Field oriented vector AC Drive

SIEIDrive

ADV200

.... Function description and parameters list

GEFRAN

8 - Parameters list

8.1 Legend

❶ Menu	❷ PAR	❸ Description	❹ UM	❺ Type	❻ Def	❼ Min	❽ Max	❾ Acc	❿ Mod
1 - MONITOR				*(Level 1 menu)*					
1.1	250	Output current	A	FLOAT	0.0	0.0	0.0	R	VSF
1.2	252	Output voltage	V	FLOAT	0.0	0.0	0.0	R	VSF
17.7 - FUNCTIONS/DOUBLE PAR SET				*(Level 2 menu)*					
17.7.1	2500	Par set enable		ENUM	Disable	0	1	ERW	VSF
	0	Disable							
	1	Enable							
17.7.2	2502	Par set select src		LINK	4000	0	16384	ERW	VSF
	L_DIGSEL2	*(Selection list)* **[*]**							

❶	Indexing of the menu and parameter
❷	Software number of the parameter (used via serial line)
❸	Parameter description
❹	UM: unit of measure
❺	Type of parameter BIT Boolean, from modbus seen as 16 bits ENUM Selection list, from modbus seen as 16 bits FLOAT Real, from modbus seen as 32 bits INT16 Integer with sign 16 bits, from modbus seen as 16 bits INT32 Integer with sign 32 bits, from modbus seen as 32 bits ILINK Selection list, from modbus seen as 16 bits LINK Selection list, from modbus seen as 16 bits UINT16 Integer without sign 16 bits , from modbus seen as 16 bits UINT32 Integer without sign 32 bits, from modbus seen as 32 bits
❻	Default value
❼	Minimum value
❽	Maximum value

❾	Accessibility : E Expert R Read S Size (set value depending on the size of the device) W Write Z parameters that can be modified ONLY with the drive disabled
❿	Available in regulation mode: V = V/f S = Sensorless F = Field Oriented Control
[*]	**Selection lists:** The "... src" format parameters are linked to a selection list. The source of the signal that will control the parameter can be selected from the list indicated. The lists are indicated in paragraph 8.4 of this manual.

1 - MONITOR

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.1	250	**Output current**	Arms	FLOAT	0.0	0.0	0.0	R	FVS

The drive output current is displayed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.2	252	**Output voltage**	Vrms	FLOAT	0.0	0.0	0.0	R	FVS

The drive line voltage output is displayed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.3	254	**Output frequency**	Hz	FLOAT	0.0	0.0	0.0	R	FVS

The drive output voltage is displayed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.4	628	**Ramp setpoint**	rpm	INT16	0	0	0	R	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.5	664	**Speed setpoint**	rpm	INT16	0	0	0	R	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.6	260	**Motor speed**	rpm	INT16	0	0	0	R	FVS

The actual output speed of the motor is displayed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.7	270	**DC link voltage**	Vdc	FLOAT	0.0	0.0	0.0	ER	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.8	272	**Heatsink temperature**	degC	INT16	0	0	0	ER	FVS

The temperature measured on the drive heatsink is displayed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.9	280	**Torque current ref**	A	FLOAT	0.0	0.0	0.0	ER	FV_

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.10	282	**Magnet current ref**	A	FLOAT	0.0	0.0	0.0	ER	FV_

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.11	284	**Torque current**	A	FLOAT	0.0	0.0	0.0	ER	FVS

The actual torque current value is displayed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.12	286	**Magnet current**	A	FLOAT	0.0	0.0	0.0	ER	FVS

The actual magnetizing current value is displayed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.13	3212	**Motor overload accum**	perc	UNIT16	0	0	100	ER	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.14	368	**Drive overload accum**	perc	UNIT16	0	0	100	ER	FVS

The drive overload level is displayed. An instantaneous overload of 180% of the drive rated current is allowed for 0.5s. The thermal image I^2t adjusts the drive output current thresholds. During normal operation, the instantaneous output current value can reach 180% of the drive rated current. After 0.5s at 180%, the output current threshold is reduced to 150%. When the overload level **par. 368 Drive overload accum** reaches 100%, the output current threshold is reduced to 100% of the rated current, and stays at that value until the I^2t integrator cycle is complete. At this point the 180% instantaneous overload is re-enabled

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.15	3260	**Bres overload accum**	perc	UINT16	0	0	100	ER	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.16	1066	**Enable state mon**		BIT	0	0	1	R	FVS

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.17	1068	**Start state mon**		BIT	0	0	1	R	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.18	1070	**FastStop state mon**		BIT	0	0	1	R	FVS

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

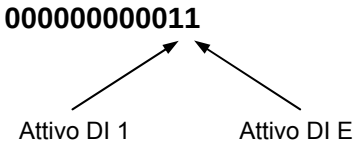
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.19	1100	**Digital input mon**		UINT16	0	0	0	R	FVS

The status of the digital inputs on the drive 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.

0 = Input disabled.

1 = Input enabled.

Example:



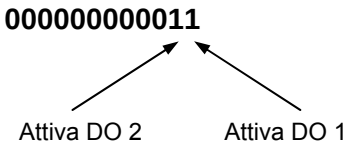
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.20	1300	**Digital output mon**		UINT16	0	0	10	R	FVS

The status of the digital outputs on the drive 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.

0 = Input disabled.

1 = Input enabled.

Example:



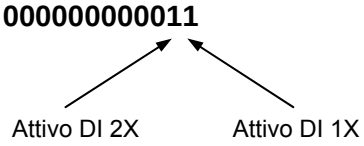
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.21	1200	**Digital input X mon**		UINT16	0	0	0	R	FVS

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

0 = Input disabled.

1 = Input enabled.

Example:



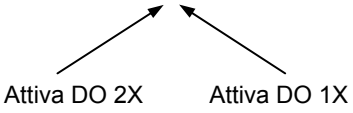
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
1.22	**1400**	**Digital output X mon**		UINT16	0	0	10	R	FVS

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

0 = Input disabled.

1 = Input enabled.

Example: **000000000011**



2 – DRIVE INFO

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
2.1	**482**	**Drive size**		UNIT16	0	0	0	RS	FVS

The drive size identification code is displayed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
2.2	**484**	**Drive family**		ENUM	No power	0	0	RS	FVS

The available mains voltage is displayed (e.g. 400V). The undervoltage alarm refers to this voltage value. The condition Ness power occurs when the regulation board has just left from production and has never been configured for any power. The configuration adjustment for a given power is achieved by linking it to a power board and running a **Save parameters**.

- **0** No power
- **1** 380V…480V
- **2** 500V…575V
- **3** 690V
- **4** 230V

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
2.3	**486**	**Drive region**		ENUM	EU	0	1	R	FVS

Setting of the geographical area in which the drive is to be used (Europe or USA). This setting determines the factory voltage and power supply frequency values (e.g. when set to 0 the default voltage is 400V and frequency 50Hz).

- **0** EU
- **1** USA

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
2.4	**488**	**Drive cont current**	A	FLOAT	CALCF	0.0	0.0	RZS	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
2.5	**490**	**Firmware ver.rel**		UINT16	0	0	0	R	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
2.6	**496**	**Firmware type**		UINT16	0	0	0	R	FVS

The type of firmware installed in the drive is displayed.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
2.7	**504**	**Application ver.rel**		UINT16	0	0	0	ER	FVS

The version number and release number of the application are displayed.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
2.8	**506**	**Application type**		UINT16	0	0	0	ER	FVS

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

Menu	**Par**	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
2.9	**510**	**Time drive power on**	h.min	UINT32	0	0.0	0.0	R	FVS

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

Menu	**Par**	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
2.10	**512**	**Time drive enable**	h.min	UINT32	0	0.0	0.0	R	FVS

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

Menu	**Par**	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
2.11	**514**	**Number power up**		UINT16	0	0	0	ER	FVS

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

Menu	**Par**	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
2.12	**520**	**Product S/N**		UINT32	0	0	0	R	FVS

The drive serial number is displayed.

Menu	**Par**	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
2.13	**522**	**Regulation S/N**		UINT32	0	0	0	R	FVS

The drive regulation card serial number is displayed.

Menu	**Par**	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
2.14	**524**	**Power S/N**		UINT32	0	0	0	R	FVS

The drive power card serial number is displayed.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
2.15	**526**	**Power file ver.rel**		UINT16	0	0	0	ER	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
2.16	530	**Slot 1 card type**		ENUM	None	0	0	R	FVS
2.17	532	**Slot 2 card type**		ENUM	None	0	0	R	FVS
2.18	534	**Slot 3 card type**		ENUM	None	0	0	R	FVS

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

0	None
1	I/O 0
769	I/O 1
1793	I/O 2
2305	I/O 3
3329	I/O 4
8	Enc 1
264	Enc 2
520	Enc 3
776	Enc 4
4	Can/Dnet
260	Profibus
516	GdNet
255	Unknown

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
2.19	536	**Slot 1 card S/N**		UINT32	0	0	0	R	FVS
2.20	538	**Slot 2 card S/N**		UINT32	0	0	0	R	FVS
2.21	540	**Slot 3 card S/N**		UINT32	0	0	0	R	FVS

The serial number of the expansion card installed in the relative slot of the drive is displayed.

3 – STARTUP WIZARD

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.1	550	**Save parameters**		BIT	0	0	1	RW	FVS

Any changes to parameter values immediately affect drive operations, but are not automatically saved in the permanent memory.
The "Save Parameters" command is used to save current parameter values in the permanent memory.
Any changes that are not saved will be lost when the drive is switched off.
To save parameters follow the procedure described in **STEP 6** of the **Startup wizard.**

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.2	552	**Regulation mode**		ENUM	V/f control	0	3	RWZ	FVS

The ADV200 is capable of operating with different control modes:

- **0** V/f control
- **1** Flux vector OL
- **2** Flux vector CL
- **3** Autotune

The open loop **V/f (V/f control)** mode is the simplest type of asynchronous motor control, as the only parameters required are the rated voltage, current and frequency of the motor.
The open loop V/F control mode is factory-set and does not require any speed feedback. The natural variation in speed generated by machine load induction (slippage) can be compensated using **Slip comp** and **Slip comp filter.**
In V/f mode a single drive can be used to control several asynchronous motors, even of different sizes, connected in parallel, provided the sum of the currents of the single motors is less than the drive rated current. If using several motors connected in parallel, be sure to provide adequate thermal protection for each single motor.
Closed loop control is also possible in the V/f mode. It requires a speed reading by a digital encoder on the motor shaft; to enable encoder feedback, you must set parameter **2444 Slip comp mode** =1. The optional EXP-ENC card is necessary in order to acquire the encoder signals. The speed feedback supplied by the encoder is used to compensate motor slippage in the different load conditions, to achieve accurate control and greater precision of the actual motor speed.

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

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

If the **Startup wizard** procedure is not used, self-tuning of the motor parameters is possible in the **self-tuning** mode **(Autotune)**. To execute the command the hardware enabling contact between terminals 7 and S2 must be opened. Then set the **Regulation Mode** parameter to **Autotune**. If not already in Local mode, press the Local key (the Loc LED lights up) and close the hardware enabling contact (terminals 7 and S3). Self-tuning can now be enabled (refer to parameters **2022** or **2224**). At the end of the self-tuning procedure, open the contact between terminals 7 and S3 again and restore the parameters that were changed. This procedure must be used for both self-tuning with the engine standing still and with the motor turning.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.3	554	**Access mode**		ENUM	Easy	0	1	RW	FVS

With this parameter you can restrict access to advanced configuration.

0 Easy

1 Expert

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

Setting the parameter to **Expert** gives access to all the parameters in the firmware. This mode allows an extremely high level of customization to be achieved in order to exploit the potential of the ADV200 to the full.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.4	556	**Control mode select**		ENUM	Ramp	0	2	ERWZ	F_S

Selection of the drive control mode.

0 Torque

1 Speed

2 Ramp

In **torque control (0 - Torque)** the reference and load of the motor determine its speed and direction of rotation. Symmetrical torque limits can be set, for each direction of rotation and for motor/generator operation. This type of control is only available in the **Flux vector CL** control mode. In this mode the **Ramp** function is not used to generate the drive speed reference so it can be used in stand-alone mode.

In **speed control (1 - Speed)** the reference arrives straight after the ramp circuit, enabling an extremely rapid response to signal variations. This is ideal for applications that require a highly dynamic response. This type of control is available in the **Flux vector OL** and **Flux vector CL** control modes. In this mode the **Ramp** function is not used to generate the drive speed reference so it can be used in stand-alone mode.

In **control with ramp (2 - Ramp)** the speed reference is applied to the input of the "**Ramp**" block and is produced by the "**Ramp ref**" block. This allows setting of both the acceleration/deceleration times and the ramp time (linear or S-shaped with customizable jerks). This type of control is available in all control modes.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.5	558	**Application select**		ENUM	None	0	2	ERWZ	FVS

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

0 None

1 Application 1

2 Application 2

The drive is supplied already incorporating a number of applications developed in the IEC 61331-3 environment. To use these, configure the desired application, run save parameter, switch the drive off and then on again.

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.6	560	**Mains voltage**	V	ENUM	400 V	SIZE	SIZE	ERWZS	FVS

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

0 None
1 230 V
2 380 V
3 400 V
4 415 V
5 440 V
6 460 V
7 480 V
8 575 V
9 690 V

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.7	562	**Switching frequency**		ENUM	SIZE	SIZE	SIZE	ERWS	FVS

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

0 1 kHz
1 2 kHz
2 4 kHz
3 6 kHz
4 8 kHz
5 10 kHz
6 12 kHz
7 16 kHz

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.8	564	**Ambient temperature**	degC	ENUM	40 degC	0	1	ERWZ	FVS

Setting of the ambient temperature value. This parameter is used to set the output current derating factor (1% for every °C above 40°C).

0 40 degC — The inverter is capable of delivering direct current continuously with ambient temperatures of up to 40°C.
1 50 degC — The inverter is capable of delivering direct current continuously with ambient temperatures of up to 50°C.

If the value is set to 1 the drive output current will be 10% less than the rated current at 40°C.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.9	**566**	**Drive overload mode**		ENUM	Heavy duty	1	2	ERWZ	FVS

Setting of the overload that can be supplied by the drive, depending on the application.

0 None
1 Heavy duty
2 Light duty

None = no drive current limitation setting.

Set **Heavy duty** when a large overload is requested: the drive can supply 180% of the rated current for 0.5 seconds and 150% for 1 minute every 5 minutes.

Select **Light duty** to enable the drive to deliver a current of 110% of the rated current for 1 minute every 5 minutes.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
4.10	**568**	**Switching freq mode**		ENUM	Constant	0	1	ERWZS	FVS

Setting of the switching frequency operating mode when drive overload is set in Heavy duty. The factory switching frequency setting is 4 kHz for motors between 2.2 kW and 37 kW (the factory switching frequency setting for smaller drives is 8kHz); this value may result in increased noise. Setting a higher switching frequency will increase drive losses and thus increase the heatsink temperature, but it will also reduce noise. To combine the advantages of both settings, with the ADV drive the heatsink temperature can be controlled by reducing the switching frequency if it increases.

0 Fixed
1 Variable

If set to **Fixed** the switching frequency is fixed and is set using the **Switching frequency** parameter, according to the size of the drive. If the selected switching frequency value is higher than the default value, the output current of the drive is derated.

If set to **Variable** the switching frequency is set to 8kHz and controlled by the temperature of the drive heatsink and by the output frequency. If the heatsink temperature exceeds a set threshold (which depends on the size of the drive) or falls to below 5Hz ± 1Hz, the switching frequency is automatically reduced to 4kHz, to prevent derating of the output current. The switching frequency is reduced in a single step. **With this setting the switching frequency value selected in the Switching frequency parameter is ineffective.**

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.11	**570**	**Password**		UINT32	0	0	99999	ERW	FVS

You can enter a **password** to protect the parameters from unauthorized tampering: the password can consist of a combination of a maximum of any 5 figures that can be selected by the user. All parameters are locked, except this one and **Save parameters**.
After entering the password, press **E** to enable it (a password enabled message (Enabled) is displayed).
So that the password remains valid even after switching the unit off and then switching it back on, save it using the **Save parameters** command.

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

To disable the password, enter the **Password** parameter (**572**) in the **DRIVE CONFIG menu.**
Check that the password is enabled (**Enabled**), press **E** and enter the combination of figures that make up the password.
Press **E** again. A message is displayed telling you the password is no longer enabled (**Disabled**).
To make sure the password continues to be disabled even after switching the unit off and then switching it back on,
save this configuration using the **Save parameters** command.
When an incorrect password is entered, the Password wrong message is displayed.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
4.12	**572**	**Application key**		UINT32	0	0	(2^32)-1	ERW	FVS

This parameter can be used to enter the key for enabling the PLC application.
You may need to enter a key to definitively enable some PLC applications. Please contact Gefran for details about which PLC applications require the key.
If executing an application that envisages a key verification and the key is incorrect, enabling is forced for 200 hours (time drive enabled).
In this phase a message is displayed informing you that the period of forced enabling time is about to expire.
At the first power-on after the 200 hours an alarm is generated and the application does not start.
Please contact Gefran for the numerical value of the key.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.13	**574**	**Startup display**		INT16	260	-1	20000	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.14	**576**	**Display backlight**		BIT	0	0	1	ERW	FVS

Enabling of the backlight on the drive display.

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.15	578	**Language select**		ENUM	English	0	4	RWZ	FVS

Setting of the drive programming language.

0 English
1 Italiano
2 Francais
3 Deutsch
4 Espanol

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.16	580	**Load default**		BIT	0	0	1	RWZ	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.17	590	**Save par to keypad**		BIT	0	0	1	RW	FVS

Transfers the parameters currently stored in the drive and saves them in the keypad memory (see procedure on page...).

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.18	592	**Load par from keypad**		BIT	0	0	1	RWZ	FVS

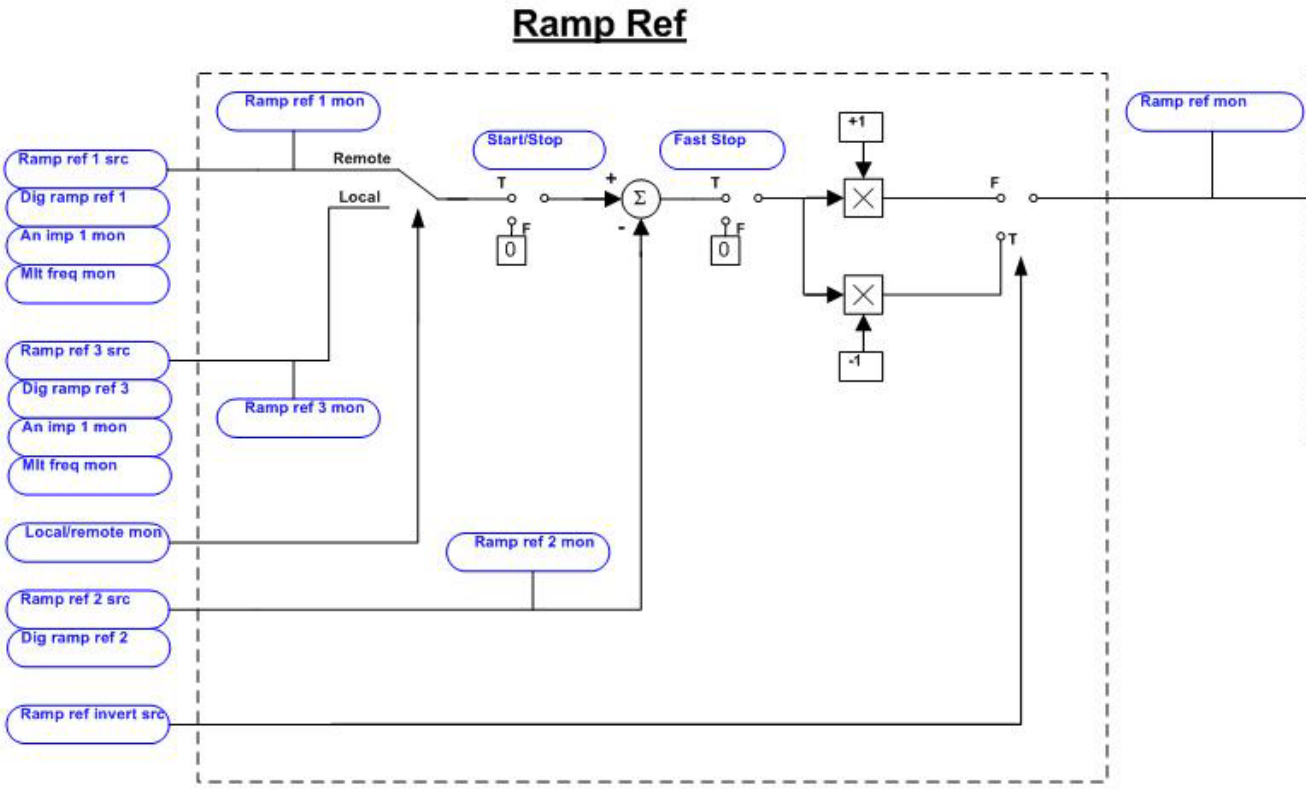
Transfers the parameters from the keypad memory to the drive (see procedure on page ...).

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
4.19	594	**Keypad memory select**		UINT16	1	1	5	ERW	FVS

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

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

Different sources can be used for the speed and torque references, depending on how the **554 Control mode select** parameter is set.



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.1	**600**	**Dig ramp ref 1**	rpm	INT16	0	CALCI	CALCI	RW	FVS

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

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

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.2	602	**Dig ramp ref 2**	rpm	INT16	0	CALCI	CALCI	ERW	FVS

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

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

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

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

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

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.3	604	**Dig ramp ref 3**	rpm	INT16	0	CALCI	CALCI	ERW	FVS

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

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

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.4	610	**Ramp ref 1 src**		LINK	852	0	260	RW	FVS
5.5	612	**Ramp ref 2 src**		LINK	602	0	260	ERW	FVS
5.6	614	**Ramp ref 3 src**		LINK	894	0	260	ERW	FVS

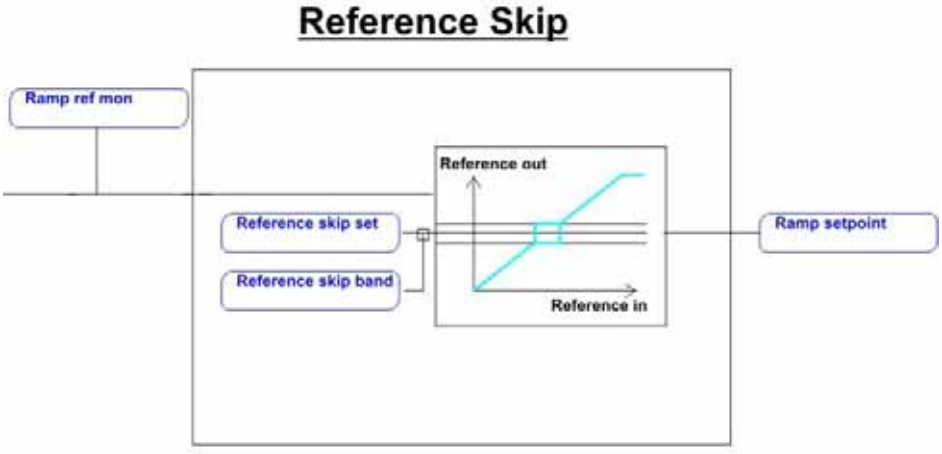
Selection of the origin (source) of the reference signals on the input of the ramp function block, that defines the main drive speed. The ramp reference values can be selected from among those listed in the “**L_MLTREF**" selection list.
When assigning the reference via terminals, signals with ±10V, 0 ...10V, 0... 20 mA and 4 ... 20 mA can be used.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.7	**616**	**Ramp ref invert src**		LINK	1050	0	16384	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.8	**620**	**Ramp ref 1 mon**	rpm	INT16	0	0	0	R	FVS
5.9	**622**	**Ramp ref 2 mon**	rpm	INT16	0	0	0	ER	FVS
5.10	**624**	**Ramp ref 3 mon**	rpm	INT16	0	0	0	ER	FVS

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



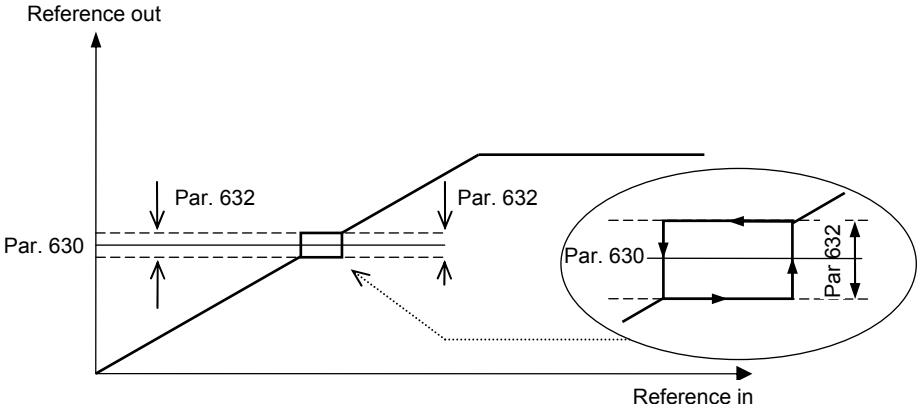
In a system comprising a drive and motor, vibrations may be generated at certain frequencies, due to mechanical resonance. This phenomenon can be limited by entering a prohibited speed at which the drive cannot operate.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.11	**630**	**Reference skip set**	rpm	INT16	0	0	CALCI	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.12	**632**	**Reference skip band**	rpm	INT16	0	0	CALCI	ERW	FVS

Setting of the prohibited bandwidth.



Example:

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

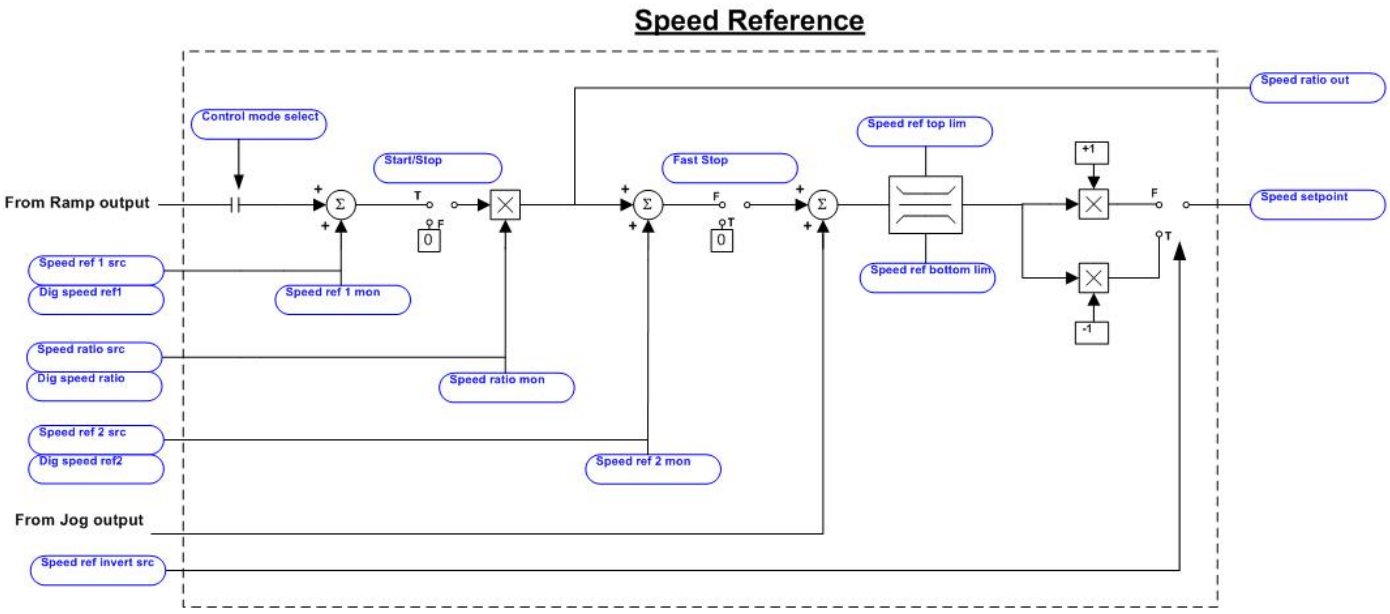
Par. 630 = 300 rpm (prohibited speed threshold)
Par. 632 = 10 rpm (thus prohibited band: 290rpm.310rpm)
Set speed reference = 295 rpmHz
Output speed = 290 rpm
Set speed reference = 305 rpm
Output speed = 290 rpm

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

Par.630 = 300 rpm (prohibited speed threshold)
Par.632 = 10 rpm (thus tolerance band: 290 rpm…310 rpm)

Set speed reference = 305 rpm
Output frequency = 310 rpm
Set speed reference = 295 rpm
Output frequency = 310 rpm

The user can thus set any reference value, but if the set value is within the prohibited range, the drive automatically maintains the speed outside the limits defined by the tolerance band.
During ramp phases the prohibited speed is passed freely and there are no points of discontinuity in the generation of the output frequency.



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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.13	**640**	**Dig speed ref 1**	rpm	INT16	0	CALCI	CALCI	ERW	FVS
5.14	**642**	**Dig speed ref 2**	rpm	INT16	0	CALCI	CALCI	ERW	FVS

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

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

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.15	**650**	**Speed ref 1 src**		LINK	640	0	260	ERW	FVS
5.16	**652**	**Speed ref 2 src**		LINK	642	0	260	ERW	FVS

Selection of the origin (source) of the drive speed reference signals. The values that can be used as speed references can be selected from those listed in the "**L_MLTREF**" selection list.
When assigning the reference via terminals, signals with ±10V, 0 ...10V, 0... 20 mA and 4 ... 20 mA can be used.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.17	**654**	**Speed ref invert src**		LINK	6000	0	16834	ERWZ	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.18	660	**Speed ref 1 mon**	rpm	INT16	0	0	0	ER	FVS
5.19	662	**Speed ref 2 mon**	rpm	INT16	0	0	0	ER	FVS

The value of the relative speed reference is displayed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.20	670	**Speed ref top lim**	rpm	INT16	CALCI	0	CALCI	RWZ	FVS

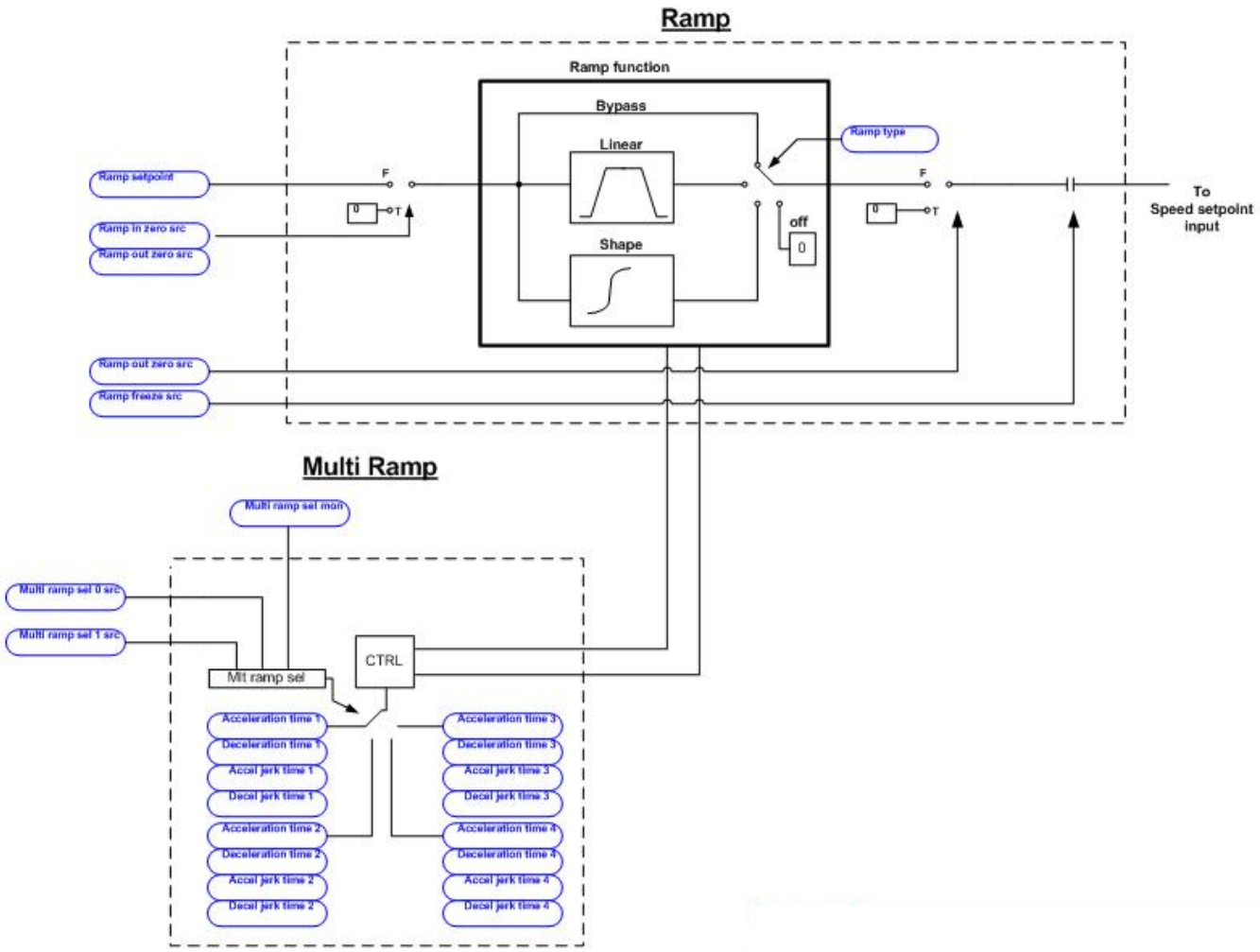
Setting of the upper speed reference limit. If the speed reference exceeds the limits, the motor speed remains at the set limit value in any case. Speed limits cannot be more than 200% of the value set in the **Full scale speed** parameter (REFENCES menu par. 680).

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.21	672	**Speed ref bottom lim**	rpm	INT16	CALCI	CALCI	0	RWZ	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
5.22	680	**Full scale speed**	rpm	INT16	CALCI	50	32000	RWZ	FVS

Setting of the reference value for all speed percentage data (References, Speed adaptives ...) corresponding to 100 % of the actual speed. This parameter can only be changed with the inverter blocked (Enable drive = Disabled). The recommended setting for the value of this parameter is the motor rated speed. If altered, the self-tuning procedure should be repeated.
Full scale speed does not define the maximum possible speed. In any case, the maximum speed percentage value is ± 200 % of the **Full scale speed** value.



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

Another ramp is available for fast stop. This can be enabled by a command from the terminal strip (Fast stop).

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

The references can be set in different ways:

- with the Ramp ref 1 and / or Ramp ref 2 references
- with the Multi speed function
- with the Motor potentiometer function
- with the Jog function

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

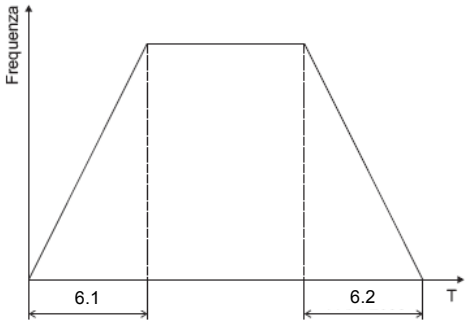
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
6.1	**700**	**Acceleration time 0**	s	FLOAT	10.0	0.01	1000.0	RW	FVS
6.2	**702**	**Deceleration time 0**	s	FLOAT	10.0	0.01	1000.0	RW	FVS
6.3	**704**	**Acceleration time 1**	s	FLOAT	10.0	0.01	1000.0	ERW	FVS
6.4	**706**	**Deceleration time 1**	s	FLOAT	10.0	0.01	1000.0	ERW	FVS
6.5	**708**	**Acceleration time 2**	s	FLOAT	10.0	0.01	1000.0	ERW	FVS
6.6	**710**	**Deceleration time 2**	s	FLOAT	10.0	0.01	1000.0	ERW	FVS
6.7	**712**	**Acceleration time 3**	s	FLOAT	10.0	0.01	1000.0	ERW	FVS
6.8	**714**	**Deceleration time 3**	s	FLOAT	10.0	0.01	1000.0	ERW	FVS

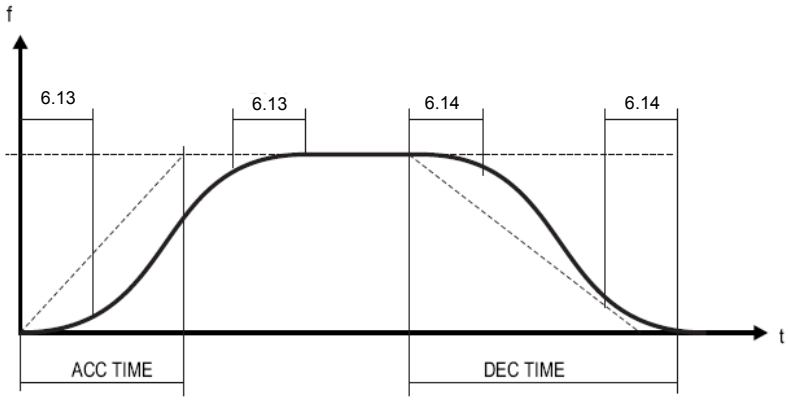
The acceleration and deceleration ramp times are used to avoid sudden changes in the drive output frequency, which could cause mechanical shocks, excessive current on the motor and excessive DC-bus voltage values. The acceleration times (***6.1, 6.3, 6.5, 6.7***) are expressed as the time necessary to bring the frequency from zero to the maximum value set in the ***Full scale speed (5.22)***. On the other hand, the deceleration times (***6.2, 6.4, 6.6, 6.8***) are expressed as the time necessary to bring the frequency from the maximum value set in the ***Full scale speed (5.22)*** parameter to zero. Each of the 4 available ramp selections can be selected using one or two digital inputs programmed as **Multi ramp sel**.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
6.9	**720**	**Ramp type**		ENUM	Linear	0	3	ERWZ	FVS

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

0 Linear
1 S-Shape
2 Bypass
3 Off





0 = Linear

1 = S-Shape

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

When S-shape ramps are set (**S-Shape**) it is possible to avoid sudden mechanical variations in the system at the beginning and end of the acceleration and deceleration phase.
The ramp time, meaning the time necessary to accelerate from zero to the maximum frequency value set, is given by the sum of the linear ramp time and that of the associated **Jerks** (see par. 6.13 – 6.20).

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
6.10	**722**	**Multi ramp sel 0**		LINK	6000	0	16384	ERWZ	FVS
6.11	**724**	**Multi ramp sel 1**		LINK	6000	0	16384	ERWZ	FVS

1 or 2 digital inputs can be used to select one of the 4 available sets of ramps.
The origin (source) of the command to enable the ramp selection function can be selected from the "**L_DIGSEL2"** selection list.

The following table describes the ramp selection procedure:

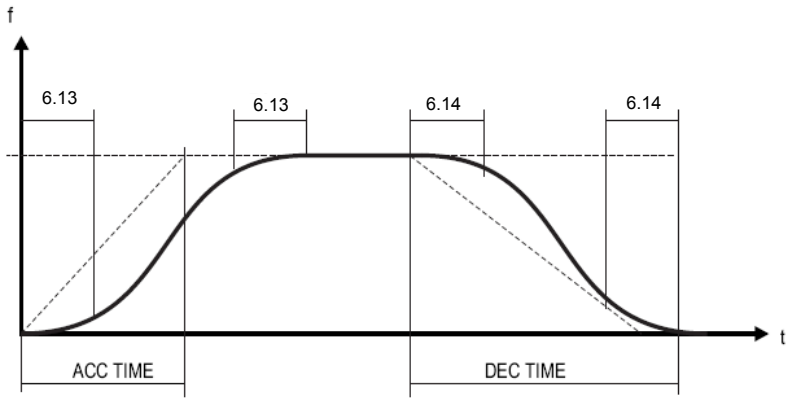
Tempo di rampa attivo	Multiramp sel 0	Multiramp sel 1
Acceleration time 0 Deceleration time 0	0	0
Acceleration time 1 Deceleration time 1	1	0
Acceleration time 2 Deceleration time 2	0	1
Acceleration time 3 Deceleration time 3	1	1

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
6.12	**726**	**Multi ramp sel mon**		UINT16	0	0	3	ER	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
6.13	**730**	**Accel jerk time 0**	s	FLOAT	1.0	0.02	10.0	ERW	FVS
6.14	**732**	**Decel jerk time 0**	s	FLOAT	1.0	0.02	10.0	ERW	FVS
6.15	**734**	**Accel jerk time 1**	s	FLOAT	1.0	0.02	10.0	ERW	FVS
6.16	**736**	**Decel jerk time 1**	s	FLOAT	1.0	0.02	10.0	ERW	FVS
6.17	**738**	**Accel jerk time 2**	s	FLOAT	1.0	0.02	10.0	ERW	FVS
6.18	**740**	**Decel jerk time 2**	s	FLOAT	1.0	0.02	10.0	ERW	FVS
6.19	**742**	**Accel jerk time 3**	s	FLOAT	1.0	0.02	10.0	ERW	FVS
6.20	**744**	**Decel jerk time 3**	s	FLOAT	1.0	0.02	10.0	ERW	FVS

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



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
6.21	750	**Ramp in zero src**		LINK	6000	0	16384	ERW	FVS

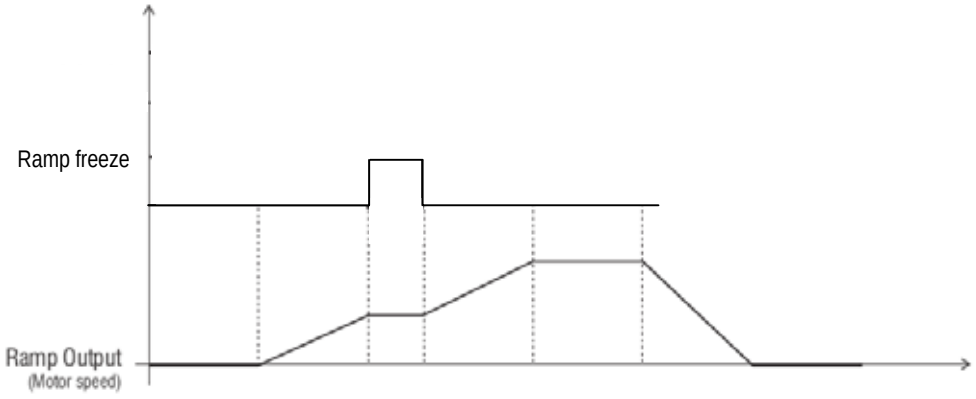
Selection of the origin (source) of the signal that blocks the ramp input and moves the reference to zero. If the ramp input is enabled, the **Ramp ref** parameter corresponds to the set reference. If the ramp input is blocked, the drive slows down with the set deceleration time until reaching zero speed.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

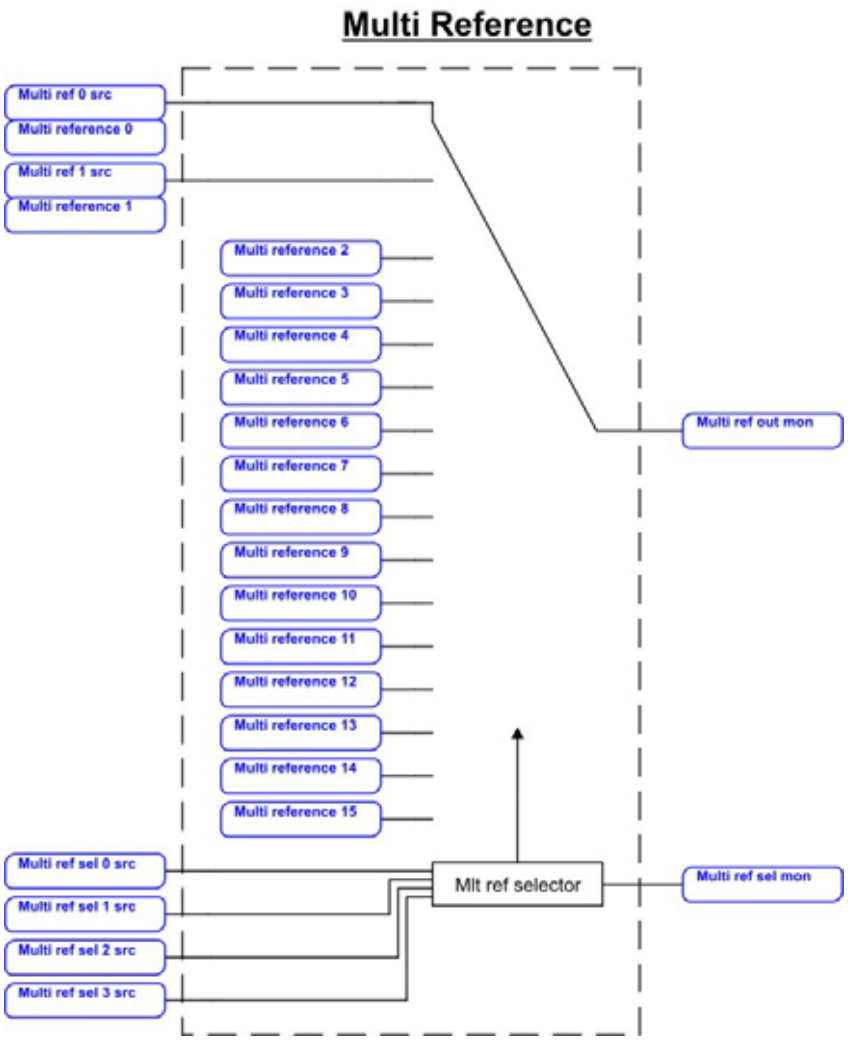
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
6.22	752	**Ramp out zero src**		LINK	6000	0	16384	ERW	FVS

Selection of the origin (source) of the signal that brings the ramp to 0 (**Ramp ref 1**/**Ramp ref 2 = 0**). When the ramp output is set to zero using **Ramp out zero**, the drive brakes with the maximum available torque; in this case the ramp is disabled. The terminal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
6.23	754	**Ramp freeze src**		LINK	6000	0	16384	ERW	FVS

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





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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
7.1	**800**	**Multi reference 0**	rpm	INT16	0	CALCI	CALCI	RW	FVS
7.2	**802**	**Multi reference 1**	rpm	INT16	0	CALCI	CALCI	RW	FVS
7.3	**804**	**Multi reference 2**	rpm	INT16	0	CALCI	CALCI	RW	FVS
7.4	**806**	**Multi reference 3**	rpm	INT16	0	CALCI	CALCI	RW	FVS
7.5	**808**	**Multi reference 4**	rpm	INT16	0	CALCI	CALCI	RW	FVS
7.6	**810**	**Multi reference 5**	rpm	INT16	0	CALCI	CALCI	RW	FVS
7.7	**812**	**Multi reference 6**	rpm	INT16	0	CALCI	CALCI	RW	FVS
7.8	**814**	**Multi reference 7**	rpm	INT16	0	CALCI	CALCI	RW	FVS
7.9	**816**	**Multi reference 8**	rpm	INT16	0	CALCI	CALCI	ERW	FVS
7.10	**818**	**Multi reference 9**	rpm	INT16	0	CALCI	CALCI	ERW	FVS
7.11	**820**	**Multi reference 10**	rpm	INT16	0	CALCI	CALCI	ERW	FVS
7.12	**822**	**Multi reference 11**	rpm	INT16	0	CALCI	CALCI	ERW	FVS
7.13	**824**	**Multi reference 12**	rpm	INT16	0	CALCI	CALCI	ERW	FVS
7.14	**826**	**Multi reference 13**	rpm	INT16	0	CALCI	CALCI	ERW	FVS
7.15	**828**	**Multi reference 14**	rpm	INT16	0	CALCI	CALCI	ERW	FVS
7.16	**830**	**Multi reference 15**	rpm	INT16	0	CALCI	CALCI	ERW	FVS

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

The frequencies are selected using the binary code of the digital inputs programmed using the **Multi ref sel 0 src**, **Multi ref sel 1 src**, **Multi ref sel 2 src** and **Multi ref sel 3 src** parameters.
References can be set via the keypad, serial line, digital inputs and BUS.
A sign can be given to the references, so that when they are defined so too is the desired direction of rotation.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
7.17	**832**	**Multi ref 0 src**		LINK	1500	0	260	RW	FVS
7.18	**834**	**Multi ref 1 src**		LINK	802	0	260	RW	FVS

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

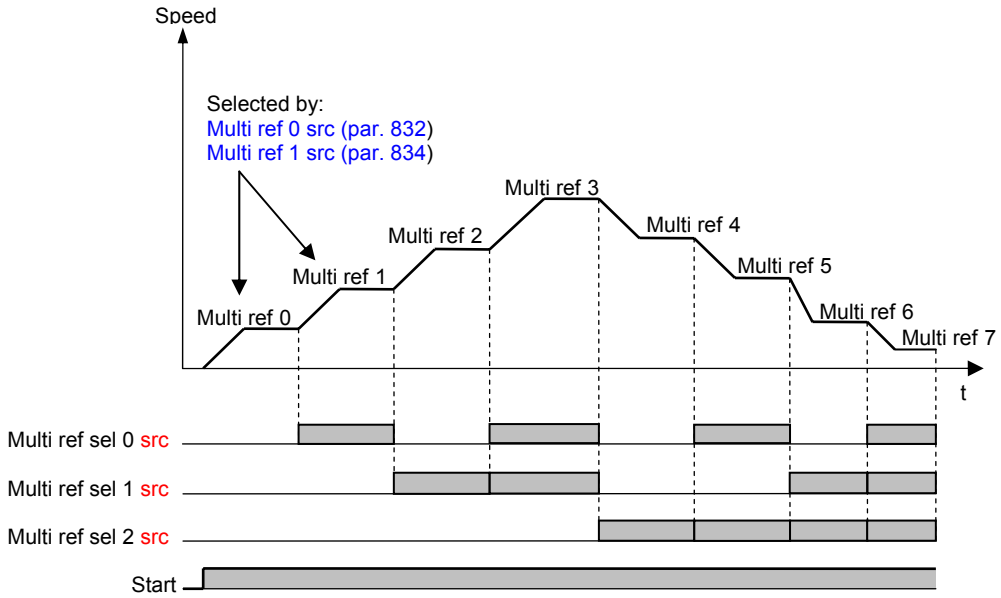
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
7.19	**840**	**Multi ref sel 0 src**		LINK	1116	0	16384	RW	FVS
7.20	**842**	**Multi ref sel 1 src**		LINK	1118	0	16384	RW	FVS
7.21	**844**	**Multi ref sel 2 src**		LINK	6000	0	16384	RW	FVS
7.22	**846**	**Multi ref sel 3 src**		LINK	6000	0	16384	ERW	FVS

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

The following table describes the selection of the Multispeed function:

Active speed ref	Sel. speed ref 0	Sel. speed ref 1	Sel. speed ref 2	Sel. speed ref 3
Multi reference 0	0	0	0	0
Multi reference 1	1	0	0	0
Multi reference 2	0	1	0	0
Multi reference 3	1	1	0	0
Multi reference 4	0	0	1	0
Multi reference 5	1	0	1	0
Multi reference 6	0	1	1	0
Multi reference 7	1	1	1	0
Multi reference 8	0	0	0	1
Multi reference 9	1	0	0	1
Multi reference 10	0	1	0	1
Multi reference 11	1	1	0	1
Multi reference 12	0	0	1	1
Multi reference 13	1	0	1	1
Multi reference 14	0	1	1	1
Multi reference 15	1	1	1	1

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

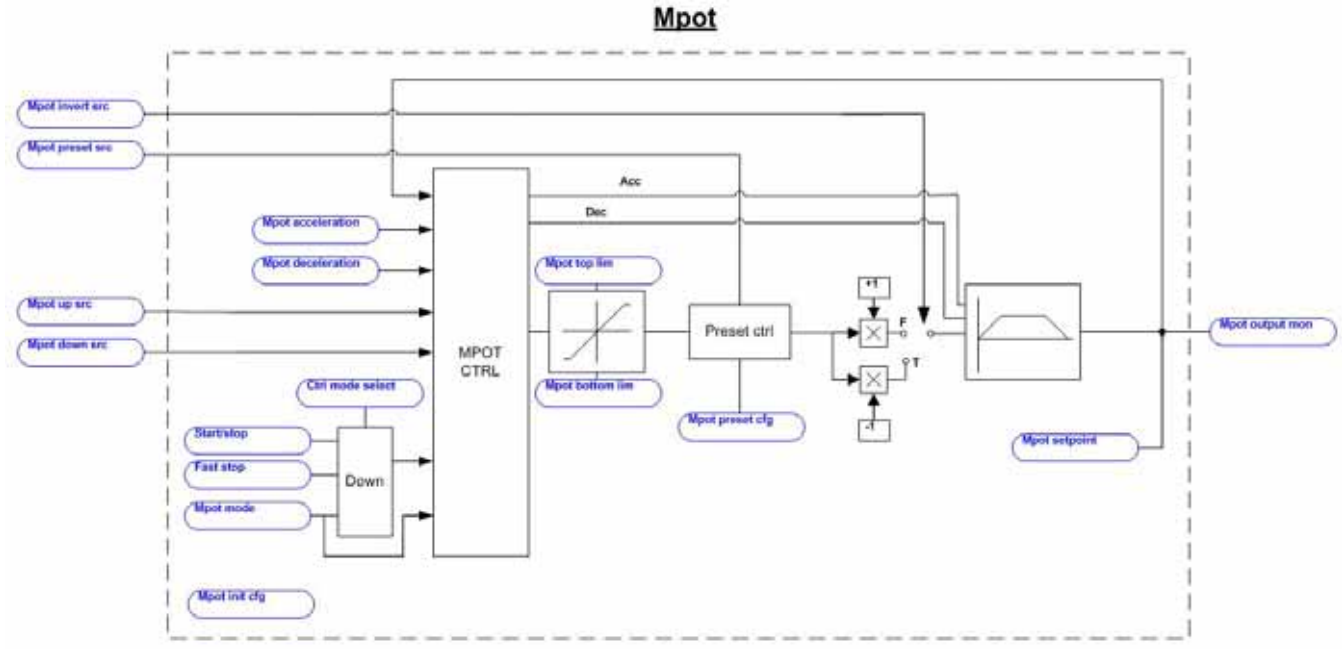


Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
7.23	**850**	**Multi ref sel mon**		UINT16	0	0	15	R	FVS

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

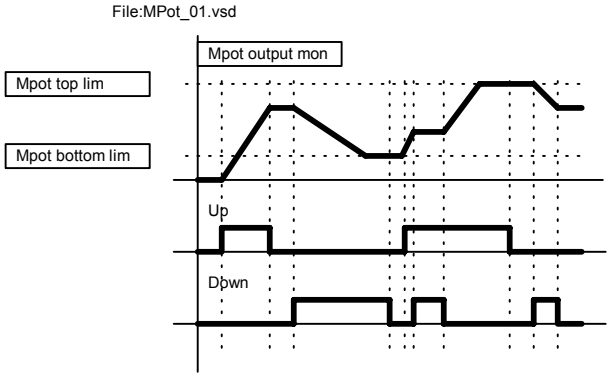
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
7.24	**852**	**Multi ref out mon**	rpm	INT16	0	0	0	R	FVS

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



The Motor potentiometer function allows the speed reference of the drive to be changed by pressing buttons with which the UP and DOWN commands are associated.
The UP and DOWN commands can be sent from the keypad, by digital inputs, the serial line or fieldbus.
To send the UP and DOWN commands from the keypad, enter the **MPot setpoint** parameter modify mode and press the UP and DOWN keys.
The UP and DOWN commands increase or decrease the speed of the motor for as long as they are present. The simultaneous presence of both commands will not produce any change (see time chart).
The speed changes according to the set ramp times and within the set lower and upper limits.
The value of the Motor potentiometer function output at drive power-on can be configured.
The preset command can be used to force a preset value for the input and output of the Motor potentiometer function.
The invert command can be used to force an inversion of the reference sign of the Motor potentiometer function.
In the default condition, the speed reference produced by the Motor potentiometer function is connected in input to the Ramp function. For direct control of the motor speed, the Acceleration time and Deceleration time parameters in the RAMP menu should be set = 0.

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



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
8.1	**870**	**Mpot setpoint**	rpm	INT16	0	CALCI	CALCI	R	FVS

The speed reference value of the Motor potentiometer function is displayed.
Enter this parameter to send the UP and DOWN commands from the keypad.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
8.2	**872**	**Mpot acceleration**	s	FLOAT	5.0	0.01	1000.0	RW	FVS
8.3	**874**	**Mpot deceleration**	s	FLOAT	5.0	0.01	1000.0	RW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
8.4	**876**	**Mpot top lim**	rpm	INT16	1500	CALCI	CALCI	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
8.5	**878**	**Mpot bottom limit**	rpm	INT16	0	CALCI	CALCI	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
8.6	**880**	**Mpot init cfg**		ENUM	Zero	0	3	ERW	FVS

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

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

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

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

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
8.7	882	**Mpot preset cfg**		ENUM	None	0	11	ERW	FVS

This parameter can be used to configure the preset of the Motor potentiometer function, i.e. to configure the value at which the Motor potentiometer input and output are set when the Preset command is enabled.
The Preset command has priority over the Up command and the Down command.
The Up and Down commands are enabled again when the Preset command is disabled.

0 None
1 Input = 0
2 Input = low lim
3 Input & ref = 0
4 Input & ref = low lim
5 Output = 0
6 Output = low lim
7 Output & ref = 0
8 Output & ref = low lim
9 Input = upp lim
10 Input & ref = upp lim
11 Freeze input

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

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

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

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

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

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

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

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

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

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

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
8.8	884	**Mpot up src**		LINK	6000	0	16384	RW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
8.9	886	**Mpot down src**		LINK	6000	0	16384	RW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
8.10	888	**Mpot invert src**		LINK	6000	0	16384	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
8.11	890	**Mpot preset src**		LINK	6000	0	16384	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
8.12	892	**Mpot mode**		ENUM	Fine & Last val	0	3	ERW	FVS

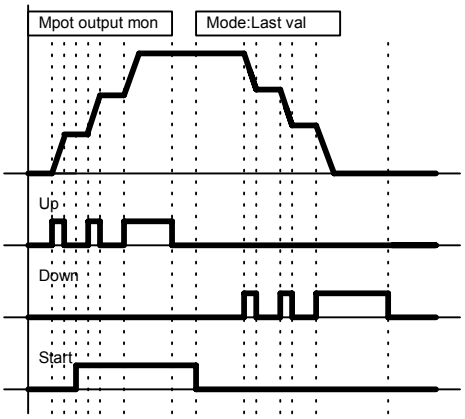
Setting of the configuration of two possible options of the Motor potentiometer function. There are two operating modes for each of the two options.

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

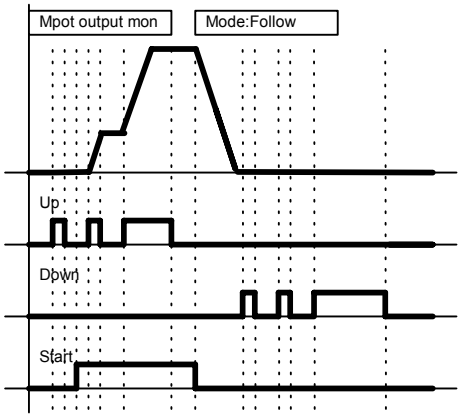
Option 1: Behaviour of the Motor potentiometer function with the Stop or FastStop command present with the **Control mode = Ramp** parameter.

The two operating modes are: **Last val** or **Follow**.
With the **Control mode** not equal to **Ramp** setting, this option is not completely applicable and it always behaves in **Last val** mode.

In **Last val** mode with the Stop or FastStop command present, the speed reference of the Motor potentiometer function is not altered.
The motor speed moves to 0 according to the selected control mode (**Control mode = Ramp** or **Control mode = Speed**). When the Run command is sent, the motor speed moves to the speed reference set by the motor potentiometer function according to the selected control mode.

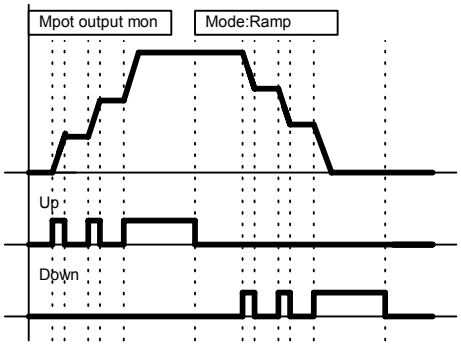


In **Follow** mode with the Stop or FastStop command present, the Down command is simulated, i.e. the output of the Motor potentiometer function moves to 0 with the set ramp time.
If the Run command is sent when the 0 speed has been reached, it is maintained until the Up command is sent. If the Run command is sent before the motor reaches the 0 speed, the speed at that moment is taken as the new reference.

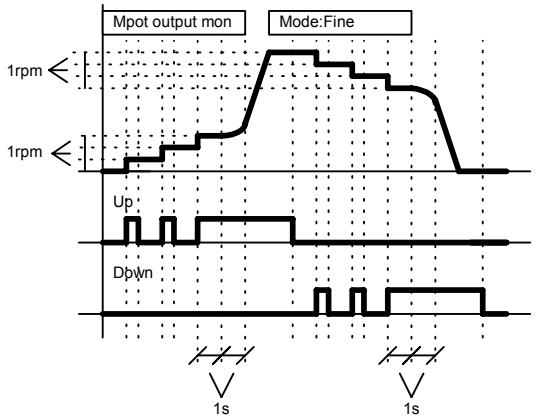


Option 2: Ramp behaviour

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



In **Fine** mode, each time the Up or Down commands are enabled, the output of the Motor potentiometer function increases or decreases by 1 rpm.
If the command persists for less than 1 second, no other changes are made on the output.
If the command persists for more than 1 second, the output increases or decreases with the set ramp. The variation with the set ramp is performed gradually (1 second). When the Up or Down command is removed the last value that was reached is maintained.

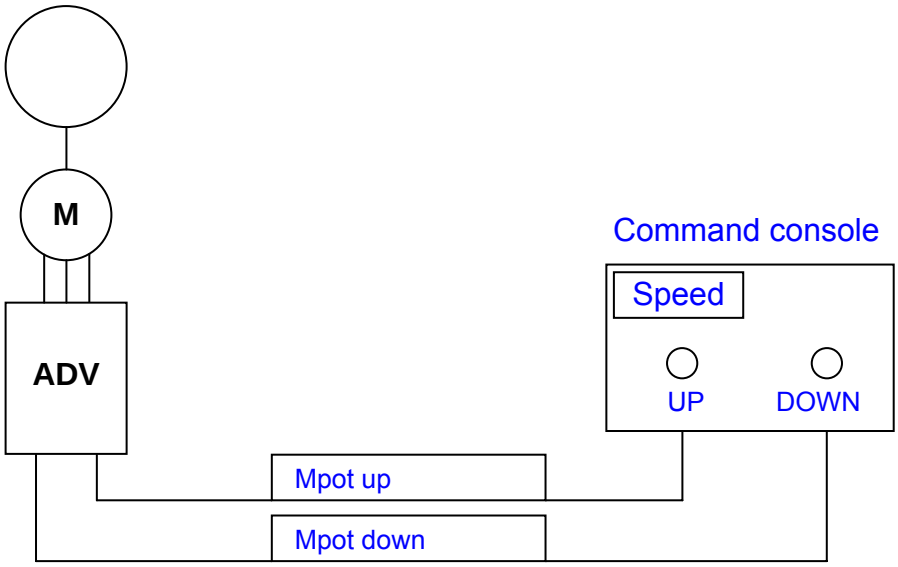


Mpot mode	Ramp behaviour	Behaviour of the Motor potentiometer function with the Stop or FastStop command present with the **Control mode = Ramp** parameter.
0	Ramp	Last val
1	Ramp	Follow
2	Fine	Last val
3	Fine	Follow

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
8.13	**894**	**Mpot output mon**	rpm	INT16	0	0	0	ER	FVS

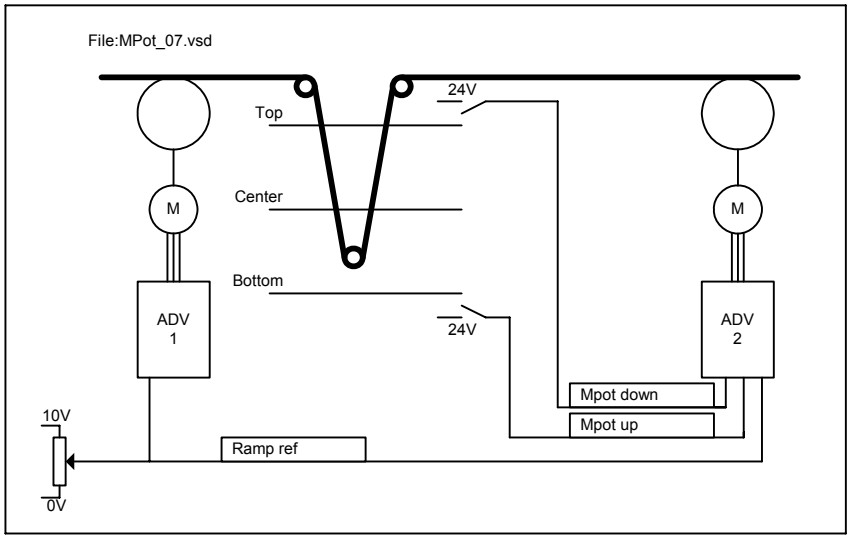
The value of the output of the motor potentiometer function is displayed.

Two examples of application of the motor potentiometer function are shown below.
Manual speed control with command sent from control desk.



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

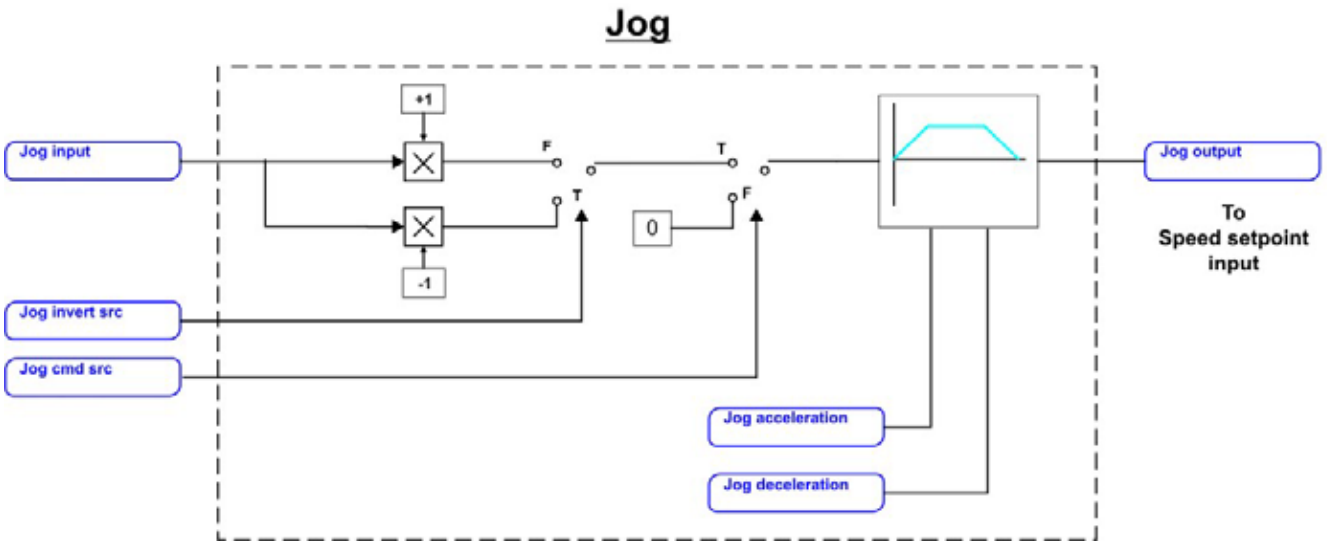
Automatic speed control for rudimentary dancer control.



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

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

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



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
9.1	910	**Jog setpoint**	rpm	INT16	0	CALCI	CALCI	RW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
9.2	912	**Jog acceleration**	s	FLOAT	5.0	0.01	1000.0	RW	FVS
9.3	914	**Jog deceleration**	s	FLOAT	5.0	0.01	1000.0	RW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
9.4	916	**Jog + command src**		LINK	6000	0	16384	RW	FVS

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
9.5	918	**Jog invert src**		LINK	6000	0	16384	RW	FVS

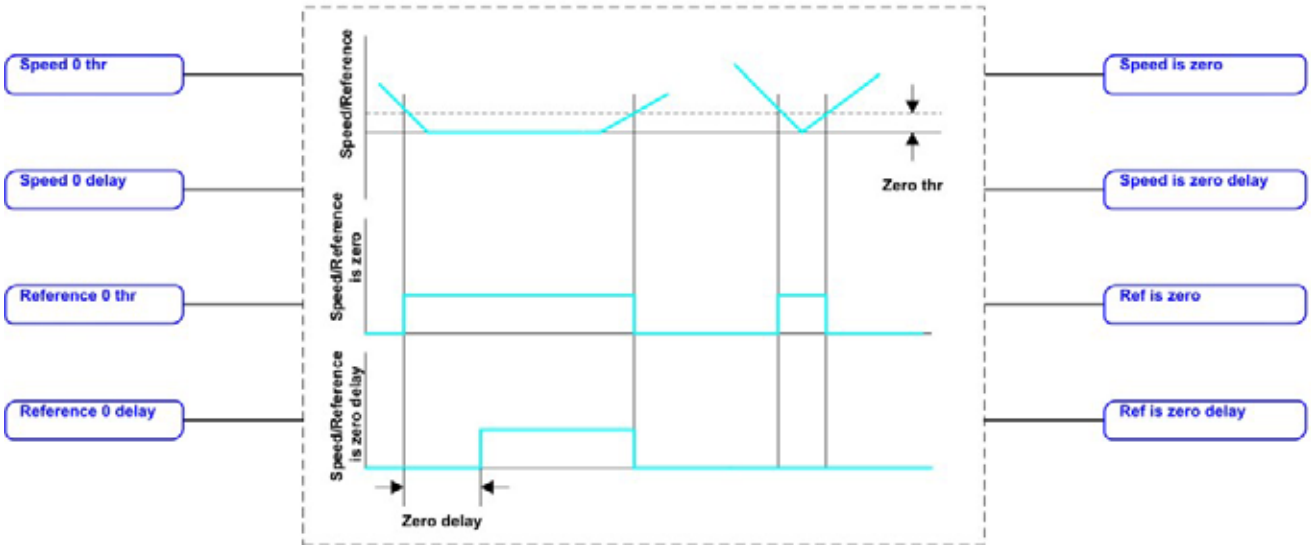
Selection of the origin (source) of the **Jog -** function enabling signal. When this command is enabled the Jog Mode reference sign is inverted with respect to the value entered in the **Jog setpoint value** parameter. The signal to be associated with this function can be selected from the "**L_DIGSEL2**"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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
9.6	**920**	**Jog output mon**	rpm	INT16	0	0	0	ER	FVS

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

Speed Zero



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
10.1	**930**	**Reference 0 thr**	rpm	INT16	30	0	CALCI	RW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
10.2	**932**	**Reference 0 delay**	ms	UINT16	400	0	10000	RW	FVS

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

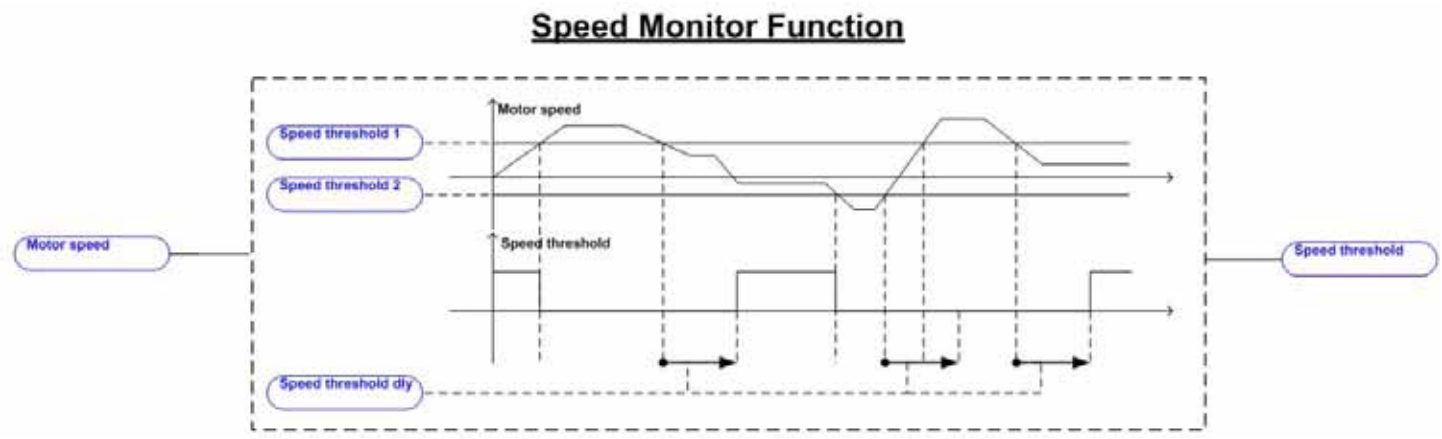
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
10.3	**940**	**Speed 0 thr**	rpm	INT16	30	0	CALCI	RW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
10.4	**942**	**Speed 0 delay**	ms	UINT16	400	0	10000	RW	FVS

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

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



Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
10.5	**950**	**Speed threshold 1**	rpm	INT16	0	CALCI	CALCI	RW	FVS

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

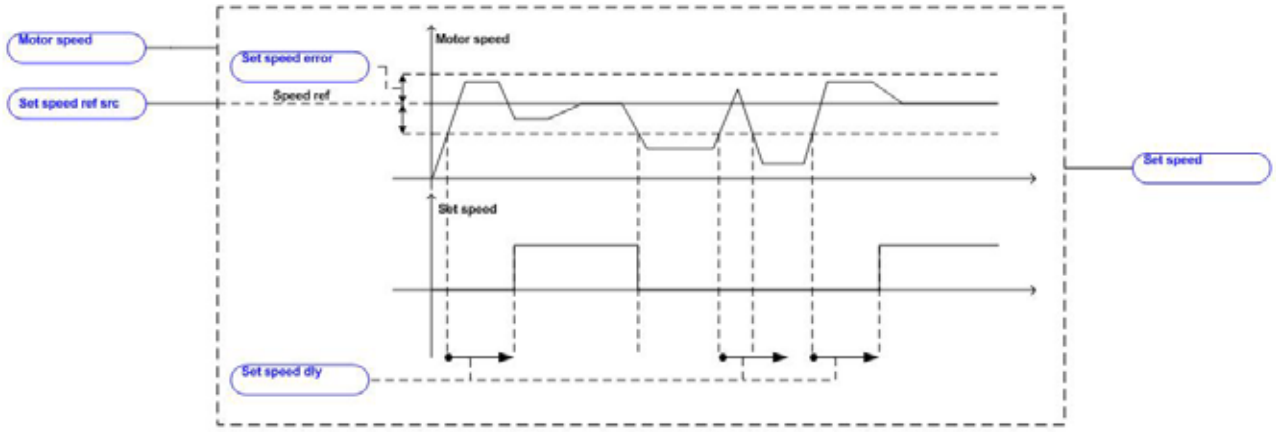
Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
10.6	**952**	**Speed threshold 2**	rpm	INT16	0	CALCI	CALCI	RW	FVS

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

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
10.7	**954**	**Speed threshold dly**	rpm	INT16	0	0	50000	RW	FVS

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

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



Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
10.8	**960**	**Set speed ref src**		LINK	628	0	260	ERW	FVS

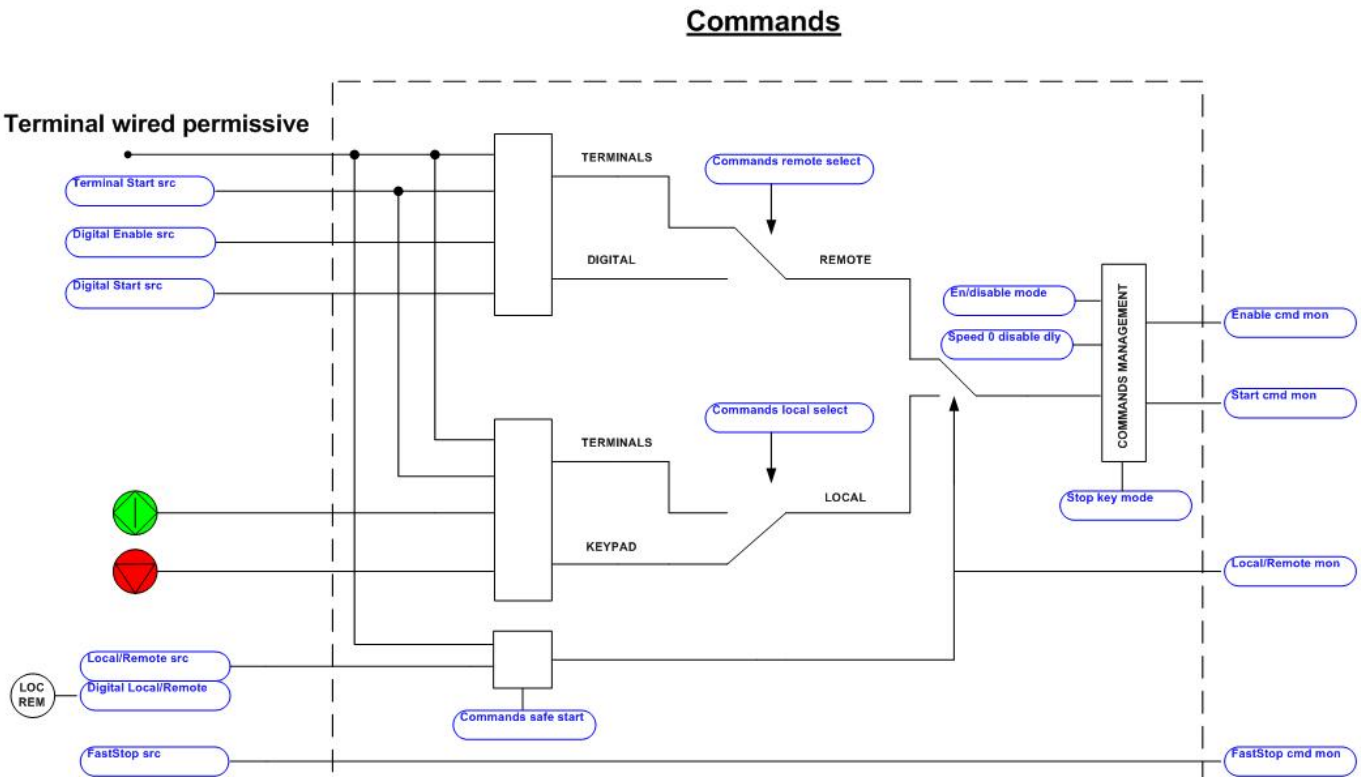
Selection of the origin (source) of the signal used as speed reference and on which the speed reached control is performed (for control with ramp, use **Ramp setpoint**, for control without ramp, use **Speed setpoint**). The signal that can be used as the speed reference can be selected from among those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

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
10.9	**962**	**Set speed error**	rpm	INT16	100	0	CALCI	RW	FVS

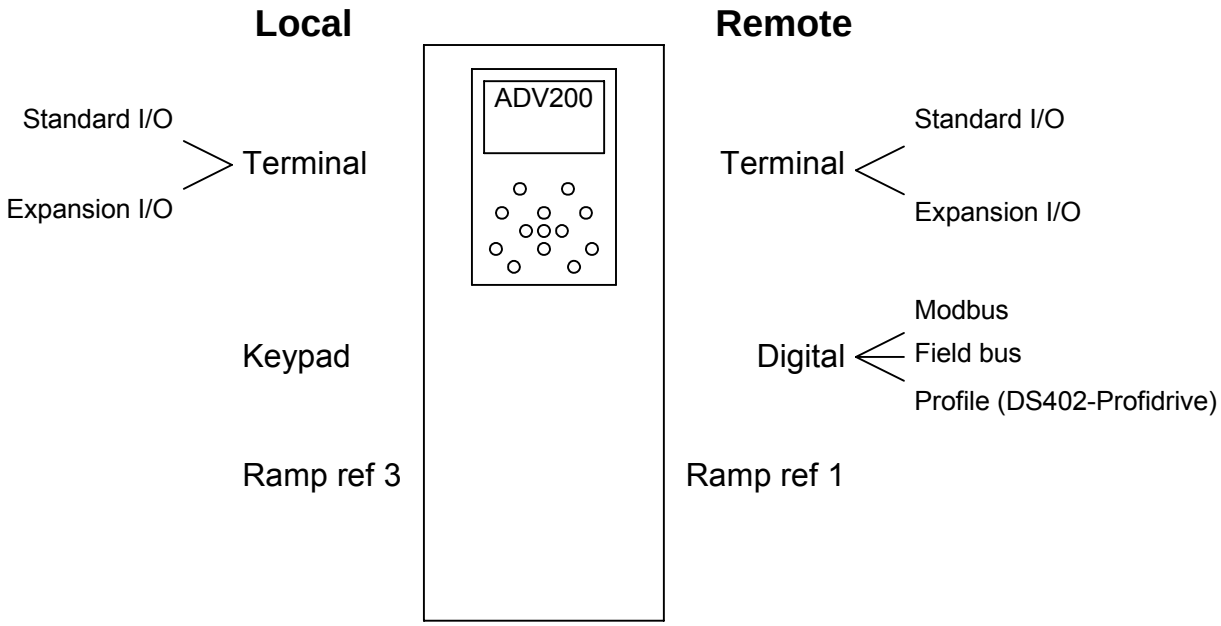
Setting of the bandwidth of the tolerance within which, even if the speed is not equal to the reference, the two values are considered to coincide and the **Set speed** signal is enabled.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
10.10	**964**	**Set speed delay**	Ms	UINT16	0	0	50000	RW	FVS

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



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



When switching between **Remote** and **Local** modes the origin of the Enable and Start commands is switched and in the **Ram Ref** block, switching occurs between Ramp ref 1 and Ramp ref 3.
In **Remote** mode the "**Commands remote sel**" parameter is used to configure the source of the Enable and Start commands which can be **Terminal** (standard digital input, expansion digital input) or **Digital** (Modbus, Fieldbus, Profile DS402, Profile profidrive).
In **Local** mode the "**Commands local sel**" parameter is used to configure the source of the Enable and Start commands, which can be **Terminal** (standard digital input, expansion digital input) or **Keypad** (Start key, Stop key).

In **Remote** -> **Digital** mode the **Digital Enable src** and **Digital Start src** parameters must be used to configure the source.
Normally the sources are the **Pad** parameters. Modbus or Fieldbus must therefore write the desired value on the Pad parameters. Alternatively, the value of 6000 can be written directly on the **Digital Enable src**

and **Digital Start src** parameters for a source of Null (0) or the value of 6002 for a source of One (1).
Another alternative is to configure the **Digital Enable src** and **Digital Start src** sources on the **BitX decomp mon** parameters, so that the Modbus or Fieldbus can then write the desired value on the **Dig word decomp** parameter.

Local ⇔ Remote switching is performed with the variable value configured as **Loc/Remote src**, i.e. it can be a standard digital input, expansion digital input, Modbus, Fieldbus, **Dig Local/Remote**.
In the default condition, the associated variable is **Dig Local/Remote,** which is written by the **LOC** key from the keypad: switching is thus performed by pressing the **LOC** key.
For safety reasons, **Local ⇔ Remote** switching is only performed with **Terminal Enable = 0**.

Example 1

With the machine in automatic operating mode, the drive works in Remote -> Digital -> Fieldbus mode.
With the machine in manual operating mode, the drive works in Local -> Terminal -> Standard digital input mode.
If switching from automatic to manual machine operation, the drive must switch between Remote and Local mode. The switch command must be sent via standard digital input or fieldbus.

Example 2

With the machine controlled from console A, the drive operates in Local -> Terminal -> Standard digital input mode.
With the machine controlled from console B, the drive operates in Remote ->Digital -> Expansion digital input mode.
When switching the control console, the drive must switch between Remote and Local mode. The switch command must be sent via Standard digital input or Expansion digital input.
This configuration is allowed because the Terminal variables are available in the digital command selection lists.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.1	**1000**	**Commands remote sel**		ENUM	Terminal	0	1	RWZ	FVS

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

The Enable command can only be set via hardware, connecting a positive voltage (+24VDC) to terminal 7.

- **0** Terminals
- **1** Digital

When the parameter is set to **Terminals** the source of the **Enable cmd mon** command is the **Enable** terminal (7) and the origin of the **Start cmd mon** command is configured using the **Terminal Start src** parameter.

When the parameter is set to **Digital** the origin of the **Enable cmd mon** command is configured using the **Digital Enable src** parameter and the origin of the **Start cmd mon** command is configured using the **Digital Start src** parameter.
If **Digital** is set to generate the **Enable cmd mon** command, as well as the variable associated with **Digital Enable src,** the enable hardware command must also be sent to the **Enable** terminal**.**

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.2	1002	**Commands local sel**		ENUM	Keypad	0	1	ERWZ	FVS

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

0 Terminals
2 Keypad

When the parameter is set to **Terminals** the source of the **Enable cmd mon** command is the **Enable** terminal (7) and the origin of the **Start cmd mon** command is configured using the **Terminal Start src** parameter.

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.3	1004	**Enable/disable mode**		ENUM	Stop/FS &Spd	0	3	ERW	FVS

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

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

If set to **0 Off:**

in **Terminal** mode the drive is enabled and disabled via the **Enable** terminal.
In **Digital** mode the drive is enabled and disabled when the signal on the **Enable** terminal and the **Digital Enable** command are present simultaneously.
In **Keypad** mode the drive is enabled if the hardware is enabled on the **Enable** terminal and the **Start** key is pressed.
In **Keypad** mode it is disabled if the hardware is not enabled on the **Enable** terminal or if the Stop key is pressed twice.

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

in **Termina**l mode the drive is enabled when the hardware is enabled on the **Enable** terminal**,** on the terminal programmed as **Terminal Start** and the **FastStop** terminal must not be enabled.
In **Termina**l mode the drive is instantly disabled if there is no signal on the **Enable** terminal**,** or when speed=0 is reached if the **Start** command is disabled or the terminal programmed as **FastStop** is enabled.
In **Digital** mode the drive is enabled when the hardware is enabled on the **Enable** terminal, the **Digital Enable,** In **Digital** mode the drive is instantly disabled if there is no signal on the **Enable** terminal**,** or when speed=0 is reached if the **Digital Start** command is disabled or the terminal programmed as **FastStop** is enabled.
In **Keypad** mode the drive is enabled if the hardware is enabled on the **Enable** terminal and the **Start** key is pressed, with the command disabled on the **FastStop** terminal.
In **Keypad** mode the drive is disabled instantly if the signal is not present on the **Enable** terminal or the **Stop** key is pressed twice.

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

in **Terminal** mode the drive is enabled if the hardware is enabled on the **Enable** terminal and the signal is enabled on the terminal programmed as **Terminal Start.**
In **Termina**l mode the drive is instantly disabled if there is no signal on the **Enable** terminal**,** or if, upon reaching the speed=0, the **Terminal Start** command is disabled.

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

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

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

in **Termina**l mode the drive is enabled when the hardware is enabled on the **Enable** terminal and the **FastStop** terminal is not enabled.
In **Termina**l mode the drive is instantly disabled if there is no signal on the **Enable** terminal**,** or when the speed=0 is reached if the terminal programmed as **FastStop** is enabled.

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.4	**1006**	**Speed 0 disable dly**	ms	UINT16	1000	0	10000	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.5	**1008**	**Stop key mode**		ENUM	Inactive	0	1	ERW	FVS

Setting of the stop key functioning on the keypad in case of Remote->Terminal or Remote->Digital or Local->Terminal mode. In Local -> Keypad mode this configuration is ineffective.

0 Inactive
1 EmgStop&Alarm

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

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
11.6	**1010**	**Commands safe start**		BIT	0	0	1	ERW	FVS

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

0 Off
1 On

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.7	1012	**Dig local/remote**		ENUM	Remote	0	1	ERW	FVS

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

0 Local
1 Remote

Writing this parameter is only effective if it is associated with **Local/Remote src** and if performed without the hardware enabled on the **Enable** terminal. Press **LOC** to modify the value of this parameter 0⇔1.
To disable the **LOC** key, set **Local/Remote src** to a value other than **Dig local/remote**.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.8	1014	**Local/remote src**		LINK	1012	0	16384	ERW	FVS

Selection of the origin (source) of the signal that switches between **Remote** and **Local**. Switching can only be performed if the hardware is not enabled on the **Enable** terminal.
The signal to be associated with this function can be selected from the "**L_DIGSEL3"** selection list.

0 Local
1 Remote

In **Remote** mode the "**Commands remote sel**" parameter is used to configure the source of the Enable and Start commands, which can be **Terminal** (standard digital input, expansion digital input) or **Digital** (Modbus, Fieldbus, Profile DS402, Profile profidrive).

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.9	1016	**Terminal Start src**		LINK	1048	0	16384	ERW	FVS

Selection of the origin (source) of the **Terminal Start** signal. Switching can only be performed if the hardware is not enabled on the **Enable** terminal.
The signal to be associated with this function can be selected from the "**L_DIGSEL3"** selection list.

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.10	1018	**Digital Enable src**		LINK	6000	0	16384	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.11	1020	**Digital Start src**		LINK	6000	0	16384	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.12	1022	**FastStop src**		LINK	6000	0	16384	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.13	1024	**Enable cmd mon**		BIT	0	0	1	R	FVS

The status of the enable command is displayed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.14	1026	**Start cmd mon**		BIT	0	0	1	R	FVS

The status of the Start command is displayed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.15	1028	**FastStop cmd mon**		BIT	0	0	1	R	FVS

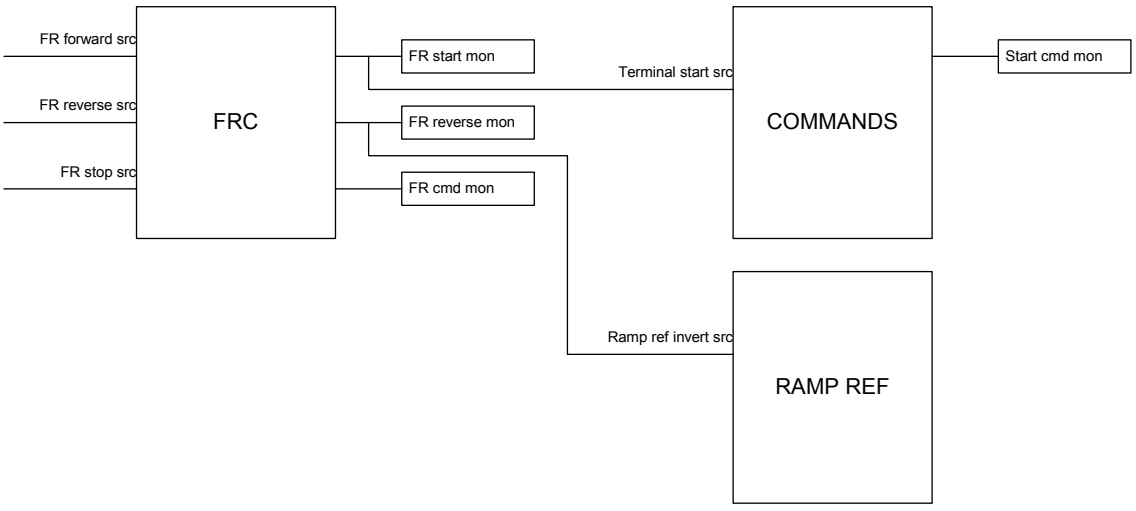
The status of the FastStop command is displayed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.16	1040	**FR mode**		ENUM	Normal	0	2	ERW	FVS

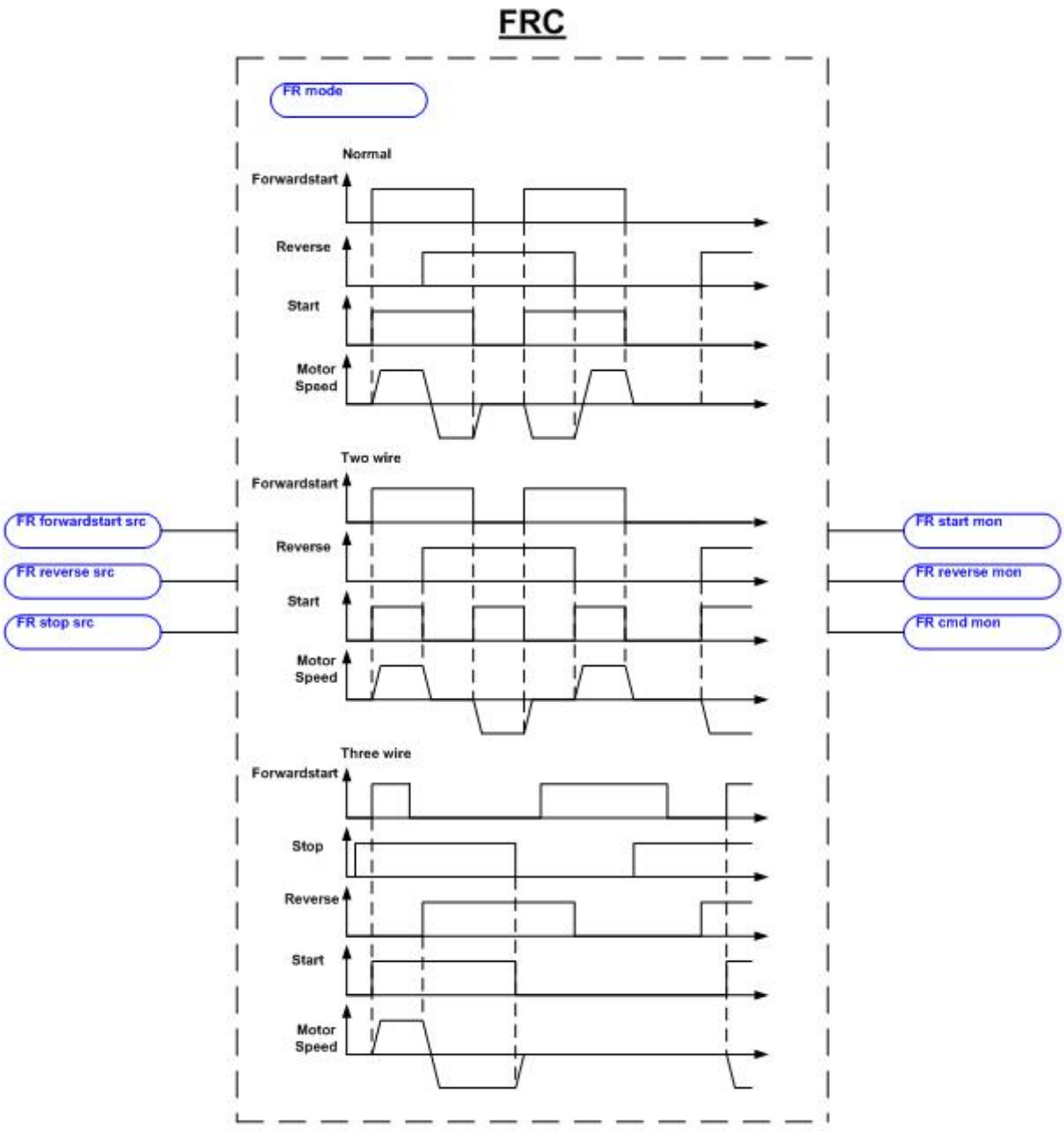
Setting of the operating mode of the Forward Reverse Control (FRC) block.

0	Normal	
1	Two wire	Controllo a due fili
2	Three wire	Controllo a tre fili

The default use of the FRC block is shown below.
The Start command is linked to the Start terminal and the Reverse command is linked to Ramp ref invert.



The function diagrams of the 3 modes are shown below.



When **0 - Normal** control is set the motor only starts rotating when the **FR Forward** command is sent. If the **FR Reverse** command is present the motor rotates in the reverse direction,
The **FR start mon** output repeats the status of the **FR Forward** command, while the **FR reverse mon** output repeats the status of the **FR Reverse** command.

When set to **1 - Two wire** control, the motor only rotates if the **FR Forward** command or **FR Reverse** command is present. The simultaneous presence of the **FR Forward** and **FR Reverse** commands causes the motor to stop.
The **FR start mon** output is enabled if the **FR Forward** and **FR Reverse** commands are not present simultaneously.
The **FR reverse mon** output repeats the status of the **FR Reverse** command.

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.17	**1042**	**FR forward src**		LINK	1112	0	16384	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.18	**1044**	**FR reverse src**		LINK	1114	0	16384	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.19	**1046**	**FR *stop src**		LINK	6000	0	16384	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.20	**1048**	**FR start mon**		BIT	0	0	1	ER	FVS

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

0 Stop
1 Start

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.21	**1050**	**FR reverse mon**		BIT	0	0	1	ER	FVS

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

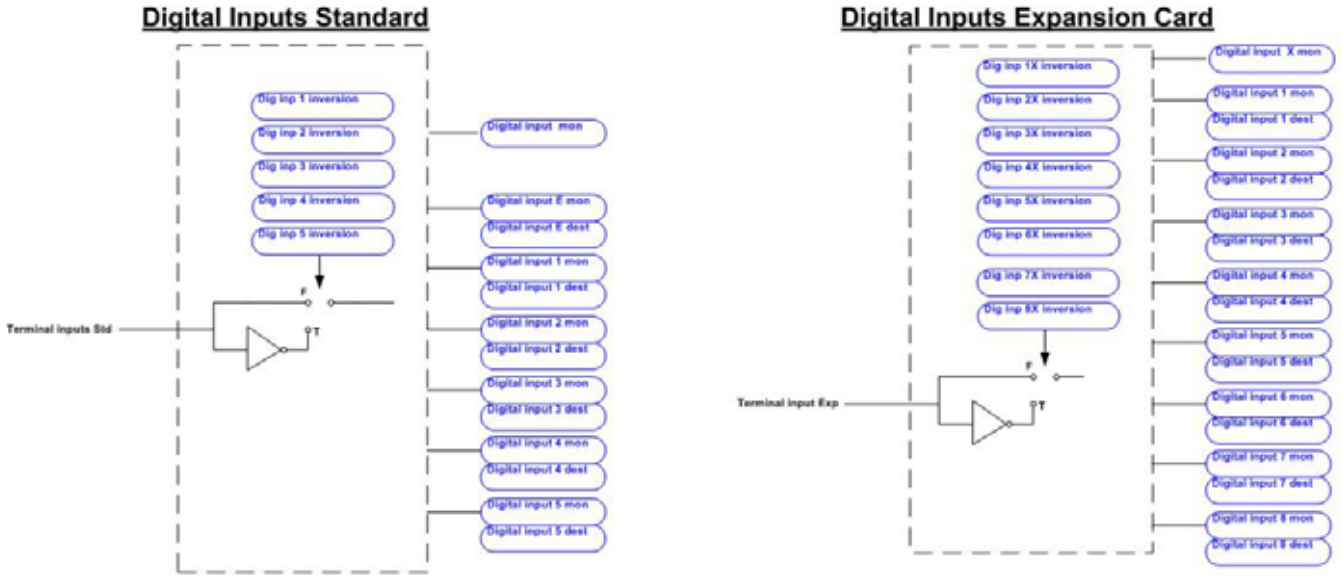
0 No Reverse
1 Reverse

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
11.22	**1052**	**FR cdm mon**		UINT16	0	0	0	ER	FVS

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

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

Digital Inputs



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
12.1	**1132**	**Digital input 2 inversion**		BIT	0	0	1	RW	FVS
12.2	**1134**	**Digital input 3 inversion**		BIT	0	0	1	RW	FVS
12.3	**1136**	**Digital input 4 inversion**		BIT	0	0	1	RW	FVS
12.4	**1138**	**Digital input 5 inversion**		BIT	0	0	1	RW	FVS
12.5	**1140**	**Digital input 6 inversion**		BIT	0	0	1	RW	FVS

Reversal of the logic status of the function associated with the digital input (e.g. from enabled with +24V signal to enabled with low signal).

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
12.6	**1150**	**Digital input E dest**		ILINK	0	0	0	ER	FVS
12.7	**1152**	**Digital input 1 dest**		ILINK	0	0	0	ER	FVS
12.8	**1154**	**Digital input 2 dest**		ILINK	0	0	0	ER	FVS
12.9	**1156**	**Digital input 3 dest**		ILINK	0	0	0	ER	FVS
12.10	**1158**	**Digital input 4 dest**		ILINK	0	0	0	ER	FVS
12.11	**1160**	**Digital input 5 dest**		ILINK	0	0	0	ER	FVS

The function to which the associated digital input refers is displayed.

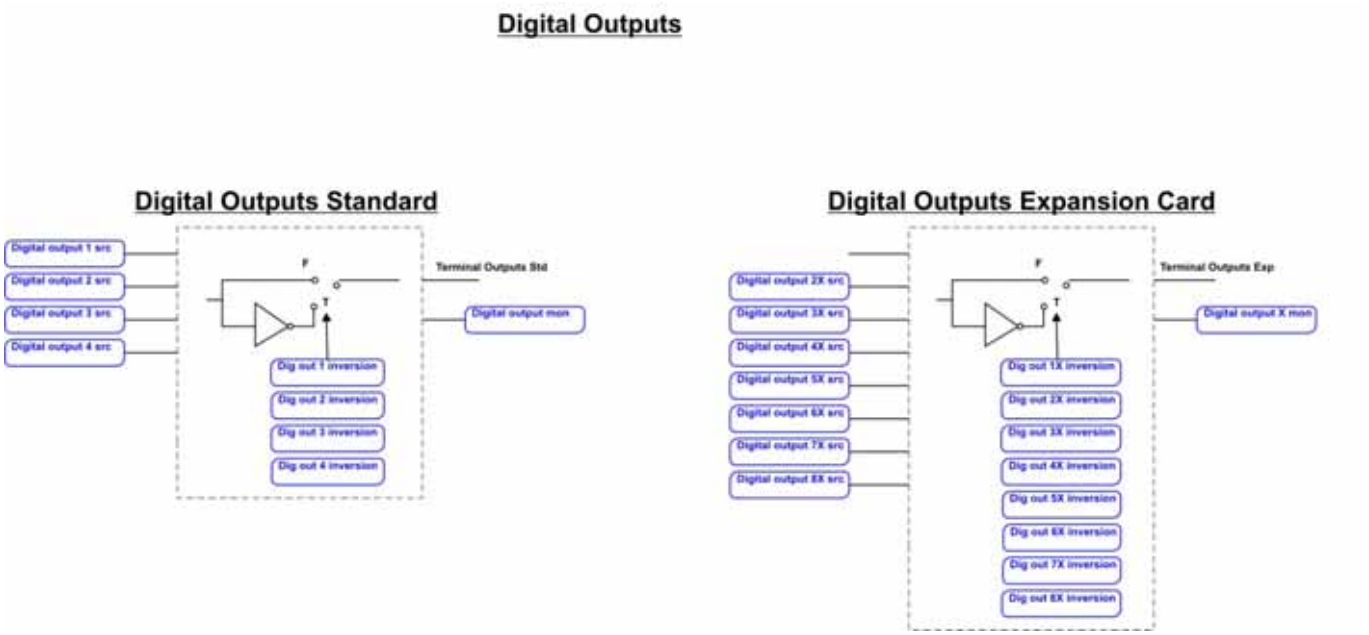
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
12.12	**1240**	**Digital input 1X inversion**		BIT	0	0	1	RW	FVS
12.13	**1242**	**Digital input 2X inversion**		BIT	0	0	1	RW	FVS
12.14	**1244**	**Digital input 3X inversion**		BIT	0	0	1	RW	FVS
12.15	**1246**	**Digital input 4X inversion**		BIT	0	0	1	RW	FVS
12.16	**1248**	**Digital input 5X inversion**		BIT	0	0	1	RW	FVS
12.17	**1250**	**Digital input 6X inversion**		BIT	0	0	1	RW	FVS
12.18	**1252**	**Digital input 7X inversion**		BIT	0	0	1	RW	FVS
12.19	**1254**	**Digital input 8X inversion**		BIT	0	0	1	RW	FVS

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

12 – DIGITAL INPUTS

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
12.20	**1270**	**Digital input 1X dest**		ILINK	0	0	0	ER	FVS
12.21	**1272**	**Digital input 2X dest**		ILINK	0	0	0	ER	FVS
12.22	**1274**	**Digital input 3X dest**		ILINK	0	0	0	ER	FVS
12.23	**1276**	**Digital input 4X dest**		ILINK	0	0	0	ER	FVS
12.24	**1278**	**Digital input 5X dest**		ILINK	0	0	0	ER	FVS
12.25	**1280**	**Digital input 6X dest**		ILINK	0	0	0	ER	FVS
12.26	**1282**	**Digital input 7X dest**		ILINK	0	0	0	ER	FVS
12.27	**1284**	**Digital input 8X dest**		ILINK	0	0	0	ER	FVS

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



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
13.1	**1310**	**Digital output 1 src**		LINK	1062	0	16384	RW	FVS
13.2	**1312**	**Digital output 2 src**		LINK	1064	0	16384	RW	FVS
13.3	**1314**	**Digital output 3 src**		LINK	946	0	16384	RW	FVS
13.4	**1316**	**Digital output 4 src**		LINK	936	0	16384	RW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
13.5	**1330**	**Dig out 1X inversion**		BIT	0	0	1	RW	FVS
13.6	**1332**	**Dig out 2X inversion**		BIT	0	0	1	RW	FVS
13.7	**1334**	**Dig out 3X inversion**		BIT	0	0	1	RW	FVS
13.8	**1336**	**Dig out 4X inversion**		BIT	0	0	1	RW	FVS

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

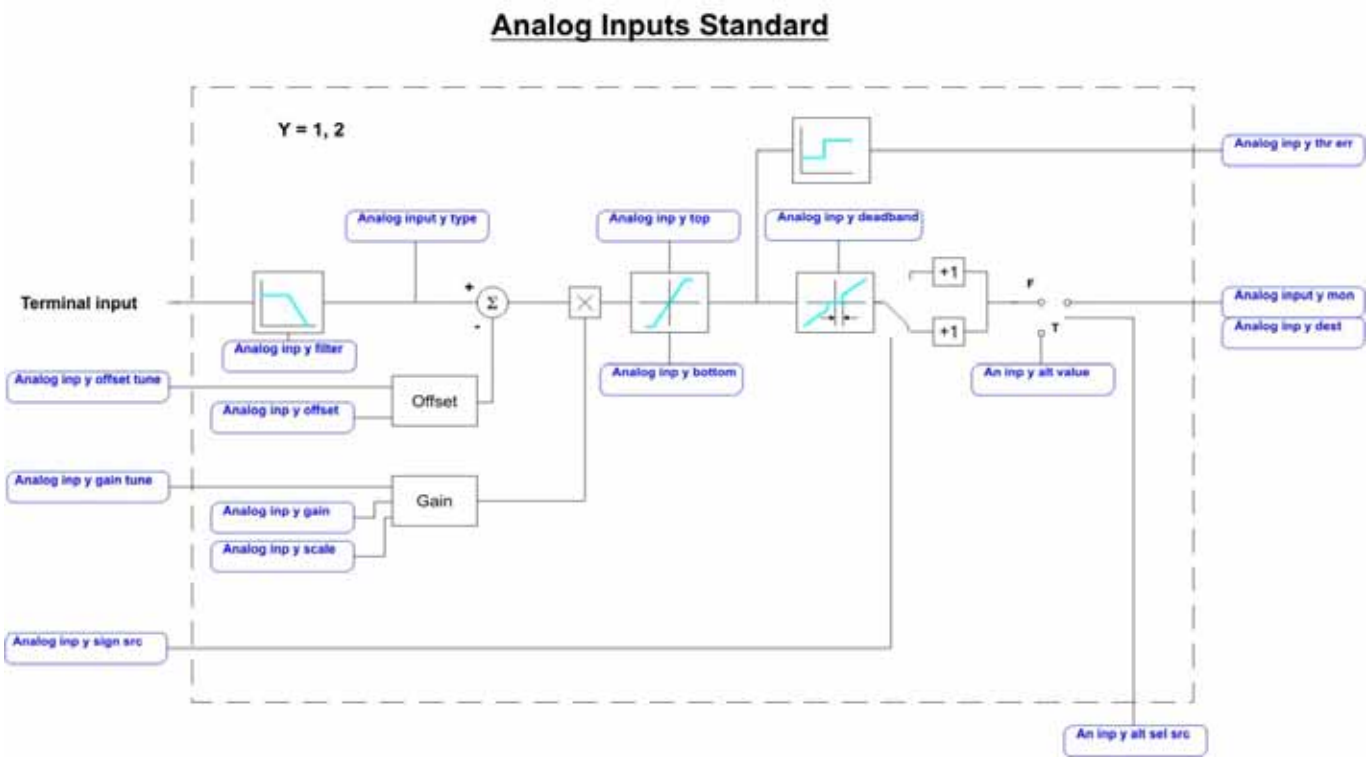
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
13.9	**1410**	**Dig output 1X src**		LINK	6000	0	16384	RW	FVS
13.10	**1412**	**Dig output 2X src**		LINK	6000	0	16384	RW	FVS
13.11	**1414**	**Dig output 3X src**		LINK	6000	0	16384	RW	FVS
13.12	**1416**	**Dig output 4X src**		LINK	6000	0	16384	RW	FVS
13.13	**1418**	**Dig output 5X src**		LINK	6000	0	16384	RW	FVS
13.14	**1420**	**Dig output 6X src**		LINK	6000	0	16384	RW	FVS
13.15	**1422**	**Dig output 7X src**		LINK	6000	0	16384	RW	FVS
13.16	**1424**	**Dig output 8X src**		LINK	6000	0	16384	RW	FVS

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

13 – DIGITAL OUTPUTS

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
13.17	**1430**	**Dig out 1X inversion**		BIT	0	0	1	RW	FVS
13.18	**1432**	**Dig out 2X inversion**		BIT	0	0	1	RW	FVS
13.19	**1434**	**Dig out 3X inversion**		BIT	0	0	1	RW	FVS
13.20	**1436**	**Dig out 4X inversion**		BIT	0	0	1	RW	FVS
13.21	**1438**	**Dig out 5X inversion**		BIT	0	0	1	RW	FVS
13.22	**1440**	**Dig out 6X inversion**		BIT	0	0	1	RW	FVS
13.23	**1442**	**Dig out 7X inversion**		BIT	0	0	1	RW	FVS
13.24	**1444**	**Dig out 8X inversion**		BIT	0	0	1	RW	FVS

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



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.1	**1500**	**Analog input 1 mon**		INT16	0	0	0	R	FVS
14.17	**1550**	**Analog input 2 mon**		INT16	0	0	0	R	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.2	**1502**	**Analog inp 1 type**		ENUM	-10V…+10V	0	2	RW	FVS
14.18	**1552**	**Analog inp 2 type**		ENUM	-10V…+10V	0	2	RW	FVS

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

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

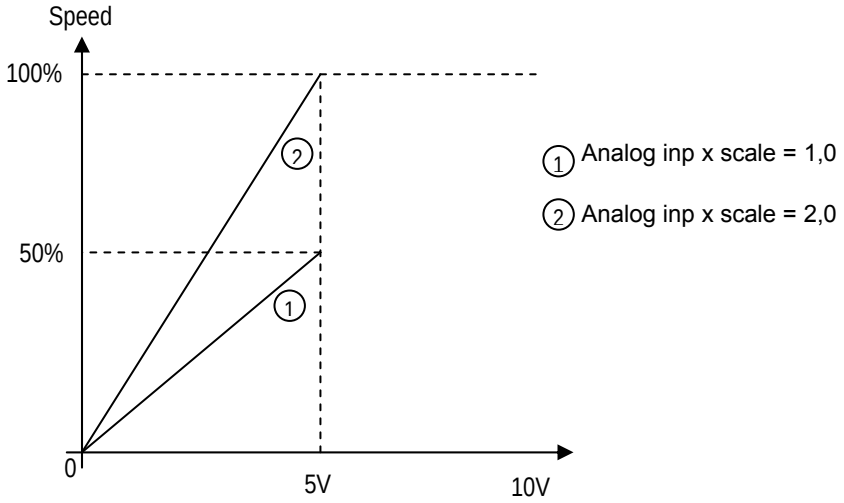
Select option **0** in order to connect a maximum voltage of ±12.5V (typically ±10V/5mA) to the analog input concerned. If the signal is used as a reference, reverse the direction of rotation by inverting the voltage polarity.

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.3	**1504**	**Analog inp 1 scale**		FLOAT	1.0	-10.0	10.0	RW	FVS
14.19	**1554**	**Analog inp 2 scale**		FLOAT	1.0	-10.0	10.0	RW	FVS

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



Example:

The speed reference of a drive is assigned with a max external voltage of 5V. With this value the drive must reach the maximum speed allowed (set using **Full scale speed**).
As the **Analog inp x scale** parameter a scale factor of 2 is entered (10V : 5V)

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.4	**1506**	**Analog inp 1 offset tune**		BIT	0	0	1	RWZ	FVS
14.20	**1556**	**Analog inp 2 offset tune**		BIT	0	0	1	RWZ	FVS

Self-tuning command for the relative analog input offset. Automatic fine tuning of the input. To perform self-tuning, set the input signal to its minimum value and execute the command. The conditions containing an offset can be compensated. When this command is sent, **Analog inp x 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 **Analog inp x offset.**

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.5	**1508**	**Analog inp 1 gain tune**		BIT	0	0	1	RWZ	FVS
14.21	**1558**	**Analog inp 2 gain tune**		BIT	0	0	1	RWZ	FVS

Self-tuning command for the relative analog input gain. Automatic fine tuning of the input. When this command is sent, **Analog inp 1 gain x** is automatically selected so that the available input signal corresponds to the maximum value of the variable.
Two conditions are necessary in order to perform automatic tuning:

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

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.6	**1510**	**Analog inp 1 filter**	ms	FLOAT	10.0	1.0	100.0	ERW	FVS
14.22	**1560**	**Analog inp 2 filter**	ms	FLOAT	10.0	1.0	100.0	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.7	**1512**	**Analog inp 1 top**	cnt	INT16	16384	-32768	+32767	ERW	FVS
14.23	**1562**	**Analog inp 2 top**	cnt	INT16	16384	-32768	+32767	ERW	FVS

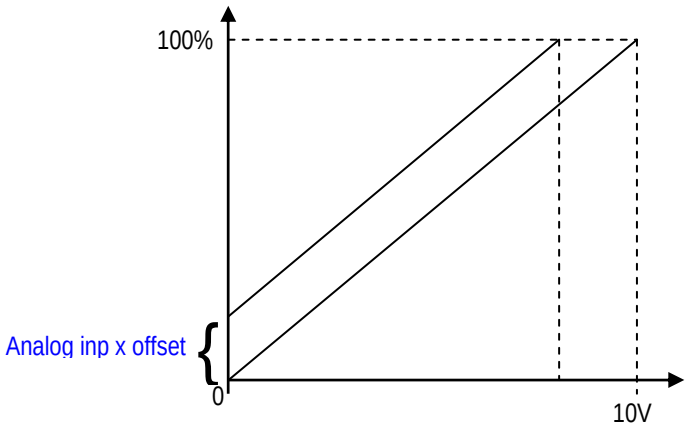
Setting of the upper speed reference limit as a function of the voltage (or current) of the relative analog reference.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.8	**1514**	**Analog inp 1 bottom**	cnt	INT16	-16384	-32768	+32767	ERW	FVS
14.24	**1564**	**Analog inp 2 bottom**	cnt	INT16	-16384	-32768	+32767	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.9	**1516**	**Analog inp 1 offset**	cnt	INT16	0	-32768	+32767	RW	FVS
14.25	**1566**	**Analog inp 2 offset**	cnt	INT16	0	-32768	+32767	RW	FVS

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



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.10	**1518**	**Analog inp 1 gain**		FLOAT	1.0	-10.0	10.0	ERW	FVS
14.26	**1568**	**Analog inp 2 gain**		FLOAT	1.0	-10.0	10.0	ERW	FVS

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

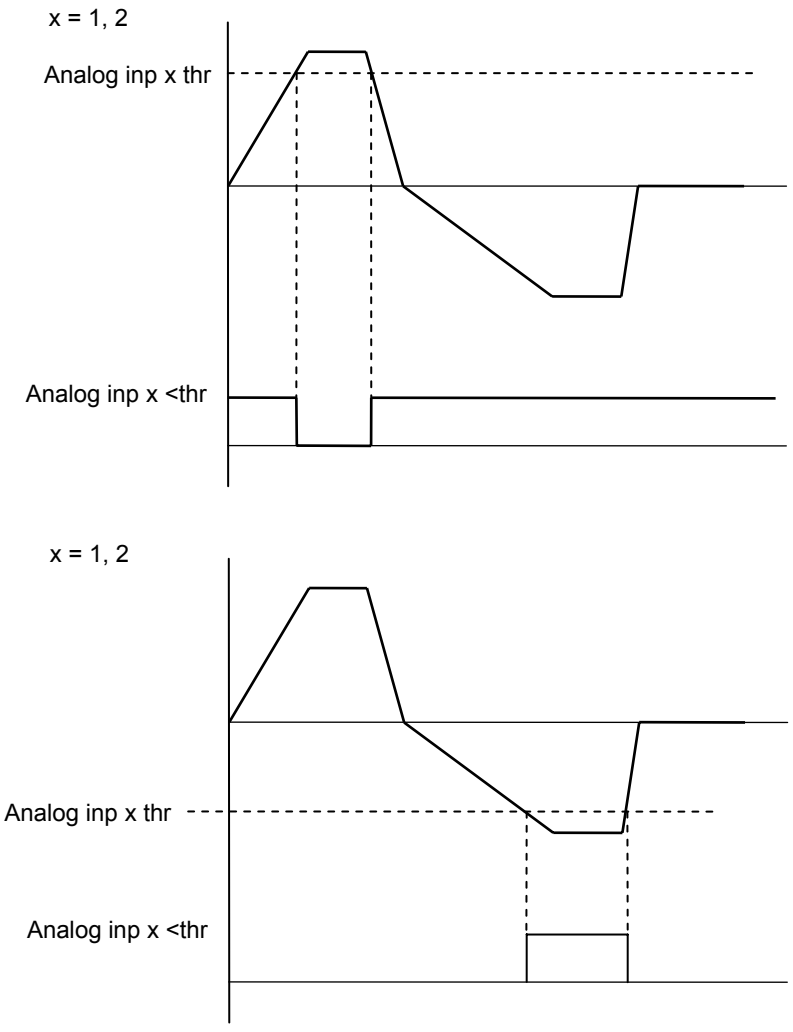
Example:

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

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

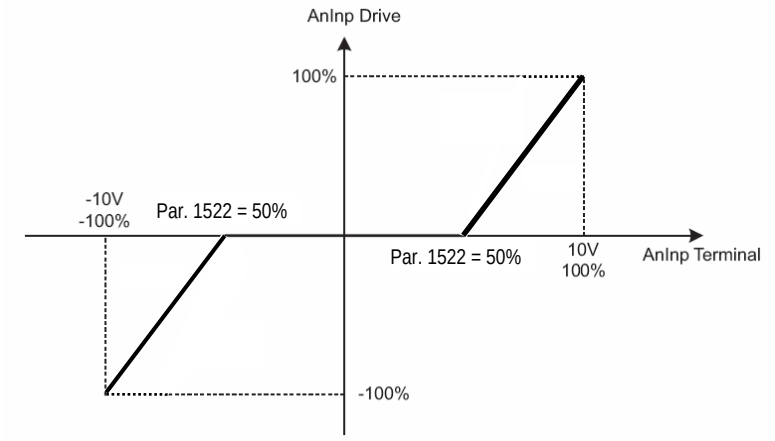
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.11	**1520**	**Analog inp 1 thr**		INT16	0	-16384	16383	ERW	FVS
14.27	**1570**	**Analog inp 2 thr**		INT16	0	-16384	16383	ERW	FVS

Setting of the analog input threshold for the **speed not exceeded** signal, which allows enabling of the digital outputs **Analog inp1<thr** (par. 1530) and **Analog inp2<thr** (par.1580).



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.12	**1522**	**An inp 1 deadband**	perc	FLOAT	0.0	0.0	100.0	ERW	FVS
14.28	**1572**	**An inp 2 deadband**	perc	FLOAT	0.0	0.0	100.0	ERW	FVS

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



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.13	**1524**	**Analog inp 1 alt value**	cnt	INT16	0	-16384	16384	ERW	FVS
14.29	**1574**	**Analog inp 2 alt value**	cnt	INT16	0	-16384	16384	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.14	**1526**	**Analog inp 1 sign src**		LINK	6000	0	16384	ERW	FVS
14.30	**1576**	**Analog inp 2 sign src**		LINK	6000	0	16384	ERW	FVS

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

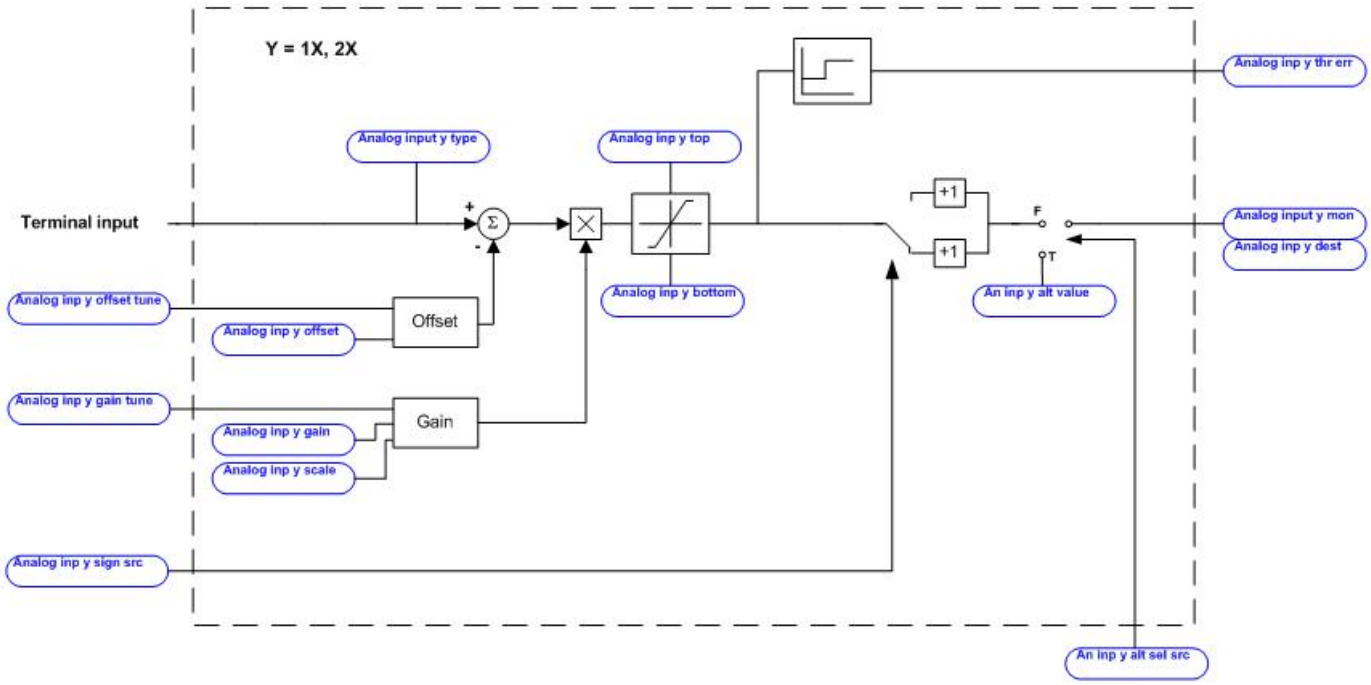
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.15	**1528**	**Analog inp 1 alt sel src**		LINK	6000	0	16384	ERW	FVS
14.31	**1578**	**Analog inp 2 alt sel src**		LINK	6000	0	16384	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.16	**1532**	**Analog inp 1 dest**		ILINK	0	0	0	ER	FVS
14.32	**1582**	**Analog inp 2 dest**		ILINK	0	0	0	ER	FVS

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

Analog Inputs Expansion Card



Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
14.33	**1600**	**Analog input 1X mon**		INT16	0	0	0	R	FVS
14.44	**1650**	**Analog input 2X mon**		INT16	0	0	0	R	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.34	**1602**	**Analog inp 1X type**		ENUM	-10V…+10V	0	2	RW	FVS
14.45	**1652**	**Analog inp 2X type**		ENUM	-10V…+10V	0	2	RW	FVS

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

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

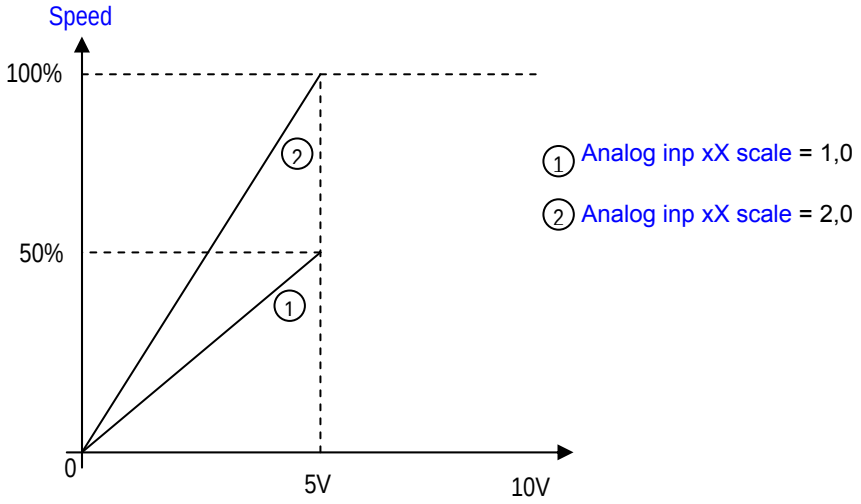
Select option **0** in order to connect a maximum voltage of ±12.5V (typically ±10V/5mA) to the analog input concerned. If the signal is used as a reference, reverse the direction of rotation of the drive by inverting the voltage polarity.

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.35	**1604**	**Analog inp 1X scale**		FLOAT	1.0	-10.0	10.0	RW	FVS
14.46	**1654**	**Analog inp 2X scale**		FLOAT	1.0	-10.0	10.0	RW	FVS

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



Example:

The speed reference of a drive is assigned with a max external voltage of 5V. With this value the drive must reach the maximum speed allowed (set using **Full scale speed**).
As the **Analog inp X scale** parameter the scale factor of 2 is entered (10V : 5V)

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.36	**1606**	**Analog inp 1X offset tune**		BIT	0	0	1	RW	FVS
14.47	**1656**	**Analog inp 2X offset tune**		BIT	0	0	1	RW	FVS

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

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.37	**1608**	**Analog inp 1X gain tune**		BIT	0	0	1	RW	FVS
14.48	**1658**	**Analog inp 2X gain tune**		BIT	0	0	1	RW	FVS

Self-tuning command for the relative analog input gain. Automatic fine tuning of the input. When this command is sent, **Analog inp 1 gain x** is automatically selected so that the available input signal corresponds to the maximum value of the variable.
Two conditions are necessary in order to perform automatic tuning:

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

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

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.38	**1612**	**Analog inp 1X top**	cnt	INT16	16384	-32768	+32767	ERW	FVS
14.49	**1662**	**Analog inp 2X top**	cnt	INT16	16384	-32768	+32767	ERW	FVS

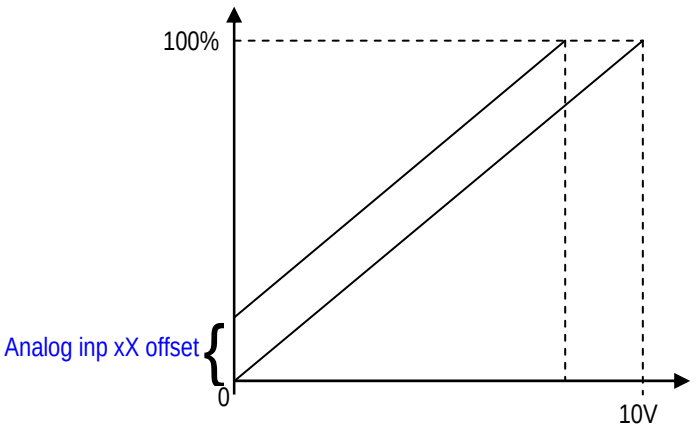
Setting of the upper speed reference limit as a function of the voltage (or current) of the relative analog reference of the expansion card.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.39	**1614**	**Analog inp 1X bottom**	cnt	INT16	-16384	-32768	+32767	ERW	FVS
14.50	**1664**	**Analog inp 2X bottom**	cnt	INT16	-16384	-32768	+32767	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.40	**1616**	**Analog inp 1X offset**	cnt	INT16	0	-32768	+32768	RW	FVS
14.51	**1666**	**Analog inp 2X offset**	cnt	INT16	0	-32768	+32768	RW	FVS

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



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.41	**1618**	**Analog inp 1X gain**		FLOAT	1.0	-10.0	10.0	ERW	FVS
14.52	**1668**	**Analog inp 2X gain**		FLOAT	1.0	-10.0	10.0	ERW	FVS

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

Example:

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

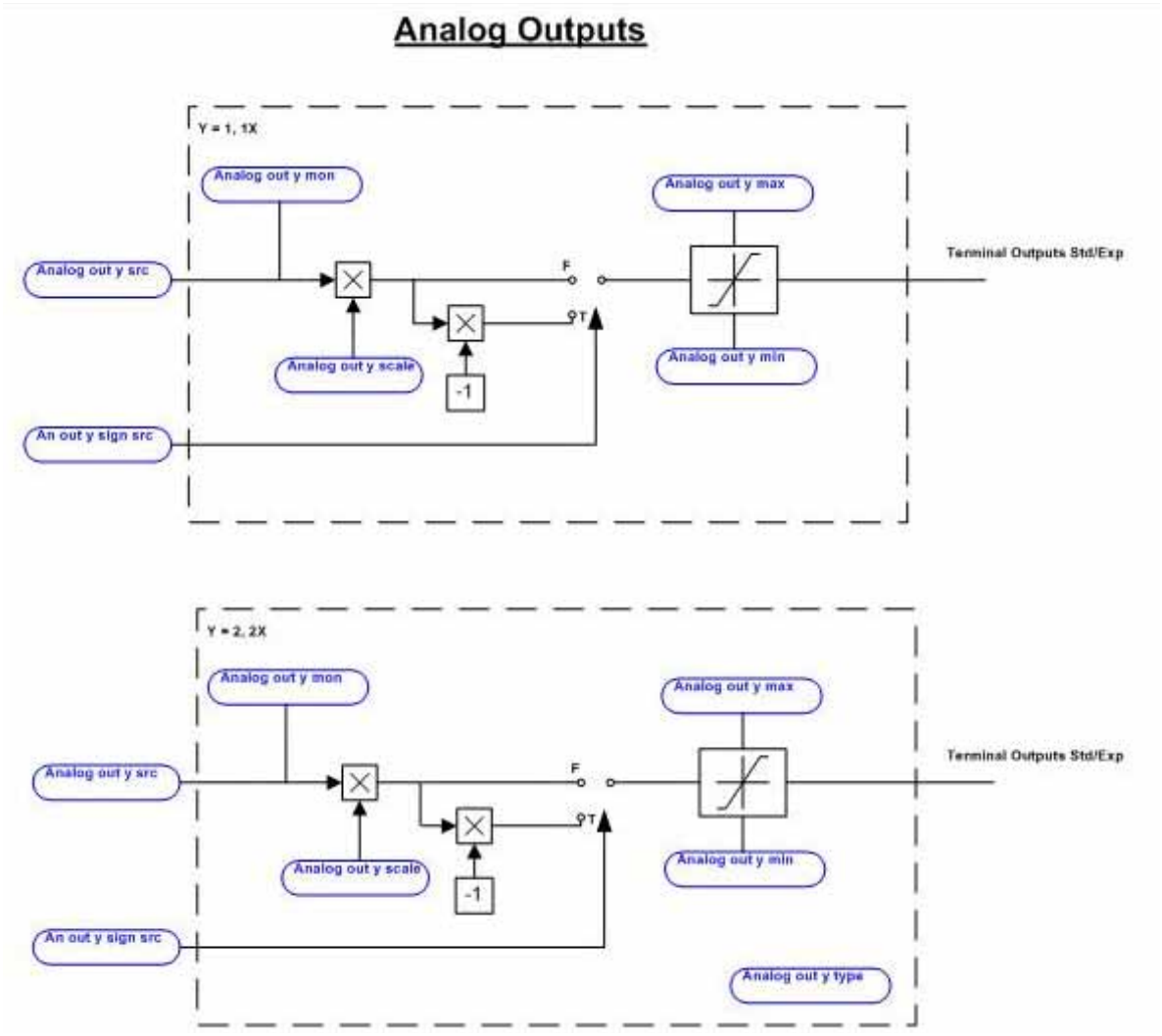
The same result can be achieved using the **Analog inp x gain tune** function. This parameter can be selected from the keypad menu. The maximum analog value available (in this case 9.8V) must be present on the terminal, with positive polarity. Press the Enter key on the keypad to start analog reference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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.42	**1626**	**Analog inp 1X sign src**		LINK	6000	0	16384	ERW	FVS
14.53	**1676**	**Analog inp 2X sign src**		LINK	6000	0	16384	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
14.43	**1632**	**Analog inp 1X dest**		ILINK	0	0	0	ER	FVS
14.54	**1682**	**Analog inp 2X dest**		ILINK	0	0	0	ER	FVS

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



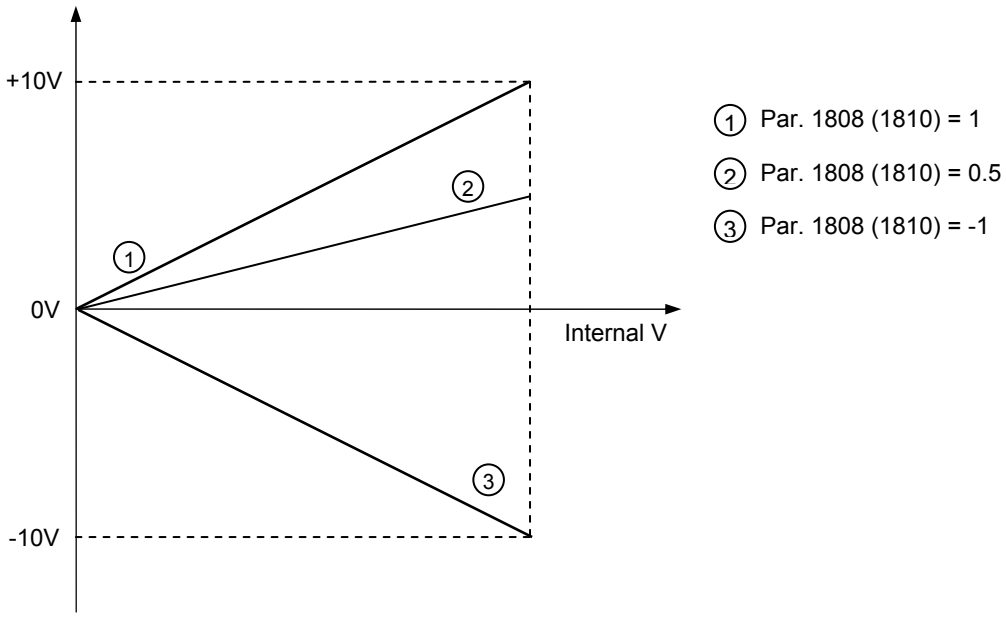
On the AVD regulation card there are two programmable analog outputs.
Analog output 1 supplies a two-pole +/-10VDC voltage signal, while analog output 2 can be programmed to obtain a 0-20mA or 4-20mA output signal in current or a signal in two-pole +/-10VDC voltage, depending on the parameter assigned.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.1	**1800**	**Analog out 1 src**		LINK	0	0	16834	RW	FVS
15.2	**1802**	**Analog out 2 src**		LINK	0	0	16834	RW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.3	**1808**	**Analog out 1 scale**		FLOAT	1.00	-10.0	10.0	RW	FVS
15.4	**1810**	**Analog out 2 scale**		FLOAT	1.00	-10.0	10.0	RW	FVS

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



$$Vout = 10 \times \left(\frac{\text{Stp Var x par. 1808 (1810)}}{\text{FS Var}} \right)$$

where:

Vout output voltage on the card terminals.
Stp Var actual value of the variable (variable unit)
SF Var full scale of the variable (variable unit)

Example of calculation of scale factor **Analog out x scale**

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.5	**1816**	**Analog output 1 mon**		INT16	0	0	0	R	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.6	**1818**	**Analog output 2 mon**		INT16	0	0	0	R	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.7	**1824**	**Analog out 1 sign src**		LINK	6000	0	16834	ERW	FVS
15.8	**1826**	**Analog out 2 sign src**		LINK	6000	0	16834	ERW	FVS

Selection of the origin (source) for the signal that determines the sign of the relative analog output. The terminal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.9	**1832**	**Analog out 1 min**		INT16	-16384	-32768	32767	ERW	FVS
15.10	**1834**	**Analog out 1 max**		INT16	16384	-32768	32767	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.11	**1840**	**Analog out 2 min**		INT16	-16384	-32768	32767	ERW	FVS
15.12	**1842**	**Analog out 2 max**		INT16	16384	-32768	32767	ERW	FVS

Impostazione dei valori minimi e massimi per l'uscita analogica per la corrente o la tensione presente sull'uscita analogica 2.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.13	**1948**	**Analog out 2 type**		ENUM	-10V..+10V	0	2	RW	FVS

Selection of the type of output (in voltage or current). Depending on the output signal, move the switch on the regulation card. The standard output is coded for the signal in voltage.

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

Select option **0** in order to apply a maximum voltage of ±12.5V (typically ±10V/5mA) to analog output 2.

Select option **1** in order to apply a maximum voltage of +10V or a signal in current of 0 ... 20 mA to analog output 2. The signal must be positive.

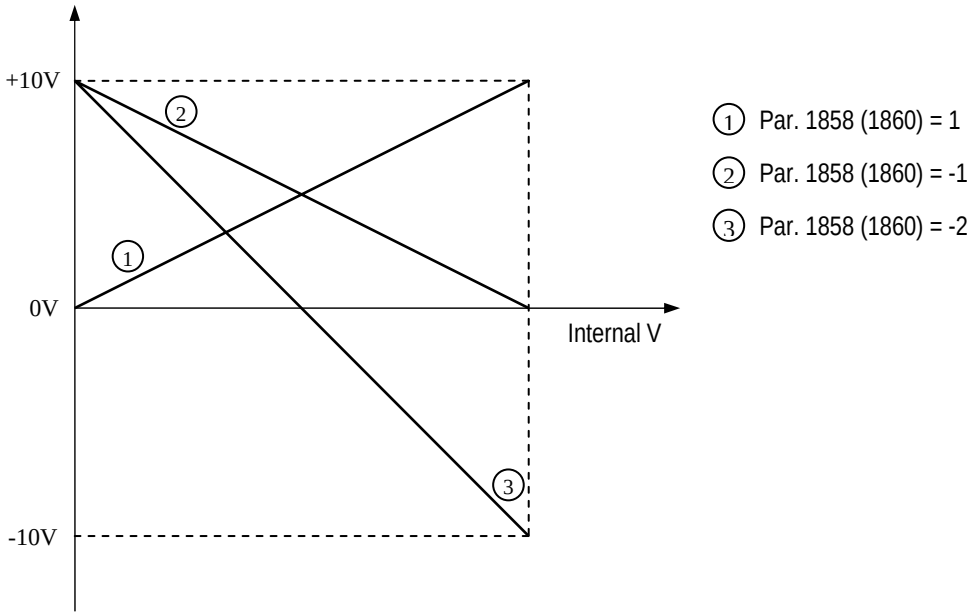
Select option **2** to apply a signal in current of 4...20 mA to analog output 2.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.14	**1850**	**Analog out 1X src**		LINK	6000	0	16394	RW	FVS
15.15	**1852**	**Analog out 2X src**		LINK	6000	0	16384	RW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.16	**1858**	**Analog out 1X scale**		FLOAT	1.00	-10.0	10.0	RW	FVS
15.17	**1860**	**Analog out 2X scale**		FLOAT	1.00	-10.0	10.0	RW	FVS

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



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

where:

Vout output voltage on the card terminals.
Stp Var actual value of the variable (variable unit)
SF Var full scale of the variable (variable unit)

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.18	**1866**	**Analog output 1X mon**		INT16	0	0	0	R	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.19	**1868**	**Analog output 2X mon**		INT16	0	0	0	R	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.20	**1874**	**An out 1X sign src**		LINK	6000	0	16384	ERW	FVS
15.21	**1876**	**An out 2X sign src**		LINK	6000	0	16384	ERW	FVS

Selection of the origin (source) for the signal that determines the polarity of the relative analog output of the expansion card. The terminal to be associated with this function can be selected from the "**L_DIGSEL2**" selection list.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.22	**1882**	**Analog out 1 min**		INT16	-16384	-32768	32767	ERW	FVS
15.23	**1884**	**Analog out 1 max**		INT16	16384	-32768	32767	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.24	**1890**	**Analog out 2X min**		INT16	-16384	-32768	32767	ERW	FVS
15.25	**1892**	**Analog out 2X max**		INT16	16384	-32768	32767	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
15.26	**1898**	**Analog out 2X type**		ENUM	-10V.+10V	0	2	RW	FVS

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

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

Select option **0** in order to apply a maximum voltage of ±12.5V (typically ±10V/5mA) to analog output 2.

Select option **1** in order to apply a maximum voltage of +10V or a signal in current of 0 ... 20 mA to analog output 2. The signal must be positive.

Select option **2** to apply a signal in current of 4...20 mA to analog output 2.

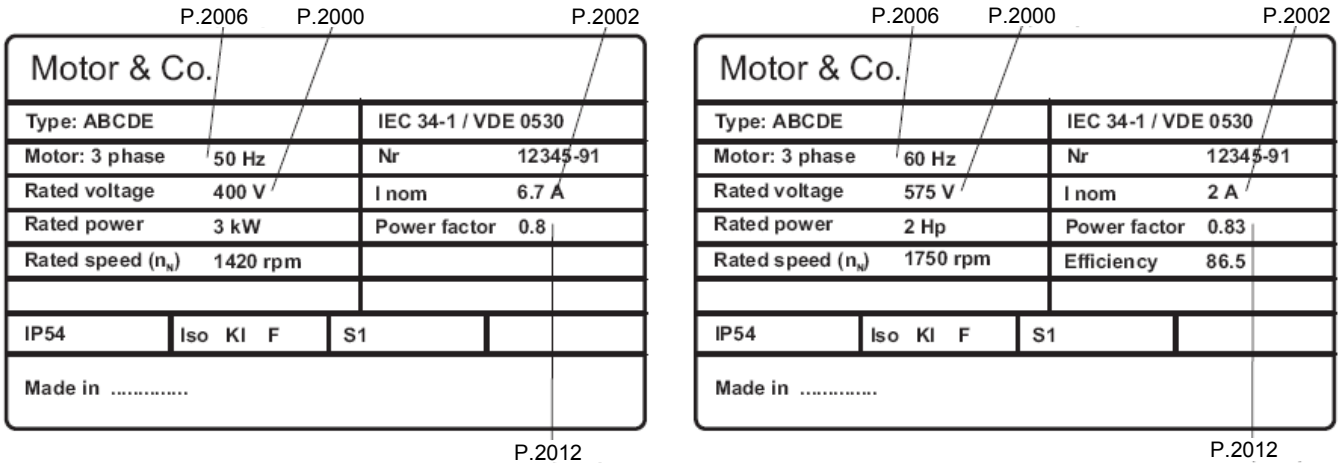
16 – MOTOR DATA

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

a) Computation of the normalization factors necessary for regulation

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

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



Esempio di targhette motore in kW e HP

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.1	**2000**	**Rated voltage**	V	FLOAT	SIZE	50.00	690.0	RWZS	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.2	**2002**	**Rated current**	A	FLOAT	SIZE	1.00	1000.00	RWZS	FVS

The motor rated current at its rated power (kW / Hp) and voltage (indicated on the motor data plate (see figure ....).
If using a single drive to control several motors connected in parallel (only possible in the V/f mode), enter a value that corresponds to the sum of the rated currents of all the motors; in this case do not perform any self-tuning operations.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.3	**2004**	**Rated speed**	rpm	FLOAT	SIZE	10.0	32000.0	RWZS	FVS

Rated speed of the motor with full load in rpm (rpm = m-1). In some motors the synchronous speed (e.g. 1500 rpm for a 4-pole motor) and slippage, i.e. the loss of revolutions between the motor idling condition and the rated load condition (e.g. 80 rpm), is indicated. Enter the following: synchronous speed - slippage.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.4	2006	**Rated frequency**	Hz	FLOAT	SIZE	10.0	1000.0	RWZS	FVS

Rated frequency of the motor expressed in Hz, at which the flux weakening range starts.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.5	2008	**Pole pairs**		UNIT16	SIZE	1	20	RWZS	FVS

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

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.6	2010	**Rated power**	Kw	FLOAT	SIZE	0.1	1000.0	RWZS	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.7	2012	**Rated power factor**		FLOAT	SIZE	0.6	0.95	RWZS	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.8	2020	**Take parameters**		BIT	0	0	1	RWZ	FVS

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.9	2022	**Autotune rotation**		BIT	0	0	1	RWZ	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.10	**2024**	**Autotune still**		BIT	0	0	1	RWZ	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.11	**2028**	**Take status**		ENUM	Required	0	0	R	FVS

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	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.12	**2030**	**Autotune status**		ENUM	Required	0	0	R	FVS

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

0 Required
1 Done

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.13	**2050**	**Measured Rs**	Ohm	FLOAT	CALCF	0.001	200.0	ERWS	FVS

Measured value of the rotor resistance.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.14	**2052**	**Measured DTL**	V	FLOAT	0.0	0.0	100.0	ERWS	FVS

Measured value of dead time compensation.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.15	**2054**	**Measured DTS**	V/A	FLOAT	0.0	0.0	100.0	ERWS	FVS

Measured compensation gradient value.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.16	**2056**	**Measured Lsig**	mH	FLOAT	CALCF	0.1	200.0	ERWS	FVS

Measured leakage inductance value.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.17	**2058**	**Measured ImN**	A	FLOAT	CALCF	0.1	1000.0	ERWS	FVS

Measured rated magnetizing current value.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.18	**2060**	**Measured ImX**	A	FLOAT	CALCF	0.0	0.0	ERWS	FVS

Measured magnetizing current saturation value.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.19	**2062**	**Measured FlxN**	Wb	FLOAT	CALCF	0.05	10.00	ERWS	FVS

Measured rated flux value.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.20	**2064**	**Measured FlxX**	Wb	FLOAT	CALCF	0.0	0.0	ERWS	FVS

Measured flux saturation value.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.21	**2066**	**Measured P1**		FLOAT	0.5	0.0	1.0	ERWS	FVS

Measured value of the first parameter to define the motor magnetization curve.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.22	**2068**	**Measured P2**		FLOAT	9.0	3.0	18	ERWS	FVS

Measured value of the second parameter to define the motor magnetization curve.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.23	**2070**	**Measured P3**		FLOAT	0.87	0.0	0.1	ERWS	FVS

Measured value of the third parameter to define the motor magnetization curve.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.24	**2072**	**Measured Rr**	ohm	FLOAT	CALCF	0.001	200.0	ERWS	FVS

Measured rotor resistance value.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
16.25	**2078**	**Take tune parameters**		BIT	0	0	1	ERWZ	FVS

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

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

The closed-loop control mode requires a speed reading by a digital encoder on the motor shaft. The optional EXP-ENC card is necessary in order to acquire the encoder signals. The natural variation in speed generated by machine load induction, known as slippage, can be compensated by the speed feedback supplied by the encoder in V/f mode. In the field oriented vector mode, closed-loop encoder feedback is essential for correct drive operation.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
17.1	**2100**	**Encoder pulses**	ppr	UINT16	1024	128	16384	RWZ	FVS

Setting of the number of feedback encoder impulses.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
17.2	**2130**	**Encoder direction**		ENUM	Not inverted	0	1	RWZ	FVS

Selection of the encoder direction

0 Not inverted
1 Inverted

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

By setting **1** the encoder feedback signals are inverted.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
17.3	**2132**	**Encoder mode**		ENUM	FP mode	0	8	ERWZ	FVS

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

0 None
1 Digital FP
2 Digital F
3 Sinus
4 Sinus SINCOS
5 Sinus ENDAT
6 Sinus SSI
7 Sinus HIPER
8 Resolver

When set to **1** the frequency and period measurement method is selected. With this method you can obtain a high level of accuracy and dynamic values at medium and high speeds.

When set to **2** the frequency measurement method is selected. This selection is recommended for applications that require operation at very low motor speeds.

Settings **3** to **8** are currently being developed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
17.4	**2134**	**Encoder speed filter**	ms	FLOAT	2.0	0.1	20.0	ERW	FVS

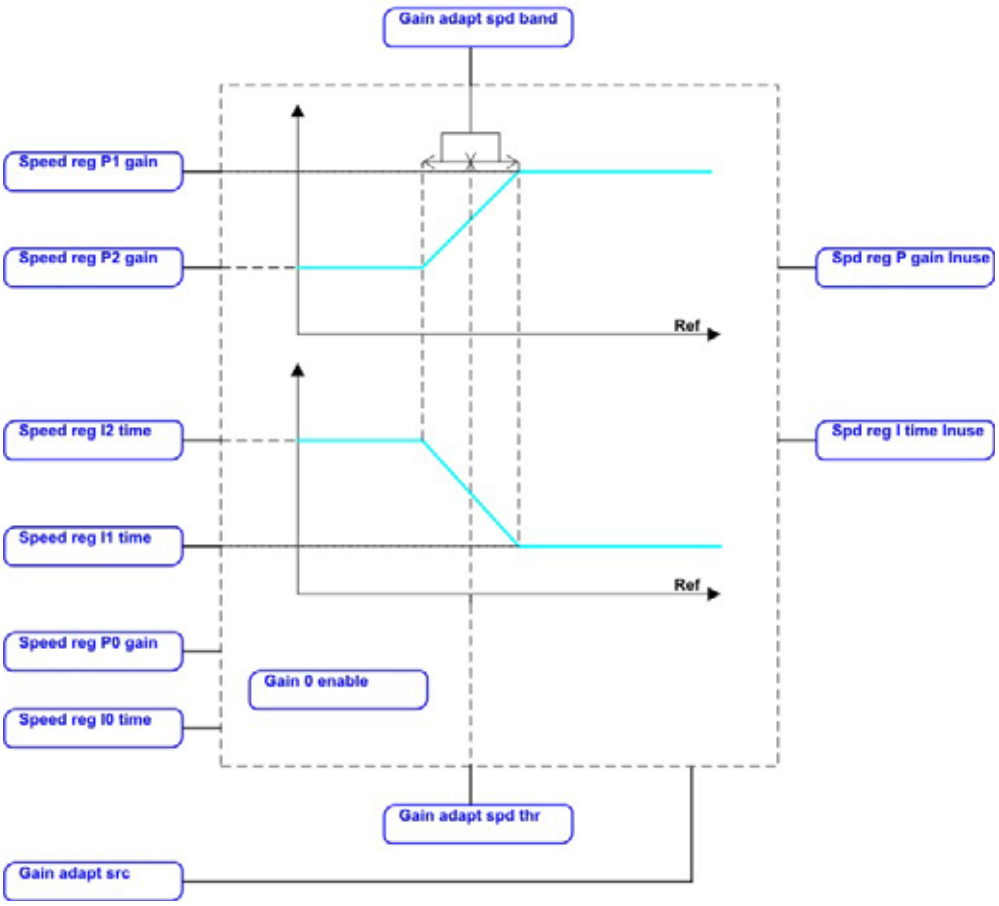
Setting of the time constant of the filter applied to the feedback encoder pulse reading. The parameter affects both the accuracy of the speed measurement and the dynamics obtainable in closed loop control. Long updating times allow greater stability (more filtering) of the speed measurement, as a higher number of encoder pulses are counted at a given speed of rotation. On the other hand, the use of a speed measurement filter introduces delays that do not permit high control loop dynamics. Low settings extend the regulation bandwidth but may accentuate any disturbance.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
17.5	**2150**	**Encoder speed**	rpm	INT16	0	0	0	ER	FVS

The motor speed measured by the encoder is displayed.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
17.6	**2162**	**Encoder position**	cnt	UINT16	0	0	0	ER	F_S

The encoder position is displayed. The scale is Number of encoder impulses *4.



The speed adaptive allows different speed regulator gains to be obtained according to the speed or another value. The behaviour of the speed regulator can thus be configured in the best way for the specific application requirements.

Note ! Current, flux and voltage regulators can be set using the self-tuning procedure. If this is not successful, current and flux regulators can be tuned manually (this does not apply to voltage regulators, whch must not be modified by the user). The speed regulator must be tuned manually. Gains are usually adjusted according to the drive speed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
18.1	**2200**	**Speed reg P1 gain**	perc	INT16	100	0	1000	RW	F_S
18.2	**2202**	**Speed reg I1 time**	perc	INT16	100	0	1000	RW	F_S

Setting of the proportional and integral gain of the speed regulator, set 1.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
18.3	**2204**	**Speed reg P2 gain**	perc	INT16	100	0	1000	ERW	F_S
18.4	**2206**	**Speed reg I2 time**	perc	INT16	100	0	1000	ERW	F_S

Setting of the proportional and integral gain of the speed regulator, set 2.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
18.5	**2208**	**Gain adapt src**		LINK	664	0	260	ERW	F_S

Selection of the origin (source) of the signal to be used for the adaptive speed gain. The values that can be associated with the function are listed in the “**L_REF**” selection list.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
18.6	2218	**Gain adapt spd thr 1_2**	rpm	INT16	0	0	CALCI	ERW	F_S

Setting of the speed threshold for changing gains from set 1 to set 2.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
18.7	2220	**Gain adapt spd band 1_2**	rpm	INT16	0	0	CALCI	ERW	F_S

Setting of the band within which gains vary between set 1 and set 2. The use of this parameter ensures a smooth transition between the two parameter sets.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
18.8	2226	**Gain 0 enable**		ENUM	Disable	0	1	ERW	F_S

Enabling of the gain at zero speed.

0 Disable
1 Enable

When this parameter is set to 0 the control of gains at zero speed is disabled.

When this parameter is set to 1 the control of gains at zero speed is enabled. This function is used to improve the response of the motor below the zero speed threshold (**Speed zero threshold**).

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
18.9	2228	**Speed reg P0 gain**	perc	INT16	100	0	1000	ERW	F_S

Setting of the proportional gain of the speed regulator at zero speed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
18.10	2230	**Speed reg I0 time**	perc	INT16	100	0	1000	ERW	F_S

Setting of the proportional gain of the speed regulator at zero speed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
18.11	2232	**Spd reg P gain Inuse**	perc	INT16	100	0	1000	ER	F_S

The current proportional coefficient of the speed regulator is displayed as a percentage.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
18.12	2234	**Spd reg I time Inuse**	perc	INT16	100	0	1000	ER	F_S

The current integral coefficient of the speed regulator is displayed as a percentage.

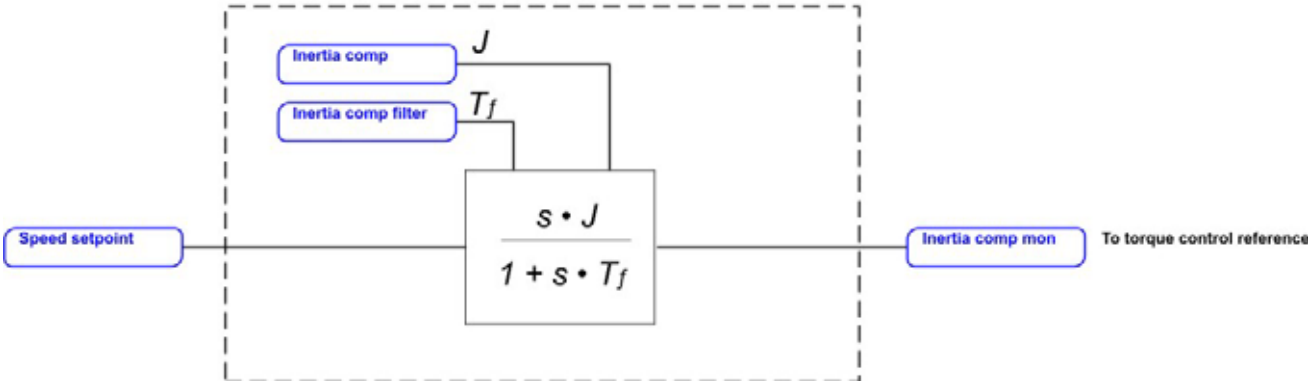
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
18.13	2236	**Speed reg P gain**	N/rpm	FLOAT	CALCF	0.0	500.0	ERWS	F_S

Setting of the proportional coefficient of the speed regulator.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
18.14	2238	**Speed reg I time**	ms	FLOAT	CALCF	1.0	5000.0	ERWS	F_S

Setting of the integral coefficient of the speed regulator.

Inertia compensation

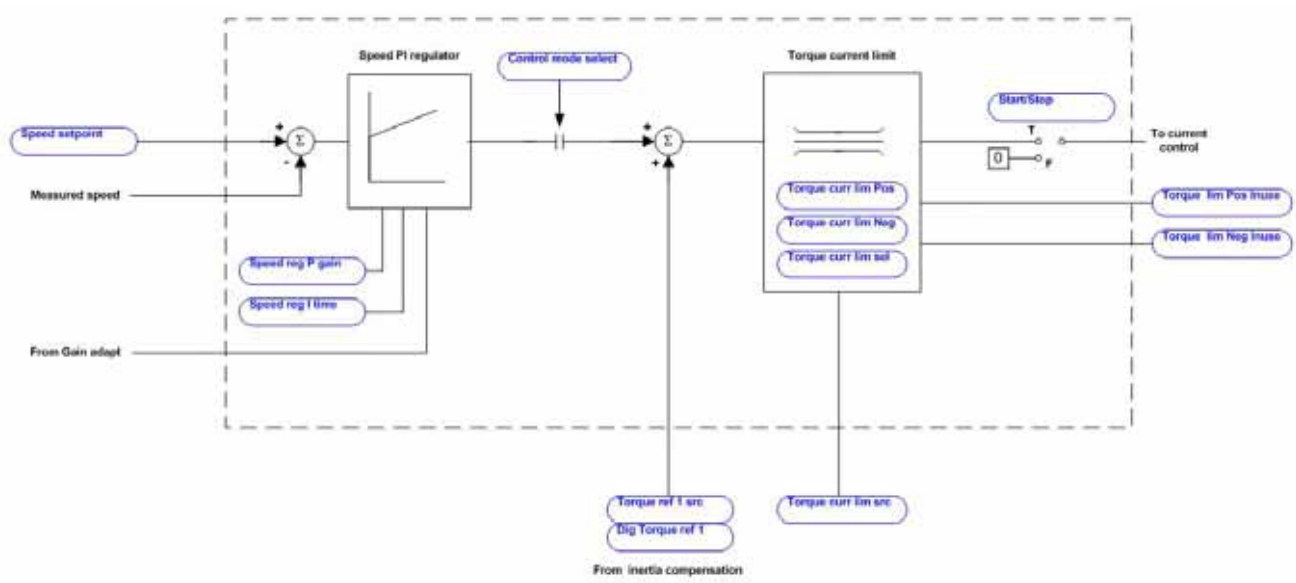


Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
18.15	**2240**	**Inertia**	kgm²	FLOAT	SIZE	0.001	100.0	RWS	F_S

Setting of the inertia compensation coefficient. An increase in the dynamic response of the speed regulator to a variation in the reference, can be modified by changing the current value during the acceleration/deceleration phase, to counter the applied machine inertia.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
18.16	**2242**	**Bandwidth**	rad/s	FLOAT	SIZE	1.0	500.0	RWS	F_S

Setting of the bandwidth. Increasing the setting of this parameter increases the dynamic response and makes the system more rigid.



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
19.1	**2250**	**Current reg P gain**	V/A	FLOAT	CALCF	0.0	0.0	ERWS	F_S

Setting of the proportional coefficient of the current regulator.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
19.2	**2252**	**Current reg I time**	ms	FLOAT	CALCF	0.0	0.0	ERWS	F_S

Setting of the integral coefficient of the current regulator.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
19.3	**2260**	**Flux reg P gain**	A/Wb	FLOAT	CALCF	0.0	0.0	ERWS	F__

Setting of the proportional coefficient of the flux regulator.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
19.4	**2262**	**Flux reg I time**	ms	FLOAT	CALCF	0.0	0.0	ERWS	F__

Setting of the integral coefficient of the flux regulator.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
19.5	**2264**	**Flux reg P gain OL**	ms	FLOAT	CALCF	0.0	0.0	ERWS	__S

Setting of the flux regulator proportional gain when the drive is used in open loop sensorless vector control mode. This parameter is set automatically by the self-tuning procedure.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
19.6	**2266**	**Flux reg I time OL**	ms	FLOAT	CALCF	0.0	0.0	ERWS	__S

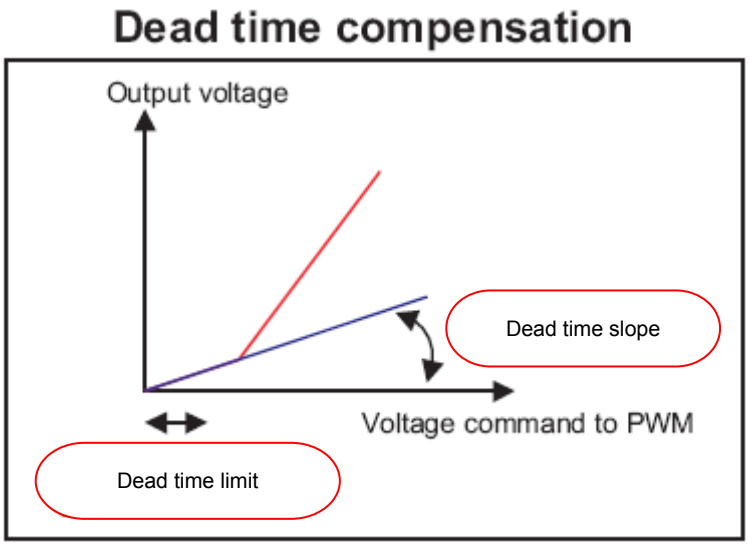
Setting of the flux regulator integral time when the drive is used in open loop sensorless vector control mode. This parameter is set automatically by the self-tuning procedure.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
19.7	**2270**	**Voltage reg P gain**	Wb/V	FLOAT	CALCF	0.0	0.0	ERWS	F_S

Setting of the proportional coefficient of the voltage regulator.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
19.8	**2272**	**Voltage reg I time**	s	FLOAT	CALCF	0.0	0.0	ERWS	F_S

Setting of the integral coefficient of the voltage regulator.



The dead time compensation function (**Dead time compensation**), compensates the distortion of output voltage caused by the voltage drop on the IGBT devices and their switching characteristics.
Distortion of output voltage could cause irregular motor rotation.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
19.9	**2280**	**Dead time limit**	V	FLOAT	SIZE	0.0	50.0	ERWS	FVS

Setting of the dead time voltage compensation value.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
19.10	**2282**	**Dead time slope**	V/A	FLOAT	SIZE	0.0	200.0	ERWS	FVS

Setting of the dead time compensation slope value.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
19.11	**2290**	**Voltage base**	V	FLOAT	CALCF	50.00	690.0	ERWS	F_S

Setting of the basic voltage of the motor. This parameter is calculated automatically by the self-tuning procedure.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
19.12	**2292**	**Voltage margin**	perc	FLOAT	5.0	0.0	10.0	ERWS	F_S

Setting of the voltage regulation margin according to the available voltage. In case of a **Voltage base** setting close to or equal to the actual mains value, **Voltage margin** represents the margin allowable by the voltage regulation to perform rapid current variations when load steps are suddenly applied.
A value of 5% allows a very fast response to load steps but with a loss of output voltage and thus power output (reduced power output).
The minimum value (1%) allows a maximum output voltage (around 98%) of the mains voltage to be achieved but with loss of quality of the dynamic response.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
19.13	**2300**	**Minimum speed OL**	rpm	INT16	30	0	CALCI	ERW	__S

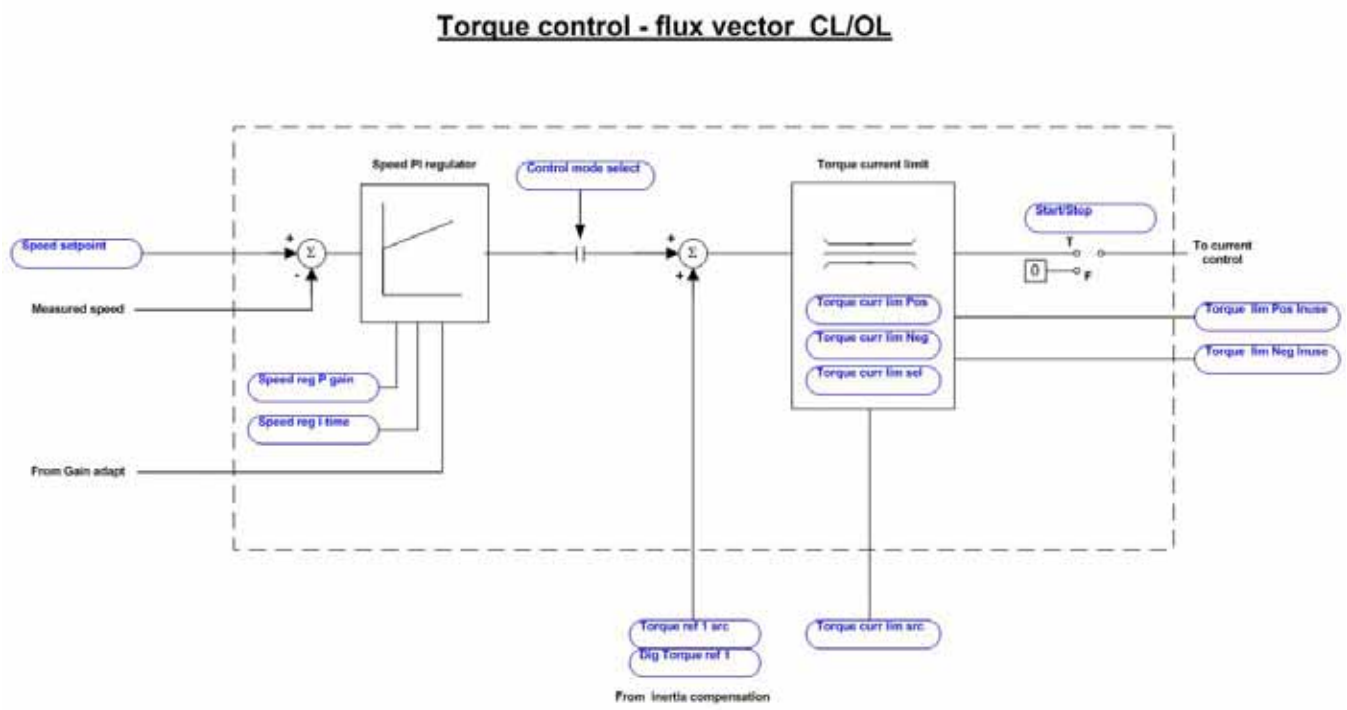
Setting of the minimum speed threshold in the sensorless vector control mode. Below this limit the sensorless regulator is disabled.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
19.14	**2302**	**Min speed delay OL**	ms	UINT16	200	0	5000	ERW	__S

Setting of the delay for disabling the sensorless regulator.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
19.15	**2304**	**Speed filter OL**	ms	FLOAT	5.0	0.1	20.0	ERWZ	__S

Setting of the time constant for the estimated speed in sensorless vector mode. By increasing this parameter it is possible to reduce the level of disturbance of the estimated speed, but the speed control dynamics are also lowered.



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
20.1	2350	**Torque curr lim Pos**	A	FLOAT	CALCF	0.0	CALCF	ERWS	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
20.2	2352	**Torque curr lim Neg**	A	FLOAT	CALCF	0.0	CALCF	ERWS	FVS

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

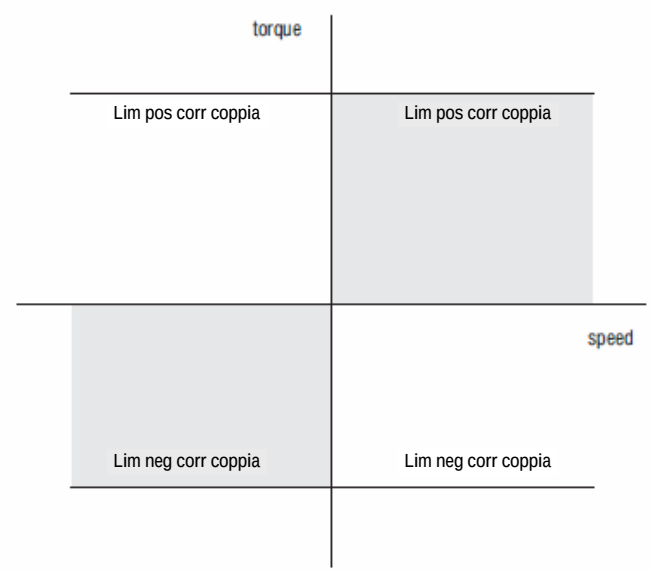
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
20.3	2354	**Torque curr lim sel**		ENUM	Off	0	3	ERWZ	FVS

Setting of the type of behaviour of the drive in the current limit condition.

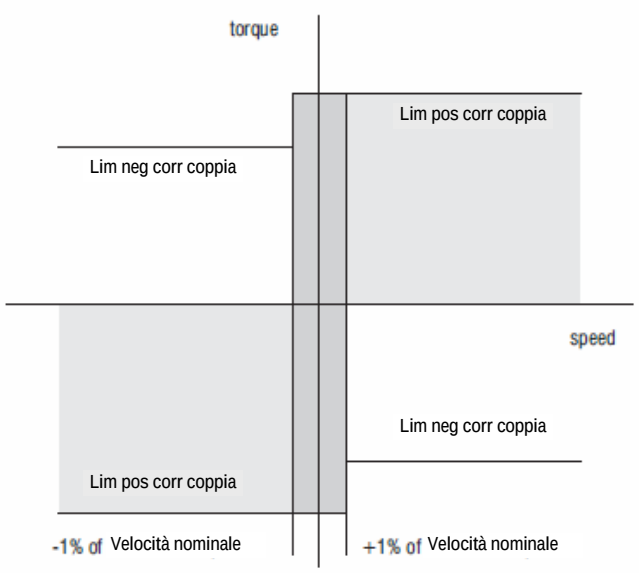
- **0** Off
- **1** T clim +/-
- **2** T clim mot/gen
- **3** T limit src

If set to **0** no specific type of current limitation is set.

If set to **1** the active positive torque limit is **Torque curr lim Pos** and the active negative torque limit is **Torque curr lim Neg**.



Torque limits with **Torque curr lim Sel** = 1



Torque limits with **Torque curr lim sel** = 2

If set to **2** three conditions are possible:

1 - If the motor speed is > +1% of **Rated speed** the active positive torque limit is **Torque curr lim Pos** and the active negative torque limit is **Torque curr lim Neg.**

2 - If the motor speed is < -1% of **Rated speed** the active positive torque limit is **Torque curr lim Neg** and the active negative torque limit is **Torque curr lim Pos**.

3 - If -1% of **Motor non speed** < motor speed < + 1% of **Rated speed** the active positive torque limit is **Torque curr lim Pos** and the active negative torque limit is **Torque curr lim Neg**

If set to **3** the torque limits are symmetrical. The torque reference is the value of **Torque curr lim Pos**. This mode is not managed with V/f control mode.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
20.4	**2358**	**Torque curr lim src**		LINK	6000	0	2380	ERWZ	F_S

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
20.5	**2360**	**Torque lim Pos Inuse**	A	FLOAT	0.0	0.0	0.0	ER	FVS

The positive torque limit value currently being used is displayed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
20.6	**2362**	**Torque lim Neg Inuse**	A	FLOAT	0.0	0.0	0.0	ER	FVS

The negative torque limit value currently being used is displayed.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
20.7	**2380**	**Dig torque ref 1**	perc	FLOAT	0.0	-300.0	300.0	ERW	F_S

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	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
20.8	**2382**	**Torque ref 1 src**		LINK	3104	0	2380	ERWZ	F_S

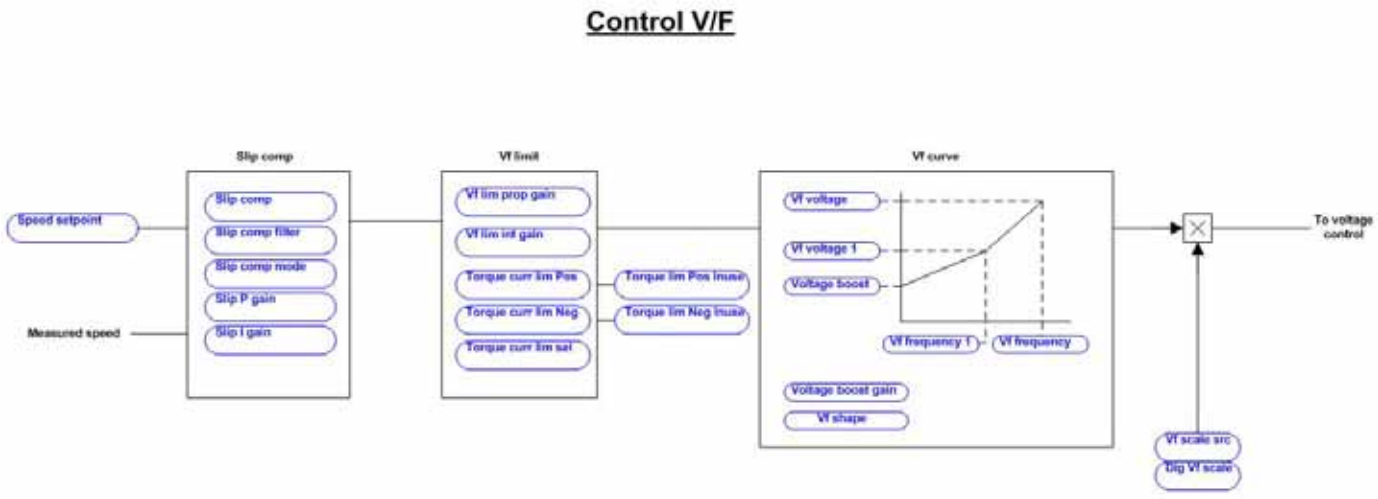
Selection of the origin (source) of the signal to be used for the torque reference. The values that can be associated with the function are listed in the "**L_VREF**" selection list.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
20.9	**2384**	**Torque ref filter**	ms	FLOAT	1.0	0.1	10.0	ERW	F_S

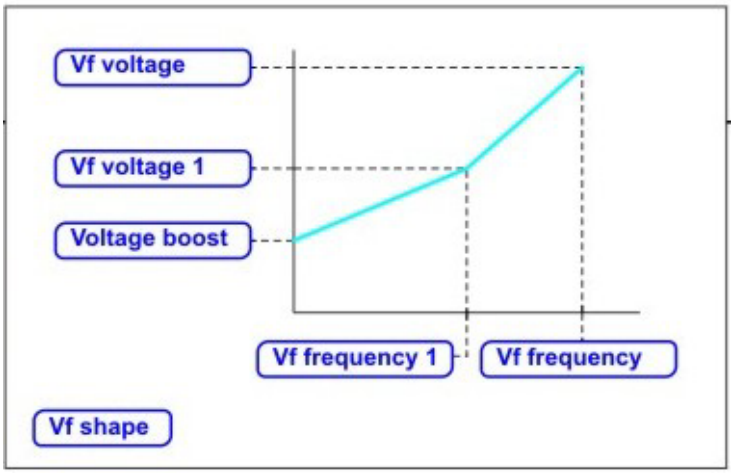
Setting of a filter on the torque reference.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
20.10	**2386**	**Torque ref**	perc	FLOAT	0.0	0.0	0.0	ER	F_S

The value of the torque reference is displayed.



V/f curve



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.1	**2400**	**Voltage boost**	perc	FLOAT	2.0	0	15.0	RWS	_V_

Setting of the boost voltage. The resistive impedance of the stator windings causes a voltage drop within the motor, which results in a reduction in torque in the lower speed range. This effect can be compensated by boosting the output voltage. If self-tuning is performed, the boost value is calculated automatically.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
21.2	**2402**	**Voltage boost gain**	V/A	FLOAT	CALCF	0.0	0.0	ERWZS	_V_

Manual setting of the voltage boost gain to apply to the motor terminals for the set V/f characteristic curve.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.3	**2406**	**Vf voltage**	V	FLOAT	CALCF	10.0	690.0	ERWZS	_V_

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.4	2408	**Vf frequency**	Hz	FLOAT	CALCF	10.0	4000.0	ERWZS	_V_

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.5	2410	**Vf voltage 1**	V	FLOAT	CALCF	CALCF	CALCF	ERWZS	_V_

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.6	2412	**Vf frequency 1**	Hz	FLOAT	CALCF	0.0	CALCF	ERWZS	_V_

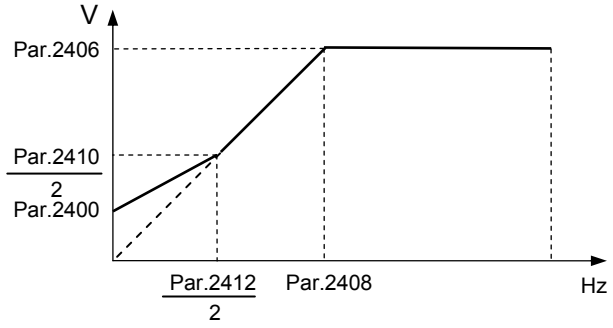
Setting of an intermediate frequency value for the custom V/f characteristic curve.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.7	2414	**Vf shape**		ENUM	Linear	0	2	ERWS	_V_

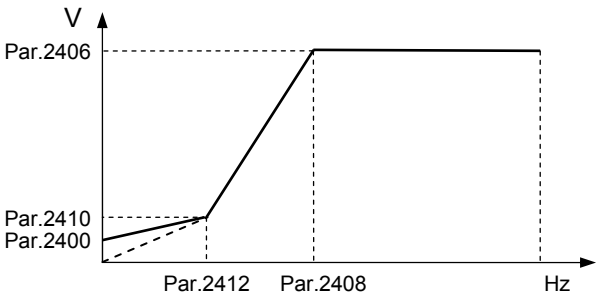
Selection of the type of V/f characteristic curve

- **0** Linear
- **1** Custom
- **2** Quadratic

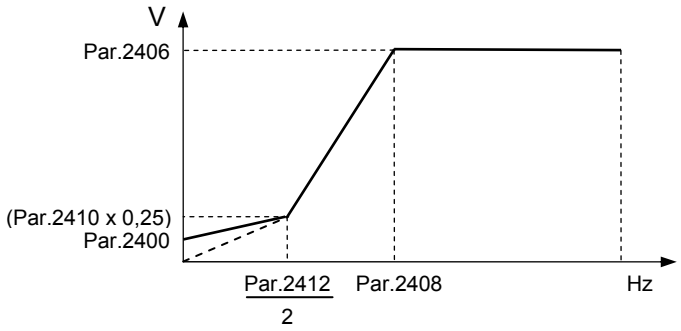
Set **0** (**Linear**) to obtain a linear V/f characteristic curve, on which the intermediate points are reset to a value that is equal to half those of parameters **2406** and **2408**.
The Boost joins the curve automatically.



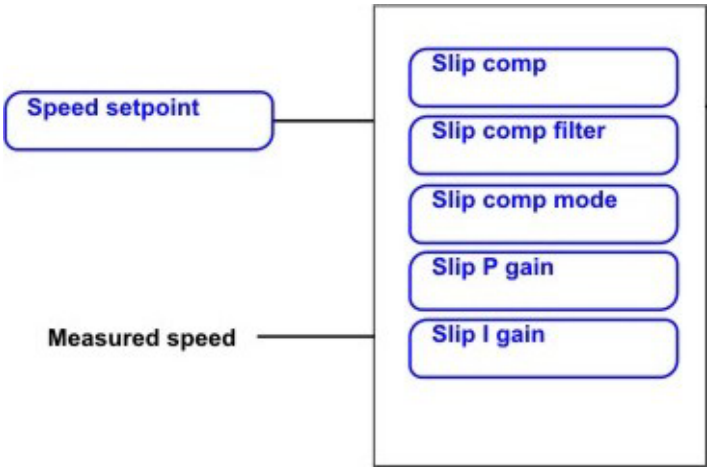
Set **1** (**Custom**) to obtain a customized V/f characteristic curve, in which the intermediate voltage and frequency values are defined by parameters **2410** and **2412,** as is the point at which the Boost joins the characteristic curve.



Set **2** (**Quadratic**) to obtain a quadratic V/f characteristic curve, useful for controlling pumps and fans, where torque is proportional to the square of the speed. When this type of curve is selected, the median voltage point is fixed at 0.25% of the maximum output voltage (par.**2406**), and the median frequency point at 50% of the basic frequency (par.**2408**).



Slip compensation



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.8	**2440**	**Slip comp**	Hz	FLOAT	CALCF	0.0	10.0	RWS	_V_

Setting of the slip compensation. When the asynchronous motor is loaded, the mechanical speed of the motor shaft varies according to the electric slippage, which affects torque generation. The slip compensation function can be used to maintain a constant motor shaft speed. Compensation is performed by varying the drive output frequency as a function of its output current and the motor parameters. Thus, to obtain the best effect, the motor plate data must be set appropriately, and the correct stator resistance value ***(Par.2050)*** must be set or measured using the self-tuning function, The slip compensation value is calculated automatically during the self-tuning procedure or set manually in this parameter.
During slip compensation tuning the drive must not be in the current limit condition.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.9	**2442**	**Slip comp filter**	ms	UINT16	400	50	5000	ERW	_V_

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.10	**2444**	**Slip comp mode**		ENUM	Open loop	0	1	RW	_V_

Setting of the slip compensation mode.

0 Open loop
1 Closed loop

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

If set to 1 (Closed loop) the slip compensation value is measured by the reading of the signals by a digital encoder keyed to the motor shaft. The EXP-DE-I1R1F1-ADV expansion card must be installed in the drive in order to acquire encoder signals.

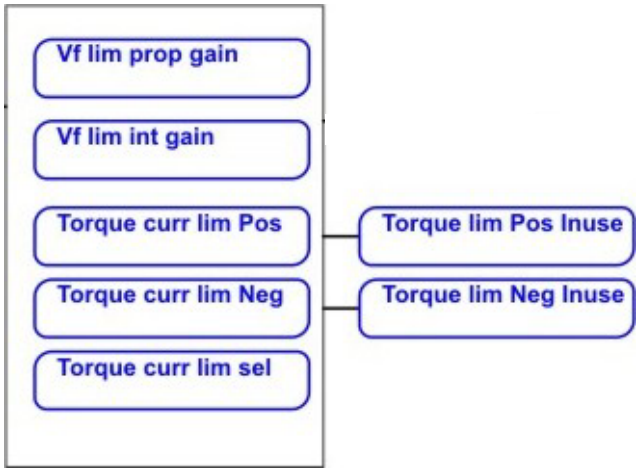
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.11	**2446**	**Slip P gain**	perc	FLOAT	1.0	0.0	100.0	ERWS	_V_

Setting of the slip compensation proportional gain.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.12	**2448**	**Slip I gain**	perc	FLOAT	1.5	0.0	100.0	ERWS	_V_

Setting of the slip compensation integral gain.

V/f limits



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.13	2460	**Vfcurrent lim P gain**	Hz/A	FLOAT	CALCF	0.0	1000.0	ERWS	_V_

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.14	2462	**Vfcurrent lim I time**	ms	FLOAT	CALCF	1.0	50.0	ERWS	_V_

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.15	2470	**Damping gain**	Hz	UINT16	0	0	100	ERW	_V_

Setting of the damping gain. The parameter is used to eliminate any oscillations or faults in the drive output current, deriving from configurations capable of generating oscillations in the drive/cable/motor system. If oscillations occur, gradually increase the value of this parameter, until they disappear.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.16	2472	**Damping threshold 1**	Hz	INT16	20	5	100	ERW	_V_

Setting of the first damping gain regulation threshold. These settings are usually effective for intermediate frequencies and make it possible to limit motor oscillations.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.17	2474	**Damping threshold 2**	Hz	INT16	30	5	100	ERW	_V_

Setting of the second damping gain regulation threshold. These settings are usually effective for intermediate frequencies and make it possible to limit motor oscillations.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.18	2480	**Vf min frequency**	Hz	FLOAT	1.0	0.0	5.0	ERW	_V_

Setting of the minimum frequency in the V/f control mode. This represents the minimum output frequency, below which frequency regulations are ineffective. It is not possible to go below this value, regardless of the reference that has been set.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.19	**2482**	**Vf min freq delay**	ms	UINT16	800	0	5000	ERW	_V_

Setting of the delay for the minimum frequency signal in the V/f control mode.

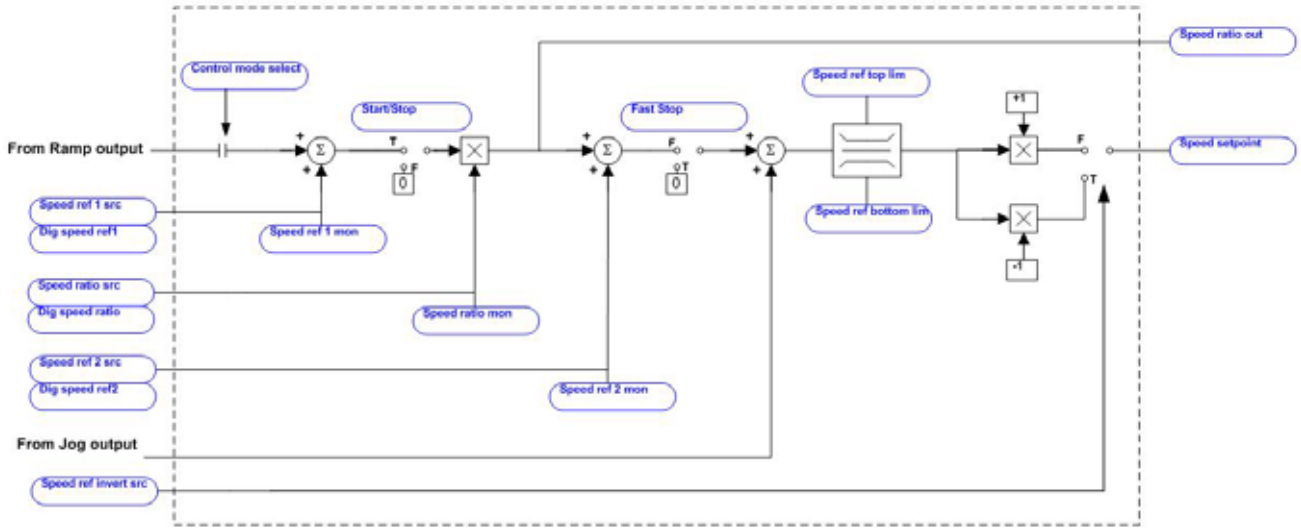
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.20	**2490**	**Dig Vf scale**		FLOAT	1.0	0.0	1.0	ERW	_V_

Setting of a digital multiplier factor for the drive output voltage in the V/f mode.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
21.21	**2492**	**Vf scale src**		LINK	3374	0	2490	ERW	_V_

Selection of the origin (source) of the signal to be used to set a multiplier factor for the drive output voltage. The associable functions are listed in the "**L_REF**" selection list.

22 – FUNCTIONS



22.1 - FUNCTIONS/SPEED RATIO

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.1.1	**3000**	**Dig speed ratio**	**perc**	INT16	100	50	200	ERW	FVS

This function allows a configurable speed ratio (**Speed ratio**) to be applied to the main reference and determines the speed ratio percentage. This setting can be performed in digital form, via fieldbus, or through an analog input. This function is useful in "multi drive" systems where a slip value is required between the various motors being used. The resulting speed value can be read through the **Speed ratio mon** parameter on a programmable analog output.

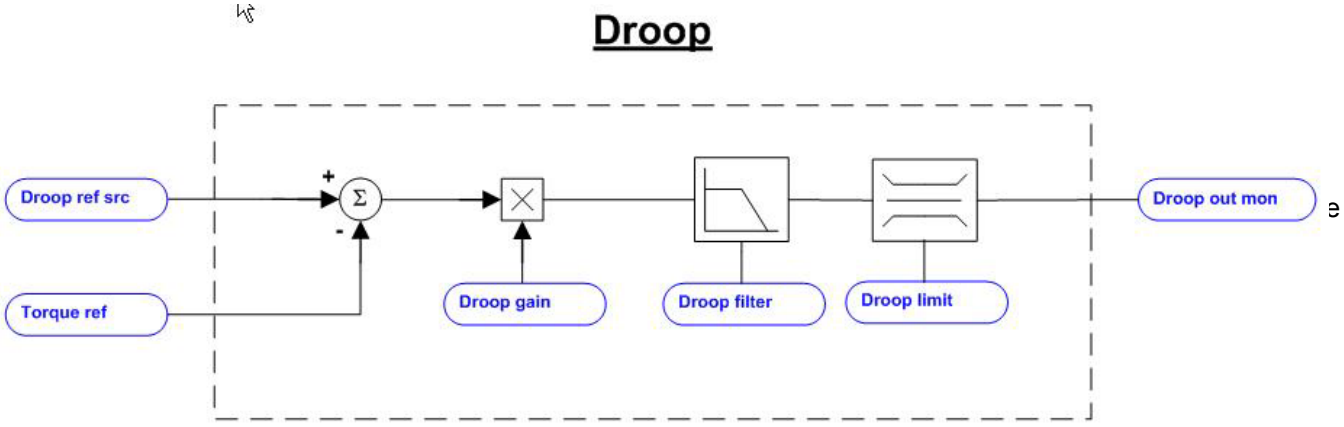
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.1.2	**3002**	**Speed ratio src**		LINK	3000	0	3000	ERW	FVS

Selection of the origin (source) of the signal that determines the speed ratio percentage value. The terminal to be associated with this function can be selected from the "**L_VREF**" selection list.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.1.3	**3004**	**Speed ratio mon**	perc	INT16	0	0	0	ER	FVS

The speed ratio value to apply to the selected speed reference signal value is displayed.

22.2 - FUNCTIONS/DROOP

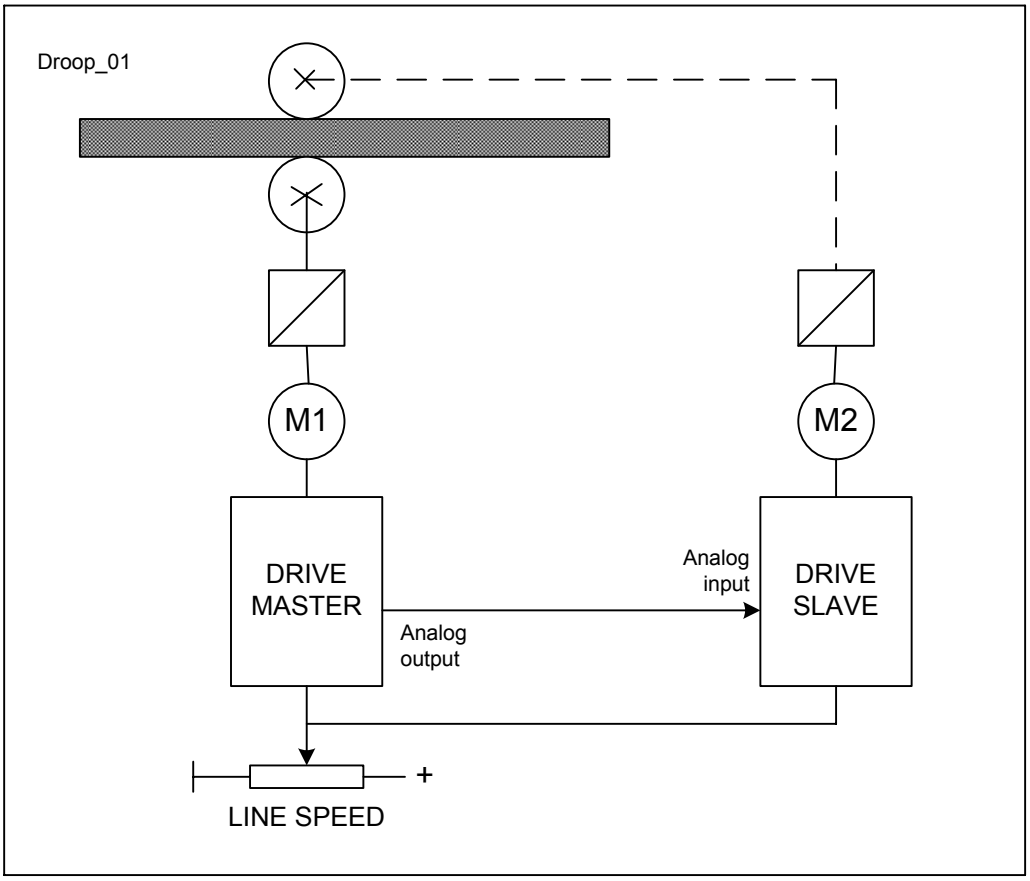


The Droop function is only active in **Regulation mode** = **Flux vector OL** or **Flux vector CL**.
The block consists of:
- a node of comparison between **Droop ref src** connected to the **Analog inp** of the master drive torque reference (set **Torque ref nofilter** on the master analog output) and slave drive torque reference (**Torque ref nofilter** produced by the speed regulator).
- a proportional regulator the output of which is added to or subtracted from the reference of the slave drive speed regulator. Set **Speed ref 1 src** equal to **Droop out mon**.
Before it is applied to the reference of the slave drive speed regulator, the adjustment passes through a low-pass filter and a limit.

The Droop function is used to control two coupled motors.
The advantage of using the Droop block is that the speed regulator can remain enabled on both drives. If using the Droop function, it can be adjusted to avoid speed regulator saturation on one of the two drives. Should there be a loss of load by one of the two drives, the adjustment provided by the Droop block is limited by the dedicated parameter.

This function is used to scale the current. This block is typically used when two motors are coupled mechanically to one another (for example if they are connected to the same shaft). They must turn at the same speed. If one of the two motors tends to turn faster, the result is a difference in the load conditions which leads to an Overload condition. The second motor acts as a brake. This causes a current unbalance, which can be eliminated by using the Droop function. An adjustment is added to or subtracted from the reference of the slave drive speed regulator (proportional to the load difference) to re-balance the two currents.

Example of machine on which the droop function can be used.



Parameter configuration:
Master drive:
Analog out x src connected to **Torque ref nofilter**
Slave drive:
Droop ref src connected to **Analog inp**.
Speed ref 1 src connected to **Droop out mon**.
Set "**Droop gain**", **Droop limit**, **Droop filter**.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.2.1	**3052**	**Droop ref src**		LINK	6000	0	2380	ERW	F_S

This parameter can be used to select the origin (source) of the **Droop ref src** signal. The signal to be associated with this function can be selected from the "L_LIM" selection list. Select an analog input to which an analog signal from the master drive with information about the torque reference level will be connected.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.2.2	**3060**	**Droop gain**	perc	FLOAT	0.0	0.0	100.0	ERW	F_S

Use the **Droop gain** parameter to tune the proportional regulator gain. Setting this parameter to 0.0 forces the output of the Droop block to 0.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.2.3	**3062**	**Droop filter**	ms	UINT16	10	1	100	ERW	F_S

The **Droop filter** parameter can be used to tune the filter time constant.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.2.4	**3064**	**Droop limit**	rpm	INT16	30	0	CALCI	ERWZ	F_S

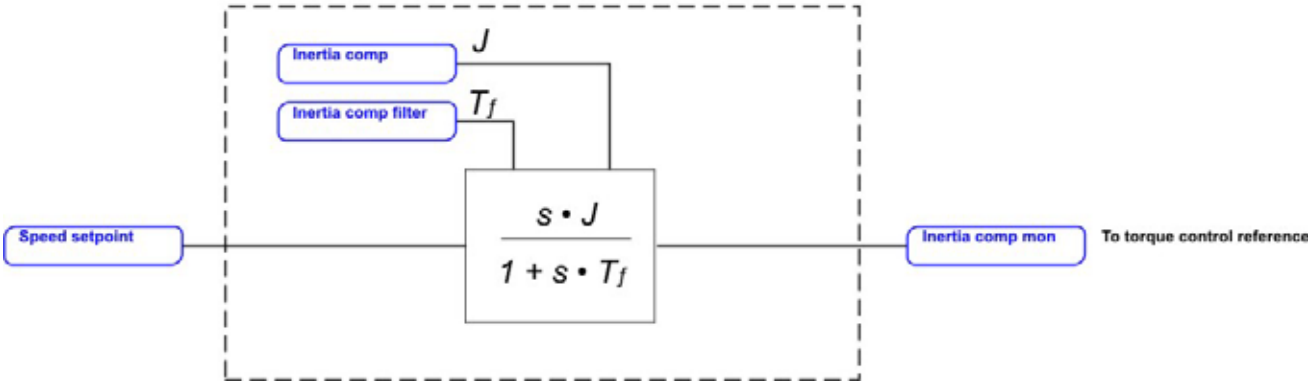
The **Droop limit** parameter can be used to tune the absolute value of the maximum adjustment applied by the Droop block to the speed reference.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.2.5	**3070**	**Droop out mon**	rpm	INT16	0	0	0	ER	F_S

The **Droop out mon** parameter can be used to read the size of the adjustment applied by the Droop block. This variable is typically connected to **Speed ref 1 src** to add or substrat the adjustment by the Droop function to or from the speed reference.
This parameter is available in the speed reference, analog output, slave->master and compare selection lists.

22.3 - FUNCTIONS/INERTIA COMP

Inertia compensation



An increase in the dynamic response of the speed regulator with a variation in the reference, can be modified by varying the current value during the acceleration/ deceleration phase, to counter the applied inertia of the machine.
These parameters are calculated by the speed loop self-tuning procedure but can also be set manually by the user.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.3.1	3100	**Inertia comp**	kgm²	FLOAT	0.0	0.0	100.0	ERWS	F_S

Total value of the inertia on the motor shaft in Kgm² identified during the self-tuning procedure. If known, this value can also be set manually by the user.

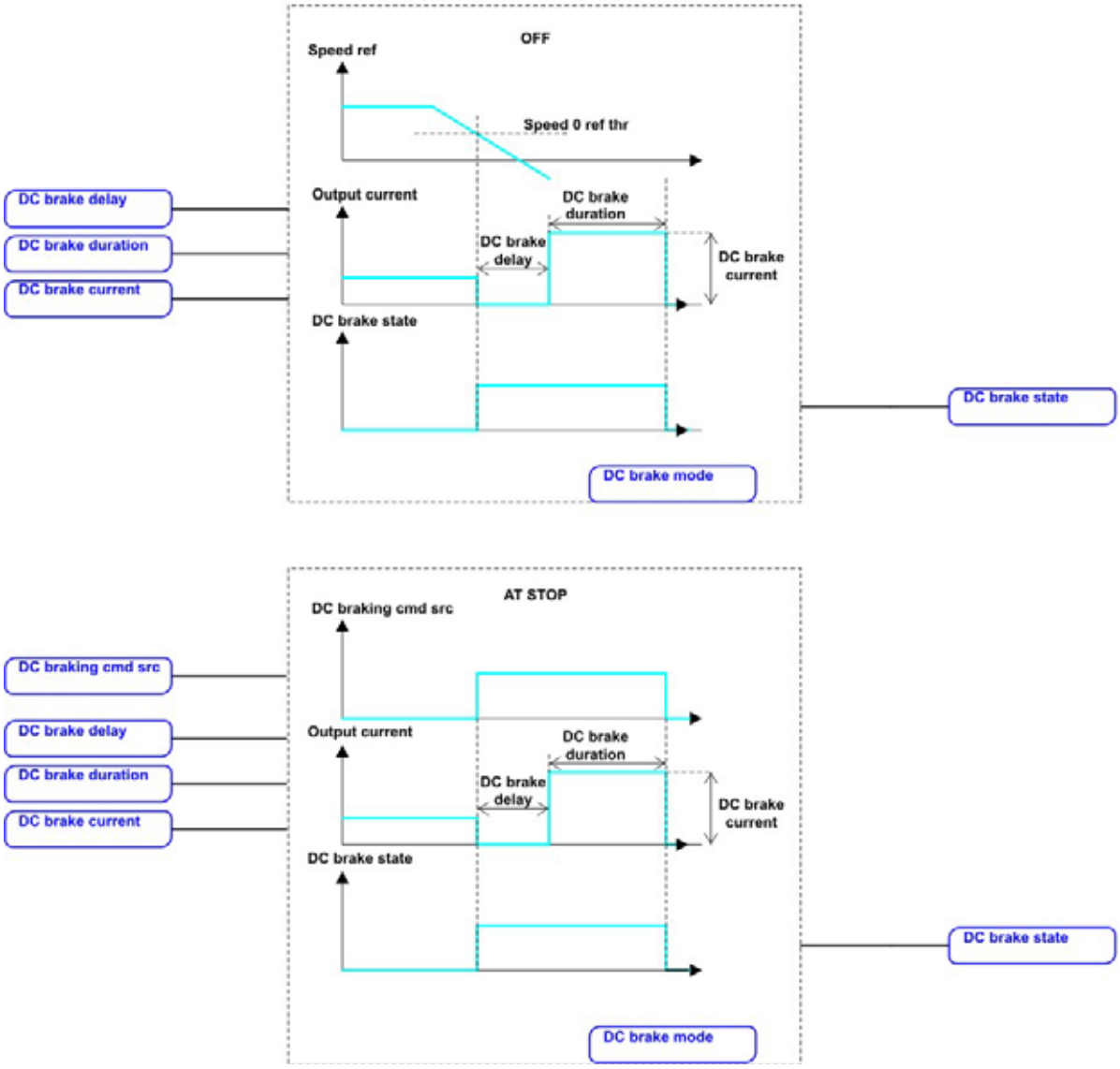
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.3.2	3102	**Inertia comp filter**	ms	UINT16	30	1	100	ERW	F_S

Setting of a filter on the torque compensation. The filter reduces noise due to speed differentiation in the inertia block.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.3.3	3104	**Inertia comp mon**	perc	FLOAT	0.0	0.0	0.0	ER	F_S

The value of inertia compensation on the function block output is displayed.

22.4 - FUNCTIONS/DC BRAKING



The drive provides a set of parameters for managing direct current braking (DC brake).
When this function is enabled, the drive injects direct current on the stator windings, generating a braking torque. The function can therefore be useful for braking the motor at around zero speed, during START and during STOP phases, or to block the rotor for short periods.
It should not be used for intermediate braking operations.
The kinetic energy of the machine is dissipated in the motor in the form of heat.
These parameters enable complete control of the DC braking function.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.4.1	3150	**DC braking cmd src**		LINK	6000	0	16384	ERW	FVS

Selection of the origin (source) of the signal to be used for the DC braking command. The terminal or signal that can be used for this function can be defined from among those available in the "**L_DIGSEL2**" selection list.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.4.2	3152	**DC brake mode**		ENUM	Off	0	1	ERW	FVS

Setting of the direct current braking mode.

0 Off
1 At Stop

If set to **0** direct current braking is not enabled.

If set to **1** direct current braking is enabled. When the "Stop" command is enabled the motor decelerates according to the selected ramp time. When the zero speed threshold (**Speed 0 ref thr**) is detected, direct current braking is enabled for the time set in **DC brake duration**.
The percentage of current that is injected between the motor phases can be defined using the **DC braking current** parameter.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.4.3	3154	**DC brake delay**	s	FLOAT	0.5	0.01	30.0	ERW	FVS

Setting of the delay for applying direct current braking. This delay enables the motor to demagnetize, and thus avoid an overcurrent due to the electromotive force of the motor (e.f.m.).

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.4.4	3156	**DC brake duration**	s	FLOAT	1.0	0.01	30.0	ERW	FVS

Setting of the duration of injection of direct current into the motor windings.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.4.5	3158	**DC brake current**	perc	FLOAT	50.0	0.0	150.0	ERW	FVS

Setting of the direct current braking current value. This is expressed as a percentage of the rated current of the motor at full load (par. **2002 Rated current**).

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.4.6	3160	**DC brake state**		ENUM	Non active	0	1	ER	FVS

The status of direct current braking is displayed.

0 Non active
1 Active

Note ! During braking the Enable command must be enabled. If this command is not present or is removed during the braking process, the drive blocks the inverter bridge and the motor stops due to inertia, without braking. Once braking has started the drive ignores the Start command and any Jog commands.

22.5 - FUNCTIONS/MOTOR OVERLOAD

The overload control function provides integrator logic to protect the motor against thermal overload. This protection presents the characteristic I²t behaviour and is an emulation of the thermal relay of the motor controlled by the ADV drive.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.5.1	**3200**	**Motor ovld enable**		BIT	0	0	1	ERW	FVS

Enabling of the motor overload control.

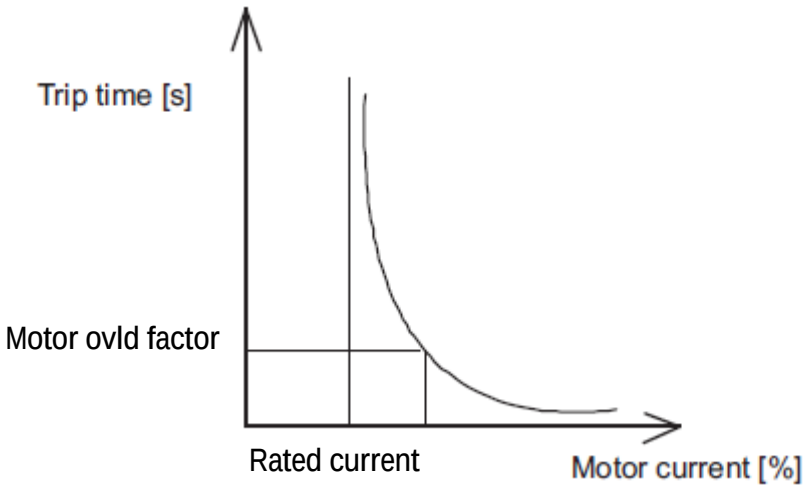
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.5.2	**3202**	**Motor ovld factor**	perc	FLOAT	150.0	110.0	300.0	ERWS	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.5.3	**3204**	**Motor ovld time**	s	FLOAT	30.0	10.0	300.0	ERWS	FVS

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

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



ìMenu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.5.4	**3206**	**Motor service factor**	perc	FLOAT	100.0	25.0	200.0	ERWS	FVS

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

22.6 - FUNCTIONS/BRES OVERLOAD

IMPORTANT! Braking resistors may be subject to sudden overloads following failures.
Always protect resistors by using
thermal protection devices.
These devices do not have to interrupt the circuit where the resistor is installed, but their auxiliary contact must interrupt the power supply of the drive power section. If the resistor requires the presence of a protection contact, this must be used together with the one belonging to the thermal protection device.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.6.1	**3250**	**Bres control**		BIT	1	0	1	ERWZ	FVS

Enabling of the overload control of the external braking resistor.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.6.2	**3252**	**Bres value ohm**	ohm	FLOAT	SIZE	10.0	1000.0	ERWS	FVS

Setting of the ohm value of the external braking resistor.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.6.3	**3254**	**Bres cont power**	kW	FLOAT	SIZE	0.1	100.0	ERWS	FVS

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

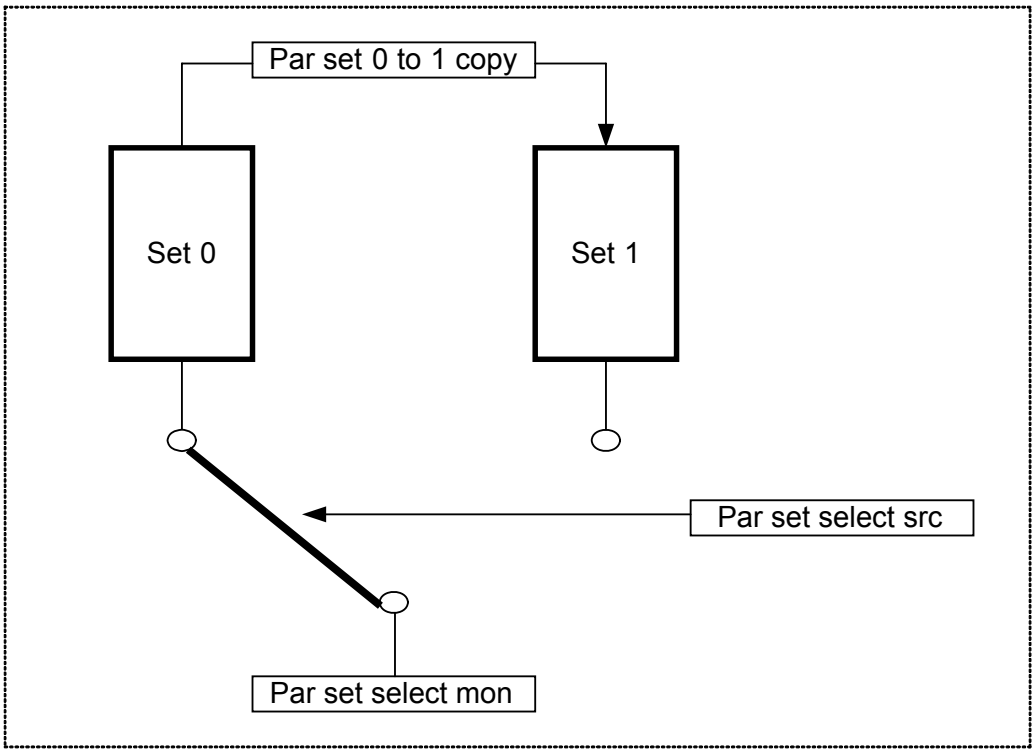
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.6.4	**3256**	**Bres overload factor**		FLOAT	SIZE	1.5	10.0	ERWS	FVS

Setting of the external resistor overload factor.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.6.5	**3258**	**Bres overload time**	s	FLOAT	SIZE	0.5	100.0	ERWS	FVS

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

22.7 - FUNCTIONS/DOUBLE PAR SET



Two independent sets of parameters can be stored in the ADV200 drive. These can be selected via the keypad or by using an external command.

This makes it possible to change all the drive parameters quickly and automatically according to the various operating requirements. For example, two motors with different characteristics can be controlled alternately.

MDPLC application parameters are not included in the two sets of parameters. This makes it possible to switch between all drive parameters in two separate groups, while having a single set of parameters for the application.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.7.1	3300	**Par set enable**		ENUM	Disable	0	1	ERW	FVS

Enabling of management of two parameter sets

0 Disable
1 Enable

When set to **0** only one parameter set is managed (the one used as the default set).

If set to **1** two separate parameter sets can be configured. These can be selected using a command signal on a digital input of the terminal strip.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.7.2	3302	**Par set select src**		LINK	6000	0	16384	ERWZ	FVS

Selection of the origin (source) of the signal to be used to select the parameter set to be used. The terminal or digital command that can be associated with this function can be selected from among those available in the "**L_DIGSEL2**" selection list.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.7.3	3304	**Par set select mon**		ENUM	Set 0	0	0	ER	FVS

The parameter set currently in use is displayed.

0 Set 0
1 Set 1

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.7.4	3306	**Par set 0 to 1 copy**		BIT	0	0	1	ERW	FVS

Procedures for setting up and managing the double parameter set

Creating the second set:

This function copies parameter set 0 onto set 1. Before enabling management of the double parameter set, the first set should be programmed with the correct values.

When the first set is ready, the second can be activated as follows:

1. Activate management of the double parameter set by enabling parameter **3300 Par set enable.**
2. Copy set 0 onto set 1 using command **3306 Par set 0 to 1 copy.**
   This creates an initial parameter base in set 1 to which changes can be made.
   Save the parameters.
3. Activate set 1 using parameter **3302 Par set select src**. To select set 1 manually, set this parameter to **"One".** Otherwise select the desired source.
4. Modify the parameters in set 1 as necessary.
5. Save the parameters.

You can change the set being used by changing the source selected in parameter **3302 Par set select src**. This can only be changed with the drive disabled.

When the double parameter set is active, the number of the set being used is shown next to the number of each parameter on the keypad.

Modifying and saving parameters.

When the double parameter set is active, any parameters that need to be the same in the two sets must be modified in each set separately.

Parameters are only saved in the set that is active at the time. To save both sets, you must first save one and then select and save the other.

Note ! Any changes to the parameters regarding the "parameter sets", performed when enabled, will be lost at the next switching unless a **Par set 0 to 1 copy** command is sent.

To save data permanently (even when the drive is switched off), send the **Save parameters** command (DRIVE CONFIG menu).

22.8 - FUNCTIONS/SPEED CAPTURE

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.8.1	**3350**	**Speed capture**		ENUM	Disable	0	1	ERW	FV_

Setting of the function that allows the drive to capture a motor that is already rotating.

0 Disable
1 Enable

When set to 0 the speed capture function is disabled. When connected the drive starts with a zero frequency.

When set to **1** the speed capture function is enabled. When the drive is connected the motor speed is measured and the output voltage and frequency are set appropriately. The drive then moves to the set reference.
This function is only available in the flux oriented vector mode.

Main fields of application:

- Capturing a motor already set in motion by the load (for example pump motors driven by the fluid)
- Reconnection after an alarm.
- If the speed reference passes through the ramp circuit, the motor speed, with Auto capture = ON, is reached following the set ramp times.

Note ! If this function is disabled, make sure the motor is not moving when the drive is connected, otherwise the drive could be blocked due to the intervention of the overcurrent or overvoltage protections.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.8.2	**3352**	**Vf catch start freq**		FLOAT	50.0	0.0	500.0	ERWZ	_V_

Setting of the starting frequency during catch on-the-fly of a motor in Vf operating mode.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.8.3	**3354**	**Vf catch delay**	Hz	UINT16	1000	10	10000	ERWZ	_V_

Setting of the delay for motor demagnetization before searching for synchronization.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.8.4	**3356**	**Vf search time**	ms	FLOAT	2.0	1.0	10.0	ERW	_V_

Determines the speed at which the inverter output frequency changes. Represents the time in which the frequency would change from zero to the motor rated frequency if the output current were equal to the motor rated current.

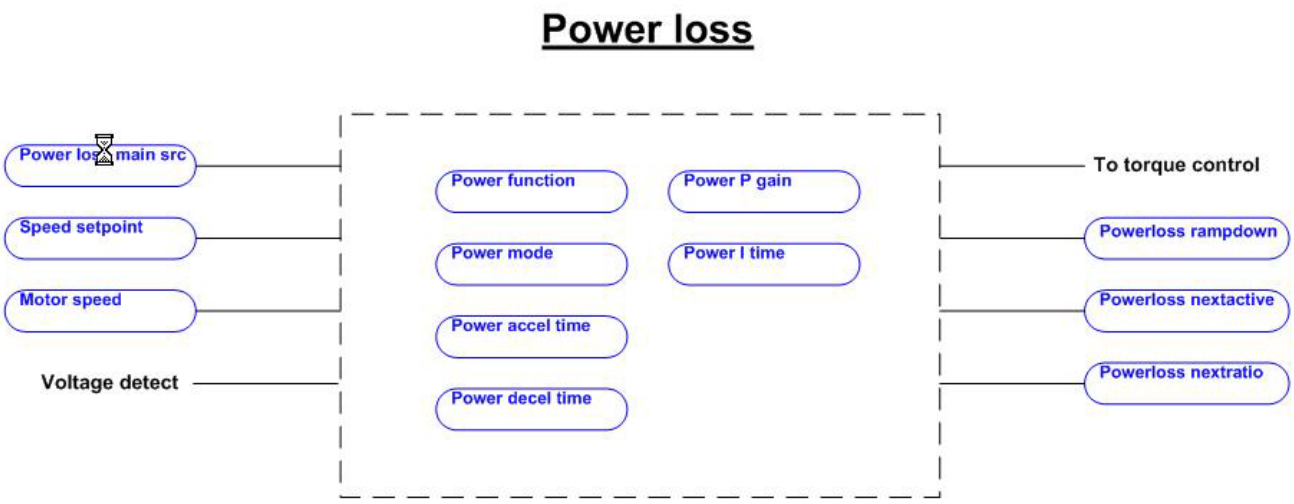
Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.8.5	**3358**	**Vf catch P gain**	s	FLOAT	10.0	0.0	100.0	ERW	_V_

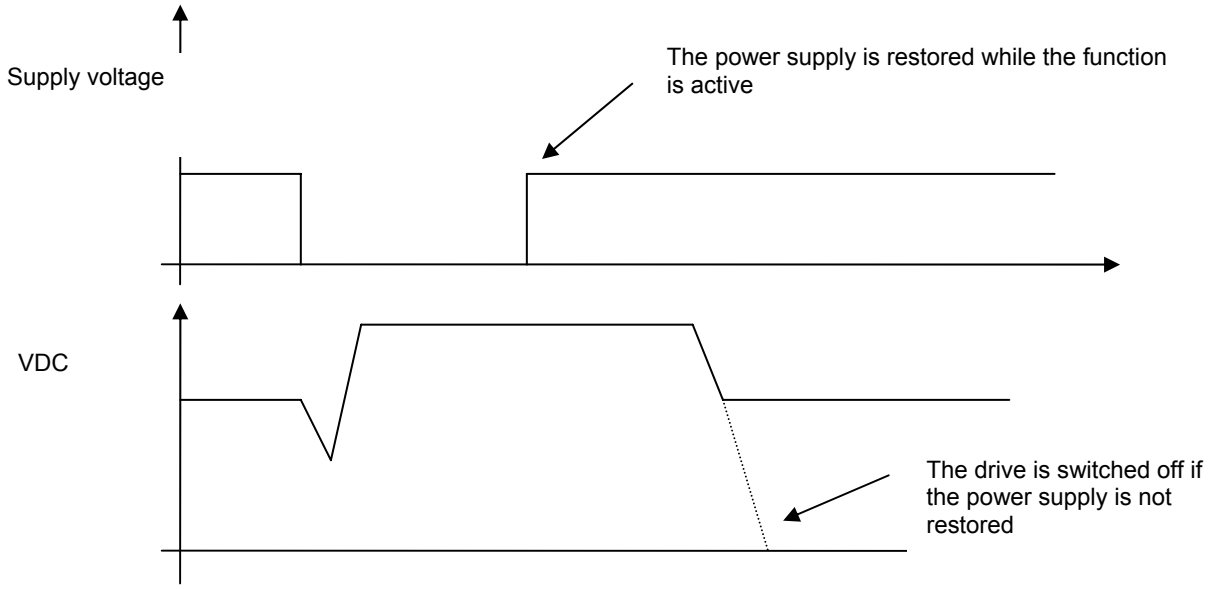
Setting of the proportional gain during catch on-the-fly of a motor in Vf operating mode.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.8.6	**3360**	**Vf catch I time**	perc	UINT16	200	200	1000	ERW	_V_

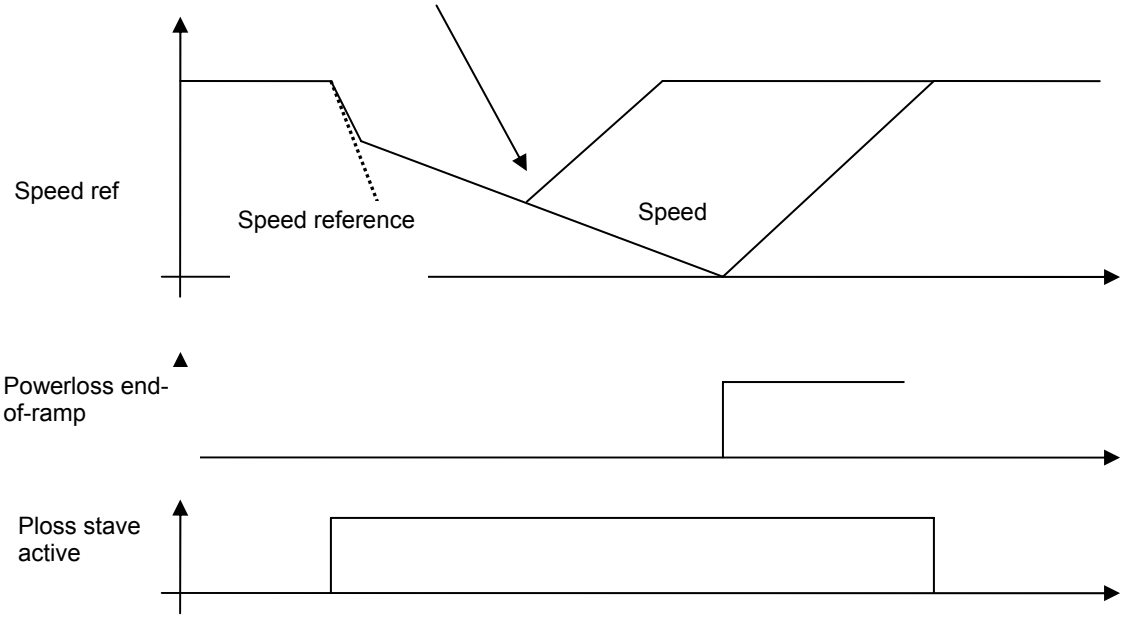
Setting of the integral time during catch on-the-fly of a motor in Vf operating mode.

22.9 - FUNCTIONS/POWER LOSS





Restart possible when the external sensor detects that the supply voltage has been restored.



Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.9.1	3400	**Powerloss function**		ENUM	Disable	0	1	ERWZ	F__

0 Disable
1 Enable

The purpose of this function is to prevent the uncontrolled stopping of the machine in case of an interruption to the power supply due to an undervoltage alarm.
When the function is enabled the drive controls the motor so as to force regeneration; the kinetic energy from the load is temporarily used to “sustain” the power supply to the drive so that the machine stops under control.
The function is only effective with loads that accumulate enough kinetic energy (typically loads with a high moment of inertia). It cannot be used for “passive loads”.

If it is important to control machine deceleration very closely, the Powerloss function must be used with a braking resistor and braking control must be enabled.

Slave control

In some applications several drives are powered via DC bus. The master drive is usually the one that controls the motor with the highest inertial load. The Powerloss function should be enabled on this drive. The speed of the other slave drives must follow that of the master drive. Together they provide the “sustaining” power supply during braking in case of an interruption in the power supply.
In this case the master drive calculates the ratio between its speed and the line speed, sending a signal to the slave drives to adjust their speed to that of the master.
The master and slave can be connected via an analog I/O or fieldbus.
The calculated ratio signal is used on the slave drives to control the speed ratio.

The following alarms must be set as described below for the function to operate correctly.

Par. 4552 SpdRefLoss activity = Ignore

Since the current reference and limit are controlled internally, there would be a difference between the speed reference and the motor speed, with activation of the **Ref Loss** alarm.

Par. 4660 SpdFbkLoss activity = Ignore

The phase loss may not be properly detected and in any case any alarm sould be ignored.

The Powerloss function can only be used in the field-oriented vector control mode.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.9.2	3402	**Powerloss acc time**	s	FLOAT	10.0	0.01	100.0	ERW	F__

Setting of the acceleration time used during Powerloss operating mode. The acceleration ramp time is used when restart has been selected and can be adjusted according to machine requirements.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.9.3	**3404**	**Powerloss dec time**	s	FLOAT	0.5	0.01	100.0	ERW	F__

Setting of the deceleration time used during the Powerloss operating mode. The deceleration time ramp must be short enough to allow the drive to enter regeneration mode quickly, otherwise an undervoltage alarm occurs.
If the deceleration ramp is too short, the drive automatically controls the voltage of the DC bus and prevents the overvoltage alarm from being generated: In this case the motor speed does not follow the reference.

When the function is activated the regulator automatically adjusts the voltage of the DC link to a level below that of the overvoltage alarm. Gains are calculated automatically.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.9.4	**3420**	**Powerloss P gain**	A/V	FLOAT	CALCF	0.0	100.000	ERWS	F__

Setting of the proportional gain during the Powerloss function (increase in case of an overvoltage error; the overvoltage error can also be prevented by increasing the deceleration time value).

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.9.5	**3422**	**Powerloss I gain**	ms	FLOAT	CALCF	1.0	1000.0	ERWS	F__

Setting of the integral time constant during the Powerloss function.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.9.6	**3438**	**Powerloss mode**	perc	ENUM	Ramp down	0	1	ERWS	F__

Setting of the type of operating mode during the Powerloss function.

0 Ramp down
1 Restart

If set to **0 Ramp down** the drive stops the motor with the ramp set in **Powerloss decel time** until the zero speed is reached, after which it is disabled.

If set to **1 Restart**, if the supply voltage is restored during the **Powerloss decel time** deceleration ramp, the drive restarts from the speed it had reached the moment the voltage was restored with the acceleration ramp set in **Powerloss decel time**. If the power supply is not re-established during the deceleration ramp and the rengenerated power is not sufficient the drive enters the undervoltage alarm status and may switch off. This occurs when the motor speed is close to zero.
Two options are available if restart mode is selected:

a) the drive controls motor speed until the zero speed is reached and then re-starts.

b) A signal is sent from an external power supply sensor if the power supply is restored; the drive can restart immediately without waiting for deceleration to be complete.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
22.9.7	**3440**	**Powerless sens src**	LINK	INT16	6000	0	16384	ERWZ	F__

Selection of the origin (source) of the signal of the external supply voltage transducer to be assigned to the relative digital input. In case of an active state on the selected input the drive is immediately enabled to restart, without waiting for the end of the deceleration ramp and for zero speed to be reached. In case of DC bus-powered drives, the signal of the external supply voltage transducer must be connected to the device used to power the DC bus.

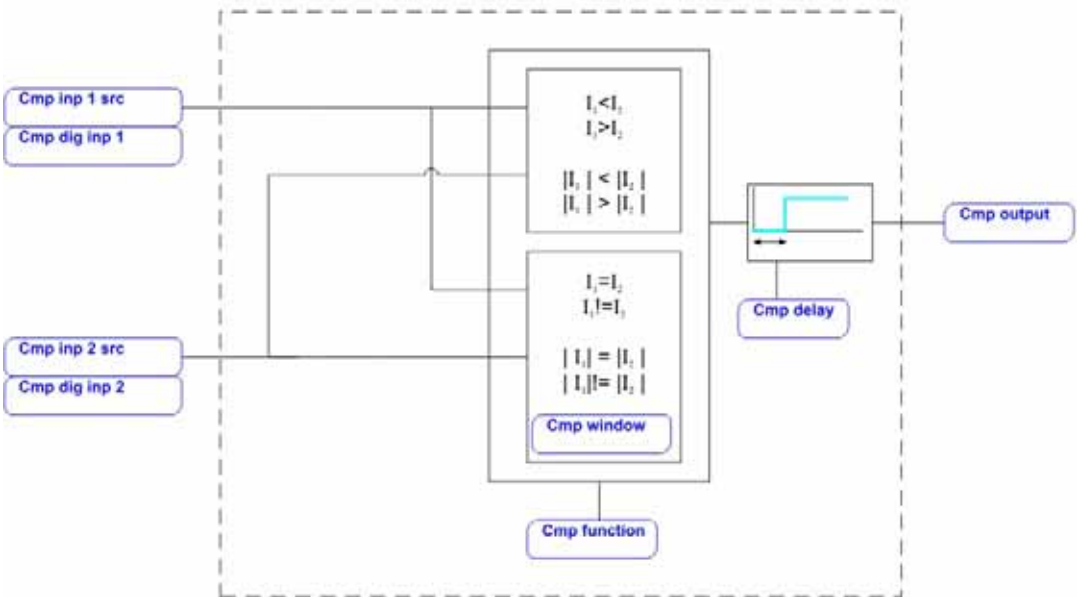
Description of output parameters for the Powerloss function

Powerloss rampdown: Used to signal the end of the deceleration ramp if the Powerloss function is in End of ramp mode. It is reset after disabling.

Powerloss Next ratio: Used to control the speed ratio of the slave drive.

Powerloss Next active: Used to detect whether the actual speed is different from the line speed.

22.10 - FUNCTIONS/COMPARE



Questa funzione permette la comparazione tra due segnali o grandezze.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.10.1	**3650**	**Dig compare input 1**	perc	FLOAT	0.0	-100.0	100.0	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.10.2	**3652**	**Dig compare input 2**	perc	FLOAT	0.0	-100.0	100.0	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.10.3	**3660**	**Compare input 1 src**		LINK	3650	0	3650	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.10.4	**3662**	**Compare input 2 src**		LINK	3652	0	3652	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.10.5	3670	**Compare function**		ENUM	None	0	8	ERW	FVS

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

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

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

If set to **1** the comparator output is enabled when the value of **Compare digital inp 1** is inside the window resulting from the value of **Compare digital inp 2** ± the tolerance set via the **Comparator Window**.

If set to **2** the comparator output is enabled when the value of **Compare digital inp 1** is not inside the window resulting from the value of **Compare digital inp 2** ± the tolerance set via the **Comparator Window**.

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

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

If set to **5** the comparator output is enabled when the value of **Compare digital inp 1** is inside the window resulting from the absolute value of **Compare digital inp 2** ± the tolerance set via the **Comparator Window**.

If set to **6** the comparator output is enabled when the absolute value of **Compare digital inp 1** is not inside the window resulting from the absolute value of **Compare digital inp 2** ± the tolerance set via the **Comparator Window**.

If set to **7** the comparator output is enabled when the absolute value of **Compare digital inp 1** is less than the absolute value of **Compare digital inp 2**. .

If set to **8** the comparator output is enabled when the absolute value of **Digital compar inp1** is more than the absolute value of **Digital compar in2**.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.10.6	3672	**Compare window**	perc	FLOAT	0.0	0.0	100.0	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.10.7	3674	**Compare delay**	s	FLOAT	0.0	0.0	30.0	ERW	FVS

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

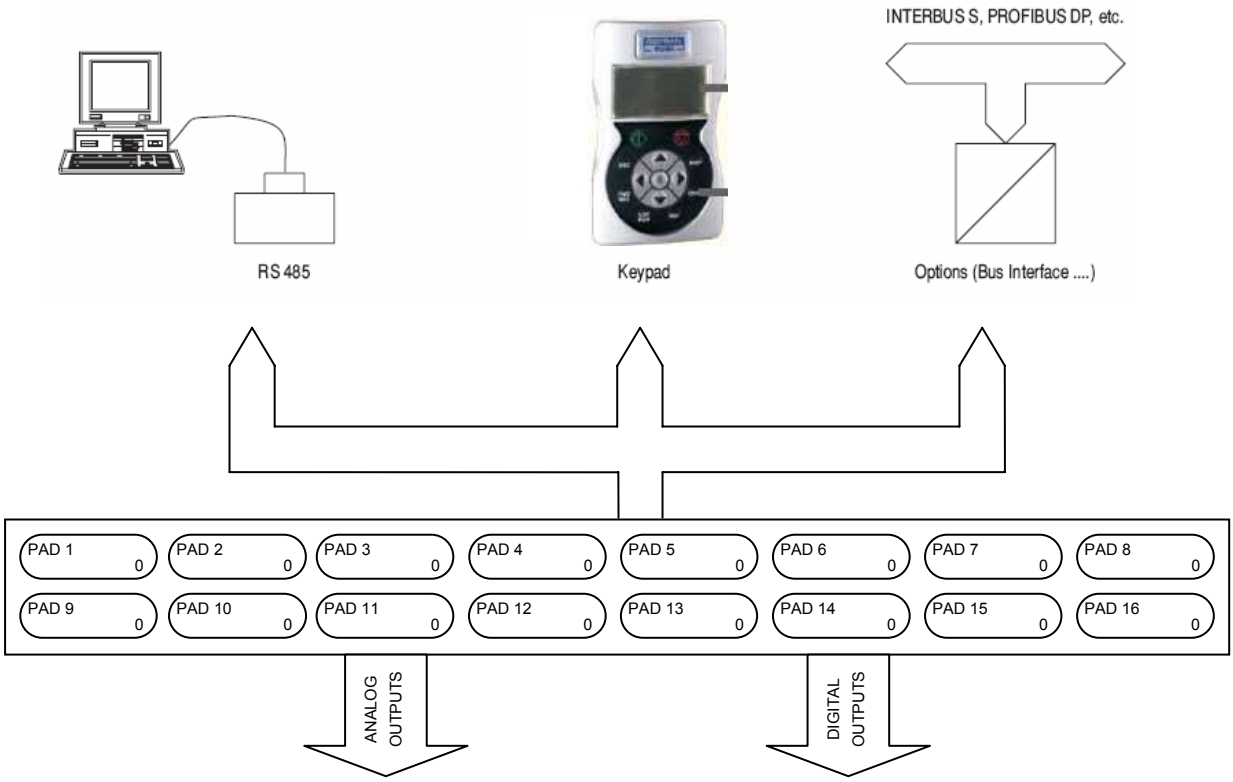
Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.10.8	**3676**	**Compare output**		BIT	0	0	1	ER	FVS

The status of the comparator output is displayed:

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

22.11 - FUNCTIONS/PADS

The general variables are used to exchange data between the various components of a Bus system. They are similar to the variables of a PLC. The basic structure of the system is illustrated below. Pads can be used, for example, to send information from a fieldbus to an optional card. All Pads can be read and written.



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
22.11.1	**3700**	**Pad 1**		INT32	0	0	0	ERW	FVS
22.11.2	**3702**	**Pad 2**		INT32	0	0	0	ERW	FVS
22.11.3	**3704**	**Pad 3**		INT32	0	0	0	ERW	FVS
22.11.4	**3706**	**Pad 4**		INT32	0	0	0	ERW	FVS
22.11.5	**3708**	**Pad 5**		INT32	0	0	0	ERW	FVS
22.11.6	**3710**	**Pad 6**		INT32	0	0	0	ERW	FVS
22.11.7	**3712**	**Pad 7**		INT32	0	0	0	ERW	FVS
22.11.8	**3714**	**Pad 8**		INT32	0	0	0	ERW	FVS
22.11.9	**3716**	**Pad 9**		INT32	0	0	0	ERW	FVS
22.11.10	**3718**	**Pad 10**		INT32	0	0	0	ERW	FVS
22.11.11	**3720**	**Pad 11**		INT32	0	0	0	ERW	FVS
22.11.12	**3722**	**Pad 12**		INT32	0	0	0	ERW	FVS
22.11.13	**3724**	**Pad 13**		INT32	0	0	0	ERW	FVS
22.11.14	**3726**	**Pad 14**		INT32	0	0	0	ERW	FVS
22.11.15	**3728**	**Pad 15**		INT32	0	0	0	ERW	FVS
22.11.16	**3730**	**Pad 16**		INT32	0	0	0	ERW	FVS

Setting of general, 32 Bit variables. PAD parameters can be used as supporting parameters to send values written by the fieldbus, serial line, etc. to analog or digital outputs.

23 – COMMUNICATION

23.1 - COMMUNICATION/RS485

The ADV200 drive is provided with a standard port (9 pole sub-D connector: XS) for connecting the RS485 serial line used for drive-PC point-to-point communication (via the GF-eXpress configuration software) or for the multidrop connection.

The RS485 serial line format is: 8 data bits, no parity and one stop bit.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
23.1.1	**3800**	**Drive address**		UINT16	1	0	255	ERW	FVS

Setting of the address to which the drive responds when connected to the RS485 serial line.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
23.1.2	**3802**	**Serial baud rate**		ENUM	38400	0	2	ERW	FVS

Setting of the RS485 serial communication speed (Baud Rate).

0 9600
1 19200
2 38400
3 57600
4 115200

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
23.1.3	**3804**	**Serial protocol**		ENUM	Modbus	0	1	ERW	FVS

Setting of the serial communication protocol:

0 Modbus
1 Jbus

Setting to 0 selects the Modbus RTU (Remote Terminal Unit) serial communication protocol.

Setting to 1 selects the Jbus serial communication protocol. The Jbus protocol is functionally identical to the Modbus, except for the different numbering of addresses: in the Modbus these start from zero (0000 = 1st address) while in the JBUS they start from one (0001 = 1st address) and maintain this difference throughout numbering.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
23.1.4	**3806**	**Serial delay**	ms	UINT16	0	0	1000	ERW	FVS

Setting of the minimum delay between the drive receiving the last byte and starting its response. This delay avoids conflicts on the serial line when the RS485 interface that is used has not been pre-set for automatic Tx/Rx switching. The parameter only concerns the use of the standard RS485 serial line.

Example: if the delay in Tx/Rx switching on the master is a maximum of 20ms, the Ser answer delay parameter must be set to at least 20ms: 22ms

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
23.1.5	**3808**	**Serial swap data**		BIT	0	0	1	ERW	FVS

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

23.2 - COMMUNICATION/FIELDBUS CONFIG

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
23.2.1	4000	**Fieldbus type**		ENUM	Off	0	5	RW	FVS

Setting of the type of fieldbus to be used.

- **0** Off
- **1** CanOpen
- **2** DeviceNet
- **3** Profibus
- **10** DS402 profile
- **30** Profidrive profile

If set to **0** no fieldbus is selected.

If set to **1** the CanOpen fieldbus profile is selected.

If set to **2** the ProfiBus-DP fieldbus profile is selected.

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

If set to **10** the DS402 fieldbus is selected.

If set to **30** the Profidrive fieldbus is selected.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
23.2.2	4004	**Fieldbus baudrate**		ENUM	500k	0	12	RW	FVS

Setting of the communication network speed (Baud Rate).

- **0** Auto
- **1** 125k
- **2** 250k
- **3** 500k
- **4** 1M
- **5** 9600
- **6** 19200
- **7** 93750
- **8** 187.5k
- **9** 1.5M
- **10** 3M
- **11** 6M
- **12** 12M

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
23.2.3	4006	**Fieldbus address**		INT16	3	0	255	RW	FVS

Setting of the node address of the drive when connected to the network.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
23.2.4	4010	**Fieldbus M->S enable**		ENUM	Enable	0	1	ERWZ	FVS

Setting of fieldbus data updating.

0 Disable
1 Enable

If set to **0,** the possibility of sending commands and references from the drive PLC via the fieldbus is disabled.

If set to **1** the possibility of sending commands and references from the drive PLC via the fieldbus is enabled.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
23.2.5	4012	**Fieldbus alarm mode**		INT32	Off	0	1	ERWZ	FVS

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

0 Off
1 On

If set to **0** the alarm is only generated if the drive is enabled.

If set to **1** the alarm is generated even with the drive disabled.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
23.2.6	4014	**Fieldbus state**		ENUM	Stop	0	7	R	FVS

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

These logic states are displayed if the selected fieldbus is CANopen.

3 Error
4 WaitPRM
5 WaitCFG
6 DataExchange
7 DPError

These logic states are displayed if the selected fieldbus is Profibus.

23.3 - COMMUNICATION/FIELDBUS M2S

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
23.3.1	**4020**	**Fieldbus M->S1 dest**		ILINK	0	0	0	R	FVS
23.3.5	**4030**	**Fieldbus M->S2 dest**		ILINK	0	0	0	R	FVS
23.3.9	**4040**	**Fieldbus M->S3 dest**		ILINK	0	0	0	R	FVS
23.3.13	**4050**	**Fieldbus M->S4 dest**		ILINK	0	0	0	R	FVS
23.3.17	**4060**	**Fieldbus M->S5 dest**		ILINK	0	0	0	R	FVS
23.3.21	**4070**	**Fieldbus M->S6 dest**		ILINK	0	0	0	R	FVS
23.3.25	**4080**	**Fieldbus M->S7 dest**		ILINK	0	0	0	R	FVS
23.3.29	**4090**	**Fieldbus M->S8 dest**		ILINK	0	0	0	R	FVS
23.3.33	**4100**	**Fieldbus M->S9 dest**		ILINK	0	0	0	R	FVS
23.3.37	**4110**	**Fieldbus M->S10 dest**		ILINK	0	0	0	R	FVS
23.3.41	**4120**	**Fieldbus M->S11 dest**		ILINK	0	0	0	R	FVS
23.3.45	**4130**	**Fieldbus M->S12 dest**		ILINK	0	0	0	R	FVS
23.3.49	**4140**	**Fieldbus M->S13 dest**		ILINK	0	0	0	R	FVS
23.3.53	**4150**	**Fieldbus M->S14 dest**		ILINK	0	0	0	R	FVS
23.3.57	**4160**	**Fieldbus M->S15 dest**		ILINK	0	0	0	R	FVS
23.3.61	**4170**	**Fieldbus M->S16 dest**		ILINK	0	0	0	R	FVS

The src parameter associated with the **M->S X** channel is displayed. This is useful for quickly understanding where a bus channel is connected. A channel can only be associated with a parameter by modifying the src parameter in its menu.
When the src parameter is associated with an **M->S** bus channel, that channel is automatically programmed with a relative value on the sys parameter of the location of the data written by the Master on the Slave.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
23.3.2	**4022**	**Fieldbus M->S1 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.6	**4032**	**Fieldbus M->S2 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.10	**4042**	**Fieldbus M->S3 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.14	**4052**	**Fieldbus M->S4 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.18	**4062**	**Fieldbus M->S5 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.22	**4072**	**Fieldbus M->S6 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.26	**4082**	**Fieldbus M->S7 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.30	**4092**	**Fieldbus M->S8 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.34	**4102**	**Fieldbus M->S9 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.38	**4112**	**Fieldbus M->S10 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.42	**4122**	**Fieldbus M->S11 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.46	**4132**	**Fieldbus M->S12 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.50	**4142**	**Fieldbus M->S13 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.54	**4152**	**Fieldbus M->S14 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.58	**4162**	**Fieldbus M->S15 sys**		ENUM	Not assigned	0	8	RW	FVS
23.3.62	**4172**	**Fieldbus M->S16 sys**		ENUM	Not assigned	0	8	RW	FVS

Setting of the format of the datum received on the channel. When the src parameter is programmed, the format is automatically programmed on the relative sys. If the src parameter is reset to null, the format does not change. The value of the format can be selected from the following list, according to the parameter selected as the source:

- **0** Not assigned
- **1** Count 16
- **2** Count 32
- **3** Fill 16
- **4** Fill 32
- **5** Mdplc 16
- **6** Mdplc 32
- **7** Eu
- **8** Eu float

If set to **0** the channel is not assigned.
If set to **1** the datum is assigned a 16-bit count.
If set to **2** the datum is assigned a 32-bit count.
If set to **3** 16 bits on the channel are reserved for the datum, not used.
If set to **4** 32 bits on the channel are reserved for the datum, not used.
If set to **5** the datum is assigned a 16-bit count used by MDPLC.
If set to **6** the datum is assigned a 32-bit count used by MDPLC.
If set to **7** the datum is assigned engineering units on a 16-bit integer.
If set to **8** the datum is assigned engineering units on a 32-bit integer.

If the sys parameter is not assigned, none of the subsequent fieldbus channels are read, even if programmed.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
23.3.3	**4024**	**Fieldbus M->S1 mon**		INT32	0	0	0	ER	FVS
23.3.7	**4034**	**Fieldbus M->S2 mon**		INT32	0	0	0	ER	FVS
23.3.11	**4044**	**Fieldbus M->S3 mon**		INT32	0	0	0	ER	FVS
23.3.15	**4054**	**Fieldbus M->S4 mon**		INT32	0	0	0	ER	FVS
23.3.19	**4064**	**Fieldbus M->S5 mon**		INT32	0	0	0	ER	FVS
23.3.23	**4074**	**Fieldbus M->S6 mon**		INT32	0	0	0	ER	FVS
23.3.27	**4084**	**Fieldbus M->S7 mon**		INT32	0	0	0	ER	FVS
23.3.31	**4094**	**Fieldbus M->S8 mon**		INT32	0	0	0	ER	FVS
23.3.35	**4104**	**Fieldbus M->S9 mon**		INT32	0	0	0	ER	FVS
23.3.39	**4114**	**Fieldbus M->S10 mon**		INT32	0	0	0	ER	FVS
23.3.43	**4124**	**Fieldbus M->S11 mon**		INT32	0	0	0	ER	FVS
23.3.47	**4134**	**Fieldbus M->S12 mon**		INT32	0	0	0	ER	FVS
23.3.51	**4144**	**Fieldbus M->S13 mon**		INT32	0	0	0	ER	FVS
23.3.55	**4154**	**Fieldbus M->S14 mon**		INT32	0	0	0	ER	FVS
23.3.59	**4164**	**Fieldbus M->S15 mon**		INT32	0	0	0	ER	FVS
23.3.63	**4174**	**Fieldbus M->S16 mon**		INT32	0	0	0	ER	FVS

The value received from the bus is displayed. This parameter must be associated with the src parameter to enable the **M->S** channel.

The user may modify the M->S and by S->M sys parameters. The consistency of the sys with the parameter assigned to the channel is checked.

Control for M->S channels:

sys parameter	FB type	result
Count 32	32 bit	Receives 32 bits from FB and copies them in the 32 bits of the monitor. OK
	16_H	Receives 32 bits from FB and copies them in the 32 bits of the monitor. OK
	16_L	Receives 32 bits from FB and copies them in the 32 bits of the monitor. OK
Count 16	32 bit	Receives 16 bits from FB and does not know whether to copy them in 16H or 16L of the monitor. Error
	16_H	Receives 16 bits from FB and copies them in the 16H bits of the monitor. OK
	16_L	Receives 16 bits from FB and copies them in the 16L bits of the monitor. OK

A Fieldbus M->S X Mon parameter can only be assigned to a single “src”. If assigned to more than one src, an error signal is generated during fieldbus initialization.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
23.3.4	**4026**	**Div M->S1 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.8	**4036**	**Div M->S2 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.12	**4046**	**Div M->S3 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.16	**4056**	**Div M->S4 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.20	**4066**	**Div M->S5 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.24	**4076**	**Div M->S6 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.28	**4086**	**Div M->S7 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.32	**4096**	**Div M->S8 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.36	**4106**	**Div M->S9 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.40	**4116**	**Div M->S10 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.44	**4126**	**Div M->S11 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.48	**4136**	**Div M->S12 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.52	**4146**	**Div M->S13 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.56	**4156**	**Div M->S14 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.60	**4166**	**Div M->S15 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.3.64	**4176**	**Div M->S16 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS

The **Div M->Sx fieldbus** parameters can be used to increase the resolution of the datum sent on the bus to the drive in the corresponding channel in EU and EU_float exchange mode. The parameter value is used by the drive as the divider of the incoming datum, so that a number with decimal digits can be transferred.
N.B.: You must check the size in bits of the datum that is sent to make sure that the maximum value in bits fits in a 16-bit integer. For example, if specifying the divider as "Fieldbus M->Sn div" = 1000, the maximum value that can be used for the exchanged datum is 32.768 (32768/1000).

.

Example: **Div M->Sx fieldbus** = 10, **M->S1 fieldbus par** = **Ramp ref src 1**, **Sys M->S1 fieldbus** = **Eu**. If the PLC sends the decimal value 1000 on the first word the value of **ramp ref 1** on the drive is 1000/10 = 100.

23.4 - COMMUNICATION/FIELDBUS S2M

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
23.4.1	**4180**	**Fieldbus S->M1 src**		LINK	6000	0	16384	ERW	FVS
23.4.5	**4190**	**Fieldbus S->M2 src**		LINK	6000	0	16384	ERW	FVS
23.4.9	**4200**	**Fieldbus S->M3 src**		LINK	6000	0	16384	ERW	FVS
23.4.13	**4210**	**Fieldbus S->M4 src**		LINK	6000	0	16384	ERW	FVS
23.4.17	**4220**	**Fieldbus S->M5 src**		LINK	6000	0	16384	ERW	FVS
23.4.21	**4230**	**Fieldbus S->M6 src**		LINK	6000	0	16384	ERW	FVS
23.4.25	**4240**	**Fieldbus S->M7 src**		LINK	6000	0	16384	ERW	FVS
23.4.29	**4250**	**Fieldbus S->M8 src**		LINK	6000	0	16384	ERW	FVS
23.4.33	**4260**	**Fieldbus S->M9 src**		LINK	6000	0	16384	ERW	FVS
23.4.37	**4270**	**Fieldbus S->M10 src**		LINK	6000	0	16384	ERW	FVS
23.4.41	**4280**	**Fieldbus S->M11 src**		LINK	6000	0	16384	ERW	FVS
23.4.45	**4290**	**Fieldbus S->M12 src**		LINK	6000	0	16384	ERW	FVS
23.4.49	**4300**	**Fieldbus S->M13 src**		LINK	6000	0	16384	ERW	FVS
23.4.53	**4310**	**Fieldbus S->M14 src**		LINK	6000	0	16384	ERW	FVS
23.4.57	**4320**	**Fieldbus S->M15 src**		LINK	6000	0	16384	ERW	FVS
23.4.61	**4330**	**Fieldbus S->M16 src**		LINK	6000	0	16384	ERW	FVS

Selection of the origin (source) of the parameter to send to the channel. The default setting is Null, which equals an inactive channel. When a parameter is selected, the format is also automatically set in the sys parameter. The data that can be used for this function can be selected from among those available in the selection list relating to the fieldbus (**L_FBS2M**).

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
23.4.2	**4182**	**Fieldbus S->M1 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.6	**4192**	**Fieldbus S->M2 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.10	**4202**	**Fieldbus S->M3 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.14	**4212**	**Fieldbus S->M4 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.18	**4222**	**Fieldbus S->M5 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.22	**4232**	**Fieldbus S->M6 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.26	**4242**	**Fieldbus S->M7 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.30	**4252**	**Fieldbus S->M8 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.34	**4262**	**Fieldbus S->M9 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.38	**4272**	**Fieldbus S->M10 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.42	**4282**	**Fieldbus S->M11 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.46	**4292**	**Fieldbus S->M12 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.50	**4302**	**Fieldbus S->M13 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.54	**4312**	**Fieldbus S->M14 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.58	**4322**	**Fieldbus S->M15 sys**		ENUM	Not assigned	0	8	RW	FVS
23.4.62	**4332**	**Fieldbus S->M16 sys**		ENUM	Not assigned	0	8	RW	FVS

Setting of the format of the datum sent to the channel. When the src parameter is programmed, the format is programmed as **Eu** or **MDPLC** 16. If the src parameter is reset to null, the datum format does not change. The value of the format can be selected from the following list.

- **0** Not assigned
- **1** Count 16
- **2** Count 32
- **3** Fill 16
- **4** Fill 32
- **5** Mdplc 16
- **6** Mdplc 32
- **7** Eu
- **8** Eu float

If set to **0** the channel is not assigned.
If set to **1** the datum is assigned a 16-bit count.
If set to **2** the datum is assigned a 32-bit count.
If set to **3** 16 bits on the channel are reserved for the datum, not used.
If set to **4** 32 bits on the channel are reserved for the datum, not used.
If set to **5** the datum is assigned a 16-bit count used by MDPLC.
If set to **6** the datum is assigned a 32-bit count used by MDPLC.
If set to **7** the datum is assigned engineering units on a 16-bit integer.
If set to **8** the datum is assigned engineering units on a 32-bit integer.

Note ! If the sys parameter is not assigned, none of the subsequent channels are transferred to the fieldbus, even if programmed.

Menu	Par	Descrizione	FC	Tipo	Def	Min	Max	Acc	Mod
23.4.3	**4184**	**Dig Fieldbus S->M1**		INT32	0	0	0	ERW	FVS
23.4.7	**4194**	**Dig Fieldbus S->M2**		INT32	0	0	0	ERW	FVS
23.4.11	**4204**	**Dig Fieldbus S->M3**		INT32	0	0	0	ERW	FVS
23.4.15	**4214**	**Dig Fieldbus S->M4**		INT32	0	0	0	ERW	FVS
23.4.19	**4224**	**Dig Fieldbus S->M5**		INT32	0	0	0	ERW	FVS
23.4.23	**4234**	**Dig Fieldbus S->M6**		INT32	0	0	0	ERW	FVS
23.4.27	**4244**	**Dig Fieldbus S->M7**		INT32	0	0	0	ERW	FVS
23.4.31	**4254**	**Dig Fieldbus S->M8**		INT32	0	0	0	ERW	FVS
23.4.35	**4264**	**Dig Fieldbus S->M9**		INT32	0	0	0	ERW	FVS
23.4.39	**4274**	**Dig Fieldbus S->M10**		INT32	0	0	0	ERW	FVS
23.4.43	**4284**	**Dig Fieldbus S->M11**		INT32	0	0	0	ERW	FVS
23.4.47	**4294**	**Dig Fieldbus S->M12**		INT32	0	0	0	ERW	FVS
23.4.51	**4304**	**Dig Fieldbus S->M13**		INT32	0	0	0	ERW	FVS
23.4.55	**4314**	**Dig Fieldbus S->M14**		INT32	0	0	0	ERW	FVS
23.4.59	**4324**	**Dig Fieldbus S->M15**		INT32	0	0	0	ERW	FVS
23.4.63	**4327**	**Dig Fieldbus S->M16**		INT32	0	0	0	ERW	FVS

If associated with the relative src, the value of this parameter is sent to the bus.

The user may modify the M->S and by S->M sys parameters. The consistency of the sys with the parameter assigned to the channel is checked.

Control for S->M channels:

sys parameter	FB type	result
Count 32	32 bit	Sends all 32 input bits to the fieldbus. **OK**
	16_H	Sends all 32 input bits to the fieldbus. **OK**
	16_L	Sends all 32 input bits to the fieldbus. **OK**
Count 16	32 bit	Does not know whether to send the 16H or 16L. **Error**
	16_H	Sends all 16H input bits to the fieldbus. **OK**
	16_L	Sends all 16L input bits to the fieldbus. **OK**

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
23.4.4	**4186**	**Mul S->M1 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.8	**4196**	**Mul S->M2 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.12	**4206**	**Mul S->M3 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.16	**4216**	**Mul S->M4 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.20	**4226**	**Mul S->M5 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.24	**4236**	**Mul S->M6 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.28	**4246**	**Mul S->M7 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.32	**4256**	**Mul S->M8 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.36	**4266**	**Mul S->M9 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.40	**4276**	**Mul S->M10 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.44	**4286**	**Mul S->M11 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.48	**4296**	**Mul S->M12 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.52	**4306**	**Mul S->M13 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.56	**4316**	**Mul S->M14 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.60	**4326**	**Mul S->M15 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS
23.4.64	**4336**	**Mul S->M16 fieldbus**		FLOAT	1.0	1.0	1000.0	ERW	FVS

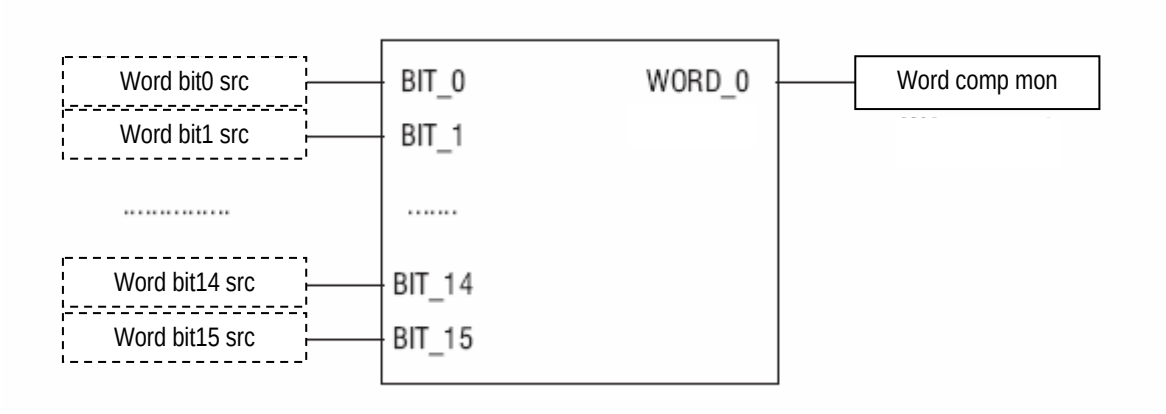
The "**Mul S->Mx Fieldbus**" parameters are multipliers that the drive applies to the datum before sending it to the bus. It is therefore possible to increase the resolution of some values read in EU and EU_float mode, also using decimal digits.
N.B.: The drive does not check that the multiplied parameter expressed in bits fits in a 16-bit integer. You must make sure that the multiplier is compatible with the maximum value of the exchanged parameter and that it does not exceed the maximum size of 32768.

Example: **Mul S->Mx fieldbus** = 10, **S->M1 fieldbus par = Motor speed**, **Sys S->M1 fieldbus** = Eu. If the motor is running at 100 rpm, the PLC reads the value 100 * 10 = 1000 on the first word that is exchanged.

23.5 - COMMUNICATION/WORD COMP

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
23.5.1	4400	Word bit0 src		LINK	6000	0	16384	ERW	FVS
23.5.2	4402	Word bit1 src		LINK	6000	0	16384	ERW	FVS
23.5.3	4404	Word bit2 src		LINK	6000	0	16384	ERW	FVS
23.5.4	4406	Word bit3 src		LINK	6000	0	16384	ERW	FVS
23.5.5	4408	Word bit4 src		LINK	6000	0	16384	ERW	FVS
23.5.6	4410	Word bit5 src		LINK	6000	0	16384	ERW	FVS
23.5.7	4412	Word bit6 src		LINK	6000	0	16384	ERW	FVS
23.5.8	4414	Word bit7 src		LINK	6000	0	16384	ERW	FVS
23.5.9	4416	Word bit8 src		LINK	6000	0	16384	ERW	FVS
23.5.10	4418	Word bit9 src		LINK	6000	0	16384	ERW	FVS
23.5.11	4420	Word bit10 src		LINK	6000	0	16384	ERW	FVS
23.5.12	4422	Word bit11 src		LINK	6000	0	16384	ERW	FVS
23.5.13	4424	Word bit12 src		LINK	6000	0	16384	ERW	FVS
23.5.14	4426	Word bit13 src		LINK	6000	0	16384	ERW	FVS
23.5.15	4428	Word bit14 src		LINK	6000	0	16384	ERW	FVS
23.5.16	4430	Word bit15 src		LINK	6000	0	16384	ERW	FVS

Selection of the origin (source) of the signal to be used for coding in **Word comp**. This function allows the user to compose a single word composed of 16 signals, each of which can be selected from among those listed in the "**L_DIGSEL1**" selection list.
The values of the sectioned sizes are converted into a single word.



Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
23.5.17	4432	Word comp mon		UINT32	0	0	0	ER	FVS

The hexadecimal value of the Word comp output is displayed.

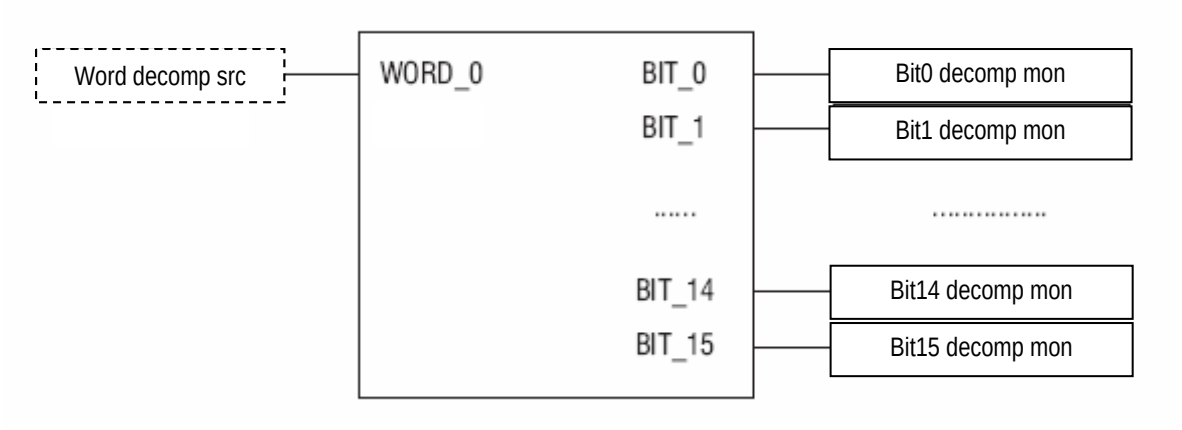
23.6 - COMMUNICATION/WORD DECOMP

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
23.6.1	**4450**	**Dig word decomp**		UINT32	0	0	0	ERW	FVS

Setting of the digital input decoded by the **"Word decomp"** block.

Menu	**Par**	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
23.6.2	**4452**	**Word decomp src**		LINK	4450	0	16834	ERW	FVS

Selection of the origin (source) of the word to be decoded by the **"Word decomp"** block. Each bit that is part of the word to be decoded is associated with the output channel of the **"Word decomp"** block. The variables that can be used for this function can be selected from among those listed in the **"L_WDECOMP"** selection list.



Menu	**Par**	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
23.6.3	**4454**	**Bit0 decomp mon**		BIT	0	0	1	ER	FVS
23.6.4	**4456**	**Bit1 decomp mon**		BIT	0	0	1	ER	FVS
23.6.5	**4458**	**Bit2 decomp mon**		BIT	0	0	1	ER	FVS
23.6.6	**4460**	**Bit3 decomp mon**		BIT	0	0	1	ER	FVS
23.6.7	**4462**	**Bit4 decomp mon**		BIT	0	0	1	ER	FVS
23.6.8	**4464**	**Bit5 decomp mon**		BIT	0	0	1	ER	FVS
23.6.9	**4466**	**Bit6 decomp mon**		BIT	0	0	1	ER	FVS
23.6.10	**4468**	**Bit7 decomp mon**		BIT	0	0	1	ER	FVS
23.6.11	**4470**	**Bit8 decomp mon**		BIT	0	0	1	ER	FVS
23.6.12	**4472**	**Bit9 decomp mon**		BIT	0	0	1	ER	FVS
23.6.13	**4474**	**Bit10 decomp mon**		BIT	0	0	1	ER	FVS
23.6.14	**4476**	**Bit11 decomp mon**		BIT	0	0	1	ER	FVS
23.6.15	**4478**	**Bit12 decomp mon**		BIT	0	0	1	ER	FVS
23.6.16	**4480**	**Bit13 decomp mon**		BIT	0	0	1	ER	FVS
23.6.17	**4482**	**Bit14 decomp mon**		BIT	0	0	1	ER	FVS
23.6.18	**4484**	**Bit15 decomp mon**		BIT	0	0	1	ER	FVS

The single bits that make up the selected word are displayed.

In the **ALARM CONFIG** menu the type of effect any alarm signals have on the drive is determined:

- The alarm status is saved
- How must the drive react to the alarm signal?
- Auto restart
- Alarm reset

For some alarms, behaviour can be configured separately for each signal, while for the others the **Disable drive** is executed. Individual signals can also be sent to a programmable digital output.

Activity

Ignore	The alarm is not included in the list of alarms, it is not included in the alarm log, it is not signalled on the digital outputs, no drive commands are modified.
Warning	The alarm is included in the list of alarms, it is included in the alarm log, it is signalled on the digital outputs, the First alarm information is updated, the Alarm enabled information is updated, no drive commands are modified.
Disable drive	The alarm is included in the list of alarms, it is included in the alarm log, it is signalled on the digital outputs, the First alarm information is updated, the Alarm enabled information is updated, a command is sent to stop and disable the motor, which stops due to inertia.
Stop	The alarm is included in the list of alarms, it is included in the alarm log, it is signalled on the digital outputs, the First alarm information is updated, the Alarm enabled information is updated, a Stop command is sent. When the zero speed is reached the drive is disabled. If **Ramp** control mode is enabled, the drive moves to the zero speed with the set ramp time; when the **Speed delay 0** signal is activated the drive is disabled. If **Speed** control mode is enabled, the drive moves to the zero speed with the maximum current possible; when the **Speed delay 0** signal is activated the drive is disabled. If **Torque** control mode is enabled, the drive moves to the zero speed with the time set by the load; when the **Speed delay 0** signal is activated the drive is disabled.
Fast stop	The alarm is included in the list of alarms, it is included in the alarm log, it is signalled on the digital outputs, the First alarm information is updated, the Alarm enabled information is updated, a Fast Stop command is sent. When the zero speed is reached the drive is disabled. If **Ramp** control mode is enabled, the drive moves to the zero speed with the set fast stop ramp time (deceleration time 3); when the **Speed delay 0** signal is activated the drive is disabled. If **Speed** control mode is enabled, the drive moves to the zero speed with the maximum current possible; when the **Speed delay 0** signal is activated the drive is disabled. If **Torque** control mode is enabled, the drive moves to the zero speed with the set load time; when the **Speed delay 0** signal is activated the drive is disabled.

n alarms with Activity = Ignore or Warning can be enabled at the same time.
If an alarm with Activity = Stop or Fast Stop is enabled and another alarm with an Activity other than Ignore or Warning is enabled, the drive stops and is disabled.

Not all alarms allow the controlled stopping of the drive. The following table shows the possibility of setting the Activities for the individual alarm signals.

Alarm	Ignore	Warning	Disable drive	Stop	Fast stop
ExtFlt	✓	✓	✓	✓	✓
Motor OT	✓	✓	✓	✓	✓
Overspeed	✓	✓	✓	✓	✓
SpdRefLoss	✓	✓	✓	✓	✓
SpdFbkLoss	✓	✓	✓	✓	✓
Drive ovld	✓	✓	✓	✓	✓
Motor ovld	✓	✓	✓	✓	✓
Bres ovld	✓	✓	✓	✓	✓
HTsens	-	-	✓	✓	✓
InAir	✓	✓	✓	✓	✓
Desat	-	-	✓	-	-
IOverC	-	-	✓	-	-
OverV	-	-	✓	-	-
UnderV	-	-	✓	-	-
PhLoss	✓	✓	✓	✓	✓
GroundFault thr	-	-	✓	-	-

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.1	**4500**	**Fault reset src**		LINK	1120	0	16384	RW	FVS

Selection of the origin (source) of the signal to be used for the command to reset the drive after an alarm. The terminal that can be used for this function can be selected from among those listed in the "**L_DIGSEL2**" selection list.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.2	**4502**	**ExtFlt src**		LINK	6000	0	16384	RW	FVS

Selection of the origin (source) of the signal to be used as the input for the drive external fault alarm **ExtFlt**. The terminal that can be used for this function can be selected from among those listed in the "**L_DIGSEL2**" selection list.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.3	**4504**	**ExtFlt activity**		ENUM	Disable	0	4	RW	FVS

Setting of the behaviour of the drive in the event of an external fault alarm **ExtFlt**. This alarm indicates the intervention of a drive external protection.

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.4	**4506**	**ExtFlt restart**		ENUM	Disable	0	1	RW	FVS

Enabling of automatic restart after the external fault alarm **ExtFlt**

- **0** Disable
- **1** Enable

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.5	4508	**ExtFlt restart time**	ms	UINT16	1000	120	30000	RW	FVS

Setting of the time within which the **External Fault** alarm must be reset in order to perform automatic restart.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.6	4510	**ExtFlt holdoff**	ms	UINT16	0	0	10000	RW	FVS

Setting of the delay between the signalling of the external fault alarm **ExtFlt** and enabling of the alarm. If an alarm condition occurs, the drive will wait for the set time before blocking is enabled. If the alarm is removed within the set time, the drive will not indicate any alarm condition.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.7	4520	**MotorOT src**		LINK	6000	0	16384	RW	FVS

Selection of the origin (source) of the signal to be used for the motor overtemperature alarm **MotorOT**. The terminal that can be used for this function can be selected from among those listed in the "**L_DIGSEL2**" selection list.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.8	4522	**MotorOT activity**		ENUM	Warning	0	4	RW	FVS

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.9	4524	**MotorOT restart**		ENUM	Disable	0	1	RW	FVS

Enabling of automatic restart after the motor overtemperature alarm **MotorOT**.

- **0** Disable
- **1** Enable

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.10	4526	**MotorOT restart time**	ms	UINT16	1000	120	30000	RW	FVS

Setting of the time within which the **Motor Overtemperature** alarm must be reset in order to perform automatic restart.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.11	4528	**MotorOT holdoff**	ms	UINT16	1000	0	30000	RW	FVS

Setting of the delay between the signalling of the motor overtemperature alarm **MotorOT** and enabling of the alarm. If an alarm condition occurs, the drive will wait for the set time before enabling the alarm. If the alarm is removed within the set time, the drive will not indicate any alarm condition.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.12	4540	**Overspeed threshold**	rpm	INT16	CALCI	0	CALCI	RW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.13	4542	**Overspeed activity**		ENUM	Disable	0	4	RW	FVS

Setting of the behaviour of the drive in case of a motor overspeed alarm **Overspeed**. This alarm indicates that the motor speed has exceeded the threshold set in the **Speed ref top lim** and **Speed ref bottom lim** parameters in the **COMMANDS** menu.

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.14	4544	**Overspeed holdoff**	ms	UINT16	0	0	5000	RW	FVS

Setting of the delay between the signalling of the motor overspeed alarm **Overspeed** and enabling of the alarm. If an alarm condition occurs, the drive will wait for the set time before enabling the alarm. If the alarm is removed within the set time, the drive will not indicate any alarm condition.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.15	4550	**SpdRefLoss threshold**	rpm	INT16	100	0	CALCI	RW	FVS

Setting of the threshold below which the speed reference loss alarm **SpdRefLoss** occurs.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.16	4552	**SpdRefLoss activity**		ENUM	Warning	0	4	RW	FVS

Setting of the behaviour of the drive in case of a speed reference loss alarm **SpdRefLoss**. This alarm indicates that the difference between the speed regulator reference and the actual motor speed is more than 100 rpm.
This alarm must be disabled (= **0** Ignore) when parameter **556 Control mode** is set to Torque (0) or when parameter **2354** is set to a value other than zero.

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.17	4554	**SpdRefLoss holdoff**	ms	UINT16	1000	0	10000	RW	FVS

Setting of the delay between the signalling of the speed reference loss alarm condition **SpdRefLoss** and enabling of the alarm. If an alarm condition occurs, the drive will wait for the set time before enabling the alarm. If the alarm is removed within the set time, the drive will not indicate any alarm condition.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.18	**4560**	**SpdFbkLoss activity**		ENUM	Disable	0	4	RW	FV

Setting of the behaviour of the drive in case of a speed feedback loss alarm **SpdFbkLoss**. This alarm indicates the loss of the encoder feedback signals.

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.19	**4562**	**SpdFbkLoss holdoff**	ms	UINT16	200	0	10000	RW	FVS

Setting of the delay between the signalling of the speed feedback loss alarm condition **SpdFbkLoss** and the enabling of the alarm. If an alarm condition occurs, the drive will wait for the set time before enabling the alarm. If the alarm is removed within the set time, the drive will not indicate any alarm condition.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.20	**4570**	**Drive ovld activity**		ENUM	Ignore	0	4	ERW	FVS

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
- **3** Stop
- **4** Fast stop

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.21	**4572**	**Motor ovld activity**		ENUM	Warning	0	4	ERW	FVS

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.22	**4574**	**Bres ovld activity**		ENUM	Disable	0	4	ERW	FVS

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

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.23	4580	**HTsens activity**		ENUM	Stop	2	4	ERW	FVS

Setting of the behaviour of the drive in case of a drive heatsink overtemperature alarm **HTsens**. This alarm indicates that the drive heatsink temperature is too high.

2 Disable
3 Stop
4 Fast stop

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.24	4582	**HTsens restart**		ENUM	Disable	0	1	ERW	FVS

Enabling of automatic restart after the drive heatsink overtemperature alarm **HTsens**.

0 Disable
1 Enable

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.25	4584	**HTsens restart time**	ms	UINT16	1000	120	30000	ERW	FVS

Setting of the time within which the **HT sensor** alarm must be reset in order to perform automatic restart.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.26	4586	**HTsens holdoff**	ms	UINT16	1000	800	30000	ERW	FVS

Setting of the delay between the signalling of the drive heatsink overtemperature alarm **HTsens** 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	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.27	4600	**InAir activity**		ENUM	Stop	0	4	ERW	FVS

Setting of the behaviour of the drive in case of an intake air overtemperature alarm **InAir**. This alarm indicates that the temperature of the intake cooling air is too high.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.28	4602	**InAir restart**		ENUM	Disable	0	1	ERW	FVS

Enabling of automatic restart after the intake air overtemperature alarm **InAir**.

0 Disable
1 Enable

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.29	4604	**InAir restart time**	ms	UINT16	1000	120	30000	ERW	FVS

Setting of the time within which the **HT sensor** alarm must be reset in order to perform automatic restart.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.30	**4606**	**InAir holdoff**	ms	UINT16	10000	0	30000	ERW	FVS

Setting of the delay between the signalling of the intake air overtemperature alarm **InAir** 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	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.31	**4610**	**Desat restart**		ENUM	Disable	0	1	ERW	FVS

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

0 Disable
1 Enable

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.32	**4612**	**Desat restart time**	ms	UINT16	2000	1000	10000	ERW	FVS

Setting of the time within which the **Desaturation** alarm must be reset in order to perform automatic restart. (Time with alarm signal active + 1000 msec).

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.33	**4620**	**IOverC restart**		ENUM	Disable	0	1	ERW	FVS

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

0 Disable
1 Enable

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.34	**4622**	**IOverC restart time**	ms	UINT16	2000	1000	10000	ERW	FVS

Setting of the time within which the **Overcurrent** alarm must be reset in order to perform automatic restart. (Time with alarm signal active + 1000 msec).

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.35	**4630**	**OverV restart**		ENUM	Disable	0	1	ERW	FVS

Enabling of automatic restart after the overvoltage alarm. This alarm indicates an overvoltage on the intermediate circuit (DC link)

0 Disable
1 Enable

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.36	**4632**	**OverV restart time**	ms	UINT16	2000	1000	10000	ERW	FVS

Setting of the time within which the **Overvoltage** alarm must be reset in order to perform automatic restart. (Time with alarm signal active + 1000 msec).

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.37	4640	**UnderV restart**		ENUM	Enable	0	1	ERW	FVS

Enabling of automatic restart after the undervoltage alarm. This alarm indicates an undervoltage on the intermediate circuit (DC link)

0 Disable
1 Enable

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.38	4642	**UnderV restart time**	ms	UINT16	1000	120	10000	ERW	FVS

Setting of the time within which the **Undervoltage** alarm must be reset in order to perform automatic restart. (Time with alarm signal active + 100 msec).

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.39	4650	**UVRep attempts**		UINT16	5	0	1000	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.40	4652	**UVRep delay**	s	UINT16	240	0	300	ERW	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.41	4660	**PhLoss activity**		ENUM	Disable	0	4	ERW	FVS

Setting of the behaviour of the drive in case of a no phase alarm. This alarm indicates the absence of a drive power supply phase.

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.42	4662	**PhLoss restart**		ENUM	Disable	0	1	ERW	FVS

Enabling of automatic restart after the no phase alarm.

0 Disable
1 Enable

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.43	4664	**PhLoss restart time**	ms	UINT16	1000	120	10000	ERW	FVS

Setting of the time within which the **Phase loss** alarm must be reset in order to perform automatic restart. (Time with alarm signal active + 100 msec).

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
24.44	**4670**	**Optionbus activity**		ENUM	Disable	0	4	ERW	FVS

Setting of the behaviour of the drive in case of an "**Opt Bus Fault**" alarm..

0 Ignore
1 Warning
2 Disable
3 Stop
4 Fast stop

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.45	**4680**	**Ground Fault thr**	perc	FLOAT	10.0	0.0	150	ERWS	FVS

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

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.46	**4700**	**Alarm dig sel 1**		ENUM	No alarm	0	40	RW	FVS
24.47	**4702**	**Alarm dig sel 2**		ENUM	No alarm	0	40	RW	FVS
24.48	**4704**	**Alarm dig sel 3**		ENUM	No alarm	0	40	RW	FVS
24.49	**4706**	**Alarm dig sel 4**		ENUM	No alarm	0	40	RW	FVS

Setting of the alarm signal to enable on a digital output. The digital output is selected using parameters **Alm dig out mon 1÷4**, which can be enabled in the L_DIGSEL1 selection list.

0 No alarm
1 Overvoltage
2 Undervoltage
3 Ground fault
4 Overcurrent
5 Desaturation
6 MultiUndervolt
7 MultiOvercurr
8 MultiDesat
9 Heatsink OT
10 HeatsinkS OTUT
11 Intakeair OT
12 Motor OT
13 Drive overload
14 Motor overload
15 Bres overload
16 Phaseloss
17 Opt Bus fault
18 Opt 1 IO fault
19 Opt 2 IO fault
20 Opt Enc fault
21 External fault
22 Speed fbk loss
23 Overspeed
24 Speed ref loss
25 Emg stop alarm
26 Power down
27 Not Used1

28 Not Used2
29 Not Used3
30 Not Used4
31 Not Used5
32 Not Used6
33 Plc1 fault
34 Plc2 fault
35 Plc3 fault
36 Plc4 fault
37 Plc5 fault
38 Plc6 fault
39 Plc7 fault
40 Plc8 fault

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.50	**4720**	**Alm autoreset time**	s	FLOAT	0.0	0.0	60.0	RW	FVS

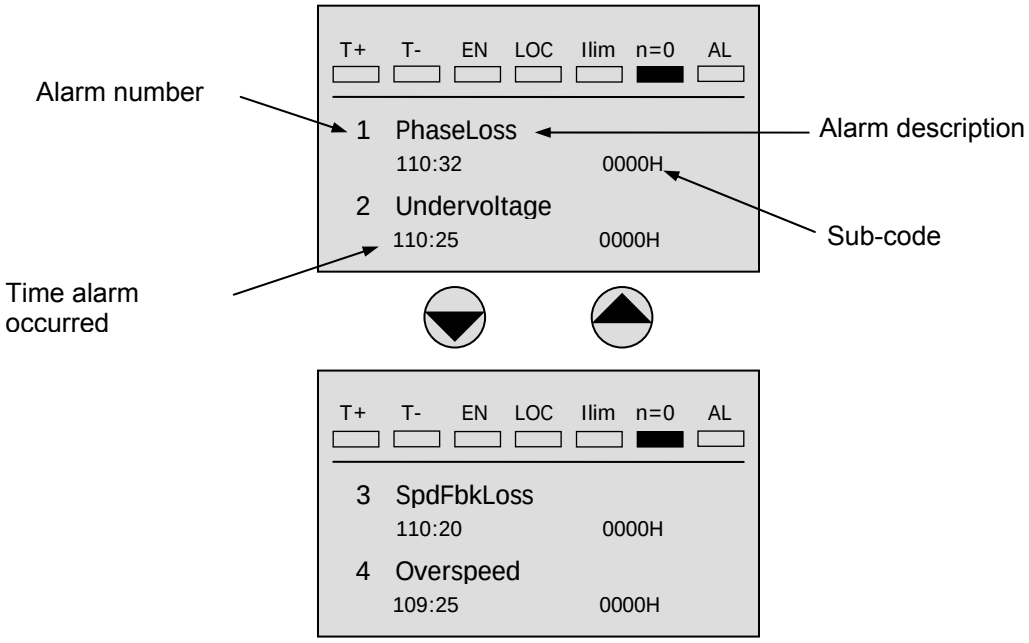
Setting of the time interval that must pass before executing an automatic reset.
If no alarms are enabled the drive is set to restart.
If some alarms are still enabled the drive is set to execute a new attempt at automatic reset.
At each attempted reset a counter increases. If the limit set in the Alm autoreset number parameter is reached the drive is set to make no more attempts at reset and waits for a user reset.
The counter is set to zero when an automatic reset or user reset is performed and no alarms are enabled.
If the parameter is 0 the function is disabled.

Menu	Par	Descrizione	UM	Tipo	Def	Min	Max	Acc	Mod
24.51	**4722**	**Alm autoreset number**		UINT16	20	0	100	RW	FVS

Setting of the maximum number of attempted automatic resets.

25 – ALARM LOG

This is the menu in which the log of previous alarms is saved, with the time the alarm occurred (in relation to the **Time drive power on** parameter). The alarms are displayed starting from the most recent (No. 1) up to the furthest back in time (No. 30). Up to 30 alarm signals can be displayed. The sub-code is used by service technicians to identify the specific type of alarm. Press the ▲ and ▼ keys to scroll the screen pages of the alarm log. The alarm log cannot be deleted.



26 – APPLICATION

This menu is designed to host two applications (e.g. PID control, etc.) using the MDPlc program, currently in progress. It will not be possible to use both applications simultaneously. The **558 Application select** parameter in the DRIVE CONFIG menu must be used to select between the two possible applications.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	262	**Motor speed nofilter**	rpm	INT16	0	0	0	ER	FVS

This parameter indicates the unfiltered motor speed.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	362	**Drive overload trip**		BIT	0	0	1	ER	FVS

This signal indicates that the drive is in the overload alarm condition.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	366	**Drive overload 80**		BIT	0	0	1	ER	FVS

This signal indicates that the drive has reached 80% of the thermal image accumulator (drive overload).

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	626	**Ramp ref out mon**	rpm	INT16	0	0	0	ER	FVS

This parameter displays the reference value output of the ramp remference function block.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	760	**Ramp out mon**	rpm	INT16	0	0	0	ER	FVS

This parameter displays the reference value output of the ramp function block.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	764	**Ramp acc state**		BIT	0	0	1	ER	FVS

This signal indicates whether the acceleration ramp is active.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	766	**Ramp dec state**		BIT	0	0	1	ER	FVS

This signal indicates whether the deceleration ramp is active.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	934	**Ref is 0**		BIT	0	0	1	ER	FVS

This signal is active when the reference is below the limit set in parameter **930 Reference 0 threshold.**

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	936	**Ref is 0 delay**		BIT	0	0	1	ER	FVS

This parameter is active when the reference is below the threshold set in parameter **930 Reference 0 threshold**. The signal is enabled after the delay set with parameter **932 Reference delay 0.**

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	944	**Speed is 0**		BIT	0	0	1	ER	FVS

This parameter is active when the speed is below the threshold set in parameter **940 Speed 0 threshold.**

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	946	**Speed is 0 delay**		BIT	0	0	1	ER	FVS

This signal is active when the reference is below the threshold set in parameter **940 Speed 0 threshold**. The signal is activated after the delay set in parameter **942 Speed 0 delay.**

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	956	**Speed threshold**		BIT	0	0	1	ER	FVS

This signal is active when the motor speed is between parameters **950 Speed threshold** 1 and **952 Speed threshold 2**.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	966	**Set speed**		BIT	0	0	1	ER	FVS

This signal is active when the error between the speed reference and actual motor speed is greater than the tolerance set in parameter **962 Set speed error**.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	1030	**Local/remote mon**		BIT	0	0	1	ER	FVS

This signal is active when the drive is in the **Remote** operating mode.

0 Local
1 Remote

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	1060	**Sequencer status**		UINT16	0	0	0	ER	FVS

This signal indicates the status of the “sequencer” that controls drive operation.

STS_INIT	0
STS_MAGN	1
STS_STOP	2
STS_START	3
STS_FS_STOP	4
STS_FS_START	5
STS_QSTOP	6
STS_FS_MAGN	7
STS_W_QSTOP	8
STS_READY	9
STS_MAGN_START	10
STS_ALM_DISABLED	11
STS_ALM_END_ACTION	12
STS_ALM_STOP	13
STS_ALM_FSTOP	14
STS_ALM_R_TO_NORMAL	15
STS_READY_START	16
STS_READY_FSTOP	17
STS_ALM_NO_RESTART	18
STS_FS_MAGN_START	19

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	1062	**Drive OK**		BIT	0	0	1	ER	FVS

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

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	1064	**Drive ready**		BIT	0	0	1	ER	FVS

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

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	1110	**Digital input E mon**		BIT	0	0	1	ER	FVS
	1112	**Digital input 1 mon**		BIT	0	0	1	ER	FVS
	1114	**Digital input 2 mon**		BIT	0	0	1	ER	FVS
	1116	**Digital input 3 mon**		BIT	0	0	1	ER	FVS
	1118	**Digital input 4 mon**		BIT	0	0	1	ER	FVS
	1120	**Digital input 5 mon**		BIT	0	0	1	ER	FVS

These signals represent the state of the corresponding digital input.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	1210	**Digital input 1X mon**		BIT	0	0	1	ER	FVS
	1212	**Digital input 2X mon**		BIT	0	0	1	ER	FVS
	1214	**Digital input 3X mon**		BIT	0	0	1	ER	FVS
	1216	**Digital input 4X mon**		BIT	0	0	1	ER	FVS
	1218	**Digital input 5X mon**		BIT	0	0	1	ER	FVS
	1220	**Digital input 6X mon**		BIT	0	0	1	ER	FVS
	1222	**Digital input 7X mon**		BIT	0	0	1	ER	FVS
	1224	**Digital input 8X mon**		BIT	0	0	1	ER	FVS

These signals represent the state of the corresponding digital input on the expansion card..

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	1530	**Analog inp1<thr**		BIT	0	0	1	ER	FVS

This signal is active when the value of the analog input is below the threshold set in parameter **1520 Analog inp 1 thr.**

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	1580	**Analog inp2<thr**		BIT	0	0	1	ER	FVS

This signal is active when the value of the analog input is below the threshold set in parameter **1570 Analog inp 2 thr.**

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	2388	**Torque ref nofilter**	perc	FLOAT	0.0	0.0	0.0	ER	FVS

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

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	3006	**Speed ratio out mon**	rpm	INT16	0	0	0	ER	FVS

This parameter displays the value of the speed ratio used by the “Speed draw” function (speed ratio).

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	3214	**Motor overload trip**		BIT	0	0	1	ER	FVS

This signal is active when the drive is in the motor overload alarm condition.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	3262	**Bres overload trip**		BIT	0	0	1	ER	FVS

This signal is active when the drive is in the braking resistor overload alarm condition.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	3374	**Motor overload trip**		INT32	0	0	0	ER	_V_

The voltage applied during capture on-the-fly of the motor in Vf mode is displayed.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	3442	**Powerloss rampdown**		BIT	0	0	1	ER	FVS

This signal is active when the drive has completed the deceleration ramp in Powerloss = End-of-ramp mode.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	3446	**Powerloss nextratio**		INT32	0	0	0	ER	FVS

This parameter displays the value of the speed ratio for the slave drive.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	3448	**Powerloss nextactive**		BIT	0	0	1	ER	FVS

This signal is activated when the actual speed is different to the line speed.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	4372	**DS402 status word**		UINT16	0	0	65535	ER	F_S

This parameter displays the status word according to the DS402 profile. For more information reference should be made to the fieldbus manual.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	4394	**PFdrv status word 1**		UINT16	0	0	65535	ER	F_S

This parameter displays the status word 1 according to the Profidrives profile. For more information reference should be made to the fieldbus manual.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	4396	**PFdrv status word 2**		UINT16	0	0	65535	ER	FVS

This parameter displays the status word 2 according to the Profidrives profile. For more information reference should be made to the fieldbus manual.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	4708	**Alm dig out mon 1**		BIT	0	0	1	ER	FVS

This signal is activated when the alarm configured in parameter **4700 alarm dig sel 1** is active.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	4710	**Alm dig out mon 2**		BIT	0	0	1	ER	FVS

This signal is activated when the alarm configured in parameter **4702 alarm dig sel 2** is active.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	4712	**Alm dig out mon 3**		BIT	0	0	1	ER	FVS

This signal is activated when the alarm configured in parameter **4704 alarm dig sel 3** is active.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	4714	**Alm dig out mon 4**		BIT	0	0	1	ER	FVS

This signal is activated when the alarm configured in parameter **4706 alarm dig sel 4** is active.

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	4770	**First alarm**		UINT32	0	0	0	ER	FVS

This parameter displays the first alarm to be activated.

41 No alarm
42 Overvoltage
43 Undervoltage
44 Ground fault
45 Overcurrent
46 Desaturation
47 MultiUndervolt
48 MultiOvercurr
49 MultiDesat
50 Heatsink OT
51 Heatsink lin OT
52 Air OT
53 Motor OT
54 Drive overload
55 Motor overload
56 Bres overload
57 Phase loss
58 Opt Bus fault
59 Opt 1 I/O fault
60 Opt 2 I/O2fault
61 Opt enc fault
62 External fault
63 Fbk loss
64 Overspeed
65 Ref Loss
66 Emg stop alarm
67 Power down
68 Not used 1
69 Not used 2
70 Not used 3
71 Not used 4
72 Not used 5
73 Not used 6
74 PLC 1 fault
75 PLC 2 fault
76 PLC 3 fault
77 PLC 4 fault
78 PLC 5 fault
79 PLC 6 fault
80 PLC 7 fault
81 PLC 8 fault

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	4780	**PLC alarm**		UINT16	0	0	0	ER	FVS

This parameter displays the state of the alarms generated by the application written with the internal PLC

Bit	Description
0	1 = PLC 1 fault active
1	1 = PLC 2 fault active
2	1 = PLC 3 fault active
3	1 = PLC 4 fault active
4	1 = PLC 5 fault active
5	1 = PLC 6 fault active
6	1 = PLC 7 fault active
7	1 = PLC 8 fault active

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	4840	**Alarm IO state**		UINT32	0	0	0	ER	FVS

This parameter displays the state of alarms 1..32 of the drive.

Bit	Description
0	1 = Overvoltage active
1	1 = Undervoltage active
2	1 = Ground fault active
3	1 = Overcurrent active
4	1 = Desaturation active
5	1 – MultiUndervolt active
6	1 = MultiOvercurr active
7	1 – MultiDesat active
8	1 = Heatsink OT active
9	1 = Heatsink lin OT active
10	1 = Air OT active
11	1 = Motor OT active
12	1 = Drive overload active
13	1 = Motor overload active
14	1 = Bres overload active
15	1 = Phase loss active
16	1 = Opt bus fault active
17	1 = Opt 1 I/O fault active
18	1 = Opt 2 I/O fault active
19	1 = Opt enc fault active
20	1 = External fault active
21	1 = Fbk loss active
22	1 = Overspeed active
23	1 = Ref loss active
24	1 = Emg stop alarm active
25	1 = Power down active
26	1 = not used
27	1 = not used
28	1 = not used
29	1 = not used
30	1 = not used
31	1 = not used

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	4842	**Alarm hi state**		UINT32	0	0	0	ER	FVS

This parameter displays the state of alarms 33.0.64 of the drive.

Bit	Description
0	1 = PLC 1 fault active
1	1 = PLC 2 fault active
2	1 = PLC 3 fault active
3	1 = PLC 4 fault active
4	1 = PLC 5 fault active
5	1 = PLC 6 fault active
6	1 = PLC 7 fault active
7	1 = PLC 8 fault active

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	6000	**Null**		UINT32	0	0	0	ER	FVS

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

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	6002	**One**		UINT32	0	0	0	ER	FVS

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

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	6004	**Speed limit state**		BIT	0	0	1	ER	FVS

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

Menu	Par	Description	UM	Type	Def	Min	Max	Acc	Mod
	6006	**Current limit state**		BIT	0	0	1	ER	FVS

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

L_ANOUT

IPA	Description
6000	Null
624	Ramp ref mon
626	Ramp setpoint
860	Ramp out mon
724	Speed setpoint
260	Motor speed
262	Motor speed nofilter
250	Output current
252	Output voltage
254	Output frequency
280	Torque current ref
282	Magnet current ref
284	Torque current
286	Magnet current
2310	Torque lim Pos Inuse
2312	Torque lim Neg Inuse
2336	Torque ref
2338	Torque ref nofilter
270	DC link voltage
2084	Position
2086	Revolutions
986	Speed ratio out
682	Multi ref out mon
900	Mpot setpoint
924	Mpot output mon
950	Jog output mon
2354	Inertia comp mon
1500	Analog input 1 mon
1550	Analog input 2 mon
1600	Analog input 1X mon
1650	Analog input 2X mon
368	Drive overload accum
2412	Motor overload accum
2440	Bres overload accum
2120	Spd reg P gain Inuse
2122	Spd reg I time Inuse
3272	DS402 status word
3092	Fieldbus M->S1 mon
3094	Fieldbus M->S2 mon
3096	Fieldbus M->S3 mon
3098	Fieldbus M->S4 mon
3100	Fieldbus M->S5 mon
3102	Fieldbus M->S6 mon
3104	Fieldbus M->S7 mon
3106	Fieldbus M->S8 mon
3108	Fieldbus M->S9 mon
3110	Fieldbus M->S10 mon
3112	Fieldbus M->S11 mon
3114	Fieldbus M->S12 mon
3116	Fieldbus M->S13 mon
3118	Fieldbus M->S14 mon
3120	Fieldbus M->S15 mon
3122	Fieldbus M->S16 mon
2700	Pad 1
2702	Pad 2
2704	Pad 3
2706	Pad 4
2708	Pad 5
2710	Pad 6
2712	Pad 7
2714	Pad 8
2716	Pad 9
2718	Pad 10
2720	Pad 11
2722	Pad 12
2724	Pad 13
2726	Pad 14
2728	Pad 15
2730	Pad 16
4008	Test gen out

L_CMP

IPA	Description
XXXX	*(1)*
624	Ramp ref mon
626	Ramp setpoint
860	Ramp out mon
724	Speed setpoint
260	Motor speed
262	Motor speed nofilter
250	Output current
252	Output voltage
254	Output frequency
280	Torque current ref
282	Magnet current ref
284	Torque current
286	Magnet current
2336	Torque ref
2338	Torque ref nofilter
270	DC link voltage
986	Speed ratio out
682	Multi ref out mon
900	Mpot setpoint
924	Mpot output mon
950	Jog output mon
1500	Analog input 1 mon
1550	Analog input 2 mon
1600	Analog input 1X mon
1650	Analog input 2X mon
368	Drive overload accum
2412	Motor overload accum
2440	Bres overload accum
3092	Fieldbus M->S1 mon
3094	Fieldbus M->S2 mon
3096	Fieldbus M->S3 mon
3098	Fieldbus M->S4 mon
3100	Fieldbus M->S5 mon
3102	Fieldbus M->S6 mon
3104	Fieldbus M->S7 mon
3106	Fieldbus M->S8 mon
3108	Fieldbus M->S9 mon
3110	Fieldbus M->S10 mon
3112	Fieldbus M->S11 mon
3114	Fieldbus M->S12 mon
3116	Fieldbus M->S13 mon
3118	Fieldbus M->S14 mon
3120	Fieldbus M->S15 mon
3122	Fieldbus M->S16 mon
2700	Pad 1
2702	Pad 2
2704	Pad 3
2706	Pad 4
2708	Pad 5
2710	Pad 6
2712	Pad 7
2714	Pad 8
2716	Pad 9
2718	Pad 10
2720	Pad 11
2722	Pad 12
2724	Pad 13
2726	Pad 14
2728	Pad 15
2730	Pad 16

(1) the XXXX parameter changes according to the src parameter used:

IPA	Description
2610	Compare input 1 src (1) = 2600 Dig compare input 1
2612	Compare input 2 src (1) = 2602 Dig compare input 2

L_DIGSEL1

IPA	Descrizione
6000	Zero
6002	Uno
1110	Mon ingr digitale E
1112	Mon ingr digitale 1
1114	Mon ingr digitale 2
1116	Mon ingr digitale 3
1118	Mon ingr digitale 4
1120	Mon ingr digitale 5
1210	Mon ingr digitale 1X
1212	Mon ingr digitale 2X
1214	Mon ingr digitale 3X
1216	Mon ingr digitale 4X
1218	Mon ingr digitale 5X
1220	Mon ingr digitale 6X
1222	Mon ingr digitale 7X
1224	Mon ingr digitale 8X
1062	Azionamento OK
1064	Azionamento pronto
934	Riferimento = 0
936	Ritardo riferim = 0
944	Velocità = 0
946	Ritardo velocità = 0
956	Soglia velocità
966	Impostazion velocità
1066	Monit stato Abilitaz
1068	Monitor stato Avvio
1070	Mon stato Arrestorap
1024	Mon com Abilitazione
1026	Monit comando Avvio
1028	Mon com Arresto Rap
4708	Mon usc digit all 1
4710	Mon usc digit all 2
4712	Mon usc digit all 3
4714	Mon usc digit all 4
1530	Ingr analog 1<soglia
1580	Ingr analog 2<soglia
362	Allarm sovracc drive
3214	Allarm sovracc motor
3262	All sovracc res fren
366	Sovraccar drive 80%
1048	Monitor avvio FR
1050	Monitor indietro FR
4454	Monitor Bit0 decomp
4456	Monitor Bit1 decomp
4458	Monitor Bit2 decomp
4460	Monitor Bit3 decomp
4462	Monitor Bit4 decomp
4464	Monitor Bit5 decomp
4466	Monitor Bit6 decomp
4468	Monitor Bit7 decomp
4470	Monitor Bit8 decomp
4472	Monitor Bit9 decomp
4474	Monitor Bit10 decomp
4476	Monitor Bit11 decomp
4478	Monitor Bit12 decomp
4480	Monitor Bit13 decomp
4482	Monitor Bit14 decomp
4484	Monitor Bit15 decomp
3700	Pad 1
3702	Pad 2
3704	Pad 3
3706	Pad 4
3708	Pad 5
3710	Pad 6
3712	Pad 7
3714	Pad 8
3716	Pad 9
3718	Pad 10
3720	Pad 11
3722	Pad 12
3724	Pad 13
3726	Pad 14
3728	Pad 15
3730	Pad 16
6004	Stato limit velocità
6006	Stato limit corrente
764	Stato rampa accel
766	Stato rampa decel
1030	Monitor local/remoto
4780	Allarme PLC
3676	Uscita comparatore

L_DIGSEL2

IPA	Descrizione
6000	Zero
6002	Uno
1110	Mon ingr digitale E
1112	Mon ingr digitale 1
1114	Mon ingr digitale 2
1116	Mon ingr digitale 3
1118	Mon ingr digitale 4
1120	Mon ingr digitale 5
1210	Mon ingr digitale 1X
1212	Mon ingr digitale 2X
1214	Mon ingr digitale 3X
1216	Mon ingr digitale 4X
1218	Mon ingr digitale 5X
1220	Mon ingr digitale 6X
1222	Mon ingr digitale 7X
1224	Mon ingr digitale 8X
4454	Monitor Bit0 decomp
4456	Monitor Bit1 decomp
4458	Monitor Bit2 decomp
4460	Monitor Bit3 decomp
4462	Monitor Bit4 decomp
4464	Monitor Bit5 decomp
4466	Monitor Bit6 decomp
4468	Monitor Bit7 decomp
4470	Monitor Bit8 decomp
4472	Monitor Bit9 decomp
4474	Monitor Bit10 decomp
4476	Monitor Bit11 decomp
4478	Monitor Bit12 decomp
4480	Monitor Bit13 decomp
4482	Monitor Bit14 decomp
4484	Monitor Bit15 decomp
3700	Pad 1
3702	Pad 2
3704	Pad 3
3706	Pad 4
3708	Pad 5
3710	Pad 6
3712	Pad 7
3714	Pad 8
3716	Pad 9
3718	Pad 10
3720	Pad 11
3722	Pad 12
3724	Pad 13
3726	Pad 14
3728	Pad 15
3730	Pad 16
1530	Ingr analog 1<soglia
1580	Ingr analog 2<soglia
1048	Monitor avvio FR
1050	Monitor indietro FR
3676	Uscita comparatore

L_DIGSEL3

IPA	Descrizione
XXXX	*(2)*
6000	Zero
6002	Uno
1110	Mon ingr digitale E
1112	Mon ingr digitale 1
1114	Mon ingr digitale 2
1116	Mon ingr digitale 3
1118	Mon ingr digitale 4
1120	Mon ingr digitale 5
1210	Mon ingr digitale 1X
1212	Mon ingr digitale 2X
1214	Mon ingr digitale 3X
1216	Mon ingr digitale 4X
1218	Mon ingr digitale 5X
1220	Mon ingr digitale 6X
1222	Mon ingr digitale 7X
1224	Mon ingr digitale 8X
1062	Azionamento OK
1064	Azionamento pronto
934	Riferimento = 0
936	Ritardo riferim = 0
944	Velocità = 0
946	Ritardo velocità = 0
954	Rit soglia velocità
966	Impostazion velocità
1066	Monit stato Abilitaz
1068	Monitor stato Avvio
1070	Mon stato Arrestorap
1024	Mon com Abilitazione
1026	Monit comando Avvio
1028	Mon com Arresto Rap
4708	Mon usc digit all 1
4710	Mon usc digit all 2
4712	Mon usc digit all 3
4714	Mon usc digit all 4
1530	Ingr analog 1<soglia
1580	Ingr analog 2<soglia
362	Allarm sovracc drive
3214	Allarm sovracc motor
3262	All sovracc res fren
366	Sovraccar drive 80%
1048	Monitor avvio FR
1050	Monitor indietro FR
4454	Monitor Bit0 decomp
4456	Monitor Bit1 decomp
4458	Monitor Bit2 decomp
4460	Monitor Bit3 decomp
4462	Monitor Bit4 decomp
4464	Monitor Bit5 decomp
4466	Monitor Bit6 decomp
4468	Monitor Bit7 decomp
4470	Monitor Bit8 decomp
4472	Monitor Bit9 decomp
4474	Monitor Bit10 decomp
4476	Monitor Bit11 decomp
4478	Monitor Bit12 decomp
4480	Monitor Bit13 decomp
4482	Monitor Bit14 decomp
4484	Monitor Bit15 decomp
3700	Pad 1
3702	Pad 2
3704	Pad 3
3706	Pad 4
3708	Pad 5
3710	Pad 6
3712	Pad 7

IPA	Descrizione
3714	Pad 8
3716	Pad 9
3718	Pad 10
3720	Pad 11
3722	Pad 12
3724	Pad 13
3726	Pad 14
3728	Pad 15
3730	Pad 16
6004	Stato limit velocità
6006	Stato limit corrente
764	Stato rampa accel
766	Stato rampa decel
4780	Allarme PLC
3676	Uscita comparatore

(2) il parametro XXXX cambia in funzione del parametro src che la utilizza:

1014 Sorg locale/remoto
(2) = 1012 Locale/remoto digit

L_FBS2M

IPA	Descrizione
XXXX	*(3)*
6000	Zero
6002	Uno
626	Monitor rifer rampa
628	Impost valore rampa
760	Mon rifer rampa usc
664	Imp. valore velocità
260	Velocità motore
262	Vel mot non filtrata
2150	Velocità encoder
250	Corrente di uscita
252	Tensione di uscita
254	Frequenza di uscita
280	Rifer corr di coppia
282	Rifer corr magnetizz
284	Corrente di coppia
286	Corr magnetizzante
2360	Lim pos coppia inuso
2362	Lim neg coppia inuso
2386	Riferimento coppia
2388	Rif coppia non filtr
270	Tensione DC link
2154	Posizione
2156	Rivoluzioni
3006	Usc rapporto velocit
852	Mon uscita multirif
870	Imp. valore motopot
894	Monit uscita motopot
920	Monitor uscita jog
3104	Monitor comp inerzia
1500	Mon ingr analogico 1
1550	Mon ingr analogico 2
1600	Mon ingr analogico1X
1650	Mon ingr analogico2X
368	Accum sovracc drive
3212	Accum sovracc motore
3260	Accum sovr res fren
272	Temperat dissipatore
1060	Stato sequencer
4432	Monitor word comp
2232	Guad P reg vel inuso
2234	Temp I reg vel inuso
4372	Word di stato DS402
4394	PFdrv word di stato1
4396	PFdrv word di stato2
4024	Mon M->S1 bus campo
4034	Mon M->S2 bus campo
4044	Mon M->S3 bus campo
4054	Mon M->S4 bus campo
4064	Mon M->S5 bus campo
4074	Mon M->S6 bus campo
4084	Mon M->S7 bus campo
4094	Mon M->S8 bus campo
4104	Mon M->S9 bus campo
4114	Mon M->S10 bus campo
4124	Mon M->S11 bus campo
4134	Mon M->S12 bus campo
4144	Mon M->S13 bus campo
4154	Mon M->S14 bus campo
4164	Mon M->S15 bus campo
4174	Mon M->S16 bus campo
3700	Pad 1
3702	Pad 2
3704	Pad 3
3706	Pad 4
3708	Pad 5
3710	Pad 6
3712	Pad 7
3714	Pad 8
3716	Pad 9
3718	Pad 10
3720	Pad 11
3722	Pad 12
3724	Pad 13
3726	Pad 14
3728	Pad 15
3730	Pad 16
4770	Primo allarme
4840	Stato allarmi basso
4842	Stato allarmi alto
1100	Monit ingr digitali
1200	Mon ingr digitali X
5008	Uscita generat test

(3) il parametro XXXX cambia in funzione del parametro src che la utilizza:

4180 Sorg S->M1 bus campo
(3) = 4184 S->M1 dig bus campo

4190 Sorg S->M2 bus campo
(3) = 4194 S->M2 dig bus campo

4200 Sorg S->M3 bus campo
(3) = 4204 S->M3 dig bus campo

4210 Sorg S->M4 bus campo
(3) = 4214 S->M4 dig bus campo

4220 Sorg S->M5 bus campo
(3) = 4224 S->M5 dig bus campo

4230 Sorg S->M6 bus campo
(3) = 4234 S->M6 dig bus campo

4240 Sorg S->M7 bus campo
(3) = 4244 S->M7 dig bus campo

4250 Sorg S->M8 bus campo
(3) = 4254 S->M8 dig bus campo

4260 Sorg S->M9 bus campo
(3) = 4264 S->M9 dig bus campo

4270 Sorg S->M10bus campo
(3) = 4274 S->M10 dig bus campo

4280 Sorg S->M11bus campo
(3) = 4284 S->M11 dig bus campo

4290 Sorg S->M12bus campo
(3) = 4294 S->M12 dig bus campo

4300 Sorg S->M13bus campo
(3) = 4304 S->M13 dig bus campo

4310 Sorg S->M14bus campo
(3) = 4314 S->M14 dig bus campo

4320 Sorg S->M15bus campo
(3) = 4324 S->M15 dig bus campo

4330 Sorg S->M16bus campo
(3) = 4334 S->M16 dig bus campo

4340 DS402 cw src
(3) = 4024 Mon M->S1 bus campo

4346 PFdrv cw 1 src
(3) = 4024 Mon M->S1 bus campo

4348 PFdrv cw 2 src
(3) = 4034 Mon M->S2 bus campo

L_LIM

IPA	Descrizione
6000	Zero
1500	Mon ingr analogico 1
1550	Mon ingr analogico 2
1600	Mon ingr analogico1X
1650	Mon ingr analogico2X
4024	Mon M->S1 bus campo
4034	Mon M->S2 bus campo
4044	Mon M->S3 bus campo
4054	Mon M->S4 bus campo
4064	Mon M->S5 bus campo
4074	Mon M->S6 bus campo
4084	Mon M->S7 bus campo
4094	Mon M->S8 bus campo
4104	Mon M->S9 bus campo
4114	Mon M->S10 bus campo
4124	Mon M->S11 bus campo
4134	Mon M->S12 bus campo
4144	Mon M->S13 bus campo
4154	Mon M->S14 bus campo
4164	Mon M->S15 bus campo
4174	Mon M->S16 bus campo
3700	Pad 1
3702	Pad 2
3704	Pad 3
3706	Pad 4
3708	Pad 5
3710	Pad 6
3712	Pad 7
3714	Pad 8
3716	Pad 9
3718	Pad 10
3720	Pad 11
3722	Pad 12
3724	Pad 13
3726	Pad 14
3728	Pad 15
3730	Pad 16
5008	Uscita generat test

L_MLTREF

IPA	Descrizione
XXXX	*(4)*
1500	Mon ingr analogico 1
1550	Mon ingr analogico 2
852	Mon uscita multirif
894	Monit uscita motopot
2150	Velocità encoder
1600	Mon ingr analogico1X
1650	Mon ingr analogico2X
4024	Mon M->S1 bus campo
4034	Mon M->S2 bus campo
4044	Mon M->S3 bus campo
4054	Mon M->S4 bus campo
4064	Mon M->S5 bus campo
4074	Mon M->S6 bus campo
4084	Mon M->S7 bus campo
4094	Mon M->S8 bus campo
4104	Mon M->S9 bus campo
4114	Mon M->S10 bus campo
4124	Mon M->S11 bus campo
4134	Mon M->S12 bus campo
4144	Mon M->S13 bus campo
4154	Mon M->S14 bus campo
4164	Mon M->S15 bus campo
4174	Mon M->S16 bus campo
3700	Pad 1
3702	Pad 2
3704	Pad 3
3706	Pad 4
3708	Pad 5
3710	Pad 6
3712	Pad 7
3714	Pad 8
3716	Pad 9
3718	Pad 10
3720	Pad 11
3722	Pad 12
3724	Pad 13
3726	Pad 14
3728	Pad 15
3730	Pad 16
5008	Uscita generat test

(4) il parametro XXXX cambia in funzione del parametro src che la utilizza:

610 Sorg riferim rampa 1
(4) = *600 Rif digitale rampa 1*

612 Sorg riferim rampa 2
(4) = *602 Rif digitale rampa 2*

614 Sorg riferim rampa 3
(4) = *604 Rif digitale rampa 3*

650 Sorg rif velocità 1
(4) = *640 Rif digit velocità 1*

652 Sorg rif velocità 2
(4) = *642 Rif digit velocità 2*

832 Sorg multiriferim 0
(4) = *800 Multiriferimento 0*

834 Sorg multiriferim 1
(4) = *802 Multiriferimento 1*

L_REF

IPA	Descrizione
1500	Mon ingr analogico 1
1550	Mon ingr analogico 2
626	Monitor rifer rampa
664	Imp. valore velocità
262	Vel mot non filtrata
2150	Velocità encoder
1600	Mon ingr analogico1X
1650	Mon ingr analogico2X
4024	Mon M->S1 bus campo
4034	Mon M->S2 bus campo
4044	Mon M->S3 bus campo
4054	Mon M->S4 bus campo
4064	Mon M->S5 bus campo
4074	Mon M->S6 bus campo
4084	Mon M->S7 bus campo
4094	Mon M->S8 bus campo
4104	Mon M->S9 bus campo
4114	Mon M->S10 bus campo
4124	Mon M->S11 bus campo
4134	Mon M->S12 bus campo
4144	Mon M->S13 bus campo
4154	Mon M->S14 bus campo
4164	Mon M->S15 bus campo
4174	Mon M->S16 bus campo
3700	Pad 1
3702	Pad 2
3704	Pad 3
3706	Pad 4
3708	Pad 5
3710	Pad 6
3712	Pad 7
3714	Pad 8
3716	Pad 9
3718	Pad 10
3720	Pad 11
3722	Pad 12
3724	Pad 13
3726	Pad 14
3728	Pad 15
3730	Pad 16
5008	Uscita generat test

L_SCOPE

IPA	Descrizione
6000	Zero

L_VREF

IPA	Descrizione
XXXX	*(5)*
3104	Monitor comp inerzia
3374	Uscita aggancio Vf
1500	Mon ingr analogico 1
1550	Mon ingr analogico 2
1600	Mon ingr analogico1X
1650	Mon ingr analogico2X
4024	Mon M->S1 bus campo
4034	Mon M->S2 bus campo
4044	Mon M->S3 bus campo
4054	Mon M->S4 bus campo
4064	Mon M->S5 bus campo
4074	Mon M->S6 bus campo
4084	Mon M->S7 bus campo
4094	Mon M->S8 bus campo
4104	Mon M->S9 bus campo
4114	Mon M->S10 bus campo
4124	Mon M->S11 bus campo
4134	Mon M->S12 bus campo
4144	Mon M->S13 bus campo
4154	Mon M->S14 bus campo
4164	Mon M->S15 bus campo
4174	Mon M->S16 bus campo
3700	Pad 1
3702	Pad 2
3704	Pad 3
3706	Pad 4
3708	Pad 5
3710	Pad 6
3712	Pad 7
3714	Pad 8
3716	Pad 9
3718	Pad 10
3720	Pad 11
3722	Pad 12
3724	Pad 13
3726	Pad 14
3728	Pad 15
3730	Pad 16
6000	Zero
5008	Uscita generat test

(5) il parametro XXXX cambia in funzione del parametro src che la utilizza:

2382 Sorg rifer coppia 1
(5) = 2380 Rifer digit coppia 1

2492 Sorgente scalat Vf
(5) = 2490 Scal digitale Vf

3002 Sorg rapp velocità
(5) = 3000 Rapp digit velocità

L_WDECOMP

IPA	Descrizione
XXXX	*(6)*
6000	Zero
6002	Uno
4432	Monitor word comp
4024	Mon M->S1 bus campo
4034	Mon M->S2 bus campo
4044	Mon M->S3 bus campo
4054	Mon M->S4 bus campo
4064	Mon M->S5 bus campo
4074	Mon M->S6 bus campo
4084	Mon M->S7 bus campo
4094	Mon M->S8 bus campo
4104	Mon M->S9 bus campo
4114	Mon M->S10 bus campo
4124	Mon M->S11 bus campo
4134	Mon M->S12 bus campo
4144	Mon M->S13 bus campo
4154	Mon M->S14 bus campo
4164	Mon M->S15 bus campo
4174	Mon M->S16 bus campo
3700	Pad 1
3702	Pad 2
3704	Pad 3
3706	Pad 4
3708	Pad 5
3710	Pad 6
3712	Pad 7
3714	Pad 8
3716	Pad 9
3718	Pad 10
3720	Pad 11
3722	Pad 12
3724	Pad 13
3726	Pad 14
3728	Pad 15
3730	Pad 16

(6) il parametro XXXX cambia in funzione del parametro src che la utilizza:

4452 Sorgente word decomp
(6) = 4450 Word decomp digitale

L_

IPA	Descrizione

TROUBLESHOOTING

Code	Error message displayed	Sub-code	Description
0	No alarm	**Condition**: No alarm present	
1	Overvoltage	**Condition**: DC link overvoltage alarm due to energy recovered from the motor. The voltage arriving at the drive power section is too high compared to the maximum threshold relating to the **560 Mains voltage** parameter setting**.**	
		Solution: - Extend the deceleration ramp. - Use a braking resistor between terminals BR1 and BR2 to dissipate the recovered energy	
2	Undervoltage	**Condition**: DC link undervoltage alarm. The voltage arriving at the drive power section is too low compared to the minimum threshold relating to the **560 Mains voltage** parameter setting due to:**.** - the mains voltage being too low or overextended voltage drops. - poor cable connections (e.g. loose contactor terminals, inductance, filter...):	
		Solution: Check the connections.	
3	Ground fault	**Condition**: Ground short circuit alarm	
		Solution: - Check drive and motor wiring. - Check that the motor is not grounded.	
4	Overcurrent	**Condition**: Instantaneous overcurrent protection intervention alarm. This may be due to the incorrect setting of current regulator parameters or a short circuit between phases or ground fault on the drive output.	
		Solution: - Check the current regulator parameters - Check wiring towards the motor	
5	Desaturation	**Condition**: Instantaneous overcurrent in the IGBT bridge alarm.	
		Solution: Switch the drive off and then switch it on again. If the alarm persists, contact the technical service centre	
6	MultiUndervolt	**Condizione**: The number of attempted automatic restarts after the **Undervoltage** alarm has exceeded the set **Underv res attempt** value in the **Underv res delay** time.	
		Soluzione: Too many **Undervoltage** alarms. Adopt the proposed solutions for the **Undervoltage** alarm.	
7	MultiOvercurr	**Condizione**: 2 attempted automatic restarts after the **Overcurrent** alarm within 30 seconds. If more than 30 seconds pass after the **Overcurrent** alarm was generated, the attempt counter is reset.	
		Soluzione: Too many **Overcurrent** alarms. Adopt the proposed solutions for the **Overcurrent** alarm.	

Code	Error message displayed	Sub-code	Description
8	MultiDesat		**Condizione**: 2 attempted at automatic restarts after the **Desaturation** alarm within 30 seconds. If more than 30 seconds pass after the **Desaturation** alarm was generated, the attempt counter is reset.
			Soluzione: Too many **Desaturation** alarms. Adopt the proposed solutions for the **Desaturation** alarm.
9	Heatsink OT		**Condition: Heatsink temperature too high alarm**
			Solution: - Verify the correct operation of the cooling fan. - Check that the heatsinks are not clogged
10	HeatsinkS OTUT		**Condition**: Heatsink temperature too high or too low alarm The temperature has exceeded the upper or lower limit set for the linear temperature transducer.
			Solution: - Verify the correct operation of the cooling fan. - Check that the heatsinks are not clogged - Check that the openings for the cabinet cooling air are not blocked.
11	Intakeair OT		**Condition**: Intake air temperature too high alarm.
			Solution: - Check correct fan operation
12	Motor OT		**Condition**: Motor overtemperature alarm. Possible causes: - Load cycle too heavy - The motor is installed in a place where the ambient temperature is too high - If the motor is provided with a blower: the fan is not working - If the motor is not provided with a blower: the load is too high at slow speeds. Cooling the fan on the motor shaft is not sufficient for this load cycle. - The motor is used at less than the rated frequency, causing additional magnetic losses.
			Solution: - Change the processing cycle. - Use a cooling fan to cool the motor.
13	Drive overload		**Condition**: Drive overload alarm. The overload threshold of the accumulator of the I²t drive thermal image has been exceeded.
			Solution: Check that the size of the drive is suitable for the application.
14	Motor overload		**Condition**: Motor overload alarm. The current absorbed during operation is greater than that specified on the motor data plate. The overload threshold of the accumulator of the I²t motor thermal image has been exceeded.
			Solution: - Reduce the motor load. - Increase the size of the motor.

Code	Error message displayed	Sub-code	Description
15	Bres overload	**Condition**: Braking resistor overload alarm. The current absorbed by the resistor is greater than the rated current. The overload threshold of the accumulator of the I²t braking resistor thermal image has been exceeded.	
		Solution: Increase the Watt value of the braking resistor	
16	Phase loss	**Condition**: Power phase loss alarm.	
		Solution: Check the mains voltage and whether any protections upstream of the drive have been tripped.	
17	Guasto opz Bus	**Condizione**: Error in the configuration stage or communication error.	
		XXX0H-X	If the first digit to the left of **"H"** in the alarm sub-code is equal to 0, the error relates to a communication problem.
		XXXH-X	If the first digit to the left of **"H"** in the alarm sub-code is other than 0, the error relates to a configuration problem.
		Soluzione: For configuration errors, check the configuration of the Bus communication, Bus type, Baudrate, address. parameter setting For communication errors verify wiring, resistance of terminations, interference immunity, timeout settings. For more details reference should be made to the datasheet of the bus being used.	
18	Opt 1 IO fault	**Condizione**: Error in the communication between Regulation and I/O expansion card in slot 1	
		Soluzione: Check that it has been inserted correctly	
19	Opt 2 IO fault	**Condizione**: Error in the communication between Regulation and I/O expansion card in slot 2 or 3	
		Soluzione: Check that it has been inserted correctly	
20	Opt Enc fault	**Condizione**: Error in the communication between Regulation and Encoder feedback card.	
		Soluzione: Check that it has been inserted correctly	
21	External fault	**Condition**: External alarm present. A digital input has been programmed as an external alarm, but the +24V voltage is not available on the terminal.	
		Solution: Check that the terminal screws are tight	

Code	Error message displayed	Sub-code	Description
22	Fbk loss		**Condition:** Speed feedback loss alarm. The encoder is not connected, not properly connected or not powered: check encoder operation by selecting the **Motor speed** parameter in the **DISPLAY** menu.
			Solution: - Check encoder wiring for integrity. - Check that the encoder is connected to the power supply. - With the drive disabled, turn the motor clockwise (seen from the motor shaft side). A positive value must be displayed. - If the value does not change or values are indicated randomly, check the encoder power supply and cables. - If the value displayed is negative, invert the encoder connections. Change channel A+ and A- or B+ and B-. - Check that the encoder electronics are consistent with those of the relative expansion card.
23	Overspeed		**Condition**: Motor overspeed alarm. The motor speed exceeds the limits set in the **Speed ref top lim** and **Speed ref bottom lim** parameters.
			Solution: - Limit the speed reference. - Check that the motor is not driven in overspeed during rotation.
24	Speed ref loss		**Condition**: Speed reference loss alarm; occurs if the difference between the speed regulator reference and the actual motor speed is more than 100 rpm. This condition occurs because the drive is in the current limit condition. It is only available in the Flux Vect OL and Flux Vect OC mode.
			Solution: Check the drive load conditions.
25	Emg stop alarm		**Condition**: Emergency stop alarm. The Stop key on the keypad was pressed with the **Stop key mode** parameter set to **EmgStop&Alarm** in case of Remote->Terminal Strip or Remote->Digital or Local->Terminal Strip mode.
			Solution: Eliminate the reason for which the Stop key on the keypad was pressed and reset the drive.
26	Power down		**Condition:** The drive was enabled with no supply voltage at the power section.
			Condition: Emergency stop alarm. The Stop key on the keypad was pressed with the **Stop key mode** parameter set to **EmgStop&Alarm** in case of Remote->Terminal Strip or Remote->Digital or Local->Terminal Strip mode.
27	Not Used1		**Condition:**
			Solution:
28	Not Used2		**Condition:**
			Solution:
29	Not Used3		**Condition:**
			Solution:

Code	Error message displayed	Sub-code	Description
30	Not Used4	**Condition:**	
		Solution:	
31	Not Used5	**Condition:**	
		Solution:	
32	Not Used6	**Condition:**	
		Solution:	
33	Plc1 fault	**Condizione**: Enabled application developed in the IEC 61131-3 environment has found the conditions for generating this specific alarm to be true. The meaning of the alarm depends on the type of application. For more information, refer to the documentation concerning the specific application..	
		XXXXH-X	The XXXXH-X code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Solution: Refer to the documentation concerning the enabled application.	
34	Plc2 fault	**Condizione**: Enabled application developed in the IEC 61131-3 environment has found the conditions for generating this specific alarm to be true. The meaning of the alarm depends on the type of application. For more information, refer to the documentation concerning the specific application.	
		XXXXH-X	The XXXXH-X code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Soluzione: Refer to the documentation concerning the enabled application.	
35	Plc3 fault	**Condizione**: Enabled application developed in the IEC 61131-3 environment has found the conditions for generating this specific alarm to be true. The meaning of the alarm depends on the type of application. For more information, refer to the documentation concerning the specific application.	
		XXXXH-X	The XXXXH-X code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Soluzione: Refer to the documentation concerning the enabled application.	
36	Plc4 fault	**Condizione:** Enabled application developed in the IEC 61131-3 environment has found the conditions for generating this specific alarm to be true. The meaning of the alarm depends on the type of application. For more information, refer to the documentation concerning the specific application.	
		XXXXH-X	The XXXXH-X code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Soluzione: Refer to the documentation concerning the enabled application.	

Code	Error message displayed	Sub-code	Description
37	Plc5 fault	**Condizione:** Enabled application developed in the IEC 61131-3 environment has found the conditions for generating this specific alarm to be true. The meaning of the alarm depends on the type of application. For more information, refer to the documentation concerning the specific application.	
		XXXXH-X	The XXXXH-X code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Soluzione: Refer to the documentation concerning the enabled application.	
38	Plc6 fault	**Condizione:** Enabled application developed in the IEC 61131-3 environment has found the conditions for generating this specific alarm to be true. The meaning of the alarm depends on the type of application. For more information, refer to the documentation concerning the specific application.	
		XXXXH-X	The XXXXH-X code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Soluzione: Refer to the documentation concerning the enabled application.	
39	Plc7 fault	**Condizione**: Enabled application developed in the IEC 61131-3 environment has found the conditions for generating this specific alarm to be true. The meaning of the alarm depends on the type of application. For more information, refer to the documentation concerning the specific application.	
		XXXXH-X	The XXXXH-X code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Soluzione: Refer to the documentation concerning the enabled application.	
40	Plc8 fault	**Condizione:** Enabled application developed in the IEC 61131-3 environment has found the conditions for generating this specific alarm to be true. The meaning of the alarm depends on the type of application. For more information, refer to the documentation concerning the specific application.	
		XXXXH-X	The XXXXH-X code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Soluzione: Refer to the documentation concerning the enabled application.	
41	Watchdog	**Condition: this condition can occur during operation when the watchdog** micro protection is enabled; the alarm is included in the list of alarms and alarm log. After this alarm: - the drive automatically runs a reset - motor control is not available.	
		XXXXH-X	The XXXXH-X code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Solution: If the alarm was a consequence of a variation to the drive configuration (parameter setting, installation of an option, downloading of a PLC application), remove it. Switch the drive off and then switch it on again.	

Code	Error message displayed	Sub-code	Description
42	Trap error	**Condition: this condition can occur during operation when the trap** micro protection is enabled; the alarm is included in the list of alarms and alarm log. After this alarm: - the drive automatically runs a reset - motor control is not available.	
		XXXXH-X	The XXXXH-X (SubHandler-Class) code indicates the reason for the error: make a note of this to discuss it with the service centre:.
		Solution: If the alarm was a consequence of a variation to the drive configuration (parameter setting, installation of an option, downloading of a PLC application), remove it. Switch the drive off and then switch it on again.	
43	System error	**Condition: this condition can occur during operation when the operating system protection is enabled**; the alarm is included in the list of alarms and alarm log. After this alarm: - the drive automatically runs a reset - motor control is not available.	
		XXXXH-X	The XXXXH-X (Error-Pid) code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Solution: If the alarm was a consequence of a variation to the drive configuration (parameter setting, installation of an option, downloading of a PLC application), remove it. Switch the drive off and then switch it on again.	
44	User error	**Condition: this condition can occur during operation when the software protection is enabled**; the alarm is included in the list of alarms and alarm log. After this alarm: - the drive automatically runs a reset - motor control is not available.	
		XXXXH-X	The XXXXH-X (Error-Pid) code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Solution: If the alarm was a consequence of a variation to the drive configuration (parameter setting, installation of an option, downloading of a PLC application), remove it. Switch the drive off and then switch it on again.	
45	Param error	**Condition: if an error occurs during the enabling of the parameter database saved in the Flash memory**; the alarm is included in the list of alarms and alarm log.	
		XXXXH-X	The XXXXH-X code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Solution: Set the parameter causing the error to the correct value and run Save parameter. Switch the drive off and then switch it back on again.	

Code	Error message displayed	Sub-code	Description
46	Load default	**Condition**: **this can occur during loading of the parameter database saved in the Flash memory** it is normal if it appears in the following conditions: the first time the drive is switched on, when a new version of the firmware is downloaded, when the regulation is installed on a new size, when a new region is entered. If this message appears when the drive is already in use it means there has been a problem in the parameter database saved in the Flash memory. If this message is displayed the drive restores the default database, i.e. the one that was downloaded.	
		0001H-1	The saved database is not valid
		0002H-2	The saved database is not compatible
		0003H-3	The saved database refers to a different size and not to the current size
		0004H-4	The saved database refers to a different region and not to the current region
		Solution: Set the parameters to the desired value and run Save parameter	
47	Plc cfg error	**Condition: this can occur during loading of the MDPLC application** The Mdplc application present on the drive is not run.	
		0004H-4	The application that has been downloaded has a different Crc on the DataBlock and Function table.
		0065H-101	The application that has been downloaded has an invalid identification code (Info).
		0066H-102	The applciation that has been downloaded uses an incorrect task number (Info).
		0067-H103	The application that has been downloaded has an incorrect software configuration.
		0068H-104	The application that has been downloaded has a different Crc on the DataBlock and Function table.
		0069H-105	A Trap error or System error has occurred. The drive has automatically executed a Power-up operation. Application not executed. See the Alarm List for more information about an error that has occurred.
		006AH-106	The application that has been downloaded has an invalid identification code (Task).
		006BH-107	The application that has been downloaded uses an incorrect task number (Task).
		006CH-108	The application that has been downloaded has an incorrect Crc (Tables + Code)
		Solution: Remove the MDPLC application or download a correct MDPLC application.	

Code	Error message displayed	Sub-code	Description
48	Load par def plc	**Condition**: **this can occur during loading of the parameter database saved in the Flash memory of the MDPLC application** it is normal if it appears the first time the drive is switched on, after downloading a new application. If this message appears when the drive is already in use it means there has been a problem in the parameter database saved in the Flash memory. If this message appears the drive automatically runs the Load default command.	
		0001H-1	The saved database is not valid
		Solution: Set the parameters to the desired value and run Save parameter.	
49	Key failed	**Condition:** this can occur at drive power-on if the wrong enabling key is entered for a given firmware function	
		0001H-1	Incorrect PLC key. PLC application not available
		Solution: Contact Gefran to request the key to enable the desired firmware function.	

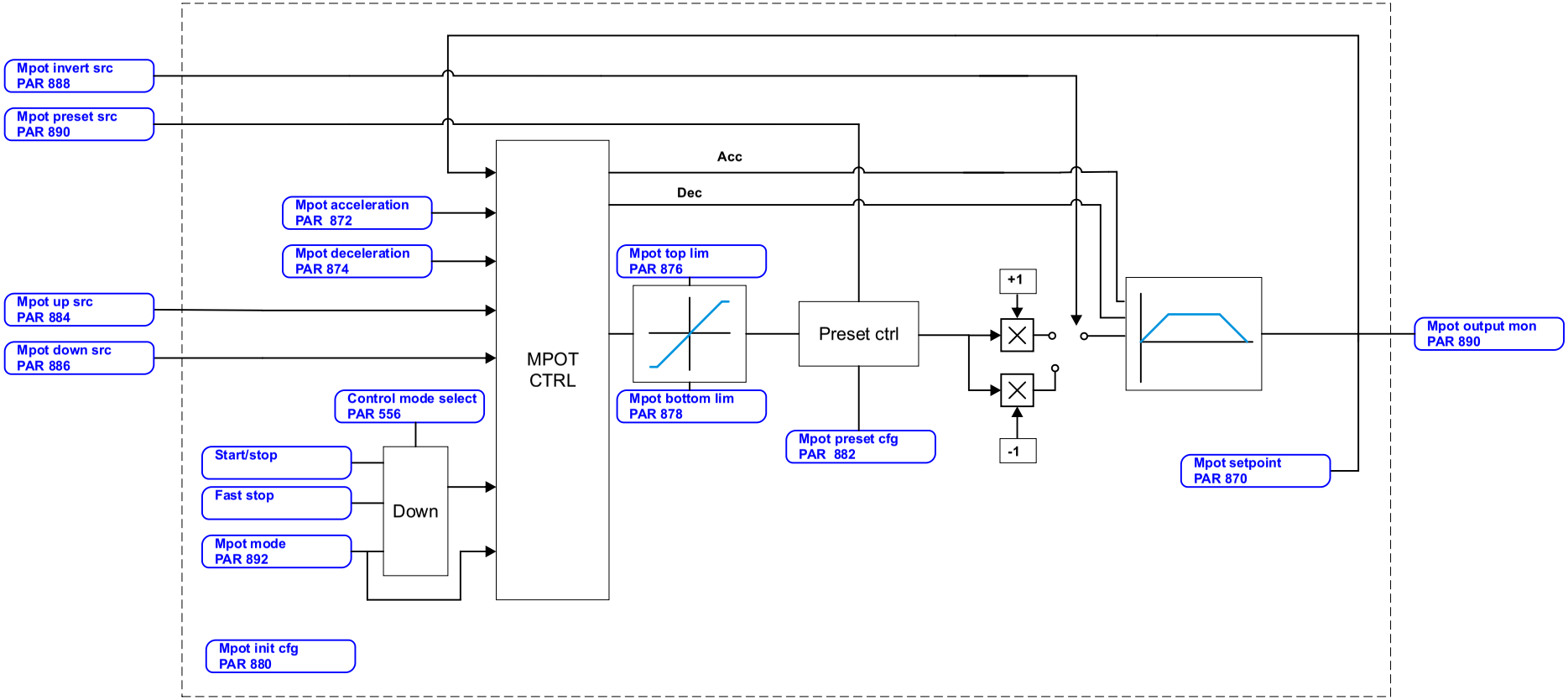
MESSAGES

Error message shown on the display	Sub-code	Description
Autotune	Condition: this may occur during the self-tuning procedure	
	0	No error
	1	The commands are not configured in Local mode.
		Solution: Execute the requested configuration
	2	The Commands local sel parameter has not been configured from the keypad
		Solution: Execute the requested configuration
	3	The motor plate data parameters have changed but the Take parameters command, PAR 2020, has not been executed
		Solution: Execute the Take parameters command.
	4	The motor is not connected
		Solution: Connect the motor
	5	While running self-tuning the ESC key was pressed or the enable contact was opened or an alarm occurred. The self-tuning command was sent with the drive in the alarm condition
		Solution: Eliminate the reason for the alarm, remove the reason for the opening of the enable contact, reset alarms.
	6	A setting performed by the self-tuning function produced a parameter value outside the min or max range.
		Solution: Check the motor plate data or drive and motor sizes have been combined incorrectly.
	7	The self-tuning command was sent without being enabled.
		Solution: Close the enable contact before sending the self-tuning command
	8 ... 21	A setting performed by self-tuning has reached a measurement method limit
		Solution: Check the motor plate data or the drive and motor sizes have been combined incorrectly.
	Solution: If the message appears with a value other than 0, follow the instructions supplied for each particular case and repeat self-tuning. This should be performed using the wizard function available from the keypad (STARTUP WIZARD) and the Tool software on the PC. Pay attention to all motor plate data parmaeters, especially: - Rated speed, Motor rated speed in rpm. - Rated frequency, Motor rated frequency in Hz - Pole pairs, Motor pole pairs Take care not to set the Rated speed parameter to the synchronous speed. The value of the Rated speed parameter must be less than: [(Rated frequency * 60) / Pole pairs]. If the problem persists even after following the instructions supplied, confirm the values of the motor plate data parameters, execute the Take parameters command but not self-tuning.	
Key expiring	Condition: this may occur at drive power-on if the incorrect enabling key was inserted for a given firmware function. At this stage the firmware function can still be used freely, but this time limit is about to expire.	
	xxxxH-x	Number of hours for which the function can still be used freely.
	Solution: Ask Gefran for the correct key to enable the desired firmware function.	
Load default	Condition: may occur during loading of the parameter database saved in flash normally appears in the following conditions: at initial power-on when a new firmware version is downloaded, when the regulation is installed on a new size, when the region is changed. If this message is displayed when the drive is already operating, this means that a problem has occurred in the parameter database saved in Flash. If this message is displayed, the drive automatically performs the Load default command.	
	0001H-1	The database saved is not valid
	0002H-2	The database saved is not compatible
	0003H-3	The database saved refers to a different size from the current size
	0004H-4	The database saved refers to a different region from the current region

	Solution: Set the parameters to the value required and perform Save parameter	
Load def plc	Condition: may occur during loading of the parameter database saved in the Flash of the Mdplc application Normally appears at initial power-on after downloading a new application. If this message is displayed when the drive is already operating, this means that a problem has occurred in the parameter database saved in Flash. If this message appears the drive restores the default database, i.e. the one that was downloaded.	
	0001H-1	The database saved is not valid
	Solution: Set the parameters to the value required and perform Save parameter	
Load par failed	Condition: during transfer of the parameters from the memory of the keypad to the drive	
	0H-0	Communication error
	0025H-37	The data saved on the keypad are not valid. No parameter is transferred from the keypad to the drive
	0026H-38	Incompatible drive series. No parameter is transferred from the keypad to the drive
	0027H-39	Incompatible software version. All the parameters present in the memory of the keypad have been transferred to the drive. The set of parameters transferred refers to a drive with a different firmware version; therefore, certain parameters may not be updated.
	0028H-40	Incompatible drive size. All the parameters present in the memory of the keypad (excluding those that depend on the size of the drive), have been transferred to the drive. The parameters that depend on size maintain their original value.
	0029H-41	Error during saving of parameters on the drive. All the parameters present in the memory of the keypad have been transferred to the drive. The transfer of one or more parameters has caused an “out of range” error, or one or more parameters does not exist. At the end of transfer, one or more parameters may not have been updated.
	002AH-42	PLC application release and version not compatible. All parameters in the keypad memory have been transferred to the drive. The transferred set of parameters relates to a drive with a PLC application in which the version and release of the application are different. As a result some of the PLC application parameters may not be updated.
	002BH-43	PLC application not compatible. All the parameters in the keypad memory except those relating to the PLC applciation have been transferred to the drive. The transferred set of parameters relates to a drive with a different PLC application. As a result none of the PLC application parameters are updated.
	Solution: Recover a set of parameters from a compatible drive (model and size)	
Options config error	Condition: may occur at drive start-up, during recognition of the optional cards installed	
	0001H-1	Non-permissible optional card in slot 1
	0002H-2	Non-permissible optional card in slot 2
	0004H-4	Non-permissible optional card in slot 3
	0010H-16	Conflict slot 1 with slot 2
	0020H-32	Conflict slot 1 with slot 3
	0040H-64	Conflict slot 2 with slot 3
	Solution: Remove the optional cards from the incorrect slots and insert them in the correct slots	
Option detect slot 1 Option detect slot 2 Option detect slot 3	Condition: at power-on, the drive recognizes the presence of an optional card in one of the three expansion slots. One of the three messages is shown on the display	
	0H-0	None
	0001H-1	I_O_1
	0004H-4	Can_Dnet
	0008H-8	Enc_1
	00FFH-255	Unknown
	0101H-257	I_O_2
	0104H-260	Profibus

	0108H-264	Enc_2
	0201H-513	I_O_3
	0204H-516	Gdnet
	0301H-769	I_O_4
	Solution:	
Plc cfg error	Condition: may occur during loading of the Mdplc application The Mdplc application present on the drive is not run.	
	0004H-4	The application downloaded has a different Crc on DataBlock and Function table
	0065H-101	The application downloaded has an invalid identifier (Info)
	0066H-102	The application downloaded has an incorrect task number (Info)
	0067H-103	The application downloaded has an incorrect software configuration
	0068H-104	The application downloaded has a different Crc on DataBlock and Function table
	0069H-105	A Trap error or System error has occurred. The drive automatically performs a Power-up operation. The application is not run. See in Alarm List for further information regarding the error occurred
	006AH-106	The application downloaded has an incorrect identifier (Task)
	006BH-107	The application downloaded has an incorrect task number (Task)
	006CH-108	The application downloaded has an incorrect Crc (Tables + Code)
	Solution: Remove the Mdplc application or download a correct Mdplc application	
Power config	Condition: may occur during recognition of power cards. If this message is displayed, it is not possible to drive the motor.	
	0020H-32	The power card is configured for a drive that is incompatible with the regulation card
	0021H-33	The configuration of the power card is not compatible with the regulation card
	0017H-23	The configuration required is not available on the power card
	Solution: Download the correct configuration on the power card	
Save par failed	Condition: during transfer of the parameters from the drive to the memory of the keypad	
	0H-0	Communication error
	0025H-37	The data saved on the keypad are not valid
	0026H-38	Incompatible drive series
	0027H-39	Incompatible software version
	0028H-40	Incompatible drive size
	0029H-41	Error during saving of parameters on the drive
	Solution:	

Mpot



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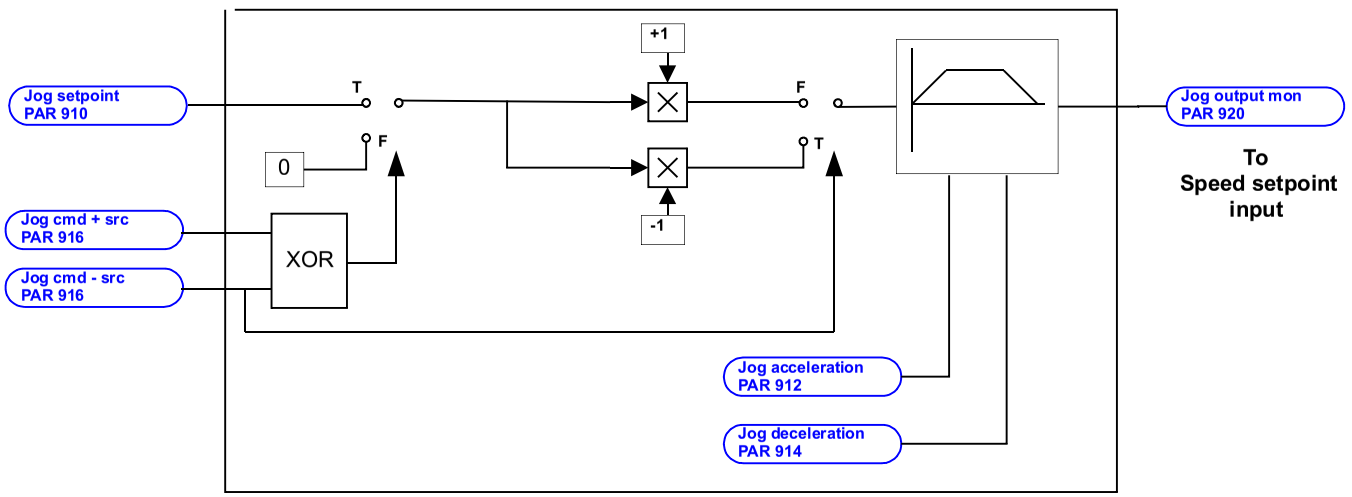
	Proprietary Information **Do Not Copy**	Issued Date --- Initials:	19/02/07
		Revision Date -- Initials:	22/01/08

Jog



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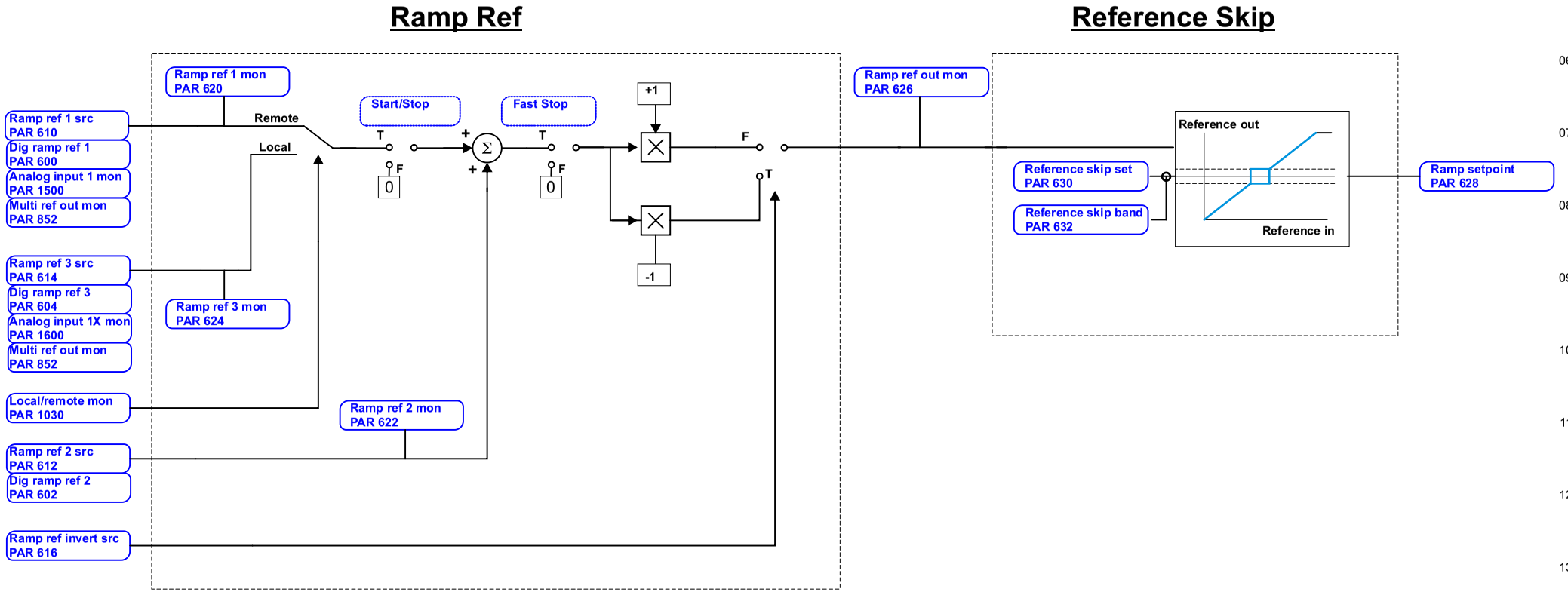
Via Carducci, 24
I-21040 Gerenzano VA

PRODUCT: ADV 200	File name:
Proprietary Information **Do Not Copy**	Issued Date --- Initials: **19/02/07**
	Revision Date -- Initials: 22/01/08



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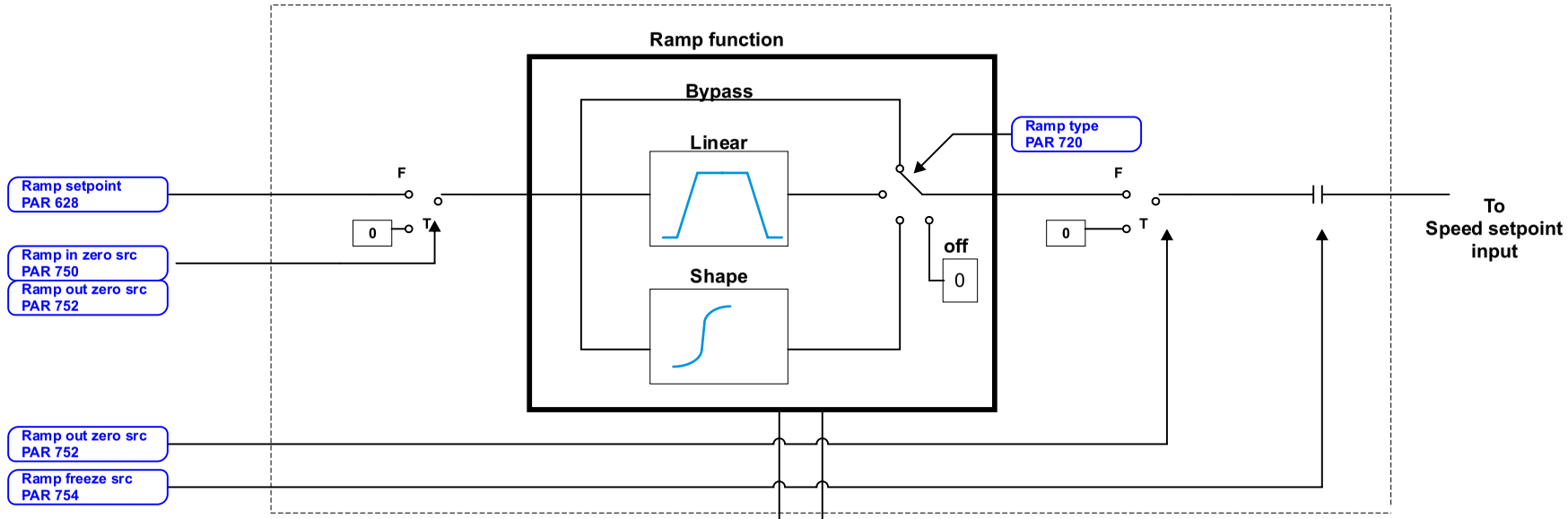
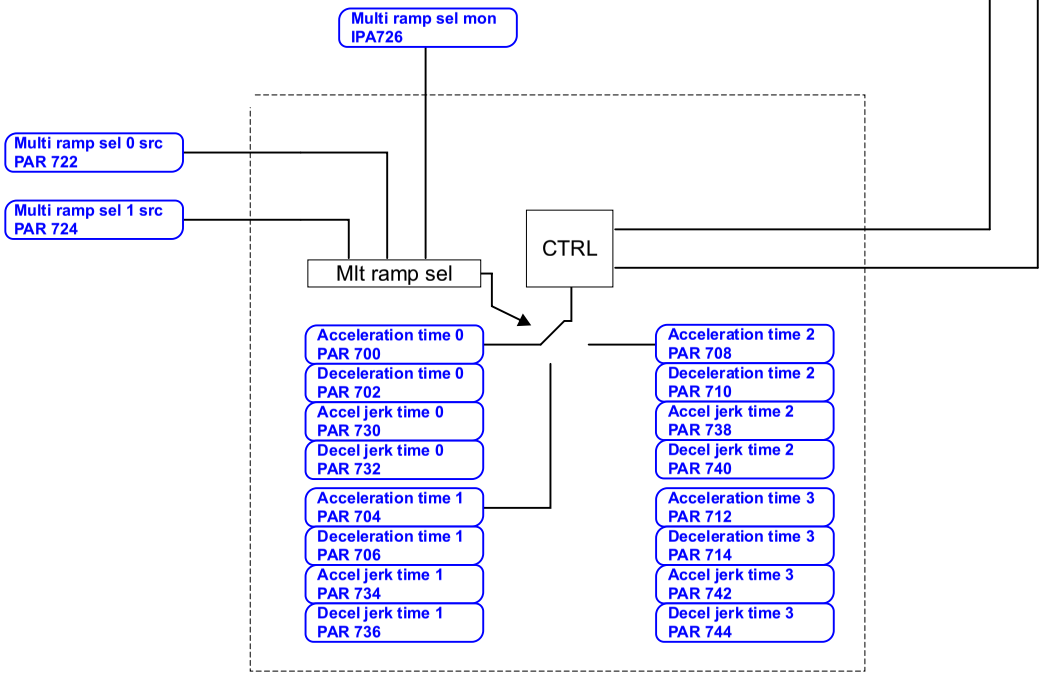
	Proprietary Information **Do Not Copy**	Issued Date --- Initials: **19/02/07**
		Revision Date -- Initials: 22/01/08

Ramp



Multi Ramp



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PRODUCT: ADV 200

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Issued Date --- Initials: 19/02/07

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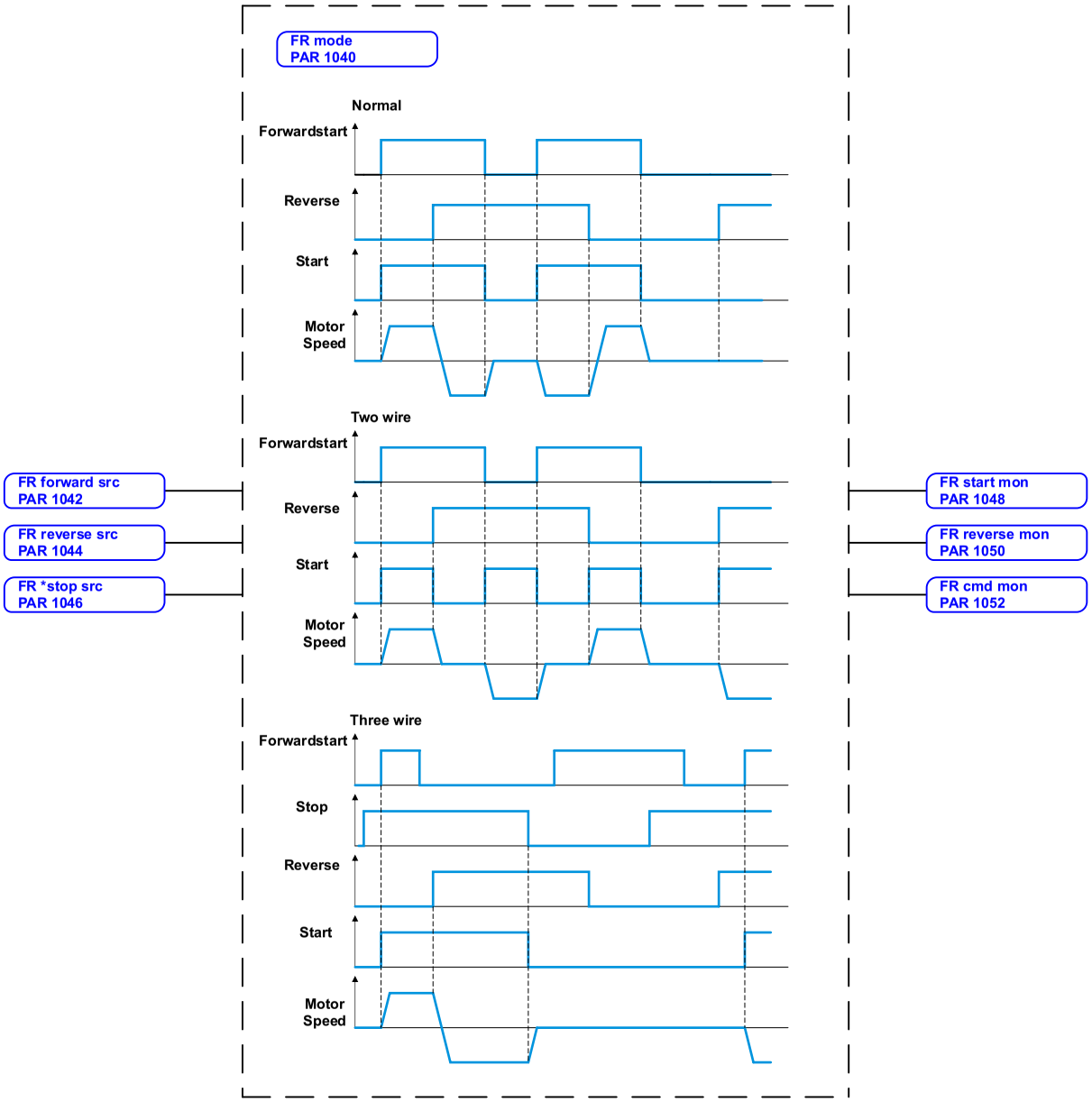
FRC



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PRODUCT:	ADV 200
Proprietary Information	**Do Not Copy**
File name:	
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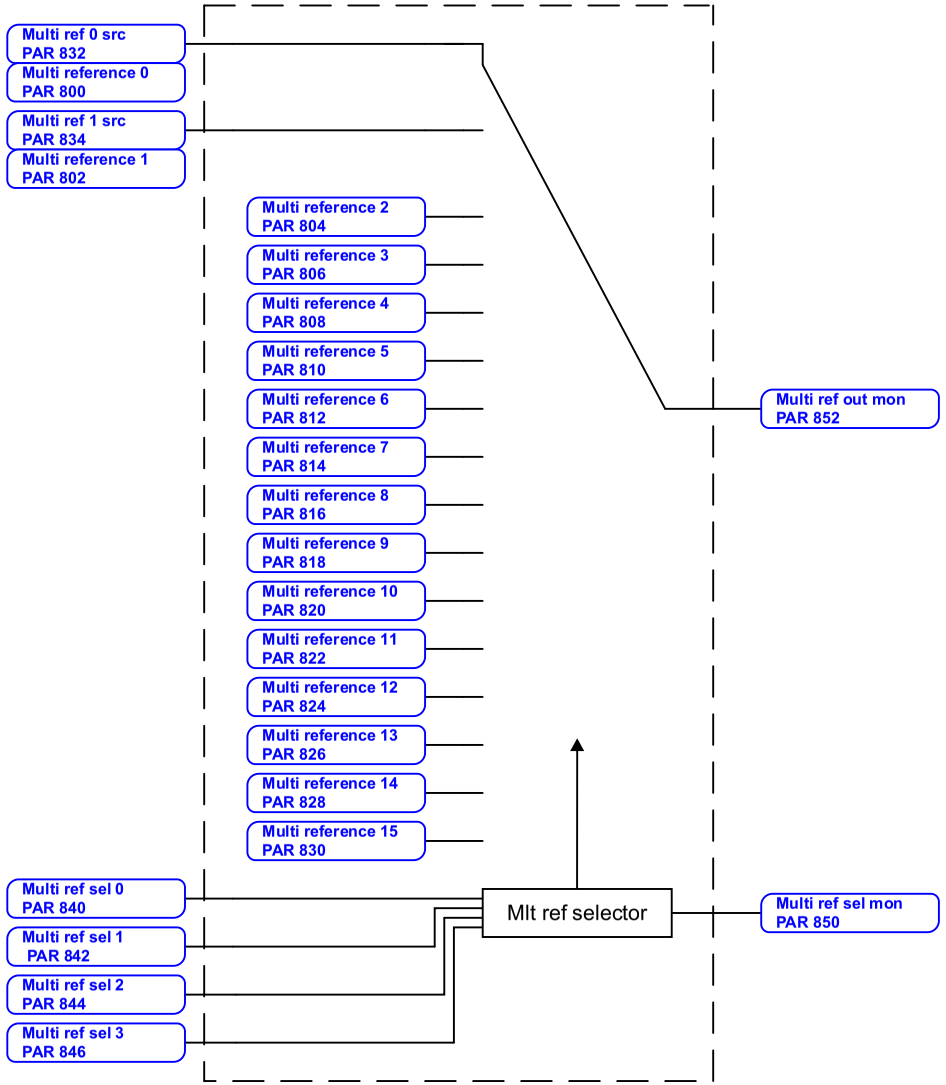
Multi Reference



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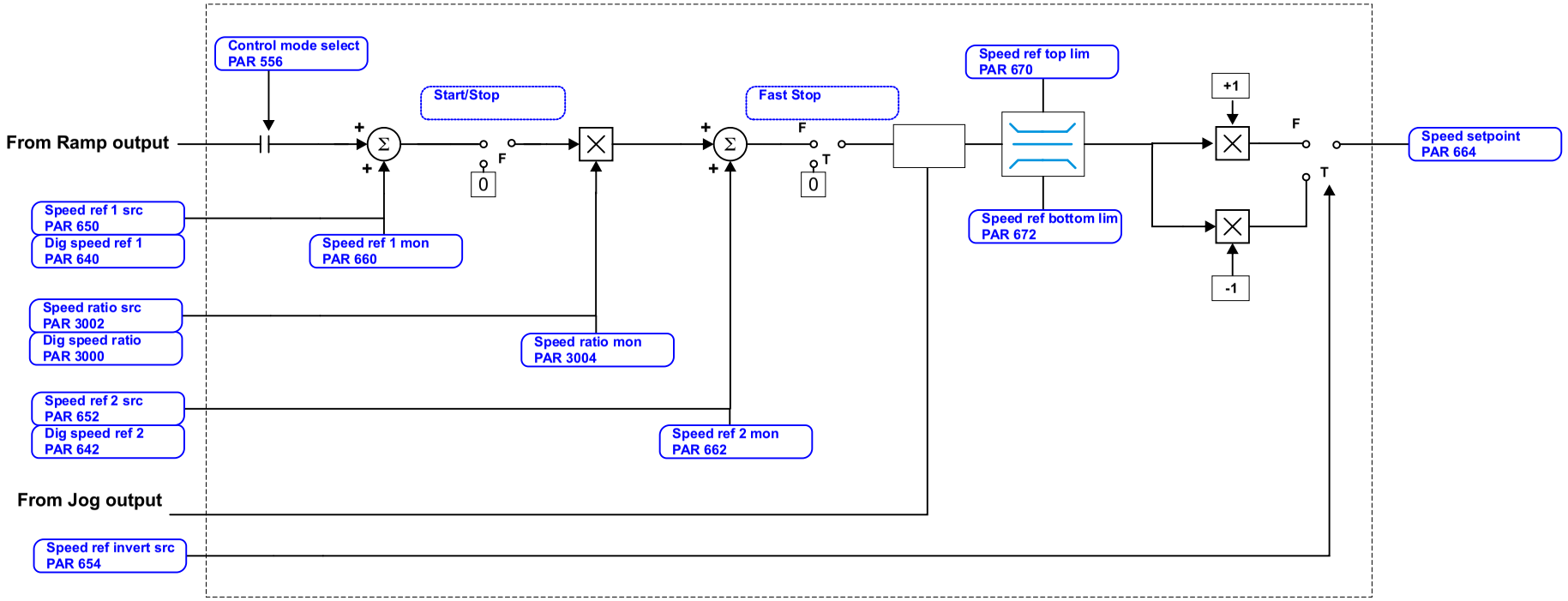
Speed Reference



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PRODUCT: ADV 200	File name:
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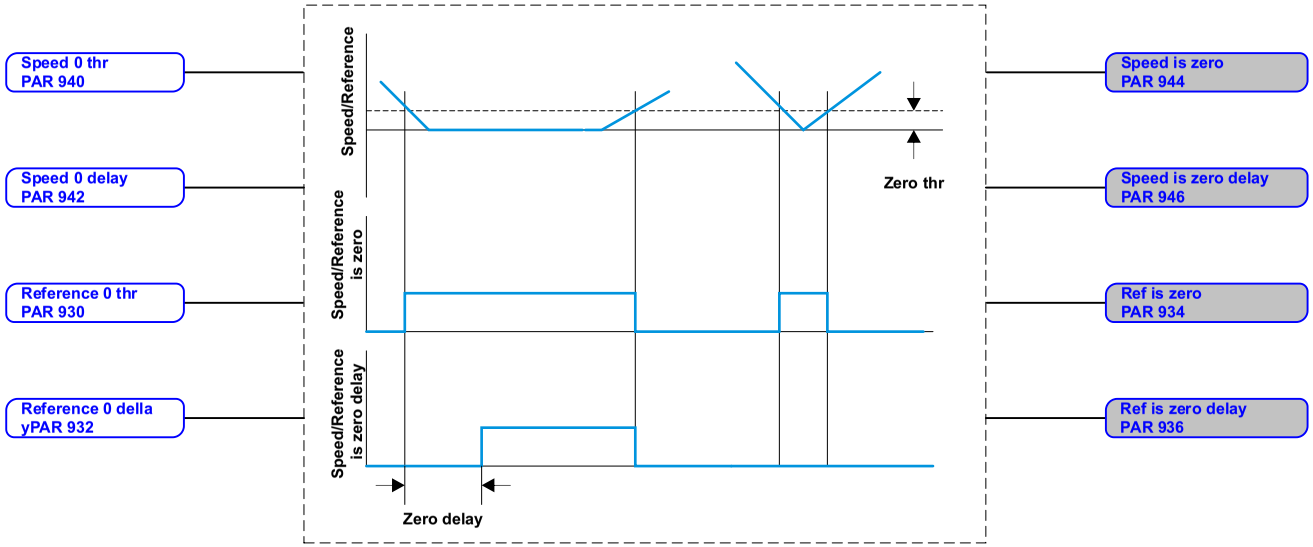
Speed Zero



On “L_DIGSEL1” and “L_DIGSEL3” selection lists

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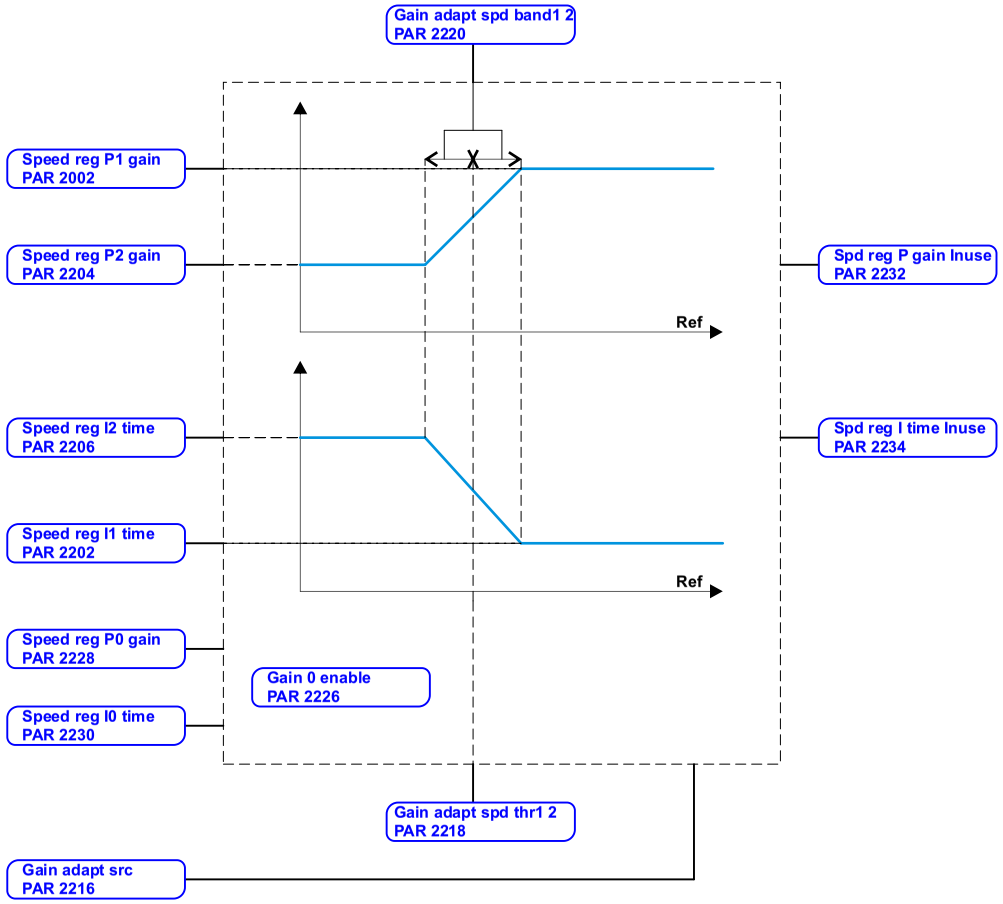
Gain adapt



GEFRAN Via Carducci, 24 I-21040 Gerenzano VA	PRODUCT: ADV 200	File name:
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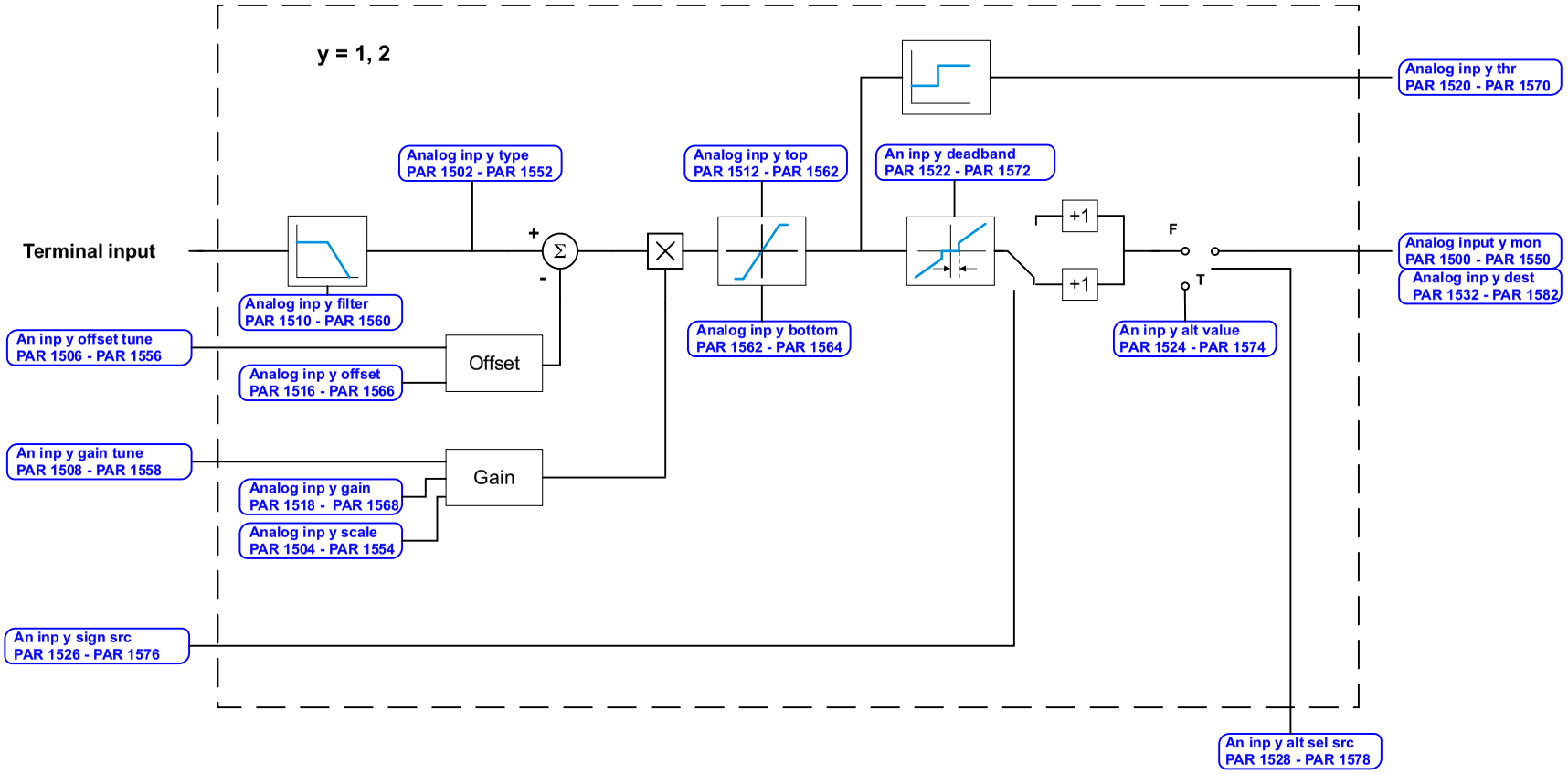
Analog Inputs Standard



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	Proprietary Information **Do Not Copy**		Issued Date --- Initials: 19/02/07
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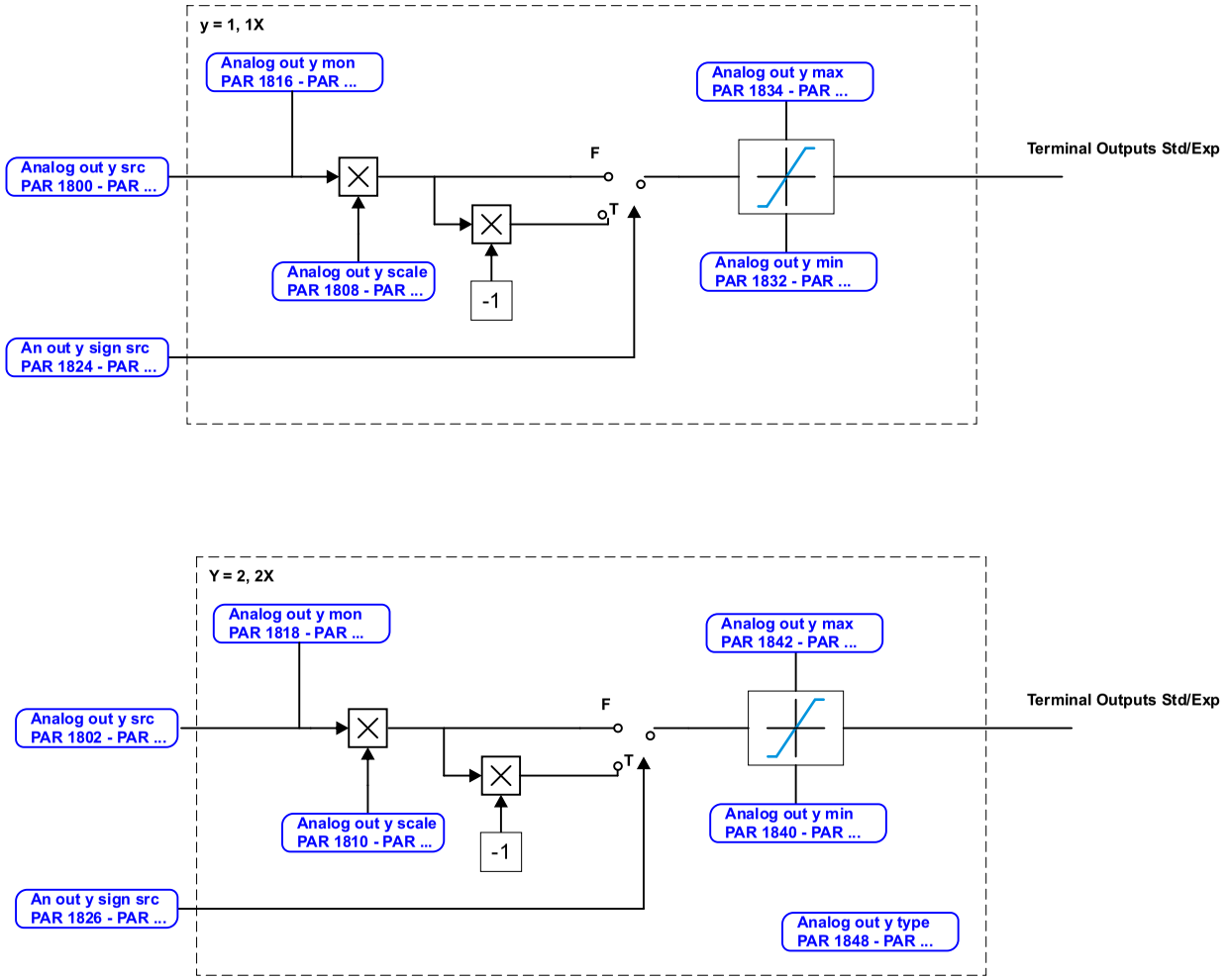
Analog Outputs



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PRODUCT: ADV 200	File name:
Proprietary Information **Do Not Copy**	Issued Date — Initials: **19/02/07**
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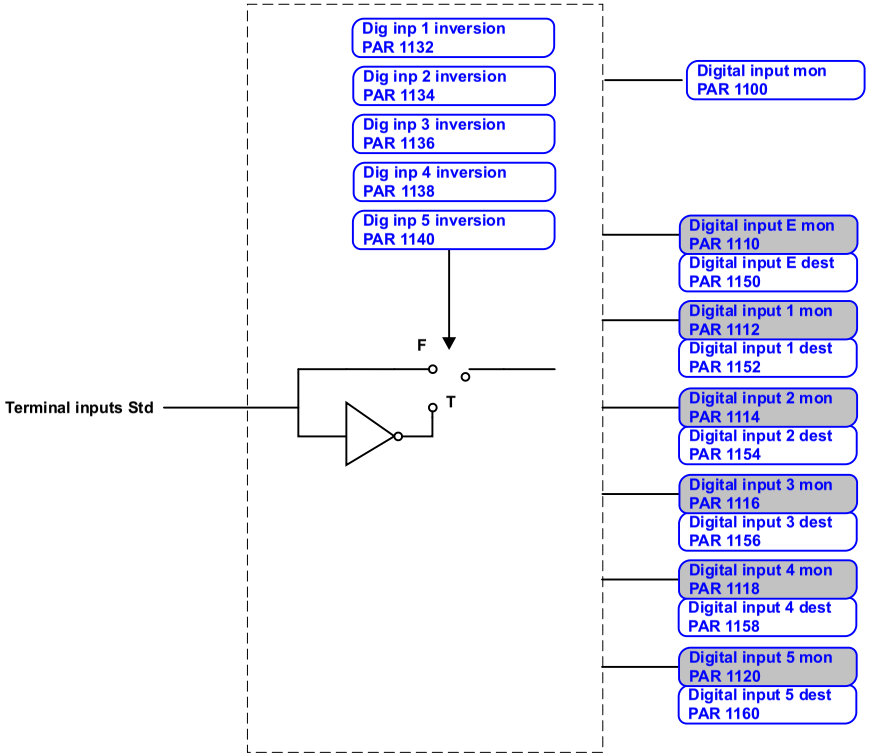
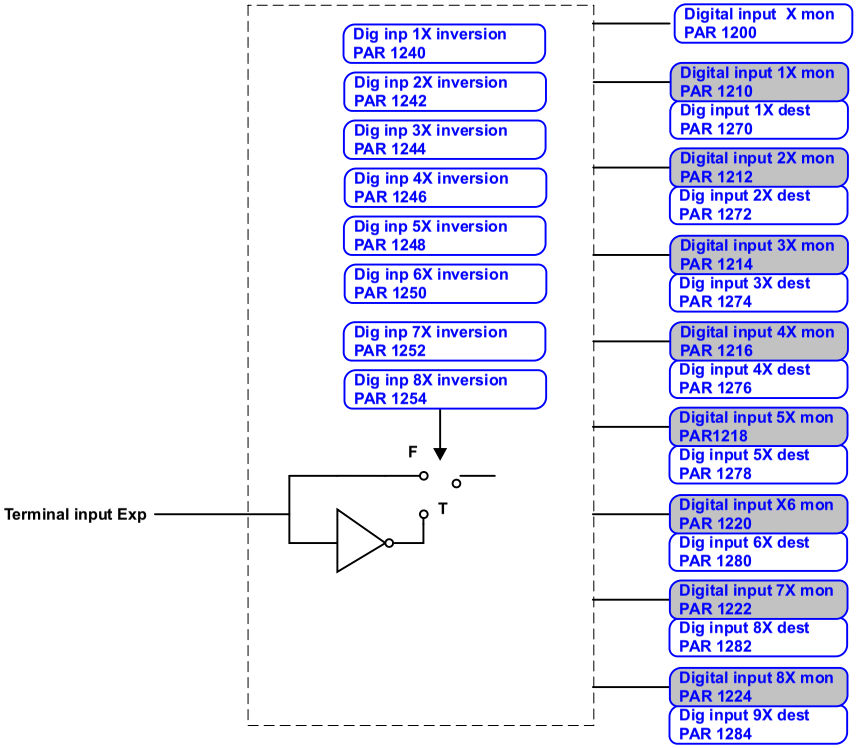
Digital Inputs

Digital Inputs Standard



Digital Inputs Expansion Card



On “L_DIGSEL1” and “L_DIGSEL2” selection lists

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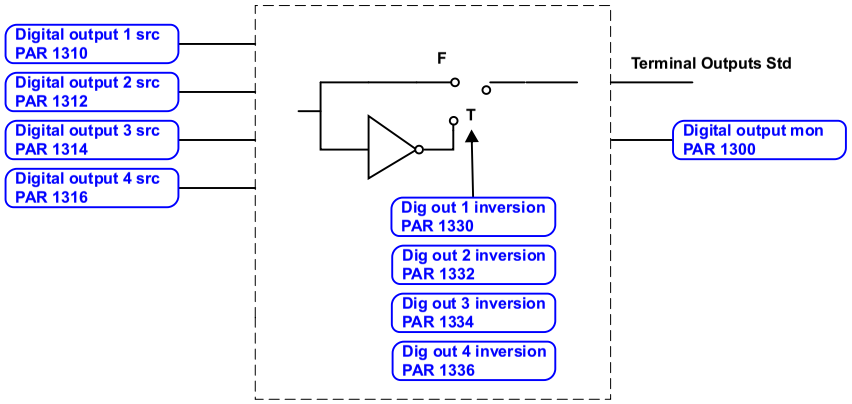
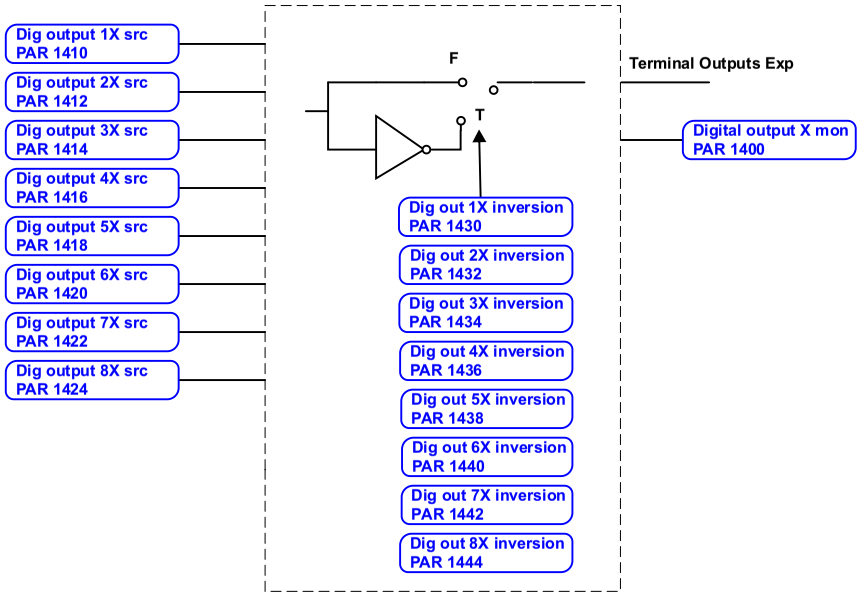
Digital Outputs

Digital Outputs Standard



Digital Outputs Expansion Card



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PRODUCT: ADV 200

File name:

Proprietary Information
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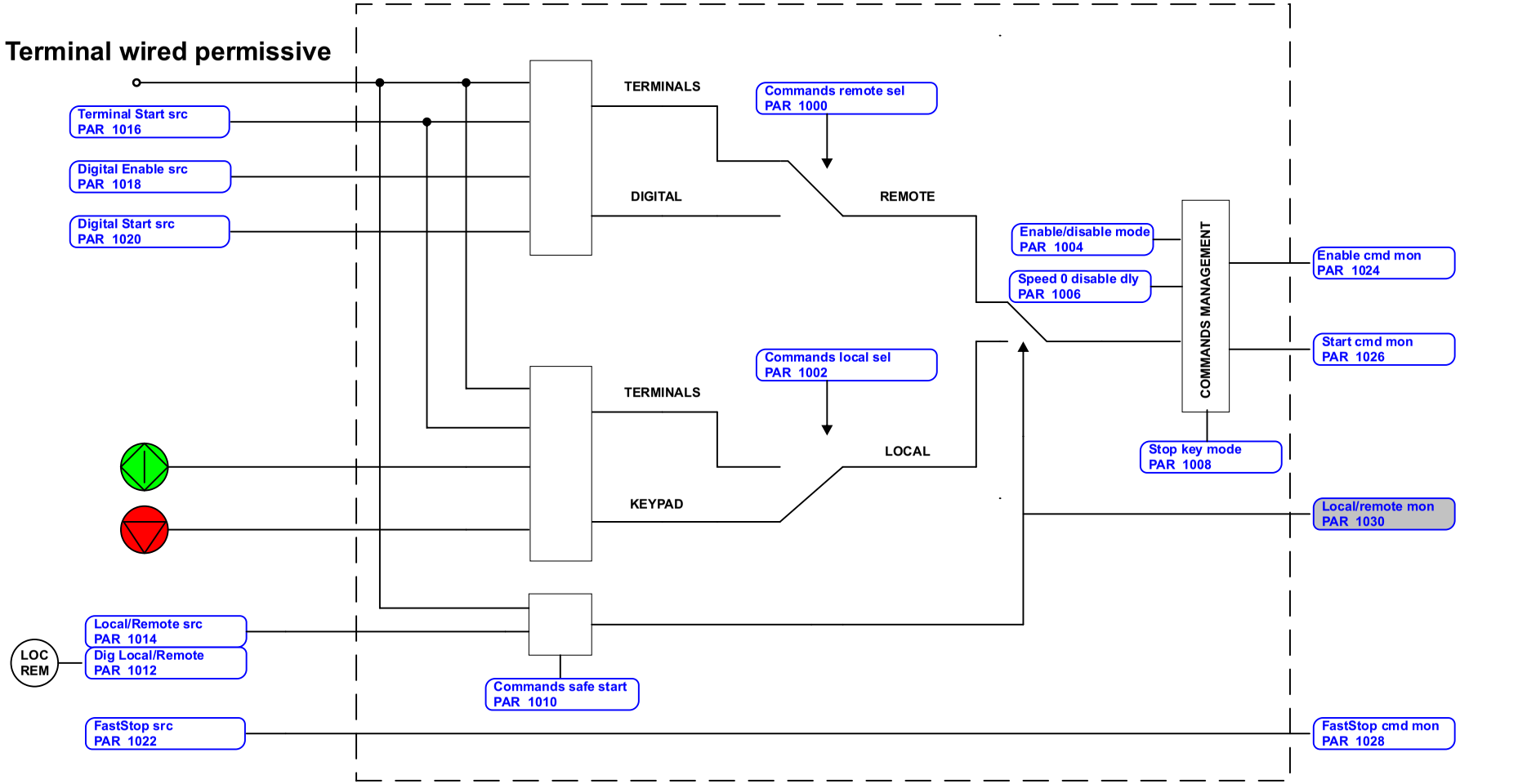
Commands



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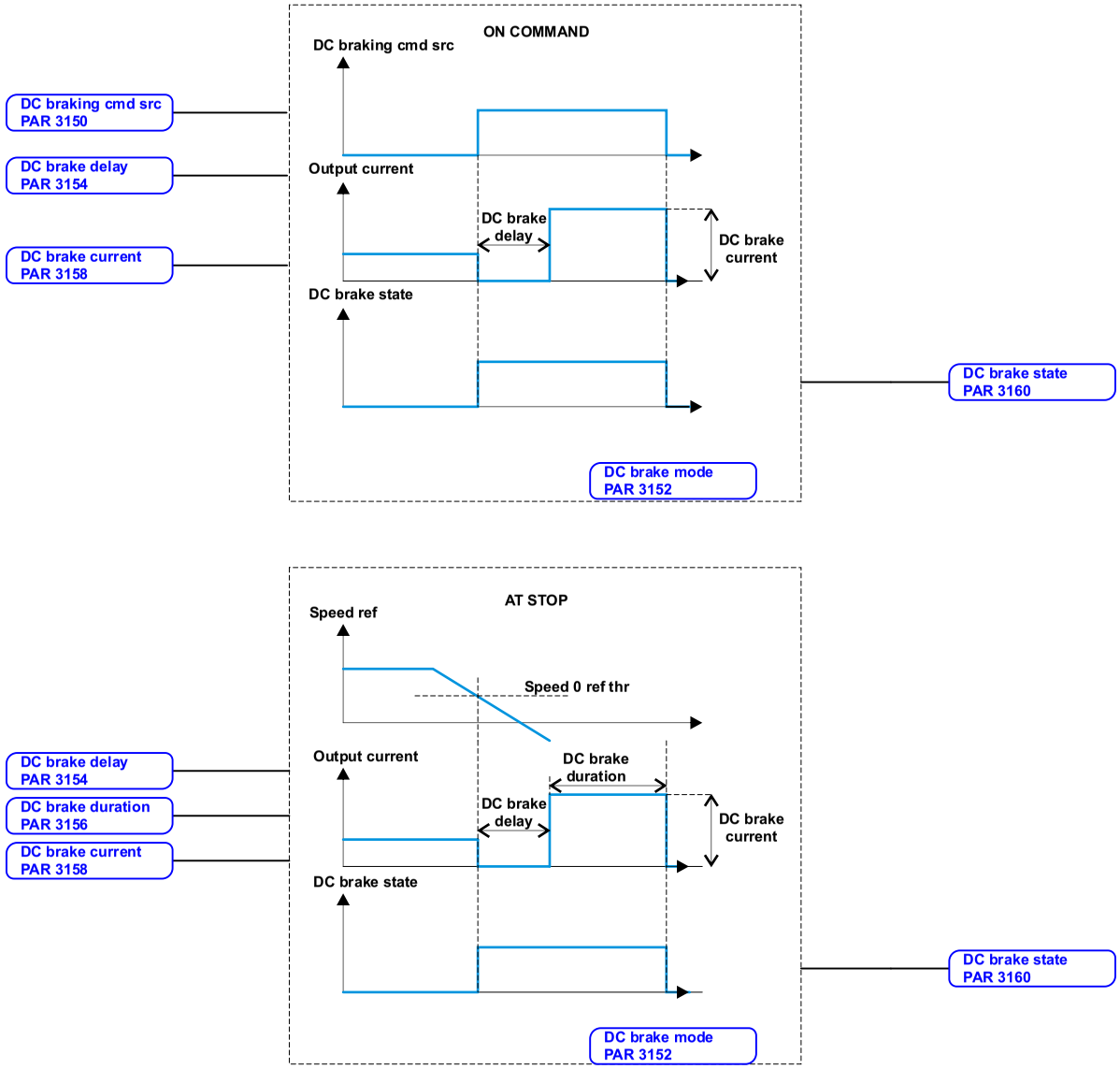
DC Braking



GEFRAN Via Carducci, 24 I-21040 Gerenzano VA	PRODUCT: ADV 200	File name:
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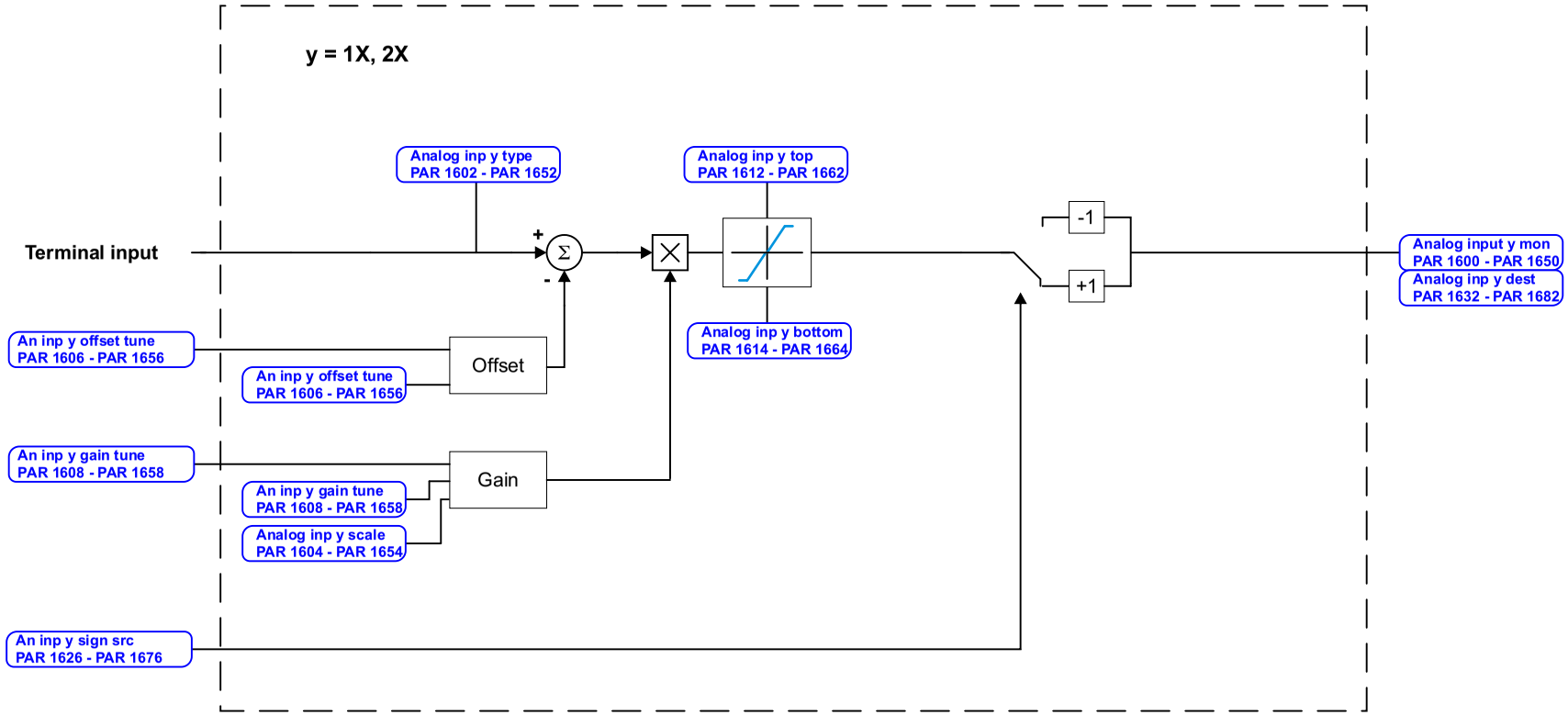
		Revision Date -- Initials: 22/01/08

Analog Inputs Expansion Card



GEFRAN Via Carducci, 24 I-21040 Gerenzano VA	PRODUCT: ADV 200	File name:
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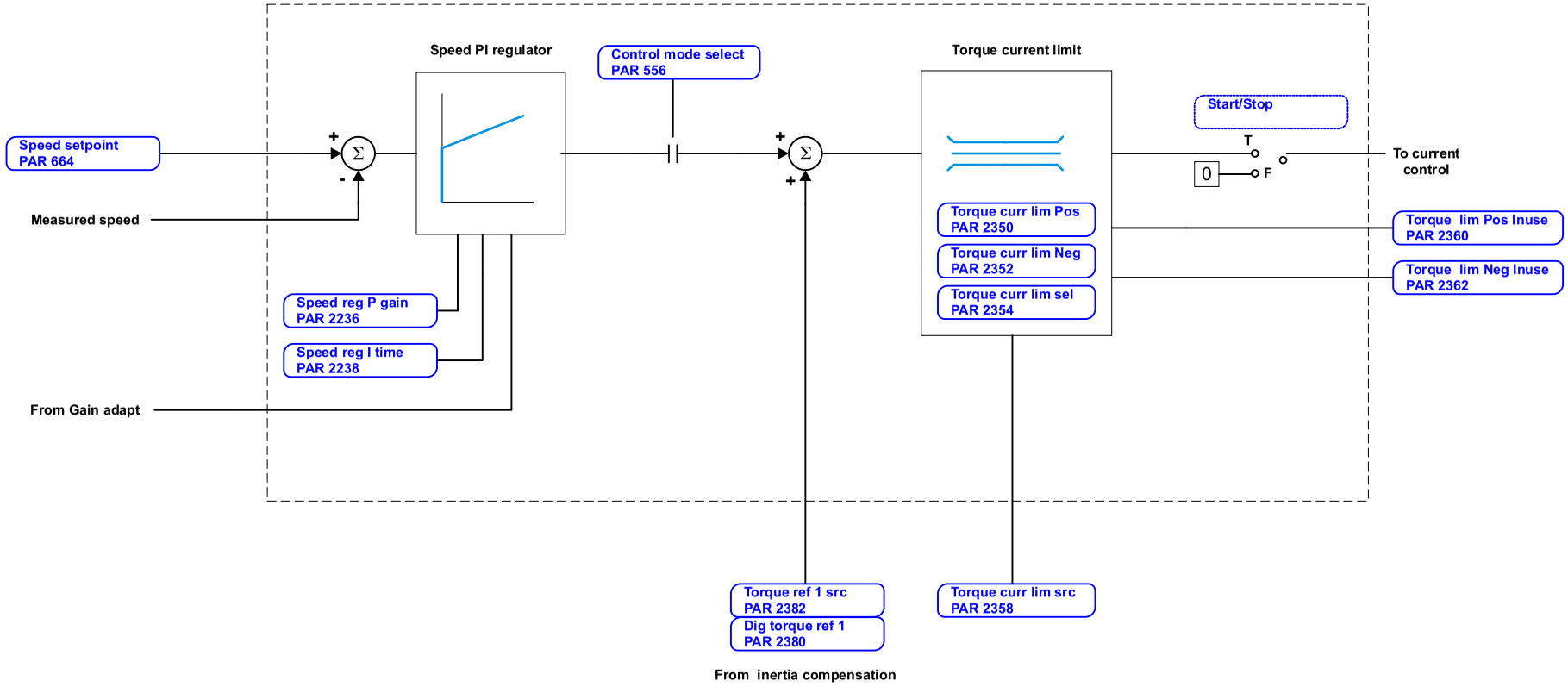
		Revision Date -- Initials: 22/01/08

Torque control - flux vector CL/OL



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PRODUCT: ADV 200	File name:
Proprietary Information **Do Not Copy**	Issued Date — Initials: 19/02/07
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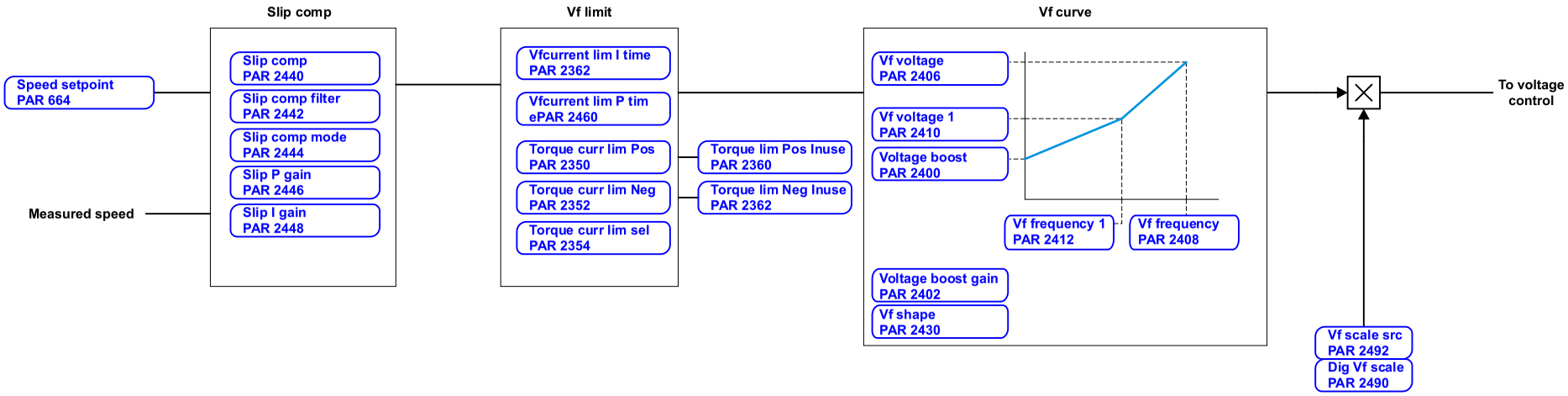
Control V/F



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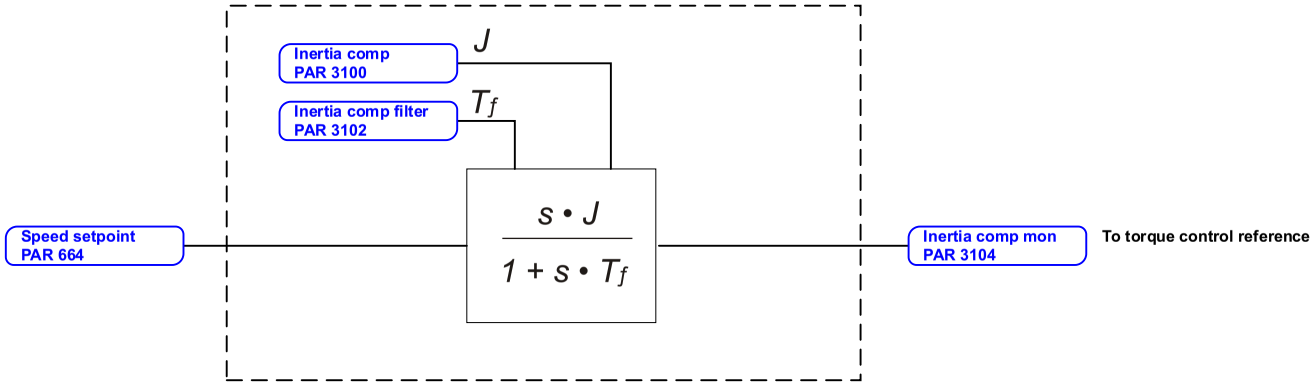
Inertia Compensation



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PRODUCT: ADV 200	File name:
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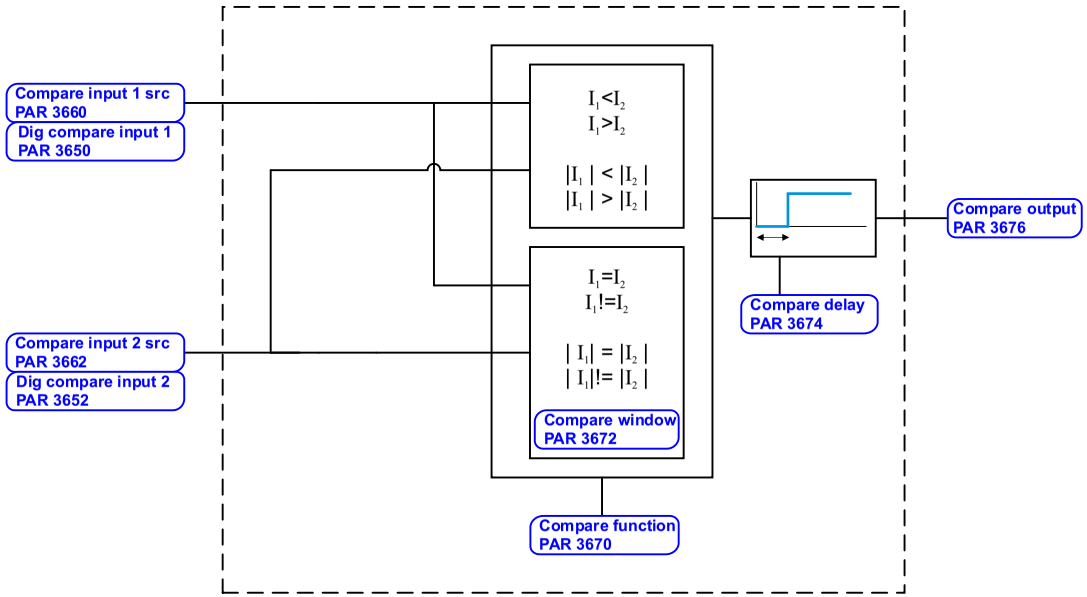
Compare



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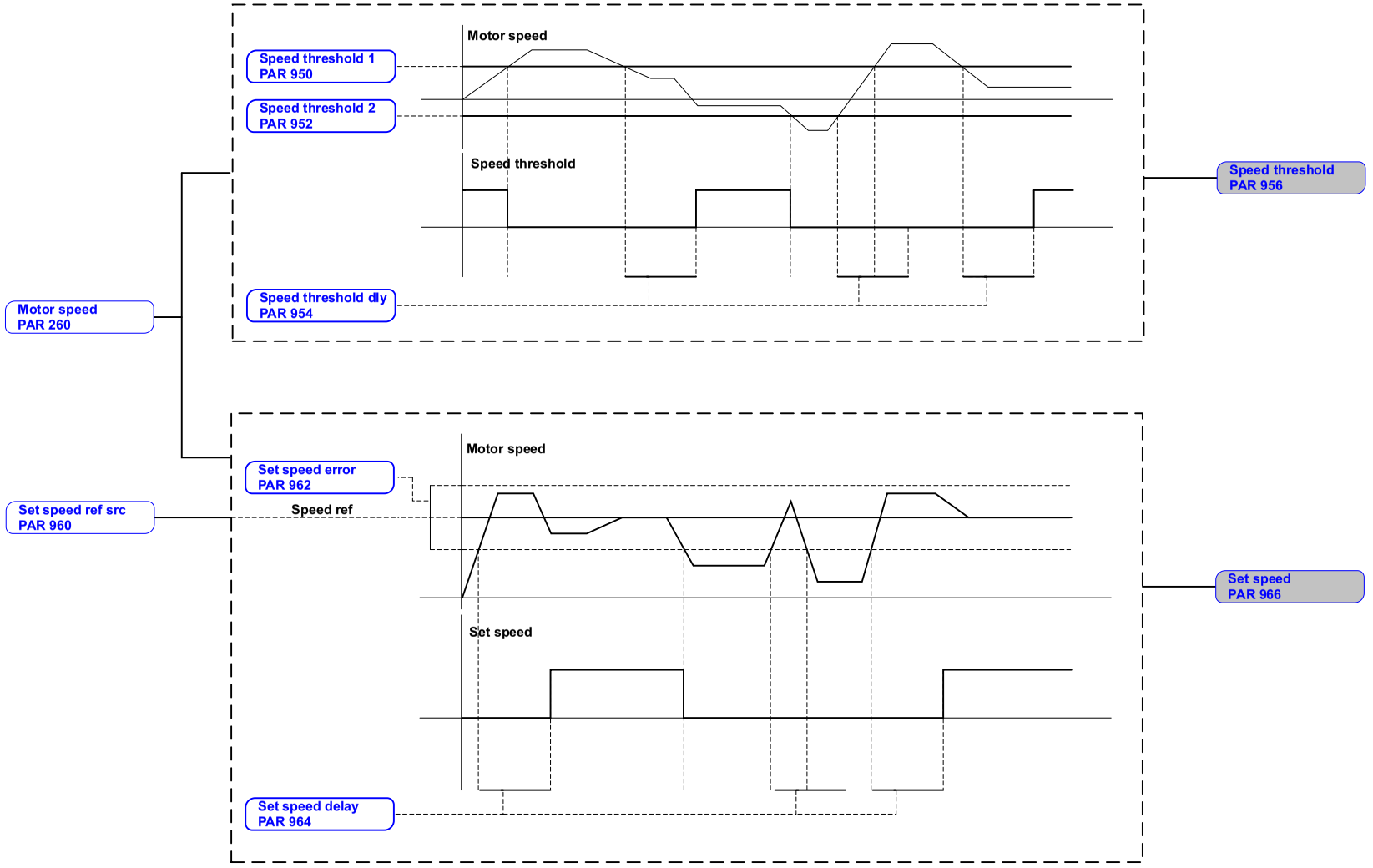
Speed Monitor Function



PAR 956, on “L_DIGSEL1” selection list
PAR 956, on “L_DIGSEL1” and “L_DIGSEL3” selection lists

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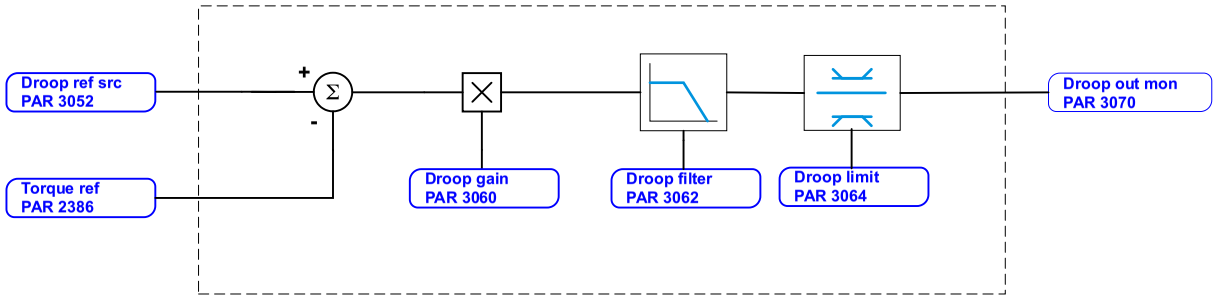
Droop



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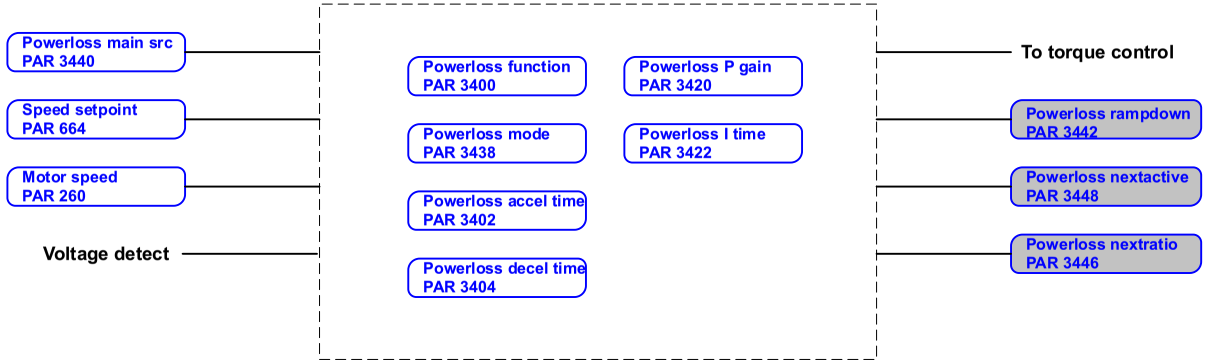
Power loss



Parameters not present on menues

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