

PROFINET MANUAL

VECTOR STEP POSITIONERS



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NOTES ON SAFETY

Products for automation manufactured by AEC must be handled, installed and maintained only by skilled and authorized personnel, that must be qualified and instructed to install components for automation. Devices must be installed only for the purposes described in the user's guide. The installer should pay particular attention to potential risks caused by mechanical and electrical hazards.

It is very important that all applications and installations meet all applicable safety requirements.

The installers must take responsibility to verify their knowledge and understanding of all applicable safety standards.

Installations which are not complying with safety requirements can damage equipment and injure the user.

AEC s.r.l. will not be liable and will not take any responsibility for damages caused by products handled or installed improperly, or if the customer have given permission or performed modifications and/or repairs not authorized from AEC s.r.l.

AEC's motion control equipment are high-performances devices for automation, able to producing high forces and rapid movements.

Pay high attention, in particular during installation and development of applications.

Use properly sized equipments for the type of application.

AEC's devices must be considered as components for automation. They are sold as end-user products, and must be installed only by qualified personnel, in accordance with all applicable safety requirements.

Skilled staff must be able to recognize possible dangers that may result from programming, modifying parameter's values and, generally, that may result from using mechanical, electric and electronic equipment.

The drive must be installed in closed cabinets, so that any parts thereof is not reachable while system is powered on.

AEC s.r.l. strongly recommends to always follow safety requirements and security rules. Failure to follow this instruction may cause and/or injuries.

General precautions

- The images contained in this manual are for demonstration purposes, and may differ from the products received.
- This manual is subject to changes due to improvement of the products, modification of specifications, or manual thereof improvement.
- AEC s.r.l. is not responsible for any damage to property or injury that could result from improper installation and/or not authorized modification to products.



*AEC's drive systems are products for general use that conform to the state of the art in technology and are designed to prevent any dangers. However, drives and drive controllers that are not specifically designed for safety functions are not approved for applications where the functioning of the drive could endanger persons. **The possibility of unexpected or unbraked movements can never be totally excluded without additional safety equipment.** For this reason personnel must never be in the danger zone of the drives unless additional suitable safety equipment prevents any personal danger. This applies to operation of the machine during production and also to all service and maintenance work on drives and the machine. The machine design must ensure personal safety. Suitable measures for prevention of property damage are also required.*



To prevent personal injury and damage to property, damaged drive systems must not be installed. Changes and modifications of the drive systems are not permitted, and if made all no warranty and liability will be accepted.

MAINTENANCE AND INSPECTION

To ensure a proper and satisfactory performance of the drives and the motors, equipments and installations need periodic inspections and checks.

Notes for maintenance personnel

After shutdown, the internal capacity will remain charged, at high voltages, for a short period of time. Wait at least 10 minutes after PWR led goes off, before working on the device.

Drives and motors can reach high temperatures during functioning, therefore it is recommended to wait for them to cool before touching any of their surfaces. In all cases, be careful.

Never plug or unplug any connector when power is connected.

Control cycles checklist

Correct operating conditions:

Operating temperature : 30° C (annual average)

Hours of work : 24 hours per day

Periodically check the correct operation of the equipments by following this checklist:

Type of inspection	Frequency	Checklist
Weekly check	Weekly	1. Operating temperature, humidity, dust, particles or foreign matter 2. Vibrations or not standard noises 3. Main and auxiliary supply voltage 4. Odors 5. Obstruction of ventilation slots 6. Cleaning of drive and connectors 7. Correct insertion of connectors 8. Integrity of the cables
Periodically check	Annual	1. Verify the correct closure of the fixing screws 2. Signal malfunction or overheating

In case that operating conditions are different from the recommended ones, carry out inspections more frequently.

REVISIONS

Manual_Profinet_EN_rev03

Version	Date	Notes
Rev. 01	November 2021	First draft
Rev. 02	April 2023	Update of cyclic/acyclic communication chapters
Rev. 03	June 2023	Addition of AEC registers with address higher than 10.000

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We do not accept any liability arising from use of the information contained in this manual.

AEC s.r.l. is constantly trying to improve the quality of its products and the information contained in this manual are subject to change without notice.

Although great care has been exercised in the preparation of this document, however AEC s.r.l. cannot accept any liability whatsoever connected with its use.

TRADEMARKS

StepControl, StepControl LT, SMD12xxxx, SMD22xxxx, SMD52xxxx are registered trademarks of AEC s.r.l.

Windows 95, 98, NT, ME, 2000, XP e Vista, Visual Basic, Excel, and .NET are registered trademarks of Microsoft Corporation.

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PROFIBUS / Profinet is a registered trademark of PROFIBUS Nutzerorganisation e.V.

INFORMATION ON PROFINET

OVERVIEW

The drives Profinet SMD1204xIN, SMD2204xIN e SMD5206xIN support several application profiles based on cyclic and acyclic communication services:

- PROFIdrive v.4.1 - Standard Telegram 9
- PROFIdrive v.4.1 - Base Mode Parameter Access (Acyclic Data Exchange)

CYCLIC AND ACYCLIC SERVICES

Normally, the data exchange uses cyclic and acyclic services.

For the cyclic data, the application profiles define:

- data independent from the manufacturers
- specific data for the manufacturer

The fixed setting and the use of the independent data from the manufacturer, permit to switch between them masters of different brand.

ACYCLIC READ/WRITE SERVICES

The acyclic Read/Write services provide access to data or parameters which cannot be accessed with cyclic data exchange.

ELECTRONIC FILE DESCRIPTION

The drives mod. SMD1204xIN, SMD2204xIN e SMD5206xIN are described by a GSDML file, used by Profinet configuration tools to obtain information on the devices themselves

GSDML files and icon files of the AEC's drives can be downloaded from the website www.aec-smd.it

The GSDML file and the icons are compressed into a .zip file, that has to be decompressed in the same folder of the hard disk.



THE DEVICES MAY PUT THEMSELVES INTO OPERATION WITHOUT NOTICE

Do not alter in any way the GSDML file. The alteration of the GSDML file may cause unexpected behaviour of the drives.

Failure to observe this precaution may cause injuries or damages to devices.



CAUTION!!! Any alteration to the GSDML file will void the AEC guarantee with immediate effect.

PROFINET CHARACTERISTICS

INTRODUCTION

The following table is an overview for the PROFINET features supported by SMDyyyyxIN drives

PROFINET RT	✓
PROFINET IRT (RT_CLASS_3)	✓
Advanced Startup	✓
Legacy Startup	✓
Minimum cycle time, RT	250us (motor controlled every 1ms)
Minimum cycle time, IRT	250us (motor controlled every 1ms)
Enhanced Configuration Support	✓
Support of I&M5	✓
Simple Network Management Protocol (SNMP)	✓
MRP Client (Media Redundancy Protocol)	✓
Number of ARs / Shared Device capable	1
IO Supervisor AR	1 (only device access)
Acyclic communication	Read/Write Record
Alarm Types	Process Alarm, Diagnostic Alarm, Plug Alarm, Pull Alarm, Return of Submodule Alarm
Identification & Maintenance	I&M0-5
Topology recognition	LLDP, SNMP V1, MIB2, PDEV
Media Redundancy	MRP client
Additional supported features	DCP, 802.1q Priority
Data rate / duplex	100 MBit/s, Full Duplex
Data transport layer	Ethernet II, IEEE 802.3
PROFINET IO specification	V2.35

TECHNICAL DATA

Type	Ethernet network
Cable	Ethernet CAT. 5e
Function	Real-time motion control, setup and parameterization, programming, diagnostics
Protocol	PROFIdrive according to Profile Drive Technology version 4.1, May 2006 (IEC 61800-7)
Error checking	Checksum
Supported Masters	Class 1, Class 2
Application Class	3 (Single axis positioning drive, with local motion control)
Number of port	2

RESTRICTIONS

Following restriction apply:

- RT over UDP not supported
- DHCP is not supported
- Fast Startup iso not supported
- Shared Inputs are not supported
- Multicast communication not supported
- Only 1 Input-CR and 1 Output-CR per AR is supported
- System Redundancy (SR-AR) and Configuration-in-Run (CiR) are not supported
- The amount of configured IO-data influences the minimum cycle time that can be reached.

CERTIFICATION

The SMDyyyyxIN device was tested with the official PROFINET IO Test Bundle of PI (Release 2017-04-05) at ComDeC test lab (Würzburger Straße 121, 90766 Fürth, Germany).

CONFIGURATION FILE

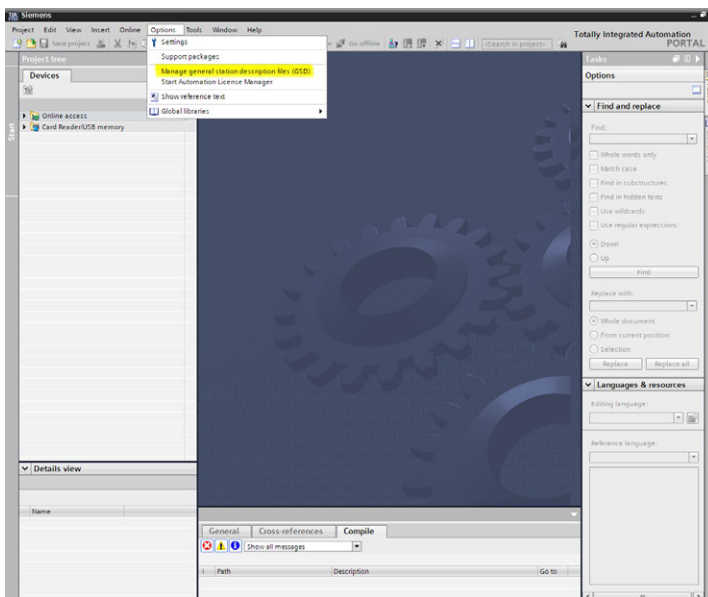
GSDML file	Interface	Profile
<i>GSDML-V2.42-AEC_{SRL}-PROFINETDRIVES-20220218.XML</i>	Profinet	PROFIdrive V4.1

CONFIGURATION SLOTS

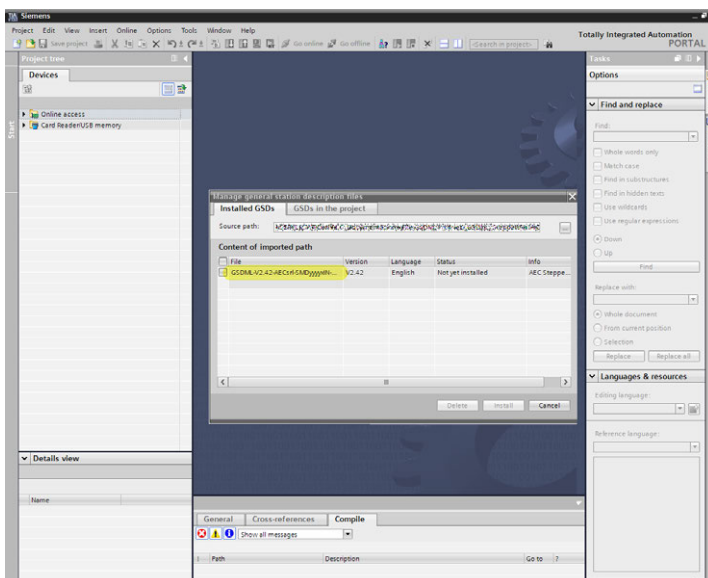
SMD2204xIN 3 axis board, ProfiNet Slots Structure									
Slot 0 (API=0)		Slot 1 (API = 0x3A00 PROFIDrive)			Slot 2 (API = 0x3A00 PROFIDrive)			Slot 3 (API = 0x3A00 PROFIDrive)	
Subslot 0		Subslot 0	Subslot 1	Subslot 2	Subslot 0	Subslot 1	Subslot 2	Subslot 0	Subslot 1
		Module Access Point (MAP)	Contains parameters Access Point and alarm	Standard Telegram x (submodule ID = PRO-FIDrive telegram number)		Module Access Point (MAP)	Contains parameters Access Point and alarm		Module Access Point (MAP)
P-Device		Drive Object 1			Drive Object 2			Drive Object 3	
SMD1204xIN SMD5206xIN		1AxLE board, ProfiNet slots structure							

GSDML FILE

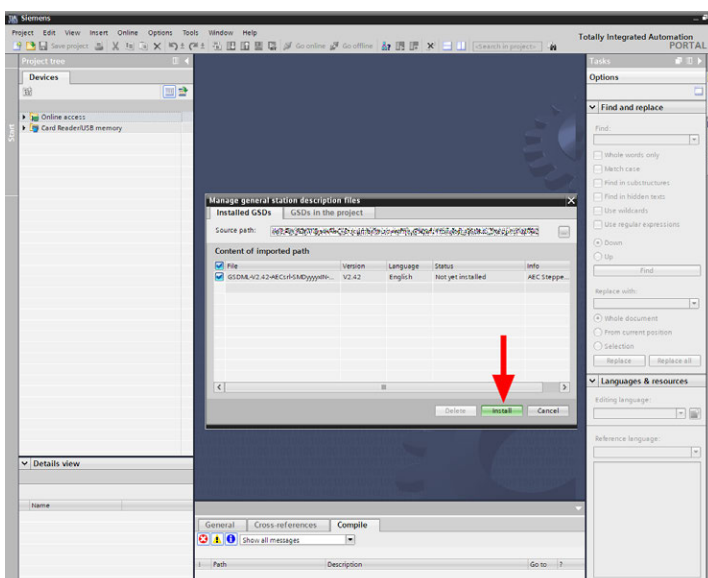
INSTALLATION OF THE GSDML FILE



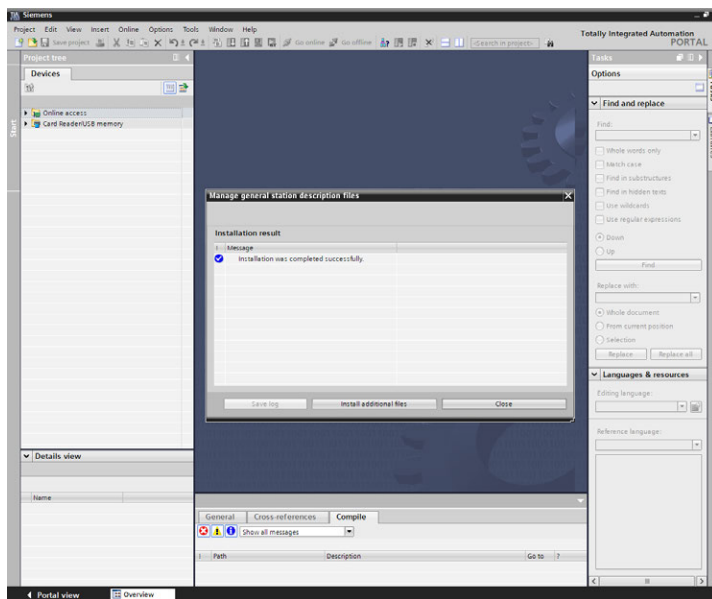
To install the GSDML file, use the command “Manage general station description files (GSD)” from the menu “Options” of the Hardware configurator.



Select the local directory where the GSDML file is stored.

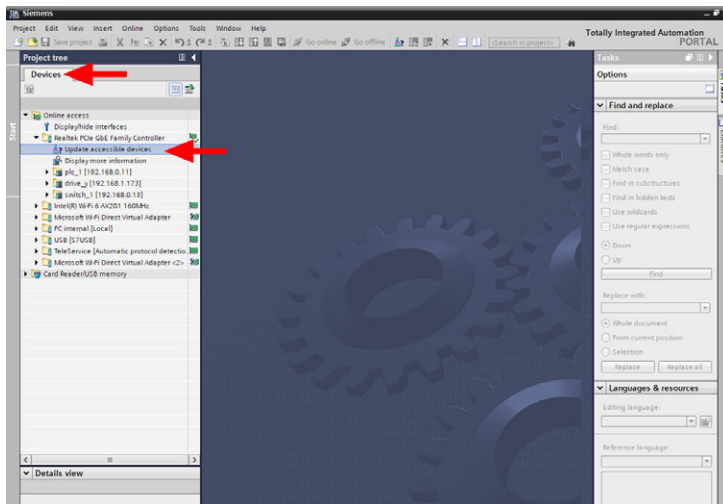


Flag the file and click on “Install”.

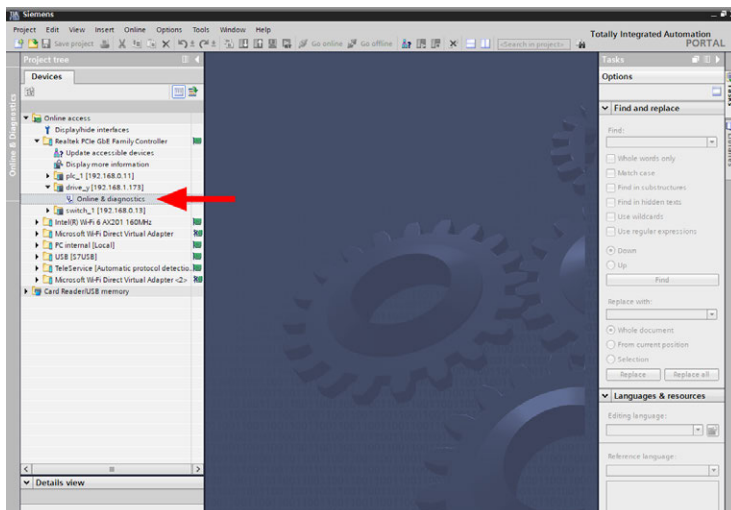


Wait until the message “Installation was completed successfully” appears.

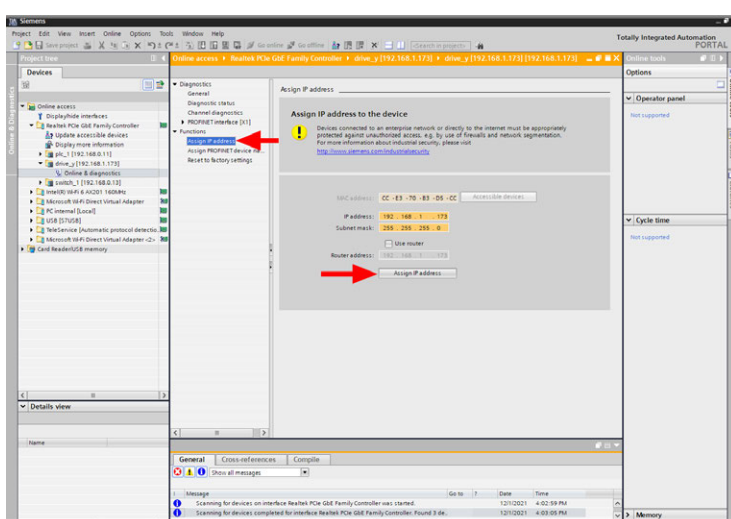
SETTING OR UPDATE OF IP ADDRESS/SUBMASK/DEVICE NAME



From the tree menu on the left, open the item “Online access” and select the network interface used by the PC, then click on “Update accessible devices”.

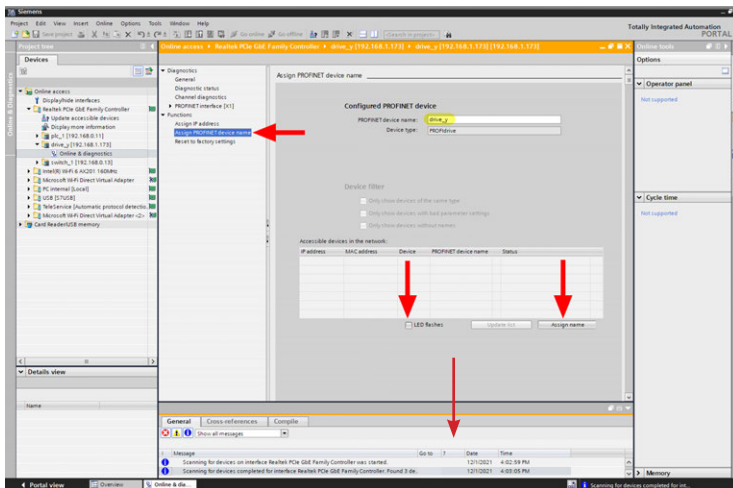


All the accessible devices on the interface are shown. Using the MAC address of the drive, select the device and click on “Online & diagnostics”



Select the item “Functions” - “Assign IP address”.

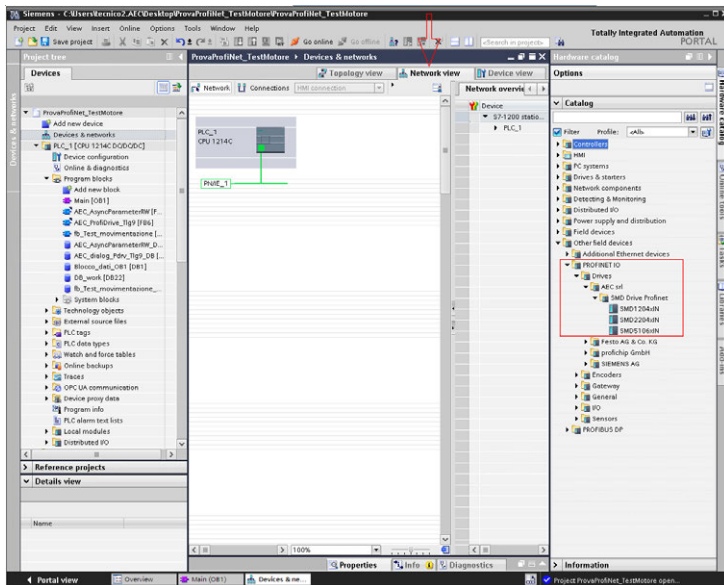
Enter the new data and click on “Assign IP address”.



Select the item “Assign PROFINET device name”.

Enter the new “PROFINET device name” and click on “Assign name”.

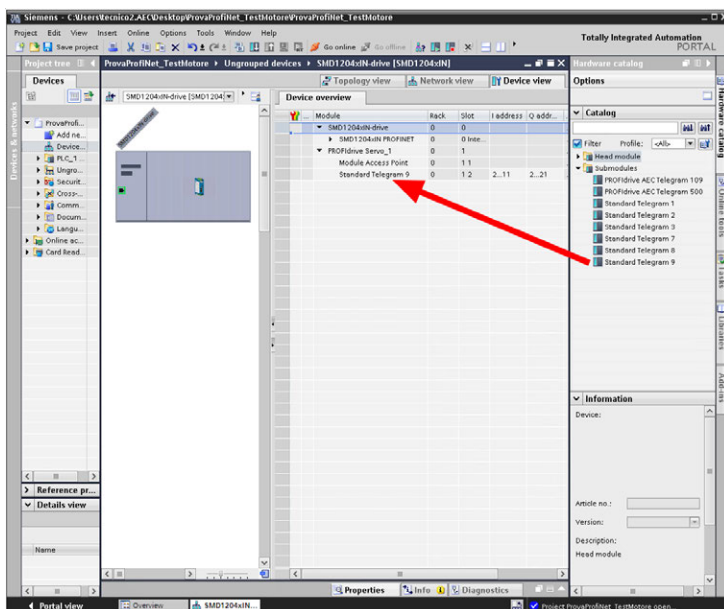
In order to verify and identify the device, it is possible to command the LED flashing by flagging “LED flashes”.



Select “Devices & networks” from the menu on the left, then select the tab “Network view”.

From the “Hardware catalog” on the right column, select the branch “Other field devices” - “Additional Ethernet devices” - “PROFINET IO” - “Drives” - “AEC srl” - “SMD Drive Profinet”.

Drag the selected model in the “Network view” section.



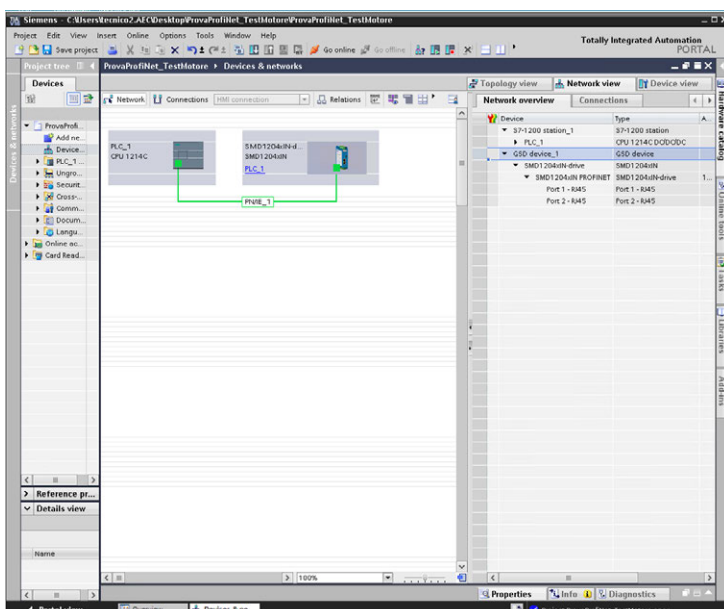
Click on the device and select the tab “Device view”.

Insert into “Device overview” column the selected telegram for the cyclic communication.

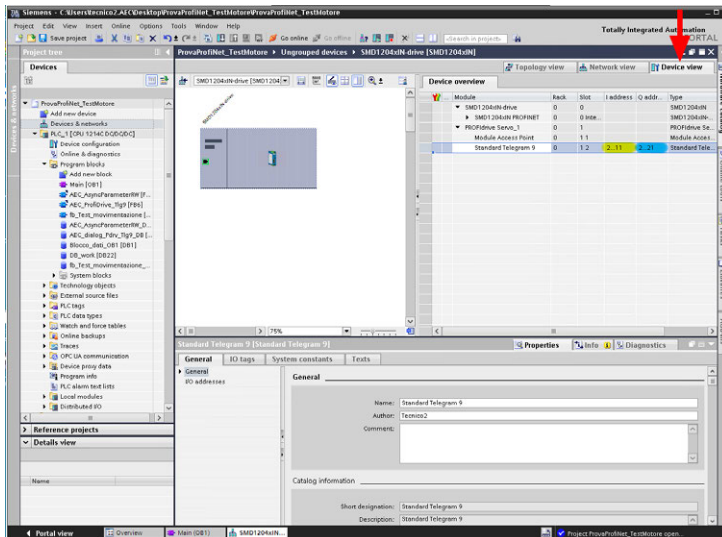
In the tab “Device overview” it is possible to see the telegram currently set for the cyclic communication.

By default, in the example file the telegram 9 is set. To replace it, delete the telegram 9 and drag the new telegram from the “Submodules” section.

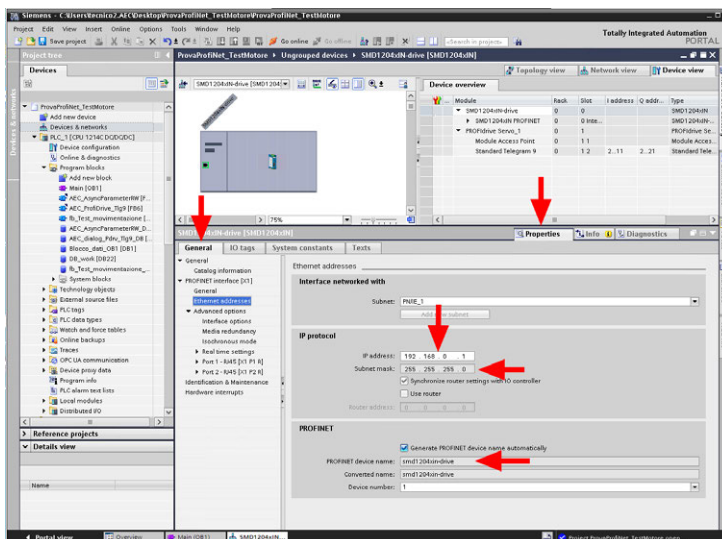
In the chapter “Cyclic communication” the differences between the telgrams are explained.



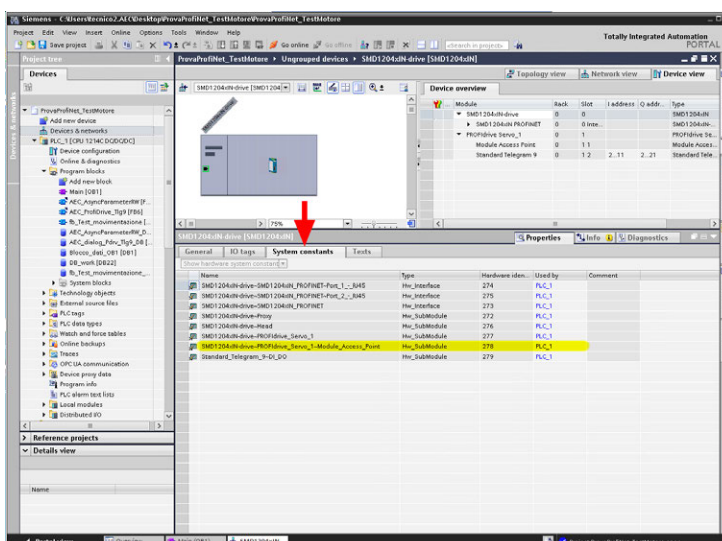
Select the tab “Network view” and associate the device to a PROFINET controller, by dragging the green square of the PLC to the green square of the drive.



Return to the tab “Device view” and set the input/output addresses for the acyclic communication. It is also possible to use the default settings. This values will be necessary for the configuration of the blocks of PLC program.



Open the tab “Properties” - “General” and set the IP address of the device, the net mask and the desired PROFINET device name.



Open the tab “System constants” and take note of hardware ID of the slot “Module access”, that will be necessary to configure the program block of the acyclic communication.

CYCLIC COMMUNICATION

OVERVIEW

On Profinet, the AEC's devices permit to configure the cyclic communication telegrams. There are several types of messages, which can be used according to the type of control that must be obtained:

- Positioning interface (Program submode)
- x set-interface, 32 bit (position setpoint interface)
- Positioning interface (Program submode + MDI submode)

During the configuration, it is necessary to choose between the telegram 9, which contains the essential commands in order to run a movement, and the telegram 109, which is longer but more complete. The following chapters explain the information contained in the telegrams.

TELEGRAM 9

Positioning interface (Program submode plus MDI submode)

he MDI permits to access directly to the motion command interface to achieve direct movements that are not configured in the traversing blocks.

The telegram 9 permits to access only to the data that are necessary to command a movement, allowing to have a shorter frame, and consequently to occupy less thr network. For all other data, the access must be made through an acyclic communication.

IO Data Number	Setpoint	Actual value
1	STW1	ZSW1
2	SATZANW	AKTSATZ
3	STW2	ZSW2
4	MDI_TARPOS	XIST_A
5		
6	MDI_VELOCITY	
7		
8	MDI_ACC	
9	MDI_DEC	
10	MDI_MOD	

Name	Abbreviation	Format	Description
Controlword 1	STW1	Unsigned16	Controlword 1
Statusword 1	ZSW1	Unsigned16	Statusword 1
Controlword 2	STW2	Unsigned16	Controlword 2 (only for winding)
Statusword 2	ZSW2	Unsigned16	Statusword 2 (only for winding)
Position actual value A	XIST_A	Signed32	Current position of the axis (step)
Traversing block selection	SATZANW	Unsigned16	Task selection
Actual traversing block	AKTSATZ	Unsigned16	Running task
MDI target position	MDI_TARPOS	Signed32	Target position (step)
MDI velocity	MDI_VELOCITY	Unsigned16	Velocity (rps*100)
MDI acceleration	MDI_ACC	Unsigned16	Acceleration (rps^2*10)
MDI deceleration	MDI_DEC	Unsigned16	Deceleration (rps^2*10)
MDI mode	MDI_MOD	Unsigned16	Positioning mode

Positioning interface (Program submode plus MDI submode)

The MDI permits to access directly to the motion command interface to achieve direct movements that are not configured in the traversing blocks.

In addition to the standard signals it is possible to read in cyclic way the current position of the external encoder and the input status, and to set the output status.

The telegram 109 permit to access to more information than the ones needed to command a movement, but it has a longer frame, and it consequently occupies more the network. For all other data, the access must be made through an acyclic communication.

IO Data Number	Setpoint	Actual value
1	STW1	ZSW1
2	SATZANW	AKTSATZ
3	STW2	ZSW2
4	MDI_TARPOS	XIST_A
5		
6		
7	MDI_VELOCITY	EXT_ENC
8		
9	MDI_ACC	MOT_ENC
10	MDI_DEC	
11	MDI_MOD	SERVICE INPUTS
12	DIGITAL OUTPUTS	DIGITAL INPUTS
13	ANALOG OUTPUT	ANALOG INPUTS
14		

Name	Abbreviation	Format	Description
Controlword 1	STW1	Unsigned16	Controlword 1
Statusword 1	ZSW1	Unsigned16	Statusword 1
Controlword 2	STW2	Unsigned16	Controlword 2 (only for winding)
Statusword 2	ZSW2	Unsigned16	Statusword 2 (only for winding)
Position actual value A	XIST_A	Signed32	Current position of the axis (step)
Traversing block selection	SATZANW	Unsigned16	Task selection
Actual traversing block	AKTSATZ	Unsigned16	Running task
MDI target position	MDI_TARPOS	Signed32	Target position (step)
MDI velocity	MDI_VELOCITY	Unsigned16	Velocity (rps*100)
MDI acceleration	MDI_ACC	Unsigned16	Acceleration (rps^2*10)
MDI deceleration	MDI_DEC	Unsigned16	Deceleration (rps^2*10)
MDI mode	MDI_MOD	Unsigned16	Positioning mode
External encoder	EXT _ ENC	Signed32	External encoder (counts)
Motor encoder	MOT _ ENC	Signed32	Motor encoder (counts)
Service Inputs	SERVICE INPUTS	Unsigned16	Service Inputs
Digital Inputs	DIGITAL INPUTS	Unsigned16	Digital Inputs
Analog Inputs	ANALOG INPUTS	Unsigned16	Analog Input
Digital outputs	DIGITAL OUTPUTS	Unsigned16	Digital outputs
Analog outputs	ANALOG OUTPUTS	Unsigned16	Analog output

In the section “fb_Test_movimentazione_M1” of the available example, it’s possible to find the program block related to the cyclic communication with the telegram 9 “AEC_dialog_Pdrv_Tlg9_M1_DB”

The screenshot displays the Siemens STEP 7 software interface. On the left, the 'Navigazione del progetto' (Project Navigation) pane shows the project structure for 'ProvaProfiNet_TestMotore_SMD2204xIN_Tlg9-109'. The 'Dispositivi' (Devices) section is expanded, showing the 'PLC_1 [CPU 1214C DC/DC]' and its associated program blocks. The 'fb_Test_movimentazione_M1 [FB1]' block is highlighted. Below this, the 'Progetti di riferimento' (Reference Projects) section is visible. At the bottom, the 'Vista dettagli' (Detailed View) pane shows the ladder logic diagram for the selected block. The diagram is a complex network of logic involving various input and output variables, including 'AEC_dialog_Pdrv_Tlg9_M1_DB' and 'AEC_ProfiDrive_Tlg9_M1_DB'. The logic is organized into several rungs, with comments in Italian providing context for the communication steps.

All the data present in the block of the telegram 9 are referred to the “DB_work_M1”

Variable name	Description
Enable	Enables the drive to perform positionings
EnablePwr	Enables the current to the motor
StartPos	Start posizionamento
PositionigMode	Positionig Mode 0: Relative movement 1: Absolute movement
JOG	JOG movement command. If the variable “UpdatePar” equals to 1, the variable JOG takes the values set in the block, else it uses the values set through Step Control in the “Power on parameters” (caution, these parameters are loaded only at the power on of the drive). With the variable “CyclicUpdate”=0, the value of the velocity is taken upon the execution of the command, with “CyclicUpdate”=1, the velocity is continuously updated.
Direction	Direction command 0: Jog+ 1: Jog -
Homing	Commands the homing sequence. The homing method is defined from the register Rhmode, it can be set through PROFINET acyclic communication, or it can be set directly through Step Control in the “Power on parameters”. The velocity of the limit switches research and the ramps take the values set in the block if the variable “UpdatePar” equals to 1, else Step Control “Power-on parameters” are used (caution, these parameters are loaded only at the power on of the drive).
FaultAcknowledge	Alarms reset command
TargetPosition	Target position (step)
Velocity	Movement velocity (rps*100)
Acceleration	Acceleration ramp (rps^2*10)
Deceleration	Deceleration ramp (rps^2*10)
CyclicUpdate	Continuous Update 1: continuous update of the velocity during JOG movements.
UpdatePar	Update Moving parameter 0: during JOG and HOMING movements, the velocity of the limit switches research and the ramps values are taken from Step Control “Power-on parameters” 1: during JOG and HOMING movements, the velocity of the limit switches research and the ramps values are taken from the program block.
Pause	Leave at 1
RejectTask	If its value is set to 0 during a positioning, it stops it. With this variable cleared, no movement commands are accepted.
Abort	ABORT command
power_enabled	Enabled drive

InPosition	Axis in position 0: Axis not in position 1: Axis in position
ActualPosStep	Current position of the axis (step)
HomingSet	Home Position set 0: Axis not homed 1: Homed axis
AxStandStill	Axis in standstill 0: Axis in movement 1: Axis in standstill
Fault	Axis in alarm
Warning	Warning is present
AckTraversingTask	GO/GOR command acquired 1: GO/GOR command acquired
OperationEnabled	Drive enabled to perform positionings

In the section “fb_Test_movimentazione_M1” of the available example, it’s possible to find the program block related to the cyclic communication with the telegram 109 “AEC_ProfiDrive_Tlg109_M1_DB”

Navigazione del progetto
Prova_blocchetto_SMD5206 ▸ PLC_1 [CPU 1214C]

Dispositivi

Prova_blocchetto_SMD5206

Aggiungi nuovo dispositivo

Dispositivi & Reti

PLC_1 [CPU 1214C DC/DC/DC]

Configurazione dispositivi

Online & Diagnostica

Blocchi di programma

Inserisci nuovo blocco

Main [OB1]

AEC_Async_Parameters_RW [FB601]

AEC_ProfiDrive_Tlg9 [FB602]

AEC_ProfiDrive_Tlg109 [FB603]

fb_Test_movimentazione_M1 [FB1]

AEC_AsyncParameterRW_M1_DB [DB1]

AEC_dialog_Pdrv_Tlg9_M1_DB [DB28]

AEC_ProfiDrive_Tlg109_M1_DB [DB11]

Blocco_dati_M1_OB1 [DB2]

DB_work_M1 [DB5]

fb_Test_movimentazione_M1_DB [DB24]

Blocchi di sistema

Oggetti tecnologici

Sorgenti esterne

Variabili PLC

Tipi di dati PLC

Progetti di riferimento

fb_Test_movimentazione_M1

Nome	Tipo di dati
← → ↶ ↷ ⏮ ⏭ ⏪ ⏩ ⏴ ⏵ ⏶ ⏷ ⏸ ⏹ ⏺ ⏻ ⏼ ⏽ ⏾ ⏿ ⏺ ⏻ ⏼ ⏽ ⏾ ⏿	
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⏮ ⏭</	

All the data present in the block of the telegram 109 are referred to the “DB_work_M1”

Variable name	Description
Enable	Enables the drive to perform positionings
EnablePwr	Enables the current to the motor
StartPos	Start posizionamento
PositionigMode	Positionig Mode 0: Relative movement 1: Absolute movement
JOG	JOG movement command. If the variable “UpdatePar” equals to 1, the variable JOG takes the values set in the block, else it uses the values set through Step Control in the “Power on parameters” (caution, these parameters are loaded only at the power on of the drive). With the variable “CyclicUpdate”=0, the value of the velocity is taken upon the execution of the command, with “CyclicUpdate”=1, the velocity is continuously updated.
Direction	Direction command 0: Jog+ 1: Jog -
Homing	Commands the homing sequence. The homing method is defined from the register Rhmode, it can be set through PROFINET acyclic communication, or it can be set directly through Step Control in the “Power on parameters”. The velocity of the limit switches research and the ramps take the values set in the block if the variable “UpdatePar” equals to 1, else Step Control “Power-on parameters” are used (caution, these parameters are loaded only at the power on of the drive).
FaultAcknowledge	Alarms reset command
TargetPosition	Target position (step)
Velocity	Movement velocity (rps*100)
Acceleration	Acceleration ramp (rps ² *10)
Deceleration	Deceleration ramp (rps ² *10)
CyclicUpdate	Continuous Update 1: continuous update of the velocity during JOG movements.
UpdatePar	Update Moving parameter 0: during JOG and HOMING movements, the velocity of the limit switches research and the ramps values are taken from Step Control “Power-on parameters” 1: during JOG and HOMING movements, the velocity of the limit switches research and the ramps values are taken from the program block.
Pause	Leave at 1
RejectTask	If its value is set to 0 during a positioning, it stops it. With this variable cleared, no movement commands are accepted.
Abort	ABORT command

DigitalOutputs	From this variable, it is possible to command the digital outputs o the drive. The value written in decimal will be converted into binary in order to activate the outputs. Bit0 = Out 0; Bit7 = Out7 Example: if 4 is written, it is converted in binary (100), so the output 2 is activated.
AnalogOutput	From this variable, it is possible to command the analog output. With the value 1024, the analog output will supply 10Vdc.
power_enabled	Enabled drive
InPosition	Axis in postion 0: Axis not in position 1: Axis in position
ActualPosStep	Current position of the axis (step)
HomingSet	Home Position set 0: Axis not homed 1: Homed axis
AxStandStill	Axis in standstill 0: Axis in movement 1: Axis in standstill
Fault	Axis in alarm
Warning	Warning is present
AckTraversingTask	GO/GOR command acquired 1: GO/GOR command acquired
OperationEnabled	Drive enabled to perform positionings
ExternalEncoder	In this variable, it is possible to read the value of the external encoder
MotorEncoder	In this variable, it is possible to read the value of the motor encoder
ServiceInputs	
DigitalInputs	Digital inputs reading (in decimal). The active input can be identified by converting the decimal value in binary. Bit0= Inp.0 ; Bit 15= Inp.15
Analog Input	0:10V analog input reading (from 0 up to 4096)

PROFINET DRIVE SIGNALS

The following table contains the DO signals (Drive Objects signals) supported by the AEC drives. These data are transferred in cyclic way, using the service "Cyclic Data Exchange DP V0". Data representation is Big-Endian type (MSWord - LSWord).

Nr. of signal	Name	Abbreviation	Format	Description
1	Controlword 1	STW1	Unsigned16	see Controlword 1
2	Statusword 1	ZSW1	Unsigned16	see Statusword 1
3	Controlword 2	STW2	Unsigned16	
4	Statusword 2	ZSW2	Unsigned16	
5	Speed setpoint A	NSOLL_A	Signed16	
6	Speed actual value A	NIST_A	Signed16	
27	Position setpoint value A	XSOLL_A	Signed32	
28	Position actual value A	XIST_A	Signed32	
32	Traversing block selection	SATZANW	Unsigned16	
33	Actual traversing block	AKTSATZ	Unsigned16	
34	MDI target position	MDI_TARPOS	Signed32	
35	MDI velocity	MDI_VELOCITY	Unsigned16	
36	MDI acceleration	MDI_ACC	Unsigned16	
37	MDI deceleration	MDI_DEC	Unsigned16	
38	MDI mode	MDI_MOD	Unsigned16	

CAUTION!!!

The direct access to the words in the periphery of a Profinet node, does not guarantee the data consistency, because the Profinet DATA-EXCHANGE cycle is not synchronous, or linked to the PLC cycle.

To read or write consistent data it is recommended to use SFC14 and SFC15.

Structure of the Controlword 1.

Bit	Value	Significance	Notes
0	1	ON	Condition "Switched ON"; enable the drive.
	0	OFF (OFF 1)	Power-down (the drive comes back to the status "Ready to switch on"); stop the drive with the maximum possible ramp, if not already stopped. During the deceleration, the bit 1 of ZSW1 remains high. The command OFF is not interruptable.
1	1	No Coast Stop (no OFF 2)	Cancel all "Coast Stop" commands.
	0	Coast Stop (OFF 2)	Disable the drive (current off) and change the status to "Switching On Inhibited"; the motor turns free until stop.
2	1	No Quick Stop (no OFF 3)	Cancel all "Quick Stop" commands.
	0	Quick Stop (OFF 3)	If necessary, enable the bit "operation enable"; the drive is stopped with the maximum possible ramp and the status is changed to "Switching On Inhibited". The command "Quick Stop" is not interruptable.
3	1	Enable Operation	Enable the drive (Current ON).
	0	Disable operation	Disable the drive (Current OFF).
4	1	Do Not Reject Traversing Task	Active a task on the rising edge of the bit 6.
	0	Reject Traversing Task	Command an emergency ramp stop (Rdeceme parameter); the motor remains stopped in current. The active task is canceled.
5	1	No Intermediate Stop	Must always be high during the execution of a ramp.
	0	Intermediate Stop	The motor brakes with the set ramp and remains stopped in current. The task in execution remains active, and it is re-enabled when the bit 5 comes back to 1.
6	1	Activate Traversing Task (0 -> 1)	A rising edge enables the execution of a task or of a MDI setpoint.
7	1	Fault Acknowledge (0 -> 1)	The rising edge acknowledges and accepts the last fault contained in the buffer. The behaviour of the drive when a fault occurs depends on the type of alarm.
	0	No significance	
8	1	JOG CW ON (JOG 1 ON)	Prerequisites: the drive is in the status "Operation Enable", and there is no ongoing positioning. Enable the clockwise movement.
	0	JOG CW OFF (JOG 1 OFF)	Stop the motor in ramp; the drive comes back to the status "Operation Enable" when the motor stops.
9	1	JOG CCW ON (JOG 2 ON)	Prerequisites: the drive is in the status "Operation Enable", and there is no ongoing positioning. Enable the counterclockwise movement.
	0	JOG CCW OFF (JOG 2 OFF)	Stop the motor in ramp; the drive comes back to the status "Operation Enable" when the motor stops.
10	1	Reserved	Reserved.
11	1	Start Homing Procedure	Prerequisites: drive in "Operation Enable" The rising edge enables the homing procedure. The start of the home procedure resets the bit 11 of the Statusword.
	0	Stop Homing Procedure	The homing procedure is cancelled and the motor stops in ramp.
12 - 13		Device Specific	
14	1	Continuous Update	Force the continuous update of the movement parameters (speed, acc, dec) during JOG movements.
	0	No Continuous Update	Parameters are not updated during the movement.
15	1	Update Moving parameter	Force the setting of the parameters (speed, acc, dec) at each movement (jog, home).
	0	No Update Moving parameter	The movement parameters are updated at the activation of a traversing task.

Structure of the Statusword 1.

Bit	Value	Significance	Notes
0	1	Ready To Switch On	Drive is enabled and initialized. Output current to the motor is disabled.
	0	Not Ready To Switch On	
1	1	Ready To Operate	Drive is power supplied.
	0	Not Ready To Operate	
2	1	Operation Enable	Drive is enabled to execute positionings.
	0	Operation Disable	Drive is disabled to execute positionings.
3	1	Fault Present	In the Fault buffer there are unread alarms and accepted by the master.
	0	No fault	
4	1	Coast Stop Not Activated (No OFF 2)	
	0	Coast Stop Activated (OFF 2)	Coast Stop command (OFF 2) is activated.
5	1	Quick Stop Not Activated (No OFF 3)	
	0	Quick Stop Activated (OFF 3)	Quick Stop command (OFF 3) is activated.
6	1	Switching On Inhibited	The drive can change status to "Switched ON" only with the condition "No Coast Stop AND No Quick Stop", followed by the command "ON".
	0	Switching On Not Inhibit	
7	1	Warning Present	There are warning messages in the parameter "I&M".
	0	No Warning	
8	1	Reserved	
9		Reserved	
10	1	Target Position Reached	Axis to the target position.
	0	Not at Target Position	Axis not in position.
11	1	Home Position Set	Axis is homed.
	0	Home Position Not Yet Set	None home position is valid.
12	Edge	Traversing Task Acknowledgment (0 ->1)	On the rising edge, Traversing Task accepted.
13	1	Drive Stopped	Axis stopped.
	0	Drive Moving	Axis is moving.
14	1	Motor direction CCW	Forward direction
	0	Motor direction CW	Backward direction
15	1	Not In Position	Motor not in position.
	0	In Position	Motor in position.

Structure of the Statusword 2, when telegrams 9 and 109 are used (Implemented with firmware 606 or higher).

Bit	Value	Significance	Notes
0	1	Drive Moving	Axis in movement
	0	Drive Stopped	Axis stopped
1	1	On acceleration ramp	Motor in acceleration ramp
	0		
2	1	Motor at constant velocity	Motor at constant speed
	0		
3	1	On deceleration ramp	Motor in deceleration ramp
	0		
4		Reserved	
5		Reserved	
6		Reserved	
7		Reserved	
8		Reserved	
9		Reserved	
10		Reserved	
11	1	Positioning enable	Positioner enabled
	0		
12		Reserved	
13		Reserved	
14		Reserved	
15		Reserved	

POSITIONING MODE

PROFIBUS GENERAL STATE MACHINE

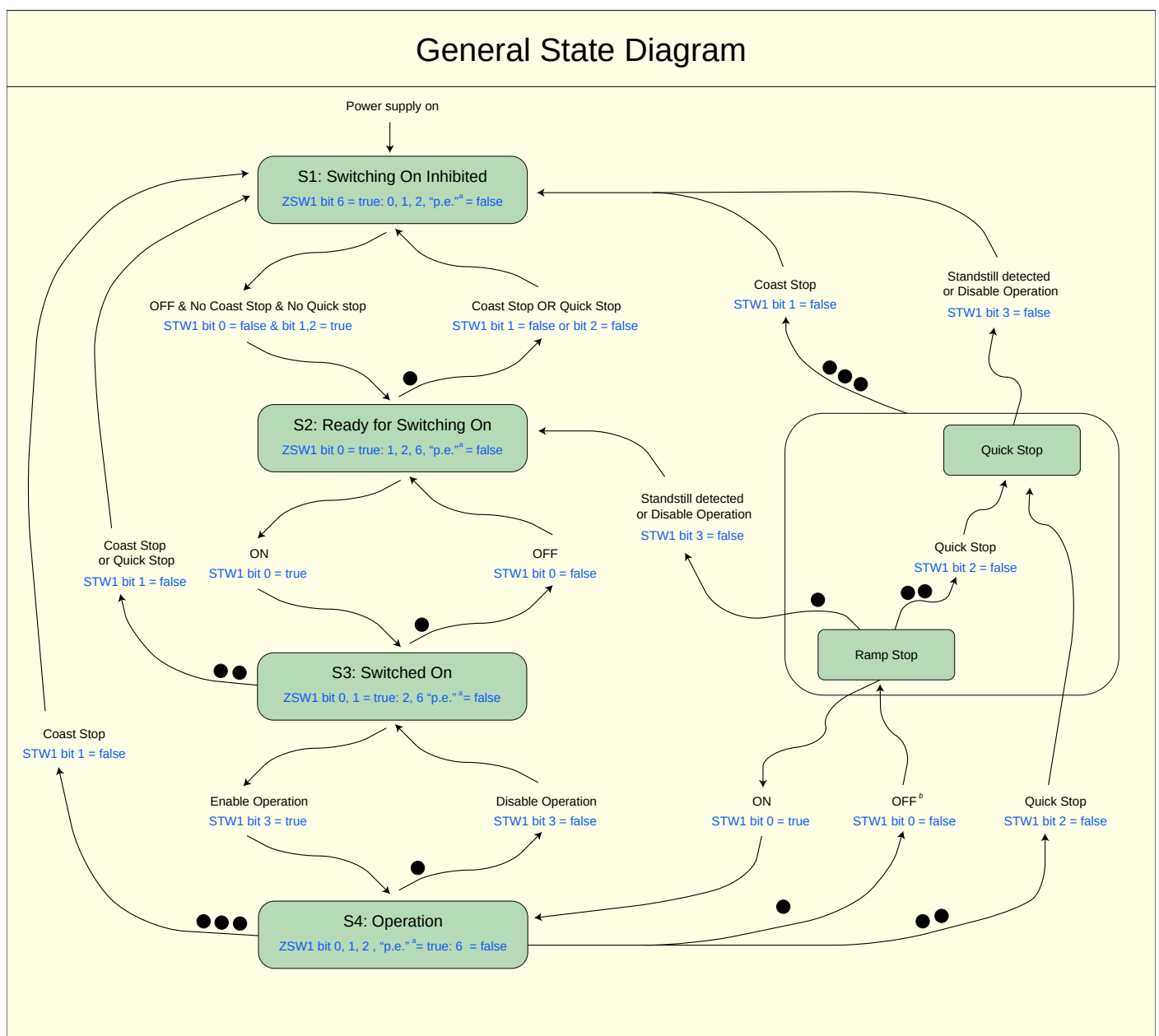
The Profinet general state machine, for the management of the Drive Objects, is composed by 4 states, common to all operation modes.

The green blocks indicate the states, and the arrows indicate the transitions from a state to another. Since, in some states, are allowed multiple transitions with different priorities, the points indicate the priority of the transition. Greater is the number of points, higher is the priority (the transitions without points have the lowest priority).

The transitions can be activated only from the master, by acting on the bit of the Controlword (STW1). The Statusword indicates the current state of the drive.

The internal conditions of the connected drive may generate some transitions independent from the master.

General State Diagram



POSITIONING INTERFACE (PROGRAM SUBMODE)

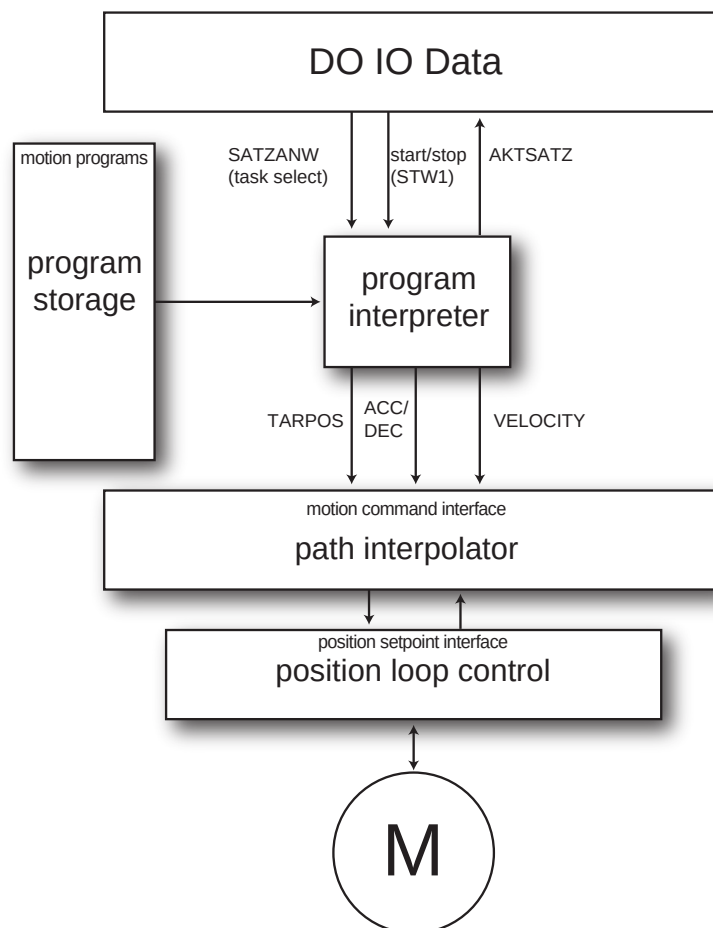
The motion controller of this mode is composed of four blocks:

1. position loop controller
2. path interpolator
3. program interpreter
4. program storage

The interpolator generates, cyclically, the setpoint position for the position controller of the axis. The input data to the interpolator is a movement command, composed of a target position; a speed setpoint; the acceleration and deceleration ramps; that are used to calculate the new positioning profile

Using the function “Program Submode”, the movement commands are stored into a memory (program storage) and manipulated from the interpreter.

Through the Controlword1 and the Traversing block selection, it is possible to check the program interpreter, and to indicate which command has to be loaded and run.



The execution of a movement program, or the switch to a new program, during the execution of a positioning block, can be obtained by selecting the new block through SATZANW (while the bit 15 is 0) and by enabling the bit 6 of STW1

Description of signal SATZANW (Traversing block selection).

Bit	Descrizione
0 - 9	Number of the block, of the program storage, to start. (values range 0 .. 63) Bits from 0 to 9 are significant only in the Program submode status.
10 - 14	Reserved
15	Selection of Submode (Modeswitch): = 1 Activation of the Submode MDI. If a positioning is ongoing (Extended state machine not in Basic State), the MDI Submode will be activated at the end of it (STW1 bit4). = 0 Disactivation of the Submode MDI. If there is a MDI command ongoing, a stop will be commanded, and the command will be rejected.

Description of signal AKTSATZ (Actual traversing block).

Bit	Descrizione
0 - 9	Number of the currently active block. (values range 0 .. 63) Bits from 0 to 9 are significant only in the Program submode status. (In MDI-submode and when there are no Traversing blocks running, the value will be 0).
10 - 14	Reserved
15	Status of Modeswitch: = 1 MDI submode active. Movement parameters are defined by the signals MDI_TARPOS, MDI_VELOCITY, MDI_ACC and MDI_DEC. = 0 Program submode active. Movement parameters are defined by the motion task indicated by bits 0 - 9.

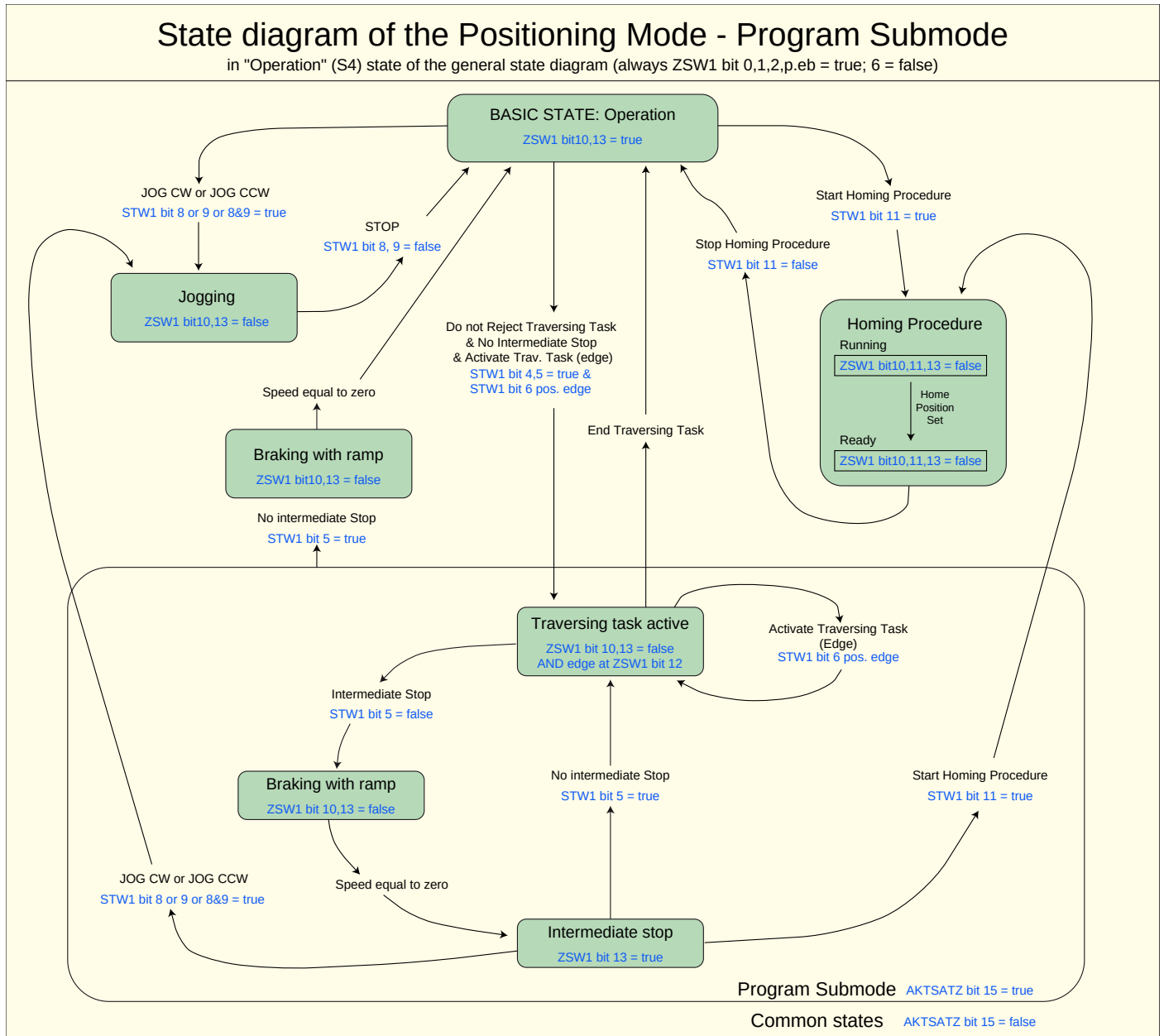
Description of signal MDI MOD (MDI mode).

Bit	Descrizione
0	Absolute/relative positioning mode = 1 Absolute positioning. The target quota indicated in TARPOS defines the absolute quota for the movement (referring to the zero). = 0 Relative positioning. The target quota indicated in TARPOS defines the relative quota for the movement (referring to the current quota).
1	Reserved
2	Reserved
3 - 15	Reserved

The extended state machine Positioning mode is composed of 3 modules: the Common State, Program Submode and the MDI Submode.

The first two states are represented below.

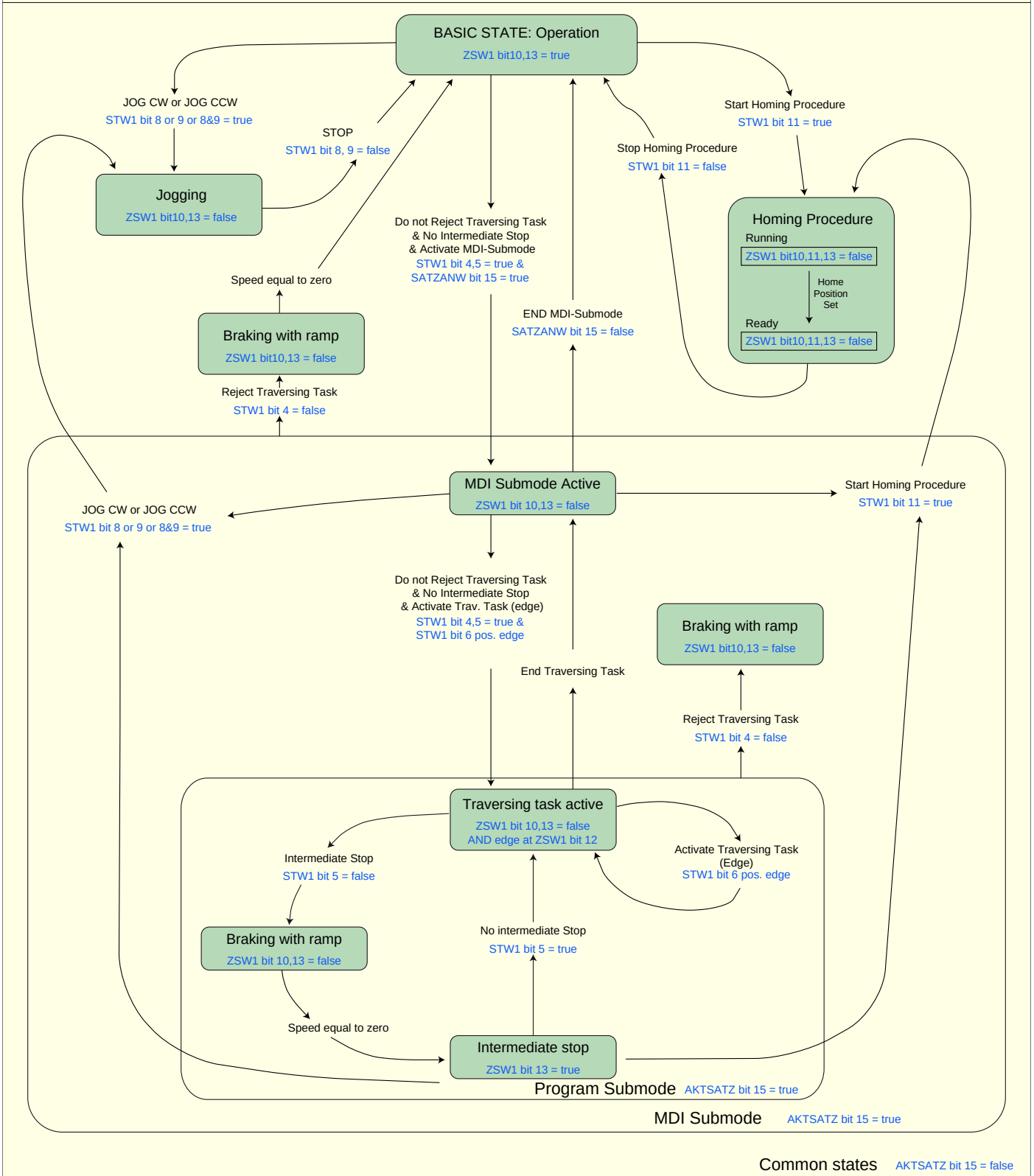
The Activate Traversing Task transition runs the motion task indicated by the bits from 0 to 9 of the signal SATZANW.



The complete state machine is represented below.

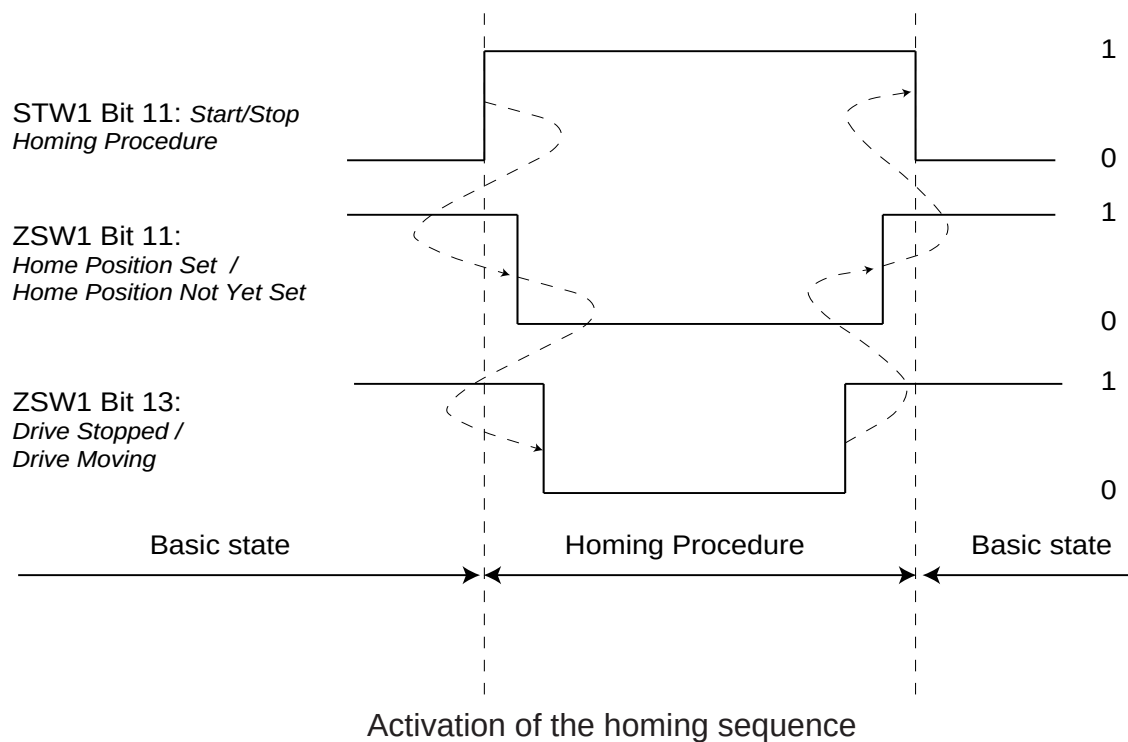
State diagram of the Positioning Mode - MDI Submode

in "Operation" (S4) state of the general state diagram (always ZSW1 bit 0,1,2,p.eb = true; 6 = false)

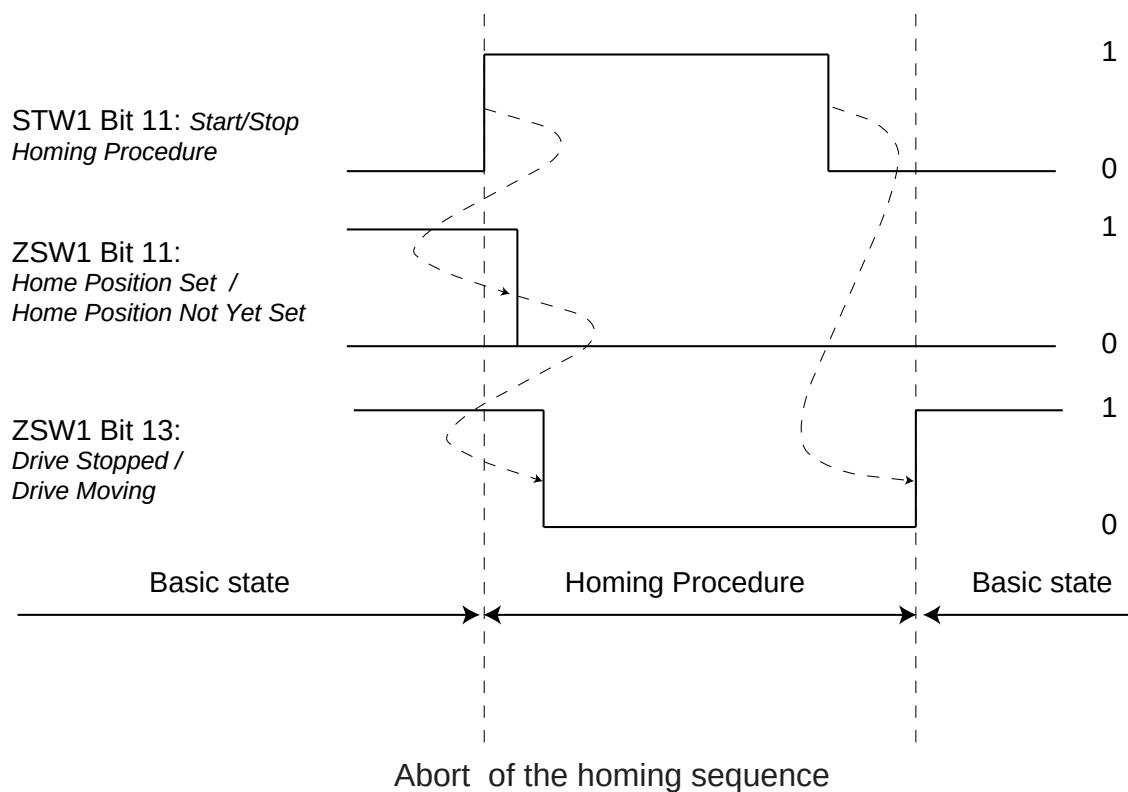


The following diagram shows the bit sequence to activate the homing procedure.

Homing procedure: Home Position Set

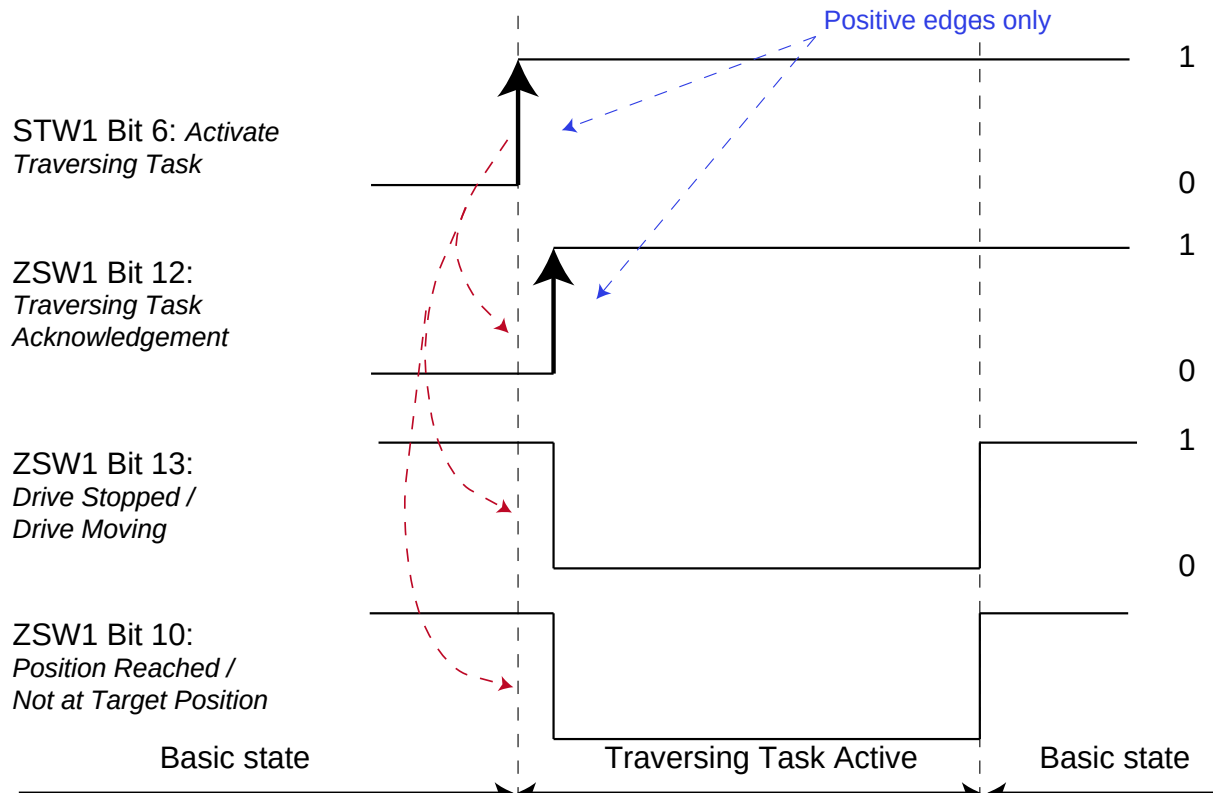


Homing procedure: Stop Homing Procedure by the Controller



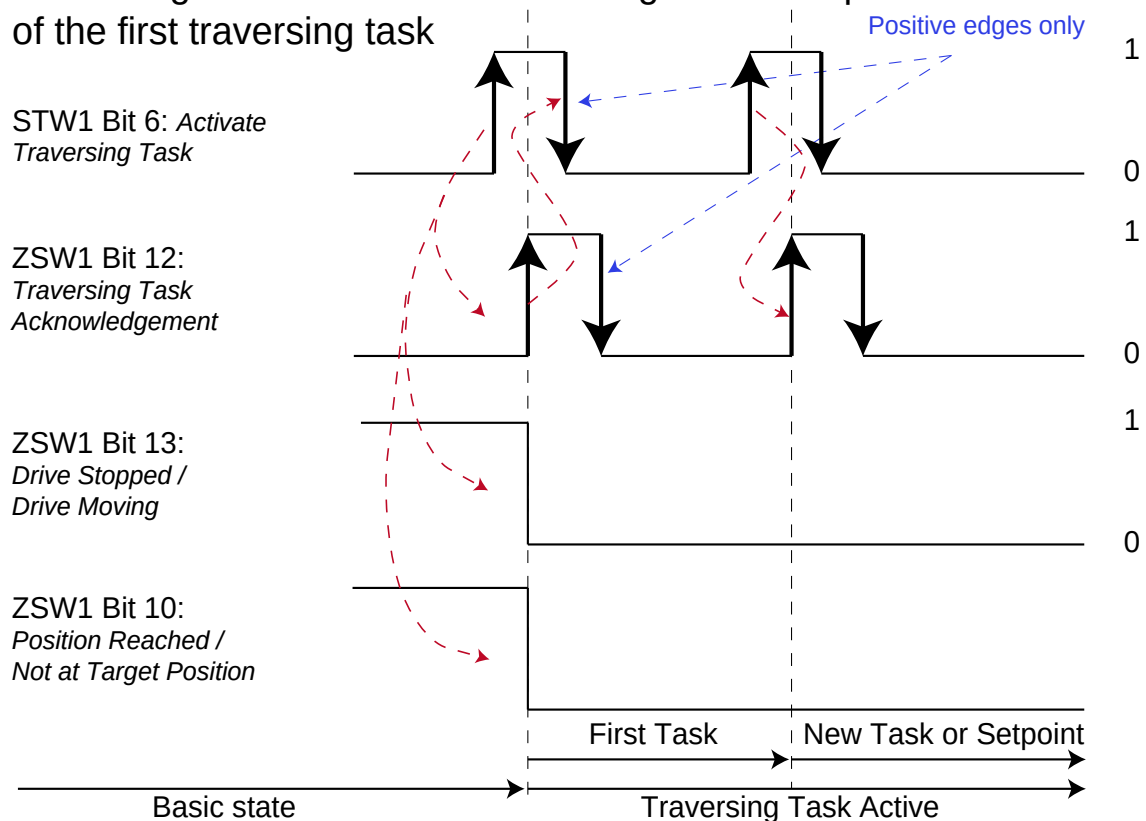
The following diagram shows the bit sequence to activate a traversing task.

Traversing Task Active



The following diagram shows the bit sequence to activate a new traversing task or a new setpoint before the end of the previous task.

Traversing Task active: new traversing task or setpoint before the end of the first traversing task



ACYCLIC COMMUNICATION

INTRODUCTION TO ACYCLIC COMMUNICATION PROFINET

This chapter describes the functions and the procedures to use AEC's drives in Profinet. Please refer to Profinet Nutzerorganisation e.V. or visit the website www.profibus.com for further information on acyclic communication Profinet.

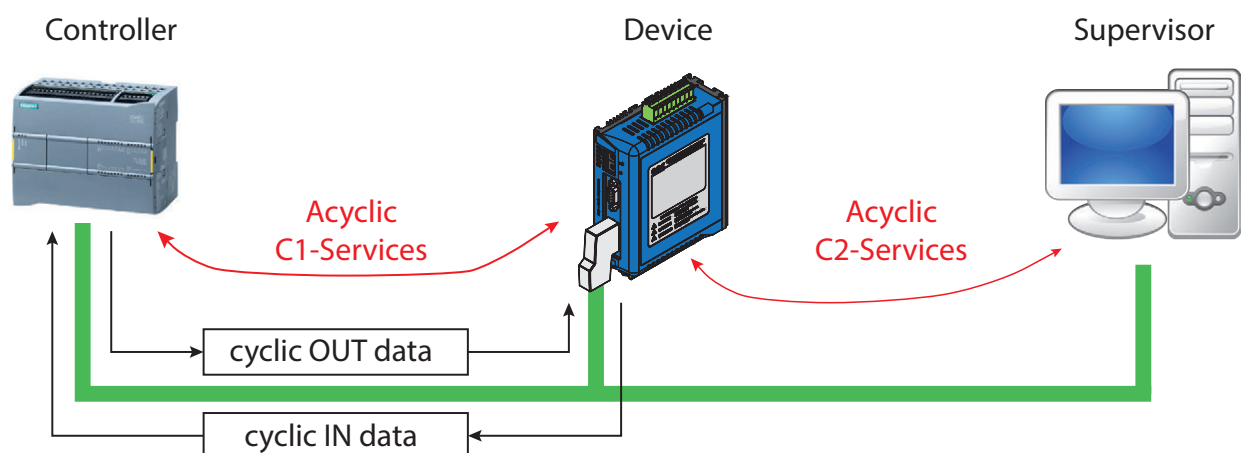
Profinet introduces a new service of acyclic read/write ; these communication services are embedded into special telegrams, that are inside the normal cyclic operativity of the bus.

The acyclic service permits to exchange volumes of data greater than the ones allowed by the cyclic service. At the same time, the communication will not be overloaded, because the acyclic communication telegram is added to the bus cycle only on request.

The Acyclic communication permits many features to the user:

- the master C1 can access in read/write to all the configuration and statuts parameters: registers, variables and tasks of the slave, and not only to the data contained in the cyclic process;
- the master C2 can access in read/write to all the configuration and statuts parameters: registers, variables and tasks of the slave;
- permits the access to the I&M (Information & Maintenance) of the drive

The following scheme summarizes the features of Profinet.



Nome	Descrizione
Controller	In a Profinet network, different classes of masters can coexist. The Controller manages the cyclic exchange with the slaves. Normally is the Controller (PLC), that manages the system automation. In case that the acyclic communication functionalities are enabled through the GSDML file, the acyclic connection between the Controller and Device is automatically enabled, in conjunction with the activation of the cyclic connection. In a Profinet network it is possible to use only one Controller.
Supervisor	The Supervisor are not able to execute cyclic exchange data with the Device. Normally, the Supervisor are visualization systems (eg. HMI) or analyses systems (network analyzers, notebook, PC), used only to monitor the state of the slaves or to alter some of their parameters.
Device	Stepper drive

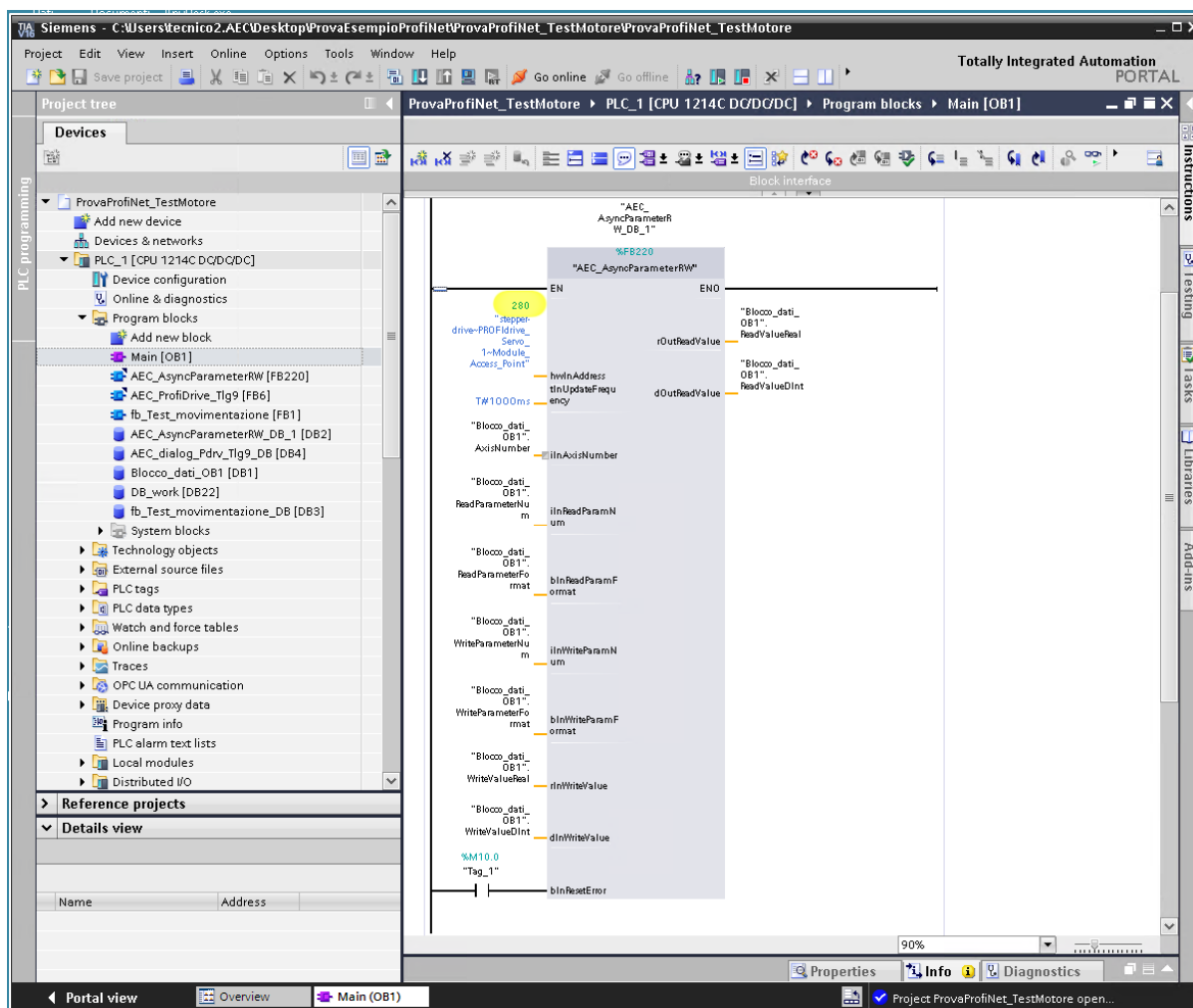
In order to access to the parameters not included in the standard telegrams, it is possible to use the acyclic communication services.

This communication system permits to request, independently from the cyclic data exchange, any register or variable of the drive.

The read/write of the data is based on an addressing mechanism through slot/index and length.

EXAMPLE OF PROFINET ACYCLIC COMMUNICATION

All'interno della sezione "Main" dell'esempio fornito da AEC si potrà trovare il blocchetto dedicato alla comunicazione aciclica "AEC_AsyncParameterRW_M1_DB"



The highlighted value must be obtained from the hardware definition pages, as described in the chapter **"Installation of an AEC drive on TIA portal"**.



On PROFINET bus it is possible to communicate with the drives SMDyyyyyIN using the Modbus TCP protocol.

The IP address of the drive must coincide to the PROFINET IP address.

The communication port used is the 502.

All the data in the program block are referred to the “Blocco_dati_M1_OB1”

Variable name	Description										
hwInAddress	Hardware ID of the drive. This value must be obtained from the hardware definition pages, as described in the chapter “Installation of an AEC drive on TIA portal”.										
ilnAxisNumber	The value must be left at 0										
ParamNumber	Number of register The number of register can be found in the chapter “Proprietary registers”, in the column PROFINET. The value is in hexadecimal format. Example: Rposact 0x2000. In the field it must be written in hexadecimal format 2000.										
Format	Data format to be read <table border="1"> <thead> <tr> <th>Data type</th><th>Value to be written</th></tr> </thead> <tbody> <tr> <td>Integer 16</td><td>3</td></tr> <tr> <td>Integer 32</td><td>4</td></tr> <tr> <td>Unsigned 16</td><td>6</td></tr> <tr> <td>Unsigned 32</td><td>7</td></tr> </tbody> </table>	Data type	Value to be written	Integer 16	3	Integer 32	4	Unsigned 16	6	Unsigned 32	7
Data type	Value to be written										
Integer 16	3										
Integer 32	4										
Unsigned 16	6										
Unsigned 32	7										
rOutReadValue	Value read with comma										
dOutReadValue	Value read without comma										
rInWriteValue	Value to be written with comma										
dInWriteValue	Value to be written without comma										
bInResetError	Reset command										
Write	Write command										
Read	Read command										

Signed32 Rposact 0x2000 “Actual position of the axis” register read/write example

Blocco_dati_M1_OB1				
	Nome	Tipo di dati	Valore di avvio	Valore di controllo
1	Static			
2	AxisNumber	Byte	16#0	16#00
3	ParameterNum	Int	16#2000	8192
4	ParameterFormat	Byte	4	16#04
5	ReadValueReal	Real	0.0	100.0
6	ReadValueDInt	DInt	0	100
7	WriteValueReal	Real	0.0	0.0
8	WriteValueDInt	DInt	0	0

- The value of the variable “ParameterNum” is displayed in decimal. 8192 in decimal corresponds to 2000 in hexadecimal, which is the address of the register “Rposact”.
- Rposact is a Signed 32 register, so the “ParameterFormat” has been set to 4 (as indicated in the variables table of the block “Blocco_dati_M1_OB1”).

Unsigned16 Rtensact 0x2095 “Actual voltage” register read/write example

Blocco_dati_M1_OB1					
		Nome	Tipo di dati	Valore di avvio	Valore di controllo
1		▼ Static			
2		AxisNumber	Byte	16#0	16#00
3		ParameterNum	Int	16#2000	8341
4		ParameterFormat	Byte	 4	16#06
5		ReadValueReal	Real	0.0	25.0
6		ReadValueDInt	DInt	0	25
7		WriteValueReal	Real	0.0	0.0
8		WriteValueDInt	DInt	0	0

- The value of the variable “ParameterNum” is displayed in decimal. 8341 in decimal corresponds to 2095 in hexadecimal, which is the address of the register “Rtensact”.
- Rtensact is an Unsigned16 register, so the “ParameterFormat” has been set to 4 (as indicated in the variables table of the block “Blocco_dati_M1_OB1”).

DEVICE OUTPUT BEHAVIOR

DESCRIPTION OF DEVICE OUTPUT BEHAVIOR

This chapter describes the device outputs behavior in certain cases.

Case	Output behavior
IOPS=bad (controller in STOP state)	Keep last value
Connection to controller is lost	Set output to zero
Power-on of the device	Set substitute value

PROPRIETARY REGISTERS

REGISTERS

The registers are memory locations inside the drives, each one with specific functions. When a determined value is written in these locations, a function defined by the correspondent register is carried out.

Some of the registers are at 32 bit, and the access to these registers is done by reading or writing two consecutive registers, according to Modbus protocol.

N.B.: ALL THE INTERNAL RESOURCES, REGISTERS E VARIABLES OF THE AEC DRIVES ARE MAPPED IN THE MEMORY LOCATION 4 "HOLDING REGISTER".

N.B.: Verify if the Modbus addresses of the master start from 0 or 1. AEC Modbus addresses start from 0, in case of using a master in which they start from 1 (e.g. Siemens or Weintek) it is necessary to add 1 to the AEC Modbus address.

Example: Rposact= 0000+1= 0001-2

POSITION REGISTERS

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0000-1	0x2000	Rposact	Actual position of the axis	Step	0x80000000	0x7FFFFFFF	Signed32	LS – MSWORD MAP READ
0004-5	0x2004	Rposactreq	Theoric position os the axis	Step	0x80000000	0x7FFFFFFF	Signed32	LS -MSWORD MAP-READ
0008-9	0x2008	Rpostarg	Target position for GO/GOR functions	Step	0x80000000	0x7FFFFFFF	Signed32	LS – MSWORD ANA_T MAP WRITE
0012-13	0x200C	Rupplim	Upper limit quota	Step	0x80000000	0x7FFFFFFF	Signed32	LS – MSWORD SAVE MAP WRITE
0016-17	0x2010	Rlowlim	Lower limit quota	Step	0x80000000	0x7FFFFFFF	Signed32	LS – MSWORD SAVE MAP WRITE
0055-56	0x2037	Rposactsa-ved	Saved quota at switch-off of the drive	Step			Signed32	LS – MSWORD SAVE NO MAP RO
0057	0x2039	Rposactsa-vedflag	B0: 1= Quota saved correctly				Unsig-ned16	WORD RO

Automatic storing of the actual quota at the switch off of the drive

The drive is equipped with a circuit that automatically detect when the supply voltage of the logic stage drops below about 20Vdc.

When this event occurs, the firmware interpretes it like a voltage loss, immediately cuts the current to the motor and, thanks to the residual load of the condensers, tries to store the actual quota (register Rposact) in the non-volatile memory.

When the voltage is again supplied to the logic stage, the firmware restarts and a dedicated function checks if the quota saved in the non-volatile memory is valid by executing some controls on data congruency.

If the stored quota is valid, this value is loaded in the register Rposactsaved (register 55) and the bit 0 of the register Rposactsavedflag (register 57) is set to 1.

If the stored quota is not valid, both Rposactsaved and Rposactsavedflag registers are load with the value 0.

The user has the possibility to check if there is an available valid switch off quota, and so pass the value of Rposactsaved in Rposact.

Please note that the motor must be in standstill at the moment of the voltage loss, else the saved quota will be not valid, because it may be affected by possible movements due to the inertia.

In case of voltage oscillations, the save of the quota is made only during the first signal of voltage loss. The saving is enabled again after the drive is powered again. In case the drive hasn't been completely switched off, if the quota Rposact is varied with respect to the saved quota, it is assumed that the control program had been able to put the motor in current and to move it in a controlled way.

It is essential to take account that this function uses the residual load of the condensers to execute the operations necessary to write the data into the non-volatile memory.

It may occur that the residual load of the condensers is not sufficient to complete the saving of the data.

In this case, when the drive is powered again, the data saved will be invalid. It will be necessary to decide the operations to be carried out, like an example an homing of the axis.

DRIVE STATUS FLAG

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0199	0x20C7	Rstsflg	Flag status register Bit 0: Drive enabled Bit 1: Drive in alarm Bit 2: Axis homed Bit 3: Motor in movement (theoric) Bit 4: Motor in acceleration Bit 5: Motor at constant speed Bit 6: Motor in deceleration Bit 7: Information contained in register Rstscllp Bit 8: Home executed with errors Bit 9: Status of current (0=CurOff/1=CurON) Bit 10: 1=Motor in position Bit 11: Following error Bit 12: Motor moved while in "disable" state (only with encoder). The range is given by the value of the Rdeadpos register. Bit 13: Counterclockwise rotation direction Bit 14: Actual quota out of software limits range Bit 15: Home in progress				Unsigned16	WORD MAP-READ RO
0200	0x20C8	Rstsflg1	Flag status 1 register Bit 0: Alarms are present in the buffer Bit 1: Warning is present Bit 2: Power OFF signal Bit 3: STOP in progress Bit 4: Task in progress Bit 5: Lower SW intervention limit Bit 6: Upper SW intervention limit Bit 7: BLS intervention (memory) Bit 8: FLS intervention (memory) Bit 9: Operation in voltage limit Bit 10: Saturated regulators Bit 11: Current limit is active Bit 12: Encoder phasing in progress Bit 13: 1 = Register 51 (Rextencvel) updated Bit 14: 1 = Register 89 (Rextenctopvel) updated Bit 15: STO active				Unsigned16	WORD MAP READ RO
0203	0x20CB	Rstscllp	Closed-loop flag status register Bit 0: Phased encoder Bit 1: Motor in theoretic movement Bit 2: Motor in position Bit 3: Positioning alarm Bit 4: Following alarm Bit 5: Reserved Bit 6: Positioning time out Bit 7: Motor in real movement Bit 8: Current limit Bit 9: Speed limit Bit 10: Acceleration limit B11: B12: B13: B14: B15: N.B. bits 0-1-2 are used to set the bit 7 of Rstsflg				Unsigned16	WORD RO

OPERATION MODE FLAG

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0058	0x203A	Rflag1	Operation mode flag 1 register (not savable) B0 = Wait end of movement B1 = Update JOG immediately B2= Enable the CAM table for function of positioning from table with start from master quota + digital outputs. B3: B4: B5: B6: B7: B8: B9: B10: B11: B12: On the rising edge, resets quotas in closed loop (real quota and theoric quota) (equal to bit 12 of STW1 of Profibus) B13: B14: B15:		0	65535	Unsig- ned16	WORD

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0102-03	0x2066	Rflag	Operation mode flag register B0 = Wait end of movement B1 = Update velocity JOG immediately (see also BIT1 of Rflag1) B2 = Enable SW low limit B3 = Enable SW high limit B4 = Enable Back Limit Switch B5 = Enable Forward Limit Switch B6 = Reset Posact after Home B7 = Reset Motenc after Home B8 = Reset Motext after Home B9 = Reset Posact after Home offset B10 = Reset Motenc after Home offset B11 = Reset Motext after Home offset (0 = Reset quota / 1 = No reset quota) B12 = 1: Enable automatic offset correction in closed loop B13 = 1: Enable automatic PID current correction in closed loop B14 = 1: Unidirectional gear B15 = 1: Forward only gear B16 = 1: Back only gear B17 = 1: In Smart Mode, at "Current ON", update the requested actual position with the actual quota obtained by the encoder B18 = 1: In Smart Mode, at "Current OFF", doesn't update the requested actual position with the actual quota obtained by the encoder, in order to permit the recovery of the quota at "Current ON" B19 = 0: USB port without slave address and fixed parameters at 9600,N,8,1 /1: USB port with parameters set by registers but without slave address. B20 = B21 = B22 = B23 = B24 = B25 = B26 = B27 = B28 = B29 = B30 = B31 =		0	0x7FFFFFFF	Unsigned32	LS – MSWORD SAVE NO MAP
0278	0x2116	Rhwconfig	Hardware configuration B0 (1): 0= Not used B1 (2): Motor encoder direction (<u>from firmware 6.15 moved to 10031</u>) B2 (4): Motor rotation direction B3 (8): Phased encoder in FC reset flag B4 (16): Configure An. Inp 0 SMD1104 B5 (32): 0=Motor encoder in quadrature / 1=Motor encoder pulse/direction (<u>from firmware 6.15 moved to 10031</u>) B6 (64): 1=Preset encoder SSI B7 (128): 0=Normal SSI encoder / 1=Complement SSI encoder B8 (256): 0=Gray SSI encoder / 1=Binary SSI encoder (<u>from firmware 6.15 moved to 10034-35</u>) B9-10: 00=SSI encoder with right alignment data / 01=SSI encoder with left alignment data / 10=SSI encoder with centered data (<u>from firmware 6.15 moved to 10034-35</u>) B11 (2048): 0=DMD with PWM 50% / 1=DMD with PWM 0-100% B12 (4096): 1=Realign entering quota in interpolation mode (Master CanOpen Nardi) B13 (8096): Rialign quotas Rposact Rposactreq in interpolation mode (Master CanOpen Sipro)		0	65535	Unsigned16	WORD SAVE

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0063-64	0x203F	Rvel	Maximum translation speed	rev*100/s	-10000	10000	Signed32	LS – MSWORD ANA MAP WRITE
0065-66	0x2041	Rvss	Start and stop speed (Start/Stop)	rev*100/s	0	10000	Signed32	LS – MSWORD MAP WRITE
0067-68	0x2043	Racc	Acceleration ramp. If =0, ramp is disabled.	rev*10/s ²	0	200000	Unsigned32	LS – MSWORD ANA MAP WRITE
0069	0x2045	Raccpro	Acceleration profile 0=S 10=Linear		0	10	Unsigned16	WORD SAVE NO MAP
0070-71	0x2046	Rdec	Deceleration ramp. If =0, ramp is disabled.	rev*10/s ²	0	200000	Unsigned32	LS – MSWORD ANA MAP WRITE
0072	0x2048	Rdecpro	Deceleration profile 0=S 10=Linear		0	10	Unsigned16	WORD SAVE NO MAP
0073-74	0x2049	Rdeceme	Emergency deceleration ramp	rev*10/s ²	0	200000	Unsigned32	LS – MSWORD SAVE MAP WRITE
0075-76	0x204B	Rvelact	Actual speed of the motor	rev*100/s			Signed32	LS – MSWORD MAP READ RO
0077-78	0x204D	Rvelactreq	Actual speed requested by the motor	rev*100/s			Signed32	LS – MSWORD MAP READ RO
0079-80	0x204F	Rvelmax	Maximum speed during quota recovery	rev*100/s	0	10000	Signed32	LS – MSWORD SAVE NO MAP
0100	0x2064	Rdefum	Define the velocity and acceleration divider. The following values can be taken: 1= 1:1 Ratio between the set value and the real value 10= 10:1 Ratio between the set value and the real value 100= 100:1 Ratio between the set value and the real value		1	100	Unsigned16	WORD NO MAP SAVE
0327	0x2147	Rpwmacc	Only for DMD. Acc/dec PWM ramp	bit/s ²			Unsigned16	WORD
0328	0x2148	Rpwm	Only for DMD. PWM opening in PWM mode, expressed in bit. It can range from 0 (100%) to 1250 (100%)	%	0	1250	Unsigned16	WORD
0366	0x216E	Rveladjpicur	Maximum velocity for current PI reduction at low velocity		0	32767	Unsigned16	WORD SAVE
0406	0x2196	Rdlyadjpicur	PI current correction activation delay (0=disable correction)	ms	0	32767	Unsigned16	WORD SAVE
0410	0x219A	Rzerovellim	Minimum value of the motor encoder steps for axis in movement. Used to detect the motor in stop in homing in mechanical stop (hard-stop) in SmartMode	Enc. Pulses	0	65535	Unsigned16	WORD SAVE NO MAP
0411	0x219B	Rzeroveltim	Motor encoder sample time for stopped motor reading. Used to detect the motor in stop in homing in mechanical stop in SmartMode	ms	0	65535	Unsigned16	WORD SAVE NO MAP
0412	0x219C	Rcurlimtim	Filter time for the signal of current limit in FOC_CLOSE	ms	0	65535	Unsigned16	WORD SAVE NO_MAP

0493-494	0x21ED	Rveltarg	Velocity target in function mode 9 (CSV). Only for protocols CANopen and EtherCAT.		-20000	+20000	Signed32	D WORD MAP WRITE
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MOVEMENT COMMANDS

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0059	0x203B	Rcmdwr	PC writing/indexer reading command register B0 (1) : DISABLE DRIVE B1 (2) : ENABLE DRIVE B2 (4) : ABORT B3 (8) : STOP B4 (16) : ESTOP B5 (32) : JOG CW B6 (64) : JOG CCW B7 (128) : New setpoint GO B8 (256) : New setpoint GOR B9 (512) : HOME B10 (1024) : GEAR B11 (2048) : CAM Start Stop B12 (4096) : CAM B13 (8192) : TASK B14 (16384): BESTOP B15 (32768): SHIFT STOP <u>CAUTION! The bits of this register must be set one at a time; the drive, once the action is performed, will clear the the bit.</u>		0	65535	Unsig- ned16	WORD MAP WRITE WO
0060	0x203C	Rcmd1wr	PC writing/indexer writing command 1 register B0: Current pulse on phase A B1: Motor phases wiring test B2: Winding mode B3: Smit mode B4: Realign quotas in SmartMode (Remove possible thrust of the motor) B5: Not used B6: Set step/dir cam mode (function as step/dire mode, but without the need to pass from "Position" to "Step Dir") B7: Recover the motor quota in SmartMode (if the motor has been shifted with the drive disabled) B8: B9: B10: B11: B12: B13: B14: B15:		0	65535	Unsig- ned16	WORD MAP WRITE WO

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0061	0x203D	Rcmdrd	PC reading/indexer writing command register B0: B1: B2: Positioning ABORT B3: Ramp movement STOP B4: ESTOP active B5: JOG + B6: JOG - B7: New setpoint GO B8: New setpoint GOR B9: Home B10: GEAR B11: CAM Start Stop Mode B12: CAM mode B13: TASK mode B14: BESTOP active B15:				Unsig- ned16	WORD MAP READ RO
0062	0x203E	Rcmd1rd	PC reading/indexer writing command 1 register B0: 1=Current step executed B1: 1=Motor phases wiring test executed (reset by writing 0 on Rcmd1wr or at the start of another test) B3: 1=Winding mode active B4: 1= Smit mode active B5: 1= Smart mode quotas realignment executed B6: Not used B7: 1= Step/dir cam mode active B8: 1= SmartMode motor quota recover executed B9: B10: B11: B12: B13: B14: B15:				Unsig- ned16	WORD MAP READ RO
0106	0x206A	Rtasknum	Number of the task to be executed with serial com- mand		0	63	Unsig- ned16	WORD
0450	0x21C2	Rptroldcmd	Executed commands buffer pointer 0= Newest 7= Oldest		0	7	Unsig- ned16	WORD NO MAP
0451	0x21C3	Rbufcmdsta- tus	Status of the last command. Indicates where the command came from: User program Serial Fieldbus				Unsig- ned16	WORD NO MAP RO
0452-53	0x21C4	Rbufcmdcom- mand	Last command executed				Unsig- ned32	H-LWORD NO MAP RO
0454-55	0x21C6	Rbufcmdpara- meter	Parameter of the last command executed				Signed32	H-LWORD NO_MAP RO

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0032-33	0x2020	Rhmaxspc	Maximum space in Home	Step	0	0x7FFFFFFF	Unsigned32	LS – MSWORD SAVE NO MAP
0034	0x2022	Rdefinpbls	Definition of input number for BLS function (back limit switch) 255 = Standard BLS input 254 = BLS input disabled 0-15 = Digital input used for BLS (if the input is not associated to a specific function)		0	255	Unsigned16	WORD SAVE
0035	0x2023	Rdefinpfls	Definition of input number for FLS function (forward limit switch) 255 = Standard FLS input 254 = FLS input disabled 0-15 = Digital input used for FLS (if the input is not associated to a specific function)		0	255	Unsigned16	WORD
0036-37	0x2024	Rhofs	Homing offset (Shift of the axis after home routine)	Step	0x80000000	0x7FFFFFFF	Signed32	LS – MSWORD SAVE NO MAP
0038-39	0x2026	Rhpos	Axis quota forced after the execution of homing function	Step	0x80000000	0x7FFFFFFF	Signed32	WORD SAVE
0040	0x2028	Rhcurcoll	% of nominal current to detect a collision during homing sequence with mechanical limit (FOC_CLOSE)	%	1	100	Unsigned16	WORD SAVE MAP-WRITE
0041	0x2029	Rhtimcoll	Filter time to detect a collision during homing sequence with mechanical limit (FOC_CLOSE)	ms	0	10000	Unsigned16	WORD NOMAP SAVE
0081	0x2051	Rhtinv	Stop time of the axis before inverting direction during homing in mS (default=512mS)	ms	0	32767	Unsigned16	WORD SAVE NO MAP

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0082	0x2052	Rhmode	Homing method (Type of home routine): -16 = Homing on FLS + encoder 1 TOP, positive direction -15 = Homing on FLS + encoder 1 TOP, negative direction -14 = Homing on FLS, positive direction -13 = Homing on FLS, negative direction -12 = Homing with forward mechanical limit + encoder 1 TOP (only SmartMode and Closed Loop) -11 = Homing with backward mechanical limit + encoder 1 TOP (only SmartMode and Closed Loop) -10 = Homing with forward mechanical limit -9 = Homing with backward mechanical limit -8 = Homing with forward mechanical limit + axis measure (Resets the registers Rlowlim and Rupplim) -7 = Homing with backward mechanical limit + axis measure (Resets the registers Rlowlim and Rupplim) -6 = Homing only with encoder 1 TOP in positive direction -5 = Homing only with encoder 1 TOP in negative direction -4 = Homing with BLS + encoder 1 TOP rising edge, positive direction -3 = Homing with BLS + encoder 1 TOP rising edge, negative direction -2 = Homing only with BLS in positive direction -1 = Homing only with BLS in negative direction 0 = Homing on place 35 = Homing on place (only in CanOpen, for DS402 compatibility) 37 = Homing on place (only in CanOpen, for DS402 compatibility)		-16	37	Signed16	WORD MAP WRITE
0083-84	0x2053	Rhvh	Homing speed during the limit switch search	rev*100 /s	0	10000	Signed32	LS-MSWORD MAP WRITE
0085-86	0x2055	Rhvl	Homing speed during the 0 point search (Must be a speed in the start/stop range)	rev*100 /s	0	10000	Signed32	LS – MSWORD MAP WRITE
0087-88	0x2057	Rhacc	Acceleration/deceleration during homing sequence	rev*10/ s²	0	200000	Unsigned32	LS – MSWORD MAP WRITE
0202	0x20CA	Rhsts	Homing sequence error code Bit 0: Home in progress Bit 1: Drive not enabled Bit 2: Maximum space for homing sequence Bit 3: BLS intervention error Bit 4: FLS intervention error Bit 5: Home interrupted Bit 6: Homing sequence not recognized Bit 7: Homing with mechanical limit (with FOC_OPEN) Bit 8: Bit 9: Bit 10: Bit 11: Bit 12: Bit 13: Bit 14: Bit 15:				Unsigned16	WORD NO MAP RO
0575-76	0x223F	Rhindexspc		Step			Signed32	D WORD

STOP INSTRUCTION

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0024-25	0x2018	Rshstop	Shift space in STOP instruction	Step	0	0x7FFFFFFF	Unsigned32	LS-MSWORD SAVE NO MAP
0028-29	0x201C	Rspcstop	Fixed stop space	Step	0	0x7FFFFFFF	Unsigned32	LS – MSWORD SAVE NO MAP
0030-31	0x201E	Rspcstopcalc	Stop space of the last stop	Step			Unsigned32	LS – MSWORD NO MAP

BESTOP INSTRUCTION (STOP ON BIT EVENT)

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0049	0x2031	Rbestpflg	BESTOP command enabling [B0..B4]: Bit Number B5: Condition (0 = Low, 1 = High) B6: Type of data (0 = Variable, 1 = Register) B7 = Stop on the rising edge of TOP mot B8 = Stop on the falling edge of TOP mot B9 = Stop on the rising edge of TOP ext B10 = Stop on the falling edge of TOP ext				Unsigned16	WORD MAP WRITE
0050	0x2032	Rbestppar	BESTOP parameter, contains the register or variable that generates ESTOP				Unsigned16	WORD MAP WRITE

N.B. In order to activate the BESTOP functions, it is necessary to raise the bit 14 of the register Rcmdwr (address 0059).

ESTOP INSTRUCTION (STOP ON REGISTER OR VARIABLE VALUE)

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0020-21	0x2014	Rshestop	Shift space in ESTOP instruction	Step	0	0x7FFFFFFF	Unsigned32	LS – MSWORD ANA_T - SAVE NO MAP
0045	0x202D	Restpflg	ESTOP command enabling B7: Type of destination data (0 = Variable, 1 = Register) B6-B5: Source: 00=Var / 01=Reg / 10=direct value / 11=not allowed. B4-B3-B2-B1: Jump condition 0000 = Equal 0001 = Not Equal 0010 = Higher 0011 = Lower 0100 = Higher or Same 0101 = Lower or Same B0: Free				Unsigned16	WORD MAP WRITE
0046-47	0x202E	Restppar1	Parameter 1 for ESTOP function				Unsigned32	WORD MAP WRITE
0048	0x2030	Restppar2	Parameter 2 for ESTOP function				Unsigned16	WORD MAP WRITE

N.B. In order to activate the Estop functions, it is necessary to raise the bit 4 of the register Rcmdwr (address 0059).

GEAR INSTRUCTION

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0104	0x2068	Rgearmul	Reduction ratio for GEAR instruction (multiplier)		1	32767	Unsigned16	WORD SAVE NO MAP
0105	0x2069	Rgeardiv	Reduction ratio for GEAR instruction (divider)		1	32767	Unsigned16	WORD SAVE NO MAP

ALARMS AND WARNINGS

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0224	0x20E0	Rpostimeout	Time for positioning Time-out	ms	0	65535	Unsigned16	WORD SAVE
0225	0x20E1	Rdeadpos	Dead band in position	Step motore	0	32767	Unsigned16	WORD SAVE NO MAP
0226	0x20E2	Rsettim	Settling time in closed loop. Time in the range of motor position with requested theoretic speed = 0, before the signal of motor in position.	ms	0	1000	Unsigned16	WORD SAVE NO MAP
0227	0x20E3	Ralarm	Drive alarms Bit 0: Overcurrent HW (not maskable) Bit 1: Overcurrent SW (not maskable) Bit 2: I2T Bit 3: Positioning error (Closed Loop. Position out of the DeadBand for time Rposalmtime with requested velocity=0) (disabled by default) Bit 4: Following error (Open Loop. Encoder pulses – normalized motor pulses greater than Rflwmax) (disabled by default) (Closed Loop. With requested velocity <>0 (Encoder pulses – normalized motor pulses) > Rflwmax for the time Rposalmtime) Bit 5: Overload digital output (not maskable) Bit 6: Overtemperature (not maskable) Bit 7: Overvoltage (not maskable) Bit 8: Undervoltage Bit 9: Motor encoder phasing error (not maskable) Bit 10: Motor phase A disconnected (not maskable) Bit 11: Motor phase B disconnected (not maskable) Bit 12: Positioning Timeout Bit 13: Homing Error Bit 14: Inverted encoder in Smart Mode or Closed Loop Bit 15: Encoder anomaly Note: write 0 into this register to reset the alarms.		0	65535	Unsigned16	WORD MAP READ

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0228	0x20E4	Rwarning	Drive pre-alarm notifications Bit 0: Overcurrent HW (= alarm) (not maskable) Bit 1: Overcurrent SW (not maskable) Bit 2: I2T Bit 3: Positioning error (Closed Loop. Position out of the DeadBand for time Rposalmtime with requested velocity=0) (disabled by default) Bit 4: Following error (Open Loop. Encoder pulses – normalized motor pulses greater than Rflwwrn) (disabled by default) (Closed Loop. With requested velocity <>0 (Encoder pulses – normalized motor pulses) > Rflwmax for the time Rposwrntime) Bit 5: Overload digital output (not maskable) Bit 6: Overtemperature (not maskable) Bit 7: Overvoltage (not maskable) Bit 8: Undervoltage Bit 9: Current limited by voltage Bit 10: Saturated regulator Bit 11: Current limit is active Bit 12: Positioning Timeout Bit 13: Free Bit 14: Free Bit 15: Free		0	65535	Unsigned16	WORD MAP READ RO
0229	0x20E5	Rbufalm0	Alarm buffer 0				Unsigned16	WORD NO MAP RO
0230	0x20E6	Rbufalm1	Alarm buffer 1				Unsigned16	WORD NO MAP RO
0231	0x20E7	Rbufalm2	Alarm buffer 2				Unsigned16	WORD NO MAP RO
0232	0x20E8	Rbufalm3	Alarm buffer 3				Unsigned16	WORD NO MAP RO
0233	0x20E9	Rbufalm4	Alarm buffer 4				Unsigned16	WORD NO MAP RO
0234	0x20EA	Rbufalm5	Alarm buffer 5				Unsigned16	WORD NO MAP RO
0235	0x20EB	Rbufalm6	Alarm buffer 6				Unsigned16	WORD NO MAP RO
0236	0x20EC	Rbufalm7	Alarm buffer 7				Unsigned16	WORD NO MAP RO
0237	0x20ED	Ralmcnt	Fault counter		0	65535	Unsigned16	WORD NO MAP RO
0238	0x20EE	Ralmack	Last alarm acknowledge Bit 0: Alarm Acknowledge Bit 1: Reset alarm counter		0	3	Unsigned16	WORD NO MAP
0239	0x20EF	Rtempalm	Temperature limit to be reached to activate the alarm. Exceeded this value, an alarm is generated.	°C	0	150	Unsigned16	WORD SAVE NO MAP
0240	0x20F0	Rtensmax	Maximum voltage limit. Exceeded this value, an alarm is generated.	Volt	0	200	Unsigned16	WORD SAVE NO MAP
0241	0x20F1	Rtensmin	Minimum voltage limit. Below this value, an alarm is generated.	Volt	0	200	Unsigned16	WORD SAVE NO MAP
0242	0x20F2	Rcurmax	Maximum current limit.	mA	0	20000	Unsigned16	WORD SAVE NO MAP

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0243-244	0x20F3	Rflwmax	Maximum delta for the generation of a following alarm.	Imp. Enco- der	0	32000	Unsig- ned32	LS – MSWORD SAVE NO MAP
0245-246	0x20F5	Ri2tmax	I2T for alarm		0	9999999	Unsig- ned32	LSWORD – MSWORD SAVE NO MAP
0247	0x20F7	Rmaskalm	Alarms mask. If bit=1 the corresponding alarm is masked. Bit 0: Not maskable Bit 1: Not maskable Bit 2: I2T Bit 3: Positioning error (Closed Loop. Position out of the DeadBand for time Rposalmtime with requested velocity=0) (disabled by default) Bit 4: Following error (Open Loop. Encoder pulses – normalized motor pulses greater than Rflwmax) (disabled by default) (Closed Loop. With requested velocity <>0 (Encoder pulses – normalized motor pulses) > Rflwmax for the time Rposalmtime) Bit 5: Not maskable Bit 6: Not maskable Bit 7: Not maskable Bit 8: Undervoltage Bit 9: Not maskable Bit 10: Not maskable Bit 11: Not maskable Bit 12: Positioning Timeout Bit 13: Not maskable Bit 14: Not maskable Bit 15: Encoder anomaly				Unsig- ned16	WORD SAVE
0248	0x20F8	Rposalmtime	Time before positioning alarm in Closed Loop.	ms	0	32000	Unsig- ned16	WORD SAVE
0249	0x20F9	Rtempwrn	Value for overtemperature warning	°C	0	150	Unsig- ned16	WORD SAVE NO MAP
0250	0x20FA	Rovvwrn	Value for overvoltage warning	Volt	0	200	Unsig- ned16	WORD SAVE NO MAP
0251	0x20FB	Runvwrn	Value for undervoltage warning	Volt	0	200	Unsig- ned16	WORD SAVE NO MAP
0252	0x20FC	Rovcwrn	Value for overcurrent warning	mA	0	20000	Unsig- ned16	WORD SAVE NO MAP
0253-254	0x20FD	Rflwwrn	Value for following warning	Step	0	32000	Unsig- ned32	LSWORD - MSWORD SAVE NO MAP
0255-256	0x20FF	Ri2twrn	Value for I2T warning		0	9999999	Unsig- ned32	LSWORD - MSWORD SAVE NO MAP

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0257	0x2101	Rmaskwrn	Warning mask. If bit=1 the corresponding warning is masked. Bit 0: Not maskable Bit 1: Not maskable Bit 2: I2T Bit 3: Positioning error (Closed Loop. Position out of the DeadBand for time Rposalmtime with requested velocity=0) (disabled by default) Bit 4: Following error (Open Loop. Encoder pulses – normalized motor pulses greater than Rflwwrn) (disabled by default) (Closed Loop. With requested velocity <>0 (Encoder pulses – normalized motor pulses) > Rflwmax for the time Rposwrntime) Bit 5: Not maskable Bit 6: Not maskable Bit 7: Not maskable Bit 8: Undervoltage Bit 9: Current limited by voltage Bit 10: Saturated regulator Bit 11: Current limit is active Bit 12: Positioning Timeout Bit 13: Free Bit 14: Free Bit 15: Free				Unsig- ned16	WORD SAVE
0258	0x2102	Rposwrn- time	Time before positioning warning in Closed Loop.	ms	0	32000	Unsig- ned16	WORD SAVE
0259-260	0x2103	Rflwdisp	Display the absolute following error. Write 0 in this register to reset the following alarm.	En- coder pulses			Signed32	LSWORD – MSWORD MAP READ
0261-262	0x2105	Rflwmem	Display the maximum saved following error. Write 0 in this register to reset.	En- coder pulses			Signed32	LSWORD – MSWORD NO MAP
0263	0x2107	Rflwtim	Filter time before the signal of following error.	ms	0	32000	Unsig- ned16	WORD SAVE NO MAP
0266	0x210A	Rflwmemp	Store the maximum positive following error at 16 bit. Value goes from 0 to 65535. Write 0 in this location to reset the memory.	En- coder pulses	0	65535	Unsig- ned16	WORD NO MAP
0267	0x210B	Rflwmemn	Store the maximum negative following error at 16 bit. Value goes from 0 to 65535. Write 0 in this location to reset the memory.	En- coder pulses	0	65535	Unsig- ned16	WORD NO MAP
0407-08	0x2197	Rflwencerr	Maximum error of counter difference between motor encoder and normalized motor steps to generate an error. This function is similar to the following error, but it doesn't have a time filter, and it's always active. It's used to detect the encoder absence. If used, it's usually set at a value of 1 or 2 turns of the encoder.	En- coder pulses	0	0x7FFFFFFF	Unsig- ned32	WORD
0409	0x2199	Rposti- meoutwrn	Time for positioning timeout warning	ms	0	65535	Unsig- ned16	WORD SAVE

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0559-60	0x222F	Ralarm32	Drive alarms Bit 0: Overcurrent HW (not maskable) Bit 1: Overcurrent SW (not maskable) Bit 2: I2T Bit 3: Positioning error (Closed Loop. Position out of the DeadBand for time Rposalmtime with requested velocity=0) (disabled by default) Bit 4: Following error (Open Loop. Encoder pulses – normalized motor pulses greater than Rflwmax) (disabled by default) (Closed Loop. With requested velocity <>0 (Encoder pulses – normalized motor pulses) > Rflwmax for the time Rposalmtime) Bit 5: Overload digital output (not maskable) Bit 6: Overtemperature (not maskable) Bit 7: Overvoltage (not maskable) Bit 8: Undervoltage Bit 9: Motor encoder phasing error (not maskable) Bit 10: Motor phase A disconnected (not maskable) Bit 11: Motor phase B disconnected (not maskable) Bit 12: Positioning Timeout Bit 13: Homing Error Bit 14: Inverted encoder in Smart Mode or Closed Loop Bit 15: Encoder anomaly Bit 16: Reserved Bit 17: Reserved Bit 18: Missing Sync (CANopen or EtherCAT) Bit 19: STO anomaly (Incongruent inputs) Bit 20: VLogic undervoltage alarm Bit 21: STO anomaly (test on STO A failed) Bit 22: STO anomaly (test on STO B failed) Bit 23: Anomaly on output pin "Drive safety state" Note: write 0 into this register to reset the alarms.		0	0xFFFFFFFF	Unsigned32	WORD MAP READ
0561-62	0x2231	Rwarning32	Drive pre-alarm notifications Bit 0: Overcurrent HW (= alarm) (not maskable) Bit 1: Overcurrent SW (not maskable) Bit 2: I2T Bit 3: Positioning error (Closed Loop. Position out of the DeadBand for time Rposalmtime with requested velocity=0) (disabled by default) Bit 4: Following error (Open Loop. Encoder pulses – normalized motor pulses greater than Rflwwrn) (disabled by default) (Closed Loop. With requested velocity <>0 (Encoder pulses – normalized motor pulses) > Rflwmax for the time Rposwrntime) Bit 5: Overload digital output (not maskable) Bit 6: Overtemperature (not maskable) Bit 7: Overvoltage (not maskable) Bit 8: Undervoltage Bit 9: Current limited by voltage Bit 10: Saturated regulator Bit 11: Current limit is active Bit 12: Positioning Timeout Bit 13: Free Bit 14: Free Bit 15: Free Bit 16: Reserved Bit 17: Reserved Bit 18: Missing Sync (CANopen or EtherCAT) Bit 19: STO anomaly		0	65536	Unsigned32	WORD MAP READ
10144	0x4800	Ralmbuffres	Alarms history buffer reset				Unsigned16	RW SAVE
10145	0x4801	Ralmbuffptr	Pointer to the alarms history buffer		0	15	Unsigned16	RW SAVE
10146-47	0x4802	Ralmbufftime	Alarm timestamp pointed by Ralmbuffptr				Unsigned32	RO

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
10148-49	0x4803	Ralmbuffcode	Alarm code pointed by Ralmbuffptr				Unsigned32	RO

Management of following control in closed loop

When the motor works in closed loop, the motor must be equipped with an encoder, so it is possible to execute a following control between the motor and the encoder.

In closed loop mode, there are two types of alarms generated by the comparison between the encoder position (real) and the position requested by the program (target).

If a movement of the motor is requested (speed different than 0) the following control is enabled.

When the theoric positioning profile ends, and the requested speed is equal to 0, it is necessary to wait the motor enters in the positioning zone indicated in the register Rdeadpos.

When the motor remains in this positioning zone for the time indicated in the register Rsettim, the flag of positioned motor is activated.

At this point, the positioning control enters in function and the following control is disabled.

The positioning control checks that the motor doesn't exit the zone indicated in the registers Rdeadpos.

In the motor exits this zone, a "motor out of position" timer starts.

After the time set in the register Rposwrntime, the bit 3 of the register Rwarning is activated to notify the warning of "motor out of position". If the motor returns to the positioning zone, the warning is automatically reset.

By setting to 1 the bit 3 of the register Rmaskwrn, this notification is disabled.

If the "motor out of position" timer reaches the value set in the register Rposalmtime, the bit 3 of the register Ralarm is activated, the drive enters into alarm state and is disabled. At this stage, an action must be taken to reset the alarm and to restart drive.

By setting to 1 the bit 3 of the register Rmaskalm, this alarm is disabled.

The following control is a continuous comparison between the actual target quota and the real quota of the encoder.

If the difference between these two values exceeds the value set in the register Rflwwrn, the bit 4 of the register Rwarning is set to 1. If the motor returns inside the range, the warning is automatically reset.

By setting to 1 the bit 4 of the register Rmaskwrn, this notification is disabled.

If the difference between the two values exceeds the value set in the register Rflwmax, a filter time is activated for the time set in the register Rflwtim. After this filter time, if the error still exceeds the value of Rflwmax, the bit 4 of the register Ralarm is activated, the drive enters into alarm state and is disabled. At this stage, an action must be taken to reset the alarm and to restart drive.

By setting to 1 the bit 4 of the register Rmaskalm, this alarm is disabled.

The warning is just an anomaly notification, and it doesn't perform any action.

When the drive is disabled, the following error is reset.

To disable the control of the positioning warning, set to 0 the register Rposwrntime.

To disable the control of the positioning error, set to 0 the register Rposalmtime.

To disable the control of the following warning, set to 0 the register Rflwwrn.

To disable the control of the following error, set to 0 the register Rflwmax.

The following registers must be set in order to use the function of following control.

Setting:

Rmotenc : Motor encoder pulses/revolution

Rflwwrn : Following error absolute maximum value in encoder pulses, to activate the warning notification. The value of this register is stored into the drive.

Rflwmax : Following error absolute maximum value in encoder pulses, to activate the error notification (after the filter time). The value of this register is stored into the drive.

Rflwtim : Filter time before the notification of the following error. The warning is immediately displayed, without filter time. The value of this register is stored into the drive.

Rposalmtime : Time before the notification positioning alarm.

Rposwrntime : Time before the notification positioning warning.

Rmaskwrn (b3) : Disable the notification of the positioning warning in the register Rwarning.

Rmaskalm (b3) : Disable the notification of the positioning alarm in the register Ralarm. Avoids the drive to enter the alarm mode, and the consequent deactivation of the motor.

Rmaskwrn (b4) : Disable the notification of the following warning in the register Rwarning.

Rmaskalm (b4) : Disable the notification of the following alarm in the register Ralarm. Avoids the drive to enter the alarm mode, and the consequent deactivation of the motor.

Displaying:

Rflwdisp : Displays the actual following error in encoder pulses.

Rflwmem : Displays the maximum following error in encoder pulses (absolute value). To reset this value, write 0 in the register.

Rflwmemp : Displays the positive maximum following error in encoder pulses (displayed in positive value). To reset this value, write 0 in the register.

Rflwmemn : Displays the negative maximum following error in encoder pulses (displayed in positive value). To reset this value, write 0 in the register.

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0107	0x206B	Rhlsi (50us)	High Speed Limit switch input. Bit 0: High Speed FLS limit switch (forward) Bit 1: High Speed BLS limit switch in (backward) Bit 2: High Speed TOP motor encoder Bit 3: High Speed CH.A motor encoder Bit 4: High Speed CH.B motor encoder Bit 5: High Speed TOP external encoder Bit 6: High Speed CH.A external encoder Bit 7: High Speed CH.B external encoder				Unsigned16	WORD MAP READ RO
0108	0x206C	Rhsinp (50us)	High speed digital input. Bit 0: High speed digital Input 0 Bit 1: High speed digital Input 1 Bit 2: High speed digital Input 2 Bit 3: High speed digital Input 3 Bit 4: High speed digital Input 4 Bit 5: High speed digital Input 5 Bit 6: High speed digital Input 6 Bit 7: High speed digital Input 7 Bit 8: High speed digital Input 8 Bit 9: High speed digital Input 9 Bit 10: High speed digital Input 10 Bit 11: High speed digital Input 11 Bit 12: High speed digital Input 12 Bit 13: High speed digital Input 13 Bit 14: High speed digital Input 14 Bit 15: High speed digital Input 15				Unsigned16	WORD MAP READ RO
0109	0x206D	Rlsi	Limit switch input. Bit 0: FLS overtravel (forward) Bit 1: BLS overtravel (backward) Bit 2: TOP motor encoder Bit 3: CH.A motor encoder Bit 4: CH.B motor encoder Bit 5: TOP external encoder Bit 6: CH.A external encoder Bit 7: CH.B external encoder				Unsigned16	WORD MAP READ RO
0110	0x206E	Rdeflsi	Service inputs "active state" definition (0=active high; 1=active low). Bit 0: FLS overtravel (forward) Bit 1: BLS overtravel (backward) Bit 2: TOP motor encoder. This input is ALWAYS active on the rising edge in case it is used with HOME, ESTOP instructions. Else, it works like other inputs. Bit 3: CH.A motor encoder Bit 4: CH.B motor encoder Bit 5: TOP external encoder Bit 6: CH.A external encoder Bit 7: CH.B external encoder				Unsigned16	WORD SAVE NO MAP
0111	0x206F	Rfillsi	Limit switch input digital filter time	ms	1	16	Unsigned16	WORD SAVE NO MAP
0112	0x2070	Renflsi	Limit switch input digital filter time enabling				Unsigned16	WORD SAVE NO MAP
0113	0x2071	Rmemlsi	Limit switch input memory				Unsigned16	WORD NO MAP

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0114	0x2072	Rinp	Digital input. Bit 0: Input 0 Bit 1: Input 1 Bit 2: Input 2 Bit 3: Input 3 Bit 4: Input 4 Bit 5: Input 5 Bit 6: Input 6 Bit 7: Input 7 Bit 8: Input 8 Bit 9: Input 9 Bit 10: Input 10 Bit 11: Input 11 Bit 12: Input 12 Bit 13: Input 13 Bit 14: Input 14 Bit 15: Input 15				Unsigned16	WORD MAP READ RO
0115	0x2073	Rdefinp	Digital input "active state" definition (0=active high; 1=active low). Bit 0: Input 0 Bit 15: Input 15				Unsigned16	WORD SAVE NO MAP
0116	0x2074	Rfilinp	Digital input digital filter time	ms	1	16	Unsigned16	WORD SAVE NO MAP
0117	0x2075	Renfinp	Filter enabling on digital input Bit 0: Input 0 Bit 15: Input 15				Unsigned16	WORD SAVE NO MAP
0118	0x2076	Rmeminp	Digital input memory Bit 0: Input 0 Bit 15: Input 15				Unsigned16	WORD NO MAP
0119	0x2077	Rout	Digital output Bit0: Output0 Bit1: Output1 Bit2: Output2 Bit3: Output3 Bit4: Output4 Bit5: Output5 Bit6: Output6 Bit7: Output7				Unsigned16	WORD MAP WRITE
0120	0x2078	Rdefout	Digital output "active state" definition (0=active high; 1=active low). Bit0: Output0 Bit7: Output7				Unsigned16	WORD SAVE NO MAP
0121	0x2079	Rfuno0	Digital output 0 function definition register 0) Normal digital output 1) Drive enabled 2) Drive alarm 3) Synchronized motor (Home executed) 4) Motor in movement 5) Task in progress 6) Alarm I ² /T 7) Motor in position 8) Motor in actual movement (for closed loop) 9) Motore in theoric+actual movement (for closed loop) 10) Command for external brake 11) Signal of changed quota while the drive was disabled (only with encoder) 12) Signal of changed quota while the drive was disabled (only with encoder) + motor in position (When the drive is enabled: output=0 if motor not in position or moved while the drive was disabled / =1 if motor in position and not been moved while the drive was disabled). 13) Virtual motor step signal output 14) Motor direction signal output 15) STO output		0	14	Unsigned16	WORD SAVE NO MAP

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0122	0x207A	Rfuno1	Digital output 1 function definition register (See Rfun0 for details)		0	14	Unsig- ned16	WORD SAVE NO MAP
0123	0x207B	Rfuno2	Digital output 2 function definition register (See Rfun0 for details)		0	14	Unsig- ned16	WORD SAVE NO MAP
0124	0x207C	Rfuno3	Digital output 3 function definition register (See Rfun0 for details)		0	14	Unsig- ned16	WORD SAVE NO MAP
0125	0x207D	Rfuno4	Digital output 4 function definition register (See Rfun0 for details)		0	14	Unsig- ned16	WORD SAVE NO MAP
0126	0x207E	Rfuno5	Digital output 5 function definition register (See Rfun0 for details)		0	14	Unsig- ned16	WORD SAVE NO MAP
0127	0x207F	Rfuno6	Digital output 6 function definition register (See Rfun0 for details)		0	14	Unsig- ned16	WORD SAVE NO MAP
0128	0x2080	Rfuno7	Digital output 7 function definition register (See Rfun0 for details)		0	14	Unsig- ned16	WORD SAVE NO MAP
0129	0x2081	Rfuni0	Digital input 0 function definition register 0) Normal digital input 1) Enable/disable drive 2) JOG forward 3) JOG backward 4) GO (Quota set in Rpostarg) 5) GOR 6) HOME 7) Bit 0 number of task to be enabled 8) Bit 1 number of task to be enabled 9) Bit 2 number of task to be enabled 10) Bit 3 number of task to be enabled 11) Bit 4 number of task to be enabled 12) Bit 5 number of task to be enabled 13) Bit 6 number of task to be enabled 14) Start task (enable selected task) 15) Alarms reset 16) Quota Line Up 17) Current reduction 18) ABORT 19) STOP 20) GEAR 21) Direction (reverse the JOG direction) 22) Position recovery (only with encoder)		0	22	Unsig- ned16	WORD SAVE NO MAP
0130	0x2082	Rfuni1	Digital input 1 function definition register (See Rfuni0 for details)		0	22	Unsig- ned16	WORD SAVE NO MAP
0131	0x2083	Rfuni2	Digital input 2 function definition register (See Rfuni0 for details)		0	22	Unsig- ned16	WORD SAVE NO MAP
0132	0x2084	Rfuni3	Digital input 3 function definition register (See Rfuni0 for details)		0	22	Unsig- ned16	WORD SAVE NO MAP
0133	0x2085	Rfuni4	Digital input 4 function definition register (See Rfuni0 for details)		0	22	Unsig- ned16	WORD SAVE NO MAP
0134	0x2086	Rfuni5	Digital input 5 function definition register (See Rfuni0 for details)		0	22	Unsig- ned16	WORD SAVE NO MAP
0135	0x2087	Rfuni6	Digital input 6 function definition register (See Rfuni0 for details)		0	22	Unsig- ned16	WORD SAVE NO MAP
0136	0x2088	Rfuni7	Digital input 7 function definition register (See Rfuni0 for details)		0	22	Unsig- ned16	WORD SAVE NO MAP

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0297	0x2129	Rdiginplev	Selection of digital inputs trigger level. 0=Trigger at 12V (for inputs at 24V) 1=Trigger at 2.5V (for inputs at 5V) The thresholds of the levels selected with this register are set in the registers 306 Rtrginp5v and 307 Rtrginp24v		0	1	Unsigned16	WORD
0298	0x212A	Rstpout-maxfreq	Maximum frequency in digital output with step function (Theoric rotation step frequency of the motor) If the real frequency is higher than the maximum frequency, the output stops at the maximum frequency. The accumulated pulses are given in output when the motor is already in stop, or when its speed drops to a theoric frequency lower than the maximum frequency.	Hz	0	10000	Unsigned16	WORD
0306	0x2132	Rtrginp5v	Set the voltage threshold for inputs at 5V. The save is performed with the command 145 in Rloadsav.	Volt *100	0	1755	Unsigned16	WORD SAVE NO MAP NO RES
0307	0x2133	Rtrginp24v	Set the voltage threshold for inputs at 24V. The save is performed with the command 145 in Rloadsav.	Volt *100	0	1755	Unsigned16	WORD SAVE NO MAP NO RES
0442	0x21BA	Rfuni8	Digital input function definition		0	22	Unsigned16	WORD SAVE NO MAP
0443	0x21BB	Rfuni9	Digital input function definition		0	22	Unsigned16	WORD SAVE NO MAP
0444	0x21BC	Rfuni10	Digital input function definition		0	22	Unsigned16	WORD SAVE NO MAP
0445	0x21BD	Rfuni11	Digital input function definition		0	22	Unsigned16	WORD SAVE NO MAP
0446	0x21BE	Rfuni12	Digital input function definition		0	22	Unsigned16	WORD SAVE NO MAP
0447	0x21BF	Rfuni13	Digital input function definition		0	22	Unsigned16	WORD SAVE NO MAP
0448	0x21C0	Rfuni14	Digital input function definition		0	22	Unsigned16	WORD SAVE NO MAP
0449	0x21C1	Rfuni15	Digital input function definition		0	22	Unsigned16	WORD SAVE NO MAP
10151	0x4807	Rstepout-time	Stepout output activation time Rstepouttime=(register value * 50uS)		0	65535	Unsigned16	RW SAVE
10152-53	0x4808	Rstepout-count	Number of steps to count before activationg the output		1	0xFFFFFFFF	Unsigned32	RW SAVE

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0137	0x2089	Ranainp	12 bit analog input register				Signed16	WORD MAP READ RO
0138	0x208A	Rdefanainp	Analog input definition register		0	558	Unsigned16	WORD SAVE NO MAP
0139	0x208B	Rmulanainp	Analog input multiplier register		1	32767	Unsigned16	WORD SAVE NO MAP
0140	0x208C	Rdivanainp	Analog input divider register		1	32767	Unsigned16	WORD SAVE NO MAP
0141	0x208D	Roffsanainp	Analog input offset		-32768	32767	Signed16	WORD SAVE NO MAP
0142	0x208E	Rdeadainp	Analog input dead band	Bit	0	4095	Unsigned16	WORD SAVE NO MAP
0143	0x208F	Ranaout	10 bit analog output register	Bit	0	1023	Unsigned16	WORD MAP WRITE
0144	0x2090	Rdefanaout	Parameter definition to be used for Ranaout register		0	558	Unsigned16	WORD SAVE NO MAP
0145	0x2091	Rmulanaout	Multiplier of the value to be set in the analog output		1	32767	Unsigned16	WORD SAVE NO MAP
0146	0x2092	Rdivanaout	Division of the value to be set in the analog output		1	32767	Unsigned16	WORD SAVE NO MAP
0147	0x2093	Roffsanout	Offset to be added to the value to be set in the analog output		-32768	32767	Signed16	WORD NO MAP SAVE
0313	0x2139	Rfloatingrollerperc	Only for DMD. Dancer roller percentage (-100/+100)	%	-100	100	Signed16	WORD SAVE
0429	0x21AD	Ranainpdisable	Disable the analog inputs 0-1-2 with respective bits B0, B1 and B2 high				Unsigned16	
0430	0x21AE	Ranainp1	Analog input 1 value (only for SMD10.04 and SMD1104)				Signed16	WORD RO MAP READ
0431	0x21AF	Rdefanainp1	Analog input 1 function definition (only for SMD10.04 and SMD1104)		0	558	Unsigned16	WORD SAVE
0432	0x21B0	Rmulainp1	Analog input 1 multiplier (only for SMD1004 and SMD1104)		1	32767	Unsigned16	WORD SAVE
0433	0x21B1	Rdivainp1	Analog input 1 divider (only for SMD1004 and SMD1104)		1	32767	Unsigned16	WORD SAVE
0434	0x21B2	Roffsanainp1	Analog input 1 offset register (only for SMD10.04 and SMD1104)		-32768	32767	Signed16	WORD SAVE
0435	0x21B3	Rdeadainp1	Analog input 1 dead band (only for SMD10.04 and SMD1104)	Bit	0	4095	Unsigned16	WORD SAVE
0436	0x21B4	Ranainp2	Analog input 2 value (only for SMD10.04 and SMD1104)				Signed16	WORD RO MAP READ
0437	0x21B5	Rdefanainp2	Analog input 2 function definition(only for SMD10.04 and SMD1104)		0	558	Unsigned16	WORD SAVE
0438	0x21B6	Rmulainp2	Analog input 2 multiplier (only for SMD10.04 and SMD1104)		1	32767	Unsigned16	WORD SAVE
0439	0x21B7	Rdivainp2	Analog input 2 divider (only for SMD10.04 and SMD1104)		1	32767	Unsigned16	WORD SAVE
0440	0x21B8	Roffsanainp2	Analog input 2 offset register (only for SMD10.04 and SMD1104)		-32768	32767	Signed16	WORD SAVE

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0441	0x21B9	Rdeadainp2	Analog input 2 dead band (only for SMD10.04 and SMD1104)	Bit	0	4095	Unsigned16	WORD SAVE

ENCODER MANAGEMENT

Indirizzo Modbus / Profibus	Indirizzo CAN EtherCAT Profinet	Nome Regi- stro	Descrizione	U.M.	Valore Minimo	Valore Mas- simo	Tipo	Note
10010	0x471A	Rencmotfbk	Motor encoder feedback for loop closure 0= Encoder 1 1= Encoder 2 2= Encoder 3 3= Absolute ncoder		Default 0		Unsign16	WORD RW SAVE
10043	0x473B	Rencnewpe- riod	Signal of reading of new encoder pulses period (previously register 165) Bit 0: New period encoder 1 Bit 1: New period encoder 2 Bit 2: New period encoder 3				Unsig- ned16	RW

ENCODER 1

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0151-152	0x2097	Rmotenc	Motor encoder quota register. From firmware rev. 6 replaced by register 10015	Enc. Pulses			Signed32	LSWORD – MSWORD MAP READ
0163	0x20A3	Rmotencper	Period read by the pulses of the motor encoder. From firmware rev. 6 replaced by register 10040				Unsig- ned16	WORD
0269	0x210D	Rmo- tencpuls	Motor encoder pulses per revolution. From firmware rev. 6 replaced by register 10025	Enc. Pulses	1	32767	Unsig- ned16	WORD SAVE NO MAP
10015-16	0x471F	Renc1pos	Encoder 1 quota	Enc. Pulses			Signed32	DWORD RW MAP
10025	0x4729	Renc1pulse	Encoder 1 pulses/turn	Pulses			Unsign16	RW SAVE
10040	0x4738	Renc1period	Period read by encoder 1 pulses				Unsig- ned16	RO
10044	0x473C	Renc1vel	Encoder 1 actual velocity				Signed16	RO
10045	0x473D	Renc1sam- ple	Encoder 1 sample time	ms			Unsig- ned16	RW SAVE
10046	0x473E	Renc1vel- mul	Encoder 1 velocity multiplier				Unsig- ned16	RW SAVE
10047	0x473F	Renc1veldiv	Encoder 1 velocity divider				Unsig- ned16	RW SAVE
10048-49	0x4740	Renc1topcnt	Counter of pulses received on encoder 1 TOP				Unsig- ned32	DWORD RW
10050	0x4742	Renc1topvel	Velocity detected on encoder 1 TOP input				Unsig- ned16	RO
10051	0x4743	Renc1top- sample	Encoder 1 TOP input sample time	ms			Unsig- ned16	RW SAVE
10052	0x4744	Ren- c1topvelmul	Encoder 1 TOP input velocity multiplier				Unsig- ned16	RW SAVE
10053	0x4745	Ren- c1topveldiv	Encoder 1 TOP input velocity divider				Unsig- ned16	RW SAVE
10074	0x475A	Renc1code	Encoder 1 model code				Unsig- ned16	RW SAVE

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0051	0x2033	Rextencvel	External encoder actual speed. From firmware rev. 6 replaced by register 10054				Unsigned16	WORD MAP READ RO
0052	0x2034	Rextencsmp	External encoder speed reading sample time. From firmware rev. 6 replaced by register 10055	ms	0	10000	Unsigned16	WORD SAVE MAP WRITE
0053	0x2035	Rextencvel-mul	External encoder speed reading multiplier. From firmware rev. 6 replaced by register 10056		0	32767	Unsigned16	WORD SAVE MAP WRITE
0054	0x2036	Rextencvel-div	External encoder speed reading divider. From firmware rev. 6 replaced by register 10057		1	32767	Unsigned16	WORD SAVE MAP WRITE
0089	0x2059	Rextenco-topvel	Speed detected from TOP input of external encoder. Sample time is set in the register Rextencsmp (52). From firmware rev. 6 replaced by register 10060				Unsigned16	WORD
0090	0x205A	Rexten-ctopvelmul	Multiplier of the speed read by external encoder TOP input. From firmware rev. 6 replaced by register 10062				Unsigned16	WORD
0091	0x205B	Rexten-ctopveldiv	Divider of the speed read by external encoder TOP input. From firmware rev. 6 replaced by register 10063				Unsigned16	WORD
0092-93	0x205C	Rexten-ctopcncnt	External encoder TOP pulses counter. From firmware rev. 6 replaced by register 10058				Unsigned32	WORD
0101	0x2065	Rextencmode	Auxiliary encoder operation mode 0 = Forward quadrature 1 = Back quadrature 2 = Step-dir (Steps multiplied by 1) 3 = Step-dir (Steps multiplied by 2) From firmware rev. 6 replaced by register 10032		0	3	Unsigned16	WORD SAVE NO MAP
0153-154	0x2099	Rextenc	External encoder quota register. From firmware rev. 6 replaced by register 10017	Enc. Pulses			Signed32	LSWORD – MSWORD MAP READ
0164	0x20A4	Rextencper	Period read by the pulses of the external encoder. From firmware rev. 6 replaced by register 10041				Unsigned16	WORD
0165	0x20A5	Rnewencper	Signal of reading of new encoder pulses period B0= Motor encoder new period B1= External encoder new period. From firmware rev. 6 replaced by register 10043				Unsigned16	WORD
0268	0x210C	Rextencpuls	External encoder pulses per revolution. From firmware rev. 6 replaced by register 10026	Enc. Pulses	0	32767	Unsigned16	WORD SAVE
10017-18	0x4721	Renc2pos	Encoder 2 quota	Imp. Enc.			Signed32	DWORD RW MAP
10026	0x472A	Renc2pulse	Encoder 2 pulses/turn	Imp.	Default 512		Unsigned16	RW SAVE
10041	0x4739	Renc2period	Period read by encoder 2 pulses				Unsigned16	RO
10054	0x4746	Renc2vel	Encoder 2 actual velocity				Signed16	RO
10055	0x4747	Renc2sample	Encoder 2 sample time	ms			Unsigned16	RW SAVE
10056	0x4748	Renc2vel-mul	Encoder 2 velocity multiplier				Unsigned16	RW SAVE
10057	0x4749	Renc2veldiv	Encoder 2 velocity divider				Unsigned16	RW SAVE
10058-59	0x474A	Renc2topcncnt	Counter of pulses received on encoder 2 TOP				Unsigned32	DWORD RW
10060	0x474C	Renc2topvel	Velocity detected on encoder 2 TOP input				Unsigned16	RO
10061	0x474D	Renc2top-sample	Encoder 2 TOP input sample time	ms			Unsigned16	RW SAVE

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
10062	0x474E	Ren- c2topvelmul	Encoder 2 TOP input velocity multiplier				Unsigned16	RW SAVE
10063	0x474F	Ren- c2topveldiv	Encoder 2 TOP input velocity divider				Unsigned16	RW SAVE
10075	0x475B	Renc2code	Encoder 2 model code				Unsigned16	RW SAVE

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0044	0x202C	Rssiencfra- melen	SSI encoder frame length. Default value is 25. From firmware rev. 6 replaced by register 10028	Bit	1	32	Unsig- ned16	WORD SAVE
0094	0x205E	Rssien- cturnbit	Bits of the frame reserved for encoder turns count. From firmware rev. 6 replaced by register 10030	Bit	0	16	Unsig- ned16	WORD RW SAVE
0095	0x205F	Rssienc- countsbit	Bits of the frame reserved for encoder position inside the turn count. From firmware rev. 6 replaced by register 10029	Bit	0	16	Unsig- ned16	WORD RW SAVE
0096	0x2060	Rssienc- counts	SSI encoder position on the turn count register N.B. Preset and complement bits are in the Rhwconfig register: BIT6 = Preset BIT7 = Complement From firmware rev. 6 replaced by register 10023		-32768	32767	Unsig- ned16	WORD MAP READ RO
0097	0x2061	Rssien- cturns	SSI absolute encoder turns counter register N.B. Preset and complement bits are in the Rhwconfig register: BIT6 = Preset BIT7 = Complement From firmware rev. 6 replaced by register 10024		-32768	32767	Unsig- ned16	WORD MAP READ RO
10021-22	0x4725	Rencab- squote	Absolute encoder quota	Enc. Pulses			Signed32	DWORD RW MAP
10023	0x4727	Rencabspos	Absolute encoder position on the turn quota	Enc. Pulses			Unsig- ned16	WORD RW MAP
10024	0x4728	Rencab- sturns	Absolute encoder number of turns	Turns			Signed16	WORD RW MAP
10028	0x472C	Rencabsfra- mebit	Absolute encoder frame length	Bit	Default 25		Unsig- ned16	RW SAVE
10029	0x472D	Ren- cabsposbit	Pulses on the turn counter frame length	Bit	Default 12		Unsig- ned16	RW SAVE
10030	0x472E	Rencab- sturnsbit	Turns counter frame length	Bit	Default 13		Unsig- ned16	RW SAVE
10031	0x472F	Renc1mode	Encoder mode 0= Quadrature forward 1= Quadrature back 2= Step-dir * 1 3= Step-dir * 2				Unsig- ned16	RW SAVE
10032	0x4730	Renc2mode	Encoder mode 0= Quadrature forward 1= Quadrature back 2= Step-dir * 1 3= Step-dir * 2				Unsig- ned16	RW SAVE

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
10034	0x4732	Rencabsmode	ABSOLUTE ENCODER MODE Bit 0: 0 = Normal / 1= Complement Bit 1: 0 = Gray / 1= Binary Bit 3-2 00: Data right alignment 01: Data left alignment 10: Centered data 11: Free Bit 4: Enable absolute encoder read Bit 5: Enable encoder presence initial check Bit 6: Enable phasing without motor movement Bit 7: Enable Preset hardware Bit 8: Complement hardware	Bit			Unsigned16	RW SAVE
10035	0x4733	Rencabsctrl	Absolute encoder Controlword 1= Reset valid absolute encoder offset in Eeprom 129= Absolute encoder preset 130= Reset absolute encoder position 0 offset in Eeprom				Unsigned16	RW
10037	0x4735	Rencabsbrate	Absolute encoder reading clock frequency (Bit rate = 25MHz / Value of the register)		4	128	Unsigned16	RW SAVE
10038	0x4736	Rencabsframepause	Pause between two absolute encoder frames readings	uS	0	20000	Unsigned16	RW SAVE
10039	0x4737	Rencabsprebit	Number of bits of absolute encoder frame header (to be ignored)				Unsigned16	RW SAVE
10077	0x475D	Rencabscode	Absolute encoder model code				Unsigned16	RW SAVE
10078	0x475E	Rencabspulse	Absolute encoder pulses/turn				Unsigned16	RW SAVE

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0194	0x20C2	Rloadsav	Depending on the value written in this register, the registers block or the variables block will be loaded from or saved into the EEPROM memory. The register is reset as the command has been executed. 01 (01h) = Load registers from the Eeprom 02 (02h) = Load variables from the Eeprom 03 (03h) = Load tasks from the Eeprom 04 (04h) = Load current sensors offset from the Eeprom 05 (05h) = Load MAC address from the Eeprom 06 (06h) = Load absolute encoder offset from the Eeprom 07 (07h) = Load current signal amplification from the Eeprom 08 (08h) = Load the trigger levels for digital inputs 09 (09h) = Load the register Rpwmmode 10 (0Ah) = Read the current ANTAIOS communication parameters 11 (0Bh) = Read PROFINET "Device Name" from ANTAIOS 12 (0Ch) = Read Rmodelanaios from expansion card 129 (81h) = Save registers in the Eeprom 130 (82h) = Save variables in the Eeprom 131 (83h) = Save tasks in the Eeprom *132 (84h) = Reset the registers block at the default parameters *133 (85h) = Reset the variables block at 0 *134 (86h) = Reset the tasks *135 (87h) = Initialize the EEPROM **137 (89h) = Save current sensors offset **138 (8Ah) = Acquire and save current sensors offset 139 (8Bh) = Apply Ethernet network parameters 141 (8Dh) = Save absolute encoder offset in the Eeprom 142-143 (8Eh-8Fh) = Restart the drive. The commands must be written in sequence consecutively. 144 (90h) = Save current signal amplification in the Eeprom. 145 (91h) = Save the trigger levels for digital inputs 146 (92h) = Save the register Rpwmmode (pwm current motor generation mode). 147-148 (93h-94h) = Put Antaios chip in Boot Mode. The sequence 147-148-148 must be written to enable the boot mode. The modbus communication is disabled. Switch off to restore. 149 (95h) = Forces IP Address setting on Antaios with PROFINET protocol 150 (96h) = Sends PROFINET Device name to Antaios * Not executed if the user program is in RUN. ** Executed only if the drive is not enabled, also if the user program is in RUN. To save the il MAC address, write the registers Rethmacaddr054, Rethmacaddr032 and Rethmacaddr010 in this order, then run the command (8Ch) in Rloadsav.		0	65535	Unsigned16	WORD NO MAP
0195	0x20C3	Rmemvar	By writing in this register, it is possible to load or save single variables in the EEPROM memory. Bit 15 = 1 Load / 0 = Save Bit 7-0 = Number of the variable to be loaded or saved (1..128)				Unsigned16	WORD NO MAP

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0196	0x20C4	Reepsts	Eeprom status 0 = OK B0 = R/W in progress B1 = Not valid command B2 = Error in reading registers B3 = Error in writing registers B4 = Error in reading variables B5 = Error in writing variables B6 = Error in reading program B7 = Error in writing program B8 = Error in reading password B9 = Error in writing password B10 = Error in reading task B11 = Error in writing task B12 = Error in reading alarms buffer B13 = Error in writing alarms buffer B14 = Error in reading current sensors offset B15 = Error in writing current sensors offset				Unsigned16	WORD NO MAP RO
0201	0x20C9	Rindex	MIL program variables indexing register		1	128	Holding Register (16bit) Unsigned16	WORD NO MAP
0329-30	0x2149	Reepsts32	32bit EEPROM status (From SMD5106 on) The low 16 bit are equal to the register Reepsts (196).				Unsigned32	LS – MSWORD MAP READ

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0216	0x20D8	Rstrtmde	Operation mode at power-on 0 = Load the registers 1 = Load the registers and set the operation mode 2 = Load the registers, set the operation mode and enable the drive 3 = Load the registers, set the operation mode, enable the drive and RUN the program		1	3	Unsigned16	WORD SAVE NO MAP
0217	0x20D9	Rstrtconf	Configuration at power-on When a register saving command is given, if bit 15 of Rconfig =0, the value of Rconfig is copied into this register.		0	13	Unsigned16	WORD SAVE NO MAP
0389-90	0x2185	Rstrtrvel	Value of Rvel set at the power-on	rev*100 /s	-10000	10000	Signed32	LS- MSWORD SAVE NO MAP
0391-92	0x2187	Rstrtvss	Value of Rvss set at the power-on	rev*100 /s	0	10000	Unsigned32	LS- MSWORD SAVE NO MAP
0393-94	0x2189	Rstrttacc	Value of Racc set at the power-on	rev*10 /s ²	1	200000	Unsigned32	LS- MSWORD SAVE NO MAP
0395-96	0x218B	Rstrtrdec	Value of Rdec set at the power-on	rev*10 /s ²	1	200000	Unsigned32	LS- MSWORD SAVE NO MAP
0397-98	0x218D	Rstrtpostarg	Value of Rpostarg set at the power-on	Step	0x80000000	0x7FFFFFFF	Signed32	LS- MSWORD SAVE NO MAP
0399-400	0x218F	Rstrthvh	Value of Rhvh set at the power-on	rev*100 /s	1	10000	Signed32	LS- MSWORD SAVE NO MAP
0401-02	0x2191	Rstrthvl	Value of Rhvl set at the power-on	rev*100 /s	1	10000	Signed32	LS- MSWORD SAVE NO MAP
0403-04	0x2193	Rstrthacc	Value of Rhacc set at the power-on	rev*10 /s ²	1	200000	Unsigned32	LS- MSWORD SAVE NO MAP

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0405	0x2195	Rstrthmode	Value of Rhmode set at the power-on -16 = Homing on FLS + motor encoder TOP, positive direction -15 = Homing on FLS + motor encoder TOP, negative direction -14 = Homing on FLS, positive direction -13 = Homing on FLS, negative direction -12 = Homing with forward mechanical limit + encoder TOP (only SmartMode and Closed Loop) -11 = Homing with backward mechanical limit + encoder TOP (only SmartMode and Closed Loop) -10 = Homing with forward mechanical limit (only SmartMode and Closed Loop) -9 = Homing with backward mechanical limit (only SmartMode and Closed Loop) -8 = Homing with forward mechanical limit + axis measuring (Resets the registers Rlowlim and Rupplim) (only SmartMode and Closed Loop) -7 = Homing with backward mechanical limit + axis measuring (Resets the registers Rlowlim and Rupplim) (only SmartMode and Closed Loop) -6 = Homing only with TOP in positive direction -5 = Homing only with TOP in negative direction -4 = Homing with BLS + TOP rising edge, positive direction -3 = Homing with BLS + TOP rising edge, negative direction -2 = Homing only with BLS in positive direction -1 = Homing only with BLS in negative direction 0 = Homing on place		-16	0	Signed16	WORD SAVE NO MAP

If the drive is powered and the rotary switches are set to 00, the communication parameters of the fieldbuses are set to AEC default values.

In detail:

Modbus RS232/RS485:

Address: 125
 BaudRate: 9600
 Parity: Even
 StopBit 1
 Modalita': Intel

CanOpen:

Address: 125
 BaudRate: 125Kbit

Profibus:

Address: 125
 BaudRate: Auto

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0099	0x2063	Rcu- ronramptime	Cuttent ramp time at current on	ms	0	65535	Unsig- ned16	WORD SAVE NO MAP
0209	0x20D1	Rcuract	Actual current	mA			Signed16	WORD MAP READ RO
0210	0x20D2	Rcurnom	Nominal current supplied to the motor	mA	0	8500	Unsig- ned16	WORD SAVE MAP WRITE
0211	0x20D3	Rcurred	Reduced current supplied to the motor	mA	0	8500	Unsig- ned16	WORD SAVE MAP WRITE
0212	0x20D4	Rcurboost	Boost current during ramps	mA	0	10000	Unsig- ned16	WORD SAVE MAP WRITE
0213	0x20D5	Rcurtorque	Requested current in TORQUE mode	mA	-10000	10000	Signed16	WORD MAP WRITE ANA
0214	0x20D6	Rtboost	Maximum boost time	ms	0	5000	Unsig- ned16	WORD SAVE NO MAP
0215	0x20D7	Rtcred	Time frame before switching to reduced current	ms	0	10000	Unsig- ned16	WORD SAVE NO MAP
0219	0x20DB	Rfocmode	Actual configuration of the drive Actual status of the control 0= Not initialized 1 = Open loop 2 = Closed loop 3 = Smart mode (smart closed loop)		0	3	Unsig- ned16	WORD NO MAP RO
0220	0x20DC	Rcurmode- act	Actual current level 0 = No current 1 = Reduced current 2 = Nominal current 3 = Current boost 4 = Automatic current reduction		0	4	Unsig- ned16	WORD RO MAP READ
0221	0x20DD	Rcurmode	Current control modes 0 = No current 1 = Reduced current 2 = Nominal current 3 = Current boost		0	3	Unsig- ned16	WORD SAVE NO MAP
0222	0x20DE	Rconfig	Drive operation mode configuration 0= Not configured 1= Reserved 2= Open Loop / Speed 3= Open Loop / Position 4= Open Loop / Step-Direction 5= Closed Loop / Torque 6= Closed Loop / Speed (with encoder) 7= Closed Loop / Position 8= Closed Loop / Step-Direction 9= Closed Loop / Speed (with tachometer – Only DMD) 10= Reserved 11= Smart Loop / Speed 12= Smart Loop / Position 13= Smart Loop / Step-Direction 14= Reserved 15= Open loop PWM (Only DMD)		0	15	Unsig- ned16	WORD NO MAP

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0223	0x20DF	Renmask	Drive enabling control mask Bit 0: Rconfig is set Bit 1: Bit 2: Bit 3: Bit 4: Bit 15: Control mask error				Unsigned16	WORD NO MAP RO
0264-265	0x2108	Rtrqdisp	Display the torque				Unsigned32	LS – MSWORD MAP READ RO
0270	0x210E	Rstpres	Motor step resolution		1	1024	Unsigned16	WORD SAVE NO MAP
0279	0x2117	Rkpiq	Kp PI current Iq		0	32767	Unsigned16	WORD SAVE NO MAP
0280	0x2118	Rkiiq	Ki PI current Iq		0	32767	Unsigned16	WORD SAVE NO MAP
0281	0x2119	Rkpid	Kp PI current Id		0	32767	Unsigned16	WORD SAVE NO MAP
0282	0x211A	Rkiid	Ki PI current Id		0	32767	Unsigned16	WORD SAVE NO MAP
0283	0x211B	Rkpvel	Kp PI velocity in FOC Close		0	32767	Unsigned16	WORD SAVE NO MAP
0284	0x211C	Rkivel	Ki PI velocity in FOC Close		0	32767	Unsigned16	WORD SAVE NO MAP
0285	0x211D	Rkcvel	Kc PI velocity in FOC Close		0	32767	Unsigned16	WORD SAVE NO MAP
0286	0x211E	Rkppos	Kp PI position in FOC Close		0	32767	Unsigned16	WORD SAVE NO MAP
0287	0x211F	Rkipos	Ki PI position in FOC Close		0	32767	Unsigned16	WORD SAVE NO MAP
0288	0x2120	Rkcipos	Kci PI position in FOC Close		0	32767	Unsigned16	WORD SAVE NO MAP
0289	0x2121	Rkffpos	Kff PI position in FOC Close		0	32767	Unsigned16	WORD SAVE NO MAP
0290	0x2122	Rkafpos	Kaf PI position in FOC Close		0	32767	Unsigned16	WORD SAVE NO MAP
0291	0x2123	Rswacfw	Acc. Forward switch choice 0 = Current 1 = Speed		0	1	Unsigned16	WORD SAVE NO MAP
0292	0x2124	Radpicur	Percentage of current PI correction from maximum to minimum current level. This permits to keep the PI reactive on the whole range of current without going in oscillation.		-100	100	Signed16	WORD SAVE NO_MAP
0299	0x212B	Rstpressd	Step resolution in step/dir mode The function of this register has been assigned to the register Rstpres from the firmware 3.44 onwards. For firmwares after 3.44, this register has no functions.		1	1024	Unsigned16	WORD SAVE NO MAP

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0300	0x212C	Rkpstpd	Kp PI increments management in step/dir mode		0	4096	Unsigned16	WORD SAVE NO MAP
0301	0x212D	Rampfrq	Amplification of the increment step/dir in FOC close mode from 1 to 10 (1 = 1:1 / 10 = Multiplies the input steps by 10)		0	32767	Unsigned16	WORD SAVE NO MAP
0309	0x2135	Rdefluxen	Enable FOCOPEN deflux		0	1	Unsigned16	WORD SAVE NO MAP
0310	0x2136	Rdefluxmin	FOCOPEN minimum deflux current		0	5000	Unsigned16	WORD SAVE NO MAP
0311	0x2137	Rphamode	Phase advance FOCOPEN mode		0	9	Unsigned16	WORD SAVE NO MAP
0312	0x2138	Rphagain	Phase advance FOCOPEN gain		0	8192	Unsigned16	WORD SAVE NO MAP
0314	0x213A	Rveladjo-penmode	Only for DMD. Speed correction in open loop (armature feedback)		-4096	4096	Signed16	WORD
0351	0x215F	Radjcura	Adjustment of signal amplification read by the current sensor of the phase A		-128	127	Signed16	WORD SAVE
0352	0x2160	Radjcurb	Adjustment of signal amplification read by the current sensor of the phase B		-128	127	Signed16	WORD SAVE
0368	0x2170	Rvbusoffs	Bus voltage reading offset		-32768	32767	Signed16	WORD SAVE
0370	0x2172	Rla	Current read from phase A	mA			Signed16	WORD MAP RO
0371	0x2173	Rlb	Current read from phase B	mA			Signed16	WORD MAP RO
0372	0x2174	Rlan	Filtered current read from phase A	mA			Signed16	WORD MAP RO
0373	0x2175	Rlbn	Filtered current read from phase B	mA			Signed16	WORD MAP RO
0374	0x2176	Rla_offs	Phase A calculated offset	Bit			Signed16	WORD NO MAP RO
0375	0x2177	Rlb_offs	Phase B calculated offset	Bit			Signed16	WORD NO MAP RO
0377	0x2179	Rlb_offsEI	Phase B offset manual correction (*) Saved with command 137 in the register Rloadsav. Calculated and saved with command 138 in the register Rloadsav.	Bit	-32768	32767	Signed16	WORD SAVE (*) NO MAP
0378	0x217A	Rid	Direct current	mA			Signed16	WORD NO MAP RO
0379	0x217B	Riq	Current in quadrature	mA			Signed16	WORD MAP RO
0388	0x2184	Ridcorr	ID correction of current in Smart Mode	mA	-5000	5000	Signed16	WORD RW SAVE
0495	0x21EF	Rpwmmode	Motor pwm current generation mode: 0=Centered 1=Left aligned Save the data with the command 146 in Rloadsav, shut down and power-on the drive.		0	1	Unsigned16	WORD

MOTOR PARAMETERS

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0218	0x20DA	Rmottype	Index of the configured motor. Indicates the index of the configured motor in the motors database.				Unsigned16	WORD SAVE NO MAP
0271	0x210F	Rmotres	Phase resistance of the motor	ohm *10	1	32767	Unsigned16	WORD SAVE NO MAP
0272	0x2110	Rmotind	Phase inductance of the motor	mH *10	1	32767	Unsigned16	WORD SAVE NO MAP
0273	0x2111	Rmotkfm	F.c.e.m. constant $L(mH) \cdot I_{nom}(mA) \cdot 100/1000$	mHA *100	1	32767	Unsigned16	WORD SAVE NO MAP
0274	0x2112	Rmottens- nom	Only for DMD. Nominal voltage of the motor.	Volt	1	32767	Unsigned16	WORD SAVE
0275	0x2113	Rmotiph	Motor nominal phase current	mA	1	32767	Unsigned16	WORD SAVE NO MAP
0276	0x2114	Rmotktq	Motor torque constant	mNm /A	1	65535	Unsigned16	WORD SAVE NO MAP
0277	0x2115	Rmotvelnom	Only for DMD. Nominal speed of the motor.	rev/s			Unsigned16	WORD SAVE

TIMER

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0155-156	0x209B	Rtim0	Register decreased by 1 down to 0 every 1 mS	ms			Unsigned32	LSWORD – MSWORD NO MAP
0157-158	0x209D	Rtim1	Register decreased by 1 down to 0 every 1 mS	ms			Unsigned32	LSWORD – MSWORD NO MAP
0159-160	0x209F	Rtim2	Register decreased by 1 down to 0 every 1 mS	ms			Unsigned32	LSWORD – MSWORD NO MAP
0161-162	0x20A1	Rtim3	Register decreased by 1 down to 0 every 1 mS	ms			Unsigned32	LSWORD – MSWORD NO MAP
0536-37	0x2218	Rtim4	Register decreased by 1 down to 0 every 1 mS	ms	0		Unsigned32	WORD
0538-39	0x221A	Rtim5	Register decreased by 1 down to 0 every 1 mS	ms	0		Unsigned32	WORD
0540-41	0x221C	Rtim6	Register decreased by 1 down to 0 every 1 mS	ms	0		Unsigned32	WORD
0542-43	0x221E	Rtim7	Register decreased by 1 down to 0 every 1 mS	ms	0		Unsigned32	WORD

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note	Note
0148	0x2094	Rtempact	Actual temperature of the drive		°C			Signed16	WORD MAP RO
0149	0x2095	Rtensact	Actual voltage of the drive CC bus		Volt			Unsigned16	WORD MAP RO
0150	0x2096	Rcurdact	Actual current requested by the drive to the DC power supply		mA			Unsigned16	WORD NO MAP RO
0190	0x20BE	Rswrev	Software revision. From firmware rev. 6 replaced by register 10005					Unsigned16	WORD NO MAP RO
0191	0x20BF	Rhwrev	Hardware revision. From firmware rev. 6 replaced by register 10006					Unsigned16	WORD NO MAP RO
0192-193	0x20C0	Rserial	Serial number of the device. From firmware rev. 6 replaced by register 10007-8					Unsigned32	LS – MSWORD SAVE NO MAP
0197	0x20C5	Rrotsw	Copy of the value read by the rotary switch			0	99	Unsigned16	WORD NO MAP RO
0343	0x2157	Rhwoptions	Active hardware options B1= STO present					Unsigned16	WORD RO

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note	Note
0198	0x20C6	Rindtype	Tipo indexer 0: SMD30.06LIM 1: SMD30.06LIC 2: SMD30.06LIP 3: SMD50.06LIM 4: SMD50.06LIC 5: SMD50.06LIP 6: SMD30.06HIM 7: SMD30.06HIC 8: SMD30.06HIP 9: SMD50.06HIM 10: SMD50.06HIC 11: SMD50.06HIP 12: SMD10.04LIM 13: SMD10.04LIC 14: SMD10.04LIP 15: SMD10.04HIM 16: SMD10.04HIC 17: SMD10.04HIP 18: SMD50.06LS 19: SMD50.06HS 20: SMD30.06LS 21: SMD30.06HS 22: SMD10.04LS 23: SMD10.04HS 24: SMD10.04LUM 25: SMD10.04HUM 26: SMD104u 27: SMD30.06LIE 28: SMD50.06LIE 29: SMD30.06HIE 30: SMD50.06HIE 31: SMD10.04LIE 32: SMD10.04HIE 33: SMD11.04LIM 34: SMD11.04LIC 35: SMD11.04LIP 36: SMD11.04LS 37: SMD11.04LUM 38: SMD11.04LIE 39: SMD11.04HIM 40: SMD11.04HIC 41: SMD11.04HIP 42: SMD11.04HS 43: SMD11.04HUM 44: SMD11.04HIE 45: SMD114u 46: SMD51.06LIM 47: SMD51.06LIC 48: SMD51.06LIP 49: SMD51.06HIM 50: SMD51.06HIC 51: SMD51.06HIP 52: SMD51.06LS 53: SMD51.06HS 54: SMD51.06LIE 55: SMD51.06HIE 56: SMD51.06LUM 57: SMD51.06HUM 58: SMD51.06LIT 59: SMD51.06HIT 60: SMD11.04LIT 61: SMD11.04HIT 62: SMD31.06LIM 63: SMD31.06LIC 64: SMD31.06LIP 65: SMD31.06HIM 66: SMD31.06HIC 67: SMD31.06HIP 68: SMD31.06LS 69: SMD31.06HS 70: SMD31.06LIE 71: SMD31.06HIE 72: SMD31.06LUM 73: SMD31.06HUM 74: SMD31.06LIT	75: SMD31.06HIT 76: SMD12.04LIM 77: SMD12.04LIC 78: SMD12.04LIP 79: SMD12.04LS 80: SMD12.04LUM 81: SMD12.04LIE 82: SMD12.04HIM 83: SMD12.04HIC 84: SMD12.04HIP 85: SMD12.04HS 86: SMD12.04HUM 87: SMD12.04HIE 88: SMD12.04LIT 89: SMD12.04HIT 90: SMD22.04LIM 91: SMD22.04LIC 92: SMD22.04LIP 93: SMD22.04HIM 94: SMD22.04HIC 95: SMD22.04HIP 96: SMD22.04LS 97: SMD22.04HS 98: SMD22.04LIE 99: SMD22.04HIE 100: SMD22.04LUM 101: SMD22.04HUM 102: SMD22.04LIT 103: SMD22.04HIT 104: SMD1204HIN 105: SMD1204LIN 106: SMD5106HIN 107: SMD5106LIN 108: SMD2204HIN 109: SMD2204LIN <u>From firmware rev. 6, replcaed be registers higher than 10000</u>				Holding Register (16bit) Unsigned16 HI-BYTE code 0: SMD 1: DMD 2: BMD b7 LO-BYTE code: 0: I (ex SMD506I) 1: A (ex SMD506S)	WORD NO MAP RO

Indirizzo Modbus / Profibus	Indirizzo CAN EtherCAT Profinet	Nome Registro	Descrizione	U.M.	Valore Minimo	Valore Massimo	Tipo	Note
10000	0x4710	Rindfamily	Drive series. (From fw 5.50 the register 198 is read at 0xFFFF) Example: -1204 -2204 -5206				Unsign16	WORD RO
10001	0x4711	Rindmodel	MODEL DEFINITION Voltage Bit 2-1-0: 000= LOW 001= HIGH Application Bit 5-4-3: 000= Indexer 001= Step/dir 010= Labeller Drive model Bit 8-7-6 000= Undefined 001= SMD 010= DMD 011= BMD Communication chip bit 11-10-9 000= DSP 001= Wiznet 010= ANTAIOS 011= VPC3				Unsign16	WORD RO
10002	0x4712	Rindfielsbus	Fieldbus Description 0= USB (xUM) 1= Modbus RTU (xxM) 2= Modbus TCP (xxE) 3= Modbus TCP ANTAIOS (xxEA) 4= Profibus (xxP) 5= Profibus ANATAIOS (xxPA) 6= EtherCAT (xxT) 7= PROFINET (xxN) 8= Canopen (xxC) 9= Canopen NATAIOS (xxCA) 10= Step-dir				Unsign16	WORD RO
10003	0x4713	Rindoptions	OPTIONS DEFINITION Absolute encoder Bit 2-1-0: 000= None 001= SSI 010= Endat 011= BISS 100= sin/cos 101= free 110= Free 11= free				Unsign16	WORD RO
10004	0x4714	Rindregset	Registers mapping 0= Revision 1"				Unsign16	WORD RO
10005	0x4715	Rindswrev	Software revision				Unsign16	WORD RO
10006	0x4716	Rindhvrev	Hardware revision				Unsign16	WORD RO
10007-8	0x4717	Rindsn	Serial number (copy of the register 192-193)				Unsign32	WORD RO

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0042-43	0x202A	Rtestintmot	Register for the control of the communication mode (32bit Intel or Motorola). The fixed value of this register is 1234567890 (0x499602D2) By executing a read of this register at 32bit, it is possible to know if the communication is configured in Inter or Motorola mode, depending on the result.		1234567890 0x499602D2	1234567890 0x499602D2	Holding Register (32bit)	WORD RO
0166	0x20A6	Rprofists	Profibus communication status 0 = Disabled 1 = Parameterization 2 = Configuration 3 = Data Exchange FF = Fatal Error				Unsigned16	WORD NO MAP RO
0167	0x20A7	Rprofibaud	Profibus baudrate 0: Auto baud-rate 1: 9.6KB 2: 19.2KB 3: 31.25KB 4: 45.45KB 5: 93.75KB 6: 187.5KB 7: 500KB 8: 1500KB 9: 3000KB 10: 6000KB 11: 12000KB		0	11	Unsigned16	WORD SAVE NO MAP
0168	0x20A8	Rprofiaddr	Profibus Address This value is added to the hardware address.		0	127	Unsigned16	WORD SAVE NO MAP
0169	0x20A9	Rcanbaud	Can Baud Rate 0 = 10Kb 1 = 20Kb 2 = 50Kb 3 = 125Kb 4 = 250Kb 5 = 500Kb 6 = 800Kb 7 = 1Mb		0	8	Unsigned16	WORD SAVE NO MAP
0170	0x20AA	Rcanaddr	Can Address This value is added to the hardware address.		0	127	Unsigned16	WORD SAVE NO MAP
0171-172	0x20AB	Rcantx	Number of messages transmitted in Can				Unsigned32	LS – MSWORD NO MAP RO
0173-174	0x20AD	Rcanrx	Number of messages received in Can				Unsigned32	LS – MSWORD NO MAP RO
0175	0x20AF	Rcanovr	Number of overrun errors in Can				Unsigned16	WORD NO MAP RO
0176	0x20B0	Rcanerr	Number of errors in Can				Unsigned16	WORD NO MAP RO
0177	0x20B1	Rcanidx	Index of the CANopen object to be read or written		0	65535	Unsigned16	WORD NO MAP
0178	0x20B2	Rcansub	Sub-index of the CANopen object to be read or written		0	255	Unsigned16	WORD NO MAP
0179-180	0x20B3	Rcannew	New value to be written in CanOpen object				Unsigned32	LS – MSWORD NO MAP

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0181	0x20B5	Rcancmd	CANopen object Read/Write command 1 = Write value 2 = Read value		0	2	Unsigned16	WORD NO MAP
0182-183	0x20B6	Rcanact	Read value from CANopen object				Unsigned32	LS – MSWORD NO MAP RO
0184	0x20B8	Rcansts	CanOpen status Bit 0..3 status LED RED b3b2b1b0 0000Disabled 0011Warning Limit reached 0100Error control event 0101Sync Error 0110Event timer error 0111Bus OFF Bit 4..7 status LED GREEN b7b6b5b4 0001Pre-Operational 0010Stopped 0100Oper				Unsigned16	WORD NO MAP RO
0185	0x20B9	Rserbaud	Serial port Baud Rate 0 = 1200 1 = 2400 2 = 4800 3 = 9600 4 = 19200 5 = 38400 6 = 57600 7 = 115200		0	7	Unsigned16	WORD SAVE NO MAP
0186	0x20BA	Rserpar	Serial port parameter (par, stop bit) 0 = NONE, 1 1 = EVEN, 1 2 = ODD, 1 3 = NONE, 2 4 = EVEN, 2 5 = ODD, 2		0	5	Unsigned16	WORD SAVE NO MAP
0187	0x20BB	Rserdly	Serial Reply delay	ms	0	16	Unsigned16	WORD SAVE NO MAP
0188	0x20BC	Rseraddr	Serial port address (this value is added to the hardware address)		0	31	Unsigned16	WORD SAVE NO MAP
0189	0x20BD	Rintmot	Intel/Motorola mode selection for 32bit registers RS232/RS485 serial ports		0	1	Unsigned16	WORD SAVE NO MAP
0302	0x212E	Rfinsenale	Enable FINS/TCP protocol in drives with Ethernet communication		0	1	Unsigned16	WORD SAVE NO MAP
0303	0x212F	Rfinsnode	FINS/TCP station number		1	254	Unsigned16	WORD SAVE NO MAP
0304	0x2130	Rmdbport	TCP port number for Modbus/TCP protocol (Default = 502)		0	65535	Unsigned16	WORD SAVE NO MAP
0305	0x2131	Rethintmot	Definition of Intel or Motorola mode for registers at 32bit in Modbus/TCP communication or Ethernet based protocols 0= Intel 1=Motorola		0	1	Unsigned16	WORD SAVE NO MAP

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0308	0x2134	Rextmdbtme	Modbus RTU inter-message additional time, expressed in ms. It's used in case of slow remote communication. Default value is 0. If a value <>0 is set, the communication speed slows down.	ms	0	10000	Unsigned16	WORD SAVE NO MAP
0353	0x2161	Rstatuscan	Controlword-Statusword congruence errors in CanOpen				Unsigned16	WORD NO MAP
0354	0x2162	Rcanmodeoperation	Copy of the object 0x6060				Unsigned16	WORD NO MAP
0355	0x2163	Rswrevariantos	Antaios firmware version From firmware rev. 6 replaced by register 10140				Unsigned16	WORD NO MAP
0356	0x2164	Rhwrevariantos	Antaios hardware firmware From firmware rev. 6 replaced by register 10141				Unsigned16	WORD NO MAP
0357	0x2165	Rethercatid	Explicit address ID Ethercat				Unsigned16	WORD NO MAP
0358	0x2166	Rstrtmodeoperation	Setting of the object 0x6060 at power-on, for CANopen and EtherCAT protocols		-1	8	Unsigned16	WORD SAVE
0365	0x216D	Rds402compatibility	Bit used to adapt the DS402 stack to the Master Bit 0: 1= Current off with Controlword xxx7 (OMRON motion blocks) Bit 1: 1= CSP and CSV active with Controlword xxxF (OMRON motion blocks)					
0515	0x2203	Rethlocipaddr32	Byte 3 - Byte 2 Ethernet local IP address		0	65535	Unsigned16	WORD SAVE
0516	0x2204	Rethlocipaddr10	Byte 1 - Byte 0 Ethernet local IP address		0	65535	Unsigned16	WORD SAVE
0517	0x2205	Rethsubnet32	Byte 3 - Byte 2 Subnet ethernet		0	65535	Unsigned16	WORD SAVE
0518	0x2206	Rethsubnet10	Byte 1 - Byte 0 Subnet ethernet		0	65535	Unsigned16	WORD SAVE
0519	0x2207	Rethgwaddr32	Byte 3 - Byte 2 Gateway address ethernet		0	65535	Unsigned16	WORD SAVE
0520	0x2208	Rethgwaddr10	Byte 1 - Byte 0 Gateway address ethernet		0	65535	Unsigned16	WORD SAVE
0521	0x2209	Rethmacaddr054	Byte 5 - Byte 4 MAC address 0 ethernet		0	65535	Unsigned16	WORD EEPROM SAVE
0522	0x220A	Rethmacaddr032	Byte 3 - Byte 2 MAC address 0 ethernet		0	65535	Unsigned16	WORD EEPROM SAVE
0523	0x220B	Rethmacaddr010	Byte 1 - Byte 0 MAC address 0 ethernet		0	65535	Unsigned16	WORD EEPROM SAVE
0524	0x220C	Rethmacaddr154	Byte 5 - Byte 4 MAC address 1 ethernet (Profinet port 1)		0	65535	Unsigned16	WORD
0525	0x220D	Rethmacaddr132	Byte 3 - Byte 2 MAC address 1 ethernet (Profinet port 1)		0	65535	Unsigned16	WORD
0526	0x220E	Rethmacaddr110	Byte 1 - Byte 0 MAC address 1 ethernet (Profinet port 1)		0	65535	Unsigned16	WORD
0527	0x220F	Rethmacaddr254	Byte 5 - Byte 4 MAC address 2 ethernet (Profinet port 2)		0	65535	Unsigned16	WORD
0528	0x2210	Rethmacaddr232	Byte 3 - Byte 2 MAC address 2 ethernet (Profinet port 2)		0	65535	Unsigned16	WORD
0529	0x2211	Rethmacaddr210	Byte 1 - Byte 0 MAC address 2 ethernet (Profinet port 2)		0	65535	Unsigned16	WORD
0544	0x2220	Rethprotocolsock1	Protocol for socket 1 0=TCP / 1=UDP		0	1	Unsigned16	WORD SAVE
0545	0x2221	Rethprotocolsock2	Protocol for socket 2 0=TCP / 1=UDP		0	1	Unsigned16	WORD SAVE
0546	0x2222	Rethprotocolsock3	Protocol for socket 3 0=TCP / 1=UDP		0	1	Unsigned16	WORD SAVE

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0547	0x2223	Rethprot-sock4	Reserved		0	1	Unsigned16	WORD SAVE
0548	0x2224	Rethprot-sock5	Reserved		0	1	Unsigned16	WORD SAVE
0549	0x2225	Rethprot-sock6	Reserved		0	1	Unsigned16	WORD SAVE
0550	0x2226	Rethprot-sock7	Reserved		0	1	Unsigned16	WORD SAVE
0551	0x2227	Rethport-sock1	Socket port 1		0	65535	Unsigned16	WORD SAVE
0552	0x2228	Rethport-sock2	Socket port 2		0	65535	Unsigned16	WORD SAVE
0553	0x2229	Rethport-sock3	Socket port 3		0	65535	Unsigned16	WORD SAVE
0554	0x222A	Rethport-sock4	Socket port 4 (only for SMD2204)		0	65535	Unsigned16	WORD SAVE
0555	0x222B	Rethport-sock5	Socket port 5 (only for SMD2204)		0	65535	Unsigned16	WORD SAVE
0556	0x222C	Rethport-sock6	Socket port 6 (only for SMD2204)		0	65535	Unsigned16	WORD SAVE
0557	0x222D	Rethport-sock7	Socket port 7 (only for SMD2204)		0	65535	Unsigned16	WORD SAVE
0558	0x222E	Rethtcpti-meout	TCP socket timeout time in absence of activities. With value=0 the timeout is disabled.	s	0	65535	Unsigned16	WORD SAVE
10080	0x4760	Rprofinetnameptr	Pointer to the string "PROFINET device name"				Unsigned16	RW
10081	0x4761	Rprofinetnamechr	Pointed character of the string "PROFINET device name"				Unsigned16	RW
10082	0x4762	Rprofinetname	PROFINET string name (not sendable directly to the drive)				STRING	
10140	0x479C	Rswrevantaio	Antaios firmware revision				Unsigned16	RW SAVE
10141	0x479D	Rhwrevantaio	Antaios hardware revision				Unsigned16	RW SAVE
10142	0x479E	Rmodelantaio	Expansion card model on Antaios FW				Unsigned16	RW SAVE

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
8200		Rfieldbusd- tarx1	Word 1 Data received via fieldbus				Unsig- ned16	WORD
8201		Rfieldbusd- tarx2	Word 2 Data received via fieldbus				Unsig- ned16	WORD
8202		Rfieldbusd- tarx3	Word 3 Data received via fieldbus				Unsig- ned16	WORD
8203		Rfieldbusd- tarx4	Word 4 Data received via fieldbus				Unsig- ned16	WORD
8204		Rfieldbusd- tarx5	Word 5 Data received via fieldbus				Unsig- ned16	WORD
8205		Rfieldbusd- tarx6	Word 6 Data received via fieldbus				Unsig- ned16	WORD
8206		Rfieldbusd- tarx7	Word 7 Data received via fieldbus				Unsig- ned16	WORD
8207		Rfieldbusd- tarx8	Word 8 Data received via fieldbus				Unsig- ned16	WORD
8208		Rfieldbusd- tarx9	Word 9 Data received via fieldbus				Unsig- ned16	WORD
8209		Rfieldbusd- tarx10	Word 10 Data received via fieldbus				Unsig- ned16	WORD
8210		Rfieldbusd- tarx11	Word 11 Data received via fieldbus				Unsig- ned16	WORD
8211		Rfieldbusd- tarx12	Word 12 Data received via fieldbus				Unsig- ned16	WORD
8212		Rfieldbusd- tarx13	Word 13 Data received via fieldbus				Unsig- ned16	WORD
8213		Rfieldbusd- tarx14	Word 14 Data received via fieldbus				Unsig- ned16	WORD
8214		Rfieldbusd- tarx15	Word 15 Data received via fieldbus				Unsig- ned16	WORD
8215		Rfieldbusd- tarx16	Word 16 Data received via fieldbus				Unsig- ned16	WORD
8216		Rfieldbusd- tarx17	Word 17 Data received via fieldbus				Unsig- ned16	WORD
8217		Rfieldbusd- tarx18	Word 18 Data received via fieldbus				Unsig- ned16	WORD
8218		Rfieldbusd- tarx19	Word 19 Data received via fieldbus				Unsig- ned16	WORD
8219		Rfieldbusd- tarx20	Word 20 Data received via fieldbus				Unsig- ned16	WORD
8220		Rfieldbusd- tarx21	Word 21 Data received via fieldbus				Unsig- ned16	WORD
8221		Rfieldbusd- tarx22	Word 22 Data received via fieldbus				Unsig- ned16	WORD
8222		Rfieldbusd- tarx23	Word 23 Data received via fieldbus				Unsig- ned16	WORD
8223		Rfieldbusd- tarx24	Word 24 Data received via fieldbus				Unsig- ned16	WORD
8224		Rfieldbusd- tarx25	Word 25 Data received via fieldbus				Unsig- ned16	WORD
8225		Rfieldbusd- tarx26	Word 26 Data received via fieldbus				Unsig- ned16	WORD
8226		Rfieldbusd- tarx27	Word 27 Data received via fieldbus				Unsig- ned16	WORD
8227		Rfieldbusd- tarx28	Word 28 Data received via fieldbus				Unsig- ned16	WORD
8228		Rfieldbusd- tarx29	Word 29 Data received via fieldbus				Unsig- ned16	WORD

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
8229		Rfieldbusd- tarx30	Word 30 Data received via fieldbus				Unsig- ned16	WORD
8230		Rfieldbusd- tarx31	Word 31 Data received via fieldbus				Unsig- ned16	WORD
8231		Rfieldbusd- tarx32	Word 32 Data received via fieldbus				Unsig- ned16	WORD
8232		Rfieldbusd- tatx1	Word 1 Data sent to fieldbus				Unsig- ned16	WORD
8233		Rfieldbusd- tatx2	Word 2 Data sent to fieldbus				Unsig- ned16	WORD
8234		Rfieldbusd- tatx3	Word 3 Data sent to fieldbus				Unsig- ned16	WORD
8235		Rfieldbusd- tatx4	Word 4 Data sent to fieldbus				Unsig- ned16	WORD
8236		Rfieldbusd- tatx5	Word 5 Data sent to fieldbus				Unsig- ned16	WORD
8237		Rfieldbusd- tatx6	Word 6 Data sent to fieldbus				Unsig- ned16	WORD
8238		Rfieldbusd- tatx7	Word 7 Data sent to fieldbus				Unsig- ned16	WORD
8239		Rfieldbusd- tatx8	Word 8 Data sent to fieldbus				Unsig- ned16	WORD
8240		Rfieldbusd- tatx9	Word 9 Data sent to fieldbus				Unsig- ned16	WORD
8241		Rfieldbusd- tatx10	Word 10 Data sent to fieldbus				Unsig- ned16	WORD
8242		Rfieldbusd- tatx11	Word 11 Data sent to fieldbus				Unsig- ned16	WORD
8243		Rfieldbusd- tatx12	Word 12 Data sent to fieldbus				Unsig- ned16	WORD
8244		Rfieldbusd- tatx13	Word 13 Data sent to fieldbus				Unsig- ned16	WORD
8245		Rfieldbusd- tatx14	Word 14 Data sent to fieldbus				Unsig- ned16	WORD
8246		Rfieldbusd- tatx15	Word 15 Data sent to fieldbus				Unsig- ned16	WORD
8247		Rfieldbusd- tatx16	Word 16 Data sent to fieldbus				Unsig- ned16	WORD
8248		Rfieldbusd- tatx17	Word 17 Data sent to fieldbus				Unsig- ned16	WORD
8249		Rfieldbusd- tatx18	Word 18 Data sent to fieldbus				Unsig- ned16	WORD
8250		Rfieldbusd- tatx19	Word 19 Data sent to fieldbus				Unsig- ned16	WORD
8251		Rfieldbusd- tatx20	Word 20 Data sent to fieldbus				Unsig- ned16	WORD
8252		Rfieldbusd- tatx21	Word 21 Data sent to fieldbus				Unsig- ned16	WORD
8253		Rfieldbusd- tatx22	Word 22 Data sent to fieldbus				Unsig- ned16	WORD
8254		Rfieldbusd- tatx23	Word 23 Data sent to fieldbus				Unsig- ned16	WORD
8255		Rfieldbusd- tatx24	Word 24 Data sent to fieldbus				Unsig- ned16	WORD
8256		Rfieldbusd- tatx25	Word 25 Data sent to fieldbus				Unsig- ned16	WORD
8257		Rfieldbusd- tatx26	Word 26 Data sent to fieldbus				Unsig- ned16	WORD
8258		Rfieldbusd- tatx27	Word 27 Data sent to fieldbus				Unsig- ned16	WORD

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
8259		Rfieldbusda- tatx28	Word 28 Data sent to fieldbus				Unsig- ned16	WORD
8260		Rfieldbusda- tatx29	Word 29 Data sent to fieldbus				Unsig- ned16	WORD
8261		Rfieldbusda- tatx30	Word 30 Data sent to fieldbus				Unsig- ned16	WORD
8262		Rfieldbusda- tatx31	Word 31 Data sent to fieldbus				Unsig- ned16	WORD
8263		Rfieldbusda- tatx32	Word 32 Data sent to fieldbus				Unsig- ned16	WORD

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0413	0x219D	Rmodulcmd	Operation mode with module cyclic quota B0 : Forward module B1 : Backward module B2 : Minimum distance module B3 : Encoder 1 module B4 : Encoder 2 module B5 : Encoder 3 module B6 : Absolute encoder module		0	65535	Unsigned16	WORD SAVE NO_MAP
0414-415	0x219E	Rmodulpos	Module quota value for positioner	Step	1	0x7FFFFFFF	Unsigned32	H- LWORD SAVE NO_MAP
0416-417	0x21A0	Rmodulmotenc	Module quota value for motor encoder	Enc. Pulses	1	0x7FFFFFFF	Unsigned32	H-LWORD SAVE NO_MAP
0418-419	0x21A2	Rmodulextenc	Module quota value for external encoder	Enc. Pulses	1	0x7FFFFFFF	Unsigned32	H-LWORD SAVE NO_MAP

Management of module quota function (cyclic or Rollover)

With the register **Rmodulcmd** it is possible to enable the management of the quota in cyclic mode (or rollover).

The quota of the positioner is closed in a loop between a minimum value of 0 and the maximum limit set in the register **Rmodulpos**. Through the bits from 3 to 6 of the module **Rmodulcmd** it is possible to do the same for the motor encoder 1-2-3 or the absolute encoder.

The quota in module is used in the management of rotary tables, where there is an accurate angular position of the table and the positions cyclically repeat themselves.

With this mode it is possible to indicate an absolute quota inside the module range, and that quota is reached, even if the table must execute a “rollover” of the quota, both forward or backward.

By using the mode “always forward direction” (BIT0=1), each quota is reached by letting the motor (or the table) rotate always in forward direction. As an example, if we are at quota 500 and we give a GO at quota 400, the new position is reached by arriving at the maximum quota of the module, then by resetting it at 0 when the 0 point is reached, and then by advancing until the quota reaches out 400.

By using the mode “always backward direction” (BIT1=1), the sequence is the same as above, but with the rotation direction always set “backward”. So, if we are at quota 500 and we give a go at 600, the new position is reached by reaching quota 0, then by executing the rollover on the maximum quota of the module, and then by proceeding with the back direction until quota 600 is reached.

The mode “minimum distance” (BIT2=1), before starting the movement, executes a check of which is the direction that brings to the achievement of the desired quota by following the shortest path.

Once the control has decided the sense of rotation of the motor (or the table), the operation mode is restored to mode “always forward” or “always backward”.

Regarding encoders, the range of the quotas is always between 0 and a maximum value indicated in the preset encoder module register.

The quotas of the motor encoder and of the external encoder are recorded in the usual registers **Rmotenc** and **Rextenc**.

The registers used in this operation mode are:

Rmodulcmd: Module operation mode selection register.

Rmodulpos: Module quota for the positioner. It's the maximum reachable quota from the positioner before executing the rollover of the quota.

Rmodulmotenc: Module quota for the encoder 1. It's the maximum reachable quota from the register of the encoder 1 before executing the rollover of the quota.

Rmodulextenc: Module quota for the encoder 2. It's the maximum reachable quota from the register of the encoder 2 before executing the rollover of the quota.

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0420	0x21A4	Rlineupcmd	Quotas realignment command B0 : positioner quota B1 : encoder 1 quota B2 : encoder 2 quota B3 : encoder 3 quota B4 : absolute encoder quota				Unsig- ned16	WORD MAP WRITE
0421-422	0x21A5	Rlineuppos	Positioner realign quota value	Step			Signed 32	H-LWORD SAVE NO_MAP
0423-424	0x21A7	Rlineupmo- tenc	Encoder 1 realign quota value	Enc. Pulses			Signed32	H-LWORD SAVE NO_MAP
0425-426	0x21A9	Rlineu- pextenc	Encoder 2 realign quota value	Enc. Pulses			Signed 32	H-LWORD SAVE NO_MAP
0427	0x21AB	Rlineupdef	Enable quotas realignment from an external com- mand (input)When the external digital command arri- ves, these bit are copied in the register Rlineupcmd. B0 : Rialign positioner quota B1 : Rialign motor encoder quota B2 : Rialign external encoder quota				Unsig- ned16	WORD SAVE MAP WRITE

Quota realignment management

It is possible to realign the actual requested quota, the motor encoder quota and the external encoder quota to a prefixed values by acting on the register Rlineupcmd.

Rlineupcmd is managed at bit. The bits have the followin meanings:

B0: Realign positioner quota to register Rposactreq.

B1: Realign motor encoder quota to register Rmotenc.

B2: Realign external encoder quota to register Rextenc.

Once the realignment is completed, the register Rlineupcmd is reset to 0, and it waits for another realignment command.

The realignment bits must be transferred all together, in order to avoid the possible loss of realignment requests.

The registers which contain the realignment quota must be already set before giving the realignment.

Essentially, the realignment function copies the lineup registers on the work registers:

Rlineuppos → Rposactreq

Rlineupmotenc → Rmotenc

Rlineupextenc → Rextenc

During the realignment, the interrupts of the DSP are blocked, so in case of realignment of more than one quota, these will be executed in the same moment.

It is advised not to use the realignment quota during the deceleration ramp.

TOUCH PROBE FUNCTION

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0331	0x214B	Rtouchpro- befunc	Controlword of the Touch Probe function. B0: 0=Switch off touch probe 1 1=Enable touch probe 1 B1: 0=Trigger first event 1=Continuous B2: 0=Trigger with t.p.1 input 1=Trigger with TOP encoder B3: Reserved B4: 0=Switch off sampling at t.p.1 1=Enable sampling at t.p.1 B5: Not supported B7-6: 00=Touch Rposact 01=Touc+E323h Motor Encoder 10=Touch External Encoder 11=Touch Absolute Encoder B8: 0=Switch off touch probe2 1=Enable touch probe 2 B9: 0=Trigger first event 1=Continuous B10: 0=Trigger with t.p.2 input 1=Trigger with TOP encoder B11: Reserved B12: 0=Switch off sampling at t.p.2 1=Enable sampling at t.p.2 B13: Not supported B15-14: 00=Touch Rposact 01=Touch Motor Encoder 10=Touch External Encoder 11=Touch Absolute Encoder From firmware rev. 6 replaced by register 10084		0	65535	Unsig- ned16	WORD SAVE MAP WRITE
0332	0x214C	Rtouchpro- bestatus	Statusword of the Touch Probe function. B0: 0=Touch Probe 1 is switched off 1=Touch Probe 1 is enabled B1: 0=T.P. 1 no value stored 1=Touch Probe 1 value stored B2: Not supported B3: Reserved B4: Reserved B5: Reserved B6: Reserved B7: Shall toggle with every update of T.P.1 value stored B8: 0=Touch Probe 2 is switched off 1=Touch Probe 2 is enabled B9: 0=T.P. 2 no value stored 1=Touch Probe 2 value stored B10: Not supported B11: Reserved B12: Reserved B13: Reserved B14: Reserved B15: Shall toggle with every update of T.P.2 value stored From firmware rev. 6 replaced by register 10085				Unsig- ned16	WORD RO MAP READ
0333-34	0x214D	Rtouchpro- bepos1pos	Touch Probe 1 position value at positive edge of t.p.1 touch signal From firmware rev. 6 replaced by register 10086-87				Signed32	WORD RO MAP READ
0335-36	0x214F	Rtouchpro- bepos1neg	Touch Probe 1 position value at negative edge of t.p.1 touch signal From firmware rev. 6 replaced by register 10088-89				Signed32	WORD RO MAP READ
0337-38	0x2151	Rtouchpro- bepos2pos	Touch Probe 2 position value at positive edge of t.p.2 touch signal From firmware rev. 6 replaced by register 10097-98				Signed32	WORD RO MAP READ
0339-40	0x2153	Rtouchpro- bepos2neg	Touch Probe 2 position value at negative edge of t.p.2 touch signal From firmware rev. 6 replaced by register 10099-100				Signed32	WORD RO MAP READ

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0341	0x2155	Rtouchprobe1inpdef	Setting of the digital input to be used for the touch probe 1 function From firmware rev. 6 replaced by register 10090		0	255	Unsigned16	WORD RO MAP WRITE
0342	0x2156	Rtouchprobe2inpdef	Setting of the digital input to be used for the touch probe 2 function From firmware rev. 6 replaced by register 10101		0	255	Unsigned16	WORD RO MAP WRITE
10084	0x4764	Rtouchprobefunc	Control word of the Touch Probe function		0	65535	Unsigned16	RW SAVE
10085	0x4765	Rtouchprobestatus	Status word of the Touch Probe function		0	65535	Unsigned16	RW SAVE
10086-87	0x4766	Rtouchprobe1pos	Touch Probe 1 position value at positive edge of t.p.1 touch signal				Signed32	RO
10088-89	0x4768	Rtouchprobe1neg	Touch Probe 1 position value at negative edge of t.p.1 touch signal				Signed32	RO
10090	0x476A	Rtouchprobe1inp	Touch Probe 1 source				Unsigned16	RW SAVE
10091-92	0x476B	Rtouchprobe1time-stamppos	Touch probe time stamp 1 positive value				Unsigned32	RO
10093-94	0x476D	Rtouchprobe1time-stampneg	Touch probe time stamp 1 negative value				Unsigned32	RO
10095	0x476F	Rtouchprobe1posed-gecnt	Touch probe positive edge counter				Unsigned16	RO
10096	0x4770	Rtouchprobe1neged-gecnt	Touch probe negative edge counter				Unsigned16	RO
10097-98	0x4771	Rtouchprobe2pos	Touch Probe position 2 positive value				Signed32	RO
10099-100	0x4773	Rtouchprobe2neg	Touch Probe position 2 negative value				Signed32	RO
10101	0x4775	Rtouchprobe2inp	Touch Probe 2 source				Unsigned16	RW SAVE
10102-3	0x4776	Rtouchprobe2time-stamppos	Touch probe time stamp 2 positive value				Unsigned32	RO
10104-5	0x4778	Rtouchprobe2time-stampneg	Touch probe time stamp 2 negative value				Unsigned32	RO
10106	0x477A	Rtouchprobe2posed-gecnt	Touch probe 2 positive edge counter				Unsigned16	RO
10107	0x477B	Rtouchprobe2neged-gecnt	Touch probe 2 negative edge counter				Unsigned16	RO
10108	0x477C	Rtouchprobe1source	Touch Probe 1 input definition 0 = Rposact 1 = Encoder 1 2 = Encoder 2 3 = Encoder 3 4 = Absolute encoder				Unsigned16	RW SAVE
10109	0x477D	Rtouchprobe2source	Touch Probe 2 encoder input definition 0 = Rposact 1 = Encoder 1 2 = Encoder 2 3 = Encoder 3 4 = Absolute encoder				Unsigned16	RW SAVE

Touch probe function

The touch probe function records an axis position at the point in time of an input digital signal.

Since the position is usually not recorded directly in the PLC, but via an external hardware latch, it is highly accurate and independent of cycle time. The touch probe function controls this mechanism and determines the externally recorded position.

Rtouchprobefunc (CanOpen/EtherCAT standard Object 60B8h) – Touch probe function

Modbus register	CanOpen Index	CanOpen SubIndex	Parameter Name	Data type	Access type	Default value	PDO mapping
"0331", or "10084" (from firmware rev. 6)	60B8h	0	Rtouchprobefunc Touch probe function	Unsigned 16	RW	0	Yes

This object indicates the configured function of the touch probe.

Notes: Bit 0 to 7: for touch probe 1

Bit 8 to 15: for touch probe 2

Bit2/10 cannot be changed after 60B8h Bit4/12 was set to 1.

Bit No.	Value	Definition
0	0	Switch off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1	continuous
2	0	Trigger with touch probe 1 input
	1	Trigger with zero signal of position encoder
3	-	Reserved
4	0	Switch off sampling at touch probe 1
	1	Enable sampling at touch probe 1
5	-	not supported
6, 7	0	User-defined (not used)
8	0	Switch off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1	continuous
10	0	Trigger with touch probe 2 input
	1	Trigger with zero signal of position encoder
11	0	Reserved
12	0	Switch off sampling at touch probe 2
	1	Enable sampling at touch probe 2
13	0	not supported
14, 15	0	User-defined (not used)

Rtouchprobestatus (CanOpen/EtherCAT standard Object 60B9h) - Touch probe status

Modbus register	CanOpen Index	CanOpen SubIndex	Parameter Name	Data type	Access type	Default value	PDO mapping
"0332", or "10085" (from firmware rev. 6)	60B9h	0	Rtouchprobestatus Touch probe Status	Unsigned 16	RO	0	Yes

This object provides the status of the touch probe.

Value range: Unsigned16

Bit No.	Value	Definition
0	0	Touch probe 1 is switched off
	1	Touch probe 1 is enabled
1	0	Touch probe 1 no value stored
	1	Touch probe 1 value stored
2	0	not supported
3 to 6	0	Reserved
7	0,1	Shall toggle with every update of Touch probe 1 value stored *1
8	0	Touch probe 2 is switched off
	1	Touch probe 2 is enabled
9	0	Touch probe 2 no value stored
	1	Touch probe 2 value stored
10	0	not supported
11 to 14	0	Reserved
15	0,1	Shall toggle with every update of Touch probe 2 value stored *1

Notes: Bit 0 to 7: for touch probe 1

Bit 8 to 15: for touch probe 2

*1) If the continuous latch is enabled (object 60B8 bit 1 = 1, or bit 9 = 1), bit 7 or bit 15 of object 60B9h is toggled with every stored update of the touch probe value.

Rtouchprobepos1pos (CanOpen/EtherCAT standard Object 60BAh) - Touch probe position 1 positive value

Modbus register	CanOpen Index	CanOpen SubIndex	Parameter Name	Data type	Access type	Default value	PDO mapping
"0333-34" "10086-87" (from firmware rev. 6)	60BAh	0	Rtouchprobepos1pos Touch probe position 1 positive value	Integer 32	RO	0	Yes

This object provides the position value of the touch probe 1.

The value shall be given in user-defined position units.

Value range: Integer32

Units: Pos units

Rtouchprobepos1neg (CanOpen/EtherCAT standard Object 60BBh) - Touch probe position 1 negative value

Modbus register	CanOpen Index	CanOpen SubIndex	Parameter Name	Data type	Access type	Default value	PDO mapping
"0335-36" "10088-89" (from firmware rev. 6)	60BBh	0	Rtouchprobepos1neg Touch probe position 1 negative value	Integer 32	RO	0	Yes

This object provides the position value of the touch probe 1.
The value shall be given in user-defined position units.

Value range: Integer32

Units: Pos units

Rtouchprobepos2pos (CanOpen/EtherCAT standard Object 60BCh) - Touch probe position 2 positive value

Modbus register	CanOpen Index	CanOpen SubIndex	Parameter Name	Data type	Access type	Default value	PDO mapping
"0337-38" "10097-98" (from firmware rev. 6)	60BCh	0	Rtouchprobepos2pos Touch probe position 2 positive value	Integer 32	RO	0	Yes

This object provides the position value of the touch probe 2.
The value shall be given in user-defined position units.

Value range: Integer32

Units: Pos units

Rtouchprobepos2neg (CanOpen/EtherCAT standard Object 60BDh) - Touch probe position 2 negative value

Modbus register	CanOpen Index	CanOpen SubIndex	Parameter Name	Data type	Access type	Default value	PDO mapping
"0339-40" "10099-100" (from firmware rev. 6)	60BDh	0	Rtouchprobepos2neg Touch probe position 2 negative value	Integer 32	RO	0	Yes

This object provides the position value of the touch probe 2.
The value shall be given in user-defined position units.

Value range: Integer32

Units: Pos units

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0345	0x2159	Rcaptselinp	Selection of the digital input to be used for "capture" function.		0	15	Unsigned16	WORD SAVE
0346-47	0x215A	Rcaptvel-max	Maximum value reachable by the timer in "capture" function. (Time base 20us)				Unsigned32	WORD SAVE
0348-49	0x215C	Rcaptval	Value of the period registered by the "capture" function between two edges of the digital input. (Time base 20us)				Unsigned32	WORD
0350	0x215E	Rcaptcnt	Number of pulses received on the digital input associated to the "capture" function. It ranges from 0 to 65535. Once the upper limit is reached, it restarts from 0.		0	65535	Unsigned16	WORD

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0380	0x217C	Rcamstpulse	Master encoder pulses per revolution (for cams Type1 and Type2)	Enc. Pulses	1	32767	Unsigned16	WORD SAVE NO MAP
0381	0x217D	Rcamstmaxfrq	Master encoder maximum pulses/sec (for cam Type2)	Enc. Pulses /s	1	32767	Unsigned16	WORD SAVE NO MAP
0382	0x217E	Rcamstrtpphase	Number of the task with the first phase to be executed (for cams Type1 and Type2)		0	63	Unsigned16	WORD SAVE MAP READ
0383	0x217F	Rcamstposact	Master encoder actual position(for cams Type1 and Type2)	Enc. Pulses			Unsigned16	WORD MAP READ RO
0384	0x2180	Rcamphaseact	Actual phase (task) in progress (for cams Type1 and Type2)				Unsigned16	WORD NO MAP RO
0385	0x2181	Rcamflgwr	Cam writing flag Bit 0: Cam reset Bit 1: Only one revolution of the cam. then stops at the maximum value. Bit 2: Bit 3: Bit 4: Bit 5: Bit 6: Bit 7: Bit 8: Bit 9: Bit 10: Bit 11: Bit 12: Bit 13: Bit 14: Bit 15: (for cams Type1 and Type2)				Unsigned16	WORD NO MAP
0386	0x2182	Rcamflgrd	Cam reading flag Bit 0: Cam reset Bit 1: Cam in movement Bit 2: Cam in acceleration Bit 3: Cam at constant speed Bit 4: Cam in deceleration Bit 5: Bit 6: Bit 7: Bit 8: Bit 9: Bit 10: Bit 11: Bit 12: Bit 13: Bit 14: Bit 15: (for cams Type1 and Type2)				Unsigned16	WORD MAP READ RO
0387	0x2183	Rcamkp	Kp PI increments management in cam mode (for cams Type1, Type2, STSP and Winding)		0	32767	Unsigned16	WORD SAVE NO MAP

START STOP CAM FUNCTION

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0456	0x21C8	Rcamst-spmstmm-pulse	Millimeters/pulse master shift in start/stop cam (mm*1000/pulse)	mm/Imp.	0	65535	Unsigned16	WORD SAVE
0457	0x21C9	Rcamst-spslvmm-step	Millimeters/pulse slave shift in start/stop cam (mm*1000/pulse)	mm/Imp.	0	65535	Unsigned16	WORD SAVE
0458	0x21CA	Rcamst-spcor	Master/slave centesimal correction in start/stop cam (-100/+100)	%	-1000	1000	Signed16	WORD SAVE
0459	0x21CB	Rcamst-spaccspace	Slave acceleration space on master space in start/stop cam	mm*10	0	65535	Unsigned16	WORD SAVE
0460	0x21CC	Rcamstspc-trl	Start/stop cam control B0: 0=Stop/1=Run B1: 1=Disable start delay B2: 1=Disable stop delay B3: 1=Simulated encoder B4: B5: B6: B7:				Unsigned16	WORD MAP WRITE
0461	0x21CD	Rcamst-spstatus	Start/stop cam status B1: Cam enabled B2: Cam in RUN B3: Cam in acceleration B4: Cam at constant acceleration B5: Cam in deceleration B6: B7:				Unsigned16	WORD RO MAP READ
0462-63	0x21CE	Rcamst-splowquotestlv	Minimum slave quota in start/stop cam	Step	0	0x7FFFFFFF	Unsigned32	H-LWORD SAVE
0464-65	0x21D0	Rcamstsphighquotestlv	Maximum slave quota in start/stop cam	Step	0	0x7FFFFFFF	Unsigned32	H-LWORD SAVE
0466-67	0x21D2	Rcamst-splowquotemst	Minimum master quota in start/stop cam	Enc. Pulses	0	0x7FFFFFFF	Unsigned32	H-LWORD SAVE
0468-69	0x21D4	Rcamstsphighquotemst	Maximum master quota in start/stop cam	Enc. Pulses	0	0x7FFFFFFF	Unsigned32	H-LWORD SAVE
0470	0x21D6	Rcammode-select	Cam mode selection 0=Type1 cam (Blk) 1=Type2 cam (Bert)		0	1	Unsigned16	WORD SAVE
0496	0x21F0	Rcamst-spsimvel	Speed in mm/s of the simulated encoder in start/stop cam function	mm/s			Unsigned16	WORD SAVE
0497	0x21F1	Rcamst-spdecspace	Slave deceleration space on master space in start/stop cam	mm*10			Unsigned16	WORD SAVE
0498	0x21F2	Rcamst-spstartdly	Master space before the slave start in start/stop cam mode	mm*10			Unsigned16	WORD SAVE
0499	0x21F3	Rcamst-spstopdly	Slave space from the stop signal to the start of the deceleration ramp	mm*10			Unsigned16	WORD SAVE

WINDING FUNCTION (WIRE GUIDE)

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0471	0x21D7	Rwindspoolimpturn	Spool encoder pulses per revolution in winding mode	Enc. Pulses	1	65535	Unsigned16	WORD SAVE
0472	0x21D8	Rwindyarnguidemmstep	Wire guide shift in mm for stepper mode in winding mode	mm*1000	0	65535	Unsigned16	WORD SAVE
0473	0x21D9	Rwindaccspoolturn	Wire guide acceleration turns to reach the requested speed in winding mode	1/10 turn	0	65535	Unsigned16	WORD SAVE
0474	0x21DA	Rwindyarnshift	Wire guide shift for spool revolution in winding mode	mm*100	0	65535	Unsigned16	WORD SAVE
0475	0x21DB	Rwindtyingshift	Wire guide shift for spool revolution during the binding phase in winding mode	mm*100	0	65535	Unsigned16	WORD SAVE
0476	0x21DC	Rwindctrl	Control word winding mode B0: 1=Enable winding cam B1: 1=Enable stop sequence B2: 1=Enable binding sequence B3: 1=Disable encoder reading B4: 1=Winding cam error reset B5: Start direction of the deposit				Unsigned16	WORD MAP WRITE
0477	0x21DD	Rwindstatus	Status word winding mode B0: 1=Winding cam enabled B1: 1=Stop sequence request enabled B2: 1=Binding sequence request enabled B3: 1=Encoder disabled B4: Cam stepper motor direction flag B5: 1=End of cam sequence B6: 1=Cam error B7: 1=Binding sequence executed B8: B9: B10: B11: B12: B13: Cam in acceleration B14: Cam in constant speed B15: Cam in deceleration				Unsigned16	WORD RO MAP READ
0478-79	0x21DE	Rwindquotelleft	Quota toward wire guide machine in winding mode	mm*10	0	0x7FFFFFFF	Unsigned32	H-LWORD
0480-81	0x21E0	Rwindquoteright	Quota toward wire guide user in winding mode	mm*10	0	0x7FFFFFFF	Unsigned32	H-LWORD
0482-83	0x21E2	Rwindquotestop	Wire guide stop quota in winding mode	mm*10	0	0x7FFFFFFF	Unsigned32	H-LWORD
0484-85	0x21E4	Rwindquotetyingleft	Quota toward wire guide machine for binding in winding mode	mm*10	0	0x7FFFFFFF	Unsigned32	H-LWORD
0486-87	0x21E6	Rwindquotetyingright	Quota toward wire guide user for binding in winding mode	mm*10	0	0x7FFFFFFF	Unsigned32	H-LWORD
0488-89	0x21E8	Rwindyarnguidemturnmotor	Wire guide shift in mm per stepper motor revolution	mm*100	0	0x7FFFFFFF	Unsigned32	H-LWORD
0490	0x21EA	Rwindrevcnt	Reversals counter in winding mode				Unsigned16	WORD MAP READ
0491-92	0x21EB	Rwindrevpause	Pulses of master encoder with stepper motor in pause during the reversal of the direction of motion	Enc. Pulses	0	0x7FFFFFFF	Unsigned32	H-LWORD
10012	0x471C	Renccamfbk	Encoder feedback for cam/winding functions 0= Encoder 1 1= Encoder 2 2= Encoder 3 3= Absolute encoder		Default 1		Unsign16	"WORD RW SAVE"

FUNCTIONAL TASK WITH DIGITAL OUTPUTS FUNCTION

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0530	0x2212	Rtskfmstfw1	Experimental function for movement from task table + outputs management				Unsigned16	WORD
0531	0x2213	Rtskfmstfw2	Experimental function for movement from task table + outputs management				Unsigned16	WORD
0532	0x2214	Rtskfmst-macvelact	Experimental function for movement from task table + outputs management				Unsigned16	WORD
0533	0x2215	Rtskfmst-macvelmax	Experimental function for movement from task table + outputs management				Unsigned16	WORD
0534	0x2216	Rtskfmst-spcphdis	Experimental function for movement from task table + outputs management				Unsigned16	WORD
0535	0x2217	Rtskfmstphinp	Experimental function for movement from task table + outputs management				Unsigned16	WORD

EXTERNAL BRAKE

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0098	0x2062	Rbrakedlyopen	Opening delay of external brake, commanded by digital output	ms	0	65535	Unsigned16	WORD SAVE
0344	0x2158	Rbrakedlyclose	Closing delay of external brake, commanded by digital output	ms	0	65535	Unsigned16	WORD SAVE

PID FUNCTION

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0500	0x21F4	Rusrpidkp	User PID proportional gain				Unsigned16	WORD SAVE
0501	0x21F5	Rusrpidki	User PID integral gain				Unsigned16	WORD SAVE
0502	0x21F6	Rusrpidkd	User PID derivative gain				Unsigned16	WORD SAVE
0503	0x21F7	Rusrpidkt	User PID integration time in mS	ms			Unsigned16	WORD SAVE
0504	0x21F8	Rusrpidflag	User PID control flag B0: 0=Stop PID / 1=Start PID B1: 1=Reset PID B2: B3: B4: B5:				Unsigned16	WORD
0505-06	0x21F9	Rusrpidmaxout	User PID maximum output value				Signed32	WORD SAVE
0507-08	0x21FB	Rusrpidminout	User PID minimum output value				Signed32	WORD SAVE
0509-10	0x21FD	Rusrpidsetpoint	User PID Setpoint				Signed32	WORD SAVE MAP WRITE
0511-12	0x21FF	Rusrpidprocessvalue	User PID process value				Signed32	WORD MAP READ
0513-14	0x2201	Rusrpidout	User PID output value				Signed32	WORD MAP READ

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0315	0x213B	Rfgapplyto	Data to which the internal function generator signal must be applied: 0: None 1: Current Phase A 2: Current Phase B 3: Speed 4: Position 5: Profile		0	5	Unsigned16	WORD
0316-17	0x213C	Rfgvalmin	Function generator minimum value	Bit	0x80000000	0x7FFFFFFF	Signed32	LS – MSWORD NO MAP RO
0318-19	0x213E	Rfgvalmax	Function generator maximum value	Bit	0x80000000	0x7FFFFFFF	Signed32	LS – MSWORD NO MAP RO
0320	0x2140	Rfgfreq	Frequency of the generated signal	Hz	1	10000	Unsigned16	WORD NO MAP
0321	0x2141	Rfgperiod	Period of the generated signal	ms	1	1000	Unsigned16	WORD NO MAP
0322	0x2142	Rfgcmd	Function generator command 0 = FG stop 1 = FG start		0	1	Unsigned16	WORD SAVE NO MAP
0323	0x2143	Rfgmode	Type of signal generated 0 = sinusoidal 1 = square wave 2 = pulse		0	2	Unsigned16	WORD
0324-25	0x2144	Rfgout32	Functions generator output				Signed32	LS – MSWORD NO MAP RO
0326	0x2146	Rfgout16	Functions generator output				Signed16	WORD

Indirizzo Modbus	Nome Registro	Descrizione	U.M.	Valore Minimo	Valore Massimo	Tipo	
7000		Oscilloscope data 0 channel 1				Unsigned16	WORD
7001-7498		Oscilloscope data 1-498 channel 1				Unsigned16	WORD
7499		Oscilloscope data 499 channel 1				Unsigned16	WORD
7500		Oscilloscope data 0 channel 2				Unsigned16	WORD
7501-7998		Oscilloscope data 1-498 channel 2				Unsigned16	WORD
7999		Oscilloscope data 499 channel 2				Unsigned16	WORD
8000		Channel 1 value divider Nuber of right Shifts				Unsigned16	WORD
8001		Channel 2 value divider Nuber of right Shifts				Unsigned16	WORD
8002		Trigger value divider Nuber of right Shifts				Unsigned16	WORD
8003		Ch1 data Modbus address				Unsigned16	WORD
8004		Ch2 data Modbus address				Unsigned16	WORD
8005		Trigger data Modbus address				Unsigned16	WORD
8006		Value for trigger				Unsigned16	WORD
8007		Trigger type Bit 0: 0=Single / 1=Continuous Bit 1: 1=Arm trigger in single mode Bit 2: 1=Immediate start Bit 3: 1=Start if trigger > Bit 4: 1=Start if trigger < Bit 5: 1=Acquisition stop Bit 6: Bit 7:				Unsigned16	WORD
8008		Pretrigger points				Unsigned16	WORD
8009		Times base Number of 250uS temporal quantum				Unsigned16	WORD
8010		Oscilloscope commands B0: Enable oscilloscope B1: B2: B3: B4: B5: B6: B7:				Unsigned16	WORD
8011		Oscilloscope Status B0: Oscilloscope enabled B1: Copy of the bit "Arm trigger in single mode" B2: Trigger armed B3: Acquisition in progress B4: Data buffer ready B5: B6: B7:				Unsigned16	WORD

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
0204	0x20CC	Rstsprg	MIL program status register Bit 0: RUN (Program in RUN if 1) Bit 1: PRG_OK (Program not valid if 0) Bit 2: Bit 3: Bit 4: Bit 5: Bit 6: Bit 7: Bit 8:				Unsigned16	WORD NO MAP RO
0205	0x20CD	Rprgrunmode Run mode User Programmable 0 = Stop 1 = Single step 2 = Run	Run mode User Program 0 = Stop 1 = Single step 2 = Run		0	2	Unsigned16	WORD NO MAP
0206	0x20CE	Rprgstopevent	Stop event status register (value reading) 0: No stop request 1: Stop from manual command 2: Not valid program 3: Program Counter over the end of the program 4: Program Counter over the end of the program memory 5: Not valid instruction 6: Interrupt event manager overflow stack pointer 7: END Instruction 8: Excessive number of subroutines 9: Excessive number of returns from subroutine(corrupted stack) 10: Excessive number of interrupt ONH events (ONH+ONL<10) 11: Excessive number of interrupt ONL events (ONH+ONL<10) 12: Excessive number of returns from interrupt events (corrupted stack)				Unsigned16	WORD RO
0207	0x20CF	Rprgcnt	Program counter User program N.B. it can be written only if user program is in stop.		0	4998	Unsigned16	WORD NO MAP
0208	0x20D0	Rprgccflag	Condition code flag B0: Carry B1: Overflow B2: Zero B3: Negative B4: Interrupt (1 ONH and ONL instruction mask)				Unsigned16	WORD NO MAP
2000		Rprgusrpsw	Password entered for the enabling of the access to the user program memory location. It is not stored in the eeprom. If not equal to the value in the eeprom, the user program memory location is not accessible neither in read nor in write.				Unsigned16	WORD
2001		Rprgcmd	Commands 0x01: Save program in EEPROM 0x02: Load program from EEPROM 0x81: Delete password (delete the whole program) 0x82: Set new password 0x83: Delete program in RAM				Unsigned16	WORD
2002		Rprgcmdsts	Command status Last command output status				Unsigned16	WORD
2003		Rprgnewpsw	New Password				Unsigned16	WORD
2004		Rprgpswact	Password active 0: Program unlocked 1: Program protected by password				Unsigned16	WORD

Modbus Profibus address	CAN EtherCAT Profinet address	Register name	Description	U.M.	Minimum value	Maximum value	Type	Note
2005		Rprgbpena- ble	Enable the software breakpoint management The value is expressed in byte				Unsig- ned16	WORD
2006		Rprgbpnum	Number of the breakpoint to be managed in read/write with Rprgbpval 0= Number of instructions to be executed in single step mode 1= Break point number 1 address 2= Break point number 2 address 3= Break point number 3 address 4= Break point number 4 address				Unsig- ned16	WORD
2007		Rprgbpval	Value read or to be written in the pointed braskpoint.				Unsig- ned16	WORD
2008		Rprglen	Length of the user program				Unsig- ned16	WORD
2009		Rprgprgcks	User program checksum				Unsig- ned16	WORD
2010		Rprgusrprg	User program location 0				Unsig- ned16	WORD
2011- 5008			User program locations nnn				Unsig- ned16	WORD
6999			User program location 4998				Unsig- ned16	WORD

VARIABLES

Variables are 32 bits memory locations, at the disposal of the programmer.

VectorStep drives are provided with a maximum of 128 variables, numbered from 1 to 128.

The transfer of the data is done with the instruction MOVE. Mathematical, comparison, increment and decrement instructions can act on a variable..

V1 : Variable 1 (Signed 32 bit)

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V128 : Variable 128 (Signed 32 bit)

MODBUS protocol only manages 16 bit values. To perform a reading or a writing of the variables, you must transfer 2 MODBUS registers at a time. The calculation of the location of a variable can be made using the following formula:

Number of variable + 4 1001

Example:

To read variable V7, you must access to the following MODBUS locations:

$(7 * 2) + 4 1000 = 4 1014$ (least significant word of the variable, bit 0-15)

$(7 * 2) + 4 1000 + 1 = 4 1015$ (most significant word of the variable, bit 16-31)

N.B.: Verify if the Modbus addresses of the master start from 0 or 1. AEC Modbus addresses start from 0, in case of using a master in which they start from 1 (e.g. Siemens or Weintek) it is necessary to add 1 to the AEC Modbus address.

Example: V1= 1002+1= 1003

AREA MODBUS	ID	Name	Format	Access	Description
4	1002-3	V1	Unsigned32	RW	V1 general purpose program variable
4	1004-5	V2	Unsigned32	RW	V2 general purpose program variable
4	1006-7	V3	Unsigned32	RW	V3 general purpose program variable
4	1008-9	V4	Unsigned32	RW	V4 general purpose program variable
4	1010-11	V5	Unsigned32	RW	V5 general purpose program variable
4	1012-13	V6	Unsigned32	RW	V6 general purpose program variable
4	1014-15	V7	Unsigned32	RW	V7 general purpose program variable
4	1016-17	V8	Unsigned32	RW	V8 general purpose program variable
4	1018-19	V9	Unsigned32	RW	V9 general purpose program variable
4	1020-21	V10	Unsigned32	RW	V10 general purpose program variable
4	1022-23	V11	Unsigned32	RW	V11 general purpose program variable
4	1024-25	V12	Unsigned32	RW	V12 general purpose program variable
4	1026-27	V13	Unsigned32	RW	V13 general purpose program variable
4	1028-29	V14	Unsigned32	RW	V14 general purpose program variable
4	1030-31	V15	Unsigned32	RW	V15 general purpose program variable
4	1032-33	V16	Unsigned32	RW	V16 general purpose program variable
4	1034-35	V17	Unsigned32	RW	V17 general purpose program variable
4	1036-37	V18	Unsigned32	RW	V18 general purpose program variable
4	1038-39	V19	Unsigned32	RW	V19 general purpose program variable
4	1040-41	V20	Unsigned32	RW	V20 general purpose program variable
4	1042-43	V21	Unsigned32	RW	V21 general purpose program variable
4	1044-45	V22	Unsigned32	RW	V22 general purpose program variable
4	1046-47	V23	Unsigned32	RW	V23 general purpose program variable
4	1048-49	V24	Unsigned32	RW	V24 general purpose program variable
4	1050-51	V25	Unsigned32	RW	V25 general purpose program variable
4	1052-53	V26	Unsigned32	RW	V26 general purpose program variable
4	1054-55	V27	Unsigned32	RW	V27 general purpose program variable

AREA MODBUS	ID	Nome	Formato	Accesso	Descrizione
4	1056-57	V28	Unsigned32	RW	V28 general purpose program variable
4	1058-59	V29	Unsigned32	RW	V29 general purpose program variable
4	1060-61	V30	Unsigned32	RW	V30 general purpose program variable
4	1062-63	V31	Unsigned32	RW	V31 general purpose program variable
4	1064-65	V32	Unsigned32	RW	V32 general purpose program variable
4	1066-67	V33	Unsigned32	RW	V33 general purpose program variable
4	1068-69	V34	Unsigned32	RW	V34 general purpose program variable
4	1070-71	V35	Unsigned32	RW	V35 general purpose program variable
4	1072-73	V36	Unsigned32	RW	V36 general purpose program variable
4	1074-75	V37	Unsigned32	RW	V37 general purpose program variable
4	1076-77	V38	Unsigned32	RW	V38 general purpose program variable
4	1078-79	V39	Unsigned32	RW	V39 general purpose program variable
4	1080-81	V40	Unsigned32	RW	V40 general purpose program variable
4	1082-83	V41	Unsigned32	RW	V41 general purpose program variable
4	1084-85	V42	Unsigned32	RW	V42 general purpose program variable
4	1086-87	V43	Unsigned32	RW	V43 general purpose program variable
4	1088-89	V44	Unsigned32	RW	V44 general purpose program variable
4	1090-91	V45	Unsigned32	RW	V45 general purpose program variable
4	1092-93	V46	Unsigned32	RW	V46 general purpose program variable
4	1094-95	V47	Unsigned32	RW	V47 general purpose program variable
4	1096-97	V48	Unsigned32	RW	V48 general purpose program variable
4	1098-99	V49	Unsigned32	RW	V49 general purpose program variable
4	1100-101	V50	Unsigned32	RW	V50 general purpose program variable
4	1102-103	V51	Unsigned32	RW	V51 general purpose program variable
4	1104-105	V52	Unsigned32	RW	V52 general purpose program variable
4	1106-107	V53	Unsigned32	RW	V53 general purpose program variable
4	1108-109	V54	Unsigned32	RW	V54 general purpose program variable
4	1110-111	V55	Unsigned32	RW	V55 general purpose program variable
4	1112-113	V56	Unsigned32	RW	V56 general purpose program variable
4	1114-115	V57	Unsigned32	RW	V57 general purpose program variable
4	1116-117	V58	Unsigned32	RW	V58 general purpose program variable
4	1118-119	V59	Unsigned32	RW	V59 general purpose program variable
4	1120-121	V60	Unsigned32	RW	V60 general purpose program variable
4	1122-123	V61	Unsigned32	RW	V61 general purpose program variable
4	1124-125	V62	Unsigned32	RW	V62 general purpose program variable
4	1126-127	V63	Unsigned32	RW	V63 general purpose program variable
4	1128-129	V64	Unsigned32	RW	V64 general purpose program variable
4	1130-131	V65	Unsigned32	RW	V65 general purpose program variable
4	1132-133	V66	Unsigned32	RW	V66 general purpose program variable
4	1134-135	V67	Unsigned32	RW	V67 general purpose program variable
4	1136-137	V68	Unsigned32	RW	V68 general purpose program variable
4	1138-139	V69	Unsigned32	RW	V69 general purpose program variable
4	1140-141	V70	Unsigned32	RW	V70 general purpose program variable
4	1142-143	V71	Unsigned32	RW	V71 general purpose program variable
4	1144-145	V72	Unsigned32	RW	V72 general purpose program variable
4	1146-147	V73	Unsigned32	RW	V73 general purpose program variable
4	1148-149	V74	Unsigned32	RW	V74 general purpose program variable
4	1150-151	V75	Unsigned32	RW	V75 general purpose program variable
4	1152-153	V76	Unsigned32	RW	V76 general purpose program variable
4	1154-155	V77	Unsigned32	RW	V77 general purpose program variable
4	1156-157	V78	Unsigned32	RW	V78 general purpose program variable
4	1158-159	V79	Unsigned32	RW	V79 general purpose program variable

AREA MODBUS	ID	Nome	Formato	Accesso	Descrizione
4	1160-161	V80	Unsigned32	RW	V80 general purpose program variable
4	1162-163	V81	Unsigned32	RW	V81 general purpose program variable
4	1164-165	V82	Unsigned32	RW	V82 general purpose program variable
4	1166-167	V83	Unsigned32	RW	V83 general purpose program variable
4	1168-169	V84	Unsigned32	RW	V84 general purpose program variable
4	1170-171	V85	Unsigned32	RW	V85 general purpose program variable
4	1172-173	V86	Unsigned32	RW	V86 general purpose program variable
4	1174-175	V87	Unsigned32	RW	V87 general purpose program variable
4	1176-177	V88	Unsigned32	RW	V88 general purpose program variable
4	1178-179	V89	Unsigned32	RW	V89 general purpose program variable
4	1180-181	V90	Unsigned32	RW	V90 general purpose program variable
4	1182-183	V91	Unsigned32	RW	V91 general purpose program variable
4	1184-185	V92	Unsigned32	RW	V92 general purpose program variable
4	1186-187	V93	Unsigned32	RW	V93 general purpose program variable
4	1188-189	V94	Unsigned32	RW	V94 general purpose program variable
4	1190-191	V95	Unsigned32	RW	V95 general purpose program variable
4	1192-193	V96	Unsigned32	RW	V96 general purpose program variable
4	1194-195	V97	Unsigned32	RW	V97 general purpose program variable
4	1196-197	V98	Unsigned32	RW	V98 general purpose program variable
4	1198-199	V99	Unsigned32	RW	V99 general purpose program variable
4	1200-201	V100	Unsigned32	RW	V100 general purpose program variable
4	1202-203	V101	Unsigned32	RW	V101 general purpose program variable
4	1204-205	V102	Unsigned32	RW	V102 general purpose program variable
4	1206-207	V103	Unsigned32	RW	V103 general purpose program variable
4	1208-209	V104	Unsigned32	RW	V104 general purpose program variable
4	1210-211	V105	Unsigned32	RW	V105 general purpose program variable
4	1212-213	V106	Unsigned32	RW	V106 general purpose program variable
4	1214-215	V107	Unsigned32	RW	V107 general purpose program variable
4	1216-217	V108	Unsigned32	RW	V108 general purpose program variable
4	1218-219	V109	Unsigned32	RW	V109 general purpose program variable
4	1220-221	V110	Unsigned32	RW	V110 general purpose program variable
4	1222-223	V111	Unsigned32	RW	V111 general purpose program variable
4	1224-225	V112	Unsigned32	RW	V112 general purpose program variable
4	1226-227	V113	Unsigned32	RW	V113 general purpose program variable
4	1228-229	V114	Unsigned32	RW	V114 general purpose program variable
4	1230-231	V115	Unsigned32	RW	V115 general purpose program variable
4	1232-233	V116	Unsigned32	RW	V116 general purpose program variable
4	1234-235	V117	Unsigned32	RW	V117 general purpose program variable
4	1236-237	V118	Unsigned32	RW	V118 general purpose program variable
4	1238-239	V119	Unsigned32	RW	V119 general purpose program variable
4	1240-241	V120	Unsigned32	RW	V120 general purpose program variable
4	1242-243	V121	Unsigned32	RW	V121 general purpose program variable
4	1244-245	V122	Unsigned32	RW	V122 general purpose program variable
4	1246-247	V123	Unsigned32	RW	V123 general purpose program variable
4	1248-249	V124	Unsigned32	RW	V124 general purpose program variable
4	1250-251	V125	Unsigned32	RW	V125 general purpose program variable
4	1252-253	V126	Unsigned32	RW	V126 general purpose program variable
4	1254-255	V127	Unsigned32	RW	V127 general purpose program variable
4	1256-257	V128	Unsigned32	RW	V128 general purpose program variable

CONNECTIONS

EMC IMMUNITY

To prevent them from being created EMI disturbances caused by cables or devices contained in the same power panel, the drive must be properly connected to protective earth as described in the in the manual.

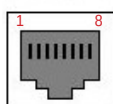
AEC does not guarantee proper EMC behavior unless the PE requirements are fulfilled



The shield of the RJ45 connector is not connected directly to PE. As all nodes in a Profinet network have to share earth connection, the Profinet cable shield has to be connected to the earth at each node in the network.

For further information, see "PROFINET Installation Guideline for Cabling and Assembly, no. 8072" available to download at www.profinet.com

CONNECTOR PINOUT



Pin no	Description
1	TD+
2	TD-
3	RD+
4, 5, 7, 8	Connected to ground over serial RC circuit
6	RD-
Housing	Cable Shield

ALERTS

LED STATUS

In order to simplify the diagnostic of the drive, there are 7 bicolor LEDs that permit to obtain information on the current status of the drive.

LED	Led name	Color	Status	Description
PWR	PWR	GREEN	ON	Drive is powered correctly
			OFF	No voltage or low voltage
		ORANGE	X	Reserved
		RED	X	Reserved
CUR	CUR	X	OFF	Output current to the motor disabled (no current)
		GREEN	ON	Nominal current
		ORANGE	ON	Reduced current
		RED	ON	Current BOOST
STS	STS	GREEN	ON	Drive OK
		ORANGE	ON	Drive in thermal protection
		RED	ON	Drive in alarm, fail or BOOT
			BLINK	No power supply
SER	SER	GREEN	X	Reserved
		ORANGE	ON	Serial port in transmission
		RED	X	Reserved
FLD 1	DATA EXCH.	GREEN	ON	Data Exchange
			BLINK	No Data Exchange
FLD 2	BUS FAIL.	RED	ON	Non initialized stack or Fatal Error
FLD 3	SF	YELLOW	ON	Service mode

FAULT ALERTS

In case an alarm occurs, the drive disables the power output and the motor will stop in non-controlled way.

The presence of errors is indicated from the bit 3 of the Statusword 1 (ZSW1.3), and from the STS LED.

The type of error that occurred is stored in a 8 locations buffer (P947), and the maximum number of errors occurred is stored in the parameter P952.

In case that number of errors is greater then 8, the last occurred error will overwrite the eighth position of the buffer.

How to delete the errors:

1. eliminate the cause of the error;
2. send the error acknowledge by changing to 1 the bit 7 of the Controlword 1 (STW1.7 Toggle);
3. repeat the previous operation until there are errors;
4. at the acknowledge of the last active error, the drive is in the status *Switching On Inhibited*;
5. change to 0 and then newly change to 1 the bit 0 of the Controlword 1 (STW1.0 Toggle), in order to return back to the status *Ready For Switching On*;
6. repeat the previous operation with the bit 1 of the Controlword 1 (STW1.1 Toggle), in order to return back to the status *Switched On*;
7. repeat the previous operation with the bit 2 of the Controlword 1 (STW1.2 Toggle), in order to return back to the status *Operation*;