulation S/N		UINT32					R	ESY	FVSY	3,5
<p>The drive regulation card serial number is displayed.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.15	524	Power S/N		UINT32					R	ESY	FVSY	3,5
<p>The drive power card serial number is displayed.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.16	526	Power file ver.rel		UINT16					R	ESY	FVSY	3,5
<p>The drive power card configuration release is displayed.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.17	9562	IP address		UINT32					R	ESY	FVSY	3,5
<p>Displays the IP address in use.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.18	9600	MAC address		STRING16					R	EXP	FVSY	3,5
<p>Displays the drive's MAC address.</p>												

4.3 DRIVE CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.3.1	550	Save parameters		BIT		0	0	1	RW	ESY	FVSY	3,5

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 "E" to enter then press "E" again to execute the command.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.3.2	580	Load default		BIT		0	0	1	RWZ	ESY	FVSY	3,5

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").

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.3.3	540	Control type		ENUM		ASY SSC			RWZ	INT	FVSY	3,5

The ADL500 can operate in different control modes:

- 0 ASY SSC
- 1 ASY FOC
- 2 SYN FOC (only ADL530 & ADL550)
- 3 ASY SSL

ASY SSC: V/F operating mode to be used when, with asynchronous motors, a motor encoder is not available. 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: field-oriented mode to be used with asynchronous motors when you have a motor encoder that allows for more precise feedback and arrival at the floor than the ASY SSC mode. 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: only for ADL530 and ADL550 field-oriented mode with synchronous motors equipped with encoders. 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.

ASY SLS: open loop sensorless vector oriented with asynchronous motor. This functionality implement both advantages of ASY SSC and ASY FOC technique with motor slippage compensation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.3.4	554	Access level		ENUM		Intermediate			RW	ESY	FVSY	3,5

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

- 0 Readonly
- 1 Easy
- 2 Intermediate
- 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	ADL
4.3.5	568	Enable passwords		BIT		0	0	1	RW	EXP	FVSY	3,5
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	ADL
4.3.7	560	Mains voltage		ENUM		400 V			RWZ	INT	FVSY	3,5
Setting of the available mains voltage value in Volts. Detection of the undervoltage alarm refers to this value. The drive automatically masks the values that can be set based on the drive version chosen.												
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	ADL
4.3.8	448	Emergency UV	V	FLOAT		CALCF	0	CALCF	RWZ	INT	FVSY	3,5
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 or AUX+ 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	ADL
4.3.9	450	Undervoltage	V	FLOAT		300.0	CALCF	CALCF	RW	INT	FVSY	3,5
Lets you change the Undervoltage value. Minimum and maximum default values depend on line voltage. Undervoltage value is setted automatically by drive based on parameter 560 Mains voltage.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.3.10	2690	Chopper ON	V	FLOAT		CALCF	0	CALCF	RWZ	EXP	FVSY	3,5
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	ADL
4.3.11	1010	Fast Start disable		BIT		1	0	1	RW	EXP	FVSY	3,5
Changes the motor 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. In OFF mode the drive, after switching on, starts after the direction signal is activated even it this has been activated before the OK drive signal become high.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.3.12	574	Startup display		INT16		-1	-1	20000	RW	INT	FVSY	3,5
It is possible to set the IPA 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. If set to 0 it will show a list of drive functioning parameters, the same shown with the key "DISP".												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.3.13	576	Display backlight		BIT		0	0	1	RW	INT	FVSY	3,5
Enabling of the backlight on the drive display. If set to 0 (Off), the display backlight will turn off after three minutes of keyboard inactivity. 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	ADL
4.3.14	578	Language select		ENUM		GB			RW	INT	FVSY	3,5
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). <u>For ADL530 and ADL550:</u> <ul style="list-style-type: none"> 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. <u>For ADL510:</u> <ul style="list-style-type: none"> connect drive to WEG_DriveLabs use setup wizard from WEG_DriveLabs and when requested by configurator select language and on the end of setup procedure new language will be installed on drive. At the end of procedure drive will restart and after that is possible to enter in configuration menu and change the language selecting the new language downloaded. Remember after language change to save parameters. 												
<div> <div>NOTE!</div> <div>The language file must be aligned with the firmware and application versions of the drive, check the correspondence! The new language will be loaded into the drive memory and will replace the Italian language. The English language cannot be replaced by another language.</div> </div>												
<div> <div>NOTE!</div> <div>The Load Default command (PAR 580) does not modify this parameter.</div> </div>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.3.15	7200	Password recovery		BIT		0	0	1	RW	ESY	FVSY	3,5
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	ADL
4.3.16	7210	Recovery code		UINT32					R	ESY	FVSY	3,5
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	ADL
4.3.17	7220	Logout time	min	UINT16		60	0	1092	RW	EXP	FVSY	3,5
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	ADL
4.3.18	590	Save par to keypad		BIT		0	0	1	RWZ	INT	FVSY	3,5
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	ADL
4.3.19	592	Load par from keypad		BIT		0	0	1	RWZ	INT	FVSY	3,5
Transfers the parameters from the keypad memory to the drive.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.3.20	596	Save to USB		BIT		0	0	1	RWZ	INT	FVSY	3,5
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	ADL
4.3.21	598	Load from USB		BIT		0	0	1	RWZ	INT	FVSY	3,5
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	ADL
4.3.23	1560	App update		BIT		0	0	1	RWZ	INT	FVSY	3,5
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 USB flash is not present, a message is displayed on the keypad.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.3.24	9548	WiFi safe removal		BIT		0	0	1	RW	ESY	FVSY	3,5
To prevent drive malfunctions, this function must be performed before removing the Wi-Fi module.												

4.4 ALARM CONFIG

Follow allarms can have severals type of activity:

- **Ignore:** the alarm is ignored and the drive normally starts at the arrival of the commands
- **Warning:** a warning is displayed on keypad and saved in alarms log and drive normally starts at the arrival of the commands
- **Disable drive:** drive is immediately disabled
- **Stop:** drive is disabled with a stop emergency ramp
- **Lift fast stop:** like Stop drive is disabled with a stop emergency ramp
- **Lift stop:** the alarm is ignored until enable command is removed. In this mode lift can arrive to floor without entrap users

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.4.1	4500	Fault reset src		ENUM	16BIT_L	6000			RW	INT	FVSY	3,5
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	ADL
4.4.2	4502	ExtFlt src		ENUM	16BIT_L	6000			RW	INT	FVSY	3,5
Selection of the origin (source) of the signal to be used for the external fault 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	ADL
4.4.3	4504	ExtFlt activity		ENUM		Disable			RW	INT	FVSY	3,5
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												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.4.4	4506	ExtFlt restart		ENUM		Disable			RW	EXP	FVSY	3,5
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	ADL
4.4.5	4508	ExtFlt restart time	ms	UINT16		1000	120	30000	RW	EXP	FVSY	3,5
Setting of the time within which the External fault [21] alarm must be reset in order to perform automatic restart.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.4.6	4510	ExtFlt holdoff	ms	UINT16		0	0	10000	RW	INT	FVSY	3,5
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	ADL
4.4.7	4518	MotorOT threshold	degC	INT16		150	0	200	RW	INT	FVY	3,5
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	ADL
4.4.8	4520	MotorOT src		ENUM	16BIT_L	6000			RW	INT	FVSY	3,5
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	ADL
4.4.9	4522	MotorOT activity		ENUM		Warning			RW	INT	FVSY	3,5
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												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.4.10	4524	MotorOT restart		ENUM		Disable			RW	EXP	FVSY	3,5
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	ADL
4.4.11	4526	MotorOT restart time	ms	UINT16		1000	120	30000	RW	EXP	FVSY	3,5
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	ADL
4.4.12	4528	MotorOT holdoff	ms	UINT16		1000	0	30000	RW	EXP	FVSY	3,5
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	ADL
4.4.13	4530	Ptc type		ENUM		None			RW	INT	FVSY	3,5

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	ADL
4.4.14	4532	PtcFail activity		ENUM		Warning			RW	INT	FVSY	3,5
PTC sensor activity failure alarm (PTC failure [11]).												
<ul style="list-style-type: none">0 Ignore1 Warning2 Disable drive3 Stop												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.4.15	4534	PtcFail restart		ENUM		Disable			RW	EXP	FVSY	3,5
Enables automatic restart after PTC failure [11] alarm.												
<ul style="list-style-type: none">0 Disable1 Enable												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.4.16	4536	PtcFail restart time	ms	UINT16		1000	120	30000	RW	EXP	FVSY	3,5
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	ADL
4.4.17	4538	PtcFail holdoff	ms	UINT16		1000	0	30000	RW	EXP	FVSY	3,5
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	ADL
4.4.18	4540	Overspeed threshold	rpm	INT16		CALCI	0	16000	RW	INT	FVSY	3,5
Setting of the threshold below which the speed reference loss alarm Overspeed [23] occurs.												

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	ADL
4.4.19	4542	Overspeed activity		ENUM		Disable			RW	INT	FVSY	3,5
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 .												
<ul style="list-style-type: none">0 Ignore1 Warning2 Disable drive												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.4.20	4544	Overspeed holdoff	ms	UINT16		0	0	5000	RW	INT	FVSY	3,5
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	ADL
4.4.21	4550	SpdRefLoss threshold	rpm	INT16		100 (*)	0	CALCI	RW	INT	FVSY	3,5

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	ADL
4.4.22	4552	SpdRefLoss activity		ENUM		Disable (*)			RW	INT	FVSY	3,5

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 Torque curr lim sel** is set to a value other than zero.

(*) Def: Ignore=ASY SSC, Disable=ASY FOC, Warning=ASY SLS, Disable= SYN FOC

- 0 Ignore
- 1 Warning
- 2 Disable drive

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.4.23	4554	SpdRefLoss holdoff	ms	UINT16		1000	0	10000	RW	INT	FVSY	3,5

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	ADL
4.4.24	4560	SpdFbkLoss activity		ENUM		Disable			RW	INT	FVSY	3,5

Drive behaviour in case of the **Speed FbkLoss [22]** 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 FbkLoss [22]** and the information acquired from the encoder are shown in the **SpdFbkLoss code** parameter 2172.

NOTE!

See menu "8. ENCODER" for further information.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.4.25	4562	SpdFbkLoss holdoff	ms	UINT16		200	0	10000	RW	INT	FVSY	3,5

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	ADL
4.4.26	4564	SpdFbkLoss threshold	rpm	INT16		100	0	CALCI	RW	INT	FVSY	3,5

Setting of the maximum speed difference between the speed measured by the encoder and the speed set by the profile within which the alarm **speed fbk loss [22]** is bypassed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.4.27	4570	Drive ovld activity		ENUM		Disable			RW	EXP	FVSY	3,5

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.4.28	4572	Motor ovld activity		ENUM		Warning			RW	EXP	FVSY	3,5
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												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.4.29	4574	Bres ovld activity		ENUM		Disable			RW	EXP	FVSY	3,5
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												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.4.30	4582	HTsens restart		ENUM		Disable			RW	EXP	FVSY	3,5
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	ADL
4.4.31	4584	HTsens restart time	ms	UINT16		20000	120	60000	RW	EXP	FVSY	3,5
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	ADL
4.4.32	4610	Desat restart		ENUM		Disable			RW	EXP	FVSY	3,5
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	ADL
4.4.33	4612	Desat restart time	ms	UINT16		2000	1000	10000	RW	EXP	FVSY	3,5
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	ADL
4.4.34	4620	IOverC restart		ENUM		Disable			RW	EXP	FVSY	3,5
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	ADL
4.4.35	4622	IOverC restart time	ms	UINT16		2000	1000	10000	RW	EXP	FVSY	3,5
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	ADL
4.4.36	4630	OverV restart		ENUM		Disable			RW	EXP	FVSY	3,5

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	ADL
4.4.37	4632	OverV restart time	ms	UINT16		2000	1000	10000	RW	EXP	FVSY	3,5

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	ADL
4.4.38	4640	UnderV restart		ENUM		Enable			RW	EXP	FVSY	3,5

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	ADL
4.4.39	4642	UnderV restart time	ms	UINT16		1000	120	10000	RW	EXP	FVSY	3,5

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	ADL
4.4.40	4650	UVRep attempts		UINT16		5	0	1000	RW	EXP	FVSY	3,5

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	ADL
4.4.41	4652	UVRep delay	s	UINT16		240	0	300	RW	EXP	FVSY	3,5

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	ADL
4.4.42	4654	PhLoss mov activity		ENUM		Ignore			RW	EXP	FVSY	3,5

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	ADL
4.4.43	4656	PhLoss mov holdoff	ms	UINT32		200	0	2000	RW	EXP	FVSY	3,5

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	ADL
4.4.44	4674	PhLoss mov freq thr	Hz	FLOAT		0.5	0.1	5	RW	EXP	FVSY	3,5

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	ADL
4.4.45	4678	PhLoss mov code		UINT32					R	EXP	FVSY	3,5

The hexadecimal value indicates which motor phases 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	ADL
4.4.46	4670	Optionbus activity		ENUM		Disable			RW	EXP	FVSY	3,5

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.4.47	4660	PhLoss in activity		ENUM		Disable			RW	EXP	FVSY	3,5

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	ADL
4.4.48	4662	PhLoss in restart		ENUM		Disable			RW	EXP	FVSY	3,5

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	ADL
4.4.49	4664	PhLoss in rest time	ms	UINT16		1000	120	10000	RW	EXP	FVSY	3,5

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	ADL
4.4.50	4668	PhLoss output test		ENUM		Enable			RW	EXP	FVSY	3,5

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	ADL
4.4.51	4680	GroundFault thr	%	FLOAT		10.0	0.0	150.0	RW	INT	FVSY	3,5

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	ADL
4.4.52	4700	Alarm dig out 1 sel		ENUM		No alarm			RW	INT	FVSY	3,5

4.4.53	4702	Alarm dig out 2 sel	ENUM	No alarm	RW	INT	FVSY	3,5
4.4.54	4704	Alarm dig out 3 sel	ENUM	No alarm	RW	INT	FVSY	3,5
4.4.55	4706	Alarm dig out 4 sel	ENUM	No alarm	RW	INT	FVSY	3,5

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	ADL
4.4.56	4720	Alm autoreset time	s	FLOAT		0.0	0.0	60.0	RW	EXP	FVSY	3,5

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	ADL
4.4.57	4722	Alm autoreset number		UINT16		3	0	100	RW	EXP	FVSY	3,5
Setting of the maximum number of attempted automatic resets.												

4.8 DIGITAL INPUTS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.8.1	1240	Dig inp 1 inversion		BIT		0	0	1	RW	INT	FVSY	5
4.8.2	1242	Dig inp 2 inversion		BIT		0	0	1	RW	INT	FVSY	5
4.8.3	1244	Dig inp 3 inversion		BIT		0	0	1	RW	INT	FVSY	5
4.8.4	1246	Dig inp 4 inversion		BIT		0	0	1	RW	INT	FVSY	5
4.8.5	1248	Dig inp 5 inversion		BIT		0	0	1	RW	INT	FVSY	5
4.8.6	1250	Dig inp 6 inversion		BIT		0	0	1	RW	INT	FVSY	5
4.8.7	1252	Dig inp 7 inversion		BIT		0	0	1	RW	INT	FVSY	5
4.8.8	1254	Dig inp 8 inversion		BIT		0	0	1	RW	INT	FVSY	5
Inversion of the logic status of the function associated with the digital input of the ADL500.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.8.9	1260	Dig inp 1x inversion		BIT		0	0	1	RW	INT	FVSY	5
4.8.10	1262	Dig inp 2x inversion		BIT		0	0	1	RW	INT	FVSY	5
4.8.11	1264	Dig inp 3x inversion		BIT		0	0	1	RW	INT	FVSY	5
4.8.12	1266	Dig inp 4x inversion		BIT		0	0	1	RW	INT	FVSY	5
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	ADL
4.8.13	1110	Dig input E mon		UINT16	16BIT_L				R	EXP	FVSY	3,5
This signal represent the state of the corresponding Enable digital input.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.8.14	1210	Dig inp 1 mon		UINT16	16BIT_L				R	EXP	FVSY	3,5
4.8.15	1212	Dig inp 2 mon		UINT16	16BIT_L				R	EXP	FVSY	3,5
4.8.16	1214	Dig inp 3 mon		UINT16	16BIT_L				R	EXP	FVSY	3,5
4.8.17	1216	Dig inp 4 mon		UINT16	16BIT_L				R	EXP	FVSY	3,5
4.8.18	1218	Dig inp 5 mon		UINT16	16BIT_L				R	EXP	FVSY	3,5
4.8.19	1220	Dig inp 6 mon		UINT16	16BIT_L				R	EXP	FVSY	3,5
4.8.20	1222	Dig inp 7 mon		UINT16	16BIT_L				R	EXP	FVSY	3,5
4.8.21	1224	Dig inp 8 mon		UINT16	16BIT_L				R	EXP	FVSY	3,5
These signals represent the logic state of the corresponding digital input.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.8.22	1230	Dig inp 1x mon		UINT16	16BIT_L				R	EXP	FVSY	5
4.8.23	1232	Dig inp 2x mon		UINT16	16BIT_L				R	EXP	FVSY	5
4.8.24	1234	Dig inp 3x mon		UINT16	16BIT_L				R	EXP	FVSY	5
4.8.25	1236	Dig inp 4x mon		UINT16	16BIT_L				R	EXP	FVSY	5
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	ADL
4.8.26	1268	Dig inp E dest		ILINK					R	EXP	FVSY	3,5
4.8.27	1270	Dig inp 1 dest		ILINK					R	EXP	FVSY	3,5

4.8.28	1272	Dig inp 2 dest		ILINK					R	EXP	FVSY	3,5
4.8.29	1274	Dig inp 3 dest		ILINK					R	EXP	FVSY	3,5
4.8.30	1276	Dig inp 4 dest		ILINK					R	EXP	FVSY	3,5
4.8.31	1278	Dig inp 5 dest		ILINK					R	EXP	FVSY	3,5
4.8.32	1280	Dig inp 6 dest		ILINK					R	EXP	FVSY	3,5
4.8.33	1282	Dig inp 7 dest		ILINK					R	EXP	FVSY	3,5
4.8.34	1284	Dig inp 8 dest		ILINK					R	EXP	FVSY	3,5

Selection of the destination of the associated digital input.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.8.35	1290	Dig inp 1x dest		ILINK					R	EXP	FVSY	5
4.8.36	1292	Dig inp 2x dest		ILINK					R	EXP	FVSY	5
4.8.37	1294	Dig inp 3x dest		ILINK					R	EXP	FVSY	5
4.8.38	1296	Dig inp 4x dest		ILINK					R	EXP	FVSY	5

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	ADL
4.9.1	1430	Dig out 1 inversion		BIT		0	0	1	RW	INT	FVSY	3,5
4.9.2	1432	Dig out 2 inversion		BIT		0	0	1	RW	INT	FVSY	3,5
4.9.3	1434	Dig out 3 inversion		BIT		0	0	1	RW	INT	FVSY	3,5
4.9.4	1436	Dig out 4 inversion		BIT		0	0	1	RW	INT	FVSY	3,5

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	ADL
4.9.5	1440	Dig out 1x inversion		BIT		0	0	1	RW	INT	FVSY	5
4.9.6	1442	Dig out 2x inversion		BIT		0	0	1	RW	INT	FVSY	5

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

NOTE!

The following parameters are related only to the analog input AI1 between pins 3 and 4 (41 and 42 for the -9 or higher version of the regulation board). The other analog input AI2 is reserved only for the thermal sensor of the engine and the circuitry is different.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.10.1	1600	Analog input mon	cnt	INT16	16BIT_H				R	ESY	FVSY	3,5

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.10.2	1602	Analog inp type		ENUM		-10V...+10V			RW	INT	FVSY	3,5

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

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

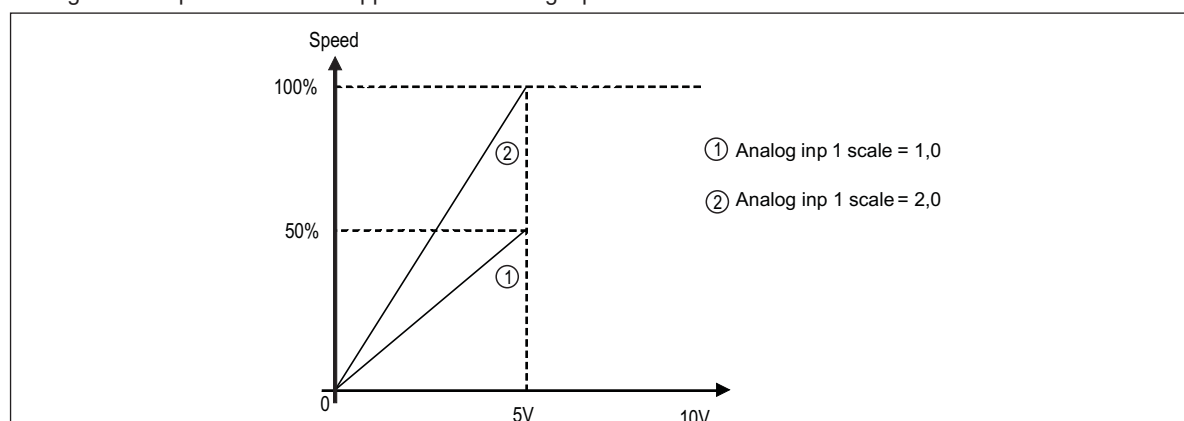
Select option **0** in order to connect a maximum voltage of $\pm 12.5V$ (typically $\pm 10V/5mA$) to the analog input. If the signal is used as a reference, reverse the direction of rotation by inverting the voltage polarity.

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	ADL
4.10.3	1604	Analog inp scale		FLOAT		1.0	-10.0	10.0	RW	INT	FVSY	3,5

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	ADL
4.10.4	1606	An inp offset tune		BIT		0	0	1	RW	INT	FVSY	3,5

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 PAR 1616 Analog inp offset.

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	ADL
4.10.5	1608	An inp gain tune		BIT		0	0	1	RW	INT	FVSY	3,5

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 PAR 1618 Analog input gain.

To perform self-tuning, set the input signal to its maximum value and execute the command. A multiplier factor is calculated to apply to the input signal value (not considering the **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	ADL
4.10.6	1610	Analog inp filter	ms	FLOAT		10	2	100	RW	EXP	FVSY	3,5

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	ADL
4.10.7	1612	Analog inp top	cnt	INT16		16384	-32768	+32768	RW	EXP	FVSY	3,5

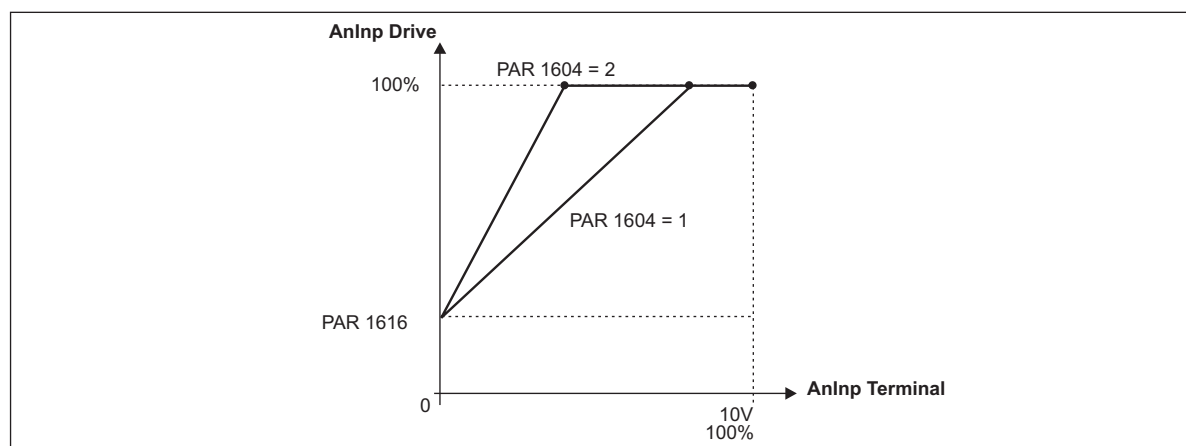
Setting of the upper speed reference limit as a function of the voltage (or current) of the analog reference.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.10.8	1614	Analog inp bottom	cnt	INT16		-16384	-32768	+32768	RW	EXP	FVSY	3,5

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	ADL
4.10.9	1616	Analog inp offset	cnt	INT16		0	-32768	+32768	RW	EXP	FVSY	3,5

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



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.10.10	1618	Analog inp gain		FLOAT		1.0	-10.0	10.0	RW	EXP	FVSY	3,5

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	ADL
4.10.11	1626	An inp sign src		ENUM	16BIT_L	6000			RW	INT	FVSY	3,5
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	ADL
4.10.12	1632	Analog input dest		ILINK					R	EXP	FVSY	3,5
The function for which the analog input has been programmed and on which it acts is displayed.												

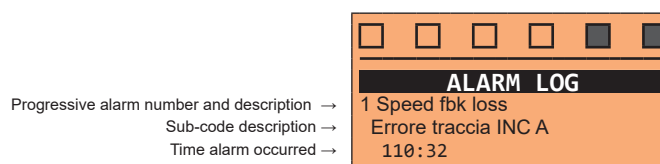
4.11 ALARM LOG

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.



NOTE!

The ALARM LOG menu is visible on the keypad.

On the WEG_DriveLabs, it is located in the command bar; press the Alarms icon. 
Using the mobile interface with WEG Liftouch, the Alarm Log menu is located in DASHBOARD / alarms.

4.12 LIFE TIME

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.12.1	510	Time drive power on	h.min	UINT32					R	ESY	FVSY	3,5
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	ADL
4.12.2	512	Time drive enable	h.min	UINT32					R	ESY	FVSY	3,5
The time for which the drive has been enabled is displayed.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.12.3	514	Number power up		UINT16					R	ESY	FVSY	3,5
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	ADL
4.12.4	516	Time fan on	h.min	UINT32					R	ESY	FVSY	3,5
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	ADL
5.1.1	14014	Trip number		UINT32					R	ESY	FVSY	3,5
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	ADL
5.1.2	14016	Sequence state		ENUM					R	ESY	FVSY	3,5
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	ADL
5.1.3	14210	Actual speed ref	m/s	FLOAT					R	ESY	FVSY	3,5
Displays the speed reference set in m/s.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.1.4	14242	Actual cabin spd	m/s	FLOAT					R	ESY	FVSY	3,5
Displays the cabin 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	ADL
5.1.5	14032	Cabin position	mm	INT					RW	INT	FVSY	3,5
Display the car position respect position when specific movement is started.												

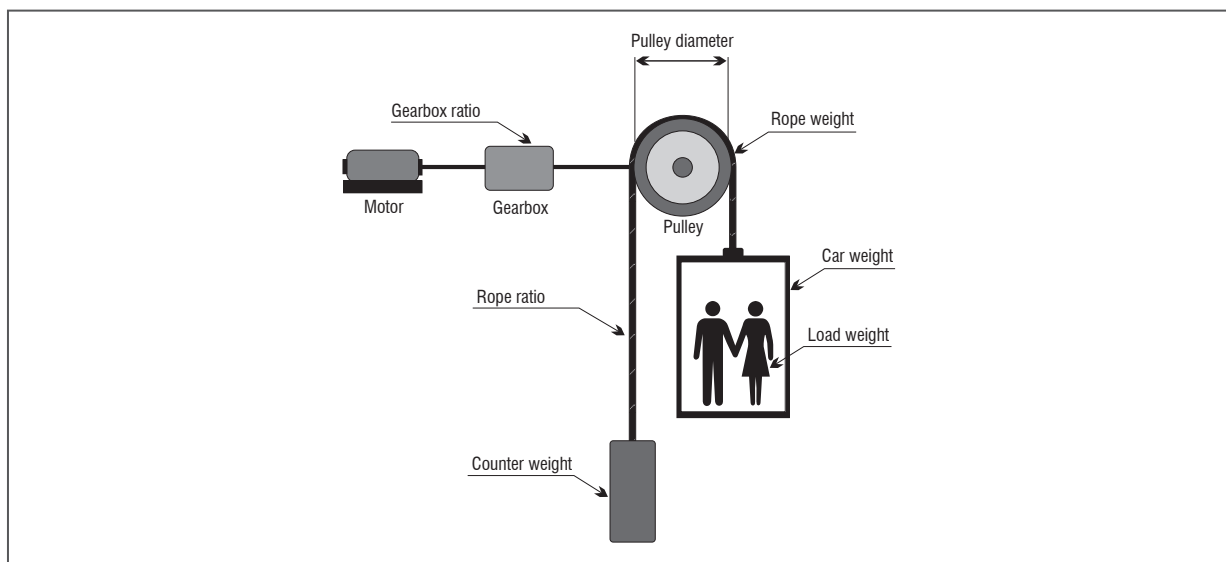
5.2 MECHANICAL DATA

The parameters described in this menu are used to define the mechanical and physical features of the system and are used from drive for one accurate estimation of system inertia and relative gain for improve one accurate calibration of motor throughout the cabin's trip.

Mechanical constants

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

Mechanical constant = $(\pi * \text{Pulley diameter}) / \text{Reduction ratio}$



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	ADL
5.2.1	11006	Cabin speed	m/s	FLOAT		SIZE	0	10	RWZ	INT	FVSY	3,5
Setting the maximum operating speed of the system. It is also used for recalculating the full scale speed (PAR 680, Full scale speed).												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.2.2	11010	Gearbox ratio		FLOAT		SIZE	0	200	RW	INT	FVSY	3,5
Sets the reduction ratio between motor and pulley.												

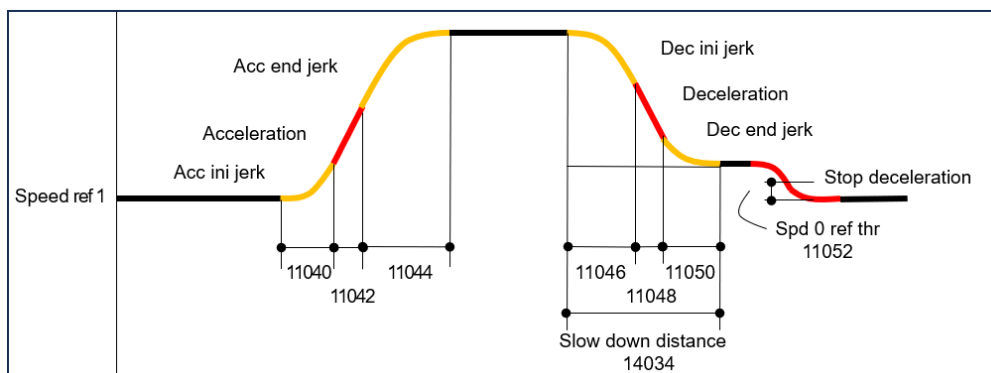
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.2.3	11164	Rope ratio		FLOAT		SIZE	1	10	RWZ	INT	FVSY	3,5
Setting the reduction ratio due to the rope rotation in the shaft between the various pulleys. Not do be confused with the number of roope of the system.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.2.4	11012	Pulley diameter	m	FLOAT		SIZE	0	5	RWZ	INT	FVSY	3,5
Setting of the diameter of the traction pulley.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.2.5	11150	Car weight	kg	FLOAT		SIZE	0	10000	RW	INT	FVSY	3,5
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	ADL
5.2.6	11152	Counter weight	kg	FLOAT		SIZE	0	10000	RW	INT	FVSY	3,5
Setting of the weight of the counterweight, including its frame.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.2.7	11154	Load weight	kg	FLOAT		SIZE	0	10000	RW	INT	FVSY	3,5
Setting the maximum load weight in the cabin (cabin capacity) for which the system is sized.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.2.8	11156	Rope weight	kg	FLOAT		SIZE	0	10000	RW	INT	FVSY	3,5
Setting of the weight of the ropes (intended as the total weight of all car suspension ropes).												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.2.9	14002	Mechanical const	m/rev	FLOAT					RW	INT	FVSY	3,5
This value is a mechanical constant that indicates the encoder revolution respect car movement.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.2.10	14046	Operating mot spd	rpm	FLOAT		CALCF			R	INT	FVSY	3,5
Setting of the diameter of the traction pulley.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.2.11	14048	Full scale spd	rpm	SHORT					R	INT	FVSY	3,5
Setting of the diameter of the traction pulley.												

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).

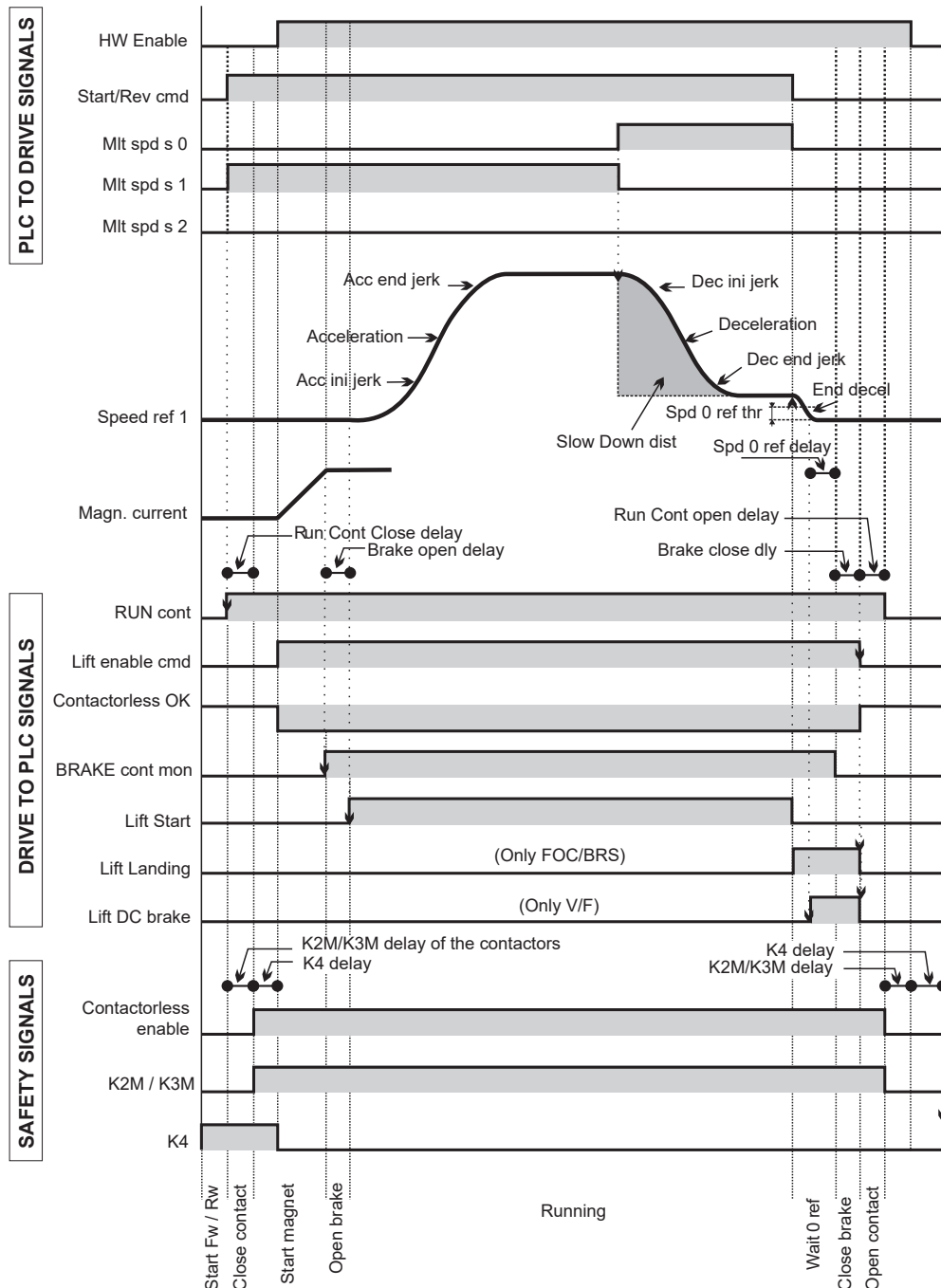
When the **Start** command is removed, the reference speed is zero regardless of the reference selected in the multispeeds. In this final part of the profile the jerk deceleration values are used directly (not multiplied by **Percent dec factor**, PAR 11056) with the **Stop deceleration** parameter as 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	ADL
5.3.1	11040	Accel initial jerk	m/s ³	FLOAT		0.2 (*)	0.001	20	RW	ESY	FVSY	3,5
Setting of the jerk value for the first part of the acceleration. (*) Def: 0.5 = ASY SSL, 0.2 = others												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.3.2	11042	Acceleration	m/s ²	FLOAT		0.600	0.001	10	RW	ESY	FVSY	3,5
Setting of the maximum acceleration value.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.3.3	11044	Accel end jerk	m/s ³	FLOAT		0.6	0.001	20	RW	ESY	FVSY	3,5
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	ADL
5.3.4	11054	Percent acc factor	%	FLOAT		100	10	1000	RW	INT	FVSY	3,5
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	ADL
5.3.5	11046	Decel initial jerk	m/s ³	FLOAT		0.6	0.001	20	RW	ESY	FVSY	3,5
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	ADL
5.3.6	11048	Deceleration	m/s ²	FLOAT		0.600	0.001	10	RW	ESY	FVSY	3,5
Setting of the maximum deceleration value.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.3.7	11050	Decel end jerk	m/s ³	FLOAT		0.500	0.001	20	RW	ESY	FVSY	3,5
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	ADL
5.3.8	11056	Percent dec factor	%	FLOAT		100	10	1000	RW	INT	FVSY	3,5
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	ADL
5.3.9	11052	Stop deceleration	m/s ²	FLOAT		0.6	0.001	10	RW	ESY	FVSY	3,5
Setting of the maximum deceleration value used when the start command is removed.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.3.10	10110	Accel ini jerk insp	m/s ²	FLOAT		0.6	0.001	30	RW	ESY	FVSY	3,5
Setting of the jerk value for the first part of the acceleration in inspection mode.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.3.11	10112	Accel ispez	m/s ²	FLOAT		0.6	0.001	30	RW	ESY	FVSY	3,5
Setting of the jerk value for the first part of the acceleration in inspection mode.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.3.12	10144	Accel end jerk insp	m/s ³	FLOAT		0.6	0.001	30	RW	ESY	FVSY	3,5
Setting of the jerk value for the last part of the acceleration, during the inspection												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.3.13	10144	Decel ini jerk insp	m/s ³	FLOAT		0.6	0.001	30	RW	ESY	FVSY	3,5
Setting of the jerk value for the first part of the deceleration, during the inspection												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.3.14	10118	Decel inspect	m/s ²	FLOAT		0.6	0.001	30	RW	ESY	FVSY	3,5
Setting of the maximum deceleration value, during the inspection												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.3.15	10116	Decel end jerk insp	m/s ³	FLOAT		0.6	0.001	30	RW	ESY	FVSY	3,5
Setting of the jerk value for the last part of the deceleration, during the inspection												

5.4 LIFT SEQUENCES

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



Starting sequence:

- 1) Reading of the enable hardware input and checking for alarms (enabling is aborted in case of an alarm).
- 2) Detection of the **Enable** and **Start** commands as set in the **Sequence start 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 and contactor feedback is reported to digit input E (digital input pin 9).
- 4) When the time set in **Contactor close dly** has elapsed if the lift enable cmd is enabled (digital input E is closed) 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) or, if the function is enabled, waits only the received of the brake feedback
- 8) When the delay before opening the brake has elapsed the Start lift command is sent and movement is enabled or, if the function is enabled, waits only the received of the brake feedback.

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) With drive in the state Lift start the Brake mon (PAR 3712) output signal can be used to activate the brake monitoring functionality.
- 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 (only for SYN FOC control), 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 of fundamental importance to foresee that at any moment the drive can go into alarm or can be disabled, in which case the drive stops and commands the opening of the contactors.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.4.1	11060	Sequence start stop		ENUM		Start fwd/rev			RWZ	ESY	FVSY	3,5

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

- 0 Start fwd/rev
- 3 Start edge F/R
- 1 Enable
- 2 Mltspd out !=0

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**.

When set to **2**, output command PAR 3702 **Run cont mon** is activated, giving as input signal PAR 11222 **Start fwd cmd src** or PAR 11224 **Start rev cmd src** and selecting a speed other than zero using the multi-speed selectors.

When set to **3**, output command PAR 3702 **Run cont mon** is activated, on the rising front edge of the signal PAR 11222 **Start fwd cmd src** or PAR 11224 **Start rev cmd src** and deactivated on the falling front edge of the enable signal.

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	ADL
5.4.2	11062	Contactor close dly	ms	INT16/32		200	0	10000	RW	ESY	FVSY	3,5

Setting of the delay time after closing the contactor.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.4.3	11064	Brake open delay	ms	INT16/32		500 (*)	0	10000	RW	ESY	FVSY	3,5

Setting of delay time after opening the brake.

(*) Def: 200 = ASY SSL, 500 = others

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.4.4	10180	Brake openDly fbk		BOOL		OFF			RW	EXP	FVY	3,5

If enabled, it allows the drive not to wait for the "brake open delay" but to activate the speed ramp as soon as the brake opening is detected via the brake feedback.

At least one brake feedback must be configured on a digital input or via fieldbus.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.4.5	11078	Speed 0 threshold	rpm	INT16		30 (1)	0	10000	RW	INT	FVSY	3,5
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	ADL
5.4.6	11080	Speed 0 delay	ms	UINT16		400	0	10000	RW	INT	FVSY	3,5
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.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.4.7	11086	Door open speed	m/s	FLOAT		0	-10000	10000	RWZ	EXP	FVSY	3,5

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.4.8	11070	Current down delay	ms	INT16/32		0 (800)	0	10000	RW	INT	SY	3,5
<p>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.</p> <p>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.</p>												

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	ADL
5.4.9	10178	DC braking		BOOL		Off	0	1	RW	EXP	F	3,5
<p>Enabling DC braking.</p> <p>When zero speed is reached, Sequence state 'Zero speed' (PAR 14016) DC braking is enabled, injecting a current configurable via parameter DC brake current (PAR 3158) which remains until the end of the brake close phase, Sequence state 'Brake close' (PAR 14016).</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.4.10	3158	DC brake current	%	FLOAT		75	0.0	150.0	RW	EXP	FS	3,5
<p>This parameter is used to configure the value of the injected direct current.</p> <p>It is expressed as a percentage of the motor current (PAR 2002 Rated current).</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.4.11	11068	Brake close delay	ms	INT16/32		500	0	10000	RW	ESY	FVSY	3,5
Setting of the delay time after closing the brake.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.4.12	11072	Contacteur open dly	ms	INT16/32		200	0	10000	RW	ESY	FVSY	3,5
Setting of the contactor opening delay time.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.4.13	11074	SC cont open delay	ms	INT16/32		0 (500)	0	2000	RW	EXP	SY	3,5
Setting of the delay for the opening of the short-circuit contactor between the motor phases.												

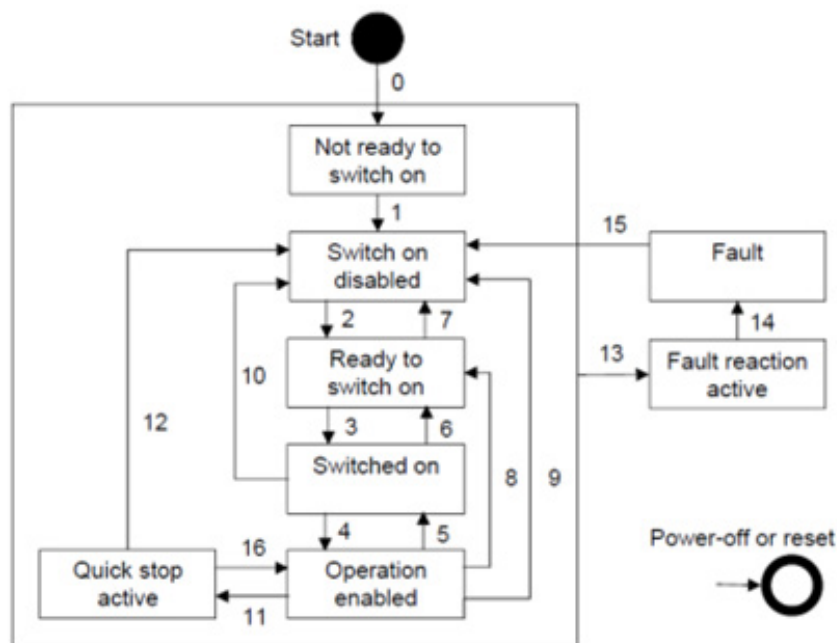
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.4.14	11244	Inversion motor rot		ENUM		Not inverted			RWZ	INT	FVSY	3,5
<p>Reversal of the motor rotation direction.</p> <p>0 Not inverted 1 Inverted</p> <p>Setting 0 does not reverse the direction of rotation. Setting 1 reverses the direction of rotation.</p> <p>International standards require that a positive reference corresponds to the motor rotating in a clockwise direction as seen from the drive side (shaft).</p> <p>For correct operation, the control algorithms provide that a positive speed reference corresponds to a positive speed measurement.</p>												

5.5 417 PROFILE

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.5.1	14044	417 state machine		ENUM					R	EXP	FVSY	3,5

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	ADL
5.5.2	14024	OperationMode		ENUM					R	INT	FVSY	3,5
<p>Parameter indicating which operating mode the drive is in. The permissible modes are:</p> <p>1 position 3 speed 0 null</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.5.3	14028	Speed ref in VelMode	mm/s	INT32					R	INT	FVSY	3,5
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	ADL
5.5.4	14026	Speed ref in PosMode	mm/s	INT32					R	INT	FVSY	3,5
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	ADL
5.5.5	14030	Pos ref in PosMode	mm	INT32					R	INT	FVSY	3,5
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	ADL
5.5.6	10124	Absolute enc pulses		FLOAT		1024	1	16384	RW	EXP	FVSY	3,5
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	ADL
5.5.7	11076	Distance for revolut	mm	FLOAT		458	1	10000	RW	EXP	FVSY	3,5
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	ADL
5.5.8	11140	417-pos acq time	ms	INT		0	0	1000	RW	EXP	FVSY	3,5
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	ADL
5.5.9	14096	Drv→417 status word	Hex	INT32					R	EXP	FVSY	3,5
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	ADL
5.6.1	11000	Landing zone	m	FLOAT					RW	INT	FVSY	3,5

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	ADL
5.6.2	11016	Final adjust fwd	m	FLOAT		0	-1000000	1000000	RW	INT	FVSY	3,5
This parameter defines an offset that is added to the end point calculated by the protocol, in fwd direction.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.6.3	10148	Final adjust rev	m	FLOAT		0	-1000000	1000000	RW	INT	FVSY	3,5
This parameter defines an offset that is added to the end point calculated by the protocol, in rev direction.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.6.4	11276	Comp-P gain		FLOAT		0.019			RW	EXP	FVSY	3,5
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	ADL
5.6.5	11254	Comp-I gain		FLOAT		0.004			RW	EXP	FVSY	3,5
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	ADL
5.6.6	11234	Landing-P gain		FLOAT		0.5			RW	EXP	FVSY	3,5
Parameter setting the integral gain used into the landing zone.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.6.7	11004	Landing-I gain		FLOAT		0.020			RW	EXP	FVSY	3,5
Parameter setting the proportional gain used into the landing zone.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.6.8	14018	Actual error	mm	FLOAT					RW	EXP	FVSY	3,5
Display the error between the floor and the cabin position.												

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

For the ADL530 and ADL550 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	SpeedRefsZero	Speed reference less than 0 limit signal
11	RunSCmon	Short circuit run contactor

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.7.1	1410	Dig output 1 src			16BIT_L	Null			RW	INT	FVSY	3,5
5.7.2	1412	Dig output 2 src			16BIT_L	Null			RW	INT	FVSY	3,5
5.7.3	1414	Dig output 3 src			16BIT_L	Null			RW	INT	FVSY	3,5
5.7.4	1416	Dig output 4 src			16BIT_L	Null			RW	INT	FVSY	3,5
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	ADL
5.7.5	1420	Dig output 1x src			16BIT_L	Null			RW	INT	FVSY	5
5.7.6	1422	Dig output 2x src			16BIT_L	Null			RW	INT	FVSY	5
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	ADL
5.7.7	14104	Command output mon	Hex	UINT32					R	INT	FVSY	3,5
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.

Typically, a signal can be connected to a digital input, to some internal signals and, for the ADL530 and ADL500, to a Decomp word bit. This word is connected to a fieldbus process channel (**PDC FieldBus M→S1**).

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

To ensure that direction and multi-speed are applied simultaneously when the car starts, eliminating any delays between the sending of the two signals, a filter can be activated, which only imposes direction+speed if these are stable for a time equal to parameter 11076. The filter only works during start, in all other phases it is not applied.

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	Contacteur 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	A3 brake close contact	Null
15	Brake 2 fbk	Second brake close contact	Brake cont mon

Multi speed configuration table

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.8.1	11220	Lift enable cmd src		ENUM		Dig input E			RW	INT	FVSY	3,5

Setting of the source for the enable command.

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.8.2	11232	Contacteur fbk src		ENUM		Run cont mon			RW	INT	FVSY	3,5

Sets the source of contactor status signal.

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.8.3	11236	Brake fbk src		ENUM		Brake cont mon			RW	INT	FVSY	3,5

Sets the source of brake status signal.

The list of functions that can be associated with the digital inputs are in the “**LiftInputAdlCmdEBC**” selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.8.4	10096	Brake 2 fbk src		ENUM		Brake cont mon			RW	INT	FVSY	3,5

Sets the source of the second brake status signal.

The list of functions that can be associated with the digital inputs are in the “**LiftInputAdlCmdEBC**” selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.8.5	11238	Door open src		ENUM		Null			RW	EXP	FVSY	3,5

Sets of source to enable early door opening control.

The list of functions that can be associated with the digital inputs are in the “**LiftInputDoorCmd**” selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.8.6	11240	Door feedback src		ENUM		Null			RW	EXP	FVSY	3,5

Setting of the source of the door 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	ADL
5.8.7	11242	Emergency mode src		ENUM		Dig input 3			RW	INT	FVSY	3,5

Setting of the source of the emergency operation 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	ADL
5.8.8	11288	Inspection mode src		ENUM		Null			RW	INT	FVSY	3,5

Setting of the source of the inspection mode.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.8.9	11272	Fast Enable src		ENUM		Null			RW	INT	FVSY	5

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

This Fast Enable input must be activated with drive ADL550 in contactorless configuration on drive that mount one regulation board before -9. For regulation board -9 or upper this input is not necessary. for regulation board version see PAR 198).

- 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	ADL
5.8.10	11820	Brake realease src		ENUM		Null			RW	EXP	VY	3,5

This function is only available in synchronous or asynchronous ASY FOC mode (asynchronous with an encoder).
The assignable functions are on the “**LiftInputAdlCmd2**” 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	ADL
5.8.11	11832	Safe Brake Test src		ENUM		Null			RW	EXP	FVSY	5

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.

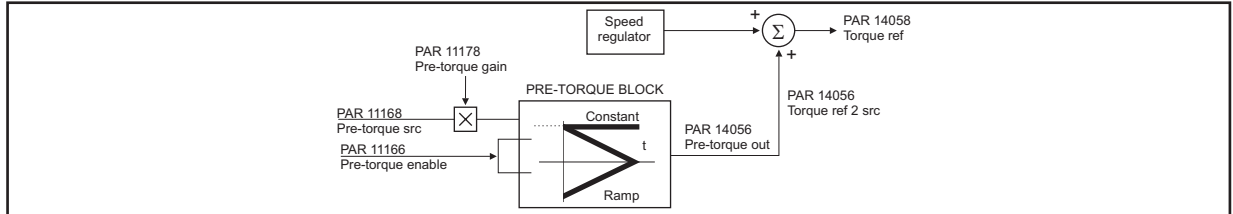
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.8.12	14102	Command input mon	Hex	UINT32					R	ESY	FVSY	3,5

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) with IPA 11168 = **Init pretorque**) or with a fixed torque value with direction dependent on movement direction (setting IPA 11168 = **Init pretorque dir**).



NOTE!

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.9.1	11166	Pre-torque enable		BIT		Off			RW	EXP	VY	3,5

Enabling of the pre-torque function.

0 Off
1 On

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.9.2	11168	Pre-torque src		ENUM		Init pre-torque			RW	EXP	VY	3,5

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

1600 Analog in 1
4034 Fieldbus M→S2 (only for ADL530 and ADL550)
4044 Fieldbus M→S3 (only for ADL530 and ADL550)
4054 Fieldbus M→S4 (only for ADL530 and ADL550)
4064 Fieldbus M→S5 (only for ADL530 and ADL550)
4074 Fieldbus M→S6 (only for ADL530 and ADL550)
4084 Fieldbus M→S7 (only for ADL530 and ADL550)
4094 Fieldbus M→S8 (only for ADL530 and ADL550)
4104 Fieldbus M→S9 (only for ADL530 and ADL550)
4124 Fieldbus M→S10 (only for ADL530 and ADL550)
4114 Fieldbus M→S11 (only for ADL530 and ADL550)
4134 Fieldbus M→S12 (only for ADL530 and ADL550)
4144 Fieldbus M→S13 (only for ADL530 and ADL550)
4154 Fieldbus M→S14 (only for ADL530 and ADL550)
4164 Fieldbus M→S15 (only for ADL530 and ADL550)
4174 Fieldbus M→S16 (only for ADL530 and ADL550)
11170 Init pretorque
11168 Init pretorque dir

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.9.3	11170	Init pre-torque	%	INT16/32		0	-100	100	RWZ	EXP	VY	3,5

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	ADL
5.9.4	11172	Pre-torque ramp up	ms	INT16/32		0	0	10000	RWZ	EXP	VY	3,5

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	ADL
5.9.5	10098	Start ramp dw		ENUM		Lift stop			RWZ	EXP	VY	3,5
Setting of the signal to start the ramp down. 0 Lift stop 1 Brake closed 2 Timer When set 0, pretorque ramp down start when the lift start signal goes on When set 1, pretorque ramp down start when the brake command open signal goes on When set 2, pretorque ramp down start at the end of the ramp down timer (PAR 10174)												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.9.6	10174	Ramp dw timer	ms	ENUM		10			RWZ	EXP	VY	3,5
Setting the start time of the ramp down. The timer starts when the set pretorque value is reached.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.9.7	11174	Pre-torque ramp down	ms	INT16/32		0	0	60000	RWZ	EXP	VY	3,5
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	ADL
5.9.8	11176	Pre-torque offset	%	FLOAT		0	-100	100	RWZ	EXP	VY	3,5
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	ADL
5.9.9	11178	Pre-torque gain		FLOAT		0	-100	100	RWZ	EXP	VY	3,5
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	ADL
5.9.10	14040	Pre-torque input	%	INT16/32					R	EXP	VY	3,5
The reference value sampled at start is displayed.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.9.11	14056	Pre-torque out	%	INT16/32					R	EXP	VY	3,5
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	ADL
5.9.12	14058	Torque reference	%	INT16/32					R	EXP	VY	3,5
The torque reference value is displayed, given by the sum of the speed loop output and the torque feed forward.												

5.10 LIFT EMERGENCY

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

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

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 or UB drive version (which are able to reenergize drive by a buffer battery pack).

In order to use batteries or UPS 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).

- **Operation with Emergency Module Supplier (EMS or UB)**

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 7.10.

- **EMS or UB 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**.

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

When the emergency is activated, the Drive can be powered with 230V single-phase UPS connected to the input power connector of drive by interlocked with main supply contactors. For connection see ADL500 HW+QS (Quick Start Guide) section 7.10 without using ADL500 EMS or UB versions.

- **Battery-saving mode of operation**

The principle of operation of the function of return 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 motor 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 + Run), 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**.



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.

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.

In the case of selection "Battery Saving" (3) the direction that the motor takes is that indicated by the input of FW or REW command.

In the case of selection "Battsav+Rec" (4) the direction taken by the motor is independent of the enabled input FW or REW and follows the recommended 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 input 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 with energized motor.

Once the car has reached the floor is the control board that controls the motor stop by removing the direction command.

- **Manual emergency mode for imbalance**

The purpose of the function is to allow the movement of the cabin when there is no main power supply 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 by 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 also by simultaneous activation of the inputs frw and rev after setting the parameter 11820 to the value "Start fwd/rev".

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 + Run" 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 motor) 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 motor if rpm is set) and the Fwd or Rev direction. In case of inspection, the maneuver is disabled.

- **Automatic emergency maneuver for imbalance**

The maneuver is identical to the manual emergency maneuver 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 or UB drive version**

Selecting in par 11262 the values 0 Off, 1 autosel or 2 Recommended, with emergency input activated, at the first driving control the drive command 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 respect to EN 81-20 in case of movement of the motor 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. Positive value of velocity respect clockwise direction of motor shaft.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.10.1	11362	Autoselect direction		ENUM		Off			RW	INT	VS	3,5
Enables the type of emergency manoeuvre.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.10.3	11278	Em DC brk current	%	FLOAT		75.0	0	150	RW	INT	VS	3,5
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	ADL
5.10.4	11284	Detection Limit	%	UINT32		20	0	100	RWZ	INT	FVSY	3,5
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 with synchronous motors (see PAR 11262).												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.10.5	14282	Chosen direction		ENUM					R	INT	FVSY	3,5
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 and how roope are involved on traction pulley (clockwise direction is considered positive up direction).												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.10.6	11094	Brake release type		ENUM		Brake			RW	EXP	VY	3,5

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

0 Brake

1 Brake + Run

0: only the brake contactor is controlled.

1: both brake and run contactors are controlled. The motor short phase SC contactor can be controlled separately if it is wired to a different drive's digital output called SC cont mon.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.10.6	11822	Em max speed		UINT32		SIZE			RW	EXP	VY	3,5

Sets the maximum speed that the cabin (or motor) can have during the maneuver for unbalance movement.

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.10.7	11824	Brake lock time	s	UINT32		4	1	30	RW	EXP	VY	3,5

Setting the brake lock time when the car reaches the maximum speed allowed during the manoeuvre for unbalance movement.

5.11 LIFT ALARMS

The EFC application add to the drive alarms also follows specific alarms (for a detailed list of drive alarms see QS manual chapter 10).

Index	Error message shown on the display	Description
32	Enable missing	<p>Condition: (ADL550 only) Occurs if Enable is not activated within 4 seconds of the Safety Enable signal. If parameter 11060 Sequence start stop is set to Start fwd/rev or Start edge F7R mode, then the starting sequence begins with the start command (FED or REV direction) which enables the drive Run contactor output which closes the safe enable input followed by the enable input. For control cards older than version -9 (see PAR 198) a second fast enable input must be connected in parallel with the enable input.</p> <p>Solution:</p> <ul style="list-style-type: none"> • if necessary, check start (FRW or REV) signal • check the SAFETY connector, contacts 1 and 2. • check the Enable signal.. • check the electrical level and Safety Enable signal current capacity. • for drive that mount regulation board before -9 (see par 198) check if additional fast enable input is configured and/or cable is connected to fast enable input.
33	Cont feedback	<p>Condition: The contactor feedback signal does not match its command.</p> <p>Solution: Check contactor feedback wiring, check logic status of feedback input to drive, increase hold off time (PAR 11202).</p>
34	Brake Feedback	<p>Condition: The brake feedback signal does not match its command.</p> <p>Solution: Check brake feedback wiring, check logic status of feedback input to drive, increase hold off time (PAR 11206).</p>
35	Door Feedback	<p>Condition: The door feedback signal does not match its command.</p> <p>Solution: Check door feedback wiring, check logic status of feedback input to drive, increase hold off time (PAR 11212).</p>
36	Brake Failure	<p>Condition: Exceeding the Threshold A3 (PAR 11270).</p> <p>Solution: Reset alarm using the reset parameter (PAR 11268), check that brake is intact, increase threshold (PAR 11270).</p>
37	Safe Brake Test	<p>Condition: Safe Brake Test failed.</p> <p>Solution: Check that brake is intact, increase the maximum deviation threshold (PAR 11840).</p>
38	Speed limit	<p>Condition: Speed limitation warning to ensure correct landing at floor, it's active when menu distance is used.</p> <p>Solution: The distance used is not enough, increase the distance between slow down sensor and floor and update the related distance.</p>
39	Up/low limit	<p>Condition: Speed threshold exceeded in limit switches zone (sensors installed at the top and bottom of the lift/elevator shaft).</p> <p>Solution: Check speed set in limit switches zone, change speed limit (PAR 11216).</p>
40	Lift ext fault	<p>Condition: External alarm signal triggered (PAR 11258).</p> <p>Solution: Check causes enabling external alarm signal, increase hold off time (PAR 11266).</p>
41	EBC fault	<p>Condition: Intervention of the alarm signal communication with the EBC.</p> <p>Solution: Check the physical connection, the presence of termination resistors on both sides of the CAN connection and the configuration of the parameters using the alarm subcodes indicated in QS manual par 10 EBC fault code.</p>
42	No battery	<p>Condition: Battery monitoring alarm triggered.</p> <p>Solution: Check whether battery is properly connected to drive.</p>

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 not 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.
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	ADL
5.11.1	11200	Contactor activity		ENUM		Disable			RWZ	INT	FVSY	3,5
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	ADL
5.11.2	11202	Cont hold off	ms	INT32		1000	0	60000	RW	INT	FVSY	3,5
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	ADL
5.11.3	11204	Brake activity		ENUM		Disable			RWZ	INT	FVSY	3,5
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	ADL
5.11.4	11206	Brake hold off	ms	INT32		1000	0	60000	RW	INT	FVSY	3,5
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	ADL
5.11.5	10094	Brake 2 hold off	ms	INT32		1000	0	60000	RW	INT	FVSY	3,5
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	ADL
5.11.6	11208	Brake run hold off		ENUM		Enable			RW	INT	FVSY	3,5
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	ADL
5.11.7	11210	Door activity		ENUM		Disable			RWZ	EXP	FVSY	3,5
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	ADL
5.11.8	11212	Door hold off	ms	INT32		1000	0	60000	RW	EXP	FVSY	3,5
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	ADL
5.11.9	11258	Lift EF alarm src		ENUM		Null			RWZ	INT	FVSY	3,5
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 “LiftInputAdiCmd” selection list.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.11.10	11264	Lift EF al activity		ENUM		Lift stop			RWZ	INT	FVSY	3,5
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	ADL
5.11.11	11266	Lift EF hold off	ms	UINT32		1000	0	60000	RW	INT	FVSY	3,5

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	ADL
5.11.12	11842	SBT Activity		ENUM		Warning			RWZ	EXP	VY	3,5

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	ADL
5.11.13	10134	EBC Activity		ENUM		Disable drive			RWZ	INT	FVSY	5

Setting of drive behaviour in case of a “EBC fault” alarm.

- 2 Disable drive
- 4 Lift fast stop
- 5 Lift stop

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.11.14	11096	EBC hold off	ms	INT32		100	0	1000	RW	INT	FVSY	5

Sets the allowed delay time if EBC is in fault.

5.12 SAFE BRAKE TEST (only for ADL550)

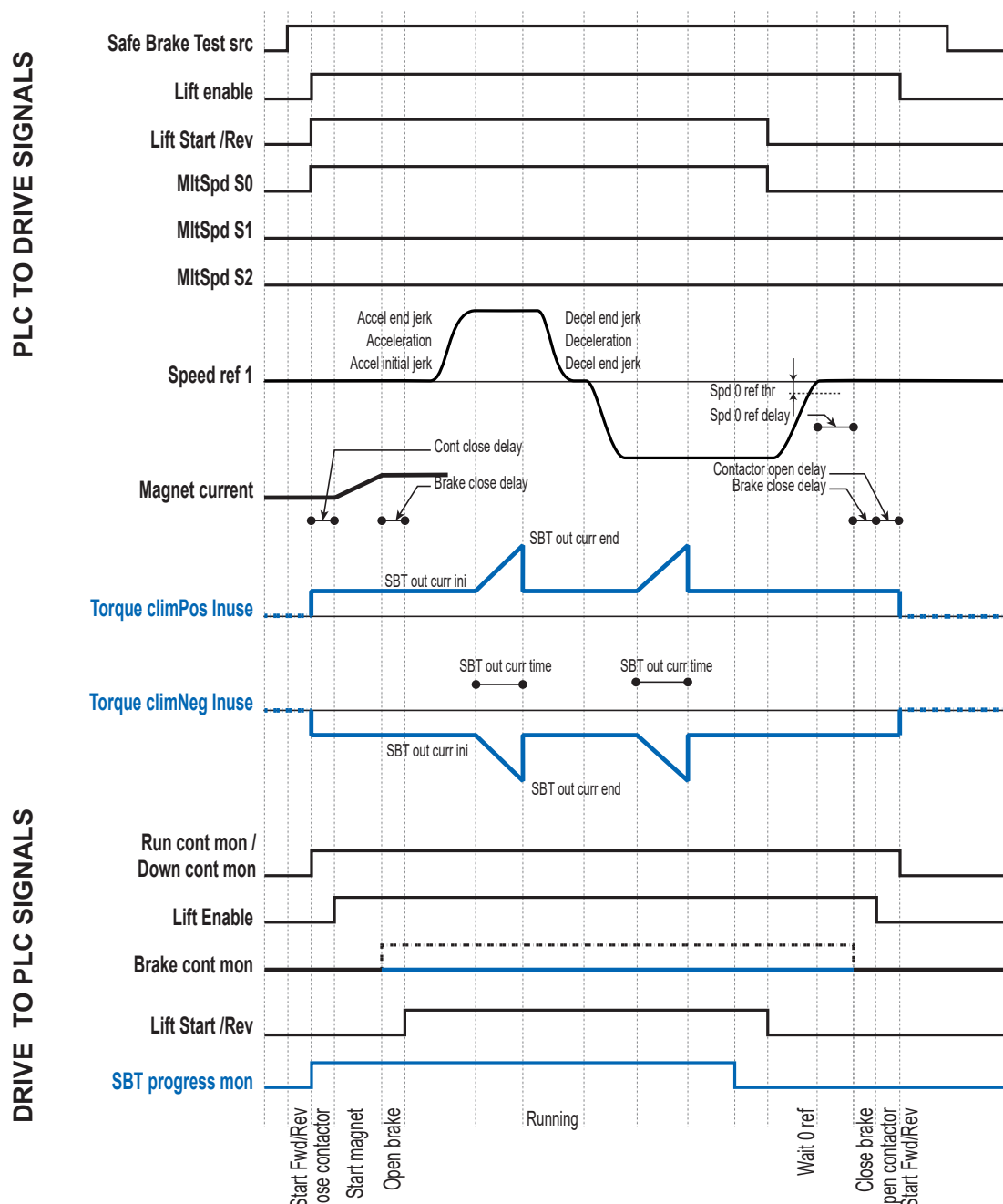
The **Safe Brake Test**, which can only be used in closed loop modes (PAR 540 **Control type** = [1] ASY FOC or [2] SYN FOC), is activated by raising the relevant digital input (**Safe Brake Test src** PAR 11832).

To activate the test:

- Raise the **StartREV** or the **StartFWD** and **Enable** commands and keep them high for the entire duration of the test.
- The line contactors are activated as in a normal maneuver.
- 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



During the commissioning of the installation and then in the periodic inspections it must be verified that the car, loaded with 125% of the capacity, is capable of stopping or slowing down to fixed stops with reduced energy.

Standard EN 81-20 in para 5.9.2.2.1 states:

'This brake must be capable of stopping the machinery by itself with the cab travelling downhill at the rated speed and with the rated capacity increased by 25%. Under these conditions, the deceleration of the cab must not be greater than the deceleration caused by parachute intervention or impact on the shock absorbers'.

This test must therefore be carried out during commissioning.

After successfully performing the test, it is time to find out what current given to the motor is capable of moving the empty car when only one of the two brakes is kept closed (the SBT function automatically performs the test by alternating the two brakes).

This current is an indication of the maximum torque required to move the motor with a ferrule at maximum efficiency.

This current can be found by running the SBT test several times to find the current value entered in the final SBT corr parameter, PAR 11836, which allows the motor to move with a closed brake.

Once this current has been found for each of the two brakes, the lowest value reduced by a percentage of approx. 25% must be entered in parameter **SBT out curr end**, PAR 11836.

During periodic brake tests, the drive will increase the current to the value entered and if the motor starts to turn, an alarm is sounded and the drive is taken out of service.

The purpose of the function is to indirectly monitor brake wear, so if the SBT test fails, the maintainer should re-run the braking test with the cab loaded as per the standard to check if the brakes are actually worn.

So to summarise:

- The test is carried out as indicated in the standard.
- Perform the SBT function several times with empty cab, increasing the current entered in the final SBT corr parameter, PAR 11836, in steps (approx. 10%) until the test fails.
- The current that caused the test to fail is stored in the SBT final corr parameter, PAR 11836 reduced by approx. 25%.

NOTE!

The safe brake test function is active in the ASY FOC and SYN motor control mode only.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.12.1	11832	Safe Brake Test src		ENUM		Null			RW	EXP	VY	5

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	ADL
5.12.2	11838	SBT out curr time	ms	INT16		2000	1	20000	RWZ	EXP	VY	5

Sets the time required to vary the output current from its initial value PAR 11834 **SBT out curr ini** to the final value PAR 11836 **SBT out curr end**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.12.3	11834	SBT out curr ini	%	INT16		75	0	150	RWZ	EXP	VY	5

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	ADL
5.12.4	11836	SBT out curr end	%	INT16		150	0	150	RWZ	EXP	VY	5

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	ADL
5.12.5	11840	SBT enc pos band		INT16		5	2	4000	RWZ	EXP	VY	5

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.

/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	ADL
5.12.6	10092	SBT 2th brake		INT16		Off	-	-	RWZ	EXP	VY	5

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 **StartREV** or the **StartFWD** and **Enable** 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.
- The 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	ADL
5.12.7	14284	SBT alarm mon		INT16					R	EXP	VY	5

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	ADL
5.12.8	14286	SBT progress mon		ENUM					R	EXP	VY	5

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 possible in combination with the EBC module. We have seen in chapter 5.12 details how to perform test.

The parameters concerned are 3:

- the type of particular test selected starting from standstill or with the motor 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 modified. 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	ADL
5.13.1	10138	EBC test type		INT16		Off			RW	EXP	FVSY	5
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	ADL
5.13.2	10140	EBC Sel brake		INT16		Brake1			RW	EXP	FVSY	5
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	ADL
5.13.3	10142	EBC test fbk		ENUM		Disable			RW	EXP	FVSY	5
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.

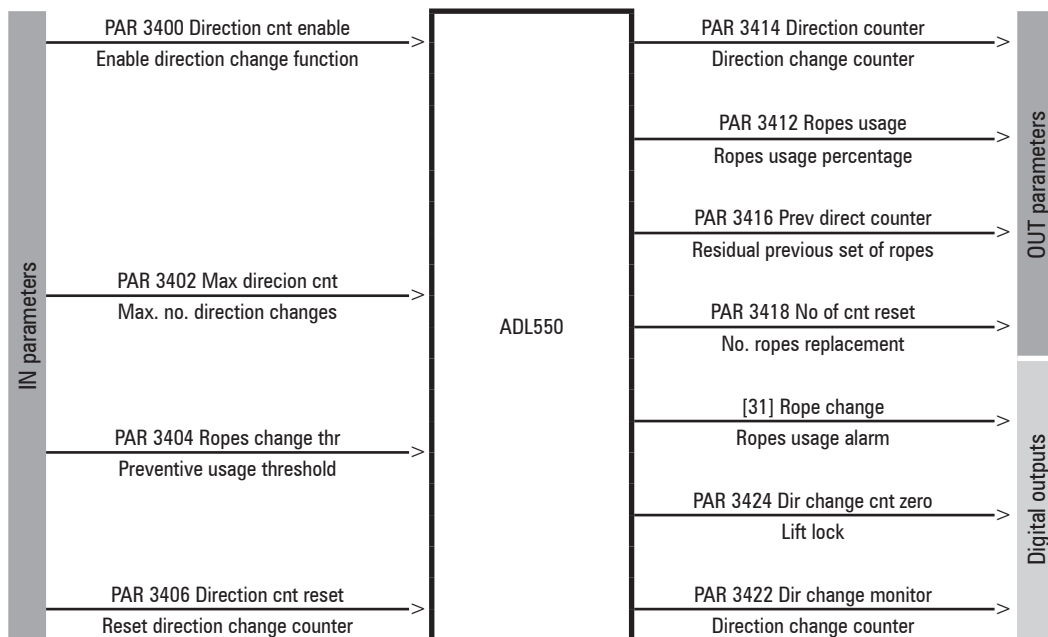
The most commonly used method is to use a password to gain access to data that cannot be deleted by mistake.

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 maintainer, 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	ADL
5.14.1	3400	Direction cnt enable		ENUM		Disable			RW	EXP	FVSY	3,5
		0 Disable										
		1 Enable										
		Enables the “Direction change count” function.										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.2	3402	Max direction cnt		UINT32		0	0	2147483647	RW	EXP	FVSY	3,5
Sets the maximum allowed number of direction changes.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.3	3404	Rope change thr	%	UINT32		98	0	100	RW	EXP	FVSY	3,5
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	ADL
5.14.4	3406	Direction cnt reset		BIT		0	0	1	RW	EXP	FVSY	3,5
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	ADL
5.14.5	3408	Dir cnt password		UINT32		0	0	999999	RW	EXP	FVSY	3,5
5.14.6	3450	Password status		ENUM		Free			R	EXP	FVSY	3,5
5.14.7	3410	Dir cnt new password		UINT32		0	0	999999	RW	EXP	FVSY	3,5
With parameters 3408 and 3410 the modification of parameters 3400, 3402, 3404, 3406, 3410 is protected. For one-time password management see parameter 3440. The password is a numeric code of up to 6 digits. To set a password from the keypad (from the configurator the new password is entered once), 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, write access is maintained until the drive is restarted. On restarting, write access to the parameters is re-established by means of a password. If the password is forgotten, it is possible to recover access to change it by using parameter 3442 PWD code build which generates a temporary code indicated by parameter 3444 PWD code which must be communicated to the Service, which will deliver a one-time password to be entered in parameter 3408, thus allowing a new known password to be entered in parameter 3410. For one-time password management, see the instructions in the description of PAR 3440. The parameter 3450 is a read-only parameter and indicates the activation status of the password. Possible values are: Free = no password set Locked = password active and entered Static pass = static password set but not entered OT pass = onetime password set but not entered Reset pass = onetime password generated OT reset pass = onetime password entered												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.8	3412	Ropes usage		UINT16	16BIT_L	0			R	EXP	FVSY	3,5
<p>Displays the ropes usage counter (as percentage) of parameter 3402 Max direction cnt.</p> <p>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.</p> <p>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.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.9	3414	Direction counter		UINT32	32BIT	0			R	EXP	FVSY	3,5
<p>Displays the countdown of direction changes remaining until useful life of the ropes is reached.</p> <p>When PAR 3414 = "0" the ropes must be replaced (corresponds to PAR 3412 = 100%): the drive finishes the current travel and then locks.</p> <p>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).</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.10	3416	Prev direct counter		UINT32	32BIT	0			R	EXP	FVSY	3,5
<p>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.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.11	3418	No of cnt reset		UINT32	32BIT	0			R	EXP	FVSY	3,5
<p>Displays the number of rope changes made.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.12	3420	Ropes change req mon		BIT	16BIT_L	0	0	1	R	EXP	FVSY	3,5
<p>Activates when the percentage of rope usage (set in PAR 3412 Ropes usage) exceeds the set threshold (PAR 3404 Ropes change thr).</p> <p>This signal is inserted in the L_DIGSEL1 selection list and can be brought to a digital output.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.13	3422	Dir change monitor		BIT	16BIT_L	0	0	1	R	EXP	FVSY	3,5
<p>This signal stays on for one second each time the drive detects a direction change and thus decrements the counter.</p> <p>This signal is inserted in the L_DIGSEL1 selection list and can be brought to a digital output.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.14	3424	Dir change cnt zero		BIT	16BIT_L	0	0	1	R	EXP	FVSY	3,5
<p>This signal activates when the drive is locked because 3414 Direction counter has reached 0.</p> <p>This signal is inserted in the L_DIGSEL1 selection list and can be brought to a digital output.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.15	3434	Save rope to USB		BIT		0	0	1	RWZ	EXP	FVSY	3,5
<p>Lets you save the configuration of the "Direction change count" function on the USB.</p> <p>The set of parameters is saved in a dedicated area on the USB memory.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.16	3436	Load rope from USB		BIT		0	0	1	RWZ	EXP	FVSY	3,5
<p>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.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.17	3440	Dircnt password type		ENUM		Static			RWZ	EXP	FVSY	3,5
<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.18	3442	PWD code build		BIT		0	0	1	RW	EXP	FVSY	3,5
<p>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 generated code will be visible in parameter 3444.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.19	3444	PWD code		UINT32		0.0			R	EXP	FVSY	3,5
<p>One time code generated by confirmation of parameter 3442 Pwd code build.</p>												

5.15 SUSPENSION SLIPPAGE TEST

Periodic control of suspension slippage with counterweight or cabin on fixed arrests with non-traditional suspensions, i.e. made with belts or coated ropes, leads to a sudden deterioration of these new suspensions making it a destructive test. To avoid this, we exploit the internal potential of the drive to promptly detect suspension slippage during these tests. The basic idea is to exploit the sudden increase in motor speed compared to the reference speed as soon as the suspension begins to slip.

To do this, when we want to do the test, we need to act on the speed ref loss alarm by lowering the threshold and lowering the intervention filter time.

To facilitate this test, a wizard has been added to the troubleshooting wizard menu. The wizard contains the parameters and instructions described below.

The procedure to follow is the following:

- Take the cabin to the lower floor,
- Write down somewhere the values contained in the following parameters:
 - PAR 4550 Speed ref loss
 - PAR 4554 speed ref loss holdon
- Make sure that the parameter 4552 Spdref loss activity is set to disable drive mode
- Then lower the par 4554 to a value of 100ms and lower the speed ref loss value by a few rpm and then make an up call with the inspection button panel.

If the drive stops in speed ref loss alarm then raise the parameter 4550 by a few rpm and always try making an up call until the alarm no longer occurs for a difference of a few rpm; if instead the drive does not stop in speed ref loss then lower the parameter 4550 until it starts to signal the alarm. In this way the limit situation of operation in normal mode has been found without any alarms occurring.
- At this point you must start with the suspension slippage test by bringing the counterweight to rest in the pit and then starting uphill (using the inspection button panel and some assembly method that allows you to move during maintenance in the re-leveling area and with bypassed extra travel) or better, by commanding the ascent until the counterweight goes to rest (with the opportunity it is perhaps the case to lower the inspection speed so that when it goes to rest, the counterweight, does not take too strong a jolt). If the suspensions start to slip, the engine sees an instantaneous speed beyond the thresholds set with respect to the reference speed and should immediately block in speed ref loss alarm avoiding damaging the suspensions.

It would then be better to do the test having the possibility of seeing the engine pulley to be sure that the speed ref loss occurs due to a slipping of the suspensions and to stop the maneuver immediately if the speed ref loss does not occur and the suspensions start to slip.

- Once the test is finished, the initial values must be put back into parameters 4550 and 4554.
Remember that the parameters, if not saved, are not maintained after a restart.

5.16 PRE-LIMIT SWITCH

The EN81-20 standard in paragraph 5.12.1.3 provides that for systems with short-stroke shock absorbers, monitoring of the normal slowdown of the machinery is provided in order to stop the cabin by means of the brake if the cabin arrives at the extreme floor at too high a speed. If auxiliary limit switches are used, the drive provides two monitoring/action options.

Using a digital input connected to an additional limit switch that is active closed only in extreme slowdown zone (the drive provides 2 input for possible separate management of the upper and lower limit switches), if the drive detects that upon activation of the digital input programmed in parameter 11246 Upper limit sel or 11248 Lower limit sel, the cabin speed exceeds the value set in parameter 11216 Speed threshold lim, then it stops the cabin movement with the mode set in parameter 11214 Upper/lower limit activity. If the limit speed threshold PAR 11216 is set to 0 then the functionality is deactivated.

According to the standard, the additional overtravel must be appropriately positioned in the slowdown zone so as to ensure that in the event of a malfunction the cabin impacts the shock absorbers at a speed lower than the maximum speed allowed by them.

6. COMMUNICATION

6.1 CONTROL COMMUNICATION (CONTROL COMM)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.1.1	4000	Communication mode		ENUM		Parallel			RW	INT	FVSY	3,5
Setting the type of communication to be used.												
With DS417 application only CAN417 serial communication mode is available.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.1.6	4004	Fieldbus baudrate		ENUM		250k			RW	EXP	FVSY	3,5
Setting of the communication network speed (Baud Rate).												
1 125k 2 250k 3 500k 4 1M												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.1.7	4006	Fieldbus address		INT16		2	1	127	RW	EXP	FVSY	3,5
Setting of the node address of the drive when connected to the network.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.1.8	4010	Fieldbus M→S enable		ENUM		Enable			RWZ	EXP	FVSY	3,5
Setting of fieldbus data updating.												
Only for PAR 4000 Communication mode = (1) CanOpen.												
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	ADL
6.1.9	4012	Fieldbus alarm mode		INT32		0	0	1	RWZ	EXP	FVSY	3,5

Setting of the **Opt Bus Fault** alarm generation mode.

- 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	ADL
6.1.10	4014	Fieldbus state		ENUM		Stop			R	EXP	FVSY	3,5

The logic status of the fieldbus connection is displayed. The value depends on the type of bus that is used.

- 0 Stop
- 1 PreOperational
- 2 Operational

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.1.11	4338	Fieldbus error		UINT16					R	EXP	FVSY	3,5

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	ADL
6.1.12	4008	Can termin.resistor		ENUM		Off			RW	EXP	FVSY	3,5

Activation of the internal termination resistor.

- 0 Off
- 1 On

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.1.13	9202	Enable remote write		BIT					RW	INT	FVSY	3,5

A time-controlled parameter (15 minutes) which, if activated by keypad, allows remote access via app to the parameter writing mode. This parameter is to be used with a person on site remotely connected to a service that needs to change inverter parameters.

- 0 Parameter deactivated
- 1 Parameter activated with time counting in progress

6.6 NETWORK CONFIG

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	ADL
6.6.1	9610	Readonly Username		STRING16		readonly			R	EXP	FVSY	3,5
Username assigned to the “Readonly” access level.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.2	9626	Easy Username		STRING16		ESY			R	EXP	FVSY	3,5
Username assigned to the “Easy” access level.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.3	9634	Easy Password		STRING16		ESY			RW	EXP	FVSY	3,5
Password used to access the “Easy” level.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.4	9642	Interm Username		STRING16		interm			R	EXP	FVSY	3,5
Username assigned to the “INT” (Intermediate) access level.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.5	9650	Interm Password		STRING16		interm			RW	EXP	FVSY	3,5
Password used to access the “INT” (Intermediate) access level.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.6	9658	Expert Username		STRING16		EXP			R	EXP	FVSY	3,5
Username assigned to the “Expert” access level.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.7	9666	Expert Password		STRING16		EXP			RW	EXP	FVSY	3,5
Password used to access the “Expert” level.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.8	9544	WiFi Fw version		UINT32		0			R	EXP	S	3,5
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	ADL
6.6.9	9546	WiFi S/N		UINT32		0			R	EXP	S	3,5
The WiFi Drive Link module serial number is displayed.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.10	9528	WiFi Network name		STRING16		WEG wifi			R	EXP	S	3,5
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	ADL
6.6.11	9536	WiFi Network Pass		STRING16		0123456789			R	EXP	S	3,5

Password used to connect to the network generated by the Wi-Fi Drive Link dongle. To be compliant with cybersecurity this password is visible only using keypad. This password is not visible via Modbus, via WEG_DriveLabs and via APP WEG Liftouch.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.12	9554	WiFi Network Channel		UINT16		11	0	12	R	EXP	S	3,5
Wi-Fi network channel.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.13	9556	IP Address set		UINT32		169.254.10.10			RW	EXP	FVSY	3,5
Enters the network IP address.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.14	9558	IP Netmask set		UINT32		255.255.0.0			RW	EXP	FVSY	3,5
Enters the subnet IP address.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.15	9560	IP Gateway set		UINT32		0.0.0.0			RW	EXP	FVSY	3,5
Enters the gateway IP address.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.16	9564	IP Netmask		UINT32		255.255.0.0			R	EXP	FVSY	3,5
Subnet IP address in use.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.17	9566	IP Gateway		UINT32		0.0.0.0	0	0	R	EXP	FVSY	3,5
Gateway IP address in use.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.18	9608	IP Assignment		ENUM		Static	0	0	RW	EXP	FVSY	3,5
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	ADL
7.1	392	Select motor		BIT		0	0	1	RWZ	INT	FVSY	3,5

This parameter is used to load into the drive motor data 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.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.2	2000	Rated voltage	V	FLOAT		SIZE	150	480	RWZ	INT	FVSY	3,5

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	ADL
7.3	2002	Rated current	A	FLOAT		SIZE	1	1500	RWZ	INT	FVSY	3,5

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	ADL
7.4	2004	Rated speed	rpm	FLOAT		SIZE	10	32000	RWZ	INT	FVSY	3,5

Rated asynchronous speed of the motor with full load in rpm. In some motors, on plate, are indicated the synchronous speed (e.g. 1500 rpm for a 4-pole motor) and slippage, i.e. the loss of revolutions between the motor idling load condition and the rated load condition (e.g. 80 rpm); in this case enter in parameter 2004 the following: synchronous speed - slippage.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.5	2006	Rated frequency	Hz	FLOAT		SIZE	1	1000	RWZ	INT	FVS	3,5

Rated frequency of the motor expressed in Hz.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.6	2008	Pole pairs		UINT16		SIZE	1	60	RWZ	INT	FVSY	3,5

Motor pole pairs. The number of motor pole pairs is calculated using the motor plate data and applying the following formula:

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

Where:

p = motor pole pairs;

f = motor rated frequency (PAR 2006);

nN = motor synchronous rated speed (Attention: it's =PAR 2004+slippage). For 4-pole motors (2 pole pairs) the synchronous speed with a 50Hz mains frequency is 1500rpm while with a 60Hz frequency it is 1800rpm.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.7	2010	Rated power	kW	FLOAT		SIZE	0.1	1500	RWZ	INT	FVS	3,5

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	ADL
7.8	2012	Rated power factor		FLOAT		SIZE	0.6	0.95	RWZ	INT	FVS	3,5

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	ADL
7.9	2014	Torque constant		FLOAT		SIZE	0	120	RWZ	INT	Y	3,5

Setting of the ratio between the torque generated and the rated current of the motor, if this data is not present on the motor plate, it can be recovered by dividing the nominal torque value of the motor by the nominal current of the motor. Torque constant = (Nominal torque Nm)/(Nominal current A).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.10	2020	Take parameters		BIT		0	0	1	RWZ	INT	FVSY	3,5

Acquires the set motor data in the drive. This command must be given last after entering the appropriate values for all the parameters listed above. This involves internal recalculations of the drive to optimize the operation of the system based on the entered motor data. The drive cannot be operated until the Acquire parameters command has been set.



For commissioning, the use of the Startup Wizard is recommended. At the end of Startup Wizard this parameter is automatically changed by drive.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.11	2022	Autotune rotation		BIT		0	0	1	RWZ	INT	FVS	3,5

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. Self-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	ADL
7.12	2024	Autotune still		BIT		0	0	1	RWZ	INT	FVSY	3,5

Performs self-tuning with the motor coupled to the transmission with brake closed. The self-tuning procedure may cause limited rotation of the motor shaft or high vibration and loud. 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	ADL
7.13	2030	Autotune status		ENUM		Required			R	INT	FVSY	3,5

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	ADL
7.14	2050	Measured Rs	ohm	FLOAT		0	0	200	RW	EXP	FVSY	3,5

Measured value of the rotor resistance.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.15	2052	Measured DTL	V	FLOAT		0	0	100	RW	EXP	FVSY	1,3,5

Measured value of dead time compensation.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.16	2054	Measured DTS	V/A	FLOAT		0	0	100	RW	EXP	FVSY	3,5

Measured compensation gradient value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.17	2056	Measured Lsig	mH	FLOAT		0.1	0.1	200	RW	EXP	FVS	3,5

Leakage inductance value measured (only for asynchronous motors).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.18	2058	Measured LsSyn	mH	FLOAT		0.1	0.1	200	RW	EXP	Y	3,5

Stator inductance value measured (only for synchronous motors).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.19	2060	Measured LsMin Syn	mH	FLOAT		0.1	0.1	200	RW	EXP	Y	3,5

Minimum stator inductance value measured (only for synchronous motors).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.20	2062	Measured ImN	A	FLOAT		CALCF	0	1000	RW	EXP	FVS	3,5

Measured value of the rated magnetising current.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.21	2066	Measured FlxN	Wb	FLOAT		CALCF	0	10	RW	EXP	FVS	3,5

Measured flux saturation value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.22	2076	Measured Rr	ohm	FLOAT		CALCF	0	200	RW	EXP	FVS	3,5

Measured rotor resistance value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.23	2078	Take tune paramenters		BIT		0	0	1	RW	INT	FVSY	3,5

Takes the motor data calculated by the self-tuning procedure in the drive. this parameter is changed automatically when used raccomanded startup procedure. Remember that for save all data is necessary a Save parameter command.

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	ADL
8.1	2100	Encoder pulses	ppr	UINT16		1024	4	16384	RWZ	INT	FVSY	3,5

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	ADL
8.2	2102	Encoder supply	V	FLOAT		5.2	5.2	20.0	RW	INT	FVSY	3,5

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	ADL
8.3	2104	Encoder input config		ENUM		TTL			RWZ	INT	FVSY	3,5

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 6.0 V.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.4	2106	Encoder repetition		ENUM		No division			RWZ	INT	FVSY	3,5

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	ADL
8.5	2108	Encoder signal Vpp	V	FLOAT		0.8	0.5	1.2	RWZ	INT	FVSY	3,5

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	ADL
8.6	2110	Encoder signal check		ENUM		Check A-B			RWZ	EXP	FVSY	3,5

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	ADL
8.7	2116	ENC signal Vpp inc	V	FLOAT		0			R	EXP	FVSY	3,5
Displays the Vpp signal of the sinusoidal tracks of the connected encoder.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.8	2118	ENC signal Vpp abs	V	FLOAT		0			R	EXP	FVSY	3,5
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	ADL
8.9	2130	Encoder direction		ENUM		Not_inverted			RWZ	INT	FVSY	3,5
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 on traction pulley side shaft. To ensure correct operation, the regulation algorithms ensure that positive speed references correspond to positive speed measurements.												
If the ropes on motor pulley are mounted in manner that with pulley that turn in clockwise direction cabin go in down direction we have that speed reference is positive but speed measurement is negative; in this case we have 2 possible solutions:												
a) invert the incremental encoder A+ and A- signals and the absolute encoder Sin+ and Sin- signals on the encoder connections. Consider that the absolute part cannot be inverted with Endat and Hiperface absolute encoders so for this type of encoder is better to change this parameter.												
b) change this parameter.												
Following option a or b, the motor phasing must be performed again.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.10	2132	Encoder mode		ENUM		None			RWZ	INT	FVSY	3,5
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 (only for ADL530 and ADL550) 4 Sinus ENDAT (only for ADL530 and ADL550) 5 Sinus BiSS (only for ADL530 and ADL550) 6 ENDAT (only for ADL530 and ADL550) 7 BiSS (only for ADL530 and ADL550) 8 Sinus SSI (only for ADL530 and ADL550)												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.11	2134	Encoder speed filter	ms	FLOAT		1.0	0.1	8.0	RW	EXP	FVSY	3,5
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	ADL
8.12	2136	Peripheral encoder		BIT		0	0	1	RW	EXP	FVSY	5
This parameter lets you select if the encoder is positioned on the tangent of the motor rotor.												
This parameter is visible only in ADL550 version with par 2132 Encoder mode = Digital.												
0 No 1 Yes												
<div>NOTE:</div> <div>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.</div>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.13	2184	Ext motor diam	mm	UINT16		1	1	65535	RWZ	EXP	FVSY	5

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	ADL
8.14	2186	Enc pulley diam		UINT16		1	1	65535	RWZ	EXP	FVSY	5

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	ADL
8.15	2150	Encoder speed	rpm	INT16	16BIT_H	0			R	ESY	FVSY	3,5

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	ADL
8.16	2162	Encoder position	cnt	UINT16	16BIT_L	0			R	ESY	FVSY	3,5

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	ADL
8.17	2164	Encoder abs position	cnt	UINT32	32BIT	0			R	EXP	FVSY	3,5

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	ADL
8.18	2172	SpdFbkLoss code		UINT16		0			R	EXP	FVSY	3,5

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 A→0 -> 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	ADL
8.19	2174	Endat error code		UINT16		0			R	EXP	FVSY	3,5
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	ADL
8.20	2176	Encoder sync mode		UINT16		1	0	3	RWZ	EXP	Y	3,5
<p>Setting of the rate of synchronisation between incremental and absolute tracks.</p> <p>If set to 0 synchronisation is only performed once at power on.</p> <p>If set to 1 synchronisation is performed each time the start command is entered.</p> <p>If set to 2 synchronisation is performed every 128 ms.</p> <p>If set to 3 synchronisation is always performed, using the absolute section.</p> <p>This function can only be used with absolute encoders Sinus SINCOS, Sinus ENDAT, Sinus BISS and Sinus SSI.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.21	2138	Encoder abs enable		BIT		1	0	1	RW	EXP	Y	3,5
<p>0 disable absolute track reading</p> <p>1 enable absolute track reading</p> <p>Parameter that enables or disables the reading of the absolute tracks of an ENDAT or SINCOS encoder. This parameter, by disabling the absolute tracks, allows you to perform a diagnostic of the encoder and motor operation to see for example if there are signal or motor power cables inversions.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.22	2190	Autophase rot		BIT		0	0	1	RWZ	EXP	Y	3,5
<p>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.</p> <p>In order to execute the command:</p> <ul style="list-style-type: none"> make sure the drive is not in Enable mode (pin 9 not closed). 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). the user has to open the brake as, for safety reasons, the output controlling the brake contactor is not enabled by the drive. at the end of the procedure you will be asked to re-open the enabling contact (Enable) to confirm completion. <p>NOTE! See section "G.2.1 Rotation phasing" for further information.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.23	2192	Autophase still		BIT		0	0	1	RWZ	EXP	Y	3,5
<p>This parameter can be set to perform encoder phasing without the motor running: the brake must be closed.</p> <p>In order to execute the command:</p> <ul style="list-style-type: none"> 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. <p>NOTE! See section "G.2.2 Static phasing" for further information.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.24	2748	Phasing mode		ENUM		Mode_1			RW	EXP	Y	3,5

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	ADL
8.25	2194	Autophase mode		ENUM		Each enable			RW	EXP	Y	3,5

The encoder phasing procedure is run as follows (if the encoder is not absolute):

0 First enable first time enable is received after start

1 Each enable each time the drive receives an enable signal

2 Count enable periodically at nth enable signal configurable with PAR 2198.

When the drive performs the calibration procedure from the engine, audio tones are heard. If these tones are heard at every start then the parameter is set to value 2 Every enable.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.26	9920	Autophase still type		ENUM		Standard			RW	EXP	Y	3,5

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	ADL
8.27	9922	Autophase I_{max} gain		FLOAT		1	0.01	1.5	RW	EXP	Y	3,5

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	ADL
8.28	2198	Autophase cnt enable		UINT16		25	2	65535	RWZ	EXP	Y	3,5

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	ADL
8.29	7100	BiSS encoder type		UINT16		0			R	EXP	Y	3,5

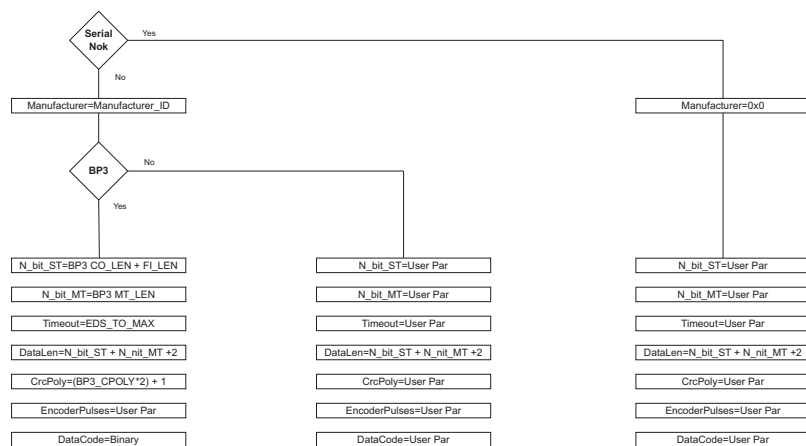
At power-on, it is checked whether the connected encoder has the incremented tracks and if it has an electronic data sheet (EDS).

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	ADL
8.30	7102	BiSS manufacturer		UINT16		0			R	EXP	Y	3,5

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	ADL
8.31	7104	BiSS clock freq		UINT16		7	0	15	RW	EXP	Y	3,5

This parameter allows setting of the BiSS sensor frequency.

Code	Sensor frequency	Sensor period
1	6,25 MHz	0,160 μ sec
2	4,16 MHz	0,240 μ sec
3	3,12 MHz	0,320 μ sec
4	2,50 MHz	0,400 μ sec
5	2,08 MHz	0,480 μ sec
6	1,78 MHz	0,560 μ sec
7	1,56 MHz	0,640 μ sec
8	1,38 MHz	0,724 μ sec
9	1,25 MHz	0,800 μ sec
10	1,13 MHz	0,884 μ sec
11	1,04 MHz	0,961 μ sec
12	0,96 MHz	1,041 μ sec
13	0,89 MHz	1,123 μ sec
14	0,83 MHz	1,204 μ sec
15	0,78 MHz	1,282 μ sec

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 μ sec	0 μ sec	40 μ sec
Transmission data time T = N Bit * "Sensor period" N Bit = BiSS data len + Crc(6) + Start(1) + Stop(1)			
Timeout BiSS TO_MAX	13 μ sec	0 μ sec	40 μ sec

The sum of the three contributions must be less than 100 μ sec.

If the sum of the three contributions exceeds 100 μ sec then the BiSS clock frequency must be increased.

i.e.:

BiSS clock freq = 7 = 0.640 μ sec

BiSS data len = 15

Contributions	Typ Time
Processing time for single cycle data + Transmission delay	10.00 μ sec
Transmission data time T = N Bit * "Sensor period" N Bit = BiSS data len + Crc(6) + Start(1) + Stop(1)	14.74 μ sec
Timeout BiSS TO_MAX	13.00 μ sec
Total	37.74 μ sec

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.32	7106	BiSS N bit ST		UINT16		13	0	64	RW	EXP	Y	3,5

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.33	7108	BiSS N bit MT		UINT16		0	0	64	RW	EXP	Y	3,5

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.34	7110	BiSS data len		UINT16		0			R	EXP	Y	3,5

This parameter shows the frame data length.
This parameter is settled automatically.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.35	7112	BiSS timeout	us	FLOAT		13	0	65	RW	EXP	Y	3,5

This parameter allows setting the BiSS Timeout. This parameter is automatically settled in case of encoder with EDS. This parameter must be settled 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	ADL
8.36	7114	BiSS Crc polinomy		UINT16		67	1	65535	RW	EXP	Y	3,5

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.37	7116	BiSS data code		ENUM		Binary			RW	EXP	Y	3,5

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	ADL
8.38	2178	Abs offset memory		ENUM		Drive memory			RW	EXP	Y	3,5

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	ADL
8.39	7150	SSI N bit ST		UINT16		13	0	13	RW	EXP	Y	3,5

This parameter sets the number of position bits of SSI encoder.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.40	7152	SSI N bit MT		UINT16		0	0	19	RW	EXP	Y	3,5

Number of bits for the single turn data (multiturn encoder only).

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.41	7154	SSI N bit TX		UINT16		13	0	32	RW	EXP	Y	3,5

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	ADL
8.42	7156	SSI data code		ENUM		Gray			RW	EXP	Y	3,5

Data code.

0 Binary

1 Gray

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.43	2732	Enc position offset		INT16		0			RW	EXP	Y	3,5

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	ADL
9.1	1058	Safety en mon		BOOL	16BIT_L				R	ESY	FVSY	5
Safety enable input signal status.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
9.2	11088	Contactless Enable		BOOL		Off			RW	INT	FVSY	5
This should be configured if the contactless mode is desired. By enabling this parameter, the Fast enable command is brought to digital Input 4 and the drive indicates the contactless operation mode to the controller through digital output 4. With control boards from version -9a onwards, the ENHW digit input is a fast input and there is no longer any need to activate a second digital input Fast Enable												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
9.3	11252	Brake fbk A3 src		ENUM		Null			RW	INT	FVSY	3,5
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 " LiftInputAdICmd " 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	ADL
9.4	11270	Threshold A3	m	FLOAT		0.1	0	2	RW	INT	FVSY	3,5
When automonitoring of brake function (ex A3 amendment) is activated, if on the drive is setted also un encoder, a second control of unwanted movement is involved: this control compare eventually motor movement with brake close with this threshold and if value is hight of threshold an errore Brake failure alarm will accour.												

10. REGULATION 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.

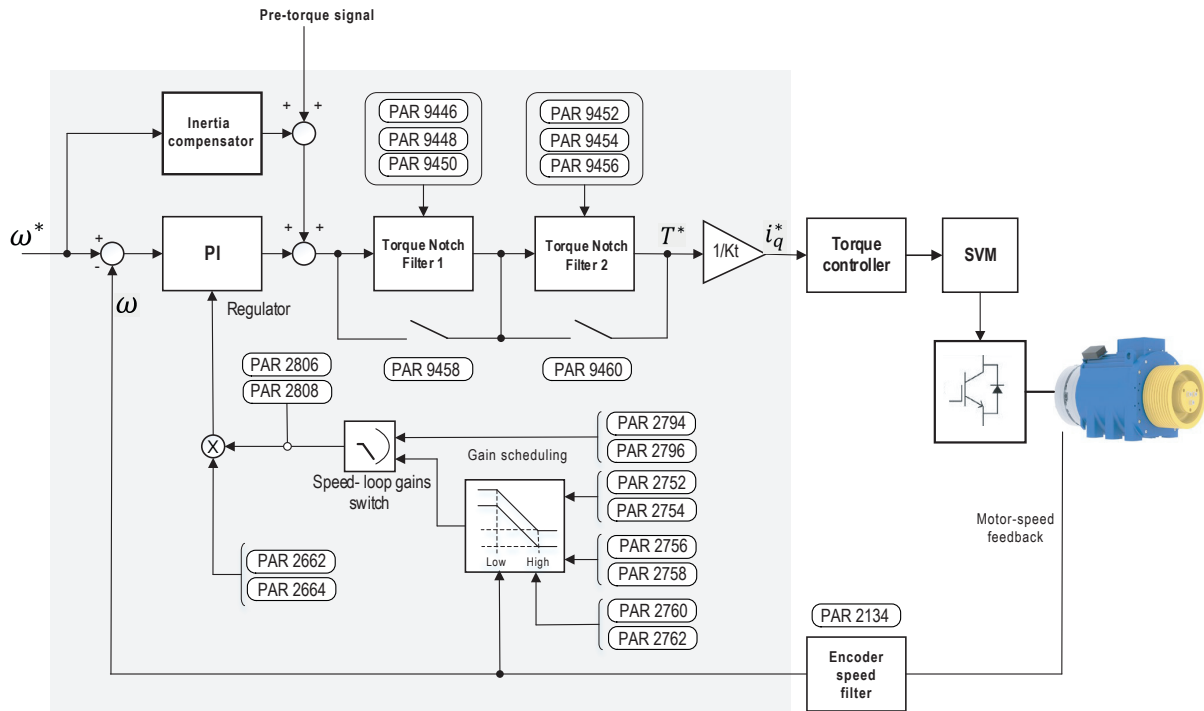
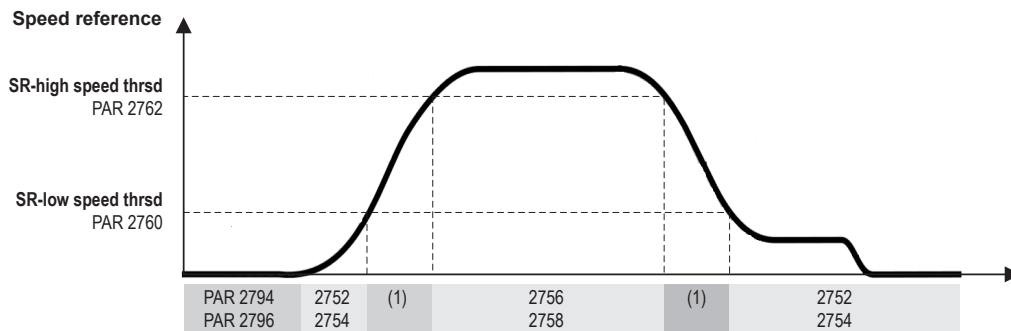


Figure 11.1: Motor speed control loop block diagram



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.

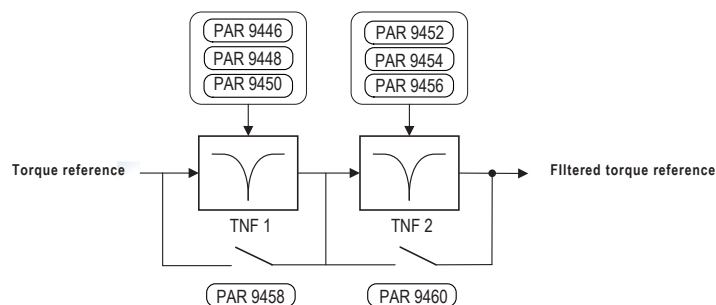


Figure 11.3: Suppressor filters in cascade

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.1.2	2240	Inerzia	kgm ²	FLOAT		0.8	0.001	1000	RW	INT	VSY	3,5

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	ADL
10.1.3	9702	Learning trip out	kgm ²	FLOAT		0			R	EXP	FVSY	3,5

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	ADL
10.1.4	2794	SR-P gain at start	%	FLOAT		150.0 (*)	0.0	400.0	RW	INT	VSY	3,5

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: 100 = ASY SSL, 150 = ASY FOC, 110 = SYN FOC

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.1.5	2796	SR-I gain at start	%	FLOAT		110.0 (*)	0.0	400.0	RW	INT	VSY	3,5

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	ADL
10.1.6	2752	SR-P gain low speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY	3,5

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	ADL
10.1.7	2754	SR-I gain low speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY	3,5

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	ADL
10.1.8	2756	SR-P gain high speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY	3,5

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	ADL
10.1.9	2758	SR-I gain high speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY	3,5

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	ADL
10.1.10	2760	SR-low speed thrsd	%	UINT16		30	1	100	RW	INT	VSY	3,5

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	ADL
10.1.11	2762	SR-high speed thrsd	%	UINT16		70	1	100	RW	INT	VSY	3,5

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	ADL
10.1.12	2662	SR-P gain	N/rpm	FLOAT		1.0			RW	INT	VSY	3,5

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 parameter PAR 2240 **Inertia**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.1.13	2664	SR-I time	ms	FLOAT		1.0			RW	INT	VSY	3,5

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	ADL
10.1.14	9446	TNF1-frequency	Hz	FLOAT		100.0	5.0	350.0	RW	INT	VSY	3,5

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	ADL
10.1.15	9448	TNF1-bandwidth	Hz	FLOAT		4	1	20	RW	EXP	VSY	3,5

Defines the TNF1 suppressor filter's frequency band.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.1.16	9450	TNF1-depth		FLOAT		20	3	60	RW	EXP	VSY	3,5

Specifies the TNFR1 suppressor filter's attenuation value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.1.17	9458	Torque Notch Fltr 1		ENUM		Disable			RW	EXP	VSY	3,5

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	ADL
10.1.18	9452	TNF2-frequency	Hz	FLOAT		100.0	5.0	350.0	RW	EXP	VSY	3,5

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	ADL
10.1.19	9454	TNF2-bandwidth	Hz	FLOAT		4	1	20	RW	EXP	VSY	3,5

Defines the TNF2 suppressor filter's frequency band.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.1.20	9456	TNF2-depth		FLOAT		20	3	60	RW	EXP	VSY	3,5

Specifies the TNF2 suppressor filter's attenuation value.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.1.21	9460	Torque Notch Fltr 2		ENUM		Disable			RW	EXP	VSY	3,5

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	ADL
10.1.22	2806	SR-P gain in use	%	FLOAT		100.0			R	INT	VSY	3,5

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	ADL
10.1.23	2808	SR-I gain in use	%	FLOAT		100.0			R	INT	VSY	3,5

Read-only parameter. Contains the current value of the speed controller's integral action level.

10.2 VF CONTROL

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.1	2200	Boost voltage	%	FLOAT		3	0	20.0	RW	ESY	F	3,5

Specifies the additional voltage value applied to the motor terminals at low speeds to increase the delivered torque. Excessive values produce an increase of current draw and motor heating due to the resistive losses in stator winding. Possible range of values: 0...20% of motor rated voltage.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.2	2202	Base voltage	V	FLOAT		0			RW	ESY	F	3,5

Specifies the maximum voltage value applicable to the motor terminals. This parameter's setting is defined by the drive automatically, based on the motor data plate, during the Wizard procedure.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.3	2204	Base frequency	Hz	FLOAT		0			RW	ESY	F	3,5

Specifies the rated motor frequency value at which the voltage applied to the motor terminals reaches the maximum value defined in parameter PAR 2202 **Base voltage**. For operating frequencies above this value the voltage applied to the motor is kept constant.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.4	2212	V/Hz Boost most		ENUM		Auto			RW	ESY	F	3,5

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 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 PAR 2204 Base frequency (see figure).

In "Auto" mode the boost voltage is dynamically adjusted by the drive. If there are problems with the sliding arriving at the floor, it is recommended to leave this function in boost mode and to vary the parameter 2214 V/Hz Gain comp slip.

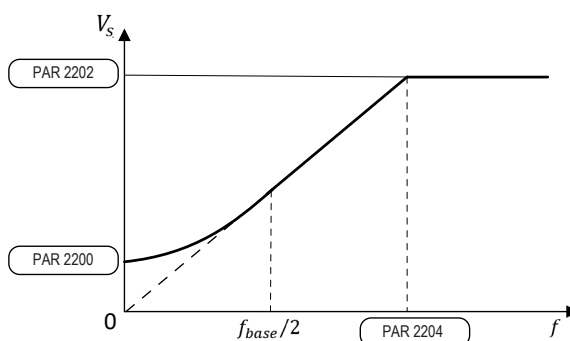


Figure 11.4: V/f characteristic curve profile

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.5	2214	V/Hz Slip ctrl gain		FLOAT		0			RW	EXP	F	3,5

This parameter influences the static accuracy of the open loop speed control. It is used for slip compensation under all load conditions. It is automatically defined by the drive based on the motor data plate and it can also be manually adjusted. Its fine adjustment in both directions results in greater precision in arriving at the floor at low speed where the effects of slip are more evident. this function has the purpose of compensating for slip by increasing or decreasing the speed of the stator rotor field in order to compensate for rotor speeds that are too low or too high. when dealing with slip, modify this value in steps of 0.005.

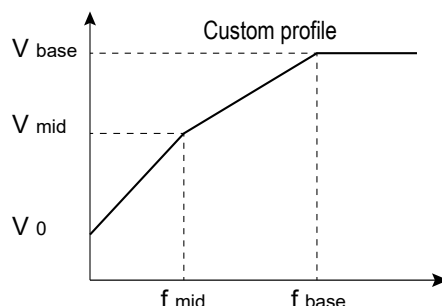
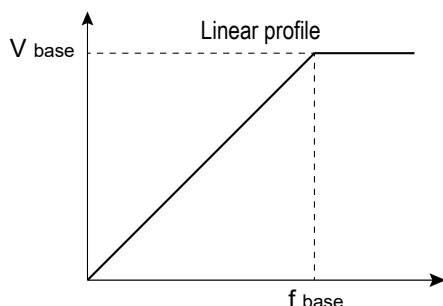
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.6	2218	V/Hz Stability gain		FLOAT		0.0			RW	EXP	F	3,5
<p>This parameter can be used to compensate for any current oscillations that may occur during travel and degrade comfort in the cabin. Its value is appropriately defined by the drive during the self-tuning procedure or after the “Take parameter” command.</p> <p>V/f control can be made more stable by increasing this parameter.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.7	2220	V/Hz Limiter Kp		FLOAT		0.2			RW	EXP	F	3,5
<p>Defines the proportional gain of the current limiter in V/f mode. Its value is set by the drive after the self-tuning procedure or after the “Take parameter” command based on the motor data plate.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.8	2222	V/Hz Limiter Ti	ms	FLOAT		50.0			RW	EXP	F	3,5
<p>Defines the time constant of the integral action of the current limiter in V/f mode. Its value is set by the drive after the self-tuning procedure or after the “Take parameter” command based on the motor data plate.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.9	2224	V/Hz slip fltr const	ms	FLOAT		10.0	1.0	1000.0	RW	EXP	F	3,5
<p>Sets the filter for slip compensation. The value set in this parameter determines the reaction time of the slip compensation function. The lower this parameter's setting, the higher the slip compensation reaction. If this parameter is set too low, undesirable speed fluctuations.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.10	2230	V/Hz Boost gain	V	FLOAT		0.0			RW	EXP	F	3,5
<p>Defines the gain for automatic boost voltage adjustment in the “Automatic” mode.</p> <p>It is defined directly by the drive after the self-tuning procedure or after the “Take parameter” command based on the motor data plate.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.11	2480	Vf Min Freq	Hz	FLOAT		0.5	0	5	RW	EXP	F	3,5
<p>Minimum frequency setting in VF control mode. This is the minimum output frequency value; below this value no frequency adjustment is effective.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.12	2482	Vf Min Dly	ms	FLOAT		800	0	5000	RW	EXP	F	3,5
<p>Delay setting for minimum frequency signal in VF control mode.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.13	2206	Middle voltage	V	FLOAT		0			RW	EXP	F	3,5
<p>Setting an intermediate voltage value for the customised V/f property.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.14	2208	Middle frequency	Hz	FLOAT		0			RW	EXP	F	3,5
<p>Setting an intermediate frequency value for the customised V/f property.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.15	2232	Initial voltage	V	FLOAT		0	0	60.0	RW	EXP	F	3,5
<p>Setting the value for the initial voltage applied at zero frequency when using the customised V/f property.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.16	2210	V/Hz Profile type		ENUM		Linear			RW	EXP	F	3,5

Selection of the type of V/f property.

- 0** Linear
1 Custom

Setting 0 (Linear) gives a V/f property that is linear, with midpoints set to half the value of parameters 2202 **Base voltage** and 2204 **Base frequency**.

Setting 1 (Custom) provides a customised V/f property where the intermediate voltage and frequency values are defined by parameters 2206 **Middle voltage** and 2208 **Middle frequency** while the initial voltage (boost) value is given by parameter 2232 **Initial voltage**.



Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.17	2226	V/Hz Boost slope		FLOAT		0.0			RW	EXP	F	3,5
Slope of the initial section of the V/f property during which the boost voltage is applied. Only valid for the linear V/f property. It is automatically defined by the drive following the self-tuning procedure.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.18	2228	Slip comp hold		ENUM		Disable			RW	EXP	F	3,5
Activates slip compensation using the torque current detected during acceleration and high speed phases as the current not measured during low speed phase; this function is beneficial and should be activated only for new generation motors with very low slip. 0 Disable 1 Enable												

10.3 REGULATOR PARAM

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.3.1	2250	CR-P gain	V/A	FLOAT		1.0			RW	EXP	FVSY	3,5
Setting of the proportional gain of the current regulator (CR).												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.3.2	2252	CR-I time	ms	FLOAT		1.0			RW	EXP	FVSY	3,5
Sets the integral time constant of the current regulator (CR).												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.3.3	2260	FR-P gain	A/Wb	FLOAT		1.0			RW	EXP	FVSY	3,5
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.												

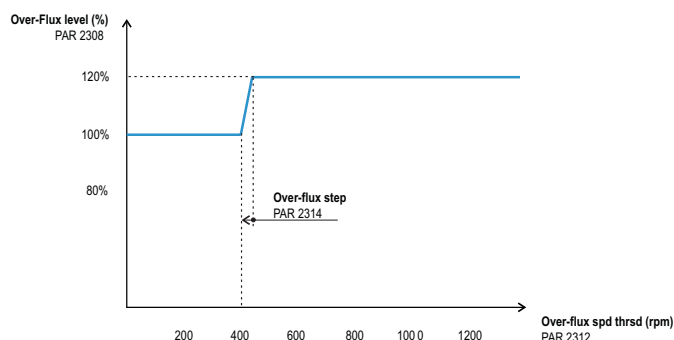
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.3.4	2262	FR-I time	ms	FLOAT		1.0			RW	EXP	FVSY	3,5
Sets the value of the integral time constant of the flux regulator (FR) used only in vector control ([1] ASY FOC, PAR 540 Control type) for asynchronous motors.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.3.5	2272	VR-I time	ms	FLOAT		1.0			RW	EXP	FVSY	3,5
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	ADL
10.3.6	2290	Deflux voltage	V	FLOAT		SIZE			RW	EXP	FVSY	3,5
<p>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.</p> <p>Flux reduction enables higher speeds to be reached at the expense of the maximum deliverable torque, which decreases accordingly.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.3.7	2292	Voltage margin	%	FLOAT		5.0	0	30.0	RW	EXP	FVSY	3,5
<p>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.</p> <p>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).</p> <p>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.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.3.8	2308	Over-flux level	%	FLOAT		100	100	150	RW	EXP	FVSY	3,5
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	ADL
10.3.9	2312	Over-flux spd thrsd	rpm	FLOAT		400	1	1000	RW	EXP	FVSY	3,5
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	ADL
10.3.10	2314	Over-flux step		FLOAT		1	0.01	10	RW	EXP	FVSY	3,5
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	ADL
10.3.11	2724	Defluxing curr lim	A	FLOAT		SIZE	0	CALCF	RW	EXP	FVSY	3,5
This parameter specifies the maximum defluxing current (direct component of motor current) applicable by the drive in Flux Weakening operating range. Standard value 50% 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	ADL
10.4.1	2350	Torque cur lim Pos	A	FLOAT	16BIT_H	CALCF	0.0	CALCF	RW	EXP	FVSY	3,5

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	ADL
10.4.2	2352	Torque curr lim Neg	A	FLOAT	16BIT_H	CALCF	0.0	CALCF	RW	EXP	FVSY	3,5

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	ADL
10.4.3	2354	Torque curr lim sel		ENUM		Off			RWZ	EXP	FVSY	3,5

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 cur lim Pos** (PAR 2350) and the active negative torque limit is **Torque curr lim Neg** (PAR 2352).

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 cur lim Pos** (PAR 2350) and the active negative torque limit is **Torque curr lim Neg** (PAR 2352).

2 - If set to 2 the Torque curr lim pos (PAR2350) and neg (PAR 2352) and max refers to Limit Torque considering direction and motor movement in motor or regenerative phase.

3 - If -1% of Motor non speed < motor speed < + 1% of **Rated speed** the active positive torque limit is **Torque cur 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 source 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	ADL
10.4.4	2358	Torque limit src		ENUM	16BIT_H	6000			RWZ	EXP	FVSY	3,5

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	ADL
10.4.5	2360	Torque climPos Inuse	A	FLOAT	16BIT_H	0.0	0.0	0.0	R	EXP	FVSY	3,5

The positive torque limit value currently being used is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.4.6	2362	Torque climNeg Inuse	A	FLOAT	16BIT_H	0.0	0.0	0.0	R	EXP	FVSY	3,5

The negative torque limit value currently being used is displayed.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.4.7	2380	Dig torque ref	%	FLOAT	16BIT_H	0.0	-300.0	300.0	RW	EXP	FVSY	3,5

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	ADL
10.4.8	2382	Torque ref src		ENUM	16BIT_H	65535			RWZ	EXP	FVSY	3,5

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	ADL
11.1.1	3150	DC braking cmd src		ENUM	16BIT_L	3710			RW	EXP	FS	3,5
<p>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".</p> <p>This function, available in ASY SSC mode allows to reduce/avoid the rollback upon arrival at the floor with the motor already stopped waiting for the brake to close again.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.1.2	3152	DC brake mode		ENUM		Off			RW	EXP	FS	3,5
<p>This parameter can be used to configure the DC braking activation modes.</p> <p>0 Off 1 At Stop 2 On Command 3 OnCmd & AtStop</p>												

In "Off" mode, the DC current injection phase is never performed.

In "Stopped" mode, the DC current injection phase is performed when the stop command is given and the speed reference threshold = zero is reached.

Example:

Motor rotating at any speed, by activating the stop command (removing the run command) the motor slows down to the speed reference threshold = zero PAR 934; at this point, the direct current injection phase is activated, which occurs after the delay configurable with PAR 3154 DC braking delay.

With PAR 3156 DC braking duration, the duration of the injection phase is configured, and with PAR 3158 DC braking current, the intensity of the injection phase current is configured.

In "On Command" mode, the DC injection phase is performed when the DC braking command is activated, configured with the parameter PAR 3150 DC braking command src.

Example:

Motor in slowdown phase arriving at the floor, activating the DC brake command activates the DC current injection phase. When the command is activated, after the delay configurable with PAR 3154 DC braking delay, the direct current injection begins. With PAR 3156 DC braking duration you configure the duration of the injection phase and with PAR 3158 DC braking current you configure the intensity of the current of the injection phase.

If the command is a pulse shorter than the duration programmed with PAR 3156 DC braking duration, then the DC current injection phase lasts, at least, for the time set with parameter 3156 DC braking duration.

If the command is a pulse longer than the duration programmed with parameter 3156 DC braking duration, then the DC current injection phase lasts as long as the command is present.

In "OnCmd & AtStop" mode, the DC current injection phase is performed when one of the two conditions described previously in the "Stopped" or "On Command" mode exists.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.1.3	3154	DC brake delay	s	FLOAT		0.01	0.01	30.0	RW	EXP	FS	3,5
<p>This parameter is used to configure the delay in seconds between the moment DC braking is requested and the moment direct current injection starts.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.1.4	3156	DC brake duration	s	FLOAT		1.0	0.01	30.0	RW	EXP	FS	3,5
<p>This parameter is used to configure the duration of direct current injection.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.1.5	3158	DC brake current	%	FLOAT		75	0.0	150.0	RW	EXP	FS	3,5
<p>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).</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.1.6	3160	DC brake state		ENUM		Not active			RW	EXP	FS	1,3,5
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 and brake without motor braking.

During the direct current injection phase the Run command should not be enabled (we are in the stopping phase with run removed and Enable again 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.

11.2 INERTIA COMP

The variation of the dynamic response of the speed regulator to a variation of the reference (and therefore to oppose the inertia generated by this variation), is applied by executing a variation of the current value during the acceleration/deceleration phase. These parameters are calculated by the self-learning procedure of the speed loop but can also be set manually by the user.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.2.1	3100	Inertia comp	kgm ²	FLOAT		0.1			RW	EXP	FVSY	3,5
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	ADL
11.2.2	3102	Inertia comp filter	ms	FLOAT		4.0	2.0	20.0	RW	EXP	FVSY	3,5
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	ADL
11.2.3	3104	Inertia comp mon	%	FLOAT	16BIT_H	0.0			R	EXP	FVSY	3,5
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	ADL
11.2.4	3106	Inertia comp fcn		ENUM		Disable			RW	EXP	FVSY	3,5
Enable inertia compensation mode.												
0 Disable												
1 Enable												

11.3 ANTI ROLLBACK (only for ADL530 and ADL550)

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	ADL
11.3.1	2766	PR-P Start gain		FLOAT		500	0	20000	RW	EXP	SY	3,5
<p>Defines the gain of the anti-rollback action at start.</p> <p>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).</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.3.2	2768	PR Start enable		ENUM		Enable			RW	EXP	SY	3,5
<p>This parameter enables/disables the anti rollback function at start-up.</p> <p>0 Disable 1 Enable</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.3.3	2812	PR-P End gain		FLOAT		500	0	20000	RW	EXP	SY	3,5
<p>Defines the gain of the anti-rollback action on arrival.</p> <p>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.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.3.4	2814	PR End enable		ENUM		Enable			RW	EXP	SY	3,5
<p>This parameter enables/disables the arrival anti rollback function.</p> <p>0 Disable 1 Enable</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.3.5	2810	Pos reg limit	rpm	FLOAT		10.0	-20	20	RW	EXP	SY	3,5
<p>Specifies the maximum and minimum value of the positioner control action.</p>												

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	ADL
11.4.1	2288	Vibration analyzer		ENUM		Disable			RW	EXP	VSY	3,5
<p>This parameter enables/disables the function for measuring resonance frequencies.</p> <p>0 Disable 1 Enable</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.4.2	9464	Vibration freq. 1	Hz	FLOAT		0			R	EXP	VSY	3,5
<p>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.</p> <p>A "0" value indicates that no resonance frequency is present in the measurement band.</p>												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.4.3	9466	Vibration freq. 2	Hz	FLOAT		0	0.0	0.0	R	EXP	VSY	3,5
<p>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.</p> <p>A "0" value indicates that no second resonance frequency is present in the measurement band.</p>												

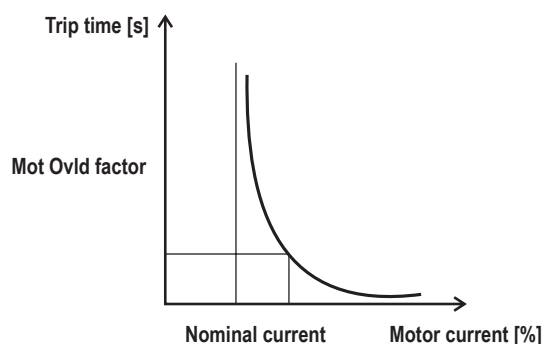
11.5 MOTOR OVERLOAD

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	ADL
11.5.1	3200	Motor ovld enable		ENUM		Off			RW	EXP	FVSY	3,5
		Enabling of the motor overload control.										
		0 Off										
		1 On										

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.5.2	3202	Motor ovld factor	%	FLOAT		150	100	300	RW	EXP	FVSY	3,5
		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	ADL
11.5.3	3204	Motor ovld time	s	FLOAT		30	10	300	RW	EXP	FVSY	3,5
		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	ADL
11.5.4	3206	Motor service factor	%	FLOAT		100	25	200	RW	EXP	FVSY	3,5
		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	ADL
11.5.5	3216	Motor fan type		ENUM		Servo fan			RW	EXP	FVSY	3,5
		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 lower than the threshold (PAR 2004 **Nominal speed / 2**) and PAR 3216 **Motor fan type** = Auto fan; since the ventilation is insufficient, we act in such a way as to reduce the intervention time of the MOTOR OVERLOAD protection.

To reduce the intervention time of the protection, below the threshold (PAR 2004 **Nominal speed / 2**) the continuous current of the MOTOR OVERLOAD function is reduced.

The continuous current of the MOTOR OVERLOAD function when the motor speed is equal to the threshold (PAR 2004 **Nominal speed / 2**) is calculated as PAR 2002 **Nominal current** * PAR 3206 **Motor service factor**, while below the threshold it is varied linearly until we have PAR 2002 **Nominal current** * 3206 **Motor service factor** * PAR 3218 **Motor load red factor** when the motor speed reaches zero.

The overload current of the MOTOR OVERLOAD function is obtained by performing the calculation PAR 2002 **Nominal current** * PAR 3206 **Motor service factor** * PAR 3202 **Motor overload factor** and represents the maximum current that can circulate in the motor; if the MOTOR OVERLOAD function is enabled, the drive will automatically set the torque current limit so that the maximum lout does not exceed this value.

The MOTOR OVERLOAD function allows you to supply the motor with a current equal to the Overload level for the maximum time set with the parameter PAR 3204 **Motor overload time**, as the motor speed decreases the time allowed is reduced (see figure at the beginning of the chapter).

Once the allowed time has elapsed, the MOTOR OVERLOAD function will automatically set the torque current limit so that the maximum current lout does not exceed the value of the continuous current of the MOTOR OVERLOAD function.

When the current motor speed is higher than the threshold (PAR 2004 **Nominal speed / 2**) and PAR 3216 **Motor fan type** = Auto fan; since the ventilation is sufficient, no reduction is applied on the continuous current.

When PAR 3216 **Motor fan type** = Servo fan, since the ventilation is sufficient, no reduction is applied on the continuous current.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.5.6	3218	Motor derat factor	%	FLOAT		50	0	100	RW	EXP	FVSY	3,5

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**.

If the value of parameter 3202 **Motor ovid 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 lout 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	ADL
11.6.1	3250	Bres control		ENUM		On			RW	INT	FVSY	3,5
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	ADL
11.6.2	3252	Bres value	ohm	FLOAT		7.0	7.0	1000.0	RW	INT	FVSY	3,5
Setting of the ohm value of the external braking resistor.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.6.3	3254	Bres cont power	kW	FLOAT		0.1	0.1	100.0	RW	INT	FVSY	3,5
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	ADL
11.6.4	3256	Bres overload factor	%	FLOAT		1.5	1.5	10.0	RW	INT	FVSY	3,5
Setting of the external resistor overload factor.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.6.5	3258	Bres overload time	s	FLOAT		0.5	0.5	50.0	RW	INT	FVSY	3,5
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	ADL
11.7.1	3122	Saved energy	kWh	FLOAT		0			R	EXP	FVSY	3,5
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	ADL
11.7.2	3124	Set energy val	kWh	FLOAT		0			RW	EXP	FVSY	3,5
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).												

11.8 COMPARE

This function allows the comparison among two signals or values.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.8.1	3650	Dig compare input 1	%	FLOAT	32BIT	0.0	-200.0	200.0	RW	EXP	FVSY	3,5
Setting of the digital value of the first element of comparison.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.8.2	3652	Dig compare input 2	%	FLOAT	32BIT	0.0	-200.0	200.0	RW	EXP	FVSY	3,5
Setting of the digital value of the second element of comparison.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.8.3	3660	Compare input 1 src		LINK	32BIT	3650	0	16384	RW	EXP	FVSY	3,5

Selection of the origin (source) of the signal to be used as the first term of comparison. The value that can be selected in the compare function are listed in the **L_CMP** selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.8.4	3662	Compare input 2 src		LINK	32BIT	3652	0	16384	RW	EXP	FVSY	3,5

Selection of the origin (source) of the signal to be used as the second term of comparison. The value that can be selected in the compare function are listed in the **L_CMP** selection list.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.8.5	3670	Compare function		ENUM		None	0	8	RW	EXP	FVSY	3,5

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

- 0** None
- 1** Inp1=Inp2
- 2** Inp1!=Inp2
- 3** Inp1<Inp2
- 4** Inp1>Inp2
- 5** |Inp1|=|Inp2|
- 6** |Inp1|!=|Inp2|
- 7** |Inp1|<|Inp2|
- 8** |Inp1|>|Inp2|

If set to **0** the comparator is not enabled.

If set to **1** the comparator output is enabled when the value of **Dig compare input 1** is inside the window resulting from the value of **Dig compare input 2** \pm the tolerance set via the **Comparator Window**.

If set to **2** the comparator output is enabled when the value of **Dig compare input 1** is not inside the window resulting from the value of **Dig compare input 2** \pm the tolerance set via the **Comparator Window**.

If set to **3** the comparator output is enabled when **Compare input 1** is less than **Compare input 2**.

If set to **4** the comparator output is enabled when **Compare input 1** is greater than **Compare input 2**.

If set to **5** the comparator output is enabled when the value of **Dig compare input 1** is inside the window resulting from the absolute value of **Dig compare input 2** \pm the tolerance set via the **Comparator Window**.

If set to **6** the comparator output is enabled when the absolute value of **Dig compare input 1** is not inside the window resulting from the absolute value of **Dig compare input 2** \pm the tolerance set via the **Comparator Window**.

If set to **7** the comparator output is enabled when the absolute value of **Dig compare input 1** is less than the absolute value of **Dig compare input 2**.

If set to **8** the comparator output is enabled when the absolute value of **Digital compare input 1** is more than the absolute value of **Digital compare input 2**.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.8.6	3672	Compare window	%	FLOAT		0.0	0.0	100.0	RW	EXP	FVSY	3,5

Setting of the tolerance window for comparing the **Compare input 1** and **Compare input 2** signals.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.8.7	3674	Compare delay	s	FLOAT		0.0	0.0	30.0	RW	EXP	FVSY	3,5

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

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.8.8	3676	Compare output		BIT	16BIT	0	0	1	R	EXP	FVSY	3,5

The status of the comparator output is displayed:

- 0** The result of the set comparison is negative
- 1** The result of the set comparison is positive

11.9 DATALOGGER

NOTE!

Please refer to the dedicated manual "**ADL500 Datalogger User manual**".

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	ADL
-	262	Motor speed no filter	rpm	INT16	16BIT_H	0			R	SRV		
		Indicates the unfiltered motor speed.										
-	626	Ramp ref out mon	rpm	INT16	16BIT_H	0			R	SRV		
		Displays the reference value output of the ramp reference function block.										
-	760	Ramp out mon	rpm	INT16	16BIT_H	0			R	SRV		
		Displays the reference value output of the ramp function block.										
-	764	Ramp acc state		BIT	16BIT_L	2	0	1	R	SRV		
		Indicates whether the acceleration ramp is active.										
-	766	Ramp dec state		BIT	16BIT_L	0	0	1	R	SRV		
		Indicates whether the deceleration ramp is active.										
-	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 .										
-	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 .										
-	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 .										
-	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 .										
-	1024	Enable cmd mon		BIT	16BIT_L	0	0	1	R	SRV		
		Enable signal monitor.										
-	1026	Start cmd mon		BIT	16BIT_L	0	0	1	R	SRV		
		Start signal monitor.										
-	1028	FastStop cmd mon		BIT	16BIT_L	0	0	1	R	SRV		
		Fast Stop signal monitor.										
-	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										
-	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.										
-	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.										
-	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.										
-	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.										
-	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	ADL
-	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.										
-	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.										
-	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.										
-	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.										
-	4770	First alarm		ENUM	No alarms				R	SRV		
		Displays the first alarm to be activated.										
-	6000	Null		UINT32	32BIT	0			R	SRV		
		Forces the variable to the zero level (always disabled).										
-	6002	One		UINT32	32BIT	1	1	1	R	SRV		
		Forces the variable to level one (always active).										
-	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.										
-	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 its monitoring as for the monitoring menu of the ADL550.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.1	8000	EBC SOK mon		BIT					R	ESY	FVSY	5
Status word image bit 3. Indicates the status of the SOK output.												
Bit = 0 (OFF)			open									
Bit = 1 (ON)			closed									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.2	8002	EBC Warning mon		BIT					R	ESY	FVSY	5
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	ADL
12.1.3	8004	EBC Alarm mon		BIT					R	ESY	FVSY	5
Status word image bit 7.												
Bit = 1 (ON)			EBC blocked in alarm mode.									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.4	8006	Brake 1 state mon		U8					R	ESY	FVSY	5
Status word i mage 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	ADL
12.1.5	8008	Brake 2 state mon		U8					R	ESY	FVSY	5
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	ADL
12.1.6	8010	Brake 1 out mon		BIT					R	ESY	FVSY	5
Status word image bit 21.												
Bit = 1 (ON)			brake 1 output powered									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.7	8012	Brake 2 out mon		BIT					R	ESY	FVSY	5
Status word image bit 29.												
Bit = 1 (ON)			brake 2 output powered									

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.8	8014	Brake 1 Fbk mon		BIT					R	ESY	FVSY	5
Status word image bit 22.												
Bit = 1 (ON) former brake 1 A3 input active												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.9	8016	Brake 2 Fbk mon		BIT					R	ESY	FVSY	5
Status word image bit 30.												
Bit = 1 (ON) former brake 2 A3 input active												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.10	8018	Brake 1 Current avg mon	A	FLOAT					R	ESY	FVSY	5
Current delivered to the brake 1 output.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.11	8020	Brake 2 Current avg mon	A	FLOAT					R	ESY	FVSY	5
Current delivered to the brake 2 output.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.12	8022	Vline rms mon	V	FLOAT					R	ESY	FVSY	5
Supply voltage.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.13	8024	Vline frequency mon	Hz	FLOAT					R	ESY	FVSY	5
Supply frequency.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.14	8026	Pwr Bridge Temperature mon	°C	FLOAT					R	ESY	FVSY	5
Rectifier bridge temperature.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.15	8320	BRK 1 Fast Close Time	ms	BIT		0			W	ESY	FVSY	5
Break 1 fast close time monitor.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.16	8322	BRK 2 Fast Close Time	ms	BIT		0			W	ESY	FVSY	5
Break 2 fast close time monitor.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.17	8324	BRK 1 slow Close Time	ms	BIT		0			W	ESY	FVSY	5
Break 1 slow close time monitor.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.18	8326	BRK 2 slow Close Time	ms	BIT		0			W	ESY	FVSY	5
Break 2 slow close time monitor.												
Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.19	8328	BRK 1 Open Time	ms	BIT		0			W	ESY	FVSY	5

Break 1 Open time monitor.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.20	8330	BRK 2 Open Time	ms	BIT		0			W	ESY	FVSY	5

Break 2 Open time monitor.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.21	8336	BRK 1 Resistance	ms	BIT		0			W	ESY	FVSY	5

Break 1 Resistance.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.22	8338	BRK 2 Resistance	ms	BIT		0			W	ESY	FVSY	5

Break 2 Resistance.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.23	8344	Brake Output V Equivalent	ms	BIT		0			W	ESY	FVSY	5

Brake Output V Equivalent monitor.

12.2 INFO

The info menu provides the identification parameters for the connected EBC; these are also read-only parameters.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.2.1	8100	Product type		U16					R	ESY	FVSY	5

Product type.

1 EBC501

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.2.2	8102	Product version		U32					R	ESY	FVSY	5

Product version.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.2.3	8104	Product conf		U8					R	ESY	FVSY	5

Monitor indicating the type of output configuration.

Brake 1-2 currently the only type envisaged

12.3 CONFIGURATION

The EBC Configuration menu presents the EBC activation parameter present in the wizard menu and the parameter describing EBC performance under local operating mode. In practice, when in local mode, a decision must be made as to whether the brake should act instantaneously - by directly opening the "run-mosfet contactors" - or whether a few millisecond delay is allowed with a soft opening, achieved by open the "Kbr contactor-controlled bridge".

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.3.1	8150	EBC enable		BIT		False			W	ESY	FVSY	5

If the brake is active, the parameter must be saved to render it effective. If it is deactivated, it is saved automatically upon deactivation.

On detects and requests the presence of the EBC

Off

does not detect the presence of the EBC and brake management is performed in the conventional manner

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.3.2	8152	EBC Local mode		U8		0			W	ESY	FVSY	5
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	ADL
12.3.3	8154	EBC Local mon		BIT					R	ESY	FVSY	5
Indicates whether the switch on the EBC is set to Local mode.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.3.4	8156	Use Brake Feedbacks		BIT		0			W	ESY	FVSY	5
		0		Enable the power mode								
		1		Enable the brake feedback mode								
In the power mode the EBC use power output to define brakes state and possible brake fails.												
In the brake feedback mode the EBC use the brake feedback to define brake status and possible brake fails. In this mode is necessary to connect to EBC brake feedback contacts.												
Independently of PAR 8156, EBC monitors the brake status by reporting it through the status variables IPA 1060 EBC Brake 1 state mon and IPA 1065 EBC Brake 2 state mon and through the corresponding signaling LEDs SFTY CH1, SFTY CH2.												
The states of each brake can be as follows:												
<ul style="list-style-type: none">• BRAKE ON: LED permanently on (Brake open)• BRAKE OFF: LED flashing (Brake closed but safety disabled)• BRAKE OFF SAFE: LED off (Brake closed and safety enabled)• BRAKE ALARM: LED flashing quickly (Brake closed, channel in alarm)												
The brake status reported by the EBC to the drive allows the drive, if enabled, to perform self-monitoring of the brakes as required by EN 81-20 (formerly function A3).												
In the feedback status mode the following parameters IPA 8252 Brake Holding Power , IPA 8254 Brake ON Holding Current Thr Perc , IPA 8256, Brake OFF Holding Current Thr Perc are not used, since it is the actual state of the feedback signals that indicates whether the brake is open or closed. In this mode the IPA 3000 Brake Holding Voltage parameter is used exactly as in the power mode, to apply a correct average voltage (Holding Voltage) after the brake is opened.												
When using power mode EBC uses the nominal voltage and power data, IPA 8250 Brake Holding Voltage , IPA 8252 Brake Holding Power (and current readings) to understand the brake status. More precisely the brake is considered open if the current is higher than Brake Holding Current x Brake ON Holding Current Thr Perc. The brake is considered closed if the current is lower than Brake Holding Current x Brake OFF Holding Current Thr Perc.												
In this case if the power and current data are not correct the status may not be true.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.3.5	8158	Brake Feedback Inverted		BIT		0			W	ESY	FVSY	5
When using the feedback mode it is important that the feedbacks are connected properly to EBC: the Fbk X input must normally be high (+24v) to consider the corresponding brake X closed and vice versa it must be at 0v to consider the brake open.												
To accommodate various and different switch configurations there are parameters 8158 and 8162												
0			Not inverted									
1			Inverted									
If the logic of the switch or wiring is inverted (0v corresponds to a closed brake) use this parameter =1.												
By activating Brake Feedback Inv the presence of voltage on Fbk x will be considered a closed brake and vice versa the absence of voltage will be considered a closed brake.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.3.6	8160	Holding Voltage Low Noise		BIT		0			W	ESY	FVSY	5
				0	Function low noise not used							
				1	Function low noise used							

The **LowNoise** mode can be activated only if brake monitoring is used through feedback use (PAR 8156 **Use Brake Feedbacks=ON**).

By activating the PAR 8160 **Holding Voltage Low Noise** parameter, EBC500 does not partialize the input voltage but provides complete half-waves in sequences such as to determine an equivalent average output voltage "close" to that defined in Holding Voltage.

In this mode, the parameter that measures the actual average voltage PAR 8344 **Brake Output V Equivalent** will generally be a little different from Holding Voltage but close to it: in particular EBC in low noise mode can apply in an output an average voltage equal to the maximum DC voltage for one of the following scaling factors: $1/4 = 0.25$, $2/7 \approx 0.2857$, $1/3 \approx 0.3333$, $2/5 = 0.4$, $3/7 \approx 0.4286$, $1/2 = 0.5$, $4/7 \approx 0.5714$, $3/5 = 0.6$, $2/3 = 0.6666$, $5/7 \approx 0.7143$, $3/4 = 0.75$, $4/5 = 0.8$, $5/6 \approx 0.8333$, $6/7 \approx 0.8571$, $2/2 = 1.0$

So, for example, if with 230 V input (corresponding to a maximum output voltage of 207 Vdc), we set Holding Voltage = 100 V, EBC500 will set a ratio of 0.5 and we will have an output voltage of PAR 8344 **Brake Output V Equivalent**, equal to 103.5 V.

Note that in this mode the output voltage cannot be less than 1/4 of the maximum output voltage.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.3.7	8162	Swap Brake Feedbacks		BIT		0			W	ESY	FVSY	5
		0		Not swapped								
		1		Swapped								
If the feedback switch1 has been wired to the Fbk2 input and vice versa, it is necessary to either rewire correctly or activate the Brake Feedback Swap parameter to ON.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.3.8	4008	Can termin.resistor		ENUM		Off			RW	INT	FVSY	3,5
Activation of the internal CANBUS termination resistor.												
		0 Off										
		1 On										

12.4 COMMUNICATION

The Communication menu includes parameters essential for reprogramming the EBC CAN port with a different ID number or baud rate; moreover, there are also parameters that display the status and control words.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.4.1	8200	EBC Communication Address		U8		119	1	127	W	ESY	FVSY	5
CAN port ID address.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.4.2	8202	EBC Communication Format		U8		1	0	1	W	ESY	FVSY	5
Communication format.												
		0		11 bit ID								
		1		29 bit ID								

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.4.3	4004	Field baudrate							W	ESY	FVSY	5
Baudrate, default is 250kb/s Canopen standard.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.4.4	8204	EBC Command word mon		U16					R	ESY	FVSY	5
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	ADL
12.4.5	8206	EBC Status word mon		U32					R	ESY	FVSY	5
Status word monitor.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.4.6	8348	EBC IP Addr Assigned		Assigned					R	ESY	FVSY	5
IP address assigned to EBC.												

12.5 BRAKE DATA

The Brake menu shows the necessary configuration parameters already present in the startup wizard menu.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.5.1	8250	Brake Holding Voltage	V	Float		103.5	1	207	W	ESY	FVSY	5
Holding voltage value. If parameter 8258 is set to holding voltage mode, then the internal bridge output voltage is adjusted to provide the set brake output holding voltage. Some manufacturers indicate this voltage on the brake dataplates along with the brake rated power and voltage.												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.5.2	8252	Brake Holding Power	W	Float		76	1	350	W	ESY	FVSY	5
<p>Rated brake power in holding mode indicated by the manufacturer on the brake dataplate.</p> <p>If only the brake's rated power and rated voltage are given in non power-saving mode and one of the power-saving modes is to be used, the voltage values reaching the brake in power-saving mode need to be entered while the following formula must be used to enter the holding power: Brake Holding Power = V holding² x P rated / V rated².</p> <p>For example, for a brake with a rated voltage of 207 Vdc and rated power of 100W, if you wish to use the brake in power-saving mode at 103.5 Vdc (the value indicated by the manufacturer), the power value to be entered is 103.5² x 100 / 207² = 25 W.</p> <p>If brake feedback mode PAR 8156 is used the following parameters are not used: PAR 8252 Brake Holding Power, PAR 8254 Brake ON Holding Current Thr Perc, PAR 8256 Brake OFF Holding Current Thr.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.5.3	8254	Brake ON Holding I	%	Float		80	0	200	W	ESY	FVSY	5
<p>Value in a percentage of the rated current. Threshold current below which the EBC considers the brake to be properly powered i.e. brake open).</p> <p>If brake feedback mode PAR 8156 is used the following parameters are not used: PAR 8252 Brake Holding Power, PAR 8254 Brake ON Holding Current Thr Perc, PAR 8256 Brake OFF Holding Current Thr.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.5.4	8256	Brake OFF Holding I	%	Float		20	0	200	W	ESY	FVSY	5
<p>Value in a percentage of the rated current. Threshold current above which the EBC considers the brake as not powered i.e. brake closed).</p> <p>If brake feedback mode PAR 8156 is used the following parameters are not used: PAR 8252 Brake Holding Power, PAR 8254 Brake ON Holding Current Thr Perc, PAR 8256 Brake OFF Holding Current Thr.</p>												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.5.5	8258	Brake Power ON Mode		U8		1			W	ESY	FVSY	5
Brake start up and holding modes.												
Full voltage the brake is activated with the input voltage rectified for both initial and holding phases												

Boost/Half voltage

the brake is activated with the input voltage rectified for the first milli-seconds indicated by parameter 3009 and then the output voltage is halved within the EBC by cutting a half-wave output from the bridge

Boost/Holding voltage

the brake is activated with the input voltage rectified for the first milli-seconds 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	ADL
12.5.6	8260	Brake Power ON Boost	ms	U16		1000	0	5000	W	ESY	FVSY	5
Time for which the output voltage is held, equal to the value of the rectified input voltage (Boost time).												

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.5.7	8262	Brake Holding I mon	A						R	ESY	FVSY	5
Indication of the current calculated by the EBC as the value corresponding to the threshold, in %, given by parameter 8254.												

12.6 DIAGNOSTIC

The Diagnostics menu presents the few parameters needed to diagnose the CAN port status: effectively the EBC communication status. These are read-only parameters.

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.6.1	8300	Time SCR power on	h:min						R			
Indicates the SCR start-up time.												

C - Parameters Lists

DRIVE SETUP

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1	578	Language select		ENUM		0			RW	INT	FVSY	3,5
				0 English								
				1 Italian								
				2 French								
				3 German								
				4 Spanish								
				5 Turkish								
2	390	Load application		ENUM					RW	INT	FVSY	3,5
				1 EFC								
				2 EPC								
				3 DCP								
				4 CAN417 (only for ADL530 and ADL550)								
3	598	Load from USB		BIT					RWZ	INT		3,5
4	2132	Encoder mode		ENUM		None			RWZ	INT	FVSY	3,5
				0 None								
				1 Digital								
				2 Sinus								
				3 Sinus SINCOS (only for ADL530 & ADL550)								
				4 Sinus ENDAT (only for ADL530 & ADL550)								
				5 Sinus BISS (only for ADL530 & ADL550)								
				6 ENDAT (only for ADL530 & ADL550)								
				7 BiSS (only for ADL530 & ADL550)								
				8 Sinus SSI (only for ADL530 & ADL550)								
5	392	Select motor		BIT					RWZ	INT		3,5

1. STARTUP WIZARD

1.1 Set control type?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.1.1	540	Control type		ENUM		ASY SSC			RW	INT	FVSY	3,5
				0 ASY SSC 1 ASY FOC 2 SYN FOC 3 ASY SLS								

1.2 Set comm mode?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.2.1	4000	Communication mode		ENUM		Parallel			RW	INT	FVSY	3,5
				3 CAN417 (only for ADL530 & ADL550)								

1.3 Set encoder param?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.3.1	2102	Encoder supply	V	FLOAT		5.2	5.2	20.0	RW	INT	FVSY	3,5
1.3.2	2132	Encoder mode		ENUM		None			RWZ	INT	FVSY	3,5
				0	None							
				1	Digital							
				2	Sinus							
				3	Sinus SINCOS (only for ADL530 & ADL550)							
				4	Sinus ENDAT (only for ADL530 & ADL550)							
				5	Sinus BISS (only for ADL530 & ADL550)							
				6	ENDAT (only for ADL530 & ADL550)							
				7	BiSS (only for ADL530 & ADL550)							
				8	Sinus SSI (only for ADL530 & ADL550)							

1.3.3	2100	Encoder pulses	ppr	UINT16	1024	4	16384	RWZ	INT	FVSY	3,5
1.3.4	2110	Encoder signal check		ENUM	Check A-B			RWZ	EXP	FVSY	3,5
				1	Check A-B						
				2	Check A-B-Z						
1.3.5	7106	BiSS N bit ST		UINT16	13	0	64	RW	EXP	FVSY	3,5
1.3.6	7108	BiSS N bit MT		UINT16	0	0	64	RW	EXP	FVSY	3,5
1.3.7	7114	BiSS Crc polinomy		UINT16	67	1	65535	RW	EXP	FVSY	3,5

1.4 Set motor data?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.4.1	2000	Rated voltage	V	FLOAT		SIZE	150	480	RWZ	INT	FVSY	3,5
1.4.2	2002	Rated current	A	FLOAT		SIZE	1	1500	RWZ	INT	FVSY	3,5
1.4.3	2004	Rated speed	rpm	FLOAT		SIZE	10	32000	RWZ	INT	FVSY	3,5
1.4.4	2006	Rated frequency	Hz	FLOAT		SIZE	1	1000	RWZ	INT	FVS	3,5
1.4.5	2008	Pole pairs		UINT16		SIZE	1	60	RWZ	INT	FVSY	3,5
1.4.6	2010	Rated power	kW	FLOAT		SIZE	0.1	1500	RWZ	INT	FVS	3,5
1.4.7	2012	Rated power factor		FLOAT		SIZE	0.6	0.95	RWZ	INT	FVS	3,5
1.4.8	2014	Torque constant	Nm/A	FLOAT		SIZE	0	120	RWZ	INT	Y	3,5

1.5 Set mechanical data?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.5.1	11006	Cabin speed	m/s	FLOAT		SIZE	0	10	RWZ	INT	FVSY	3,5
1.5.2	11010	Gearbox ratio		FLOAT		SIZE	1	200	RW	INT	FVSY	3,5
1.5.3	11164	Rope ratio		FLOAT		SIZE	1	10	RWZ	INT	FVSY	3,5
1.5.4	11012	Pulley diameter	m	FLOAT		SIZE	0	5	RWZ	INT	FVSY	3,5
1.5.5	11150	Car weight	kg	FLOAT		SIZE	0	10000	RW	INT	FVSY	3,5
1.5.6	11152	Counter weight	kg	FLOAT		SIZE	0	10000	RW	INT	FVSY	3,5
1.5.7	11154	Load weight	kg	FLOAT		SIZE	0	10000	RW	INT	FVSY	3,5
1.5.8	11156	Rope weight	kg	FLOAT		SIZE	0	1000	RW	INT	FVSY	3,5

1.6 Set EBC param? Only for ADL550

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.6.1	8150	EBC Enable		BIT		0	0	1	RWZ	INT	FVSY	5
1.6.2	8250	Brake Holding V	V	FLOAT		103.5	1	207	RW	INT	FVSY	5
1.6.3	8252	Brake Holding P	W	FLOAT		76	1	350	RW	INT	FVSY	5
1.6.4	8258	Brake Power Mode		ENUM		Boost_Half_Voltage			RW	INT	FVSY	5
						Full voltage						
						Boost/Half voltage						
						Boost/Holding voltage 2						
1.6.5	8260	Brake Power Boost	ms	UINT16		1000	0	5000	RW	INT	FVSY	5
1.6.6	4008	Can termin.resistor		ENUM		Off			RW	INT	FVSY	3,5
						0 Off						
						1 On						

1.7 Run autotune still?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.7.1	2032	Autotune		BIT		0	0	1	RWZ	INT	FVSY	3,5

1.8 Save parameters?

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
1.8.1	550	Save parameters		BIT		0	0	1	RW	INT	FVSY	3,5

2. OPTIMIZATION WIZARD

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
2.1	9720	Learning trip		BIT		0	0	1	RW	INT	FVSY	3,5
2.2	12000	RollBack at start		UINT32		1	1	5	RW	INT	FVSY	3,5
				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								
2.3	12006	RollBack at arrival		UINT32		1	1	3	RW	INT	FVSY	3,5
				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								
2.4	12002	Comfort high spd		UINT32		1	1	3	RW	INT	FVSY	3,5
				1 Basic level pre-selected as default level 2 Intermediate optimization level 2 3 High optimization level								
2.5	12004	Comfort low spd		UINT32		1	1	3	RW	INT	FVSY	3,5
				1 Basic level pre-selected as default level 2 Intermediate optimization level 2 3 High optimization level								

3. TROUBLESHOOTING

3.1 Start

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
3.1.1	11064	Brake open delay	ms	INT16/ 32		500	0	10000	RW	INT	FVSY	3,5

3.2 Rollback

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
3.2.1	2200	Boost Voltage	%	FLOAT		3	0	20.0	RW	INT	FS	3,5
3.2.2	2212	V/Hz Boost Mode		ENUM		Auto			RW	INT	FS	3,5
				0 Fixed 1 Auto								
3.2.3	2794	SR-P gain at start	%	FLOAT		150.0	0.0	400.0	RW	INT	VSY	3,5
3.2.4	2796	SR-I gain at start	%	FLOAT		110.0	0.0	400.0	RW	INT	VSY	3,5

3.3 Too fast acceleration (Too fast accel.)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
3.3.1	11040	Accel initial jerk	m/s ³	FLOAT		0.2	0.001	20	RW	INT	FVSY	3,5
3.3.2	11042	Acceleration	m/s ²	FLOAT		0.600	0.001	10	RW	INT	FVSY	3,5

3.4 Slow speed vibrations (Slow speed vibr.)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
3.4.1	2752	SR-P gain low speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY	3,5
3.4.2	2754	SR-I gain low speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY	3,5

3.5 High speed vibrations (High speed vibr.)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
3.5.1	2756	SR-P gain high speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY	3,5
3.5.2	2758	SR-I gain high speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY	3,5

3.7 Too fast deceleration (Too fast dec.)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
3.7.1	11046	Decel initial jerk	m/s ³	FLOAT		0.6	0.001	20	RW	INT	FVSY	3,5
3.7.2	11048	Deceleration	m/s ²	FLOAT		0.600	0.001	10	RW	INT	FVSY	3,5

3.8 Floor leveling

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
3.8.1	11068	Brake close delay	ms	INT16/32		500	0	10000	RW	INT	FVSY	3,5

3.9 Brake closing

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
3.9.1	11070	Current down delay	ms	INT16/32		0 (800)	0	10000	RW	INT	SY	3,5

3.10 Vibration analyzer

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
3.10.1	9464	Vibration freq. 1	Hz	FLOAT		0	0.0	0.0	R	INT	VSY	3,5
3.10.2	9466	Vibration freq. 2	Hz	FLOAT		0	0.0	0.0	R	INT	VSY	3,5

3.11 Suspension slip

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
3.11.1	4540	SpdRefLoss threshold	rpm	INT16		CALCI	0	16000	RW	INT	FVSY	3,5
3.11.2	4554	SpdRefLoss holdoff	ms	UINT16		1000	0	10000	RW	INT	FVSY	3,5

4. DRIVE

4.1 DRIVE MONITOR

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.1.1	250	Output current	A	FLOAT	16BIT_H				R	ESY	FVSY	3,5
4.1.2	252	Output voltage	V	FLOAT	16BIT_H				R	ESY	FVSY	3,5
4.1.3	254	Output frequency	Hz	FLOAT	16BIT_H				R	ESY	FVSY	3,5
4.1.4	664	Speed setpoint	rpm	INT16	16BIT_H				R	ESY	FVSY	3,5
4.1.5	260	Motor speed	rpm	FLOAT	16BIT_H				R	ESY	FVSY	3,5
4.1.6	270	DC link voltage	V	FLOAT	16BIT_H				R	ESY	FVSY	3,5
4.1.7	272	Heatsink temperature	degC	FLOAT	16BIT_L				R	ESY	FVSY	3,5
4.1.8	274	Motor temp	degC	INT16					R	ESY	FVSY	3,5
4.1.9	280	Torque current ref	A	FLOAT	16BIT_H				R	EXP	FVSY	3,5
4.1.10	282	Magnet current ref	A	FLOAT	16BIT_H				R	EXP	FVSY	3,5

4.1.11	284	Torque current	A	FLOAT	16BIT_H		R	INT	FVSY	3,5
4.1.12	286	Magnet current	A	FLOAT	16BIT_H		R	INT	FVSY	3,5
4.1.13	3212	Motor overload	%	UINT16	16BIT_H		R	ESY	FVSY	3,5
4.1.14	368	Drive overload	%	UINT16	16BIT_H		R	ESY	FVSY	3,5
4.1.15	3260	Bres overload	%	UINT16	16BIT_H		R	ESY	FVSY	3,5
4.1.16	1066	Enable state mon		UINT16	16BIT_L		R	ESY	FVSY	3,5
				0 Enabled 1 Disabled						
4.1.17	1068	Start state mon		UINT16	16BIT_L		R	ESY	FVSY	3,5
4.1.18	2386	Torque ref	%	FLOAT	16BIT_H		R	EXP	VSY	3,5
4.1.19	2388	Torque	%	FLOAT	16BIT_H		R	INT	VSY	3,5
4.1.20	372	In use current limit	A	FLOAT	16BIT_H		R	EXP	FVSY	3,5
4.1.21	1058	Safety en mon		BIT	16BIT_L		R	ESY	FVSY	5
4.1.22	1200	Dig input mon		UINT16	16BIT_L		R	ESY	FVSY	3,5
				1 Input high 0 Input low						
4.1.23	1202	Dig input mon x		UINT16	16BIT_L		R	ESY	FVSY	5
				1 Input high 0 Input low						
4.1.24	1400	Digital output mon		UINT16			R	ESY	FVSY	3,5
				1 Output enabled 0 Output disabled						
4.1.25	1402	Digital output mon x		UINT16			R	ESY	FVSY	5
				1 Output enabled 0 Output disabled						

4.2 DRIVE INFO

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.2.1	172	Drive type		ENUM		ADL510			R	ESY	FVSY	3,5
				1 ADL510 2 ADL530 3 ADL550								
4.2.2	482	Drive size		UINT16					R	ESY	FVSY	3,5
4.2.3	484	Drive family		ENUM		No Power			R	INT	FVSY	3,5
				0 No power 1 230V ... 480V 2 500V ... 575V 3 690V 4 230V								
4.2.4	488	Drive cont current	A	FLOAT		CALCF			R	ESY	FVSY	3,5
4.2.6	174	Firmware version		UINT32					R	ESY	FVSY	3,5
4.2.7	176	DSP Firmware version		UINT32					R	ESY	FVSY	3,5
4.2.8	180	DSP Boot version		UINT32					R	ESY	FVSY	3,5
4.2.9	182	HMI Boot version		UINT32					R	ESY	FVSY	3,5
4.2.10	184	Application name		STRING16					R	ESY	FVSY	3,5
4.2.11	192	Application version		UINT32					R	ESY	FVSY	3,5
4.2.12	198	Hardware version		UINT16					R	ESY	FVSY	3,5
4.2.13	520	Product S/N		UINT32					R	ESY	FVSY	3,5
4.2.14	522	Regulation S/N		UINT32					R	ESY	FVSY	3,5
4.2.15	524	Power S/N		UINT32					R	ESY	FVSY	3,5
4.2.16	526	Power file ver.rel		UINT16					R	ESY	FVSY	3,5
4.2.17	9562	IP address		UINT32					R	ESY	FVSY	3,5

4.2.18	9600	MAC address		STRING16					R	EXP	FVSY	3,5
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4.3 DRIVE CONFIG*

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.3.1	550	Save parameters		BIT		0	0	1	RW	ESY	FVSY	3,5
4.3.2	580	Load default		BIT		0	0	1	RWZ	ESY	FVSY	3,5
4.3.3	540	Control type		ENUM 0 ASY SSC 1 ASY FOC 2 SYN FOC (only for ADL530 and ADL550) 3 ASY SLS		ASY SSC			RWZ	INT	FVSY	3,5
4.3.4	554	Access level		ENUM 0 Readonly 1 Easy 2 Intermediate 3 Expert 4 Service		Intermediate			RW	ESY	FVSY	3,5
4.3.5	568	Enable passwords		BIT		0	0	1	RW	EXP	FVSY	3,5
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	3,5
4.3.8	448	Emergency UV	V	FLOAT		CALCF	0	CALCF	RWZ	INT	FVSY	3,5
4.3.9	450	Undervoltage	V	FLOAT		300.0	CALCF	CALCF	RW	INT	FVSY	3,5
4.3.10	2690	Chopper ON	V	FLOAT		CALCF	0	CALCF	RWZ	EXP	FVSY	3,5
4.3.11	1010	Fast Start disable		BIT		1	0	1	RW	EXP	FVSY	3,5
4.3.12	574	Startup display		INT16		-1	-1	20000	RW	INT	FVSY	3,5
4.3.13	576	Display backlight		BIT		0	0	1	RW	INT	FVSY	3,5
4.3.14	578	Language select		ENUM 0 English 1 Italian 2 French 3 German 4 Spanish 5 Turkish		GB			RW	INT	FVSY	3,5
4.3.15	7200	Password recovery		BIT		0	0	1	RW	ESY	FVSY	3,5
4.3.16	7210	Recovery code		UINT32					R	ESY	FVSY	3,5
4.3.17	7220	Logout time	min	UINT16		60	0	1092	RW	EXP	FVSY	3,5
4.3.18	590	Save par to keypad		BIT		0	0	1	RWZ	INT	FVSY	3,5
4.3.19	592	Load par from keypad		BIT		0	0	1	RWZ	INT	FVSY	3,5
4.3.20	596	Save to USB		BIT		0	0	1	RWZ	INT	FVSY	3,5
4.3.21	598	Load from USB		BIT		0	0	1	RWZ	INT	FVSY	3,5
4.3.23	1560	App update		BIT		0	0	1	RWZ	INT	FVSY	3,5
4.3.24	9548	WiFi safe removal		BIT		0	0	1	RW	ESY	FVSY	3,5

* 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	ADL
4.4.1	4500	Fault reset src		ENUM	16BIT_L	6000			RW	INT	FVSY	3,5
4.4.2	4502	ExtFlt src		ENUM	16BIT_L	6000			RW	INT	FVSY	3,5

4.4.3	4504	ExtFlt activity		ENUM	Disable			RW	INT	FVSY	3,5
				0 Ignore 1 Warning 2 Disable drive 3 Stop							
4.4.4	4506	ExtFlt restart		ENUM	Disable			RW	EXP	FVSY	3,5
				0 Disable 1 Enable							
4.4.5	4508	ExtFlt restart time	ms	UINT16	1000	120	30000	RW	EXP	FVSY	3,5
4.4.6	4510	ExtFlt holdoff	ms	UINT16	0	0	10000	RW	INT	FVSY	3,5
4.4.7	4518	MotorOT threshold	degC	INT16	150	0	200	RW	INT	FVY	3,5
4.4.8	4520	MotorOT src		ENUM	16BIT_L	6000		RW	INT	FVSY	3,5
4.4.9	4522	MotorOT activity		ENUM	Warning			RW	INT	FVSY	3,5
				0 Ignore 1 Warning 2 Disable drive 3 Stop							
4.4.10	4524	MotorOT restart		ENUM	Disable			RW	EXP	FVSY	3,5
				0 Disable 1 Enable							
4.4.11	4526	MotorOT restart time	ms	UINT16	1000	120	30000	RW	EXP	FVSY	3,5
4.4.12	4528	MotorOT holdoff	ms	UINT16	1000	0	30000	RW	EXP	FVSY	3,5
4.4.13	4530	Ptc type		ENUM	None			RW	INT	FVSY	3,5
				0 None 1 PTC 2 KTY84-130							
4.4.14	4532	PtcFail activity		ENUM	Warning			RW	INT	FVSY	3,5
				0 Ignore 1 Warning 2 Disable drive 3 Stop							
4.4.15	4534	PtcFail restart		ENUM	Disable			RW	EXP	FVSY	3,5
				0 Disable 1 Enable							
4.4.16	4536	PtcFail restart time	ms	UINT16	1000	120	30000	RW	EXP	FVSY	3,5
4.4.17	4538	PtcFail holdoff	ms	UINT16	1000	0	30000	RW	EXP	FVSY	3,5
4.4.18	4540	Overspeed threshold	rpm	INT16	CALCI	0	16000	RW	INT	FVSY	3,5
4.4.19	4542	Overspeed activity		ENUM	Disable			RW	INT	FVSY	3,5
				0 Ignore 1 Warning 2 Disable drive							
4.4.20	4544	Overspeed holdoff	ms	UINT16	0	0	5000	RW	INT	FVSY	3,5
4.4.21	4550	SpdRefLoss threshold	rpm	INT16	100 (*)	0	CALCI	RW	INT	FVSY	3,5
4.4.22	4552	SpdRefLoss activity		ENUM	Disable			RW	INT	FVSY	3,5
				0 Ignore 1 Warning 2 Disable drive							
4.4.23	4554	SpdRefLoss holdoff	ms	UINT16	1000	0	10000	RW	INT	FVSY	3,5
4.4.24	4560	SpdFbkLoss activity		ENUM	Disable			RW	INT	FVSY	3,5
				0 Ignore 1 Warning 2 Disable drive							
4.4.25	4562	SpdFbkLoss holdoff	ms	UINT16	200	0	10000	RW	INT	FVSY	3,5
4.4.26	4564	SpdFbkLoss threshold	rpm	INT16	100	0	CALCI	RW	INT	FVSY	3,5
4.4.27	4570	Drive ovld activity		ENUM	Disable			RW	EXP	FVSY	3,5

				0 Ignore 1 Warning 2 Disable drive 3 Stop							
4.4.28	4572	Motor ovld activity		ENUM 0 Ignore 1 Warning 2 Disable drive 3 Stop	Warning			RW	EXP	FVSY	3,5
4.4.29	4574	Bres ovld activity		ENUM 0 Ignore 1 Warning 2 Disable drive 3 Stop	Disable			RW	EXP	FVSY	3,5
4.4.30	4582	HTsens restart		ENUM 0 Disable 1 Enable	Disable			RW	EXP	FVSY	3,5
4.4.31	4584	HTsens restart time	ms	UINT16	20000	120	60000	RW	EXP	FVSY	3,5
4.4.32	4610	Desat restart		ENUM 0 Disable 1 Enable	Disable			RW	EXP	FVSY	3,5
4.4.33	4612	Desat restart time	ms	UINT16	2000	1000	10000	RW	EXP	FVSY	3,5
4.4.34	4620	IOverC restart		ENUM 0 Disable 1 Enable	Disable			RW	EXP	FVSY	3,5
4.4.35	4622	IOverC restart time	ms	UINT16	2000	1000	10000	RW	EXP	FVSY	3,5
4.4.36	4630	OverV restart		ENUM 0 Disable 1 Enable	Disable			RW	EXP	FVSY	3,5
4.4.37	4632	OverV restart time	ms	UINT16	2000	1000	10000	RW	EXP	FVSY	3,5
4.4.38	4640	UnderV restart		ENUM 0 Disable 1 Enable	Enable			RW	EXP	FVSY	3,5
4.4.39	4642	UnderV restart time	ms	UINT16	1000	120	10000	RW	EXP	FVSY	3,5
4.4.40	4650	UVRep attempts		UINT16	5	0	1000	RW	EXP	FVSY	3,5
4.4.41	4652	UVRep delay	s	UINT16	240	0	300	RW	EXP	FVSY	3,5
4.4.42	4654	PhLoss mov activity		ENUM 0 Ignore 1 Warning 2 Disable drive	Ignore			RW	EXP	FVSY	3,5
4.4.43	4656	PhLoss mov holdoff	ms	UINT32	200	0	2000	RW	EXP	FVSY	3,5
4.4.44	4674	PhLoss mov freq thr	Hz	FLOAT	0.5	0.1	5	RW	EXP	FVSY	3,5
4.4.45	4678	PhLoss mov code		UINT32				R	EXP	FVSY	3,5
4.4.46	4670	Optionbus activity		ENUM 0 Ignore 1 Warning 2 Disable drive 3 Stop	Disable			RW	EXP	FVSY	3,5
4.4.47	4660	PhLoss in activity		ENUM 0 Ignore 1 Warning 2 Disable drive	Disable			RW	EXP	FVSY	3,5
4.4.48	4662	PhLoss in restart		ENUM 0 Disable 1 Enable	Disable			RW	EXP	FVSY	3,5
4.4.49	4664	PhLoss in rest time	ms	UINT16	1000	120	10000	RW	EXP	FVSY	3,5

4.4.50	4668	PhLoss output test		ENUM	Enable			RW	EXP	FVSY	3,5
				0 Ignore 1 Warning 2 Powerup							
4.4.51	4680	GroundFault thr	%	FLOAT	10.0	0.0	150.0	RW	INT	FVSY	3,5
4.4.52	4700	Alarm dig out 1 sel		ENUM	No alarm			RW	INT	FVSY	3,5
4.4.53	4702	Alarm dig out 2 sel		ENUM	No alarm			RW	INT	FVSY	3,5
4.4.54	4704	Alarm dig out 3 sel		ENUM	No alarm			RW	INT	FVSY	3,5
4.4.55	4706	Alarm dig out 4 sel		ENUM	No alarm			RW	INT	FVSY	3,5
				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							
4.4.56	4720	Alm autoreset time	s	FLOAT	0.0	0.0	60.0	RW	EXP	FVSY	3,5
4.4.57	4722	Alm autoreset number		UINT16	3	0	100	RW	EXP	FVSY	3,5

4.8 DIGITAL INPUTS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.8.1	1240	Dig inp 1 inversion		BIT		0	0	1	RW	INT	FVSY	5

4.8.2	1242	Dig inp 2 inversion	BIT	0	0	1	RW	INT	FVSY	5
4.8.3	1244	Dig inp 3 inversion	BIT	0	0	1	RW	INT	FVSY	5
4.8.4	1246	Dig inp 4 inversion	BIT	0	0	1	RW	INT	FVSY	5
4.8.5	1248	Dig inp 5 inversion	BIT	0	0	1	RW	INT	FVSY	5
4.8.6	1250	Dig inp 6 inversion	BIT	0	0	1	RW	INT	FVSY	5
4.8.7	1252	Dig inp 7 inversion	BIT	0	0	1	RW	INT	FVSY	5
4.8.8	1254	Dig inp 8 inversion	BIT	0	0	1	RW	INT	FVSY	5
4.8.9	1260	Dig inp 1x inversion	BIT	0	0	1	RW	INT	FVSY	5
4.8.10	1262	Dig inp 2x inversion	BIT	0	0	1	RW	INT	FVSY	5
4.8.11	1264	Dig inp 3x inversion	BIT	0	0	1	RW	INT	FVSY	5
4.8.12	1266	Dig inp 4x inversion	BIT	0	0	1	RW	INT	FVSY	5
4.8.13	1110	Dig input E mon	UINT16	16BIT_L			R	EXP	FVSY	3,5
4.8.14	1210	Dig inp 1 mon	UINT16	16BIT_L			R	EXP	FVSY	3,5
4.8.15	1212	Dig inp 2 mon	UINT16	16BIT_L			R	EXP	FVSY	3,5
4.8.16	1214	Dig inp 3 mon	UINT16	16BIT_L			R	EXP	FVSY	3,5
4.8.17	1216	Dig inp 4 mon	UINT16	16BIT_L			R	EXP	FVSY	3,5
4.8.18	1218	Dig inp 5 mon	UINT16	16BIT_L			R	EXP	FVSY	3,5
4.8.19	1220	Dig inp 6 mon	UINT16	16BIT_L			R	EXP	FVSY	3,5
4.8.20	1222	Dig inp 7 mon	UINT16	16BIT_L			R	EXP	FVSY	3,5
4.8.21	1224	Dig inp 8 mon	UINT16	16BIT_L			R	EXP	FVSY	3,5
4.8.22	1230	Dig inp 1x mon	UINT16	16BIT_L			R	EXP	FVSY	5
4.8.23	1232	Dig inp 2x mon	UINT16	16BIT_L			R	EXP	FVSY	5
4.8.24	1234	Dig inp 3x mon	UINT16	16BIT_L			R	EXP	FVSY	5
4.8.25	1236	Dig inp 4x mon	UINT16	16BIT_L			R	EXP	FVSY	5
4.8.26	1268	Dig inp E dest	ILINK				R	EXP	FVSY	3,5
4.8.27	1270	Dig inp 1 dest	ILINK				R	EXP	FVSY	3,5
4.8.28	1272	Dig inp 2 dest	ILINK				R	EXP	FVSY	3,5
4.8.29	1274	Dig inp 3 dest	ILINK				R	EXP	FVSY	3,5
4.8.30	1276	Dig inp 4 dest	ILINK				R	EXP	FVSY	3,5
4.8.31	1278	Dig inp 5 dest	ILINK				R	EXP	FVSY	3,5
4.8.32	1280	Dig inp 6 dest	ILINK				R	EXP	FVSY	3,5
4.8.33	1282	Dig inp 7 dest	ILINK				R	EXP	FVSY	3,5
4.8.34	1284	Dig inp 8 dest	ILINK				R	EXP	FVSY	3,5
4.8.35	1290	Dig inp 1x dest	ILINK				R	EXP	FVSY	5
4.8.36	1292	Dig inp 2x dest	ILINK				R	EXP	FVSY	5
4.8.37	1294	Dig inp 3x dest	ILINK				R	EXP	FVSY	5
4.8.38	1296	Dig inp 4x dest	ILINK				R	EXP	FVSY	5
4.8.35	1290	Dig inp 1x dest	ILINK				R	EXP	FVSY	5
4.8.36	1292	Dig inp 2x dest	ILINK				R	EXP	FVSY	5
4.8.37	1294	Dig inp 3x dest	ILINK				R	EXP	FVSY	5
4.8.38	1296	Dig inp 4x dest	ILINK				R	EXP	FVSY	5

4.9 DIGITAL OUTPUTS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.9.1	1430	Dig out 1 inversion		BIT		0	0	1	RW	INT	FVSY	3,5
4.9.2	1432	Dig out 2 inversion		BIT		0	0	1	RW	INT	FVSY	3,5
4.9.3	1434	Dig out 3 inversion		BIT		0	0	1	RW	INT	FVSY	3,5
4.9.4	1436	Dig out 4 inversion		BIT		0	0	1	RW	INT	FVSY	3,5

			0 Off 1 On									
4.9.5	1440	Dig out 1x inversion	BIT	0	0	1	RW	INT	FVSY	5		
4.9.6	1442	Dig out 2x inversion	BIT	0	0	1	RW	INT	FVSY	5		
			0 Off 1 On									

4.10 ANALOG INPUTS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.10.1	1600	Analog input mon	cnt	INT16	16BIT_H				R	ESY	FVSY	3,5
4.10.2	1602	Analog inp type		ENUM		-10V...+10V			RW	INT	FVSY	3,5
				0 -10 V ... +10 V 1 0.20 mA , 0.10 V 2 4 ... 20 mA								
4.10.3	1604	Analog inp scale		FLOAT		1.0	-10.0	10.0	RW	INT	FVSY	3,5
4.10.4	1606	An inp offset tune		BIT		0	0	1	RW	INT	FVSY	3,5
4.10.5	1608	An inp gain tune		BIT		0	0	1	RW	INT	FVSY	3,5
4.10.6	1610	Analog inp filter	ms	FLOAT		10	2	100	RW	EXP	FVSY	3,5
4.10.7	1612	Analog inp top	cnt	INT16		16384	-32768	+32768	RW	EXP	FVSY	3,5
4.10.8	1614	Analog inp bottom	cnt	INT16		-16384	-32768	+32768	RW	EXP	FVSY	3,5
4.10.9	1616	Analog inp offset	cnt	INT16		0	-32768	+32768	RW	EXP	FVSY	3,5
4.10.10	1618	Analog inp gain		FLOAT		1.0	-10.0	10.0	RW	EXP	FVSY	3,5
4.10.11	1626	An inp sign src		ENUM	16BIT_L	6000			RW	INT	FVSY	3,5
4.10.12	1632	Analog input dest		ILINK					R	EXP	FVSY	3,5

4.12 LIFE TIME

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
4.12.1	510	Time drive power on	h.min	UINT32					R	ESY	FVSY	3,5
4.12.2	512	Time drive enable	h.min	UINT32					R	ESY	FVSY	3,5
4.12.3	514	Number power up		UINT16					R	ESY	FVSY	3,5
4.12.4	516	Time fan on	h.min	UINT32					R	ESY	FVSY	3,5

5. LIFT

5.1 MONITOR

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.1.1	14014	Trip number		UINT32					R	ESY	FVSY	3,5
5.1.2	14016	Sequence state		ENUM					R	ESY	FVSY	3,5
				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							
5.1.3	14210	Actual speed ref	m/s	FLOAT					R	ESY	FVSY	3,5
5.1.4	14242	Actual cabin spd	m/s	FLOAT					R	ESY	FVSY	3,5
5.1.5	14032	Cabin position	mm	INT					RW	INT	FVSY	3,5

5.2 MECHANICAL DATA

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.2.1	11006	Cabin speed	m/s	FLOAT		SIZE	0	10	RWZ	INT	FVSY	3,5
5.2.2	11010	Gearbox ratio		FLOAT		SIZE	0	200	RW	INT	FVSY	3,5
5.2.3	11164	Rope ratio		FLOAT		SIZE	1	10	RWZ	INT	FVSY	3,5
5.2.4	11012	Pulley diameter	m	FLOAT		SIZE	0	5	RWZ	INT	FVSY	3,5
5.2.5	11150	Car weight	kg	FLOAT		SIZE	0	10000	RW	INT	FVSY	3,5
5.2.6	11152	Counter weight	kg	FLOAT		SIZE	0	10000	RW	INT	FVSY	3,5
5.2.7	11154	Load weight	kg	FLOAT		SIZE	0	10000	RW	INT	FVSY	3,5
5.2.8	11156	Rope weight	kg	FLOAT		SIZE	0	10000	RW	INT	FVSY	3,5
5.2.9	14002	Mechanical const	m/rev	FLOAT					RW	INT	FVSY	3,5
5.2.10	14046	Operating mot spd	rpm	FLOAT		CALCF			R	INT	FVSY	3,5
5.2.11	14048	Full scale spd	rpm	SHORT					R	INT	FVSY	3,5

5.3 RAMPS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.3.1	11040	Accel initial jerk	m/s ³	FLOAT		0.2	0.001	20	RW	ESY	FVSY	3,5
5.3.2	11042	Acceleration	m/s ²	FLOAT		0.600	0.001	10	RW	ESY	FVSY	3,5
5.3.3	11044	Accel end jerk	m/s ³	FLOAT		0.6	0.001	20	RW	ESY	FVSY	3,5
5.3.4	11054	Percent acc factor	%	FLOAT		100	10	1000	RW	INT	FVSY	3,5
5.3.5	11046	Decel initial jerk	m/s ³	FLOAT		0.6	0.001	20	RW	ESY	FVSY	3,5
5.3.6	11048	Deceleration	m/s ²	FLOAT		0.600	0.001	10	RW	ESY	FVSY	3,5
5.3.7	11050	Decel end jerk	m/s ³	FLOAT		0.500	0.001	20	RW	ESY	FVSY	3,5
5.3.8	11056	Percent dec factor	%	FLOAT		100	10	1000	RW	INT	FVSY	3,5
5.3.9	11052	Stop deceleration	m/s ²	FLOAT		0.6	0.001	10	RW	ESY	FVSY	3,5
5.3.10	10110	Accel ini jerk insp	m/s ²	FLOAT		0.6	0.001	30	RW	ESY	FVSY	3,5
5.3.11	10112	Accel ispez	m/s ²	FLOAT		0.6	0.001	30	RW	ESY	FVSY	3,5
5.3.12	10144	Accel end jerk insp	m/s ³	FLOAT		0.6	0.001	30	RW	ESY	FVSY	3,5
5.3.13	10144	Decel ini jerk insp	m/s ³	FLOAT		0.6	0.001	30	RW	ESY	FVSY	3,5
5.3.14	10118	Decel inspect	m/s ²	FLOAT		0.6	0.001	30	RW	ESY	FVSY	3,5

5.3.15	10116	Decel end jerk insp	m/s ³	FLOAT		0.6	0.001	30	RW	ESY	FVSY	1,3,5
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5.4 LIFT SEQUENCES

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.4.1	11060	Sequence start stop		ENUM		Start fwd/rev			RWZ	ESY	FVSY	3,5
				0		Start fwd/rev						
				3		Start edge F/R						
				1		Enable						
				2		Mltspd out = 0						
5.4.2	11062	Contactor close dly	ms	INT16/32		200	0	10000	RW	ESY	FVSY	3,5
5.4.3	11064	Brake open delay	ms	INT16/32		500	0	10000	RW	ESY	FVSY	3,5
5.4.4	10180	Brake openDly fbk		BOOL		OFF			RW	ESY	FVSY	3,5
5.4.5	11078	Speed 0 threshold	rpm	INT16		30 (1)	0	10000	RW	INT	FVSY	3,5
5.4.6	11080	Speed 0 delay	ms	UINT16		400	0	10000	RW	INT	FVSY	3,5
5.4.7	11086	Door open speed	m/s	FLOAT		0	-10000	10000	RWZ	EXP	FVSY	3,5
5.4.8	11070	Current down delay	ms	INT16/32		0 (800)	0	10000	RW	INT	SY	3,5
5.4.9	10178	DC braking		BOOL		Off	0	1	RW	EXP	FS	3,5
5.4.10	3158	DC brake current	%	FLOAT		75	0.0	150.0	RW	EXP	FS	3,5
5.4.11	11068	Brake close delay	ms	INT16/32		500	0	10000	RW	ESY	FVSY	3,5
5.4.12	11072	Contactor open dly	ms	INT16/32		200	0	10000	RW	ESY	FVSY	3,5
5.4.13	11074	SC cont open delay	ms	INT16/32		0 (500)	0	2000	RW	EXP	SY	3,5
5.4.14	11244	Inversion motor rot		ENUM		Not inverted			RWZ	INT	FVSY	3,5
				0		Not inverted						
				1		Inverted						

5.5 417 PROFILE

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.5.1	14044	417 state machine		ENUM					R	EXP	FVSY	3,5
5.5.2	14024	OperationMode		ENUM					R	INT	FVSY	3,5
5.5.3	14028	Speed ref in VelMode	mm/s	INT32					R	INT	FVSY	3,5
5.5.4	14026	Speed ref in PosMode	mm/s	INT32					R	INT	FVSY	3,5
5.5.5	14030	Pos ref in PosMode	mm	INT32					R	INT	FVSY	3,5
5.5.6	10124	Absolute enc pulses		FLOAT		1024	1	16384	RW	EXP	FVSY	3,5
5.5.7	11076	Distance for revolut	mm	FLOAT		458	1	10000	RW	EXP	FVSY	3,5
5.5.8	11140	417-pos acq time	ms	INT		0	0	1000	RW	EXP	FVSY	3,5
5.5.9	14096	Drv→417 status word	Hex	INT32					R	EXP	FVSY	3,5

5.6 417 CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.6.1	11000	Landing zone	m	FLOAT					RW	INT	FVSY	3,5
5.6.2	11016	Final adjust fwd	m	FLOAT		0	-1000000	1000000	RW	INT	FVSY	3,5
5.6.3	10148	Final adjust rev	m	FLOAT		0	-1000000	1000000	RW	INT	FVSY	3,5
5.6.4	11276	Comp-P gain		FLOAT		0.019			RW	EXP	FVSY	3,5
5.6.5	11254	Comp-I gain		FLOAT		0.004			RW	EXP	FVSY	3,5
5.6.6	11234	Landing-P gain		FLOAT		0.5			RW	EXP	FVSY	3,5
5.6.7	11004	Landing-I gain		FLOAT		0.020			RW	EXP	FVSY	3,5
5.6.8	14018	Actual error	mm	FLOAT					RW	EXP	FVSY	3,5

5.7 LIFT OUT

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.7.1	1410	Dig output 1 src			16BIT_L	Null			RW	INT	FVSY	3,5
5.7.2	1412	Dig output 2 src			16BIT_L	Null			RW	INT	FVSY	3,5
5.7.3	1414	Dig output 3 src			16BIT_L	Null			RW	INT	FVSY	3,5
5.7.4	1416	Dig output 4 src			16BIT_L	Null			RW	INT	FVSY	3,5
5.7.5	1420	Dig output 1x src			16BIT_L	Null			RW	INT	FVSY	5
5.7.6	1422	Dig output 2x src			16BIT_L	Null			RW	INT	FVSY	5
5.7.7	14104	Command output mon	Hex	UINT32					R	INT	FVSY	3,5

5.8 LIFT IN

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.8.1	11220	Lift enable cmd src		ENUM		Dig input E			RW	INT	FVSY	3,5
5.8.2	11232	Contacteur fbk src		ENUM		Run cont mon			RW	INT	FVSY	3,5
5.8.3	11236	Brake fbk src		ENUM		Brake cont mon			RW	INT	FVSY	3,5
5.8.4	10096	Brake 2 fbk src		ENUM		Brake cont mon			RW	INT	FVSY	3,5
5.8.5	11238	Door open src		ENUM		Null			RW	EXP	FVSY	3,5
5.8.6	11240	Door feedback src		ENUM		Null			RW	EXP	FVSY	3,5
5.8.7	11242	Emergency mode src		ENUM		Dig input 3			RW	INT	FVSY	3,5
5.8.8	11288	Inspection mode src		ENUM		Null			RW	INT	FVSY	3,5
5.8.9	11272	Fast Enable src		ENUM		Null			RW	INT	FVSY	5
				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							
5.8.10	11820	Brake realease src		ENUM		Null			RW	EXP	VY	3,5
5.8.11	11832	Safe Brake Test src		ENUM		Null			RW	EXP	FVSY	5
5.8.12	14102	Command input mon	Hex	UINT32					R	ESY	FVSY	3,5

5.9 PRE TORQUE

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.9.1	11166	Pre-torque enable		BIT		Off			RW	EXP	VY	3,5
				0	Off							
				1	On							
5.9.2	11168	Pre-torque src		ENUM		Init pre-torque			RW	EXP	VY	3,5

1600 Analog in 1
4034 Fieldbus M→S2 (only for ADL530 and ADL550)
4044 Fieldbus M→S3 (only for ADL530 and ADL550)
4054 Fieldbus M→S4 (only for ADL530 and ADL550)
4064 Fieldbus M→S5 (only for ADL530 and ADL550)
4074 Fieldbus M→S6 (only for ADL530 and ADL550)
4084 Fieldbus M→S7 (only for ADL530 and ADL550)
4094 Fieldbus M→S8 (only for ADL530 and ADL550)
4104 Fieldbus M→S9 (only for ADL530 and ADL550)
4124 Fieldbus M→S10 (only for ADL530 and ADL550)
4114 Fieldbus M→S11 (only for ADL530 and ADL550)
4134 Fieldbus M→S12 (only for ADL530 and ADL550)
4144 Fieldbus M→S13 (only for ADL530 and ADL550)
4154 Fieldbus M→S14 (only for ADL530 and ADL550)
4164 Fieldbus M→S15 (only for ADL530 and ADL550)
4174 Fieldbus M→S16 (only for ADL530 and ADL550)
11170 Init pretorque

5.9.3	11170	Init pre-torque	%	INT16/32	0	-100	100	RWZ	EXP	VY	3,5
5.9.4	11172	Pre-torque ramp up	ms	INT16/32	0	0	10000	RWZ	EXP	VY	3,5
5.9.5	10098	Start ramp dw		ENUM	Lift stop			RWZ	EXP	VY	3,5
5.9.6	10174	Ramp dw timer	ms	ENUM	10			RWZ	EXP	VY	3,5
5.9.7	11174	Pre-torque ramp down	ms	INT16/32	0	0	60000	RWZ	EXP	VY	3,5
5.9.8	11176	Pre-torque offset	%	FLOAT	0	-100	100	RWZ	EXP	VY	3,5
5.9.9	11178	Pre-torque gain		FLOAT	0	-100	100	RWZ	EXP	VY	3,5
5.9.10	14040	Pre-torque input	%	INT16/32				R	EXP	VY	3,5
5.9.11	14056	Pre-torque out	%	INT16/32				R	EXP	VY	3,5
5.9.12	14058	Torque reference	%	INT16/32				R	EXP	VY	3,5

5.10 LIFT EMERGENCY

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.10.1	11362	Autoselect direction		ENUM		Off			RW	INT	VS	3,5
5.10.3	11278	Em DC brk current	%	FLOAT		75.0	0	150	RW	INT	VS	3,5
5.10.4	11284	Detection Limit	%	UINT32		20	0	100	RWZ	INT	FVSY	3,5
5.10.5	14282	Chosen direction		ENUM					R	INT	FVSY	3,5
				0	No direction (selected)							
				1	Forward							
				2	Reverse							
5.10.6	11094	Brake release type		ENUM		Brake			RW	EXP	VY	3,5
				0	Brake							
				1	Brake + Run							
5.10.7	11822	Em max speed		UINT32		SIZE			RW	EXP	VY	3,5
5.10.8	11824	Brake lock time	s	UINT32		4	1	30	RW	EXP	VY	3,5

5.11 LIFT ALARMS

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.11.1	11200	Contactor activity		ENUM		Disable			RWZ	INT	FVSY	3,5
				0	Ignore							
				1	Warning							
				2	Disable drive							
				3	Fast stop							
				4	Lift fast stop							
				5	Lift stop							
5.11.2	11202	Cont hold off	ms	INT32		1000	0	60000	RW	INT	FVSY	3,5
5.11.3	11204	Brake activity		ENUM		Disable			RWZ	INT	FVSY	3,5

				0 Ignore 1 Warning 2 Disable drive 3 Fast stop 4 Lift fast stop 5 Lift stop								
5.11.4	11206	Brake hold off	ms	INT32	1000	0	60000	RW	INT	FVSY	3,5	
5.11.5	10094	Brake 2 hold off	ms	INT32	1000	0	60000	RW	INT	FVSY	3,5	
5.11.6	11208	Brake run hold off		ENUM	Enable			RW	INT	FVSY	3,5	
				0 Disable 1 Enable								
5.11.7	11210	Door activity		ENUM	Disable			RWZ	EXP	FVSY	3,5	
				0 Ignore 1 Warning 2 Disable drive 3 Fast stop 4 Lift fast stop 5 Lift stop								
5.11.8	11212	Door hold off	ms	INT32	1000	0	60000	RW	EXP	FVSY	3,5	
5.11.9	11258	Lift EF alarm src		ENUM	Null			RWZ	INT	FVSY	3,5	
5.11.10	11264	Lift EF al activity		ENUM	Lift stop			RWZ	INT	FVSY	3,5	
				0 Ignore 1 Warning 2 Disable drive 3 Fast stop 4 Lift fast stop 5 Lift stop								
5.11.11	11266	Lift EF hold off	ms	UINT32	1000	0	60000	RW	INT	FVSY	3,5	
5.11.12	11842	SBT Activity		ENUM	Warning			RWZ	EXP	VY	3,5	
				0 Ignore 1 Warning 2 Disable drive								
5.11.13	10134	EBC Activity		ENUM	Disable drive			RWZ	INT	FVSY	5	
				2 Disable drive 4 Lift fast stop 5 Lift stop								
5.11.14	11096	EBC hold off	ms	INT32	100	0	1000	RW	INT	FVSY	5	

5.12 SAFE BRAKE TEST

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.12.1	11832	Safe Brake Test src		ENUM		Null			RW	EXP	VY	5
5.12.2	11838	SBT out curr time	ms	INT16		2000	1	20000	RWZ	EXP	VY	5
5.12.3	11834	SBT out curr ini	%	INT16		75	0	150	RWZ	EXP	VY	5
5.12.4	11836	SBT out curr end	%	INT16		150	0	150	RWZ	EXP	VY	5
5.12.5	11840	SBT enc pos band		INT16		5	2	4000	RWZ	EXP	VY	5
5.12.6	10092	SBT 2th brake		INT16		Off	-	-	RWZ	EXP	VY	5
5.12.7	14284	SBT alarm mon		INT16					R	EXP	VY	5
5.12.8	14286	SBT progress mon		ENUM					R	EXP	VY	5
				0 Init 1 Up 2 Down 3 Test off								

5.13 LIFT TEST

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.13.1	10138	EBC test type		INT16		Off			RW	EXP	FVSY	5
				0	off							
				1	at start							
				2	upon arrival							
5.13.2	10140	EBC Sel brake		INT16		Brake1			RW	EXP	FVSY	5
				0	Brake1 + Brake2							
				1	Brake1							
				2	Brake2							
5.13.3	10142	EBC test fbk		ENUM		Disable			RW	EXP	FVSY	5
				0	Disable							
				1	Enable							

5.14 DIRECTION CNT

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
5.14.1	3400	Direction cnt enable		ENUM		Disable			RW	EXP	FVSY	3,5
				0	Disable							
				1	Enable							
5.14.2	3402	Max direction cnt		UINT32		0	0	2147483647	RW	EXP	FVSY	3,5
5.14.3	3404	Rope change thr	%	UINT32		98	0	100	RW	EXP	FVSY	3,5
5.14.4	3406	Direction cnt reset		BIT		0	0	1	RW	EXP	FVSY	3,5
				0	Disable							
				1	Enable							
5.14.5	3408	Dir cnt password		UINT32		0	0	999999	RW	EXP	FVSY	3,5
5.14.6	3450	Password status		ENUM		Free			R	EXP	FVSY	3,5
5.14.7	3410	Dir cnt new password		UINT32		0	0	999999	RW	EXP	FVSY	3,5
5.14.8	3412	Ropes usage		UINT16	16BIT_L	0			R	EXP	FVSY	3,5
5.14.9	3414	Direction counter		UINT32	32BIT	0			R	EXP	FVSY	3,5
5.14.10	3416	Prev direct counter		UINT32	32BIT	0			R	EXP	FVSY	3,5
5.14.11	3418	No of cnt reset		UINT32	32BIT	0			R	EXP	FVSY	3,5
5.14.12	3420	Ropes change req mon		BIT	16BIT_L	0	0	1	R	EXP	FVSY	3,5
5.14.13	3422	Dir change monitor		BIT	16BIT_L	0	0	1	R	EXP	FVSY	3,5
5.14.14	3424	Dir change cnt zero		BIT	16BIT_L	0	0	1	R	EXP	FVSY	3,5
5.14.15	3434	Save rope to USB		BIT		0	0	1	RWZ	EXP	FVSY	3,5
5.14.16	3436	Load rope from USB		BIT		0	0	1	RWZ	EXP	FVSY	3,5
5.14.17	3440	Dircnt password type		ENUM		Static			RWZ	EXP	FVSY	3,5
5.14.18	3442	PWD code build		BIT		0	0	1	RW	EXP	FVSY	3,5
5.14.19	3444	PWD code		UINT32		0.0			R	EXP	FVSY	3,5

6. COMMUNICATION

6.1 CONTROL COMMUNICATION (CONTROL COMM)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.1.1	4000	Communication mode		ENUM		Parallel			RW	INT	FVSY	3,5
						Only Can417 communication mode is allowed.						
6.1.6	4004	Fieldbus baudrate		ENUM		250k			RW	EXP	FVSY	3,5
				1	125k							
				2	250k							
				3	500k							
				4	1M							
6.1.7	4006	Fieldbus address		INT16		2	1	127	RW	EXP	FVSY	3,5

			0 Disable 1 Enable								
6.1.9	4012	Fieldbus alarm mode	INT32	0	0	1	RWZ	EXP	FVSY	3,5	
			0 Disable 1 Enable								
6.1.10	4014	Fieldbus state	ENUM	Stop			R	EXP	FVSY	3,5	
			0 Stop 1 PreOperational 2 Operational								
6.1.11	4338	Fieldbus error	UINT16				R	EXP	FVSY	3,5	
6.1.12	4008	Can termin.resistor	ENUM	Off			RW	EXP	FVSY	3,5	
			0 Off 1 On								
6.1.13	9002	Enable remote write	BIT				RW	INT	FVSY	3,5	
			0 Parameter deactivated 1 Parameter activated with time counting in progress								

6.6 NETWORK CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
6.6.1	9610	Readonly Username		STRING16		readonly			R	EXP	FVSY	3,5
6.6.2	9626	Easy Username		STRING16		ESY			R	EXP	FVSY	3,5
6.6.3	9634	Easy Password		STRING16		ESY			RW	EXP	FVSY	3,5
6.6.4	9642	Interm Username		STRING16		interm			R	EXP	FVSY	3,5
6.6.5	9650	Interm Password		STRING16		interm			RW	EXP	FVSY	3,5
6.6.6	9658	Expert Username		STRING16		EXP			R	EXP	FVSY	3,5
6.6.7	9666	Expert Password		STRING16		EXP			RW	EXP	FVSY	3,5
6.6.8	9544	WiFi Fw version		UINT32		0			R	EXP	S	3,5
6.6.9	9546	WiFi S/N		UINT32		0			R	EXP	S	3,5
6.6.10	9528	WiFi Network name		STRING16		WEG wifi			R	EXP	S	3,5
6.6.11	9536	WiFi Network Pass		STRING16		0123456789			R	EXP	S	3,5
6.6.12	9554	WiFi Network Channel		UINT16		11	0	12	R	EXP	S	3,5
6.6.13	9556	IP Address set		UINT32		169.254.10.10			RW	EXP	FVSY	3,5
6.6.14	9558	IP Netmask set		UINT32		255.255.0.0			RW	EXP	FVSY	3,5
6.6.15	9560	IP Gateway set		UINT32		0.0.0.0			RW	EXP	FVSY	3,5
6.6.16	9564	IP Netmask		UINT32		255.255.0.0			R	EXP	FVSY	3,5
6.6.17	9566	IP Gateway		UINT32		0.0.0.0	0	0	R	EXP	FVSY	3,5
6.6.18	9608	IP Assignment		ENUM		Static	0	0	RW	EXP	FVSY	3,5
			0 DHCP 1 Static									

7. MOTOR DATA

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
7.1	392	Select motor		BIT		0	0	1	RWZ	INT	FVSY	3,5
7.2	2000	Rated voltage	V	FLOAT		SIZE	150	480	RWZ	INT	FVSY	3,5
7.3	2002	Rated current	A	FLOAT		SIZE	1	1500	RWZ	INT	FVSY	3,5
7.4	2004	Rated speed	rpm	FLOAT		SIZE	10	32000	RWZ	INT	FVSY	3,5
7.5	2006	Rated frequency	Hz	FLOAT		SIZE	1	1000	RWZ	INT	FVS	3,5
7.6	2008	Pole pairs		UINT16		SIZE	1	60	RWZ	INT	FVSY	3,5
7.7	2010	Rated power	kW	FLOAT		SIZE	0.1	1500	RWZ	INT	FVS	3,5
7.8	2012	Rated power factor		FLOAT		SIZE	0.6	0.95	RWZ	INT	FVS	3,5

7.9	2014	Torque constant		FLOAT	SIZE	0	120	RWZ	INT	Y	3,5
7.10	2020	Take parameters		BIT	0	0	1	RWZ	INT	FVSY	3,5
7.11	2022	Autotune rotation		BIT	0	0	1	RWZ	INT	FVS	3,5
7.12	2024	Autotune still		BIT	0	0	1	RWZ	INT	FVSY	3,5
7.13	2030	Autotune status		ENUM	Required			R	INT	FVSY	3,5
				0 Required 1 Done							
7.14	2050	Measured Rs	ohm	FLOAT	0	0	200	RW	EXP	FVSY	3,5
7.15	2052	Measured DTL	V	FLOAT	0	0	100	RW	EXP	FVSY	3,5
7.16	2054	Measured DTS	V/A	FLOAT	0	0	100	RW	EXP	FVSY	3,5
7.17	2056	Measured Lsig	mH	FLOAT	0.1	0.1	200	RW	EXP	FVS	3,5
7.18	2058	Measured LsSyn	mH	FLOAT	0.1	0.1	200	RW	EXP	Y	3,5
7.19	2060	Measured LsMin Syn	mH	FLOAT	0.1	0.1	200	RW	EXP	Y	3,5
7.20	2062	Measured ImN	A	FLOAT	CALCF	0	1000	RW	EXP	FVS	3,5
7.21	2066	Measured FlxN	Wb	FLOAT	CALCF	0	10	RW	EXP	FVS	3,5
7.22	2076	Measured Rr	ohm	FLOAT	CALCF	0	200	RW	EXP	FVS	3,5
7.23	2078	Take tune paramenterers		BIT	0	0	1	RW	INT	FVSY	3,5

8. ENCODER

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
8.1	2100	Encoder pulses	ppr	UINT16		1024	4	16384	RWZ	INT	FVSY	3,5
8.2	2102	Encoder supply	V	FLOAT		5.2	5.2	20.0	RW	INT	FVSY	3,5
8.3	2104	Encoder input config		ENUM 0 HTL 1 TTL		TTL			RWZ	INT	FVSY	3,5
8.4	2106	Encoder repetition		ENUM 0 No division 1 Divide 2 2 Divide 4 3 Divide 8 4 Divide16 5 Divide 32 6 Divide 64		No division			RWZ	INT	FVSY	3,5
8.5	2108	Encoder signal Vpp	V	FLOAT		0.8	0.5	1.2	RWZ	INT	FVSY	3,5
8.6	2110	Encoder signal check		ENUM 1 Check A-B 2 Check A-B-Z		Check A-B			RWZ	EXP	FVSY	3,5
8.7	2116	ENC signal Vpp inc	V	FLOAT		0			R	EXP	FVSY	3,5
8.8	2118	ENC signal Vpp abs	V	FLOAT		0			R	EXP	FVSY	3,5
8.9	2130	Encoder direction		ENUM 0 Not inverted 1 Inverted		Not_inverted			RWZ	INT	FVY	3,5
8.10	2132	Encoder mode		ENUM 0 None 1 Digital 2 Sinus 3 Sinus SINCOS (only for ADL530 and ADL550) 4 Sinus ENDAT (only for ADL530 and ADL550) 5 Sinus BISS (only for ADL530 and ADL550) 6 ENDAT (only for ADL530 and ADL550) 7 BiSS (only for ADL530 and ADL550) 8 Sinus SSI (only for ADL530 and ADL550)		None			RWZ	INT	FVSY	3,5
8.11	2134	Encoder speed filter	ms	FLOAT		1.0	0.1	8.0	RW	EXP	FVSY	3,5

8.12	2136	Peripheral encoder	BIT	0	0	1	RW	EXP	FVSY	5		
8.13	2184	Ext motor diam	mm	UINT16	1	1	65535	RWZ	EXP	FVSY	5	
8.14	2186	Enc pulley diam	mm	UINT16	1	1	65535	RWZ	EXP	FVSY	5	
8.15	2150	Encoder speed	rpm	INT16	16BIT_H	0		R	ESY	FVSY	3,5	
8.16	2162	Encoder position	cnt	UINT16	16BIT_L	0		R	ESY	FVSY	3,5	
8.17	2164	Encoder abs position	cnt	UINT32	32BIT	0		R	EXP	FVSY	3,5	
8.18	2172	SpdFbkLoss code		UINT16		0		R	EXP	FVSY	3,5	
8.19	2174	Endat error code		UINT16		0		R	EXP	FVSY	3,5	
8.20	2176	Encoder sync mode		UINT16		1	0	3	RWZ	EXP	Y	3,5
8.21	2138	Encoder abs enable	BIT		1	0	1	RW	EXP	Y	3,5	
				0 disable absolute track reading 1 enable absolute track reading								
8.22	2190	Autophase rot	BIT		0	0	1	RWZ	EXP	Y	3,5	
8.23	2192	Autophase still	BIT		0	0	1	RWZ	EXP	Y	3,5	
8.24	2748	Still phasing mode	ENUM		Mode_1			RW	EXP	Y	3,5	
				0 Mode 1 1 Mode 2								
8.25	2194	Phasing repeat	ENUM		Each enable			RW	EXP	Y	3,5	
				0 First enable 1 Each enable 2 Count enable								
8.26	9920	Autophase still type	ENUM		Standard			RW	EXP	Y	3,5	
				Standard Reserved								
8.27	9922	Autophase lmax gain	FLOAT		1	0.01	1.5	RW	EXP	Y	3,5	
8.28	2198	Autophase cnt enable	UINT16		2198	2	65535	RWZ	EXP	Y	3,5	
8.29	7100	BiSS encoder type	UINT16		0			R	EXP	Y	3,5	
8.30	7102	BiSS manufacturer	UINT16		0			R	EXP	Y	3,5	
8.31	7104	BiSS clock freq	UINT16		7	0	15	RW	EXP	Y	3,5	
8.32	7106	BiSS N bit ST	UINT16		13	0	64	RW	EXP	Y	3,5	
8.33	7108	BiSS N bit MT	UINT16		0	0	64	RW	EXP	Y	3,5	
8.34	7110	BiSS data len	UINT16		0			R	EXP	Y	3,5	
8.35	7112	BiSS timeout	us	FLOAT	13	0	65	RW	EXP	Y	3,5	
8.36	7114	BiSS Crc polinomy	UINT16		67	1	65535	RW	EXP	Y	3,5	
8.37	7116	BiSS data code	ENUM		Binary			RW	EXP	Y	3,5	
				0 Binary 1 Gray								
8.38	2178	Abs offset memory	ENUM		Drive memory			RW	EXP	Y	3,5	
				0 Drive memory 1 Encoder memory								
8.39	7150	SSI N bit ST	UINT16		13	0	13	RW	EXP	Y	3,5	
8.40	7152	SSI N bit MT	UINT16		0	0	19	RW	EXP	Y	3,5	
8.41	7154	SSI N bit TX	UINT16		13	0	32	RW	EXP	Y	3,5	
8.42	7156	SSI data code	ENUM		Gray			RW	EXP	Y	3,5	
				0 Binary 1 Gray								
8.43	2732	Enc position offset	INT16		0			RW	EXP	Y	3,5	

9. SAFETY

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
9.1	1058	Safety en mon		BOOL	16BIT_L				R	ESY	FVSY	5
9.2	11088	Contactless Enable		BOOL		Off			RW	INT	FVSY	5
9.3	11252	Brake fbk A3 sel		ENUM		Null			RW	INT	FVSY	3,5
		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								
9.4	11270	Threshold A3	m	FLOAT		0.1	0	2	RW	INT	FVSY	1,3,5

10. REGULATION MENU

10.1 SPEED REGULATION GAINS (SPEED REG GAINS)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.1.1	2240	Inerzia	kgm ²	FLOAT		0.8	0.001	1000	RW	INT	VSY	3,5
10.1.2	9702	Learning trip out	kgm ²	FLOAT		0			R	EXP	FVSY	3,5
10.1.3	2794	SR-P gain at start	%	FLOAT		150.0 (*)	0.0	400.0	RW	INT	VSY	3,5
10.1.4	2796	SR-I gain at start	%	FLOAT		110.0	0.0	400.0	RW	INT	VSY	3,5
10.1.5	2752	SR-P gain low speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY	3,5
10.1.6	2754	SR-I gain low speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY	3,5
10.1.7	2756	SR-P gain high speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY	3,5
10.1.8	2758	SR-I gain high speed	%	FLOAT		100.0	0.0	400.0	RW	INT	VSY	3,5
10.1.9	2760	SR-low speed thrsd	%	UINT16		30	1	100	RW	INT	VSY	3,5
10.1.10	2762	SR-high speed thrsd	%	UINT16		70	1	100	RW	INT	VSY	3,5

10.1.11	2662	SR-P gain	N/rpm	FLOAT	1.0				RW	INT	VSF	3,5
10.1.12	2664	SR-I time	ms	FLOAT	1.0				RW	INT	VSF	3,5
10.1.13	9446	TNF1-frequency	Hz	FLOAT	100.0	5.0	350.0		RW	INT	VSF	3,5
10.1.14	9448	TNF1-bandwidth	Hz	FLOAT	4	1	20		RW	EXP	VSF	3,5
10.1.15	9450	TNF1-depth		FLOAT	20	3	60		RW	EXP	VSF	3,5
10.1.16	9458	Torque Notch Fltr 1		ENUM	Disable				RW	EXP	VSF	3,5
				0	Disable							
				1	Enable							
10.1.17	9452	TNF2-frequency	Hz	FLOAT	100.0	5.0	350.0		RW	EXP	VSF	3,5
10.1.18	9454	TNF2-bandwidth	Hz	FLOAT	4	1	20		RW	EXP	VSF	3,5
10.1.19	9456	TNF2-depth		FLOAT	20	3	60		RW	EXP	VSF	3,5
10.1.20	9460	Torque Notch Fltr 2		ENUM	Disable				RW	EXP	VSF	3,5
				0	Disable							
				1	Enable							
10.1.21	2806	SR-P gain in use	%	FLOAT	100.0				R	INT	VSF	3,5
10.1.22	2808	SR-I gain in use	%	FLOAT	100.0				R	INT	VSF	3,5

10.2 VF CONTROL

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.2.1	2200	Boost voltage	%	FLOAT		3	0	20.0	RW	ESY	F	3,5
10.2.2	2202	Base voltage	V	FLOAT		0			RW	ESY	F	3,5
10.2.3	2204	Base frequency	Hz	FLOAT		0			RW	ESY	F	3,5
10.2.4	2212	V/Hz Boost most		ENUM		Auto			RW	ESY	F	3,5
10.2.5	2214	V/Hz Slip ctrl gain		FLOAT		0			RW	EXP	F	3,5
10.2.6	2218	V/Hz Stability gain		FLOAT		0.0			RW	EXP	F	3,5
10.2.7	2220	V/Hz Limiter Kp		FLOAT		0.2			RW	EXP	F	3,5
10.2.8	2222	V/Hz Limiter Ti	ms	FLOAT		50.0			RW	EXP	F	3,5
10.2.9	2224	V/Hz slip fltr const	ms	FLOAT		10.0	1.0	1000.0	RW	EXP	F	3,5
10.2.10	2230	V/Hz Boost gain	V	FLOAT		0.0			RW	EXP	F	3,5
10.2.11	2480	Vf Min Freq	Hz	FLOAT		0.5	0	5	RW	EXP	F	3,5
10.2.12	2482	Vf Min Dly	ms	FLOAT		800	0	5000	RW	EXP	F	3,5
10.2.13	2206	Middle voltage	V	FLOAT		0			RW	EXP	F	3,5
10.2.14	2208	Middle frequency	Hz	FLOAT		0			RW	EXP	F	3,5
10.2.15	2232	Initial voltage	V	FLOAT		0	0	60.0	RW	EXP	F	3,5
10.2.16	2210	V/Hz Profile type		ENUM		Linear			RW	EXP	F	3,5
				0	Linear							
				1	Custom							
10.2.17	2226	V/Hz Boost slope		FLOAT		0.0			RW	EXP	F	3,5
10.2.18	2228	Slip comp hold		ENUM		Disable			RW	EXP	F	3,5
				0	Disable							
				1	Enable							

10.3 REGULATOR PARAM

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.3.1	2250	CR-P gain	V/A	FLOAT		1.0			RW	EXP	FVSF	3,5
10.3.2	2252	CR-I time	ms	FLOAT		1.0			RW	EXP	FVSF	3,5
10.3.3	2260	FR-P gain	A/Wb	FLOAT		1.0			RW	EXP	FVSF	3,5
10.3.4	2262	FR-I time	ms	FLOAT		1.0			RW	EXP	FVSF	3,5
10.3.5	2272	VR-I time	ms	FLOAT		1.0			RW	EXP	FVSF	3,5

10.3.6	2290	Deflux voltage	V	FLOAT	SIZE				RW	EXP	FVSY	3,5
10.3.7	2292	Voltage margin	%	FLOAT	5.0	0	30.0		RW	EXP	FVSY	3,5
10.3.8	2308	Over-flux level	%	FLOAT	100	100	150		RW	EXP	FVSY	3,5
10.3.9	2312	Over-flux spd thrsd	rpm	FLOAT	400	1	1000		RW	EXP	FVSY	3,5
10.3.10	2314	Over-flux step		FLOAT	1	0.01	10		RW	EXP	FVSY	3,5
10.3.11	2724	Defluxing curr lim	A	FLOAT	SIZE	0	CALCF		RW	EXP	FVSY	3,5

10.4 TORQUE CONFIG

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
10.4.1	2350	Torque cur lim Pos	A	FLOAT	16BIT_H	CALCF	0.0	CALCF	RW	EXP	FVSY	3,5
10.4.2	2352	Torque curr lim Neg	A	FLOAT	16BIT_H	CALCF	0.0	CALCF	RW	EXP	FVSY	3,5
10.4.3	2354	Torque curr lim sel		ENUM		Off			RWZ	EXP	FVSY	3,5
				0 Off 1 T clim +/- 2 T clim mot/gen 3 T limit src								
10.4.4	2358	Torque limit src		ENUM	16BIT_H	6000			RWZ	EXP	FVSY	3,5
10.4.5	2360	Torque climPos lnuse	A	FLOAT	16BIT_H	0.0	0.0	0.0	R	EXP	FVSY	3,5
10.4.6	2362	Torque climNeg lnuse	A	FLOAT	16BIT_H	0.0	0.0	0.0	R	EXP	FVSY	3,5
10.4.7	2380	Dig torque ref	%	FLOAT	16BIT_H	0.0	-300.0	300.0	RW	EXP	FVSY	3,5
10.4.8	2382	Torque ref src		ENUM	16BIT_H	65535			RWZ	EXP	FVSY	3,5

11. FUNCTIONS

11.1 DC BRAKING

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.1.1	3150	DC braking cmd src		ENUM	16BIT_L	3710			RW	EXP	FS	3,5
11.1.2	3152	DC brake mode		ENUM		Off			RW	EXP	FS	3,5
				0 Off 1 At Stop 2 On Command 3 OnCmd & AtStop								
11.1.3	3154	DC brake delay	s	FLOAT		0.01	0.01	30.0	RW	EXP	FS	3,5
11.1.4	3156	DC brake duration	s	FLOAT		1.0	0.01	30.0	RW	EXP	FS	3,5
11.1.5	3158	DC brake current	%	FLOAT		75	0.0	150.0	RW	EXP	FS	3,5
11.1.6	3160	DC brake state		ENUM		Not active			RW	EXP	FS	3,5
				0 Not active 1 Active								

11.2 INERTIA COMP

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.2.1	3100	Inertia comp	kgm ²	FLOAT		0.1			RW	EXP	FVSY	3,5
11.2.2	3102	Inertia comp filter	ms	FLOAT		4.0	2.0	20.0	RW	EXP	FVSY	3,5
11.1.3	3154	DC brake delay	s	FLOAT		0.01	0.01	30.0	RW	EXP	FS	3,5
11.2.3	3104	Inertia comp mon	%	FLOAT	16BIT_H	0.0			R	EXP	FVSY	3,5
11.2.4	3106	Inertia comp fcn		ENUM		Disable			RW	EXP	FVSY	3,5

11.3 ANTI ROLLBACK

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.3.1	2766	PR-P Start gain		FLOAT		500	0	20000	RW	EXP	SY	3,5
11.3.2	2768	PR Start enable		ENUM		Enable			RW	EXP	SY	3,5
				0	Disable							
				1	Enable							
11.3.3	2812	PR-P End gain		FLOAT		500	0	20000	RW	EXP	SY	3,5
11.3.4	2814	PR End enable		ENUM		Enable			RW	EXP	SY	3,5
11.3.5	2810	Pos reg limit	rpm	FLOAT		10.0	-20	20	RW	EXP	SY	3,5
				0	Disable							
				1	Enable							

11.4 VIBRATION ANALYSIS (VIBR. ANALYSIS)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.4.1	2288	Vibration analyzer		ENUM		Disable			RW	EXP	VSY	3,5
				0	Disable							
				1	Enable							
11.4.2	9464	Vibration freq. 1	Hz	FLOAT		0			R	EXP	VSY	3,5
11.4.3	9466	Vibration freq. 2	Hz	FLOAT		0	0.0	0.0	R	EXP	VSY	3,5

11.5 MOTOR OVERLOAD

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.5.1	3200	Motor ovld enable		ENUM		Off			RW	EXP	FVSY	3,5
11.5.2	3202	Motor ovld factor	%	FLOAT		150	100	300	RW	EXP	FVSY	3,5
11.5.3	3204	Motor ovld time	s	FLOAT		30	10	300	RW	EXP	FVSY	3,5
10.4.4	2358	Torque limit src		ENUM	16BIT_H	6000			RWZ	EXP	FVSY	3,5
11.5.4	3206	Motor service factor	%	FLOAT		100	25	200	RW	EXP	FVSY	3,5
11.5.5	3216	Motor fan type		ENUM		Servo fan			RW	EXP	FVSY	3,5
				0	Auto fan							
				1	Servo fan							
11.5.6	3218	Motor derat factor	%	FLOAT		50	0	100	RW	EXP	FVSY	3,5

11.6 BRAKING RESISTOR OVERLOAD (BRES OVERLOAD)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.6.1	3250	Bres control		ENUM		On			RW	INT	FVSY	3,5
				0	Off							
				1	On							
11.6.2	3252	Bres value	ohm	FLOAT		7.0	7.0	1000.0	RW	INT	FVSY	3,5
11.6.3	3254	Bres cont power	kW	FLOAT		0.1	0.1	100.0	RW	INT	FVSY	3,5
11.6.4	3256	Bres overload factor	%	FLOAT		1.5	1.5	10.0	RW	INT	FVSY	3,5
11.6.5	3258	Bres overload time	s	FLOAT		0.5	0.5	50.0	RW	INT	FVSY	3,5

11.7 ENERGY SAVING (ENER. SAVING)

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.7.1	3122	Saved energy	kWh	FLOAT		0			R	EXP	FVSY	3,5
11.7.2	3124	Set energy val	kWh	FLOAT		0			RW	EXP	FVSY	3,5

11.8 COMPARE

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
11.8.1	3650	Dig compare input 1	%	FLOAT	32BIT	0.0	-200.0	200.0	RW	EXP	FVSY	3,5
11.8.2	3652	Dig compare input 2	%	FLOAT	32BIT	0.0	-200.0	200.0	RW	EXP	FVSY	3,5
11.8.3	3660	Compare input 1 src		LINK	32BIT	3650	-0	16384	RW	EXP	FVSY	3,5
11.8.4	3662	Compare input 2 src		LINK	32BIT	3650	-0	16384	RW	EXP	FVSY	3,5
11.8.5	3670	Compare function	A	ENUM		None	0	8	RW	EXP	FVSY	3,5
				0 None 1 Inp1=Inp2 2 Inp1!=Inp2 3 Inp1<Inp2 4 Inp1>Inp2 5 Inp1 = Inp2 6 Inp1 != Inp2 7 Inp1 < Inp2 8 Inp1 > Inp2								
11.8.6	3672	Compare window	%	FLOAT		0.0	0.0	100.0	RW	EXP	FVSY	3,5
11.8.7	3674	Compare delay	s	FLOAT		0.0	0.0	30.0	RW	EXP	FVSY	3,5
11.8.8	3676	Compare output		BIT	16BIT	0	0	1	R	EXP	FVSY	3,5

11.9 DATALOGGER

NOTE!

Please refer to the dedicated manual "**ADL500 Datalogger User manual**".

12. EBC

12.1 MONITOR

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.1.1	8000	EBC SOK mon		BIT					R	ESY	FVSY	5
				Bit = 0 (OFF) open Bit = 1 (ON) close								
12.1.2	8002	EBC Warning mon		BIT					R	ESY	FVSY	5
				Bit = 1 (ON) close								
12.1.3	8004	EBC Alarm mon		BIT					R	ESY	FVSY	5
				Bit = 1 (ON) close								
12.1.4	8006	Brake 1 state mon		U8					R	ESY	FVSY	5
				0 Brake OFF safe 1 Brake OFF 2 Brake ON 3 Fail								
12.1.5	8008	Brake 2 state mon		U8					R	ESY	FVSY	5
				0 Brake OFF safe 1 Brake OFF 2 Brake ON 3 Fail								
12.1.6	8010	Brake 1 out mon		BIT					R	ESY	FVSY	5
				Bit = 1 (ON) close								
12.1.7	8012	Brake 2 out mon		BIT					R	ESY	FVSY	5
				Bit = 1 (ON) close								
12.1.8	8014	Brake 1 Fbk mon		BIT					R	ESY	FVSY	5
				Bit = 1 (ON) close								
12.1.9	8016	Brake 2 Fbk mon		BIT					R	ESY	FVSY	5

Bit = 1 (ON) close												
12.1.10	8018	Brake 1 Current avg mon	A	FLOAT					R	ESY	FVSY	5
12.1.11	8020	Brake 2 Current avg mon	A	FLOAT					R	ESY	FVSY	5
12.1.12	8022	Vline rms mon	V	FLOAT					R	ESY	FVSY	5
12.1.13	8024	Vline frequency mon	Hz	FLOAT					R	ESY	FVSY	5
12.1.14	8026	Pwr Bridge Temperature mon	°C	FLOAT					R	ESY	FVSY	5
12.1.15	8320	BRK 1 Fast Close Time	ms	BIT		0			W	ESY	FVSY	5
12.1.16	8322	BRK 2 Fast Close Time	ms	BIT		0			W	ESY	FVSY	5
12.1.17	8324	BRK 1 slow Close Time	ms	BIT		0			W	ESY	FVSY	5
12.1.18	8326	BRK 2 slow Close Time	ms	BIT		0			W	ESY	FVSY	5
12.1.19	8328	BRK 1 Open Time	ms	BIT		0			W	ESY	FVSY	5
12.1.20	8330	BRK 2 Open Time	ms	BIT		0			W	ESY	FVSY	5
12.1.21	8336	BRK 1 Resistance	ms	BIT		0			W	ESY	FVSY	5
12.1.22	8338	BRK 2 Resistance	ms	BIT		0			W	ESY	FVSY	5
12.1.23	8344	Brake Output V Equivalent	ms	BIT		0			W	ESY	FVSY	5

12.2 INFO

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.2.1	8100	Product type		U16					R	ESY	FVSY	5
				1 EBC500								
12.2.2	8102	Product version		U32					R	ESY	FVSY	5
12.2.3	8104	Product conf		U8					R	ESY	FVSY	5
				Brake 1-2								

12.3 CONFIGURATION

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.3.1	8150	EBC enable		BIT		False			W	ESY	FVSY	5
				On detects and requests the presence of the EBC								
				Off does not detect the presence of the EBC								
12.3.2	8152	EBC Local mode		U8		0			W	ESY	FVSY	5
				0 emergency stop								
				1 smooth stop								
12.3.3	8154	EBC Local mon		BIT					R	ESY	FVSY	5
12.3.4	8156	Use Brake Feedbacks		BIT		0			W	ESY	FVSY	5
				0 Enable the power mode								
				1 Enable the brake feedback mode								
12.3.5	8158	Brake Feedback Inverted		BIT		0			W	ESY	FVSY	5
				0 Not inverted								
				1 Inverted								
12.3.6	8160	Holding Voltage Low Noise		BIT		0			W	ESY	FVSY	5
				0 Function low noise not used								
				1 Function low noise used								
12.3.7	8162	Swap Brake Feedbacks		BIT		0			W	ESY	FVSY	5
				0 Not swapped								
				1 Swapped								

12.3.4	4008	Can termin.resistor	ENUM	Off					RW	INT	FVY	3,5
			0 Off									
			1 On									

12.4 COMMUNICATION

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.4.1	8200	EBC Communication Address		U8		119	1	127	W	ESY	FVSY	5
12.4.2	8202	EBC Communication Format		U8		1	0	1	W	ESY	FVSY	5
				0 11bit ID								
				1 29 bit ID								
12.4.3	4004	Field baudrate							W	ESY	FVSY	5
12.4.4	8204	EBC Command word mon		U16					R	ESY	FVSY	5
				1 125 K								
				2 250 K								
				3 500 K								
				4 1 MI								
12.4.5	8206	EBC Status word mon		U32					R	ESY	FVSY	5
12.4.6	8348	EBC IP Addr Assigned		Assigned					R	ESY	FVSY	5

12.5 BRAKE DATA

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.5.1	8250	Brake Holding Voltage	V	Float		103.5	1	207	W	ESY	FVSY	5
12.5.2	8252	Brake Holding Power	W	Float		76	1	350	W	ESY	FVSY	5
12.5.3	8254	Brake ON Holding I	%	Float		80	0	200	W	ESY	FVSY	5
12.5.4	8256	Brake OFF Holding I	%	Float		20	0	200	W	ESY	FVSY	5
12.5.5	8258	Brake Power ON Mode		U8		1			W	ESY	FVSY	5
				Full voltage								
				Boost/Half voltage								
				Boost/Holding voltage								
12.5.6	8260	Brake Power ON Boost	ms	U16		1000	0	5000	W	ESY	FVSY	5
12.5.7	8262	Brake Holding I mon	A						R	ESY	FVSY	5

12.6 DIAGNOSTIC

Menu	PAR	Description	UM	Type	FB BIT	Def	Min	Max	Acc	Lev	Vis	ADL
12.6.1	8300	Time SCR power on	h:min						R			5

D - Selection Lists

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

D - Selection Lists

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

D - Liste di selezione

1232	Dig input 2x	4.8.23
1234	Dig input 3x	4.8.24
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	5.8.13
12252	B1 Lift decomp	5.8.13
12254	B2 Lift decomp	5.8.13
12256	B3 Lift decomp	5.8.13
12258	B4 Lift decomp	5.8.13
12260	B5 Lift decomp	5.8.13
12262	B6 Lift decomp	5.8.13
12264	B7 Lift decomp	5.8.13
12266	B8 Lift decomp	5.8.13
12268	B9 Lift decomp	5.8.13
12270	B10 Lift dcomp	5.8.13
12272	B11 Lift dcomp	5.8.13
12274	B12 Lift dcomp	5.8.13
12276	B13 Lift dcomp	5.8.13
12278	B14 Lift dcomp	5.8.13
12280	B15 Lift dcomp	5.8.13

LIFTINPUTDOORCMD

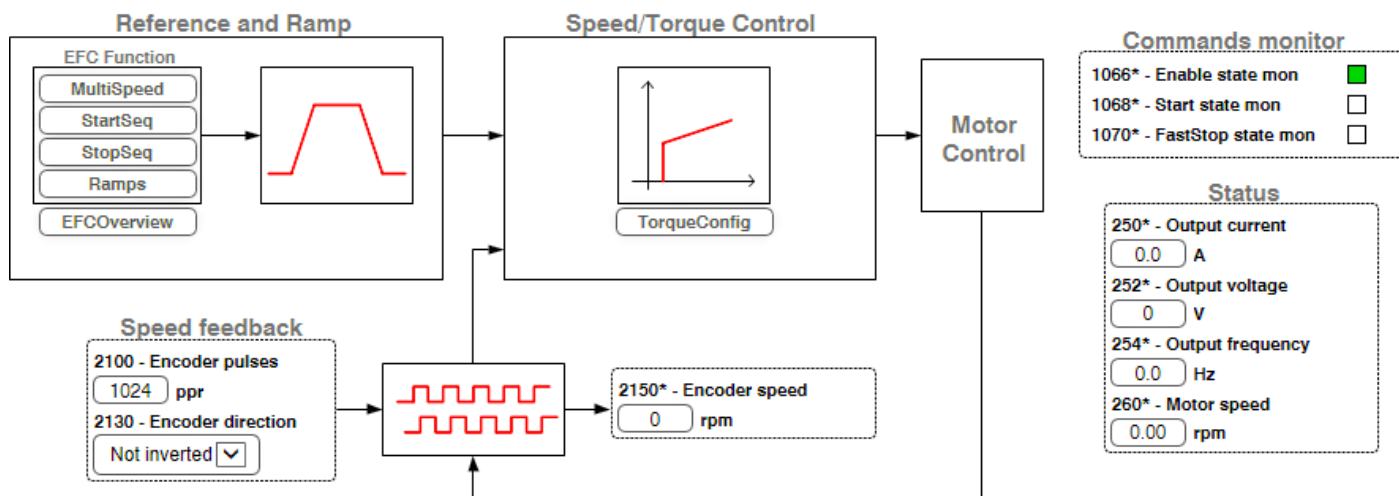
PAR	Description	Menu
1110	Dig input E mon	4.8.13
1210	Dig input 1 mon	4.8.14
1212	Dig input 2 mon	4.8.15
1214	Dig input 3 mon	4.8.16
1216	Dig input 4 mon	4.8.17
1218	Dig input 5 mon	4.8.18
1220	Dig input 6 mon	4.8.19
1222	Dig input 7 mon	4.8.20
1224	Dig input 8 mon	4.8.21
1230	Dig input 1x mon	4.8.22
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	5.8.13
12252	B1 Lift decomp	5.8.13
12254	B2 Lift decomp	5.8.13
12256	B3 Lift decomp	5.8.13
12258	B4 Lift decomp	5.8.13
12260	B5 Lift decomp	5.8.13
12262	B6 Lift decomp	5.8.13
12264	B7 Lift decomp	5.8.13
12266	B8 Lift decomp	5.8.13
12268	B9 Lift decomp	5.8.13
12270	B10 Lift dcomp	5.8.13
12272	B11 Lift dcomp	5.8.13
12274	B12 Lift dcomp	5.8.13
12276	B13 Lift dcomp	5.8.13
12278	B14 Lift dcomp	5.8.13
12280	B15 Lift dcomp	5.8.13

LIFTINPUTADLCMDEBC

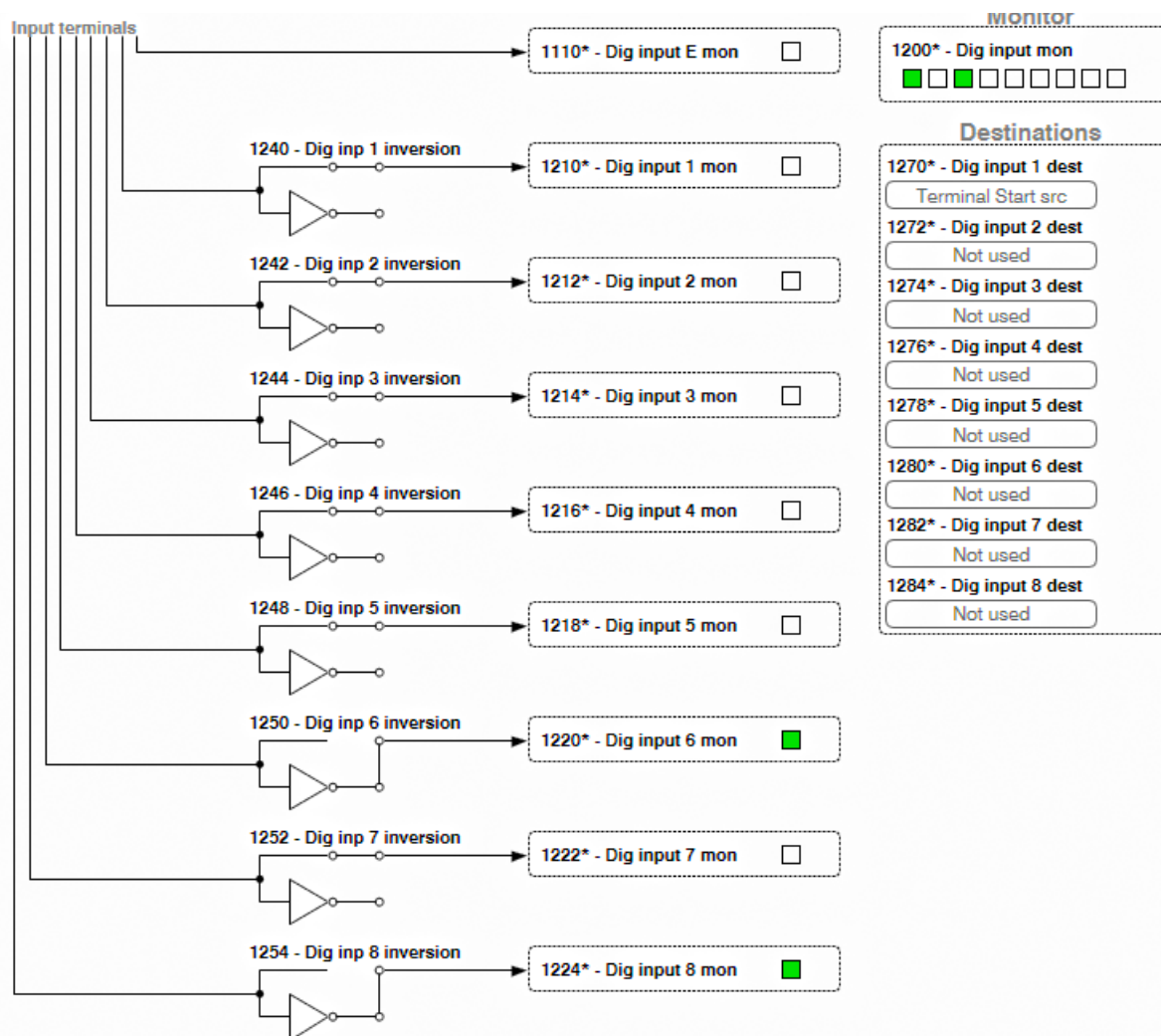
PAR	Description	Menu
1110	Dig input E mon	4.8.13
1210	Dig input 1 mon	4.8.14
1212	Dig input 2 mon	4.8.15
1214	Dig input 3 mon	4.8.16
1216	Dig input 4 mon	4.8.17
1218	Dig input 5 mon	4.8.18
1220	Dig input 6 mon	4.8.19
1222	Dig input 7 mon	4.8.20
1224	Dig input 8 mon	4.8.21
1230	Dig input 1x mon	4.8.22
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 fbk1	12.1.2
8004	EBC fbk2	12.1.3
6000	Null	
6002	One	
12250	B0 Lift decomp	5.8.13
12252	B1 Lift decomp	5.8.13
12254	B2 Lift decomp	5.8.13
12256	B3 Lift decomp	5.8.13
12258	B4 Lift decomp	5.8.13
12260	B5 Lift decomp	5.8.13
12262	B6 Lift decomp	5.8.13
12264	B7 Lift decomp	5.8.13
12266	B8 Lift decomp	5.8.13
12268	B9 Lift decomp	5.8.13
12270	B10 Lift dcomp	5.8.13
12272	B11 Lift dcomp	5.8.13
12274	B12 Lift dcomp	5.8.13
12276	B13 Lift dcomp	5.8.13
12278	B14 Lift dcomp	5.8.13
12280	B15 Lift dcomp	5.8.13

DRIVE

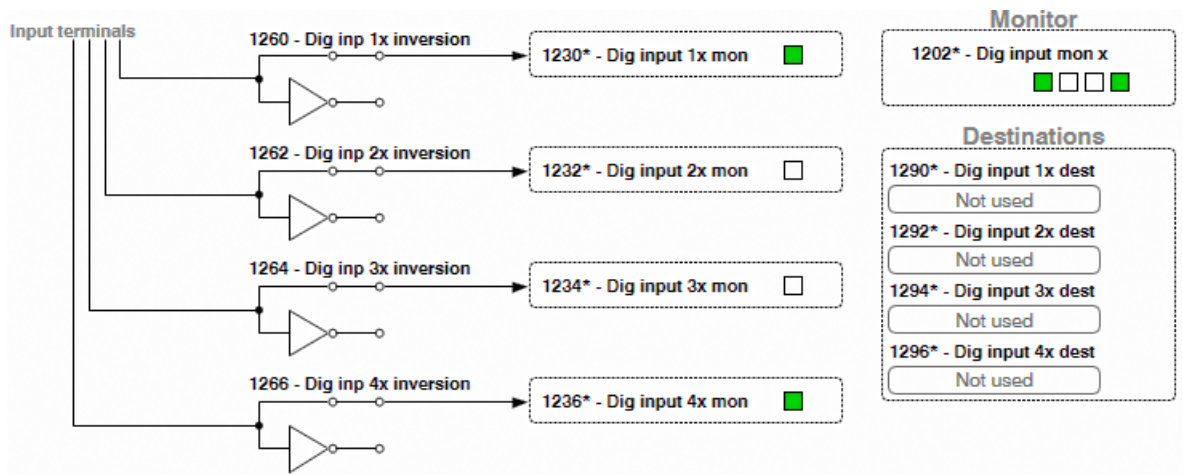
DRIVE OVERVIEW



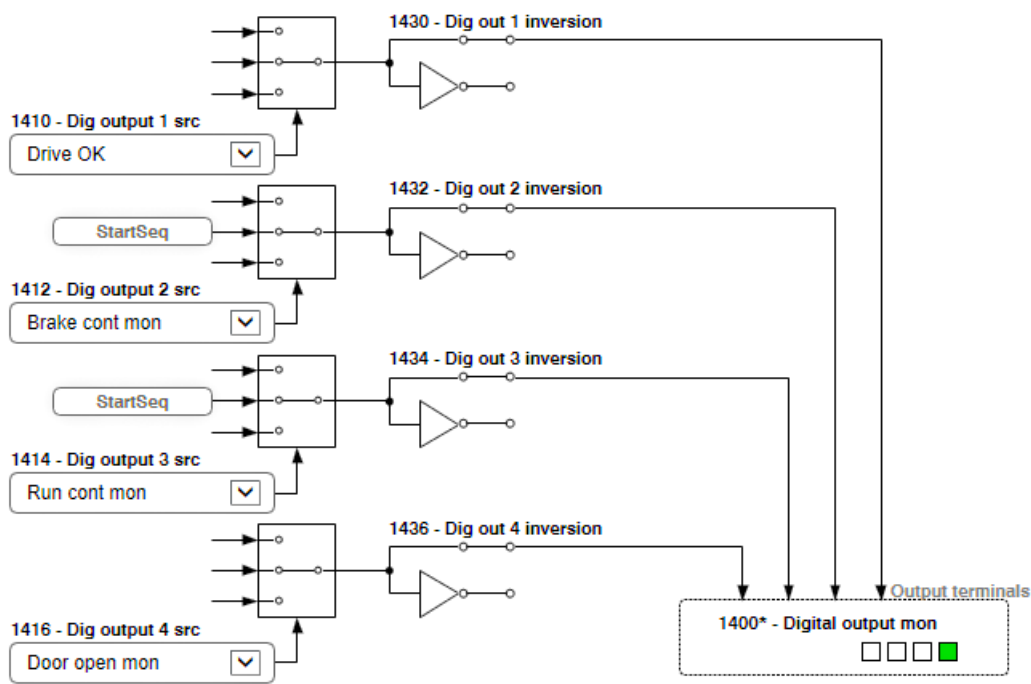
DIGITAL INPUTS



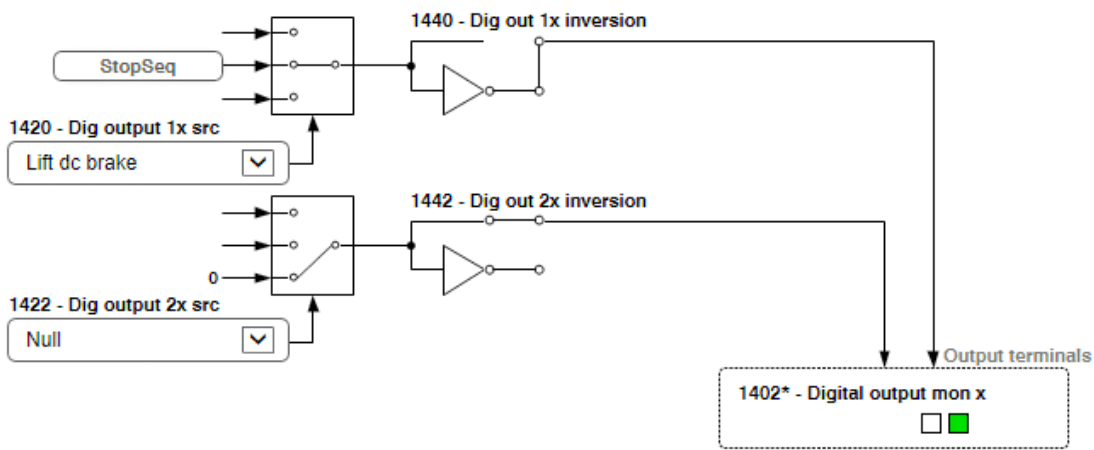
EXPANSION DIGITAL INPUTS



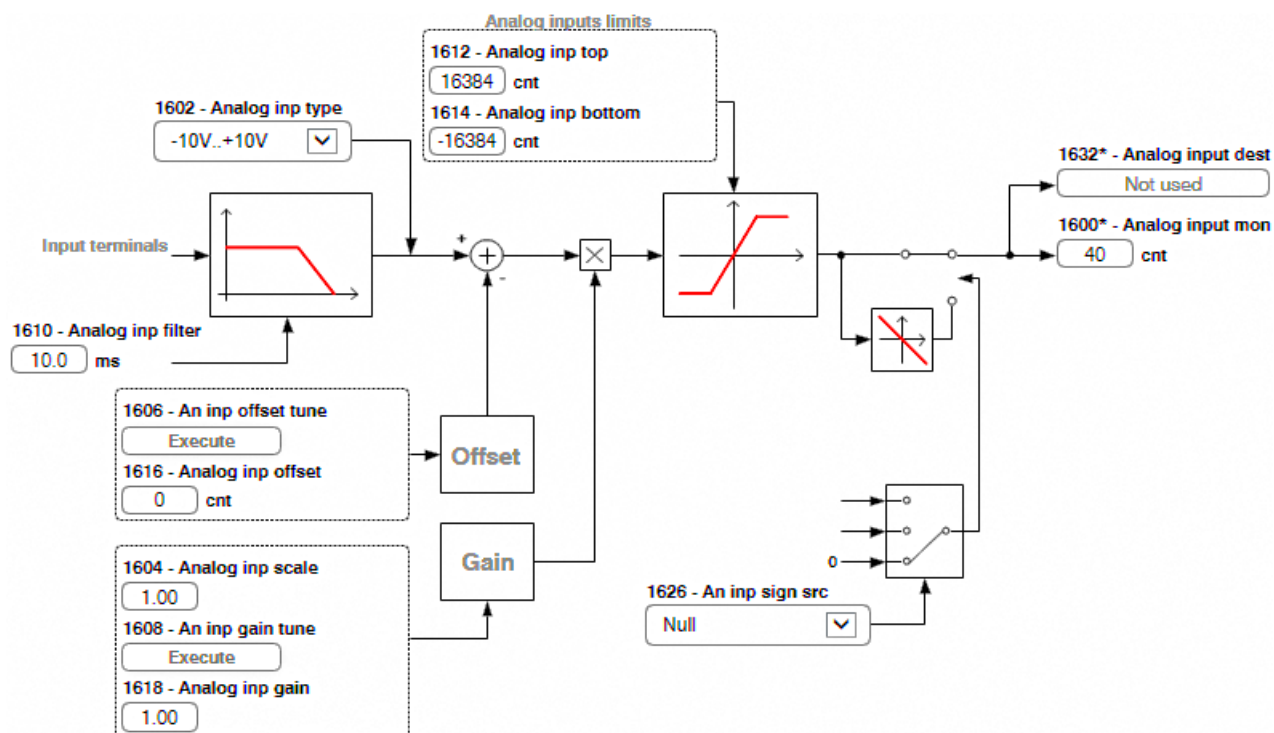
DIGITAL OUTPUTS



EXPANSION DIGITAL OUTPUTS

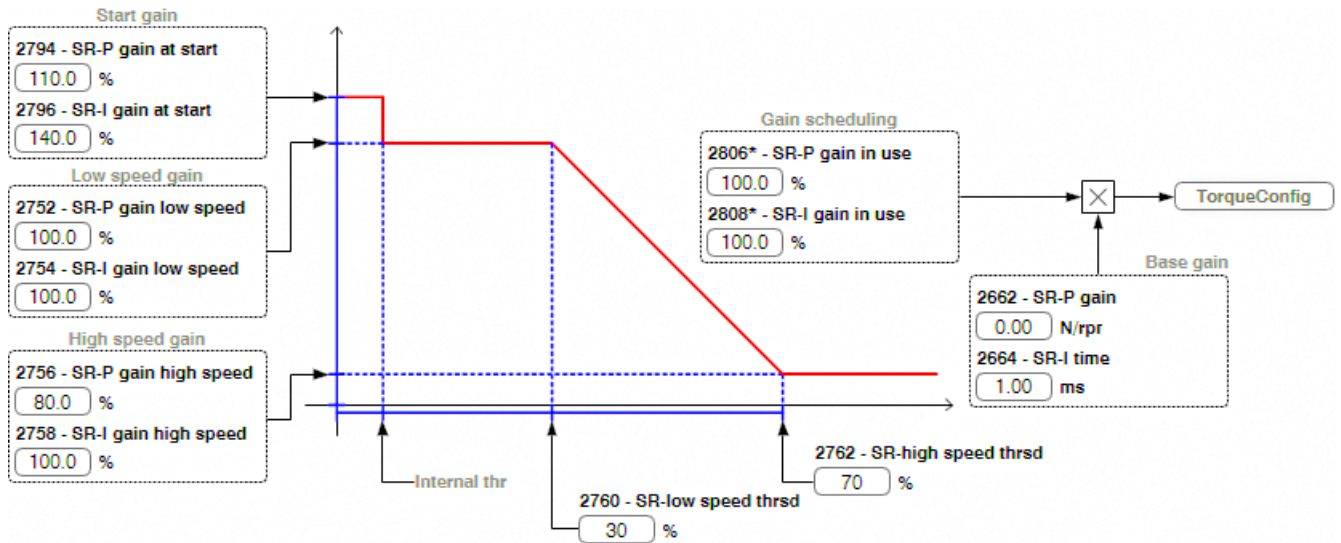


ANALOG INPUTS

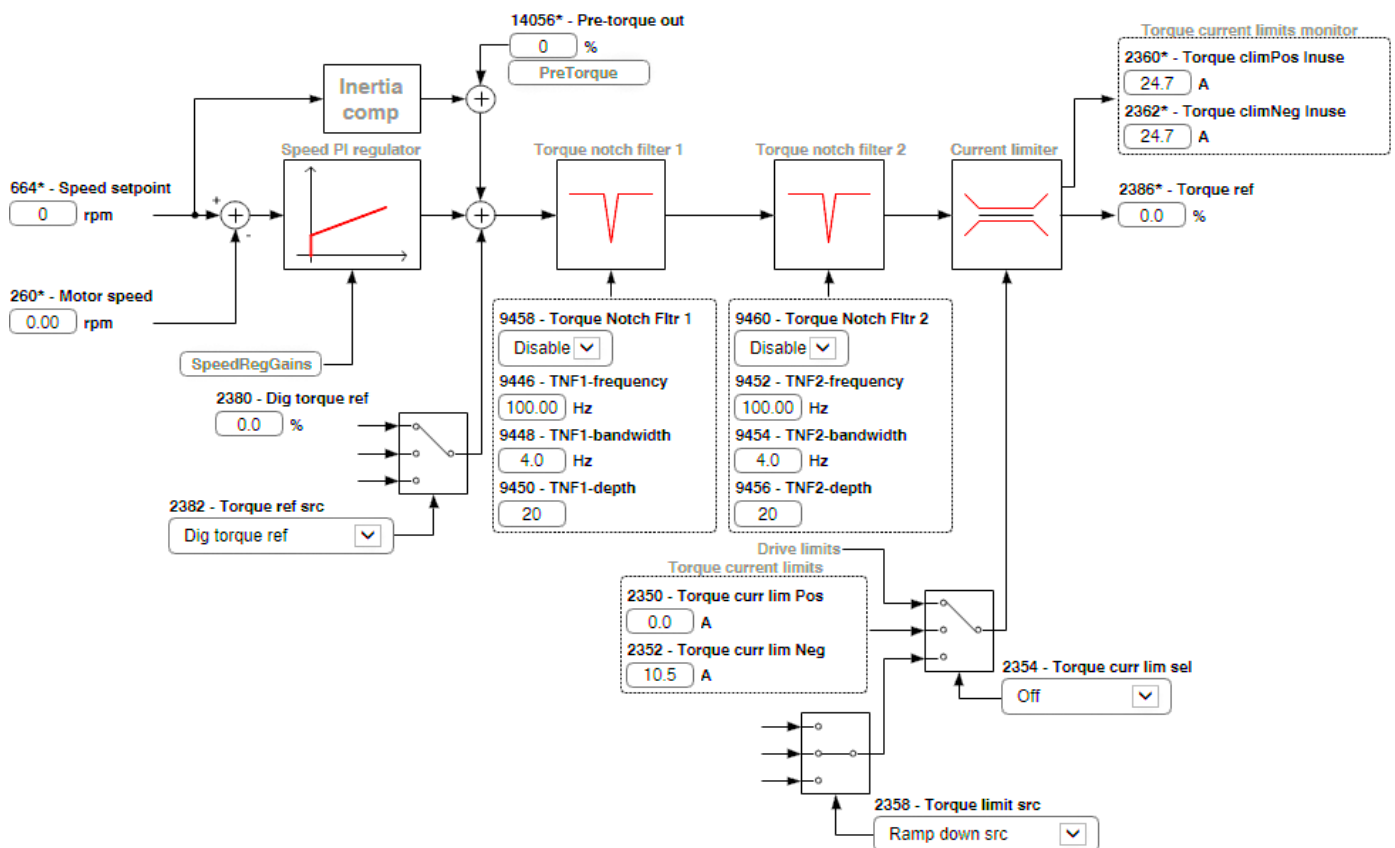


REGULATIONS

SPEED REG GAINS

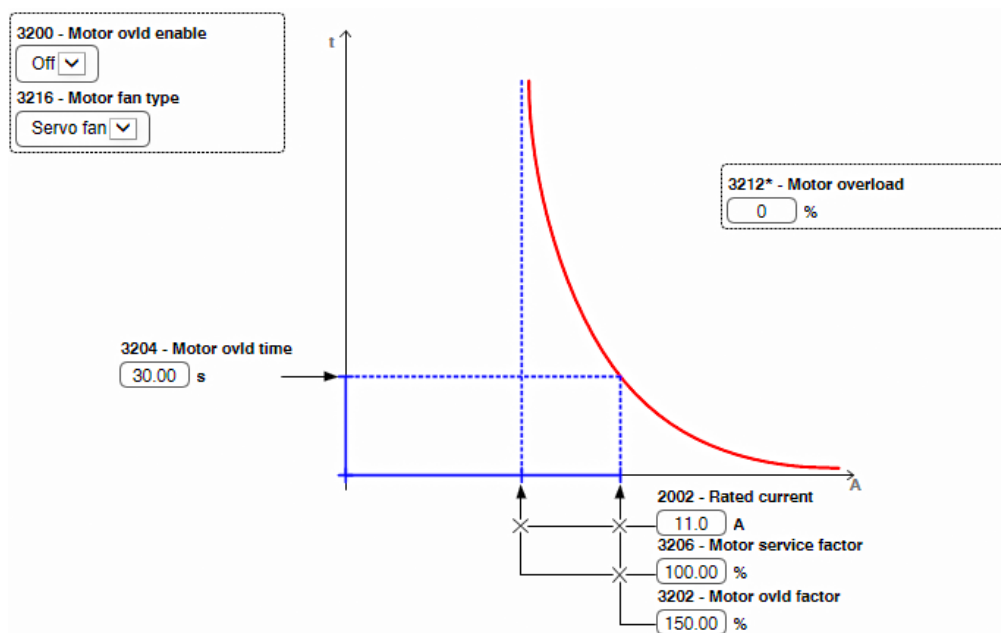


TORQUE CONFIG

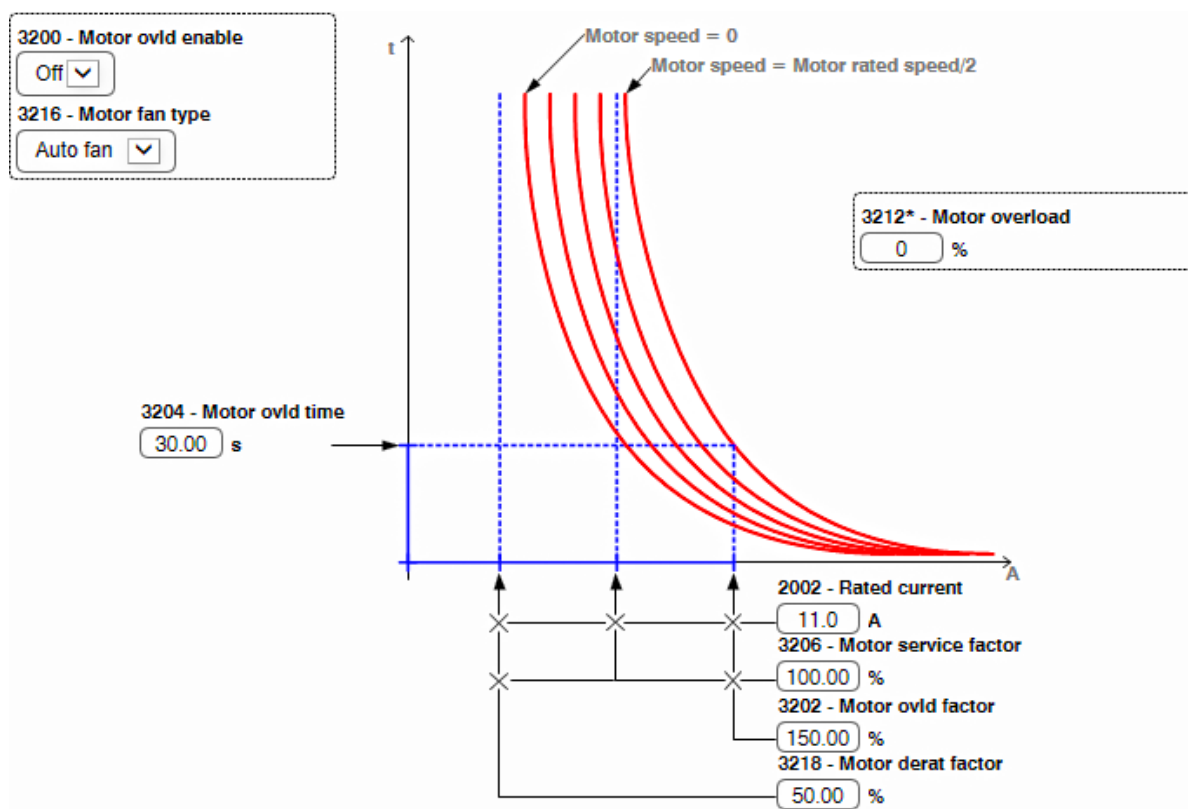


FUNCTIONS

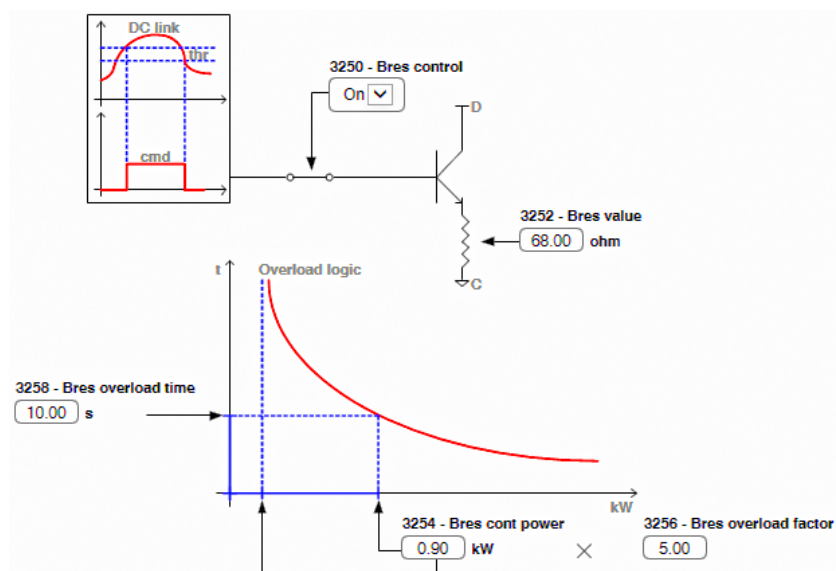
MOTOR OVERLOAD SERVOFAN



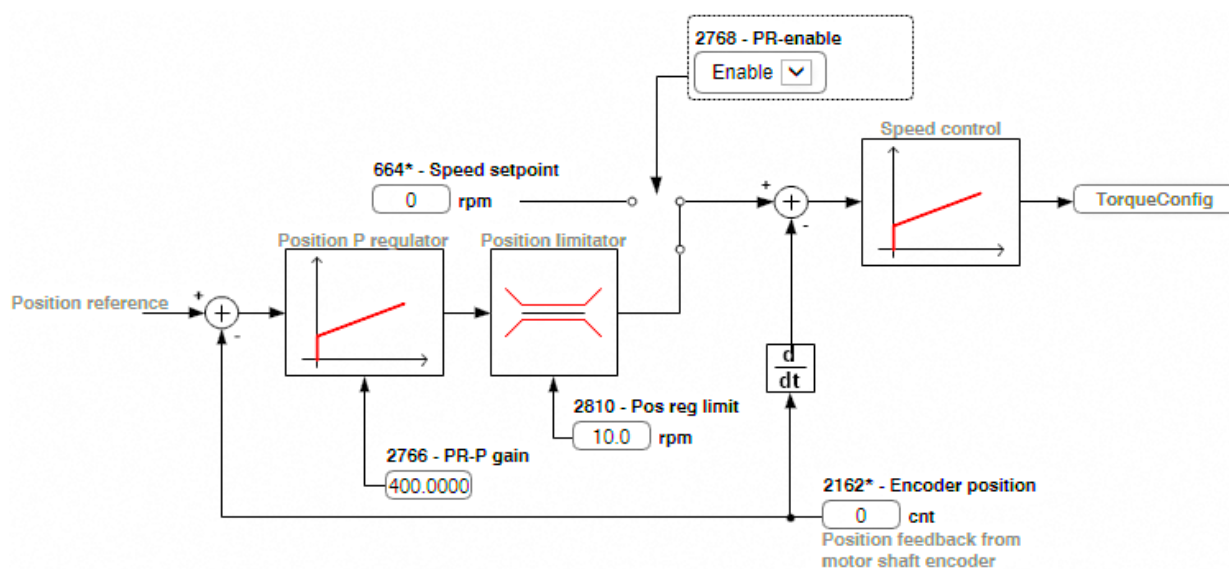
MOTOR OVERLOAD AUTO FAN



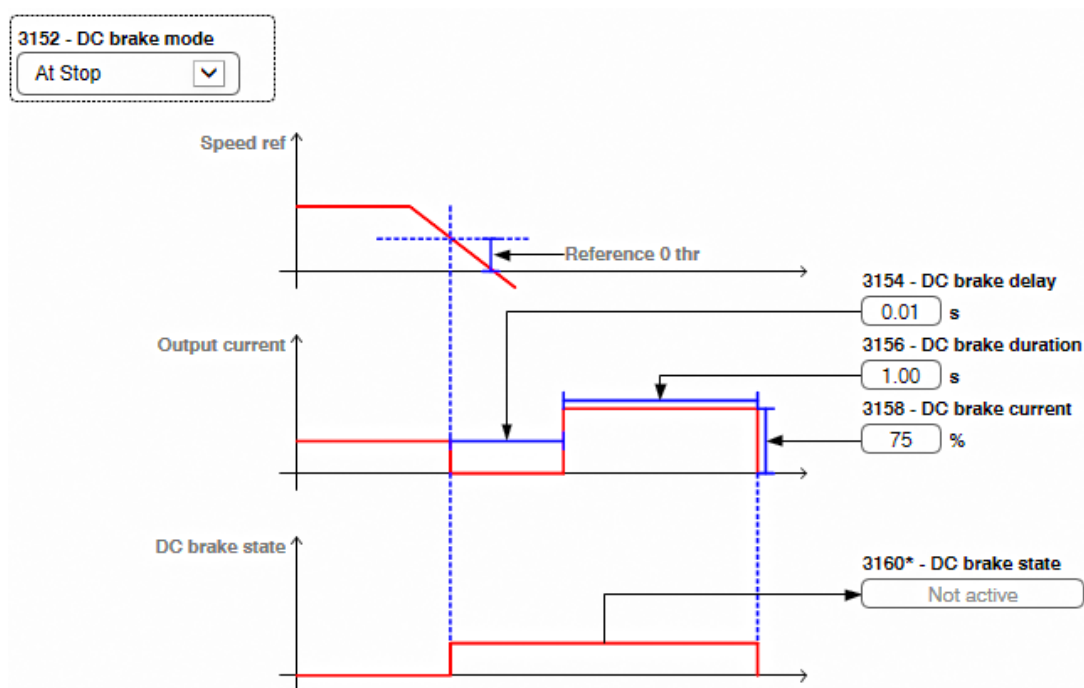
BRES OVERLOAD



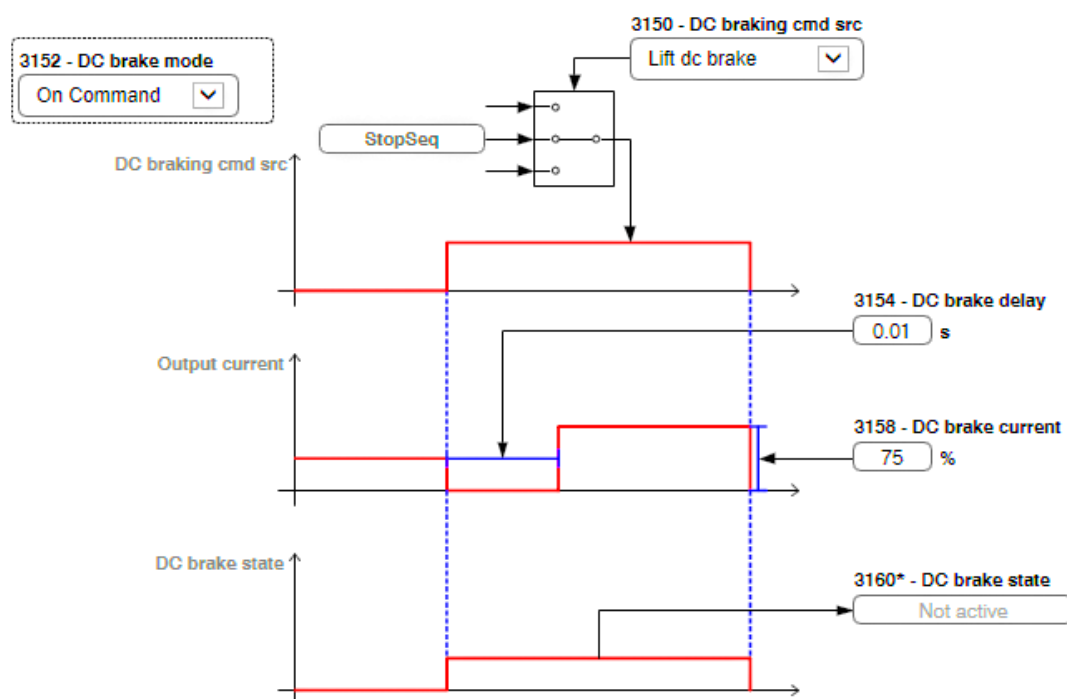
ANTI ROLLBACK



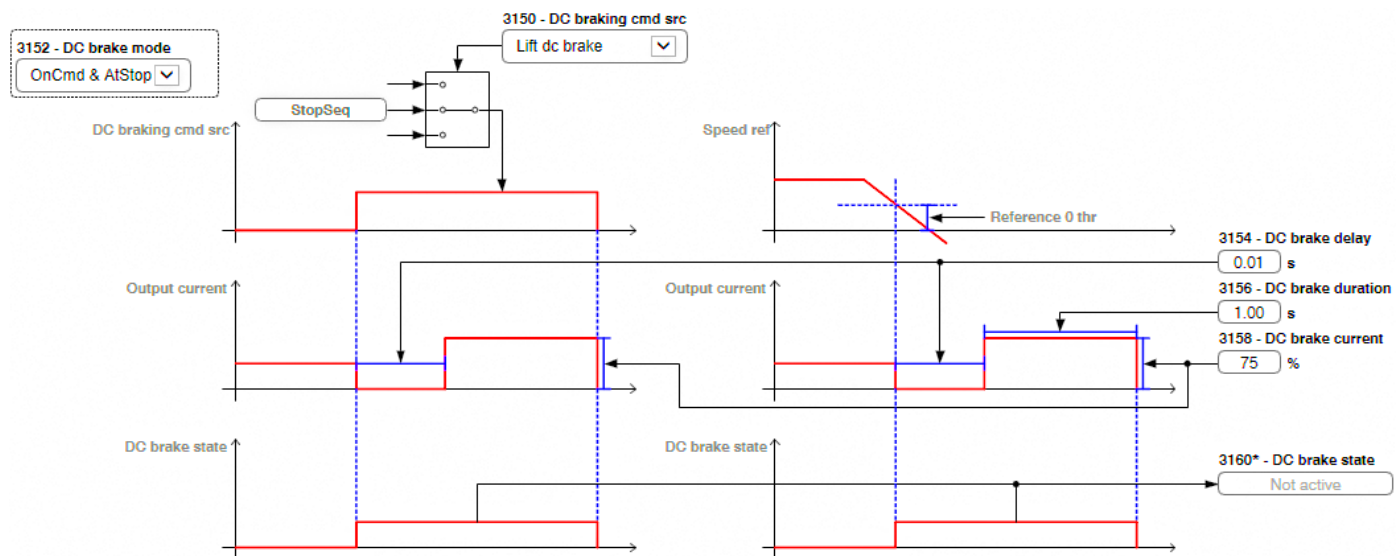
DC BRAKING AT STOP



DC BRAKING ON COMMAND



DC BRAKING ON CMD & AT STOP



F - Appendix 1 - Alarms

F.1 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.

Code	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" & "Fieldbus M->Sn sys" address more than 16 words in PDC
FF84..FF93	*	S2M Channel n : too many words in PDC	"Fieldbus S->Mn src" & "Fieldbus S->Mn sys" address more than 16 words in PDC
FFB4..FFC3	*	Internal database error on channel n	Internal error, contact manufacturer
8100		Bus off	Too many repeated hardware communication errors; check hardware connections and presence of terminal resistance on both sides of CAN BUS cable
8110		CAN msg overflow	Too many packets for selected baudrate
8130		LifeGuard/HeartBeat error	Software timeout from master
FFC5		Wrong NMT message length	Check NMT packets
FFC6		Invalid NMT command	Check NMT packets
FFC7		CAN bus off	Check line state for problems

Drive alarm handling

Drive alarms are managed by means of an Emergency message containing the error code relating to the alarm that is generated, according to the table below:

Selection	Code	Selection	Code	Selection	Code
No alarm	0	External fault	21	No battery	42
Overvoltage	1	Speed fbk loss	22	Plc10 fault	42
Undervoltage	2	Overspeed	23	Plc11 fault	43
Ground fault	3	Speed ref loss	24	Plc12 fault	44
Overcurrent	4	Not used	25	Plc13 fault	45
Desaturation	5	Power down	26	Plc14 fault	46
MultiUndervolt	6	Phaseloss out	27	Plc15 fault	47
MultiOvercurr	7	OV safety	28	Plc16 fault	48
MultiDesat	8	Safety failure	29	Watchdog	49
Heatsink OT	9	Mot phase loss	30	Trap error	50
HeatsinkS OTUT	10	Ropes change	31	System error	51
PTC failure	11	Enable missing	32	User error	52
Motor OT	12	Cont feedback	33	Param error	53

Selection	Code		Selection	Code		Selection	Code
Drive overload	13		Brake Feedback	34		Load def par	54
Motor overload	14		Door Feedback	35		Plc cfg error	55
Bres overload	15		Brake Failure	36		Load def plc	56
Phaseloss	16		Safe Brake Test	37		Key failed	57
Opt Bus fault	17		Speed limit	38		Encoder error	58
Opt 1 IO fault	18		Up/low limit	39		Recovery mode	59
Precharge fault	19		Lift ext fault	40			
Not used	20		EBC fault	41			

EBC Alarms

Malfunctions of the bus between EBC and ADL are signalled by the EBC fault alarm (41).

This alarm is only active when parameter 8150 EBC enable is enabled, which activates communication with an 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 PRODUCT_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 ADL500 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.
For the procedure to be followed, please refer to the notes attached to the parameter description.
- PAR 2192 **Autophase still** → static phasing:
this procedure must be performed with the motor still and brake applied.
For the procedure to be followed, please refer to the notes attached to the parameter description.

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 modifying PAR 2130 **Encoder direction**.

Note!

In the case described above (Encoder direction inversion), 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**.

The anomalies that can be found concern:

- 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.

G.2.3 Autophasing

Without absolute encoders.

If a digital or sinusoidal incremental encoder is mounted on a brushless motor that does not have absolute tracks, we run into the need to phase the position of the rotor with respect to the stator of the motor at least every time the drive is turned on. The timing of the phasing function is defined by parameter 2194 Autophase mod int which allows rephasing only after the drive is turned on at the first motor start or at every motor start or periodically. The moment in which the drive performs the phasing is warned by tones emitted by the motor. If you do not want to hear the tones every time the motor is turned on, you must set parameter 2194 = 1 first enable.

Description of functions and parameter list of DS417 application

Series: ADL530, ADL550

Revision: 1.3

Date: 10/10/2025

Codice: 1S95DSEN

WEG Automation Europe S.r.l.

Via Giosuè Carducci, 24
21040 Gerenzano (VA) · Italy
info.motion@weg.net

Technical Assistance: technohelp@weg.net
Customer Service: salesmotion@weg.net