



# USE AND MAINTENANCE MANUAL

## Series D Valve Island Fieldbus and Series CX4

### CANopen



Made in Italy


The products are in compliance with the requirements stated in the following directives:

- 2004/108/EC

The products comply either fully, or for the applicable parts, with the following standards:

- IEC EN 61131-2

The EC Compliance Declarations can be downloaded from [www.camozzi.it](http://www.camozzi.it)

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		Version 16

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## 1 General recommendations

Please comply with the recommendations for safe use described in this document:

- Some hazards can only be associated with the product after it has been installed on the machine/equipment. It is the responsibility of the end user to identify these hazards and reduce the risks associated with them.
- For information regarding the reliability of the components, contact Camozzi Automation.
- Read the information in this document carefully before using the product.
- Keep this document in a safe place and close at hand for the whole of the product's life cycle.
- Pass this document on to any subsequent owner or user.
- The instructions in this manual must be observed in conjunction with the instructions and additional information concerning the product in this manual, available from the following reference links:
  - Website <http://www.camozzi.com>
  - Camozzi general catalogue
  - Technical assistance service
- Assembly and commissioning must be performed exclusively by qualified and authorised personnel on the basis of these instructions.
- It is the responsibility of the system/machine designer to ensure the correct selection of the most suitable pneumatic component according to the intended application.
- Use of appropriate personal protective equipment is recommended to minimise the risk of physical injury.
- For all situations not contemplated in this manual and in situations in which there is the risk of potential damage to property, or injury to persons or animals, contact Camozzi for advice.
- Do not make unauthorised modifications to the product. In this case, any damage or injury to property, persons or animals will be the responsibility of the user.
- It is recommended to comply with all safety regulations that apply to the product.
- Never intervene on the machine/system until you have verified that all working conditions are safe.
- Before installation or maintenance, ensure that the required safety locks are active, and then disconnect the electrical mains (if necessary) and system pressure supply, discharging all residual compressed air from the circuit and deactivating residual energy stored in springs, condensers, recipients and gravity.
- After installation or maintenance, the system pressure and electrical power supply (if necessary) must be reconnected, and the regular operation and sealing of the product must be checked. In the event of leaks or malfunction, the product must not be used.
- The product may only be used in observance of the specifications provided; if these requirements are not met, the product may only be used upon authorisation by Camozzi.
- Avoid covering the equipment with paint or other substances that may reduce heat dissipation.

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## 1.1 Product storage and transport

- Adopt all measures possible to avoid accidental damage to the product during transport, and when available use the original packaging.
- Observe the specified storage temperature range of  $-10 \div 50$  °C.

## 1.2 Use

- Make sure that the distribution network voltage and all operating conditions are within the permissible values.
- The product may only be used in observance of the specifications provided; if these requirements are not met, the product may only be used upon authorisation by Camozzi.
- Follow the indications shown on the identification plate.

## 1.3 Limitations of use

- Do not exceed the technical specifications given in paragraph **Errore. L'origine riferimento non è stata trovata.** (General characteristics and conditions of use) and in the Camozzi general catalogue.
- Do not install the product in environments where the air itself may cause hazards.
- With the exception of specific intended uses, do not use the product in environments where direct contact with corrosive gases, chemicals, salt water, water or steam may occur.

## 1.4 Maintenance

- Incorrectly performed maintenance operations can compromise the good working order of the product and harm surrounding persons.
- Check conditions to prevent sudden release of parts, then suspend the power supply and allow residual stresses to discharge before taking action.
- Assess the possibility of having the product serviced by a technical service centre.
- Never disassemble a live unit.
- Isolate the product electrically before maintenance.
- Always remove accessories before maintenance.
- Always wear the correct personal protective equipment as envisaged by local authorities and in compliance with current legislation.
- In the event of maintenance, or replacement of worn parts, exclusively use the original Camozzi kits and ensure that operations are performed by specialised and authorised personnel. Otherwise, product approval will be rendered invalid.

## 1.5 Ecological Information

- At the end of the product's life cycle, it is recommended to separate the materials for recycling.
- Follow the waste disposal regulations in force in your country.
- The product and relative parts all comply with the ROHS and REACH standards.




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## 2 General characteristics and conditions of use

PNEUMATIC SECTION					
Versions		D1	D2	D4	D5
Valve construction		Spool with seals			
Valve functions		5/2 monostable and bistable 2x3/2 NC 2x3/2 NO 5/3 CC - CP - CO 1X3/2 NC+1X3/2 NO			
Materials	Body	Aluminium			
	Spool	Aluminium			
	Sub-base	Technopolymer	Technopolymer	Aluminium	Technopolymer
	End cover	Technopolymer			
	Seal	HNBR			
Connections		Uses 2 and 4 Thread (only D4) or bushings, tube size variable according to the pitch			
Temperature		0 ÷ 50 °C			
Air feature		Compressed air filtered and not lubricated in class 7.4.4 according to ISO 8573-1: 2010. If lubrication is required, use only oils with max. viscosity. 32 Cst and the version with external servo drive. The servo drive air quality must be in class 7.4.4 according to ISO 8573-1: 2010 (do not lubricate).			
Valve pitch		10.5 mm	16 mm	25 mm	10.5 e 16 mm
Working pressure		-0.9 ÷ 10 bar			
Drive pressure		2.5 ÷ 7 bar 4.5 ÷ 7 bar (with working pressure higher than 6 bar for the 2x3/2 version)			
Flow rate		250 NL/min (10.5 mm)	950 NL/min (16 mm)	2000 NL/min (25 mm)	250 NL/min (10.5 mm) / 950 NL/min (16 mm)
Assembly position		Any			
Degree of protection		IP65			

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ELECTRICAL SECTION	
Power and bus connection type	M12 – 5 poli
Supply voltage Logic	24 V DC +/-25%
Supply voltage Power	24 V DC +/-10%
Valve maximum absorption	2.5 A
Maximum no. valve positions	64 (128 coils)
Coil power	1W (reduction to 0.5W after 100ms)
Maximum cable length	20 m
Protocol	CANopen 

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### 3 General description of the system

The CX4 CANopen module is a device for driving valves and/or managing digital and/or analogue I/O by connecting it to a CANopen network. The CX4 consists of power connectors, input and output connectors for the CANopen field bus and LEDs for system diagnostics. It is possible to connect the Series D coil valves on the right side of the CX4, while on the left side it is possible to connect the digital and analogue I/O modules.

#### Nomenclature

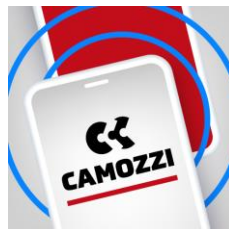
*The CX4 module can be used by just connecting the input and output modules; in this case the device will take the name of **Series CX4 Stand Alone** module. If coil valves (with or without I/O modules) are connected to the CX4 on the pneumatic side, the device becomes a valve island and is called **Series D Valve Island Fieldbus**.*

The CX4 module, both in Series CXA and Series D valve island fieldbus configurations, is a solution dedicated to Industry 4.0 because it is a SMART device capable of connecting to other devices or networks (ex. WiFi, USB, NFC) for information exchange. The system can transmit data of the main variables, the diagnostics of all the components of which the island is made. In addition, the system can configure the island and each connected module. The smart interfaces with the system are:

- Camozzi UVIX (Universal visual interface), a software that can be installed on a PC/server/gateway used by USB or included in a company network and accessible from other PCs (ch. **Errore. L'origine riferimento non è stata trovata.**).



- NFCamApp (NFC Camozzi Application), smartphone application for Android and iOS (ch. **Errore. L'origine riferimento non è stata trovata.**).



**NOTE.** In addition, in the Series D Serial valve island configuration, the system has **COILVISION** technology which monitors the correct operation of the coil valve. Each actuation of the coil, in different cyclic configurations and environmental conditions, is analysed to acquire information which, when processed by software algorithms, allows the health of the component to be diagnosed and predicted (par. 8.1.2).

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## 4 Recipients

The manual is intended exclusively for qualified experts in control and automation technologies who have experience in the installation, commissioning, programming and diagnostics of programmable logic controllers (PLCs) and fieldbus systems.

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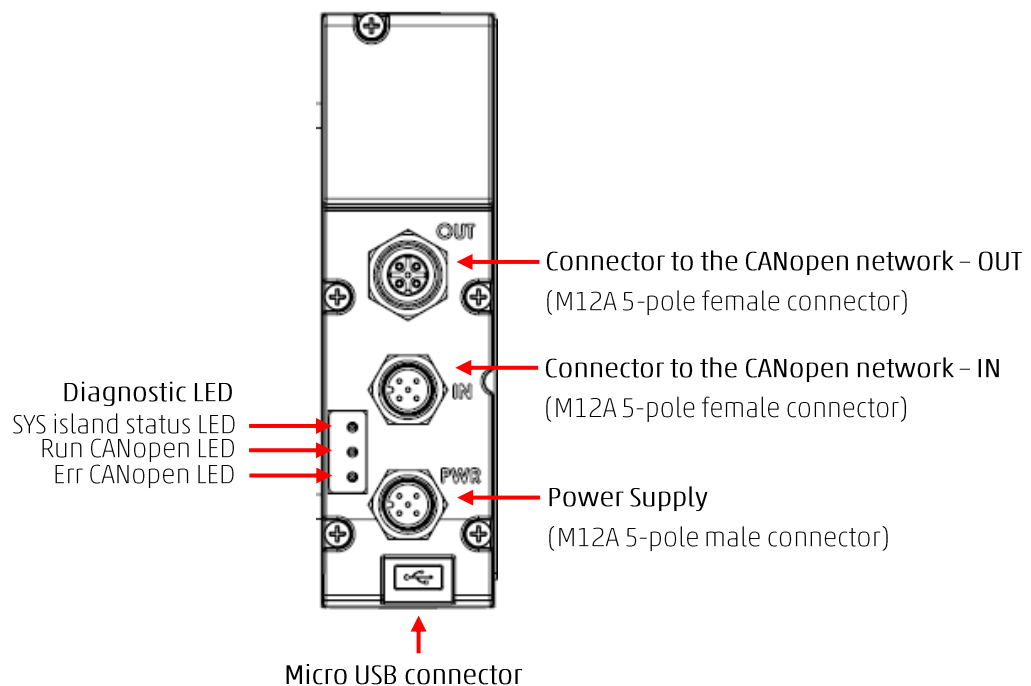
## 5 Installation

### 5.1 General installation instructions

For reasons of operator safety and to prevent functional damage to the system, before starting any installation or maintenance operation, disconnect:

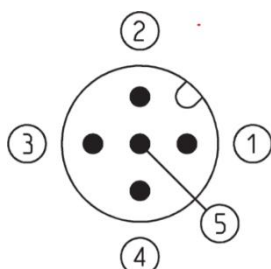
- The air supply.
- The power supply of the control electronics and outputs/coil valves.

### 5.2 Connecting and warning components



#### 5.2.1 Power Supply Connector

The Power Supply connector is a 5-pole M12A male.

Pin	Signal	Description	Symbol
1	L24V	24 Vdc power supply (logic, digital inputs, analogue I/O): connect to the positive pole of the 24 Vdc power supply (referred to GND).	
2	P24V	24 Vdc power supply (digital outputs and valves): connect to the positive pole of the 24 Vdc power supply (referred to GND).	
3	GND	Common (reference pin 1 and 2): connect to the negative pole of the 24Vdc power supply (compulsory).	
4	EARTH	Earth connection	
5	NC	Not Connected	

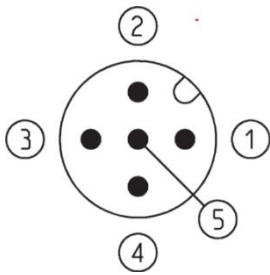
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**NOTE.** To connect the system to the mains it is recommended to use the connectors from the Camozzi catalogue:

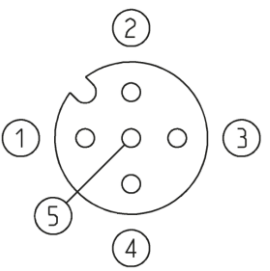
- CS-LF04HB, straight connector for power supply.

### 5.2.2 Connector to the CANopen network

The connectors for the CANopen network IN are M12A 5-pole male.

Pin	Signal	Description	Symbol
1	EARTH	Earth connection	
2	CAN_V+	Not Connected	
3	GND	Common reference for CAN bus	
4	CAN_H	CAN-H bus line	
5	CAN_L	CAN-L bus line	

The connectors for the CANopen network OUT are M12A 5-pole female.

Pin	Signal	Description	Symbol
1	EARTH	Earth connection	
2	CAN_V+	Not Connected	
3	GND	Common reference for CAN bus	
4	CAN_H	CAN-H bus line	
5	CAN_L	CAN-L bus line	

**NOTE.** To avoid malfunctions due to faulty wiring, it is recommended to connect the system to the CANopen network using the pre-wired cables from the Camozzi catalogue:

- CS-LF05HC, straight female M12 connector for Bus-IN.
- CS-LM05HC, straight female M12 connector for Bus-OUT.
- CS-LP05H0, male M12 termination resistor.

### 5.2.3 USB Connector

The USB communication connector is a standard micro version. The connector allows the CX4 to be connected to the UVIX interface for monitoring or configuration.

**NOTE.** The dedicated USB connector can be found in the Camozzi catalogue:

- G11W-G12W-2, standard cable with micro-USB connector length 2m.

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### 5.3 Power supply

The power supply is separated into *logic* (L24V), which allows the communication buses, the sub-bases of the pneumatic part and the I/O modules to be powered, and into *power* (P24V), which powers the valves and digital outputs. Therefore, for the system to work, it is essential to connect the *logic* power supply, otherwise the CX4 remains off. The two separate power supplies make it possible, if necessary, to disconnect the power supply to the valves while the bus power line remains active. The lack of *power* supply is signalled by the flashing red SYS island status LED. This problem is also signalled through a message via the network to provide for proper alarm management.

If the loads or inputs connected to the initial node require tighter tolerances of the supply voltage value, the node power supply voltage must respect these.

**NOTE.** The nominal power supply voltage of the CPU module is 24 Vdc  $\pm$  10%.

#### 5.3.1 Voltage drop in the valve island (rules for activating the coils)

In normal standard operation, the coil valves are activated, for 100 ms, with a power of 1 W (@ 24 V the absorbed current is therefore 41.6 mA). Subsequently, the coil valves are kept activated by reducing the absorbed power to 50% of the initial value, by means of a PWM control technique.

The permitted power supply voltage for the series D valve island is 24 Vdc  $\pm$  10%, therefore the useful range is 21.6 Vdc ÷ 26.4 Vdc. The currents absorbed by the coil valve coils corresponding to the power supply range are 39 mA ÷ 48 mA (in typical conditions) in the first 100 ms of activation and subsequently 19.5 mA ÷ 24 mA in the power reduction phase due to the use of PWM.

The continuous operation of the valve island is guaranteed for a maximum absorption of 2.5 A.

In the worst conditions (maximum current absorption for 26.4 Vdc power supply) it is possible to activate up to 50 coils simultaneously with all the valves of the island off. Subsequently, it is possible to proceed by using the following formula:

$$\text{No. of coils to be controlled simultaneously} = 50 - (0.6 \times \text{No. active coils})$$

#### Example

- If 10 coils are already active, 44 coils can be activated simultaneously.
- If 20 coils are already active, 38 coils can be activated simultaneously.

**NOTE.** The maximum number of simultaneously active coils is 80. Each subsequent activation with respect to the previous group of coils must happen after 150 ms.

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## 5.4 Connectable accessories

Series D pneumatic coil valves or I/O modules can be connected to the CX4 module.

Here is the complete list of devices that can be connected to the CX4, with the respective references to the technical details in the manual.

- Series D sub-bases and coil valves in three different sizes (par. 8.1)
- 8- or 16-channel digital input modules (par. 8.2).
- 8- or 16-channel digital output modules (par. Errore. L'origine riferimento non è stata trovata.).
- Analog input modules (par. Errore. L'origine riferimento non è stata trovata.):
  - RTD modules (par. 8.4.4).
  - Thermocouple modules (par. 8.4.5).
  - Bridge modules (par. 8.4.6).
  - Voltage/Current modules (par. 8.4.7).
- Analog output modules (par. 8.5).



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## 5.5 Assembly

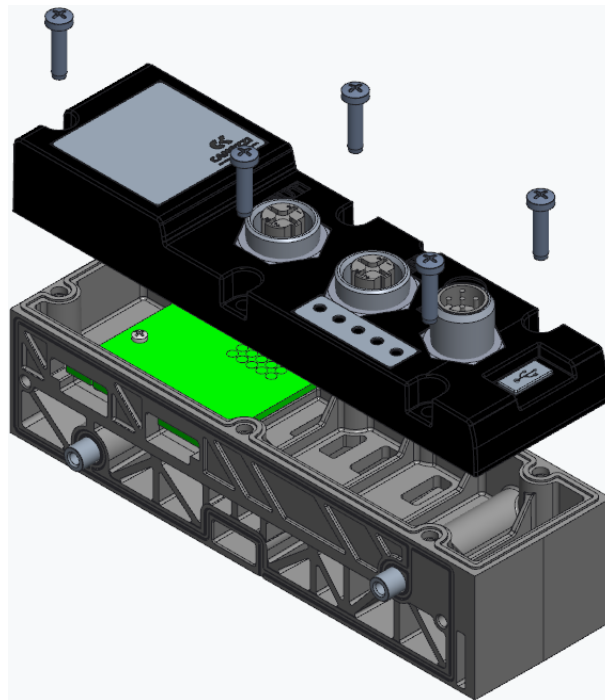
### 5.5.1 Dismantling and fitting CX4 module

Dismantle the CX4 module as follows:

1. Switch off the power supply of the CX4 module to avoid problems for the device or user.
2. Loosen the 5 screws.
3. Pull the cover of the CX4 module carefully and without tilting from the manifold base.

Fit the CX4 module as follows:

1. Switch off the operating voltage supply of the CX4 module to avoid problems for the device or user.
2. Make sure that the gaskets are tight and not damaged.
3. Push the cover of the CX4 module carefully and without tilting as far as possible into the manifold base.
4. Tighten the 5 screws (Torque max 0.6 Nm).



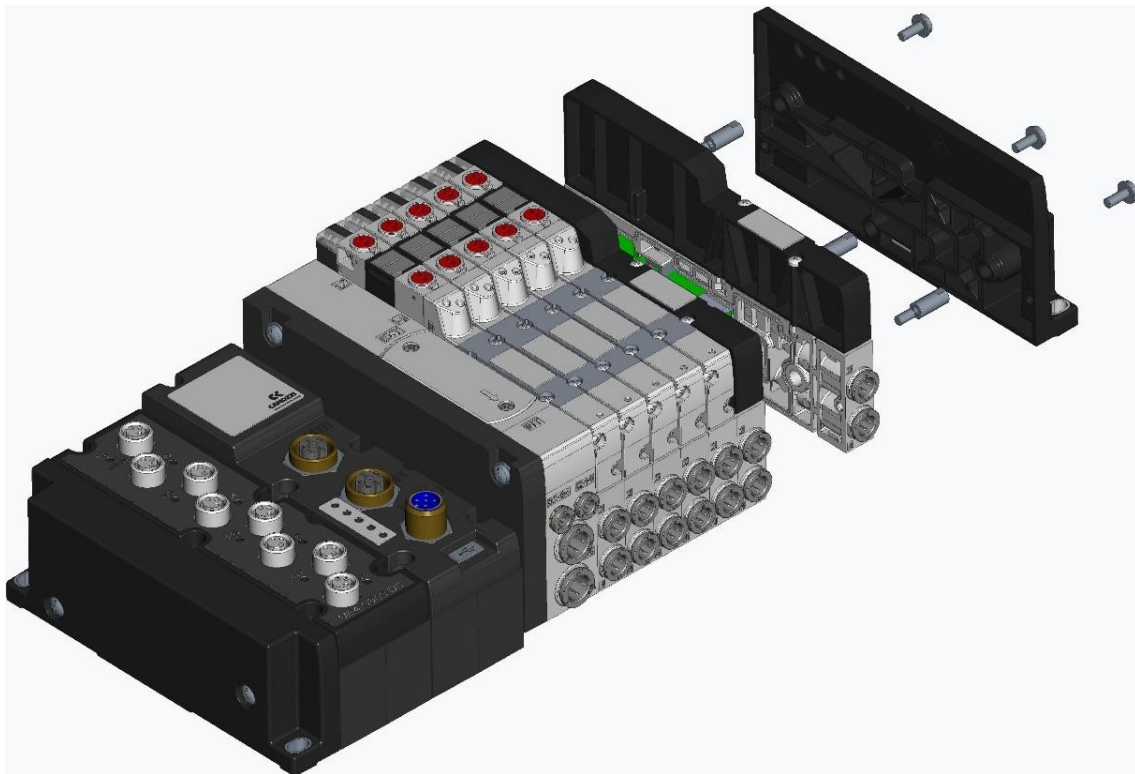
**NOTE.** After an island modification, the mapping procedure is required (par. 6.3).

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### 5.5.2 Series D subbases assembly

Dismantle and fit the Series D subbases as follows:

1. Switch off the power supply of the CX4 module to avoid problems for the device or user.
2. Unscrew the 3 screws to the cover at the end of the island and open the valves subbases pack.
3. Remove the valves subbases from the tie-rods and replace with the new modules.
4. Push the valves subbases as far as possible to allow a correct electrical contact.
5. Mount the cover at the end of the island and tighten the 3 screws (Torque max 0.9 Nm)



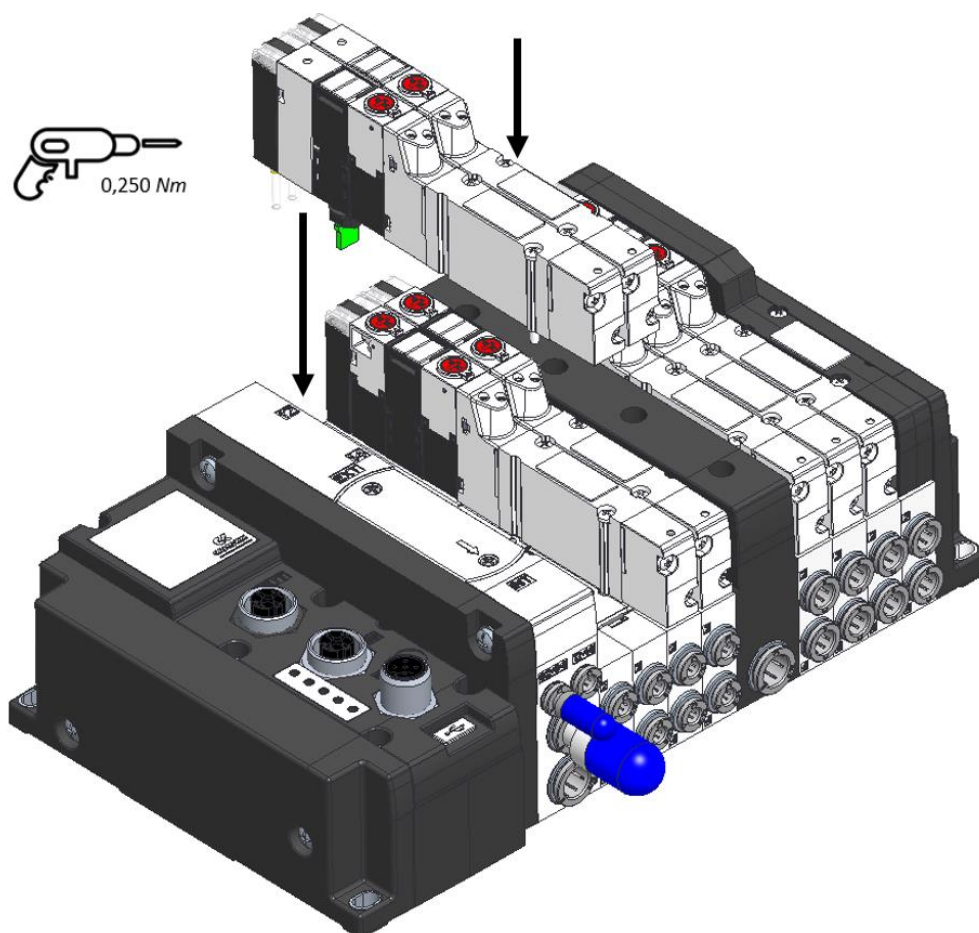
\* Example for Series D1 Valve Island.

**NOTE.** The mapping procedure must be carried out in all those cases in which the I/O modules are added, removed, or moved (par. 6.3).

### 5.5.3 Dismantling and fitting Serie D coil valves

Dismantle and fit the Serie D coil valves on the same size sub-bases as follows:

1. Unscrew the 2 screws above the Serie D coil valves.
2. Pull the valves carefully and without tilting from the sub-base to avoid damages.
3. Add the new valves carefully and without tilting to the sub-base to avoid damages.
4. Tighten the 2 screws (Torque max 0.25 Nm (D1/D5), 0.5 Nm (D2), 2.0 Nm (D4)).
5. Reset the sub-base information from UVIX interface or controller/PLC.



\* Example for Series D1 Valve Island.

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#### 5.5.4 I/O modules assembly

Dismantle and fit the I/O modules as follows:

1. Switch off the power supply of the CX4 module to avoid problems for the device or user.
2. Unscrew the 2 screws to the cover at the end of the island and open the I/O pack.
3. Remove the I/O modules from the tie-rods and replace with the new modules.
4. Push the I/O modules as far as possible to allow a correct electrical contact.
5. Mount the cover at the end of the island and tighten the 2 screws (Torque max 0.9 Nm)



\* Example for Series D1 Valve Island.

**NOTE.** The mapping procedure must be carried out in all those cases in which the I/O modules are added, removed, or moved (par. 6.3).

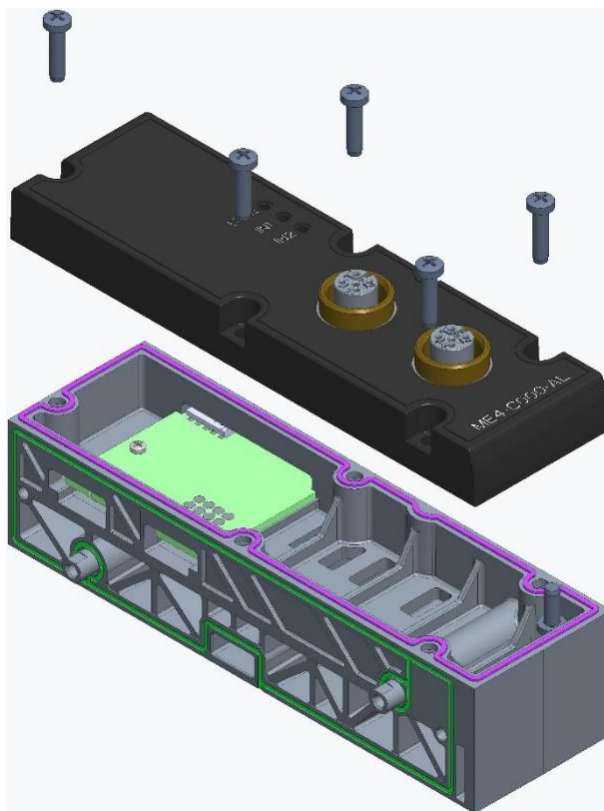
### 5.5.1 Dismantling and fitting I/O modules

Dismantle the cover of the I/O module as follows:

1. Switch off the power supply of the CX4 module to avoid problems for the device or user.
2. Loosen the 5 screws.
3. Pull the cover of the I/O module carefully and without tilting from the manifold base.

Fit the cover of the I/O module as follows:

1. Switch off the operating voltage supply of the CX4 module to avoid problems for the device or user.
2. Make sure that the gaskets are tight and not damaged.
3. Push the cover of the I/O module carefully and without tilting as far as possible into the manifold base.
4. Tighten the 5 screws (Torque max 0.6 Nm).



**NOTE.** After an island modification, the mapping procedure is required (par. 6.3).

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## 6 Commissioning

### 6.1 Electrical connections

The following steps are recommended for the correct electrical connection of the system:

- Connect the IN connector to the CANopen network coming from the controller (or PLC).
- Connect the OUT connector to the next device in the CANopen network. If this connector is not used, close with the appropriate cap to ensure IP65 protection.
- Connect the power supply connector.

**NOTE.** The dedicated caps for IP65 protection of our connectors (for digital and analogue input/output modules and subnet) can be found in the Camozzi catalogue:

- CS-DFTP, M8 connector cover cap.
- CS-LFTP, M12 connector cover cap.

### 6.2 Start-up operation

The CX4 module performs a system-wide configuration check at start-up. This is called *mapping*. Specifically, the system configuration is determined by the type and position of the coil valve sub-bases and connected I/O modules. The system mapping is saved in the CX4 module's internal memory. If the mapping has never been stored or the configuration of the system has been modified, a new mapping request must be made (see par. 6.3). During the mapping operation, the general diagnostic LEDs of each connected accessory device light up in sequence, first on the coil valve side and then on the I/O module side.

- If the mapping finishes successfully, the CX4 moves on to the next stage. Furthermore, the diagnostic LEDs of each recognized module are switched off.
- If the mapping is not completed correctly, a diagnostic alarm will be triggered (see par. 7.1.2) and the CX4 module will not proceed with any other operations.

The second step at system start-up is the configuration of parameters. The CX4 will wait for a maximum of 1 minute for any parameters from the controller/PLC, otherwise the parameters saved in internal memory or the default parameters will be loaded. While waiting for the configuration parameters, the LEDs of the I/O modules flash until this operation is complete (The type of flashing is defined for each individual accessory module in chapter 0).

At the end of this second start-up phase, the system, managed by the CX4 module, switches into normal operation mode and is ready to perform the required operations.

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### 6.3 Mapping procedure

The CX4 module, in CX4 Series serial module or Series D serial valve island configuration, is extremely flexible and its configuration can be modified by removing, replacing or changing the positions of the coil valve sub-bases and/or I/O modules. Each time a change is made, the mapping procedure must be carried again out to correctly configure the entire system. The CX4 module must be aware of the composition of the entire island: number, type and location of coil valve sub-bases and I/O modules.

The mapping operation can be performed with the use of software, by sending a request for new mapping, without having to physically work with the island. A new mapping can be requested in the following ways:

- Camozzi UVIX as Gateway-USB (par. 9.7.3).
- NFCamApp, smartphone app (par. Errore. L'origine riferimento non è stata trovata.).

**NOTE.** Once the mapping request has been made, the CX4 module must be restarted.

### 6.4 Automatic mapping procedure for PDOs

The CX4 island can execute an automatic mapping procedure for the PDOs, to make the mapped object coherent with the effective modules mapped into the island. The object that executes the automatic mapping in the 2023h (automatic mapping procedure, on the transition of the object from 0 to 1).

The PDOs are mapped as following (conformed to the Cia401 standard):

- TPDO:
  - TPDO1: the input modules are mapped following the order as they are placed into the island (independently if the modules are 8 bit, index 6000h, or 16 bit, index 6100h) until there are available byte in the PDO.
  - TPDO2: the first two 16bit analogue input modules are mapped (6401h).
  - TPDO3: the third and the fourth 16bit analogue input modules are mapped (6401h).
  - TPDO4: the fifth and the sixth 16bit analogue input modules are mapped (6401h).
  - TPDOx: since the non-standard COB-ID, these TPDOs are not compiled. They can be changed manually.
- RPDO:
  - RPDO1: the valves are mapped (oggetto 2200h). Then, the digital output modules (independently if modules are 8 bit, index 6200h, or 16 bit, index 6300h) following the order as they are placed into the island) until there are available byte in the PDO.
  - RPDO2: the first two 16bit analogue output modules are mapped (6411h).
  - RPDO3: the third and the fourth 16bit analogue output modules are mapped (6411h).
  - RPDO4: the fifth and the sixth 16bit analogue output modules are mapped (6411h)
  - RPDOx: since the non-standard COB-ID, these TPDOs are not compiled. They can be changed manually.



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Once the PDOs are correctly mapped, the relative COB-ID is automatically enabled.

The object 2003h is not saved into the flash memory, it must be sent at every start of the island.

Mapping example:

- Island composition: 15 valves, modules: DO8, DI8, DI16, DO16, DI8, AI8, AI16, AI16, AO16, AO16:
  - o TPDO1 (object 1A00h):
    - Sub0: 3;
    - Sub1: 6000h sub1;
    - Sub2: 6100h sub1;
    - Sub3: 6000h sub2.
  - o TPDO2 (object 1A01h):
    - Sub0: 4;
    - Sub1: 6401h sub1;
    - Sub2: 6401h sub2;
    - Sub3: 6401h sub3;
    - Sub4: 6401h sub4.
  - o RPDO1 (object 1600h):
    - Sub0: 4;
    - Sub1: 2200h sub1;
    - Sub2: 2200h sub2;
    - Sub3: 6200h sub1;
    - Sub4: 6300h sub1.
  - o RPDO2 (object 1601h):
    - Sub0: 4;
    - Sub1: 6411h sub1;
    - Sub2: 6411h sub2;
    - Sub3: 6411h sub3;
    - Sub4: 6411h sub4.

## 6.5 Addressing and communication speed

The CX4 CANopen module must have a unique address in order to be correctly identified on the network and the communication speed (*baud rate*) must be set.

To change the default information, you can use the UVIX interface for remote control or the LSS protocol, as specified by CiA. There are several ways to edit the default information:

- Camozzi UVIX as Gateway-USB (par. [Errore. L'origine riferimento non è stata trovata.](#))
- NFCamApp, smartphone app (par. [Errore. L'origine riferimento non è stata trovata.](#)).

In case of using the LSS protocol, the object that must be considered is "Identity object" (1018h) of the object dictionary. It is composed by four fields:



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- Vendor ID: equal to 0x97 for all CX4 CANopen device.
- Product code: equal to 0x5B for all CX4 CANopen device.
- Revision number: equal to 0x04 for all CX4 CANopen device.
- Serial number: whose number can be found on the device label.

The messages to configure the device via LSS protocol are:

Identifier	Payload (hex)	Description
0x7E5	04 01 00 00 00 00 00 00	Set all the devices into the LSS configuration mode. No replay to this message.
0x7E5	40 VI 00 00 00 00 00 00	VI stands for "Vendor ID". For Camozzi devices is 0x97.
0x7E5	41 PC 00 00 00 00 00 00	PC stands for "Product Code". For CX4CO devices is 0x5B.
0x7E5	42 RN 00 00 00 00 00 00	RN stands for "Revision Number". For CX4CO devices is 0x04.
0x7E5	43 SN 00 00 00 00 00 00	SN stands for "Serial Number". Look at the label of the device.
0x7E5	11 NN 00 00 00 00 00 00	NN stands for "Node Number". Configure node ID.
0x7E5	13 00 NB 00 00 00 00 00	NB stands for "New Baudrate". Configure bit timing.
0x7E5	17 00 00 00 00 00 00 00	Store command.

In case of using the application, once it is scanned the NFC tag of the device, it is possible to select the "Fieldbus" section, where it is possible to modify the communication parameters of the CAN bus via the button "Write fieldbus".

In the event of failure to establish communication between the valve island and the controller, the problem is indicated by the bus diagnostic LED.

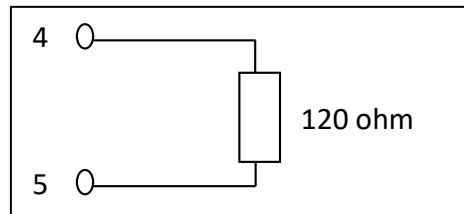
To connect the CX4 module to the CANopen bus, use a twisted and shielded four-core cable. The maximum length of the CANopen line depends on the baud rate (transmission speed), used as indicated in the following table.

Baud rate [Kbits/s]	Maximum segment length [m]
20	2500
50	1000
125	500
250	250
500	100
800	50
1000	25

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If the CPU module is the last node of the CANopen line, you must assemble the bus termination: for the CPU module, you need a CS-LP05H0 connector, which already contains the necessary resistors, and which must be assembled on the BUS OUT connector.

The diagram below shows the connection the resistors that make up the termination, the numbers refer to the pins of the BUS OUT connector.



## 6.6 Configuration via EDS file

To configure the CX4 in a CANopen network, the EDS file must be imported to the programming software used for the controller. The configuration file describes the characteristics of the CANopen valve island and allows the Inputs/Outputs to be configured correctly.

The EDS file can be found on the Camozzi website at:

<http://catalogue.camozzi.com/Downloads>

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## 6.7 Address assignment

The volume of addresses of the Series D valve island in the CANopen network is limited as shown in the table.

Modules	Number of channels	Bytes per single module	Number of modules that can be connected	Assigned address volume	Maximum number of I/Os
Valve sub-bases	2	2 bit per valve	64	16 bytes	128 coils
8-channel digital input modules	8	1 byte	16	16 bytes	128 digital inputs
16-channel digital input modules	16	2 bytes	8	16 bytes	128 digital inputs
8-channel digital output modules	8	1 byte	16	16 bytes	128 digital outputs
16-channel digital output modules	16	2 bytes	8	16 bytes	128 digital outputs
Analogue input modules for RTD	2	4 bytes	8	32 bytes	16 analogue inputs for RTD
Analogue input modules for Thermocouples	2	4 bytes	8	32 bytes	16 analogue inputs for Thermocouples
Analogue input modules for BRIDGE	2	8 bytes	4	32 bytes	8 analogue inputs for BRIDGE
Analogue input modules for Voltage/Current	2	4 bytes	8	32 bytes	16 Analogue inputs for Voltage/Current
Analogue output modules for Voltage/Current	2	4 bytes	8	32 bytes	16 Analogue outputs for Voltage/Current

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## 6.8 Object dictionary

The objects are defined by the CiA 301 profile, the CiA 401 profile and the manufacturer's specifications.

### 6.8.1 CiA 301 objects

ID	Sub	Description	Type	Access	PDO Mapping	Default value
1000h	0	Device Type	U32	RO		0xFF7F0191
1001h	0	Error register	U8	RO	X	0x0
1002h	0	Manufacturer status register	U32	RO	X	0x0
1003h		Pre-defined error list				
	0	Number of error	U32	RW		0x0
	1	Standard error field	U32	RO		0x0
	2	Standard error field	U32	RO		0x0
	3	Standard error field	U32	RO		0x0
	4	Standard error field	U32	RO		0x0
	5	Standard error field	U32	RO		0x0
	6	Standard error field	U32	RO		0x0
	7	Standard error field	U32	RO		0x0
	8	Standard error field	U32	RO		0x0
1005h	0	COB_ID sync	U32	RW		0x80
1006h	0	Communication Cycle Period	U32	RW		0x0
1007h	0	Synchronous Window Length	U32	RW		0x0
1008h	0	Manufacturer device name	STR	CONST		CX4MCO
1009h	0	Manufacturer hardware version	STR	CONST		0x1
100Ah	0	Manufacturer software version	STR	CONST		0x0
100Ch	0	Guard time	U16	RW		0x0
100Dh	0	Life time factor	U16	RW		0x0
1010h		Store parameter field				
	0	Highest sub-index supported	U32	RO		0x1
	1	Save all parameters	U32	RW		0x0
1011h		Restore default parameters				
	0	Highest sub-index supported	U32	RO		0x1
	3	Restore application parameters	U32	RW		0x0
1012h	0	COB-ID time stamp	U32	RW		0x80000100
1014h	0	COB_ID emcy	U32	RO		0x80
1015h	0	Inhibit time emergency	U16	RW		0x0
1017h	0	Producer heartbeat time	U16	RW		0x0
1018h		Identity object				
	0	Number of entries	U8	RO		0x4

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ID	Sub	Description	Type	Access	PDO Mapping	Default value
	1	Vendor id	U32	RO		0x97
	2	Product code	U32	RO		0x5B
	3	Revision number	U32	RO		0x4
	4	Serial number	U32	RO		0x0
1019h	0	Synchronous counter overflow value	U8	RW		0x0
1020h		Verify configuration				
	0	Highest sub-index supported	U32	RO		0x2
	1	Configuration date	U32	RW		0x0
	2	Configuration Time	U32	RW		0x0
1029h		Error behaviour				
	0	Highest sub-index supported	U8	RO		0x1
	1	Communication error	U8	RW		0x0
1200h		Server SDO parameter				
	0	Highest sub-index supported	U8	RO		0x2
	1	COIB-ID client->server	U32	RO		0x600
	2	COIB-ID server->client	U32	RO		0x580
1400h		Rx PDO communication parameter 1				
	0	Highest sub-index supported	U8	RO		0x2
	1	COB-ID	U32	RW		0x200
	2	Transmission type	U8	RW		0xFF
1401h		Rx PDO communication parameter 2				
	0	Highest sub-index supported	U8	RO		0x2
	1	COB-ID	U32	RW		0x80000300
	2	Transmission type	U8	RW		0xFF
1402h		Rx PDO communication parameter 3				
	0	Highest sub-index supported	U8	RO		0x2
	1	COB-ID	U32	RW		0x80000400
	2	Transmission type	U8	RW		0xFF
1403h		Rx PDO communication parameter 4				
	0	Highest sub-index supported	U8	RO		0x2
	1	COB-ID	U32	RW		0x80000500
	2	Transmission type	U8	RW		0xFF
1404h		Rx PDO communication parameter 5				
	0	Highest sub-index supported	U8	RO		0x2
	1	COB-ID	U32	RW		0x80000000
	2	Transmission type	U8	RW		0xFF
1405h		Rx PDO communication parameter 6				

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ID	Sub	Description	Type	Access	PDO Mapping	Default value
	0	Highest sub-index supported	U8	RO		0x2
	1	COB-ID	U32	RW		0x80000000
	2	Transmission type	U8	RW		0xFF
1406h		Rx PDO communication parameter 7				
	0	Highest sub-index supported	U8	RO		0x2
	1	COB-ID	U32	RW		0x80000000
	2	Transmission type	U8	RW		0xFF
1407h		Rx PDO communication parameter 8				
	0	Highest sub-index supported	U8	RO		0x2
	1	COB-ID	U32	RW		0x80000000
	2	Transmission type	U8	RW		0xFF
1600h		Rx PDO mapping parameter 1				
	0	Number of mapped objects	U8	RW		0x3
	1	Mapping entry 1	U32	RW		0x22000108
	2	Mapping entry 2	U32	RW		0x22000208
	3	Mapping entry 3	U32	RW		0x22000308
	4	Mapping entry 4	U32	RW		0x0
	5..8	Mapping entry X	U32	RW		0x0
1601h		Rx PDO mapping parameter 2				
	0	Number of mapped objects	U8	RW		0x0
	1..8	Mapping entry X	U32	RW		0x0
1602h		Rx PDO mapping parameter 3				
	0	Number of mapped objects	U8	RW		0x0
	1..8	Mapping entry X	U32	RW		0x0
1603h		Rx PDO mapping parameter 4				
	0	Number of mapped objects	U8	RW		0x0
	1..8	Mapping entry X	U32	RW		0x0
1604h		Rx PDO mapping parameter 5				
	0	Number of mapped objects	U8	RW		0x0
	1..8	Mapping entry X	U32	RW		0x0
1605h		Rx PDO mapping parameter 6				
	0	Number of mapped objects	U8	RW		0x0
	1..8	Mapping entry X	U32	RW		0x0
1606h		Rx PDO mapping parameter 7				
	0	Number of mapped objects	U8	RW		0x0
	1..8	Mapping entry X	U32	RW		0x0
1607h		Rx PDO mapping parameter 8				

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ID	Sub	Description	Type	Access	PDO Mapping	Default value
	0	Number of mapped objects	U8	RW		0x0
	1..8	Mapping entry X	U32	RW		0x0
1800h		Tx PDO communication parameter 1				
	0	Sub-index supported	U8	RO		0x5
	1	COIB-ID	U32	RW		0x180
	2	Transmission type	U8	RW		0xFE
	3	Inhibit time	U16	RW		0x0
	4	Compatibility entry	U8	RW		0x0
	5	Event timer	U16	RW		0x64
1801h		Tx PDO communication parameter 2				
	0	Sub-index supported	U8	RO		0x5
	1	COIB-ID	U32	RW		0x80000280
	2	Transmission type	U8	RW		0xFF
	3	Inhibit time	U16	RW		0x0
	4	Compatibility entry	U8	RW		0x0
	5	Event timer	U16	RW		0x0
1802h		Tx PDO communication parameter 3				
	0	Sub-index supported	U8	RO		0x5
	1	COIB-ID	U32	RW		0x80000380
	2	Transmission type	U8	RW		0xFF
	3	Inhibit time	U16	RW		0x0
	4	Compatibility entry	U8	RW		0x0
	5	Event timer	U16	RW		0x0
1803h		Tx PDO communication parameter 4				
	0	Sub-index supported	U8	RO		0x5
	1	COIB-ID	U32	RW		0x80000480
	2	Transmission type	U8	RW		0xFF
	3	Inhibit time	U16	RW		0x0
	4	Compatibility entry	U8	RW		0x0
	5	Event timer	U16	RW		0x64
1804h		Tx PDO communication parameter 5				
	0	Sub-index supported	U8	RO		0x5
	1	COIB-ID	U32	RW		0x80000000
	2	Transmission type	U8	RW		0xFF
	3	Inhibit time	U16	RW		0x0
	4	Compatibility entry	U8	RW		0x0
	5	Event timer	U16	RW		0x0

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ID	Sub	Description	Type	Access	PDO Mapping	Default value
1805h		Tx PDO communication parameter 6				
	0	Sub-index supported	U8	RO		0x5
	1	COIB-ID	U32	RW		0x80000000
	2	Transmission type	U8	RW		0xFF
	3	Inhibit time	U16	RW		0x0
	4	Compatibility entry	U8	RW		0x0
	5	Event timer	U16	RW		0x0
1806h		Tx PDO communication parameter 7				
	0	Sub-index supported	U8	RO		0x5
	1	COIB-ID	U32	RW		0x80000000
	2	Transmission type	U8	RW		0xFF
	3	Inhibit time	U16	RW		0x0
	4	Compatibility entry	U8	RW		0x0
	5	Event timer	U16	RW		0x0
1807h		Tx PDO communication parameter 8				
	0	Sub-index supported	U8	RO		0x5
	1	COIB-ID	U32	RW		0x80000000
	2	Transmission type	U8	RW		0xFF
	3	Inhibit time	U16	RW		0x0
	4	Compatibility entry	U8	RW		0x0
	5	Event timer	U16	RW		0x0
1A00h		Tx PDO mapping parameter 1				
	0	Number of mapped objects	U8	RW		0x2
	1	Mapping entry 1	U32	RW		0X10020020
	2	Mapping entry 2	U32	RW		0x60000108
	3..8	Mapping entry X	U32	RW		0X0
1A01h		Tx PDO mapping parameter 2				
	0	Number of mapped objects	U8	RW		0x0
	1..8	Mapping entry X	U32	RW		0x0
1A02h		Tx PDO mapping parameter 3				
	0	Number of mapped objects	U8	RW		0x0
	1..8	Mapping entry X	U32	RW		0x0
1A03h		Tx PDO mapping parameter 4				
	0	Number of mapped objects	U8	RW		0x0
	1..8	Mapping entry X	U32	RW		0x0
1A04h		Tx PDO mapping parameter 5				
	0	Number of mapped objects	U8	RW		0x0



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ID	Sub	Description	Type	Access	PDO Mapping	Default value
	1..8	Mapping entry X	U32	RW		0x0
1A05h		Tx PDO mapping parameter 6				
	0	Number of mapped objects	U8	RW		0x0
	1..8	Mapping entry X	U32	RW		0x0
1A06h		Tx PDO mapping parameter 7				
	0	Number of mapped objects	U8	RW		0x0
	1..8	Mapping entry X	U32	RW		0x0
1A07h		Tx PDO mapping parameter 8				
	0	Number of mapped objects	U8	RW		0x0
	1..8	Mapping entry X	U32	RW		0x0
1F80h	0	NMT start-up	U32	RW		0x0

## 6.8.2 CiA 301 object descriptions

### 6.8.2.1 1000h Device type

This object contains information on the type of device and its functions. It consists of two 16-bit fields, one describing the profile used, and a second containing additional specific information.

### 6.8.2.2 1001h Error register

This object contains the device's internal error mapping, it is a mandatory object for all devices and is part of the emergency objects. The values are defined in the table.

Bit	Optional	Description
0	Mandatory	Generic error
1	Optional	Current
2	Optional	Voltage
3	Optional	Temperature
4	Optional	Communication error
5	Optional	Profile-specific
6	Optional	Reserved
7	Optional	Reserved

### 6.8.2.3 1002h Manufacturer status register

This object contains the device status, it is manufacturer specific.

### 6.8.2.4 1003h Pre-defined error field

This object contains errors that have been identified on the device and have been signalled by the emergency message. This creates an error history.

Sub-index 0 contains the number of errors that are currently saved, from sub-index 1 to sub-index 8. When there are no errors, it takes a value of zero. Each new error is saved at index 1 and the old ones are moved up an index.

Entering zero into sub-index 0 deletes the error history, resetting all saved errors to zero.

Each error consists of a 16-bit field containing the error code, defined by CANopen, and another 16-bit field containing additional manufacturer information.

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Manufacturer info	Error type
0x2320	Valve overcurrent error
0x3120	Low master power error
0x4201	High master temperature error
0x4202	High sub-base temperature error
0x4203	High coil temperature error
0x8100	CANopen communication error
0x8110	CAN overrun error
0x8120	CAN Error Passive error
0x8130	Heartbeat or life-guard error
0x8140	CAN busoff recovery
0x8210	PDO length error
0x8220	Long PDO error
0xF001	Enumeration error
0xF002	485 mapping error
0xF003	CAN mapping error
0xF004	Valve error: N. fault coil
0xF005	Valve error: Interrupted Pilot
0xF006	Valve error: Comm.

#### 6.8.2.5 1005h COB-ID sync

This object contains the configuration of the COB-ID of the synchronization (SYNC) message, indicating whether the device generates the message or not.

Bit	Value	Description
31(MSB)	X	Not used
30	0	Device does not generate SYNC message
	1	
29	0	Device generates SYNC message
	1	
28-0	X	11-bit CAN-ID
11-0	X	29-bit CAN-ID

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#### 6.8.2.6 1006h Communication cycle period

This object contains the time in milliseconds of the cyclic communication of SYNC messages; when its value is null, the device does not send synchronism messages.

#### 6.8.2.7 1007h Synchronous window length

This object contains the length of the time window for synchronous PDO messages, i.e. the time from the synchronism message within which these PDOs must arrive in order to be valid.

If the value is set to zero, the synchronization window is disabled.

#### 6.8.2.8 1008h Manufacturer device name

This object contains the device name given by the manufacturer.

#### 6.8.2.9 1009h Manufacturer hardware version

This object contains the hardware version of the device.

#### 6.8.2.10 100Ah Manufacturer software version

This object contains the software version of the device.

#### 6.8.2.11 100Ch Guard time

This object together with the following 100Dh represent the configuration of the *life guarding* protocol. The *Guard time* contains the time in which the *guarding* message is sent, expressed in ms; if it is set to zero, the *life guarding* protocol is disabled.

#### 6.8.2.12 100Dh Life time factor

This object contains the number of *guarding* messages that may be lost. This value multiplied by the *Guard time* is the maximum amount of time in which the *guarding* messages must arrive in order to prevent an error and communication reset.

#### 6.8.2.13 1010h Store parameter field

This object controls the storage of parameters in the permanent memory. With read access, the device provides information on its storage capacity.

There are different groups of parameters:

- Sub-index 00h contains the highest sub-index supported.
- Sub-index 01h refers to all parameters that can be stored in the CANopen device.
- Sub-index 02h refers to the communication parameters (indexes 1000h to 1FFFh).
- Sub-index 03h refers to the application parameters (indexes 6000h to 9FFFh).

#### 6.8.2.14 1011h Restore default parameter

This object restores the default parameters. By means of a read operation, the device communicates information on the ability to restore these values. There are many different groups of parameters. To restore the default values, the *load* signal (00x64616f6c) must be written.

Different sub-indexes restore different parameters:

- Sub-index 1: all parameters.

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- Sub-index 2: communication parameters.
- Sub-index 3: application parameters.

#### 6.8.2.15 1012h COIB-ID time stamp

This object contains the configuration of the *time stamp* (TIME) message, indicating whether the device consumes or produces the message.

Bit	Value	Description
31(MSB)	0	Device does not consume the TIME message
	1	Device consumes the TIME message
30	0	Device does not produce the TIME message
	1	Device produces the TIME message
29	0	11-bit CAN-ID
	1	29-bit CAN-ID
28-0	X	29-bit extended address
11-0	X	11-bit standard address

#### 6.8.2.16 1014h COIB-ID EMCY

This object contains the configuration of the EMCY service.

Bit	Value	Description
31(MSB)	0	EMCY present / valid
	1	EMCY absent / invalid
30	0	Reserved
29	0	11-bit CAN-ID
	1	29-bit CAN-ID
28-0	X	29-bit extended address
11-0	X	11-bit standard address

#### 6.8.2.17 1015h Inhibit time emergency

This object contains the inhibit time of the EMCY message, which must be a multiple of 100  $\mu$ s. If set to zero it disables the inhibit time.

#### 6.8.2.18 1017h Producer heartbeat time

This object contains the configuration of the *heartbeat* protocol, indicating the time in which the *heartbeat* message is produced. The time must be a multiple of 1msecond. If set to zero *heartbeat* management is disabled.

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#### 6.8.2.19 1018h Identity object

This object contains information about the device:

Sub-index	Value	Description
0	4	Sub-index number
1	151h	Vendor ID
2	05Ah	Product code
3	001h	Revision number
4	000h	Serial number

#### 6.8.2.20 1019h Synchronous counter overflow value

This object contains the configuration of the SYNC message. If the value is set to zero, the SYNC message will have no parameter; if the value is between 2 and 240 then the SYNC message will have a parameter of one data byte, which will contain a counter.

#### 6.8.2.21 1020h Verify configuration

This object contains the date and time of the last configuration. Sub-index 1 contains the date after 01/01/1984; sub-index 2 contains the number of seconds after midnight of the set day.

#### 6.8.2.22 1029h Error behaviour

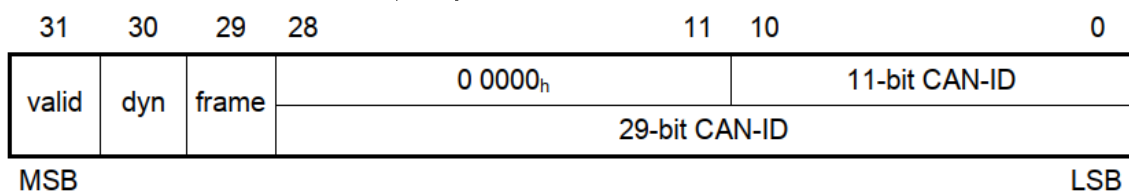
This object contains the type of error that can occur. Sub-index 0 contains the number of error classes; sub-index 1 contains the communication error; sub-indexes 2 to 254 should contain the errors specified by the CANopen profile or the errors defined by the manufacturer.

The error classes can be:

- 0, pre operational
- 1, no change of state
- 2, stopped
- 3– 127, reserved

#### 6.8.2.23 1200h Server SDO parameter 1

The number of entities supported of objects in the SDO record is specified in sub-index 00h. In this device, the values at sub-index 01h and 02h specify the COB-ID for this SDO.



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#### 6.8.2.24 1400h – 1407h Receive PDO Communication Parameter

These objects contain the configuration of the PDO communication that the device can receive. The PDO transmission parameters are described in the document CIA301, section 7.4.8.1.

*Sub-index 1* contains the COB-ID of the PDO:

Bit	Value	Description
31 (MSB)	0	PDO present / valid
	1	PDO absent / invalid
30	x	Reserved
29	0	11-bit CAN-ID
	1	29-bit CAN-ID
29-11		29-bit CAN-ID (extended message)
10-0		11-bit CAN-ID (standard message)

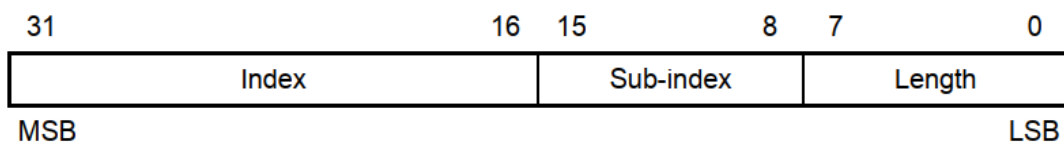
*Sub-index 2* contains the transmission type:

- Value = 0 Synchronous transmission (with SYNC messages)
- Value = 1- 240 Synchronous transmission every N SYNC messages
- Value = 252- 253 Transmission only on transmission request (RTR)
- Value = 254 Asynchronous transmission specific to manufacturer
- Value = 255 Asynchronous transmission specific to device profile

#### 6.8.2.25 1600h – 1607h Receive PDO Mapping Parameter

These objects contain the PDO mapping that the device is able to receive.

*Sub-index 0* contains the number of objects mapped in the PDO; if the value is set to zero, it means that no object is mapped. Each *sub-index* from 1 to the previously specified number contains information on the object mapped in the PDO.



Below is the sequence for changing the mapping of a PDO:

- Disable the Rx PDO by setting bit 31, in sub-index 1 of the RPDO communication parameter, to a value of 1.
- Disable the existing mapping by setting sub-index 0 to zero.
- Change the mapping by editing the value of the corresponding sub-index.
- Enable mapping by setting sub-index 0 to the number of mapped objects.
- Enable the Rx PDO by setting bit 31, in sub-index 1 of the RPDO communication parameter, to the value 0.

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#### 6.8.2.26 1800h – 1807h Transmit PDO Communication Parameter

These objects contain the configuration of the PDO communication that the device can transmit. The PDO transmission parameters are described in the document CIA301, section 7.4.8.1. Sub-index 1 contains the COB-ID of the PDO.

Bit	Value	Description
31 (MSB)	0	PDO present / valid
	1	PDO absent / invalid
30	0	RTR supported
	1	RTR not supported
29	0	11-bit CAN-ID
	1	29-bit CAN-ID
29-11		29-bit CAN-ID (extended message)
10-0		11-bit CAN-ID (standard message)

Sub-index 2 contains the transmission type:

- Value = 0                      Synchronous transmission (with SYNC messages)
- Value = 1-240                Synchronous transmission every N SYNC messages
- Value = 252-253            Transmission only on transmission request (RTR)
- Value = 254                  Asynchronous transmission specific to manufacturer
- Value = 255                  Asynchronous transmission specific to device profile

Sub-index 3 contains the minimum time interval with which the TPDO can be transmitted when the transmission type set is 255 or 254. This value is a multiple of 100 µs; if it is set to zero, the minimum interval is disabled.


Sub-index 4 is reserved.

Sub-index 5 contains the maximum time interval with which the TPDO is transmitted when the set transmission type is 255 or 254. This value is a multiple of 1 ms; if it is set to zero, the maximum interval is disabled.

#### 6.8.2.27 1A00h – 1A07h Transmit PDO Mapping Parameter

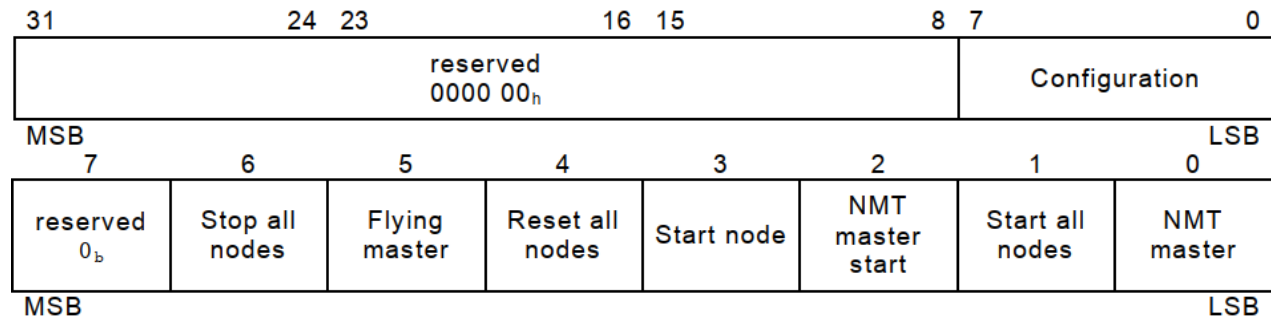
Same as for RxPDO mapping.



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#### 6.8.2.28 1F80h NMT Start-up

This object contains configuration of the master behaviour at *start-up*, its value in bits is described in the following image.



Activation allows you to edit the 2-bit NMT master start:

- 0 = Allows the device to enter operational state autonomously at start-up.
- 1 = Does not allow the device to enter operational state autonomously.
- And to change the 3-bit Start node:
  - 0 = The master must put the device into operational state.
  - 1 = the device enters operational state immediately at start-up.

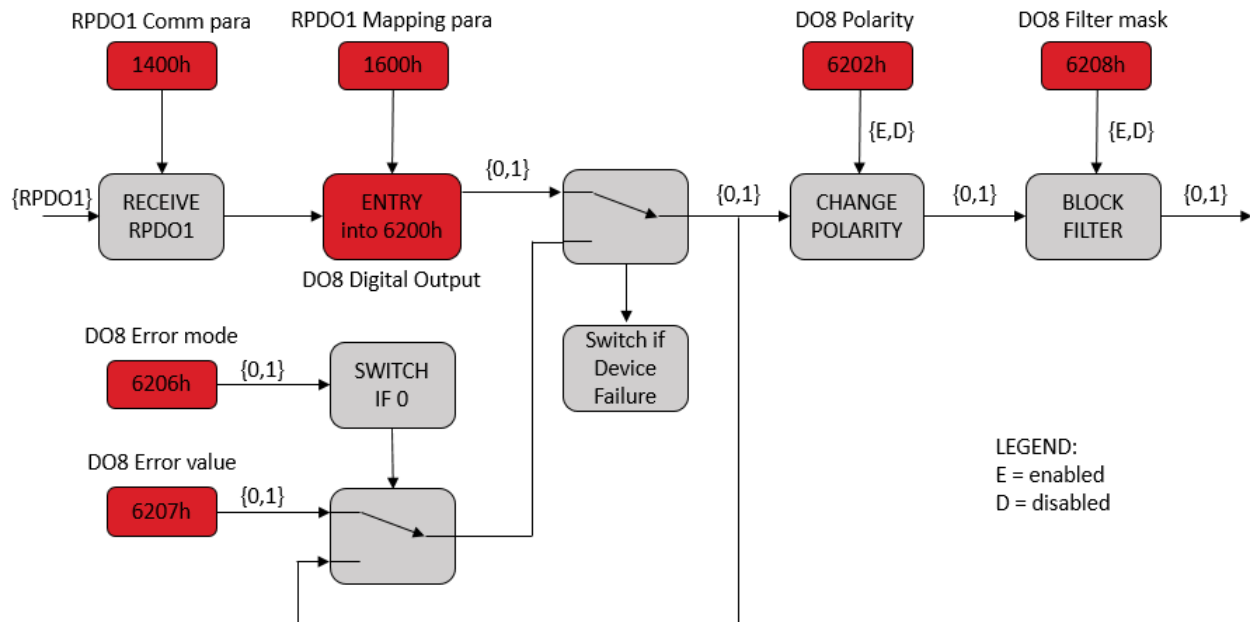
Attempting to set a bit that is not managed by the device returns an object writing *abort* error.

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### 6.8.3 Accessorises module objects representation

#### 6.8.3.1 Digital output 8 bit

The objects related to 8 bit digital output follow the schema, as specified by CiA401:

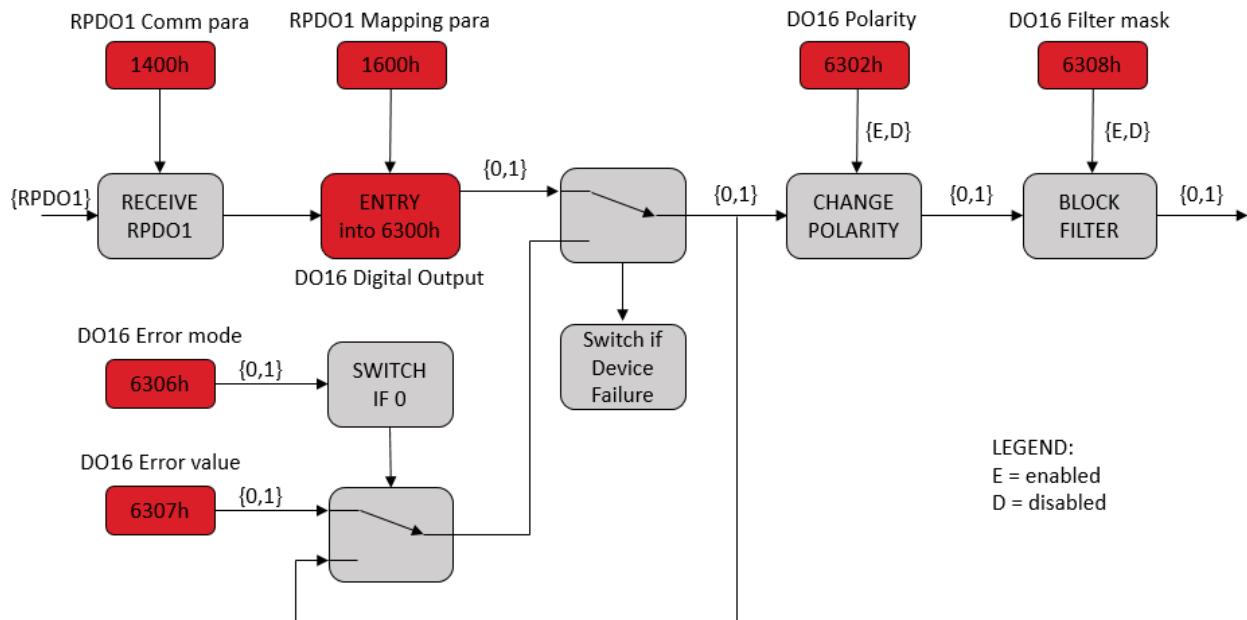


Besides, there are more related object in the "Manufacturer specific" section:

- 2500h, DO8 Module Setting.
- 2501h, DO8 PWM Channel Mode.
- 2502h, DO8 PWM Activation Time.
- 2503h, DO8 PWM Channel Duty Cycle.

### 6.8.3.2 Digital output 16 bit

The objects related to 16 bit digital output follow the schema, as specified by CiA401:

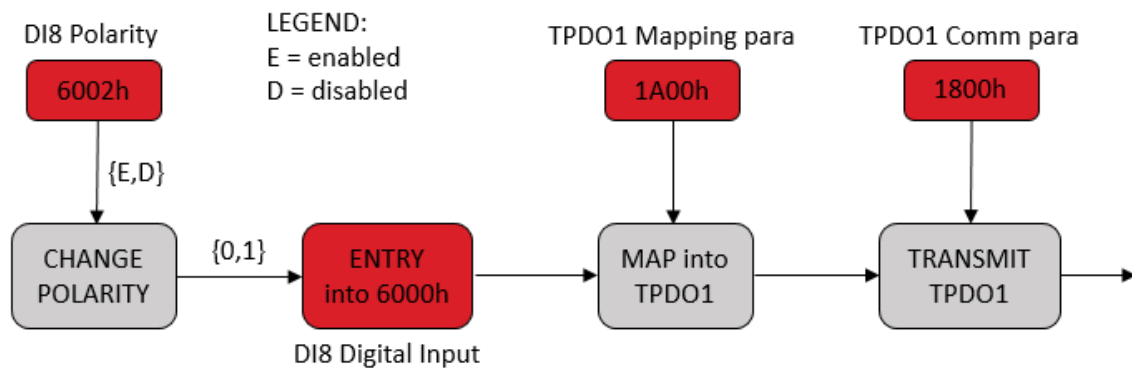


Besides, there are more related object in the "Manufacturer specific" section:

- 2510h, DO16 Module setting.
- 2511h, DO16 PWM Channel Mode.
- 2512h, DO16 PWM Activation Time.
- 2513h, DO16 PWM Channel Duty Cycle.

### 6.8.3.3 Digital input 8 bit

The objects related to 8 bit digital input follow the schema, as specified by CiA401:



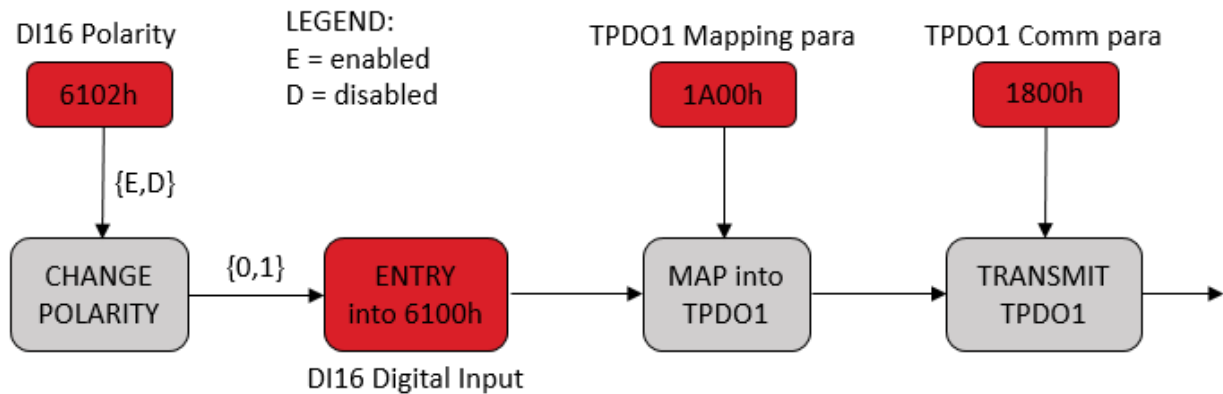
Besides, there are more related object in the "Manufacturer specific" section:

- 24A0h, DI8 Digital input Minimum activation time input.
- 24A1h, DI8 Digital Input Extension time input.

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#### 6.8.3.4 Digital input 16 bit

The objects related to 16 bit digital input follow the schema, as specified by CiA401:

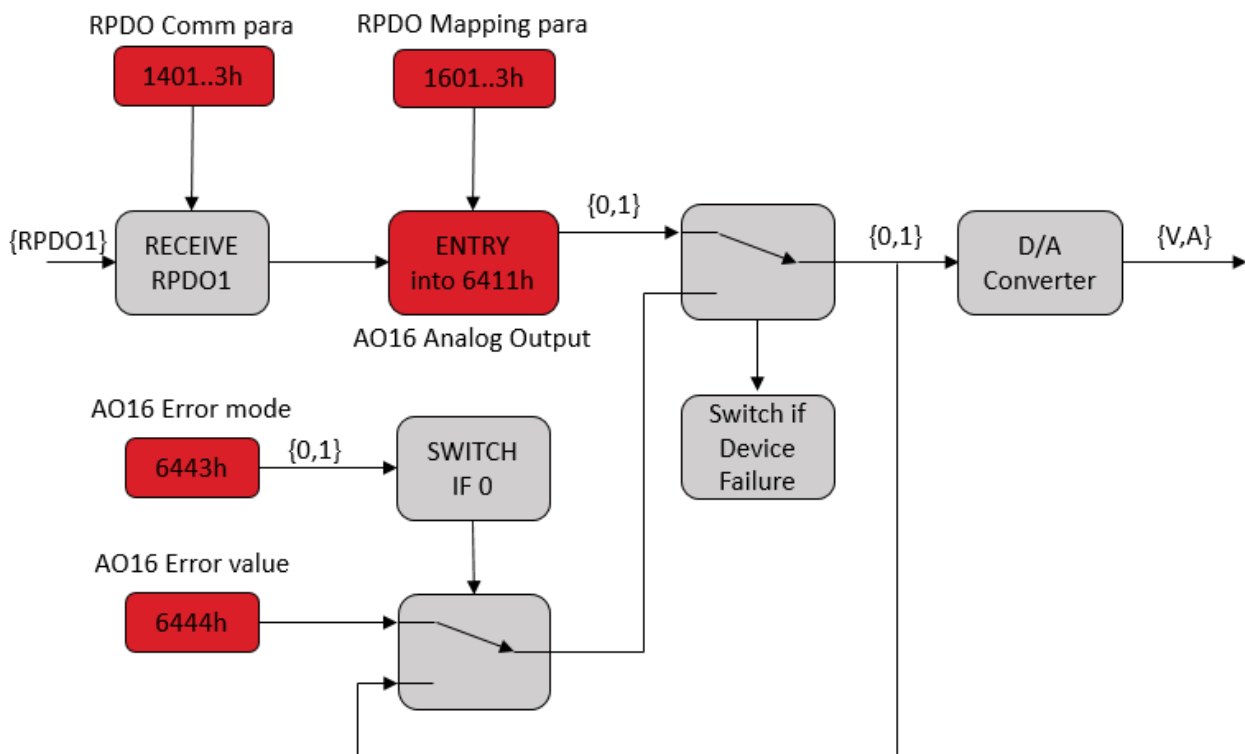


Besides, there are more related objects in the "Manufacturer specific" section:

- 24B0h, DI16 Minimum activation time input.
- 24B1h, DI16 Extension time input.

#### 6.8.3.5 Analog output 16 bit

The objects related to 16 bit analogue output follow the schema, as specified by CiA401:



Besides, there are more related objects in the "Manufacturer specific" section:

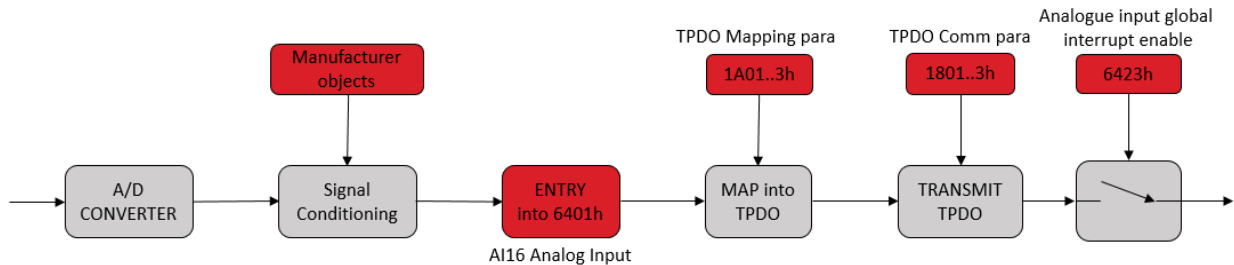
- 2640h, AO16 Module setting.

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#### 6.8.3.6 Analog input 16 bit

The objects related to 16 bit analogue input follow the schema, as specified by CiA401:

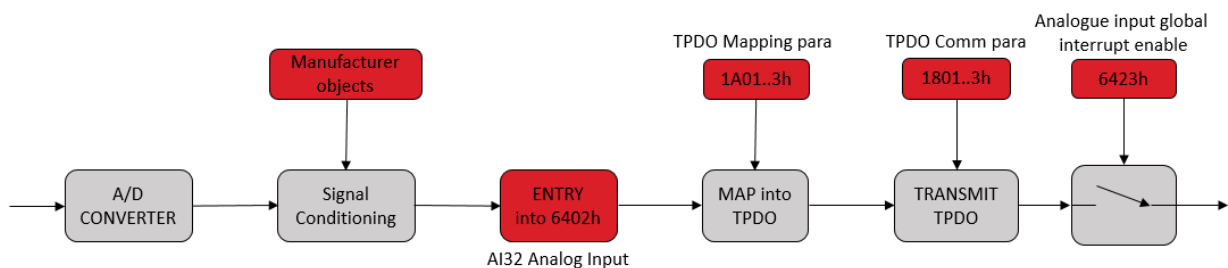


Besides, there are more related objects in the "Manufacturer specific" section (subdivided following the type of the submodule):

- 2600h, AI RTD Sensor Type.
- 2601h, AI RTD Sensor Wires.
- 2602h, AI RTD Sampling Threshold.
- 2603h, AI RTD Sampling Threshold Timeout.
- 2604h, AI RTD Sampling Rate.
- 2605h, AI RTD Filter.
- 2610h, AI TH Sensor Type.
- 2611h, AI TH Sampling Threshold.
- 2612h, AI TH Sampling Threshold Timeout.
- 2613h, AI TH Sampling Rate.
- 2614h, AI TH Filter.
- 2630h, AI CV Input Type.
- 2631h, AI CV Sampling Threshold.
- 2632h, AI CV Sampling Threshold Timeout.
- 2633h, AI CV Sampling Rate.
- 2634h, AI CV Filter.

#### 6.8.3.7 Analog input 32 bit

The objects related to 32 bit analogue input follow the schema, as specified by CiA401:



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Besides, there are more related objects in the "Manufacturer specific" section:

- 2620h, AI BRG Factor.
- 2621h, AI BRG Sampling Threshold.
- 2622h, AI BRG Sampling Threshold Timeout.
- 2623h, AI BRG Sampling Rate.
- 2624h, AI BRG Filter.

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#### 6.8.4 Objects CiA 401 profile

ID	Sub	Description	Type	Access	PDO Mapping	Default value
6000h		DI8 Digital Input				
	0	Highest sub-index supported	U8	CONST		0x10
	1..32	Digital input x to y	U8	RO	X	0x0
6002h		DI8 Polarity				
	0	Highest sub-index supported	U8	CONST		0x10
	1..16	Polarity Input x to y	U8	RW		0xFF
6100h		DI16 Digital Input				
	0	Highest sub-index supported	U16	CONST		0x8
	1..8	Digital input x to y	U16	RO	X	0x0
6102h		DI16 Polarity				
	0	Highest sub-index supported	U16	CONST		0x8
	1..8	Polarity Input x to y	U16	RW		0xFFFF
6200h		DO8 Digital Output				
	0	Highest sub-index supported	U8	CONST		0x10
	1..32	Digital output x to y	U8	RW	X	0x0
6202h		DO8 Polarity				
	0	Highest sub-index supported		CONST		0x10
	1..16	Polarity output x to y	U8	RW		0x0
6206h		DO8 Error mode				
	0	Highest sub-index supported	U8	CONST		0x10
	1..16	Error mode output x to y	U8	RW		0x0
6207h		DO8 Error value				
	0	Highest sub-index supported	U8	CONST		0x10
	1..16	Error value output x to y	U8	RW		0x0
6208h		DO8 Filter mask				
	0	Highest sub-index supported	U8	CONST		0x10
	1..16	Filter mask output x to y	U8	RW		0x0
6300h		DO16 Digital Output				
	0	Highest sub-index supported	U16	CONST		0x8
	1..8	Digital output x to y	U16	RW	X	0x0
6302h		DO16 Polarity				

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ID	Sub	Description	Type	Access	PDO Mapping	Default value
	0	Highest sub-index supported	U16	CONST		0x8
	1..8	Polarity output 16	U16	RW	X	0x0
6306h		D016 Error mode				
	0	Highest sub-index supported	U16	CONST		0x8
	1..8	Error mode output x to y	U16	RW	X	0x0
6307h		D016 Error value				
	0	Highest sub-index supported	U16	CONST		0x8
	1..8	Error value output x to y	U16	RW	X	0x0
6308h		D016 Filter mask				
	0	Highest sub-index supported	U16	CONST		0x8
	1..8	Filter mask output x to y	U16	RW	X	0x0
6401h		AI16 Analog input				
	0	Highest sub-index supported	I16	CONST		0x10
	1..16	Analog input x	I16	RO	X	0x0
6402h		AI32 Analog input				
	0	Highest sub-index supported	I32	CONST		0x8
	1..8	Analog input x	I32	RO	X	0x0
6411h		A016 Analogue output				
	0	Highest sub-index supported	I16	CONST		0x10
	1..16	Analog output x	I16	RW	X	0x0
6423h	0	Analogue input global interr enable	BOOL	RW		0x0
6443h		A016 Error mode				
	0	Highest sub-index supported	U8	CONST		0x8
	1..8	A016 ErrorModeOutput Mod. x	U8	RW		0x0
6444h		A016 Error value				
	0	Highest sub-index supported	I32	CONST		0x8
	1..8	A016 Analog output – Mod. x	I32	RW		0x0



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## 6.8.5 Cia 401 object descriptions

### 6.8.5.1 6000h DI8 Digital Input

This object contains the status of the digital inputs grouped in sets of 8.

### 6.8.5.2 6002h DI8 Polarity

This object defines the polarity of a group of a line of 8 inputs. The polarity can be inverted individually. If the bit assigned to the input is 1, the input is inverted; otherwise, it is not inverted.

### 6.8.5.3 6100h DI16 Digital Input

This object contains the status of the digital inputs grouped in sets of 16.

### 6.8.5.4 6102h DI16 Polarity

This object defines the polarity of a group of a line of 16 inputs. The polarity can be inverted individually. If the bit assigned to the input is 1, the input is inverted; otherwise, it is not inverted.

### 6.8.5.5 6200h DO8 Digital Output

This object contains the status of the digital outputs grouped in sets of 8.

### 6.8.5.6 6202h DO8 Polarity

This object defines the polarity of a group of a line of 8 outputs. The polarity can be inverted individually. If the bit assigned to the output is 1, the output is inverted; otherwise, it is not inverted.

### 6.8.5.7 6206h DO8 Error mode

This object occurs, in any case if an output is set to a default value (object 6207h), in the case of an internal device malfunction or a *Stop remote node* signal.

Object value and corresponding function:

- 1, the output value must assume the condition of the default value specified in object 6207h
- 0, the output value must be maintained if an error occurs.

### 6.8.5.8 6207h DO8 Error value

If the corresponding value in object 6206h is active, the malfunction of the device sets the output to the configured value of this object.

Object value and corresponding function:

- 0, the output is set to 0 in the case of a malfunction, if object 6206 is enabled.
- 1, the output is set to 1 in the event of a malfunction, if object 6206 is enabled.

### 6.8.5.9 6208h DO8 Filter mask

This object defines the enable of the output for a group of 8 outputs.

Object value and corresponding function:

- 0, the received output value is ignored for the appropriate output channel, the old output value is maintained.
- 1, the output is set to the value received from the output.

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#### 6.8.5.10 6300h D016 Digital Output

This object contains the status of the digital outputs grouped in sets of 16.

#### 6.8.5.11 6302h D016 Polarity

This object defines the polarity of a group of a line of 16 outputs. The polarity can be inverted individually. If the bit assigned to the output is 1 (P) the output is inverted; otherwise, it is not inverted (N).

#### 6.8.5.12 6306h D016 Error mode

This object occurs, in any case if an output is set to a default value (object 6307h), in the case of an internal device malfunction or a *Stop remote node* signal.

Object value and corresponding function:

- 1, the output value must assume the condition of the default value specified in object 6307h
- 0, the output value must be maintained if an error occurs.

#### 6.8.5.13 6307h D016 Error value

If the corresponding value in object 6306h is active, the malfunction of the device sets the output to the configured value of this object.

Object value and corresponding function:

- 0, the output is set to 0 in the case of a malfunction, if object 6306 is enabled
- 1, the output is set to 1 in the case of a malfunction, if object 6306 is enabled.

#### 6.8.5.14 6308h D016 Filter mask

This object defines an additional filter mask configurable on the output for a group of 16 outputs.

Object value and corresponding function:

- 0, the received output value is neglected for the appropriate output channel, the old output value must be maintained
- 1, the output must be set to the value received from the output.

#### 6.8.5.15 6401h AI16 Analog input

This object contains the status of the analogue inputs grouped in sets of 16.

#### 6.8.5.16 6402h AI32 Analog input

This object contains the status of the analogue inputs grouped in sets of 32.

#### 6.8.5.17 6411h AO16 Analog output

This object contains the status of the analogue outputs represented in a word of 16 bits.

#### 6.8.5.18 6423h Analogue input global interrupt enable

This object enables sending the PDOs which contains in the mapped objects the one or both objects 6401h and 6402h, if PDOs are configured as event transmit (if the inputs change the message is sent). The sub-index "Transmission Type" of those PDOs must be configured as 0xFF or 0xFE. By default, the interrupt is not enabled. To set the threshold to send the message, it is necessary to refer to the custom object:

- Objects for RTD: 2602h, 2603h.

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- Object for TH: 2611h, 2612h.
- Object for CV: 2631h, 2632h.
- Object for BRIDGE: 2621h, 2621h.

#### 6.8.5.19 6443h A016 Error mode

This object occurs, in any case if an output is set to a default value (object 6444h), in the case of an internal device malfunction or a *Stop remote node* signal.

Object value and corresponding function:

- 1, the output value must assume the condition of the default value specified in object 6444h
- 0, the output value must be maintained if an error occurs.

#### 6.8.5.20 6444h A016 Error value

If the corresponding value in object 6443h is active, the malfunction of the device sets the output to the configured value of this object.

Object value and corresponding function:

- 0, the output is set to 0 in the case of a malfunction, if object 6443h is enabled
- 1, the output is set to 1 in the case of a malfunction, if object 6443h is enabled.

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#### 6.8.6 Custom manufacturer objects

ID	Sub	Description	Type	Access	PDO Mapping	Default value
2000h		Status master				
	0	Highest sub-index supported	I16	CONST		0x2
	1	Supply voltage	I16	RO		0x0
	2	Temperature	I16	RO		0x0
2001h		Slave enumeration				
	0	Slave enumeration	U32	RW		0x0
2002h		System start behaviour				
	0	System start behaviour	U8	RW		0x0
2003h		Automatic Mapping Procedure				
	0	Automatic Mapping Procedure	U8	RW		0x0
21F0h		Dummy 8 bit for TPDO				
	0	Highest sub-index supported	U8	CONST		0x8
	1..8	DummyTbyte X	U8	RO	X	0x0
21F1h		Dummy 8 bit for RPDO				
	0	Highest sub-index supported	U8	CONST		0x8
	1..8	DummyRbyte X	U8	WO	X	0x0
2200h		Valves output 8				
	0	Highest sub-index supported	U8	CONST		0x10
	1	ValvesOutput_1_8	U8	RW	X	0x0
	2	ValvesOutput_9_16	U8	RW	X	0x0
	3..16	ValvesOutput_X_Y	U8	RW	X	0x0
2206h		Error mode valves				
	0	Highest sub-index supported	U8	CONST		0x10
	1	ErrorModeValves_1_8	U8	RW		0x0
	2	ErrorModeValves_9_16	U8	RW		0x0
	3..16	ErrorModeValves_X_Y	U8	RW		0x0
2207h		Error value valves				
	0	Highest sub-index supported	U8	CONST		0x10
	1	ErrorValueValves_1_8	U8	RW		0x0
	2	ErrorValueValves_9_16	U8	RW		0x0
	3..16	ErrorValueValves_X_Y	U8	RW		0x0

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ID	Sub	Description	Type	Access	PDO Mapping	Default value
22A0h		Maintenance status				
	0	Highest sub-index supported	U8	CONST		0x8
	1	MaintenanceStatusValves_1_8	U8	RO	X	0x0
	2	MaintenanceStatusValves_9_16	U8	RO	X	0x0
	3..8	MaintenanceStatusValves_X_Y	U8	RO	X	0x0
22A1h		Health status				
	0	Highest sub-index supported	U8	CONT		0x80
	1	HealthStatusValve_1	U8	RO		0x0
	2	HealthStatusValve_2	U8	RO		0x0
	3..128	HealthStatusValve_3..128	U8	RO		0x0
22A2h		Cycle counter				
	0	Highest sub-index supported	U32	CONT		0x80
	1	CycleCounterValve_1	U32	RO		0x0
	2	CycleCounterValve_2	U32	RO		0x0
	3..128	CycleCounterValve_3..128	U32	RO		0x0
22A3h		Error counter				
	0	Highest sub-index supported	U32	CONT		0x80
	1	ErrorCounterValve_1	U32	RO		0x0
	2	ErrorCounterValve_2	U32	RO		0x0
	3..128	ErrorCounterValve_3..128	U32	RO		0x0
22A4h		Error latched valves				
	0	Highest sub-index supported	U8	CONST		0x08
	1	ErrorLatchedValves_1_8	U8	RW		0x0
	2	ErrorLatchedValves_9_16	U8	RW		0x0
	3..8	ErrorLatchedValves_X_Y	U8	RW		0x0
22E0h		Reset info slave				
	0	Reset info slave	U32	RW		0x0
22E1h		Enable fault coil alarm				
	0	Enable fault coil alarm	U8	RW		0x0

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ID	Sub	Description	Type	Access	PDO Mapping	Default value
24A0h		DI8 Digital input Minimum activation time input				
	0	Highest sub-index supported	U8	CONST		0x10
	1	DI8 MinimumActivationTimeInput Mod 1	U8	RW		0x0
	2	DI8 MinimumActivationTimeInput Mod 2	U8	RW		0x0
	3..16	MinimumActivationTimeInput_X	U8	RW		0x0
24A1h		DI8 Digital Input Extension time input				
	0	Highest sub-index supported	U16	CONST		0x10
	1	DI8 ExtensionTimeInput Mod 1	U16	RW		0x0
	2	DI8 ExtensionTimeInput Mod 2	U16	RW		0x0
	3..16	DI8 ExtensionTimeInput Mod X	U16	RW		0x0
24B0h		DI16 Minimum activation time input				
	0	Highest sub-index supported	U8	CONST		0x08
	1	DI16 MinimumActivationTimeInput Mod 1	U8	RW		0x0
	2	DI16 MinimumActivationTimeInput Mod 2	U8	RW		0x0
	3..8	DI16 MinimumActivationTimeInput Mod X	U8	RW		0x0
24B1h		DI16 Extension time input				
	0	Highest sub-index supported	U8	CONST		0x08
	1	DI16 ExtensionTimeInput Mod 1	U8	RW		0x0
	2	DI16 ExtensionTimeInput Mod 2	U8	RW		0x0
	3..8	DI16 ExtensionTimeInput Mod X	U8	RW		0x0
24B2h		DI16 Power Source				
	0	Highest sub-index supported	U8	CONST		0x08
	1	DI16 PowerSource Mod 1	U8	RW		0x0
	2	DI16 PowerSource Mod 2	U8	RW		0x0
	3..8	DI16 PowerSource Mod X	U8	RW		0x0
2500h		D08 module setting				
	0	Highest sub-index supported	U8	CONST		0x10
	1	D08 ModuleSetting Mod 1	U8	RW		0x0
	2	D08 ModuleSetting Mod 2	U8	RW		0x0
	3..16	D08 ModuleSetting Mod X	U8	RW		0x0
2501h		D08 PWM Channel Mode				

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ID	Sub	Description	Type	Access	PDO Mapping	Default value
	0	Highest sub-index supported	U8	CONST		0x10
	1	D08 PWMChannelMode Mod 1	U8	RW		0x0
	2	D08 PWMChannelMode Mod 2	U8	RW		0x0
	3..16	D08 PWMChannelMode Mod X	U8	RW		0x0
2502h		D08 PWM Activation Time				
	0	Highest sub-index supported	U8	CONST		0x10
	1	D08 PWMActivationTime Mod 1	U8	RW		0x0
	2	D08 PWMActivationTime Mod 2	U8	RW		0x0
	3..16	D08 PWMActivationTime Mod X	U8	RW		0x0
2503h		D08 PWM Channel Duty Cycle				
	0	Highest sub-index supported	U8	CONST		0x80
	1..128	D08 DutyCycle Mod 1 Ch 1	U8	RW		0x0
2510h		D016 Module Setting				
	0	Highest sub-index supported	U16	CONST		0x8
	1	D016 ModuleSetting Mod 1	U16	RW		0x0
	2	D016 ModuleSetting Mod 2	U16	RW		0x0
	3..8	D016 ModuleSetting Mod X	U16	RW		0x0
2511h		D016 Module Setting				
	0	Highest sub-index supported	U16	CONST		0x8
	1	D016 PWMChannelMode Mod 1	U16	RW		0x0
	2	D016 PWMChannelMode Mod 2	U16	RW		0x0
	3..8	D016 PWMChannelMode Mod X	U16	RW		0x0
2512h		D016 PWM Activation Time				
	0	Highest sub-index supported	U16	CONST		0x8
	1	D016 PWMActivationTime Mod 1	U16	RW		0x0
	2	D016 PWMActivationTime Mod 2	U16	RW		0x0
	3..8	D016 PWMActivationTime Mod X	U16	RW		0x0
2513h		D016 PWM Channel Duty Cycle				
	0	Highest sub-index supported	U16	CONST		0x80
	1..128	D016 DutyCycle Mod 1 Ch 1	U8	WO		0x0
2600h		AI RTD Sensor Type				

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ID	Sub	Description	Type	Access	PDO Mapping	Default value
	0	Highest sub-index supported	U8	CONST		0x10
	1	AI RTD SensorType Mod 1 Ch 1	U8	RW		0x0
	2	AI RTD SensorType Mod 1 Ch 2	U8	RW		0x0
	3	AI RTD SensorType Mod 2 Ch 1	U8	RW		0x0
	4..16	AI RTD Sensor Type Mod X Ch Y	U8	RW		0x0
2601h		AI RTD Sensor Wires				
	0	Highest sub-index supported	U8	CONST		0x10
	1	AI RTD SensorWires Mod 1 Ch 1	U8	RW		0x0
	2	AI RTD SensorWires Mod 1 Ch 2	U8	RW		0x0
	3	AI RTD SensorWires Mod 2 Ch 1	U8	RW		0x0
	4..16	AI RTD SensorWires Mod X Ch Y	U8	RW		0x0
2602h		AI RTD Sampling Threshold				
	0	Highest sub-index supported	U8	CONST		0x8
	1	AI RTD SamplingThreshold Mod 1	U8	RW		0x0
	2	AI RTD SamplingThreshold Mod 2	U8	RW		0x0
	3..8	AI RTD SamplingThreshold Mod X	U8	RW		0x0
2603h		AI RTD Sampling Threshold Timeout				
	0	Highest sub-index supported	U8	CONST		0x8
	1	AIRTDSamplingThresholdTimeout Mod 1	U8	RW		0x0
	2	AIRTDSamplingThresholdTimeout Mod 2	U8	RW		0x0
	3..8	AIRTDSamplingThresholdTimeout Mod X	U8	RW		0x0
2604h		AI RTD Sampling Rate				
	0	Highest sub-index supported	U8	CONST		0x8
	1	AI RTD SamplingThreshold Mod 1	U8	RW		0x0
	2	AI RTD SamplingThreshold Mod 2	U8	RW		0x0
	3..8	AI RTD SamplingThreshold Mod X	U8	RW		0x0
2605h		AI RTD Filter				
	0	Highest sub-index supported	U8	CONST		0x10
	1	AI RTD Filter Mod 1 Ch 1	U8	RW		0x0
	2	AI RTD Filter Mod 1 Ch 2	U8	RW		0x0
	3	AI RTD Filter Mod 2 Ch 1	U8	RW		0x0
	4..16	AI RTD Filter Mod X Ch Y	U8	RW		0x0



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ID	Sub	Description	Type	Access	PDO Mapping	Default value
2610h		AI TH Sensor Type				
	0	Highest sub-index supported	U8	CONST		0x10
	1	AI TH SensorType Mod 1 Ch 1	U8	RW		0x0
	2	AI TH SensorType Mod 1 Ch 2	U8	RW		0x0
	3	AI TH SensorType Mod 2 Ch 1	U8	RW		0x0
	4..16	AI TH SensorType Mod X Ch Y	U8	RW		0x0
2611h		AI TH Sampling Threshold				
	0	Highest sub-index supported	U8	CONST		0x8
	1	AI TH SamplingThreshold Mod 1	U8	RW		0x0
	2	AI TH SamplingThreshold Mod 2	U8	RW		0x0
	3..8	AI TH SamplingThreshold Mod X	U8	RW		0x0
2612h		AI TH Sampling Threshold Timeout				
	0	Highest sub-index supported	U8	CONST		0x8
	1	AI TH SamplingThresholdTimeout Mod 1	U8	RW		0x0
	2	AI TH SamplingThresholdTimeout Mod 2	U8	RW		0x0
	3..8	AI TH SamplingThresholdTimeout Mod X	U8	RW		0x0
2613h		AI TH Sampling Rate				
	0	Highest sub-index supported	U8	CONST		0x8
	1	AI TH SamplingThreshold Mod 1	U8	RW		0x0
	2	AI TH SamplingThreshold Mod 2	U8	RW		0x0
	3..8	AI TH SamplingThreshold Mod X	U8	RW		0x0
2614h		AI TH Filter				
	0	Highest sub-index supported	U8	CONST		0x10
	1	AI TH Filter Mod 1 Ch 1	U8	RW		0x0
	2	AI TH Filter Mod 1 Ch 2	U8	RW		0x0
	3	AI TH Filter Mod 2 Ch 1	U8	RW		0x0
	4..16	AI TH Filter Mod X Ch Y	U8	RW		0x0
2620h		AI BRG Factor				
	0	Highest sub-index supported	U8	CONST		0x8
	1	AI BRG Factor Mod 1 Ch 1	U8	RW		0x0
	2	AI BRG Factor Mod 1 Ch 2	U8	RW		0x0
	3	AI BRG Factor Mod 2 Ch 1	U8	RW		0x0

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ID	Sub	Description	Type	Access	PDO Mapping	Default value
	4..8	AI BRG Factor Mod X Ch Y	U8	RW		0x0
2621h		AI BRG Sampling Threshold				
	0	Highest sub-index supported	U8	CONST		0x4
	1	AI BRG SamplingThreshold Mod 1	U8	RW		0x0
	2..4	AI BRG Sampling Threshold - Mod X	U8	RW		0x0
2622h		AI BRG Sampling Threshold Timeout				
	0	Highest sub-index supported	U8	CONST		0x4
	1	AI BRG SamplingThresholdTimeout Mod 1	U8	RW		0x0
	2..4	AI BRG SamplingThresholdTimeout Mod X	U8	RW		0x0
2623h		AI BRG Sampling Rate				
	0	Highest sub-index supported	U8	CONST		0x4
	1	AI BRG SamplingThreshold Mod 1	U8	RW		0x0
	2..4	AI BRG SamplingThreshold Mod X	U8	RW		0x0
2624h		AI BRG Filter				
	0	Highest sub-index supported	U8	CONST		0x8
	1	AI BRG Filter Mod 1 Ch 1	U8	RW		0x0
	2	AI BRG Filter Mod 1 Ch 2	U8	RW		0x0
	3	AI BRG Filter Mod 2 Ch 1	U8	RW		0x0
	4..8	AI BRG Filter Mod X Ch Y	U8	RW		0x0
2630h		AI CV Input Type				
	0	Highest sub-index supported	U8	CONST		0x10
	1	AI CV InputType Mod 1 Ch 1	U8	RW		0x0
	2	AI CV InputType Mod 1 Ch 2	U8	RW		0x0
	3	AI CV InputType Mod 2 Ch 1	U8	RW		0x0
	4..16	AI CV InputType Mod X Ch Y	U8	RW		0x0
2631h		AI CV Sampling Threshold				
	0	Highest sub-index supported	U8	CONST		0x8
	1	AI CV SamplingThreshold Mod 1	U8	RW		0x0
	2	AI CV SamplingThreshold Mod 2	U8	RW		0x0
	3..8	AI CV SamplingThreshold Mod X	U8	RW		0x0
2632h		AI CV Sampling Threshold Timeout				
	0	Highest sub-index supported	U8	CONST		0x8

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ID	Sub	Description	Type	Access	PDO Mapping	Default value
	1	AI CV SamplingThresholdTimeout Mod 1	U8	RW		0x0
	2	AI CV SamplingThresholdTimeout Mod 2	U8	RW		0x0
	3..8	AI CV SamplingThresholdTimeout Mod X	U8	RW		0x0
2633h		AI CV Sampling Rate				
	0	Highest sub-index supported	U8	CONST		0x8
	1	AI CV SamplingThreshold Mod 1	U8	RW		0x0
	2	AI CV SamplingThreshold Mod 2	U8	RW		0x0
	3..8	AI CV SamplingThreshold Mod X	U8	RW		0x0
2634h		AI CV Filter				
	0	Highest sub-index supported	U8	CONST		0x10
	1	AI CV Filter Mod 1 Ch 1	U8	RW		0x0
	2	AI CV Filter Mod 1 Ch 2	U8	RW		0x0
	3	AI CV Filter Mod 2 Ch 1	U8	RW		0x0
	4..16	AI CV Filter Mod X Ch Y	U8	RW		0x0
2640h		A016 Module Setting				
	0	Highest sub-index supported	U8	CONST		0x10
	1	A0 Module setting Mod 1 Ch 1	U8	RW		0x0
	2	A0 Module setting Mod 1 Ch 2	U8	RW		0x0
	3	A0 Module setting Mod 2 Ch 1	U8	RW		0x0
	4..16	A0 Module setting Mod X Ch Y	U8	RW		0x0

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## 6.8.7 Description of custom manufacturer objects

### 6.8.7.1 2000h Status master

This object contains the status of the master. It has two sub-indexes: 0x1 and 0x2, both accessible in read-only mode. The first sub-index contains the value of the supply voltage expressed in millivolts [mV]; the second sub-index contains the value of the temperature at which the master is working, this quantity is expressed in tenths of a degree Celsius [0.1 °C].

### 6.8.7.2 2001h Slave enumeration

This object represents a command to be sent to the device in order to carry out the numbering procedure required in case of adding or removing a valve position or changing the order of the sub-bases. To run the command, the user must send the device a write SDO whose data field contains the numeric password 12345678h.

### 6.8.7.3 2002h System start behaviour

This object contains the mode of use of the island parameters.

- Value 1: parameters set by PLC.
- Value 0: parameters set by the internal memory.

It is essential to set it with the correct value in order to have the configuration set by the PLC or the one saved in the device via the UVIX external environment.

### 6.8.7.4 2003h Automatic mapping procedure

This object executes the automatic mapping procedure for the PDOs. Whenever the value of this object goes from 0 to 1, the automatic mapping procedure is performed. Reference to chapter [6.4](#).

### 6.8.7.5 21F0h Dummy 8 bit for TPDO

This object contains dummy bytes (unused) which can be used in TPDO mapping.

### 6.8.7.6 21F1h Dummy 8bit for RPDO

This object contains dummy bytes (unused) which can be used in RPDO mapping.

### 6.8.7.7 2200h Valves output 8

This object contains the status of valves grouped in sets of 8.

### 6.8.7.8 2206h Error mode valves

This object contains the *failsafe* enabler, i.e. the behaviour the valves must adopt when communication with the PLC is lost. If the *failsafe* is active (bit=1) then the valves move to the status set by object 2207h (*Error value valves*), otherwise (bit=0) the valves maintain the last status set. The latter is the default behaviour.

The object is divided into 16 sub-indexes, each sub-index being a bit mask for setting the behaviour of each valve.

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#### 6.8.7.9 2207h Error value valves

This object contains the behaviour of the valves must adopt in case of error if the *failsafe* is enabled (2206h *Error mode valves*). Each bit is dedicated to a single: if the bit is active (bit=1) in case of error and with the failsafe enabled, the valve is set, reset otherwise. The latter is the default status.

The object is divided into 16 sub-indexes, each sub-index being a bit mask for setting the behaviour for each valve.

#### 6.8.7.10 22A0h Maintenance status

The sub-indexes of this object, accessible in read-only mode, indicate whether a valve position needs to be replaced because the health of a coil is degraded. Each sub-index is a bit mask and each bit takes the following meaning.

- Value 0: valve position healthy.
- Value 1: valve position degraded (performance not guaranteed).

#### 6.8.7.11 22A1h Health status

The sub-indexes of this object, accessible in read-only mode, contain the health status for each coil. The data can assume the following range: 0 ÷ 100, where 100 indicates that the coil of the sub-base is functioning correctly with the optimal health status, a lower value indicates that the coil's health status and therefore its performance are declining, up to a value below 5, where health status is too low and will be signalled via object 22A0h.

#### 6.8.7.12 22A2h Cycle counter

This object contains the number of cycles for the coils/valves. Each valve is shown in a sub-index (as shown in the table above).

#### 6.8.7.13 22A3h Error counter

This object contains the number of errors for the coils/valves. Each valve is shown in a sub-index (as shown in the table above).

#### 6.8.7.14 22A4h Error latched valves

This object contains the error mode of behaviour on the valves.

- Value 1: non-blocking error, if the command on the valve is removed the error is reset.
- Value 0: blocking error, to reset the error, the power must be switched off and on again.

#### 6.8.7.15 22E0h Reset info slave

This object represents a command to be sent to the device in order to reset all information regarding the efficiency, the number of cycles and the error number. To perform the reset, the user must send the device a write SDO whose data field contains the numeric password 1234h.

#### 6.8.7.16 22E1h Enable fault coil alarm

This object enables signalling the warning related to the missing commutation of the coil measured on board of the subbase.

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#### 6.8.7.17 24A0h DI8 Digital input Minimum activation time input

The sub-indexes of this object, with read and write access, contain the minimum time that the input level must be maintained for it to be intercepted and signalled to the PLC (anti-bounce filter). Each value is expressed in one byte:

- Value 0: filter disabled.
- Value 1-255: value in ms.

This object relates to modules with 8 inputs.

#### 6.8.7.18 24A1h DI8 Digital Input Extension time input

The sub-indexes of this object, with read and write access, contain the minimum duration of the input status. Each value is expressed in two bytes.

- Value 0: extension disabled.
- Value 1-1023: extension in ms.

This object relates to modules with 16 inputs.

#### 6.8.7.19 24B0h DI16 Minimum activation time input

The sub-indexes of this object, with read and write access, contain the minimum time that the input level must be maintained for it to be intercepted and signalled to the PLC (anti-bounce filter). Each value is expressed in one byte.

- Value 0: filter disabled
- Value 1-255: value in ms.

This object relates to modules with 16 inputs.

#### 6.8.7.20 24B1h DI16 Extension time input

The sub-indexes of this object, with read and write access, contain the minimum duration of the input status. Each value is expressed in two bytes.

- Value 0: extension disabled.
- Value 1-1023: extension in ms.

This object relates to modules with 16 inputs.

#### 6.8.7.21 24B2h DI16 Power source

The sub-indexes of this object, which are accessible f in read and write mode, specify the power source for the input module groups with 16 inputs. Each sub-index is related to a module. If the value set in the sub-index is 0, the input power source is taken internally. If 1, it must be supplied externally.

#### 6.8.7.22 2500h DO8 Module Setting

In the sub-indexes of this object, with read and write access, you can enable the open circuit alarm for a module of outputs grouped in sets of 8. Bit 0 in the module sub-index must be set to 1 to enable this mode.

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#### 6.8.7.23 2501h D08 PWM Channel Mode

In the sub-indexes of this object, with read and write access, you can select the type of output channels, grouped in modules of 8. If the bit relating to the channel of the module sub-index is set to 1, the output will be PWM; otherwise, it will be on/off.

#### 6.8.7.24 2502h D08 PWM Activation Time

In the sub-indexes of this object, with read and write access, you can set the activation time of the outputs set in PWM (in object 2501h), grouped into modules of 8. This time is expressed in milliseconds and can be between 0 and 255 ms. Each sub-index of this object relates to one module.

#### 6.8.7.25 2503h D08 PWM Channel Duty Cycle

In the sub-indexes of this object, with read and write access, you can set the PWM value (if active in object 2501h). The *duty cycle* time can be set to a value between 0 and 100 (percentage value). Each sub-index relates to a single output grouped in modules of 8.

#### 6.8.7.26 2510h D016 Module Setting

In the sub-indexes of this object, with read and write access, you can enable the open circuit alarm for a module of outputs grouped in sets of 16. To enable this mode, bit 0 in the module sub-index must be set to 1.

#### 6.8.7.27 2511h D016 PWM Channel Mode

In the sub-indexes of this object, with read and write access, you can select the type of output channels, grouped in modules of 16. If the bit relating to the channel of the module sub-index is set to 1, the output will be PWM; otherwise, it will be on/off.

#### 6.8.7.28 2512h D016 PWM Activation Time

In the sub-indexes of this object, with read and write access, you can set the activation time of the outputs set in PWM (in object 2501h), grouped into modules of 16. This time is expressed in milliseconds and can be between 0 and 255 ms. Each sub-index of this object relates to one module.

#### 6.8.7.29 2513h D016 PWM Channel Duty Cycle

In the sub-indexes of this object, with read and write access, you can set the PWM value (if active in object 2501h). The *duty cycle* time can be set to a value between 0 and 100 (percentage value). Each sub-index relates to a single output grouped in modules of 16.

#### 6.8.7.30 2600h AI RTD Sensor Type

In the sub-indexes of this object, with read and write access, you can set the type of sensor connected to a channel of a specific module.

The values that the sub-indexes can take, with the relative sensor specified, are:

- 0, channel disabled (no sensor connected)
- 1, PT100 (385)
- 2, PT200 (385)
- 3, PT500 (385)

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- 4, PT1000 (385)
- 5, Ni100 (618)
- 6, Ni120 (672)
- 7, Ni1000 (618)
- 8, PT100 (3926)

#### 6.8.7.31 2601h AI RTD Sensor Wire

In the sub-indexes of this object, with read and write access, you can set the number of wires of the sensor connected to a channel of a specific module.

The values that the sub-indexes can take, with their relative value specified, are:

- 0, 2 wires
- 1, 3 wires
- 2, 4 wires

#### 6.8.7.32 2602h AI RTD Sampling Threshold

In the sub-indexes of this object, with read and write access, you can set the variation of the sensor read value for which you want to transmit the measurement.

The values that the sub-indexes can take, with their relative value specified, are:

- 0, Disabled
- 1, 0.1 °C
- 2, 0.2 °C
- 3, 0.3 °C
- 4, 0.4 °C
- 5, 0.5 °C
- 6, 1 °C
- 7, 2 °C
- 8, 3 °C
- 9, 4 °C
- 10, 8 °C
- 11, 10 °C
- 12, 16 °C
- 13, 50 °C
- 14, 100 °C
- 15, 200 °C

#### 6.8.7.33 2603h AI RTD Sampling Threshold Timeout

In the sub-indexes of this object, with read and write access, you can set a value between 0 and 15 seconds, which indicates the transmission *timeout* of the values read by the channels of a specific module. When the module is set with threshold transmission, the data is sent each time the *timeout* is reached,



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regardless of the variation of the data. The *timeout* cannot be deactivated: the value 0 is interpreted as the default value, i.e. 1 second.

#### 6.8.7.34 2604h AI RTD Sampling Rate

In the sub-indexes of this object, with read and write access, you can set the transmission frequency of the measurement of a specific module to the master.

The values that the sub-indexes can take, with the relative sensor specified, are:

- 0, disabled (threshold transmission)
- 1, 1Hz
- 2, 2Hz
- 3, 5Hz
- 4, 10Hz
- 5, 25Hz
- 6, 50Hz
- 7, 100Hz
- 8, 250Hz
- 9, 500Hz
- 10, 1000Hz

When the module is operating in threshold mode, this parameter determines the upper frequency limit with which the data will be sent to the master, regardless of the frequency of variation of the input signal with respect to the threshold. This parameter cannot be deactivated: the value 0 is interpreted by the slave as a default value, i.e. 1 kHz.

#### 6.8.7.35 2605h AI RTD Filter

In the sub-indexes of this object, with read and write access, you can set a value between 0 and 128, which indicates the number of phases of the moving average filter that is applied to the measurement. If the value is set to 0 or 1, the filter is disabled.

#### 6.8.7.36 2610h AI TH Sensor Type

In the sub-indexes of this object, with read and write access, you can set the type of TH sensor (thermocouple) connected to a channel of a specific module.

The values that the sub-indexes can take, with the relative sensor specified, are:

- 0, channel disabled (no sensor connected)
- 1, B
- 2, E
- 3, J
- 4, K
- 5, N
- 6, R
- 7, S

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- 8, T

#### 6.8.7.37 2611h AI TH Sampling Threshold

In the sub-indexes of this object, with read and write access, you can set the variation of the sensor read value for which you want to transmit the measurement.

The values that the sub-indexes can take, with their relative value specified, are:

- 0, Disabled
- 1, 0.1 °C
- 2, 0.2 °C
- 3, 0.3 °C
- 4, 0.4 °C
- 5, 0.5 °C
- 6, 1 °C
- 7, 2 °C
- 8, 3 °C
- 9, 4 °C
- 10, 8 °C
- 11, 10 °C
- 12, 16 °C
- 13, 50 °C
- 14, 100 °C
- 15, 200 °C

#### 6.8.7.38 2612h AI TH Sampling Threshold Timeout

In the sub-indexes of this object, with read and write access, you can set a value between 0 and 15 seconds, which indicates the transmission *timeout* of the values read by the channels of a specific module. When the module is set with threshold transmission, the data is sent each time the *timeout* is reached, regardless of the variation of the data. The *timeout* cannot be deactivated: the value 0 is interpreted as the default value, i.e. 1 second.

#### 6.8.7.39 2613h AI TH Sampling Rate

In the sub-indexes of this object, with read and write access, you can set the transmission frequency of the measurement of a specific module to the master.

The values that the sub-indexes can take, with the relative sensor specified, are:

- 0, disabled (threshold transmission)
- 1, 1Hz
- 2, 2Hz
- 3, 5Hz
- 4, 10Hz
- 5, 25Hz

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- 6, 50Hz
- 7, 100Hz
- 8, 250Hz
- 9, 500Hz
- 10, 10000Hz

When the module is operating in threshold mode, this parameter determines the upper frequency limit with which the data will be sent to the master, regardless of the frequency of variation of the input signal with respect to the threshold. This parameter cannot be deactivated: the value 0 is interpreted as the default value, i.e. 1 kHz.

#### **6.8.7.40 2614h AI TH Filter**

In the sub-indexes of this object, with read and write access, you can set a value between 0 and 128, which indicates the number of phases of the moving average filter that is applied to the measurement. If the value is set to 0 or 1, the filter is disabled.

#### **6.8.7.41 2620h AI BRG Factor**

In the sub-indexes of this object, with read and write access, you can set a value expressed in  $\frac{mV}{V_{DC}}$  of the bridge connected to a channel of a specific module. If the set value is 0, the channel is disabled.

#### **6.8.7.42 2621h AI BRG Sampling Threshold**

In the sub-indexes of this object, with read and write access, you can set the variation of the sensor read value for which you want to transmit the measurement.

The values that the sub-indexes can take, with their relative value specified, are:

- 0, disabled
- 0, 1  $\mu V$
- 1, 2  $\mu V$
- 3, 3  $\mu V$
- 4, 4  $\mu V$
- 5, 5  $\mu V$
- 6, 10  $\mu V$
- 7, 20  $\mu V$
- 8, 30  $\mu V$
- 9, 40  $\mu V$
- 10, 80  $\mu V$
- 11, 100  $\mu V$
- 12, 160  $\mu V$
- 13, 500  $\mu V$
- 14, 1000  $\mu V$
- 15, 2000  $\mu V$

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#### 6.8.7.43 2622h AI BRG Sampling Threshold Timeout

In the sub-indexes of this object, with read and write access, you can set a value between 0 and 15 seconds, which indicates the transmission *timeout* of the values read by the channels of a specific module. When the module is set with threshold transmission, the data is sent each time the *timeout* is reached, regardless of the variation of the data. The *timeout* cannot be deactivated: the value 0 is interpreted as the default value, i.e. 1 second.

#### 6.8.7.44 2623h AI BRG Sampling Rate

In the sub-indexes of this object, with read and write access, you can set the transmission frequency of the measurement of a specific module to the master.

The values that the sub-indexes can take, with the relative sensor specified, are:

- 0, disabled (threshold transmission)
- 1, 1Hz
- 2, 2Hz
- 3, 5Hz
- 4, 10Hz
- 5, 25Hz
- 6, 50Hz
- 7, 100Hz
- 8, 250Hz
- 9, 500Hz
- 10, 1000Hz

When the module is operating in threshold mode, this parameter determines the upper frequency limit with which the data will be sent to the master, regardless of the frequency of variation of the input signal with respect to the threshold. This parameter cannot be deactivated: the value 0 is interpreted by the slave as the default value, i.e. 1 kHz.

#### 6.8.7.45 2624h AI BRG Filter

In the sub-indexes of this object, with read and write access, you can set a value between 0 and 128, which indicates the number of phases of the moving average filter that is applied to the measurement. If the value is set to 0 or 1, the filter is disabled.

#### 6.8.7.46 2630h AI CV Input Type

In the sub-indexes of this object, with read and write access, you can set the type of generic input connected to a channel of a specific module.

The values that the sub-indexes can take, with the relative sensor specified, are:

- 0, channel disabled (no sensor connected)
- 1, 0-10 V
- 2,  $\pm 10$  V
- 3, 4-20 mA

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- 4, 0-20 mA
- 5,  $\pm 20$  mA

#### 6.8.7.47 2631h AI CV Sampling Threshold

In the sub-indexes of this object, with read and write access, you can set the variation of the sensor read value for which you want to transmit the measurement.

The values that the sub-indexes can take, with their relative value specified, are:

- 0, disabled
- 0, 1 mV| $\mu$ A
- 1, 2 mV| $\mu$ A
- 3, 3 mV| $\mu$ A
- 4, 4 mV| $\mu$ A
- 5, 5 mV| $\mu$ A
- 6, 10 mV| $\mu$ A
- 7, 20 mV| $\mu$ A
- 8, 30 mV| $\mu$ A
- 9, 40 mV| $\mu$ A
- 10, 80 mV| $\mu$ A
- 11, 100 mV| $\mu$ A
- 12, 160 mV| $\mu$ A
- 13, 500 mV| $\mu$ A
- 14, 1000 mV| $\mu$ A
- 15, 2000 mV| $\mu$ A

#### 6.8.7.48 2632h AI CV Sampling Threshold Timeout

In the sub-indexes of this object, with read and write access, you can set a value between 0 and 15 seconds, which indicates the transmission *timeout* of the values read by the channels of a specific module. When the module is set with threshold transmission, the data is sent each time the *timeout* is reached, regardless of the variation of the data. The *timeout* cannot be deactivated: the value 0 is interpreted as the default value, i.e. 1 second.

#### 6.8.7.49 2633h AI CV Sampling Rate

In the sub-indexes of this object, with read and write access, you can set the transmission frequency of the measurement of a specific module to the master.

The values that the sub-indexes can take, with the relative sensor specified, are:

- 0, disabled (threshold transmission)
- 1, 1Hz
- 2, 2Hz
- 3, 5Hz
- 4, 10Hz

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- 5, 25Hz
- 6, 50Hz
- 7, 100Hz
- 8, 250Hz
- 9, 500Hz
- 10, 10000Hz

When the module is operating in threshold mode, this parameter determines the upper frequency limit with which the data will be sent to the master, regardless of the frequency of variation of the input signal with respect to the threshold. This parameter cannot be deactivated: the value 0 is interpreted as the default value, i.e. 1 kHz.

#### **6.8.7.50 2634h AI CV Filter**

In the sub-indexes of this object, with read and write access, you can set a value between 0 and 128, which indicates the number of phases of the moving average filter that is applied to the measurement. If the value is set to 0 or 1, the filter is disabled.

#### **6.8.7.51 2640h AO Module Setting**

In the sub-indexes of this object, with read and write access, you can set the type of generic output connected to a channel of a specific module.




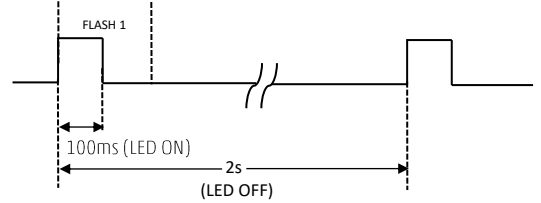
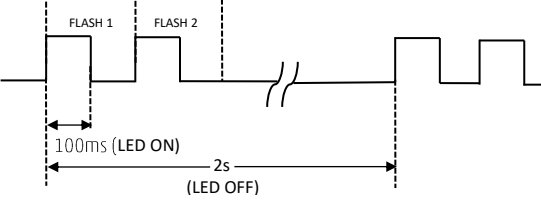
The values that the sub-indexes can take are:

- 0, disabled channel
- 1, 0÷10 V
- 2, 0÷5 V
- 3, 4÷20 mA
- 4, 0÷20 mA

## 7 Diagnostics

The diagnostics of the CX4 CANopen module, in Stand Alone configuration or as a Series D Serial valve island, is defined in three different ways.

- Software messages are routed over the CANopen network.
- The status of the LEDs on the CX4 or on the individual modules connected to it (see details in the chapter **Errore. L'origine riferimento non è stata trovata.**). The following table provides the typical behaviour of the LEDs on our modules. The colour of the LEDs can be different for each module (the table refers to a red LED).

Symbol	Led status	Description
	RED OFF	Led is OFF
	RED ON	Led is ON
	FLASHING	<p>The led flashes with a specified sequence for each diagnostic state: @XX [ms/Hz] every YY [s]</p> <ul style="list-style-type: none"> <li>XX is the ON time of a led flashing.</li> </ul> <p>The flashing sequence is represented by an ON state and an OFF state of the same time.</p> <ul style="list-style-type: none"> <li>YY is the time of the repeated flashing sequence.</li> </ul> <p>-----</p> <p>Example: 1 flash @100 ms every 2 s</p>  <p>Example: 2 flashes @100 ms every 2 s</p>  <p>-----</p>

- The UVIX user interface (Ch. **Errore. L'origine riferimento non è stata trovata.**)










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## 7.1 CX4 CANopen module

### 7.1.1 CANopen node

Diagnostics of the CANopen node are defined by the status of the two LEDs, Run CAN and Err CAN.








LED	Operation	Description
Run CAN	 GREEN OFF	The device is executing a reset.
	 1 flash GREEN @200 ms every 1.2 s	The device is in STOPPED state.
	 1 flash GREEN @200 ms every 400 ms (f = 2.5 Hz)	The device is in the PREOPERATIONAL state.
	 GREEN ON	The device is in the OPERATIONAL state.
Err CAN	 RED OFF	No error: the device is in the working condition.
	 1 flash RED @200 ms every 1.2 s	Warning Limit reached: at least one of the error counters of the CAN controller has reached or exceeded the warning level (too many error frames).
	 2 flashes RED @200 ms every 1.8 s	Error Control Event: A guard event (NMT Slave or NMT-master) or a heartbeat event (Heartbeat consumer) has occurred.
	 3 flashes RED @200 ms every 2.2 s off	The sync message was not received in the set cycle time (dictionary object 1006h).
	 RED ON	The CAN controller is bus off.






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### 7.1.2 CX4 system diagnostics

The diagnostic is transmitted to the controller through the specific object of the Code Emergency dictionary specific to the CANopen CiA 301 profile. The following table shows the operation of the LEDs, the codes of the CANopen messages that manage the diagnostics of the entire system and the messages that can be displayed on the UVIX interface.

Module status and alarms	SYS LED	CANopen messages			UVIX
		Diagnostic Status (0x1002)	CANopen Code	Extra Info CANopen	
Normal operation	 1 flash GREEN @100 ms every 1 s	0x00			
I/O modules absent	 1 flash GREEN @100 ms every 1 s	0x01			I/O modules absent
Valves absent	 1 flash GREEN @100 ms every 1 s	0x02			Valves absent
Valves substitution	 1 flash GREEN @100 ms every 1 s	0x03			Valve Subbase Substitution
Overheating CX4 module	 RED ON	0xFB	0x4201	Byte 1 = 0 Byte 2 = 0 Byte 3 = 0 Byte 4 = 0 Byte 5 = 0	Overheating CX4 module
Undervoltage CX4 module	 RED ON	0xFC	0x3120	Byte 1 = 0 Byte 2 = 0 Byte 3 = 0 Byte 4 = 0 Byte 5 = 0	Undervoltage CX4 module
Alarm of mapping I/O modules error	 2 flashes RED @100 ms every 1 s	0xFD	0xF003	Byte 1 = 0 Byte 2 = 0 Byte 3 = 0 Byte 4 = 0 Byte 5 = 0	Mapping I/O modules error

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Module status and alarms	SYS LED	CANopen messages			UVIX
		Diagnostic Status (0x1002)	CANopen Code	Extra Info CANopen	
Alarm of mapping valves error	 2 flashes RED @100 ms every 1 s	0xFE	0xF002	Byte 1 = 0 Byte 2 = 0 Byte 3 = 0 Byte 4 = 0 Byte 5 = 0	Mapping valves error
Alarm of mapping absent	 1 flash RED @100 ms every 1 s	0xFF	0xF001	Byte 1 = 0 Byte 2 = 0 Byte 3 = 0 Byte 4 = 0 Byte 5 = 0	Mapping absent
Alarms of valve errors or I/O module errors	 3 flashes RED @100 ms every 1 s	<b>NOTE.</b> The diagnostic states and CANopen codes are specified for each single module in the following tables.			

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### 7.1.3 CX4 module diagnostic solutions

#### 7.1.3.1 *Replace solenoid valve*

This warning indicates that the optimal performance of at least one solenoid valve has deteriorated and is no longer guaranteed.

**Solution:** replace the deteriorated solenoid valve.

**N.B.** To find out which solenoid valves on the island are in these conditions, you need to connect to the Camozzi user interface (UVIX) and check the health status of the individual solenoid valves (par. 9.2.2.1).

#### 7.1.3.2 *Fieldbus fatal error*

This alarm can occur for two reasons.

- The fieldbus has been programmed incorrectly and the board has no MAC address.
- The fieldbus version loaded on the board is incorrect.

**Solution:** reprogram the board with the correct firmware (par. **Errore. L'origine riferimento non è stata trovata.**). If the problem persists, contact Camozzi support.

#### 7.1.3.3 *Over-temperature alarm*

The CX4 module has reached or exceeded the limit temperature over which the normal operation of the device is not guaranteed and, if the condition persists, this can lead to the failure of a component on the board.

**Solution:** restart the island; if the problem persists, contact Camozzi support.

#### 7.1.3.4 *Undervoltage alarm*

The CX4 module is powered with a voltage lower than the minimum acceptable value; therefore, correct operation of the system is not guaranteed.

**Solution:** check that the wiring is correct and that the wires are properly inserted into the connector. Check that the logic supply (pins 1 and 3) and power supply (pins 2 and 5) are physically present on the connector. If the problem persists, contact Camozzi support.

#### 7.1.3.5 *Alarm - I/O module mapping error*

During the mapping phase (par. 6.3), an error has occurred on the I/O modules. The mapping has failed at the first I/O module with the diagnostic LED off.

**Solution:** repeat the mapping procedure and replace where necessary the I/O module where the mapping ends (first I/O module with diagnostic LED off). If the problem persists, contact Camozzi support.

#### 7.1.3.6 *Alarm - Solenoid valve mapping error*

During the mapping phase (par. 6.3), a solenoid valve error has occurred on the sub-base. The mapping has failed at the first sub-base with the diagnostic LED off.

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**Solution:** repeat the mapping procedure and replace where necessary the sub-base where the mapping ends (first sub-base with diagnostic LED off). If the problem persists, contact Camozzi support.

#### **7.1.3.7 Alarm - No mapping**

After requesting a new system mapping (par. 6.3), an error has occurred both on the I/O modules and on the solenoid valve sub-bases. The mapping ends at the first accessory module (I/O module or sub-base) with the diagnostic LED off.

**Solution:** repeat the mapping procedure and replace where necessary the sub-base where the mapping ends (first accessory module with diagnostic LED off). If the problem persists, contact Camozzi support.

#### **7.1.3.8 Solenoid valve or I/O module alarms**

These alarms are specific for each individual accessory module. The UVIX and PROFINET/IO messages are specified in the following tables, while the diagnostics via LEDs - found on each individual module - and the specific solutions are detailed in the accessories section (cap. **Errore. L'origine riferimento non è stata trovata.**).

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## 7.2 Series D valve sub-bases

The following table shows the diagnostic status of the Series D coil valves, with the respective CANopen messages and the display on the UVIX interface. The valves display a diagnostic signal through LED signalling directly on the sub-base where they are mounted. For details regarding LED diagnostics and possible solutions to any alarms, refer to the Accessories chapter (par. 0).

Module status and alarms	CANopen messages			UVIX
	Diagnostic Status (0x1002)	CANopen Code	Extra Info CANopen	
Configuration parameters	0xE6	0xF011	Byte 1 = bus type = 2 (CAN) Byte 2 = board type = 1 (Dig. In) Byte 3 = board number Byte 4 = 0 Byte 5 = 0	
Overheating subbase	0xE8	0x4202	Byte 1 = bus type = 1 (485) Byte 2 = board type = 2 (bis. V.) Byte 3 = board number Byte 4 = 0 Byte 5 = 0	Overheating subbase
Overheating coil (Position 14/12)	0xE9	0x4203	Byte 1 = bus type = 1 (485) Byte 2 = board type = 2 (bis. V.) Byte 3 = board number Byte 4 = Coil Id Byte 5 = 0	Overheating coil 14/12
Overcurrent coil (Position 14/12)	0xEA	0x2320	Byte 1 = bus type = 1 (485) Byte 2 = board type = 2 (bis. V.) Byte 3 = board number Byte 4 = Coil Id Byte 5 = 0	Overcurrent coil 14/12
Interrupted coil (Position 14/12)	0xEB	0xF005	Byte 1 = bus type = 1 (485) Byte 2 = board type = 2 (bis. V.) Byte 3 = board number Byte 4 = Coil Id Byte 5 = 0	Interrupted coil 14/12
Fault coil (Position 14/12)	0xEC	0xF004	Byte 1 = bus type = 1 (485) Byte 2 = board type = 2 (bis. V.) Byte 3 = board number Byte 4 = Coil Id Byte 5 = 0	Fault coil 14/12
Communication alarm	0xEF	0xF006	Byte 1 = bus type = 1 (485) Byte 2 = board type = 2 (bis. V.) Byte 3 = board number Byte 4 = 0 Byte 5 = 0	Communication alarm

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### 7.3 Digital Input Modules

The following table shows the diagnostic statuses of the digital inputs, with the respective CANopen messages and the display on the UVIX interface. The digital inputs also display a diagnostic signal via LED signalling directly on the module. Details on LED diagnostics and possible solutions to any alarms can be found in the chapter Accessories (par. 8.2.5).

Module status and alarms	CANopen messages			UVIX
	Diagnostic Status (0x1002)	CANopen Code	Extra Info CANopen	
Short circuit on the channel n	0xDD	0x2321	Byte 1 = bus type = 2 (CAN) Byte 2 = board type = 1 (Dig. In) Byte 3 = board number Byte 4 = channel number Byte 5 = 0	Short circuit Group 0-3 Short circuit Group 4-7 Short circuit Group 8-11 Short circuit Group 12-15
Configuration parameters alarm	0xDE	0xF008	Byte 1 = bus type = 2 (CAN) Byte 2 = board type = 1 (Dig. In) Byte 3 = board number Byte 4 = 0 Byte 5 = 0	Configuration alarm
Communication alarm	0xDF	0xF007	Byte 1 = bus type = 2 (CAN) Byte 2 = board type = 1 (Dig. In) Byte 3 = board number Byte 4 = 0 Byte 5 = 0	Communication alarm

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## 7.4 Digital Output Modules

The following table shows the diagnostic statuses of the digital outputs, with the respective CANopen messages and the display on the UVIX interface. The digital outputs display a diagnostic signal via LED signalling directly on the module. Details on LED diagnostics and possible solutions to any alarms can be found in the chapter Accessories (par. 8.3.4).

**NOTE.** 16-channel digital output modules require an external power supply.

Module status and alarms	CANopen messages			UVIX
	Diagnostic Status (0x1002)	CANopen Code	Extra Info CANopen	
Short circuit on the channel n	0xCA	0x2322	Byte 1 = bus type = 2 (CAN) Byte 2 = board type = 1 (Dig. In) Byte 3 = board number Byte 4 = channel number Byte 5 = 0	Short Circuit Channel n
Open circuit on the channel n	0xCB	0x2323	Byte 1 = bus type = 2 (CAN) Byte 2 = board type = 1 (Dig. In) Byte 3 = board number Byte 4 = channel number Byte 5 = 0	Open Load Channel n
Undervoltage power line*	0xCC	0x3121	Byte 1 = bus type = 2 (CAN) Byte 2 = board type = 1 (Dig. In) Byte 3 = board number Byte 4 = 0 Byte 5 = 0	Under Voltage Power Supply
No external power line*	0xCD	0x3122	Byte 1 = bus type = 2 (CAN) Byte 2 = board type = 1 (Dig. In) Byte 3 = board number Byte 4 = 0 Byte 5 = 0	Zero Voltage Power Supply
Configuration parameters alarm	0xCE	0xF00A	Byte 1 = bus type = 2 (CAN) Byte 2 = board type = 1 (Dig. In) Byte 3 = board number Byte 4 = 0 Byte 5 = 0	Configuration alarm
Communication alarm	0xCF	0xF009	Byte 1 = bus type = 2 (CAN) Byte 2 = board type = 1 (Dig. In) Byte 3 = board number Byte 4 = 0 Byte 5 = 0	Communication alarm

\* Power supply alarms refer to the external power supply for 16-channel modules.

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## 7.5 Analogue Input Modules

### 7.5.1 Data format

Each channel restores the conversion of the corresponding input into a 16-bit or 32-bit word. The datum is represented in 2's complement and, depending on the module, corresponds to different values.

Module	Word transmitted	Data format	Size
RTD	16 bit	16 bit, 2's complement	°C/10
THERMOCOUPLES	16 bit	16 bit, 2's complement	°C/10
BRIDGE	32 bit	24 bit, 2's complement	µV
VOLTAGE/CURRENT	16 bit	16 bit, 2's complement	mV, µA

Each channel is also associated with a diagnostics byte which reports the errors indicated in the diagnostic. In case of correct operation, the diagnostics byte is equal to 0. Otherwise, it is possible to analyse the error by referring to the paragraph on the field bus.

If the diagnostics byte is different from 0, the bridge module will send data equal to 0x7FFFF while all the others will transmit the value 0x7FFF.

The data format used by the CX4 for communication with the PLC is of the *big endian* type for the CANopen protocol.

### Example

In the "big endian" format, the most significant byte (MSB) is sent first. For example, the value 100000 µV (0x186A0) received from a BRIDGE module will be sent as follows:

	MSB	MID	LSB
Address	0x00	0x01	0x02
Datum	0x01	0x86	0xA0

### 7.5.2 Diagnostic messages

The following table shows the diagnostic statuses of the analogue inputs, with the respective CANopen messages and the display on the UVIX interface. The analogue inputs display a diagnostic signal via LED signalling directly on the module. Details regarding LED diagnostics and possible solutions to any alarms can be found in the chapter Accessories (par. 8.4.3).



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Module status and alarms	CANopen messages			UVIX
	Diagnostic Status (0x1002)	CANopen Code	Extra Info CANopen	
Sensor fault on channel 1	0xB6	0xF0A0	Byte 1 = 2 (CAN bus) Byte 2 = Board Type Byte 3 = Board Number Byte 4 = 1 (channel id)	Sensor fault channel 1
Missing bridge on channel 1	0xB7	0xF0A1	Byte 1 = 2 (CAN bus) Byte 2 = 8 (Bridge Type) Byte 3 = Board Number Byte 4 = 1 (channel id)	Missing bridge channel 1
ADC communication alarm	0xB8	0xF0A2	Byte 1 = 2 (CAN bus) Byte 2 = Board Type Byte 3 = Board Number	ADC communication error
Alarm on the voltage reference 3.3V	0xB9	0xF0A3	Byte 1 = 2 (CAN bus) Byte 2 = Board Type Byte 3 = Board Number	RESDCDC error
Sensor fault on channel 2	0xBA	0xF0A0	Byte 1 = 2 (CAN bus) Byte 2 = Board Type Byte 3 = Board Number Byte 4 = 2 (channel id)	Sensor fault channel 2
Missing bridge on channel 2	0xBB	0xF0A1	Byte 1 = 2 (CAN bus) Byte 2 = 8 (Bridge Type) Byte 3 = Board Number Byte 4 = 2 (channel id)	Missing bridge channel 1
Configuration parameters alarm	0xBE	0xF00D	Byte 1 = 2 (CAN bus) Byte 2 = Board Type Byte 3 = Board Number	Configuration alarm
Communication alarm	0xBF	0xF00C	Byte 1 = 2 (CAN bus) Byte 2 = Board Type Byte 3 = Board Number	Communication alarm

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## 7.6 Analogue Output Modules

### 7.6.1 Data format

Each channel restores the conversion of the corresponding input into a 16-bit.

Module	Word transmitted	Data format	Size
VOLTAGE/CURRENT	16 bit	16 bit	mV, uA

The data format used by the CX4 for communication with the PLC is of the *big endian* type for the CANopen protocol.

#### Example

In the "big endian" format, the least significant byte (MSB) is sent first. For example, the value 5000 mV (0x1388) received from a V/C module will be sent as follows:

	MSB	LSB
Data	0x13	0x88

### 7.6.2 Diagnostic messages

The following table shows the diagnostic statuses of the analogue outputs, with the respective CANopen messages and the display on the UVIX interface. The analogue outputs display a diagnostic signal via LED signalling directly on the module. Details regarding LED diagnostics and possible solutions to any alarms can be found in the chapter Accessories (par. 0).

Module status and alarms	CANopen messages			UVIX
	Diagnostic Status (0x1002)	Diagnostic Status (0x1002)	Diagnostic Status (0x1002)	
Internal error	0xA9	0xF012	Byte 1 = 2 (CAN bus) Byte 2 = Board Type Byte 3 = Board Number	Internal Error
Open circuit on the channel n	0xAA	0xF013	Byte 1 = 2 (CAN bus) Byte 2 = Board Type Byte 3 = Board Number Byte 4 = 2 (channel id)	Channel n Open Load
Over Heating	0xAB	0xF014	Byte 1 = 2 (CAN bus) Byte 2 = Board Type Byte 3 = Board Number	Board Over Heating

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Module status and alarms	CANopen messages			UVIX
	Diagnostic Status (0x1002)	Diagnostic Status (0x1002)	Diagnostic Status (0x1002)	
Power Supply Short Circuit	0xAC	0xF015	Byte 1 = 2 (CAN bus) Byte 2 = Board Type Byte 3 = Board Number	Power Supply Short Circuit
Power Supply Under Voltage	0xAD	0xF016	Byte 1 = 2 (CAN bus) Byte 2 = Board Type Byte 3 = Board Number	Power Supply Under Threshold
Configuration parameters alarm	0xAE	0xF017	Byte 1 = 2 (CAN bus) Byte 2 = Board Type Byte 3 = Board Number	Configuration alarm
Communication alarm	0xAF	0xF018	Byte 1 = 2 (CAN bus) Byte 2 = Board Type Byte 3 = Board Number	Communication alarm

## 8 Accessories

### 8.1 Series D valve sub-bases

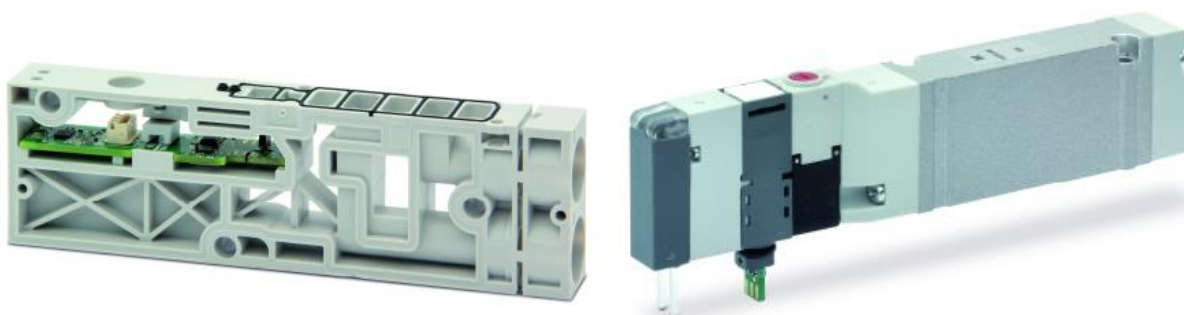
The CX4 can be used to create a Series D Serial valve island by connecting the sub-bases on the pneumatic side to allow the new Camozzi Series D coil valves to be connected.

Series D valves are available in three sizes depending on the pitch:

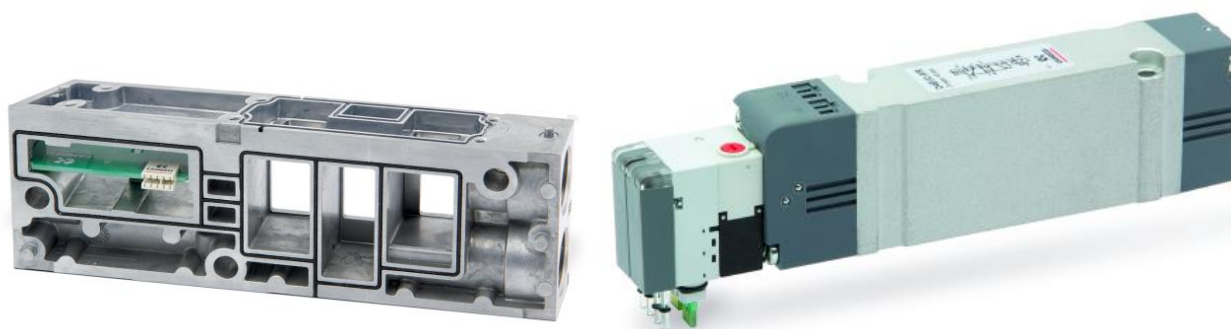
- Series D1 coil valves, 10.5 mm pitch



- Series D2 coil valves, 16 mm pitch



- Series D4 coil valves, 25 mm pitch



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### 8.1.1 Technical Data

Key feature	Value
Construction	Balanced spool
Valve functions	2x3/2 NC/NO/NC+NO; 5/2; 5/3 CC/CO/CP
Materials	body, spool= AL; bases, end cover = technopolymer; bases = AL only D4; seals = HNBR
Attachments	Variable Bushings Ø (D1-D2-D5) Thread G3/8 (D4)
Ambient temperature	0÷50 °C
Fluid	<ul style="list-style-type: none"> <li>Compressed air filtered and not lubricated in class 7.4.4 according to ISO 8573-1: 2010.</li> <li>If lubrication is required, use only oils with max. viscosity. 32 Cst and the version with external servo drive.</li> <li>The servo drive air quality must be in class 7.4.4 according to ISO 8573-1:2010.</li> </ul>
Voltage	24 Vdc
Voltage tolerance	± 10%
Absorption	1 W
Insulation class	class F

### 8.1.2 Coilvision








The sub-bases of Series D valves are equipped with **COILVISION** technology. This technology was developed to constantly monitor the functional parameters of the coil that drives the spool. Each actuation of the coil, in different cyclic configurations and environmental conditions, is analysed to acquire information which, when processed by software algorithms, allows the health of the component to be diagnosed and predicted.

The information on the health status of the solenoid valve is data supplied by the CX4 module to the PLC and via the UVIX browser interface in the form of a percentage and gauge indicator (par. 9.2.2.1). Via UVIX, you can also receive a replace solenoid valve warning when its performance has deteriorated (par. 9.2.2.2).

### 8.1.3 Sub-base diagnostics

The diagnostics of the sub-bases for the coil valves are defined by coded flashing of the yellow LED associated with the single coil (the sub-base D4 is associated to two yellow LEDs with the same behaviour for each single coil).

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Module status and alarms	LED status	Description of the status and solutions of the alarms
Normal operation without alarms	 YELLOW OFF	The valve is not controlled.
	 YELLOW ON	The valve has been operated correctly.
Fault coil (Position 14/12)	 1 flash YELLOW @100 ms every 1 s	The coil did not energise properly. <b>Solution:</b> the alarm is not blocking, so try operating the coil valve again. If the problem persists, replace the coil valve.
Interrupted coil (Position 14/12)	 2 flashes YELLOW @100 ms every 1 s	The coil is interrupted or missing. This alarm may be blocking (if configured as such) and therefore the island must be restarted. <b>Solution:</b> replace the coil valve.
Overcurrent coil (Position 14/12)	 3 flashes YELLOW @100 ms every 1 s	The current consumption of the coil is excessive and therefore the coil valve is automatically switched off. <b>Solution:</b> replace the coil valve.
Overheating coil (Position 14/12)	 3 flashes YELLOW @100 ms every 1 s	The coil temperature is too high. This alarm may be blocking (if configured as such) and therefore the island must be restarted. <b>Solution:</b> remove the ON control on the coil valve and allow the coil to cool down. If the problem persists, replace the coil valve.
Overheating subbase	 5 flashes YELLOW @100 ms every 1 s	The sub-base electronics temperature is too high. <b>Solution:</b> switch off the island and let the device cool down. If the problem persists, contact support and replace the sub-base.

**NOTE.** The interrupted coil and overcurrent alarms can block operation (configurable feature) and can only be reset by restarting the entire system.

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## 8.2 Digital Input Modules

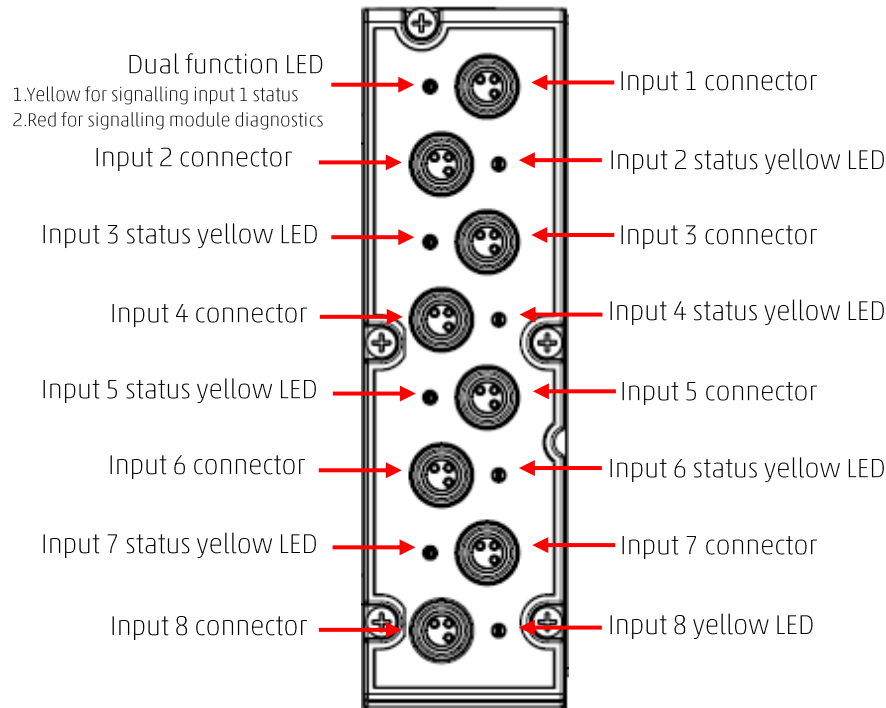
### 8.2.1 General operation

The digital input module allows 8 or 16 digital signals to be monitored. 2-wire or 3-wire digital sensors can be connected, with the option of powering the sensors directly through the module (24 V power supply).

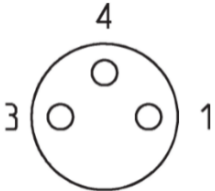
After being connected to the CX4 module, the digital input module must be mapped from the island (par. *Errore. L'origine riferimento non è stata trovata.*). If the mapping procedure ends successfully, the digital input module waits to receive the configuration parameters from the CX4 module (maximum wait 1 minute). Upon receipt of these parameters, the module enters the normal operating state and the digital inputs can be read. Otherwise, if the mapping procedure is not completed successfully, the module remains in an error state, deactivating any operational function.

There is a dedicated diagnostic LED for each input, although the LED of the first channel is used for general diagnostics. (par. 8.2.5).

### 8.2.2 Connections and signals of the 8 digital input modules (M8 version)




#### 8.2.2.1 M8 connectors pinout

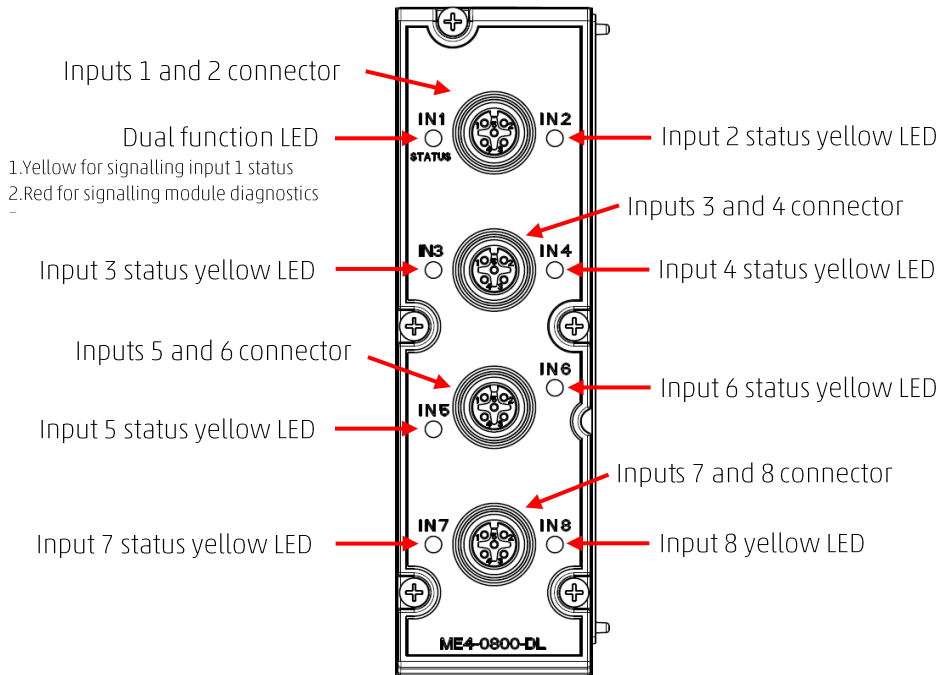
Pin	Signal	Description	Symbol
1	VCC	24 Vdc power supply supplied by the module to outside	
3	GND	Reference	
4	Input	Input (max 100 mA for each input)	

**NOTE.** For the digital input modules, the M8 3-pole male connector for wiring is available in the Camozzi catalogue (cod. CS-DM03HB)




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### 8.2.3 Connections and signals of the 8 digital input modules (M12 version)



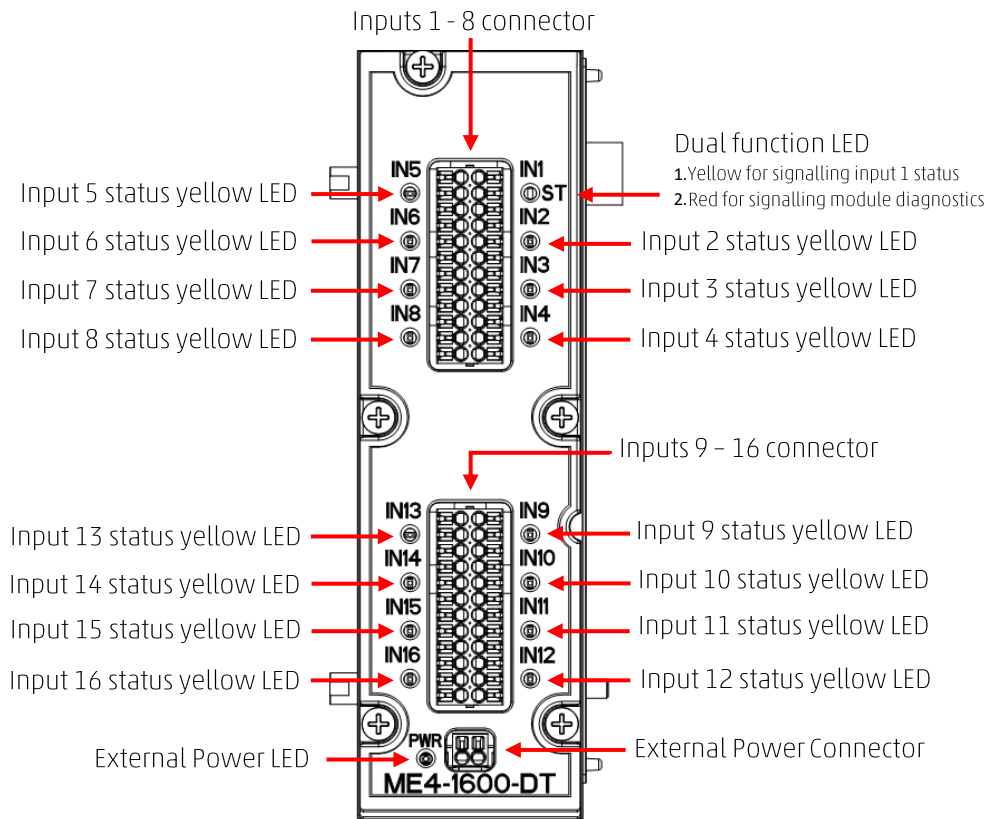
#### 8.2.3.1 M12 connectors pinout

Pin	Signal	Description	Symbol
1	VCC	24 Vdc power supply supplied by the module to outside	
2	Input n+1	Input n+1 (max 100 mA for each input)	
3	GND	Reference	
4	Input n	Input n (max 100 mA for each input)	

**NOTE.** For the digital input modules, the M12 5-pole male connector for wiring (DUO version, with two possible cables to wire) is available in the Camozzi catalogue (code CS-LD05HF). Also, the M12 5-pole male connector for single wiring (CANopen Bus-Out) is available in the Camozzi catalogue (code CS-LM05HC).

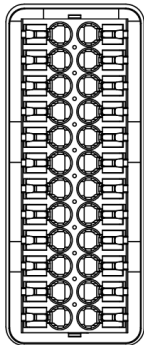
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#### 8.2.4 Connections and signals of the 16 digital input modules



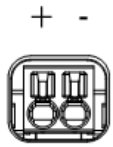
##### 8.2.4.1 Input connectors pinout

The 16-channel connector is a RTB (DFMC and FMC series from Phoenix). The cables must have a cross-section of 0.5mm<sup>2</sup> and a 0.4x2 screwdriver can be used to remove the terminal block from the module as per the datasheet.

Pin	Signal	Description	Symbol
1	VCC	24 Vdc power supply supplied by the module to outside	
2	Input	Channel 1 input (max 50 mA for each input with internal power supply; 125 mA with external power supply)	
3	GND	Reference	

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#### 8.2.4.2 External power supply connector pinout

Pin	Signal	Description	Symbol
1	+	Input 24Vdc	
2	-	GND reference	

### 8.2.5 Module diagnostics

#### 8.2.5.1 General diagnostic LED



The signalling LED of the first channel has the dual function of indicating the module diagnostics, as well as the activation status of the channel itself. When the module experiences certain conditions, the LED behaves as described in the following table.

Module status and alarms	LED status	Description of the status and solutions of the alarms
Start-up End of the mapping or configuration phase	 RED OFF	The module enters this state upon power-up and at the end of the mapping phase or the reception of configuration parameters.
Mapped module	 RED ON	The LED is lit during the mapping phase and is turned off if this procedure is completed successfully.
Waiting for configuration parameters	 1 flash RED @100 ms every 2 s	The module is waiting for configuration parameters (maximum duration 1 minute).
Communication alarm	 2 flashes RED @100 ms every 2 s	The alarm indicates that there is no communication between the digital input module and the CX4 module. <b>Solution:</b> Try restarting the whole island and verifying that the physical connection to the digital input module is secure. If the problem persists, contact support and replace the digital input module.
Short circuit on digital input channels	 RED ON	At least one of the digital inputs is short-circuited. <b>Solution:</b> Remove the input sensor and check the connection. If the problem persists, replace the sensor.

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### 8.2.5.2 Inputs status LED





When the module is in normal operating mode (fully operational and with no particular critical issues), the LED of the first channel behaves like the signalling LEDs of the remaining channels (from 2 to 16), i.e. it is lit and yellow when the input is active and off when the input is inactive.


Input status	LED status	Description
Input n inactive	 YELLOW OFF	The LED indicates that the corresponding digital input is not active.
Input n activated	 YELLOW ON	The LED indicates that the corresponding digital input has activated successfully.

### 8.2.5.3 Diagnostic LED of the external power supply

In the 16-channel configuration, the digital input module is equipped with a connector for the external power supply with associated signalling LED.

**NOTE.** The external power supply can be enabled or disabled through the configuration parameters from the controller/PLC or from UVIX.

External power status	LED status	Description of the status and solutions of the alarms
Not configured	 LED OFF	Power for the digital inputs is supplied directly from the digital input module.
External power supply present	 GREEN ON	External power is present, and the digital inputs are externally powered. For this mode, the parameter for using the external power supply must be configured correctly.
No external power supply	 RED ON	The module is configured to receive an additional external power supply but this is not being detected by the module. <b>Solution:</b> Check that the power is reaching the module correctly and that the connection has been made correctly.
Configured (External power supply out of range)	 1 flash RED @100 ms very 1 s	The module is configured to receive an additional external power supply but this has a value of <21 Vdc or >27 Vdc. <b>Solution:</b> change the value of the power supply from the outside, bringing it within the proper operating range ( $21 \text{ Vdc} \leq V_{cc} \leq 27 \text{ Vdc}$ ).

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### 8.3 Digital Output Modules

#### 8.3.1 General operation

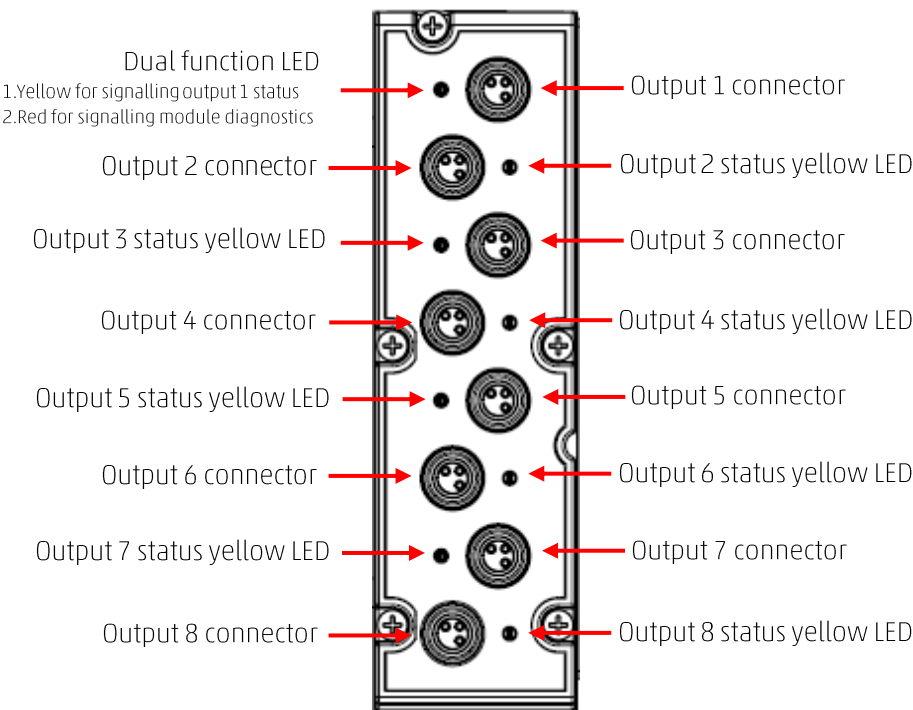
The digital output module allows 8 or 16 digital signals to be provided outside the system. 2-wire or 3-wire digital actuators, type P or N, can be connected.

**NOTE.** The 16-channel digital output module must be externally powered.

The digital output module, after being connected to the CX4 module, must be mapped by the island (par. Errore. L'origine riferimento non è stata trovata.). If the mapping procedure is completed successfully, the digital output module waits to receive the configuration parameters from the CX4 module (maximum wait 1 minute). Once these parameters have been received, the module enters the normal operational state and the digital outputs can be activated. Otherwise, if the mapping procedure is not end successfully, the module remains in an error state, deactivating any operational functionality.

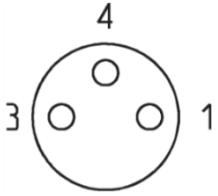
For each input there is a dedicated diagnostic LED, while for general diagnostics the LED of the first channel is used (par. 8.3.4).

#### 8.3.2 Connections and signals of the 8 digital output modules



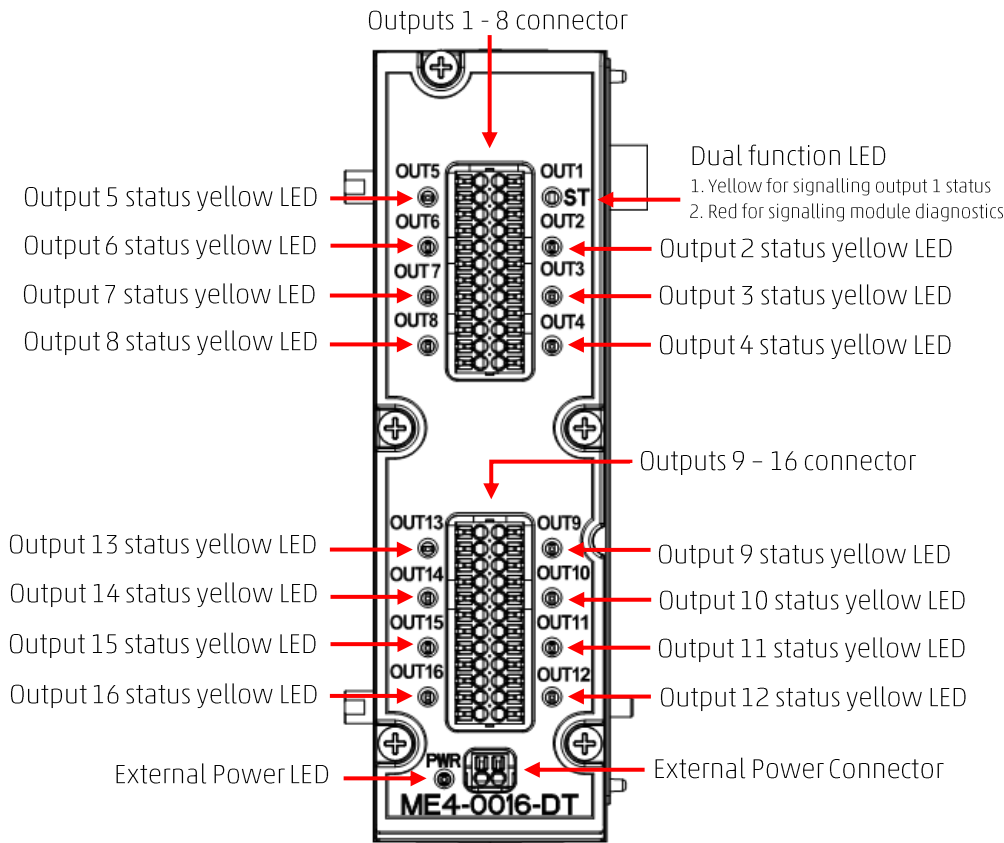
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### 8.3.2.1 M8 connectors pinout

Pin	Signal	Description	Symbol
1	VCC	24 Vdc power supply supplied by the module to outside	
3	GND	Reference	
4	Output	Output (max 125 mA for each output)	

**NOTE.** For the digital output modules, the M8 3-pole male connector for wiring is available in the Camozzi catalogue (cod. CS-DM03HB).

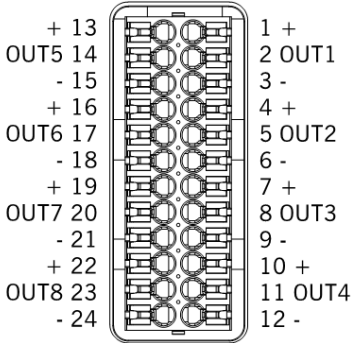
### 8.3.3 Connections and signals of the 16 digital output modules




#### 8.3.3.1 Output connectors pinout

The 16-channel connector is a RTB (DFMC and FMC series from Phoenix). The cables must have a cross-section of 0.5 mm<sup>2</sup> and a 0.4x2 screwdriver can be used to remove the terminal block from the module as per the datasheet.

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Pin	Signal	Description	Symbol
1	VCC	24 Vdc power supply supplied by the module to outside	
2	Output	Output channel 1 (125 mA)	
3	GND	Reference	




#### 8.3.3.2 External power supply connector pinout

Pin	Signal	Description	Symbol
1	+	Input 12÷32 Vdc	
2	-	GND reference	






### 8.3.4 Module diagnostics

#### 8.3.4.1 General diagnostic LED

The signalling LED of the first channel has the dual function of indicating the module diagnostics, as well as the activation status of the channel itself. When the module experiences certain conditions, the LED behaves as described in the following table.

Module status and alarms	LED status	Description of the status and solutions of the alarms
Start-up End of the mapping or configuration phase	 RED OFF	The module enters this state when it is switched on, at the end of the mapping phase and when the configuration parameters are received.
Mapped module	 RED ON	The LED is lit during the mapping phase and is switched off if this procedure is completed successfully.
Waiting for configuration parameters	 1 flash RED @100 ms every 2 s	The module is waiting for configuration parameters (maximum duration 1 minute).



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Module status and alarms	LED status	Description of the status and solutions of the alarms
Short circuit on digital output channels	 RED ON	At least one of the digital outputs is short-circuited. <b>Solution:</b> check the connection and, if necessary, remove the output load and replace it.
Open circuit on digital output channels	 3 flashes RED @100 ms every 2 s	At least one output is not connected to the load and the open circuit is detected. <b>Solution:</b> check the load connection with the output connector.
Undervoltage voltage supply*	 4 flashes RED @100 ms every 2s	The supply voltage is less than 4.5 V. <b>Solution:</b> change the power supply value and return to the correct operating range (Vcc = 24 V).
No voltage supply*	 4 flashes RED @100 ms every 2 s	Circuit power is missing or shorted. <b>Solution:</b> check that the power reaches the module correctly and that the connection has been made correctly.
Communication alarm	 2 flashes RED @100 ms every 2 s	No response from the CX4 to output status and diagnostic signalling. <b>Solution:</b> contact support and replace the digital output module cover.

\* Power supply alarms refer to external power supply for 16-channel modules.

#### 8.3.4.2 Outputs status LED

When the module is in normal operating mode (fully operational and with no particular critical issues), this LED behaves like the signalling LEDs of the remaining channels (from 2 to 16), i.e. it is lit and yellow when the output is active and off when the output is inactive.

Output status	LED status	Description
Output n inactive	 YELLOW OFF	The LED indicates that the corresponding digital output is not active.
Output n activated	 YELLOW ON	The LED indicates that the corresponding digital output has activated successfully.





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#### 8.3.4.3 Diagnostic LED of the external power supply

In the 16-channel configuration, the digital output module is equipped with a connector for the external power supply with associated signalling LED.

**NOTE.** It is mandatory for the external power supply to be connected.

External power status	LED status	Description of the status and solutions of the alarms
External power supply ok	 GREEN ON	The module is correctly receiving the additional external power supply.
No external power supply	 GREEN OFF	The module does not detect the additional power supply and therefore cannot work. <b>Solution:</b> verify that power is reaching the module properly. If the problem persists, contact support and replace the module.

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## 8.4 Analogue Input Modules

### 8.4.1 General operation

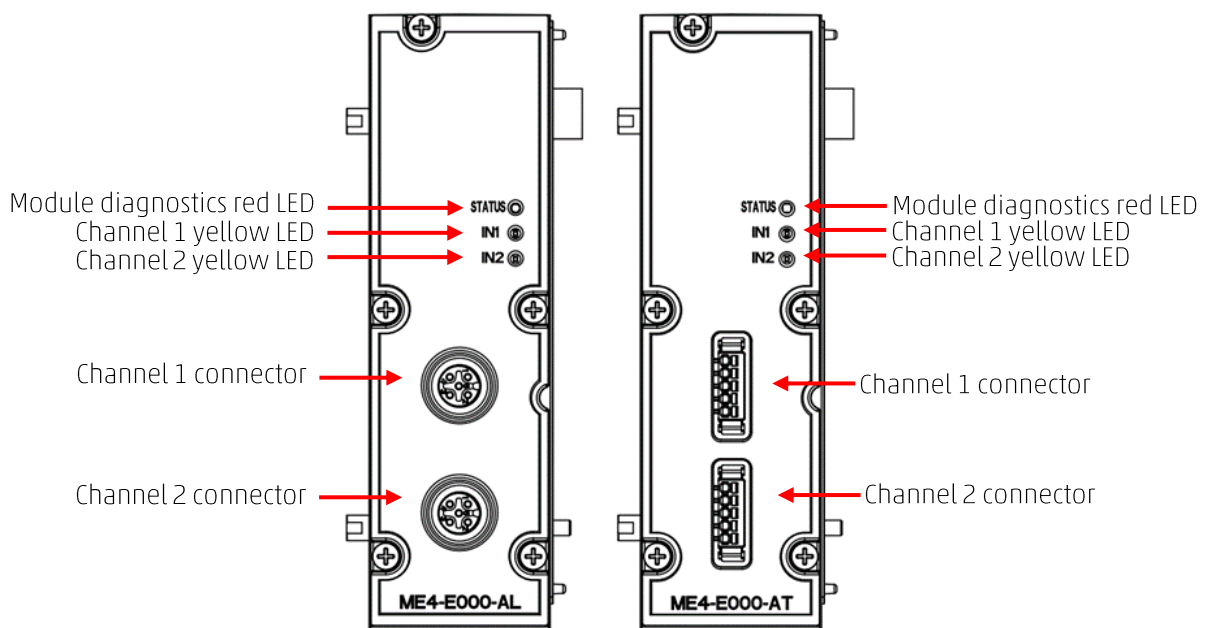
The analogue input module can monitor two analogue sensors simultaneously. The types of sensors that can be connected are:

- Resistance thermometers (RTD) for temperature measurement.
- Thermocouples for temperature measurement.
- Bridge for resistance measurement.
- Generic sensors with voltage or current outputs.

The analogue input module, after being connected to the CX4 module, must be mapped from the island (par. **Errore. L'origine riferimento non è stata trovata.**). If the mapping procedure is completed successfully, the module waits to receive the configuration parameters from the CX4 module. Upon receipt of these parameters, the module enters the normal operating state and the analogue inputs can be read out. Otherwise, if the mapping procedure is not completed successfully, the module remains in an error state, deactivating any operational function.



















### 8.4.2 Connections and signals of the modules

The analogue modules can have two types of connectors for connections with sensors. In the following figure, the left side shows an analogue module with 5-pole coded M12 A female connectors, while the right side shows an analogue module with 5-pole female TB connectors. The different types of analogue input modules have specific pinouts dedicated to their functionality. Visual indication of operation and diagnostics is via three LEDs.












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#### 8.4.3 Module diagnostics

Module status and alarms	LED STATUS	LED IN1	LED IN2	Description of the status and solutions of the alarms
Waiting for configuration parameters	 1 flash RED @100 ms every 2 s	 YELLOW OFF	 YELLOW OFF	The module is waiting for configuration parameters (maximum duration 1 minute).
Sensor working on channel 1	 RED OFF	 YELLOW ON	 YELLOW OFF	The sensor connected to channel 1 is functioning correctly.
Sensor working on channel 2	 RED OFF	 YELLOW OFF	 YELLOW ON	The sensor connected to channel 2 is functioning correctly.
Sensor alarm on channel 1	 2 flashes RED @100 ms every 2 s	 2 flashes YELLOW @100 ms every 2 s	 YELLOW OFF	Sensor fault enabled and connected on channel 1. <b>Solution:</b> check the correct connection of the sensor and its power supply.
Bridge sensor missing on channel 1	 3 flashes RED @100 ms every 2 s	 3 flashes YELLOW @100ms every 2s	 YELLOW OFF	Bridge sensor missing or faulty when configuring the module on channel 1. (This error is only valid for bridge type modules and remains in place until the module is restarted) <b>Solution:</b> Check sensor connections and restart the module.
Sensor alarm on channel 2	 2 flashes RED @100 ms every 2 s	 YELLOW OFF	 2 flashes YELLOW @100 ms every 2 s	Sensor fault enabled and connected on channel 2 <b>Solution:</b> check that the sensor and its power supply are connected correctly.

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Module status and alarms	LED STATUS	LED IN1	LED IN2	Description of the status and solutions of the alarms
Bridge sensor missing on channel 2	 3 flashes RED @100 ms every 2 s	 YELLOW OFF	 3 flashes YELLOW @100 ms every 2 s	Bridge sensor missing or faulty when configuring the module on channel 2. (This error is only valid for bridge type modules and remains in place until the module is restarted) <b>Solution:</b> Check sensor connections and restart the module.
ADC communication error	 4 flashes RED @100 ms every 2 s	 YELLOW OFF	 YELLOW OFF	It occurs in the event of communication problems between the microcontroller and the ADC that measures the physical input quantity. <b>Solution:</b> Contact support and replace the module.
Reference voltage 3.3V error	 RED ON	 YELLOW OFF	 YELLOW OFF	Occurs when there is a problem with the logic voltage (3.3V). <b>Solution:</b> Contact support and replace the module.

**NOTE.** For a detailed description of the sensor faults, refer to the specific paragraphs of each module (RTD, thermocouples, bridge and V/C modules).

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#### 8.4.4 RTD Module (Resistance Temperature Detector)

Resistance temperature detectors (RTDs) can be connected to these analogue modules for temperature measurement. It is possible to configure some parameters individually to take the measurements.


##### 8.4.4.1 Technical Data

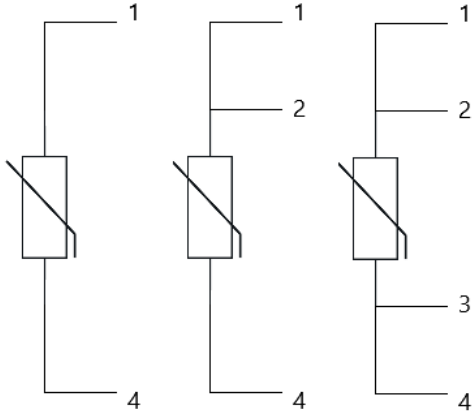

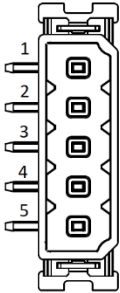
Key feature	Value		
Sensor types	Type	Temperature [°C]	
		Minimum	Maximum
	PT100 (385)	-200	850
	PT100 (3926)	-200	630
	PT200 (385)	-200	850
	PT500 (385)	-200	850
	PT1000 (385)	-200	850
	Ni100 (618)	-60	180
	Ni120 (672)	-80	260
	Ni1000 (618)	-60	250
Type of connections	2/3/4 wires		
Number of inputs	2		
Sensor connections	M12 A-coded 5 pole female connectors for each input TB 5 pole female connectors for each input		
Converter resolution	16 bit		
Reading resolution	0.1 °C		
Measurement error	< ±1 °C		
Sampling frequency	4 Hz for each input		
Digital filter	Moving average filter (configurable up to 128 samples) for each input		
Signalling and diagnostics	Board diagnostics red LED Yellow LED for each input		

##### 8.4.4.2 Electrical connections

The RTD wiring diagram is different depending on the number of wires used:

- 2-wire RTDs must be connected between pin 1 and pin 4 of the connector.
- 3-wire RTDs must be connected between pin 2 and pin 4 of the connector, compensation wire to pin 1.
- 4-wire RTDs must be connected between pin 2 and pin 3 of the connector, compensation wires to pin 1 and 4.

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Possible types of connections (2/3/4 wires)	M12A female connector 5 poles	TB female connector 5 poles
		

#### 8.4.4.3 Faults

The module is able to detect the following faults:

- RTD sensor disconnected or broken.
- Sensor temperature range exceeded by more than  $\pm 1^{\circ}\text{C}$ .

**NOTE.** Detection of compensation wire disconnection (A4- input for 3-wire RTD, A1 + and/or A4 + inputs for 4-wire RTD) can take several seconds.

#### 8.4.5 Thermocouple module

Thermocouples can be connected to these analogue modules for temperature measurement. It is possible to configure some parameters individually to take the measurements.

##### 8.4.5.1 Technical Data


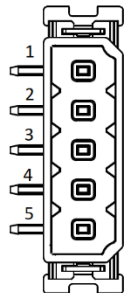
Key feature	Value		
Sensor types	Type	Temperature [ $^{\circ}\text{C}$ ]	
		Minimum	Maximum
	B	250	1820
	E	-200	1000
	J	-210	1200
	K	-200	1372
	N	-200	1300
	R	-50	1768.1
	S	-50	1768.1
	T	-200	400
Number of inputs	2		
Sensor connections	M12 A-coded 5 pole female connectors for each input		

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Key feature	Value
	TB 5 pole female connectors for each input
Converter resolution	16 bit
Reading resolution	0.1 °C
Measurement error	< ±2°C for thermocouples E, J, K, N, T < ±4°C for thermocouples B, R, S
Sampling frequency	4 Hz for each input
Digital filter	Moving average filter (configurable up to 128 samples) for each input
Signalling and diagnostics	Board diagnostics red LED Yellow LED for each input

#### 8.4.5.2 Electrical connections

The thermocouple must be connected to pins 2 (positive) and 4 (negative) of the M12 or TB connector. Between pins 1 and 3 there is an RTD (PT100) on the circuit, which is needed to perform CJC (Cold Junction Compensation) fully automatically.

Pin	Signal	Description	M12A female connector 5 poles	TB female connector 5 poles
1	CJC	PT100 for cold junction compensation (do not connect)		
2	TC+	Thermocouple positive input		
3	CJC	PT100 for cold junction compensation (do not connect)		
4	TC-	Thermocouple negative input		
5	GND	Earth		

#### 8.4.5.3 Faults

The module is able to detect the following faults:

- Thermocouples sensor disconnected or broken.
- Sensor temperature range exceeded by more than ± 2° C.

**NOTE.** Detection of thermocouple sensor disconnection may take several seconds.

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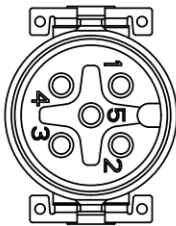
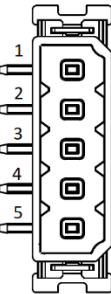
#### 8.4.6 Bridge module

Bridge modules are based on resistive bridge operation with variable sensitivity (e.g. load cells).

##### 8.4.6.1 Technical Data

Key feature	Value
Sensor types	4-wire resistor bridges (e.g. load cells) with variable bridge factor (sensitivity) are supported: from 2 mV/V to 255 mV/V at intervals of 1 mV/V
Number of inputs	2
Sensor connections	M12 A-coded 5 pole female connectors for each input TB 5 pole female connectors for each input
Converter resolution	24 bit
Reading resolution	1 $\mu$ V
Measurement error	Dependent on the bridge factor
Sampling frequency	1 KZ for each input
Bridge excitation voltage	5 V
Digital filter	Moving average filter (configurable up to 128 samples) for each input
Signalling and diagnostics	Board diagnostics red LED Yellow LED for each input

##### 8.4.6.2 Electrical connections

Pin	Signal	Description	M12A female connector 5 poles	TB female connector 5 poles
1	ECC1+	Positive excitation voltage of the resistor bridge (+ 5V)		
2	ECC1-	Negative excitation voltage of the resistor bridge (0V)		
3	SBR1+	Positive differential signal of the resistor bridge		
4	SBR1-	Negative differential signal of the resistor bridge		
5	GND	Earth		



#### 8.4.6.3 Load cells

The load cells can be connected to the Bridge module to measure a force applied to an object by reading the voltage made by the resistor bridge. The voltage to weight conversion formula for load cells is as follows:

$$F = \frac{F_N \cdot U}{C \cdot U_{EXC}}$$

Where:

- $F$  is the force detected by the load cell (Kg)
- $F_N$  is the capacity of the load cell (Kg)
- $C$  is the sensitivity of the load cell (mV/V)
- $U_{EXC}$  is the excitation voltage of the resistor bridge, this value is fixed and equal to 5V
- $U$  is the voltage read by the load cell

#### Example

A load cell has the following characteristics:

$$C = 2mV/V$$

$$F_N = 5Kg$$

Following the application of a force on the load cell, the module detects a voltage of 100  $\mu V$ . Obtain the corresponding weight value:

$$F = \frac{5 Kg \cdot 0.1mV}{2mV/V \cdot 5V} = 0.05 Kg$$

Therefore the weight value read corresponds to 50 grams.

#### 8.4.6.4 Measurement error

The AD converter on the module includes a PGA (Programmable Gain Amplifier) whose gain is optimised according to the bridge factor set. This gain determines the full scale of the measurement and the related noise. The following table shows the full-scale errors for the most common bridge factors.

Bridge factor (mV/V)	Full scale (mV)	Error % (referring to full scale)
< 8	78.1	±0.0243
16	156.3	±0.0128
32	312.5	±0.0067
64	625.0	±0.0062
128	1250.0	±0.0056
256	2500.0	±0.0064

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#### 8.4.6.5 Faults

The module is able to detect the following faults:

- Short circuit between ECC + and ECC- pin (excitation voltage).
- Resistor bridge disconnected.
- Exceeding the full scale value of the resistor bridge ( $U_{EXC} \cdot C$ ) by 1%.

**NOTE.** the disconnection of the resistor bridge can only be detected at the moment the module is configured and not while in operating mode. The error remains set until a resistor bridge is inserted and a subsequent reconfiguration is performed.

### 8.4.7 Voltage/Current module

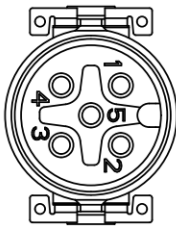
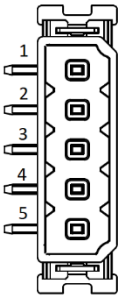
The voltage/current (V/C) modules are analogue input modules that allow both analogue current and voltage measurements.

#### 8.4.7.1 Technical Data

Key feature	Value
Sensor types	<p>The following voltage and current inputs are supported:</p> <p>0÷10 V  ±10 V  4÷20 mA  0÷20 mA  ±20 mA</p>
Number of inputs	2
Sensor connections	<ul style="list-style-type: none"> <li>▪ M12 A-coded 5 pole female connectors for each input</li> <li>▪ TB 5 pole female connectors for each input</li> </ul>
Converter resolution	16 bit
Reading resolution	<p>1 mV  1 uA</p>
Measurement error	<ul style="list-style-type: none"> <li>▪ &lt;±0.3% (relative to the full scale ±10 V)</li> <li>▪ &lt;±0.3% (relative to the full scale 0÷20mA)</li> </ul>
Sampling frequency	100 Hz for each input
Digital filter	Moving average filter (configurable up to 128 samples) for each input
Signalling and diagnostics	<ul style="list-style-type: none"> <li>▪ Board diagnostics red LED</li> <li>▪ Yellow LED for each input</li> </ul>

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#### 8.4.7.2 Electrical connections

Pin	Signal	Description	M12A female connector 5 poles	TB female connector 5 poles
1	+24EX	24 Vdc auxiliary voltage. Maximum absorption value: 200 mA per channel or 400 mA if there is only one sensor powered by the board		
2	IN+	Positive voltage or current signal differential input		
3	GND	Earth		
4	IN-	Negative voltage or current signal differential input		
5	GND	Earth		

#### 8.4.7.3 Faults

The module is able to detect the following faults:

- Minimum and maximum voltage/current exceeded by  $\pm 60\text{mV}$  or  $\pm 60\mu\text{A}$ .
- Open circuit (if channel configured with voltage).

**NOTE.** Open circuit detection (voltage configured channel) can take several seconds.

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## 8.5 Analogue Output Modules

### 8.5.1 General operation


The analogue output module can control two independent outputs with the following configurations:

- 0÷10 V voltage
- 0÷5 V voltage
- 0÷20 mA current
- 4÷20 mA current

The analogue output module, after being connected to the CX4 module, must be mapped from the island (par. 6.3). If the mapping procedure ends correctly, the module waits for the reception of the configuration parameters from the CX4 module. Once these parameters have been received, the module enters normal operating status and the outputs, if enabled, can be set. Otherwise, if the mapping procedure does not finish correctly, the module remains in an error state by disabling any operational functionality.

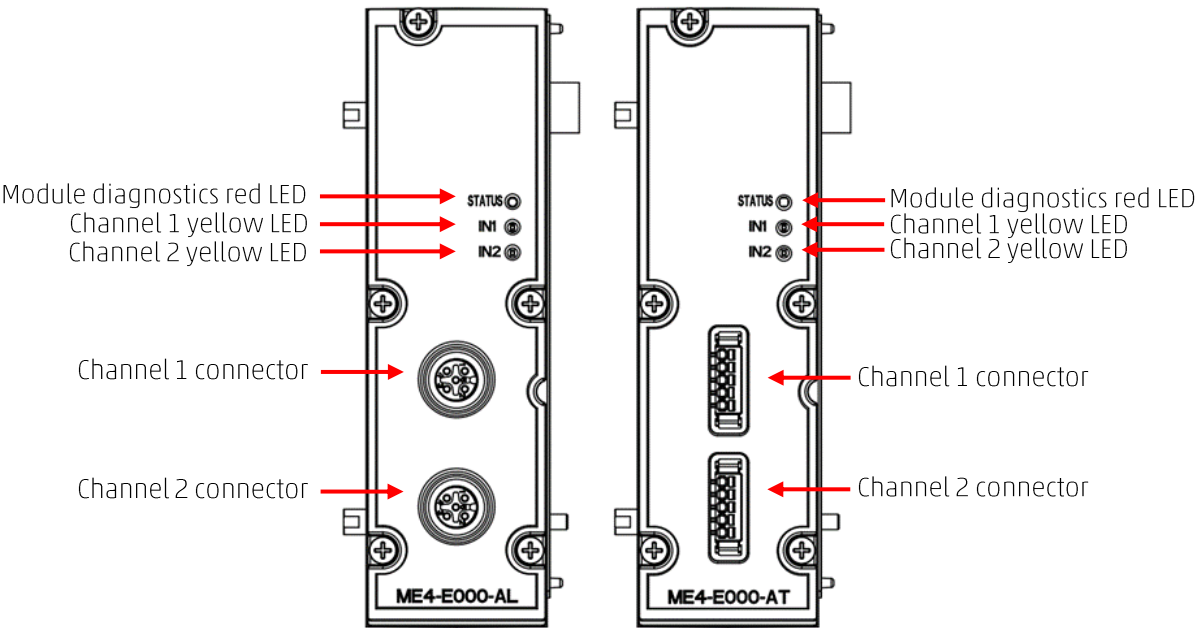
#### 8.5.1.1 Technical Data

Key feature	Value
Sensor types	0÷10 V 0÷5 V 0÷20 mA 4÷20 mA
Number of outputs	2
Sensor connections	<ul style="list-style-type: none"> <li>▪ M12 A-coded 5 pole female connectors for each input</li> <li>▪ TB 5 pole female connectors for each input</li> </ul>
Converter resolution	16 bits
Reading resolution	1 mV 1 µA
Measurement error	
Signalling and diagnostics	<ul style="list-style-type: none"> <li>▪ Board diagnostics red LED</li> <li>▪ Yellow LED for each input</li> </ul>


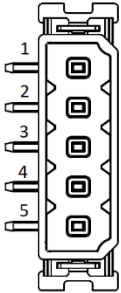
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### 8.5.2 Connections and signals of the modules

The analogue modules can have two types of connectors for connections with sensors. In the following figure, the left side shows an analogue module with 5-pole coded M12 A female connectors, while the right side shows an analogue module with 5-pole female TB connectors. The different types of analogue output modules have specific pinouts dedicated to their functionality. Visual indication of operation and diagnostics is via three LEDs.
























#### 8.5.2.1 Electrical connections

Pin	Signal	Description	M12A female connector 5 poles	TB female connector 5 poles
1	+24EX	24V auxiliary voltage. Maximum absorption value: 200mA per channel or 400mA if there is only one sensor powered by the board		
2	OUT	Voltage or current signal output		
3	GND	Earth		
4	NC	Not connected		
5	NC	Not connected		

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### 8.5.3 Module diagnostics

Module status and alarms	LED STATUS	LED IN1	LED IN2	Description of the status and solutions of the alarms
Waiting for configuration parameters	 1 flash RED @100 ms every 2 s	 YELLOW OFF	 YELLOW OFF	The module is waiting for configuration parameters (maximum duration 1 minute).
Output working on channel 1	 RED OFF	 YELLOW ON	 YELLOW OFF	The output to channel 1 is functioning correctly.
Output working on channel 2	 RED OFF	 YELLOW OFF	 YELLOW ON	The output to channel 2 is functioning correctly.
Communication fault	 2 flashes RED @100 ms every 2 s	 2 flashes YELLOW @100 ms every 2 s	 2 flashes YELLOW @100 ms every 2 s	Communication fault between head and module. <b>Solution:</b> Contact support and replace the module.
No load on channel 1	 3 flashes RED @100 ms every 2 s	 3 flashes YELLOW @100 ms every 2 s	 YELLOW OFF	Load on the output 1 not present. (This error is valid only for the current configuration) <b>Solution:</b> Check connections with the load and restart the module.
No load on channel 2	 3 flashes RED @100 ms every 2 s	 YELLOW OFF	 3 flashes YELLOW @100 ms every 2 s	Load on the output 2 not present. (This error is valid only for the current configuration) <b>Solution:</b> Check connections with the load and restart the module.
Module error	 4 flashes RED @100 ms every 2 s	 4 flashes YELLOW @100 ms every 2 s	 4 flashes YELLOW @100 ms every 2 s	Occurs in case of the following problems: <ul style="list-style-type: none"> <li>Overheating</li> <li>Undervoltage power supply</li> <li>Internal DAC error</li> </ul> <b>Solution:</b> Contact support and replace the module.

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## 9 UVIX

Camozzi's proprietary environment, called UVIX, allows the user to monitor and configure all new generation Camozzi devices (*Camozzi Smart Devices*) that support connection to it.

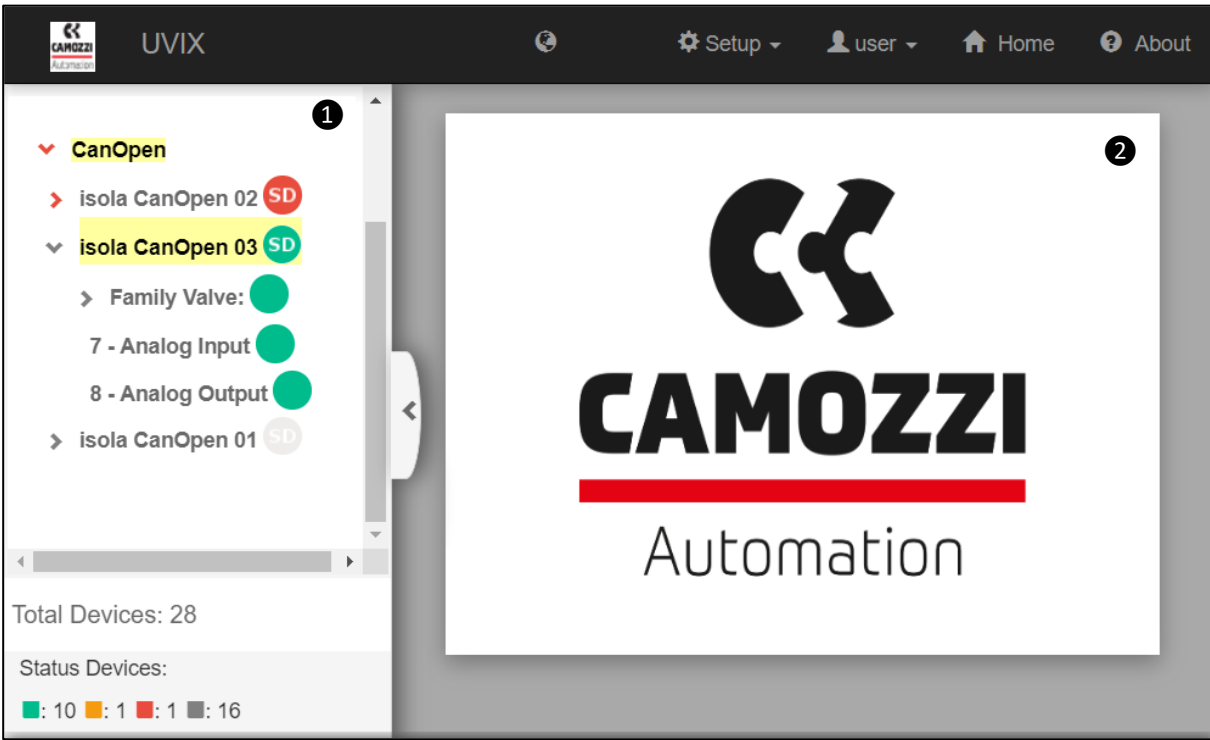
Devices can be connected to UVIX in two ways: wireless or USB. This system has been implemented with a web-based architecture so that information can be accessed straightforwardly using a browser.

Monitoring consists of displaying all the device variables, whether they relate to operation, diagnostics, or parameterization.

For details on the UVIX architecture, its installation, and general operations, see the [UVIX Manual](#).

### 9.1 General information

The devices connected to the UVIX are displayed in a tree diagram **1** consisting of Device Groups, Family and Devices. Select one of the components to view in the main window **2** all the information on the various devices and perform configuration operations or manual commands.



Select the CX4 module - in Stand-Alone or Valve Island configuration - or the individual accessory modules, Series D solenoid valve sub-bases or I/O modules, to view the general status information and details. The details are divided into variables, alarms, and commands (only for solenoid valves, digital outputs and analogue outputs).


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### 9.1.1 Status information

Select a Series CX4 module to view the main information.

- ❶ Series CX4 identification image.
- ❷ Device name, assigned when recognized and added in UVIX.
- ❸ Device identification number (17 characters).
- ❹ Device family name: *Series CX4*.
- ❺ Type of Series D Fieldbus according to the connected accessory modules:
  - *Stand-Alone*, with only I/O modules connected.
  - *D1* with at least one Series D1 solenoid valve connected.
  - *D2* with at least one Series D2 solenoid valve connected.
  - *D4* with at least one Series D4 solenoid valve connected.
  - *D5* with at least one Series D1 and one Series D2 solenoid connected.
- ❻ Firmware version.
- ❼ Date and time of the last transmission between CX4 module and UVIX.
- ❽ General status of the module: ● *Not available*, ● *OK*, ● *Alarm*.
- ❾ Operating status of the module:
  - *Init* → initialization of the CX4 module and accessory modules.
  - *Enumeration* → numbering of the accessory modules connected to the CX4 module (required if modules are replaced or moved with respect to the original configuration).
  - *Mapping* → mapping of the accessory modules connected to the CX module (required to check that there have been no changes since the last system configuration).
  - *Work* → normal operation.
  - *Manual* → manual operation.
  - *Configuration* → configuration of the parameters of the CX4 module and the accessory modules.
  - *Fatal error* → fatal error that renders the CX4 module inoperative
- ❿ WiFi connection status: ● *Online*, ● *Offline*.
- ⓫ Fieldbus used by the module: *CANopen*.
- ⓬ Fieldbus communication status: ● *Online*, ● *Offline*.

Status information: ⌵

❶ 

❷ Name: CX4 CANOpen 01

❸ Device number: 01322109990000013

❹ Family name: Series CX4

❺ Subtype: Series D Fieldbus - D1

❻ Firmware: 2.12

❼ Last data transmission: 2022-09-21 10:54:22


❽ Device status: ●

❾ Operational status: Manual

❿ Connection: ●

⓫ FieldBus: CanOpen

⓬ Link status: ●

⓭ Configuration: 

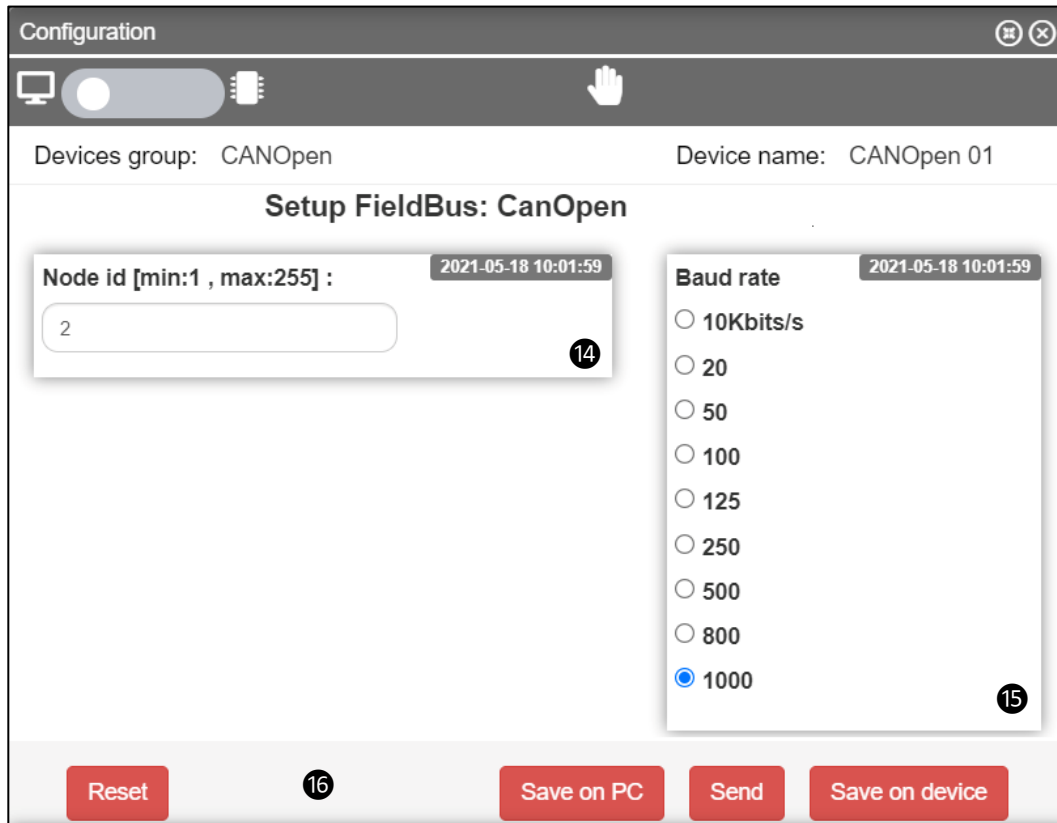


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#### 9.1.1.1 CANopen network configuration

From the status information page, you can access the window for configuring certain fieldbus parameters **13**. In the specific case of CANopen, you can configure the identification number of the node **14** and the Baud rate **15** (par. Errore. L'origine riferimento non è stata trovata.).

Using the buttons in the bottom bar of the configuration window **18**, the configured parameters can be sent to the module, saved on the PC, saved on the device, or reset to default values.






## 9.1.2 Details

### 9.1.2.1 Variables

The first tab of the details page deals shows the variables that are monitored by the CX4 module.

- ❶ Internal temperature of the module.
- ❷ Power voltage that supplies the sub-bases of the solenoid valves: the measurement is made by the first sub-base connected (position 1) and is sent via serial communication. If there are no valves connected, this voltage is not displayed.
- ❸ Logic voltage that powers the module circuit board. Without this supply voltage, the entire system is without power and, therefore, turned off.

Details:


















Name	Value
Temperature ❶	83 °C
Supply voltage ❷	23.7 V
Supply voltage (logic) ❸	23.7 V

### 9.1.2.2 Alarms

The second tab on the details page displays possible CX4 module alarms.

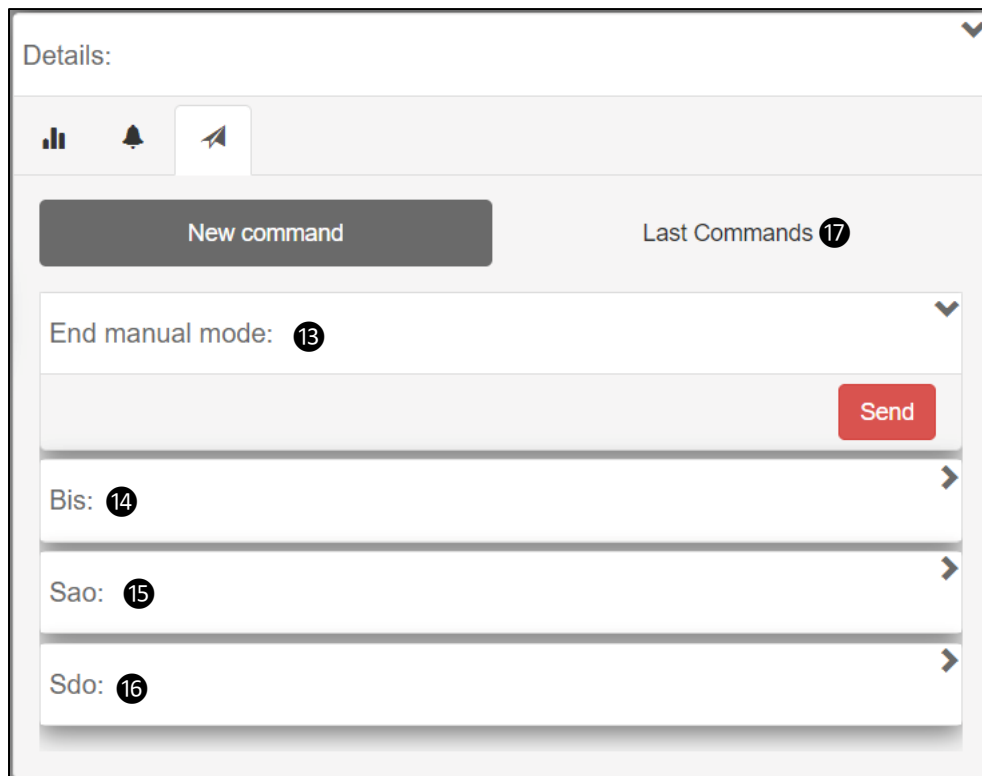
- ④ No mapping: indicates that there are no accessory modules connected to the CX4 module.
- ⑤ Valve mapping error: this can occur if the positions of the sub-bases of the solenoid valves have been changed, moving them from their original position or adding new ones, or if a sub-base fails to respond to the mapping request from the CX4 module.
- ⑥ CX4 module overheating.
- ⑦ Supply voltage of the CX4 module lower than the voltage given in the specifications.
- ⑧ I/O module mapping error: this can occur if the positions of the I/O modules have been changed, moving them from their original position or adding new ones, or if an I/O module fails to respond to the mapping request from the CX4 module.
- ⑨ Fatal error on fieldbus: this occurs if the fieldbus protocol stack is incorrect.
- ⑩ Configuration error
- ⑪ No valve mapping: indicates that there are no solenoid valve sub-bases connected to the CX4 module.
- ⑫ No I/O module mapping: indicates that there are no I/O modules connected to the CX4 module.

Details: 		
  		
Event Name	Status ▾	Event Onset
Mapping absent ④		
Mapping valves error ⑤		
Overheating CX4 module ⑥		
Undervoltage CX4 module ⑦		
Mapping I/O modules error ⑧		
Fieldbus fatal error ⑨		
Configuration error ⑩		
Valves absent ⑪		
I/O modules absent ⑫		

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### 9.1.2.3 Commands

The third tab of details on the CX4 module shows the commands that can be sent via UVIX to the device. The Manual Mode command **13** allows you to control the system manually from UVIX, sending configuration parameters to the CX4 module and to the individual connected accessory modules. In manual mode, you can command the modules that include outputs (if present), such as the solenoid valves **14** (par. 9.2.3), digital outputs **15** (par. 9.4.3) and analogue outputs **16** (par. 9.6.3). The history of the commands sent to the CX4 module from when communication with UVIX was started can be viewed under Last Commands **17**.






**NOTE.** If there are solenoid valve sub-bases connected to the CX4 module, the valve information can be reset at any time, without activating manual mode.

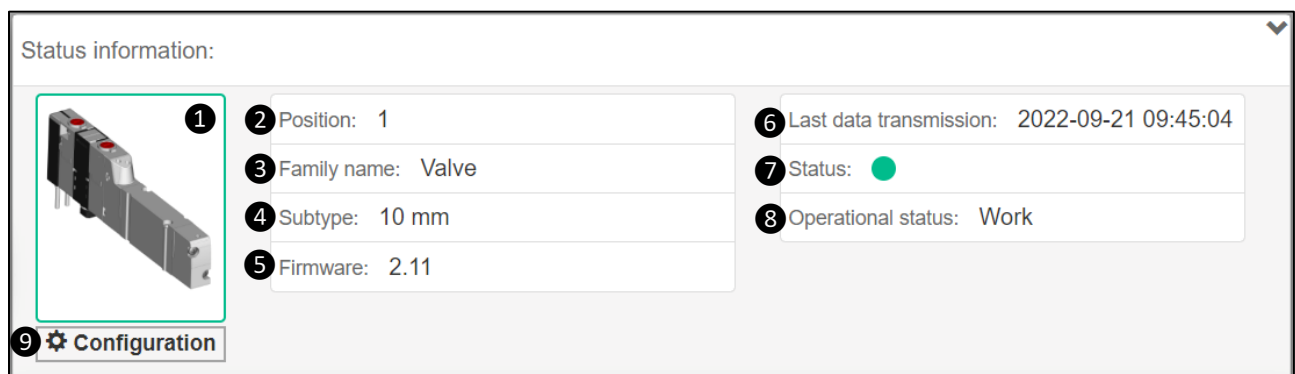
	<b>Series D Valve Island Fieldbus and Series CX4</b>  <b>CANopen</b>	5000041280
		Version 16

## 9.2 Series D coil valves and sub-bases

### 9.2.1 Status information

On the first page of UVIX, you can select one of the solenoid valves connected to the CX4 module in the configuration of a Series D valve island to view the general information of the individual sub-base.

- ❶ Identification images of the coil valve mounted on the sub-base.
- ❷ Position of the sub-base in the assigned valve island after mapping.
- ❸ Name of the accessory module family: Valve.
- ❹ Solenoid valve family sub-type: 10 mm, 16 mm, 25 mm.
- ❺ Firmware version.
- ❻ Date and time of the last transmission of the variables between the sub-base and UVIX.
- ❼ General status of the solenoid valve:  *Not available*,  *OK*,  *Alarm*.
- ❽ Operating status of the sub-base:
  - *Init* → initialization (mapping and configuration of parameters).
  - *Work* → normal operation.
  - *Error* → sub-base error.



#### 9.2.1.1 Configuration of Series D coil valve sub-base

From the status information page, you can configure certain operating-related parameters of the solenoid valves ❹.

- ❿ Enable/disable the alarms that the valve can generate (default: all alarms enabled).
- ⓫ Enable/disable the Failsafe for each individual pilot: *Yes enabled*, *No disabled* (default).
- ⓬ Set the Failsafe status for each pilot for which the Failsafe has been enabled: *On* pilot activated, *Off* pilot deactivated (default).
- ⓭ Set the behaviour of the valve failure error (Coil Fault): *Latched*, *Not Latched* (default).
- ⓮ The buttons in the bottom bar of the tab allow you to send the configuration parameters to the module, save them on the PC, save them on the device or reset them to default values.

Configuration

Devices group: Camozzi

Device name: Series D fieldbus

Slave: 1 - Valve

Valve alarms enable

2022-01-28 11:32:57

5 selected ▾

10

Failsafe enable

2022-01-28 11:32:57

Pilot 1

No ☐ Yes

Pilot 2

No ☐ Yes

11

Failsafe status

2022-01-28 11:32:57

Pilot 1

Off ☐ On

Pilot 2

Off ☐ On

12

Alarm mode

2022-01-28 11:32:57

☒ Not latched
 ☐ Latched

13

Reset

14

Save on PC

Send

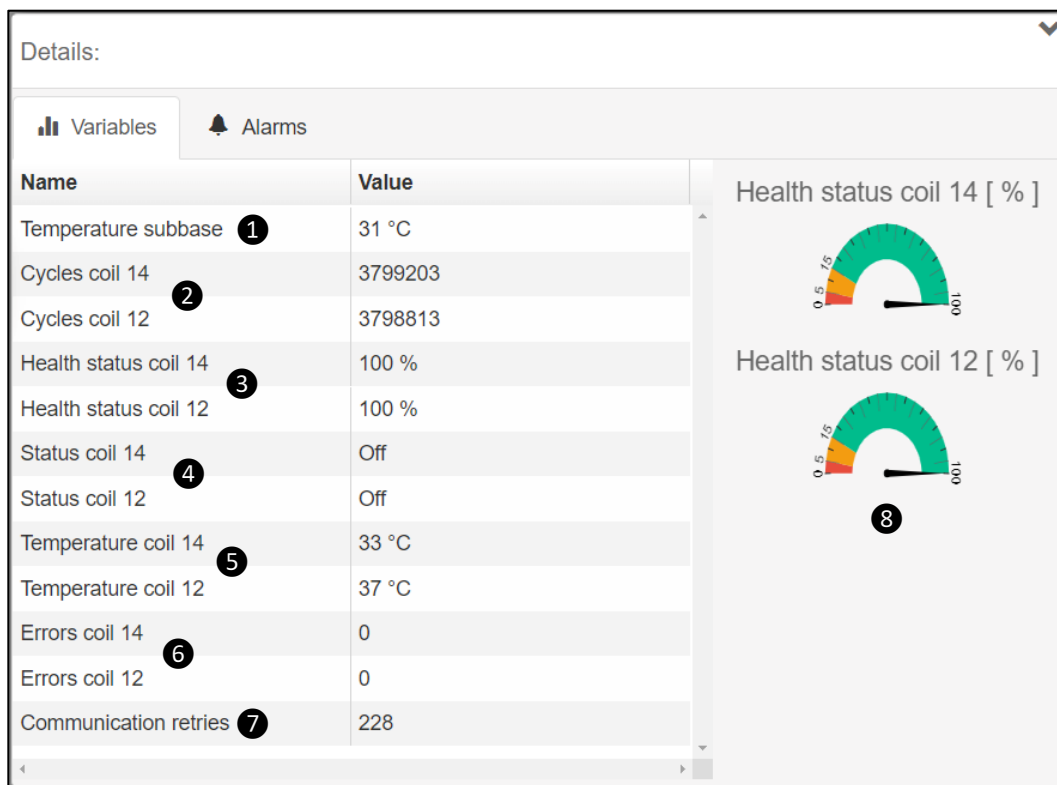
Save on device

## 9.2.2 Details

### 9.2.2.1 Variables

The first tab on the details page shows the variables that are monitored by the sub-base of an individual solenoid valve. These variables can be reset using the commands by selecting the CX4 module to which the sub-bases are connected (par. 9.2.3).
















- ❶ Sub-base temperature.
- ❷ Cycles performed by the pilots in position 14 and position 12.
- ❸ Percentage health status of the pilots in position 14 and position 12.
- ❹ Status of the pilots in position 14 and position 12 (*On/Off*).
- ❺ Temperature of the pilots in position 14 and position 12.
- ❻ Errors of the pilots in position 14 and position 12.
- ❼ Communication errors between the CX4 module and the selected sub-base.
- ❽ Gauge indicators that show graphically the percentage health status of the two pilots.



### 9.2.2.2 Alarms

The second details tab displays the alarms of the sub-base of the selected valve.

- 8 Communication alarm due to communication failure between CX4 module and sub-base.
- 9 Sub-base overheating.
- 10 Overheating of the pilots in position 14 and position 12.
- 11 Overcurrent of the pilots in position 14 and position 12.
- 12 Alarm - solenoid valves closed in position 14 and position 12.
- 13 Energization malfunction of the solenoid pilots in position 14 and position 12.
- 14 Alarm - configuration of sub-base parameters.
- 15 Replace valve warning.

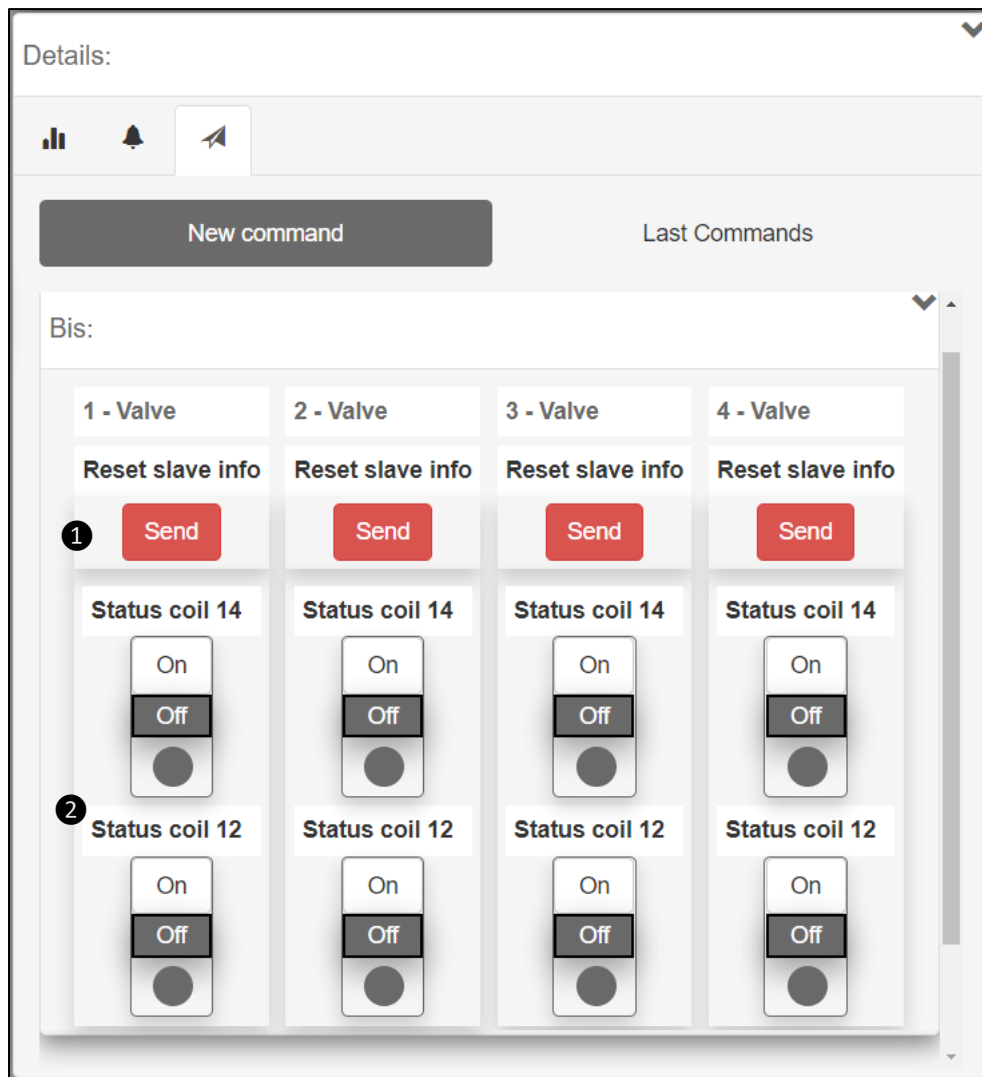
Details: 		
<div>  Variables            Alarms         </div>		
Event Name	Status ▾	Event Onset
Communication alarm 8		
Overheating subbase 9		
Overheating coil 14 10		
Overheating coil 12		
Overcurrent coil 14 11		
Overcurrent coil 12		
Interrupted coil 14 12		
Interrupted coil 12		
Fault coil 14 13		
Fault coil 12		
Configuration alarm 14		
Valve substitution 15		



### 9.2.3 Commands

On the main page of the CX4 module (par.9.1.2.2), there is a tab showing the commands for the solenoid valves. In particular, you can reset the valve information **1** (cycles, errors, health status). This operation needs to be performed when the valve connected to the sub-base is replaced and can also be performed in normal working mode.

You can also control the individual pilots (position 12 and 14) of the solenoid valves **2**. For this operation, the island must be in manual mode.



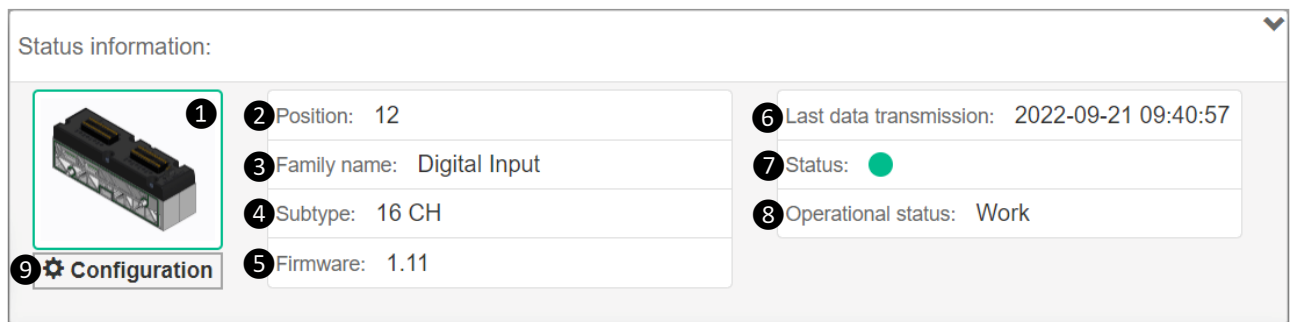
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## 9.3 Digital Input Modules

### 9.3.1 Status information

On the first page of UVIX, select one of the digital inputs connected to the CX4 module to view the general information of the accessory module.

- ❶ Identification images of the digital input module (8 or 16 channels).
- ❷ Module position assigned after mapping.
- ❸ Name of the accessory module family: *Digital Input*.
- ❹ Subtype of the family of the digital input module: 8 CH, 16 CH.
- ❺ Firmware version.
- ❻ Date and time of the last transmission of the variables between the module and UVIX.
- ❼ General status of the module: ● *Not available*, ● *OK*, ● *Alarm*.
- ❽ Operating status of the module:
  - *Init* → initialization (mapping and configuration of parameters).
  - *Work* → normal operation.
  - *Error* → module error.



#### 9.3.1.1 Configuration of digital input modules

From the status information page, you can configure certain operating-related parameters of the digital input modules ❹.

- ❿ Parameter for the polarity of each channel, High or Low (default).
- ⓫ Minimum input level activation time in milliseconds (anti-bounce filter, default: 0).
- ⓬ Minimum input rereading time in milliseconds (default: 0).
- ⓭ Using the buttons in the bottom bar of the configuration window, the configured parameters can be sent to the module, saved on the PC, saved on the device or reset to default values.

Configuration

Devices group: Camozzi

Device name: Series D fieldbus

Slave: 5 - Digital Input

Set Activation Mode

Activation mode (1-8)

Ch1

Low ☒ High

Ch2

Low ☒ High

Ch3

Low ☒ High

Ch4

Low ☒ High

Ch5

Low ☒ High

Ch6

Low ☒ High

Ch7

Low ☒ High

Ch8

Low ☒ High

Minumum activation time [min:0 , max:255] :

0

Signal extension time [min:0 , max:1023] :

0

Reset

Save on PC

Send

Save on device

### 9.3.2 Details

#### 9.3.2.1 Variables

The first tab on the details page displays the status of the digital inputs ①: ☒ active, ☐ not active.

Details:

Variables

Alarms

Group 1-8 ①

ch1	ch2	ch3	ch4	ch5	ch6	ch7	ch8
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

126

### 9.3.2.2 Alarms

The second details tab displays the alarms of the digital input module.

- **2** Alarm - communication failure between the digital input module and the CX4 module.
- **3** Alarm - configuration of module parameters.
- **4** Short-circuit of at least one digital input belonging to an input group. This alarm can be divided into two groups for modules with 8 channels or into four groups for modules with 16 channels.

Details:

Variables	Alarms	
Event Name	Status	Event Onset
Communication alarm <b>2</b>	!	
Configuration alarm <b>3</b>	!	
Short circuit Group 0-3	!	
Short circuit Group 4-7 <b>4</b>	!	

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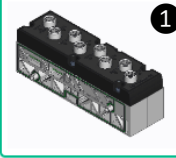
## 9.4 Digital Output Modules

### 9.4.1 Status information

On the first page of UVIX, select one of the digital outputs connected to the CX4 module to view the general information of the accessory module.

- ❶ Identification images of the digital output module (8 or 16 channels).
- ❷ Module position assigned after mapping.
- ❸ Name of the accessory module family: *Digital Output*.
- ❹ Subtype of the family of the digital output module: 8 CH, 16 CH.
- ❺ Firmware version.
- ❻ Date and time of the last transmission of the variables between the module and UVIX.
- ❼ General status of the module: ● *Not available*, ● *OK*, ● *Alarm*.
- ❽ Operating status of the module:
  - *Init* → initialization (mapping and configuration of parameters).
  - *Work* → normal operation.
  - *Error* → module error.

Status information: ▼



❶

❷ Position: 14

❸ Family name: Digital Output

❹ Subtype: 8 CH

❺ Firmware: 1.10

❻ Last data transmission: 2022-09-21 09:43:00

❼ Status: ●

❽ Operational status: Work

❹ Configuration

#### 9.4.1.1 Configuration of digital output modules

From the status information page, you can configure certain operating-related parameters of the digital output modules ❹.

- ❿ Enable output: No disabled, Yes enabled (default).
- ⓫ Set the type of individual output channel: type N, type P (default).
- ⓬ Enable the individual functions related to the whole module, see the detection of no load by the power driver.
- ⓭ Set the PWM for individual outputs: Yes enabled, No disabled (default).
- ⓮ Enable the protection failsafe, which can be set for the individual outputs: Yes enabled, No disabled (default).
- ⓯ Failsafe status, which can be set for the individual outputs: *On*, *Off* (default).
- ⓰ Using the buttons in the bottom bar of the configuration window, the configured parameters can be sent to the module, saved on the PC, saved on the device or reset to default values.

Configuration

Devices group: Camozzi
Device name: Series D fieldbus
Slave: 6 - Digital Output

Set enable out channel

Enable channels (1-8)
2022-01-28 11:32:57

Channel 1
No ☒ Yes

Channel 2
No ☒ Yes

Channel 3
No ☒ Yes

Channel 4
No ☒ Yes

Channel 5
No ☒ Yes

Channel 6
No ☒ Yes

Channel 7
No ☒ Yes

Channel 8
No ☒ Yes

10

Set type out channel

Channel Type (1-8)
2022-01-28 11:32:57

Channel 1
N ☒ P

Channel 2
N ☒ P

Channel 3
N ☒ P

Channel 4
N ☒ P

Channel 5
N ☒ P

Channel 6
N ☒ P

Channel 7
N ☒ P

Channel 8
N ☒ P

11

Module Settings
2022-01-28 11:32:57

Enable alarm n.c.
No ☐ Yes

12

Set enable PWM

Enable PWM (1-8)
2022-01-28 11:32:57

Channel 1
No ☐ Yes

Channel 2
No ☐ Yes

Channel 3
No ☐ Yes

Channel 4
No ☐ Yes

Channel 5
No ☐ Yes

Channel 6
No ☐ Yes

Channel 7
No ☐ Yes

Channel 8
No ☐ Yes

13

Set enable failsafe channel

Enable failsafe (1-8)
2022-01-28 11:32:57

Channel 1
No ☒ Yes

Channel 2
No ☐ Yes

Channel 3
No ☐ Yes

Channel 4
No ☐ Yes

Channel 5
No ☐ Yes

Channel 6
No ☐ Yes

Channel 7
No ☐ Yes

Channel 8
No ☐ Yes

14

Set state failsafe channel

Failsafe state (1-8)
2022-01-28 11:32:57

Channel 1
Off ☐ On

Channel 2
Off ☐ On

Channel 3
Off ☐ On

Channel 4
Off ☐ On

Channel 5
Off ☐ On

Channel 6
Off ☐ On

Channel 7
Off ☐ On

Channel 8
Off ☐ On

15

Reset

16


Save on PC

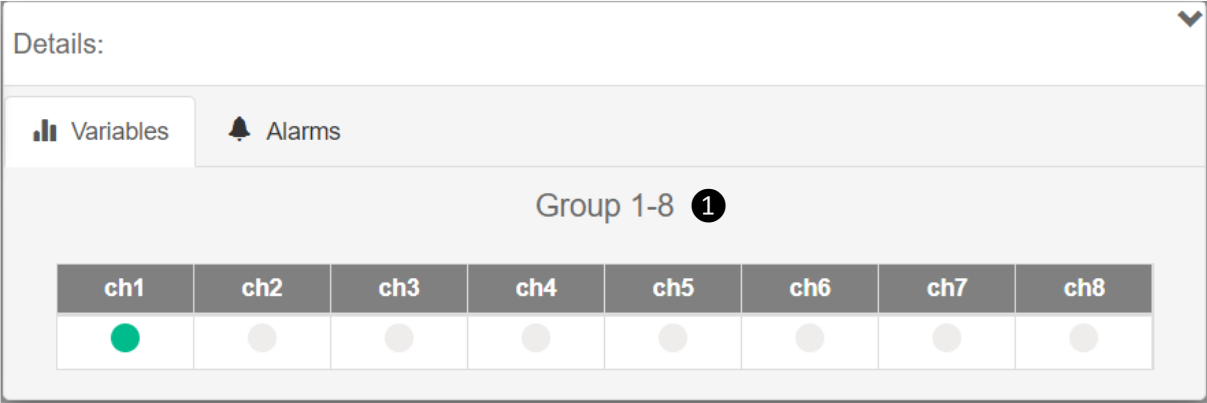
Send

Save on device

9.4.2 Details

9.4.2.1 Variables























The first tab on the details page displays the status of the digital outputs **1**:  active,  not active.



#### 9.4.2.2 Alarms

The second details tab displays the alarms of the digital output module.

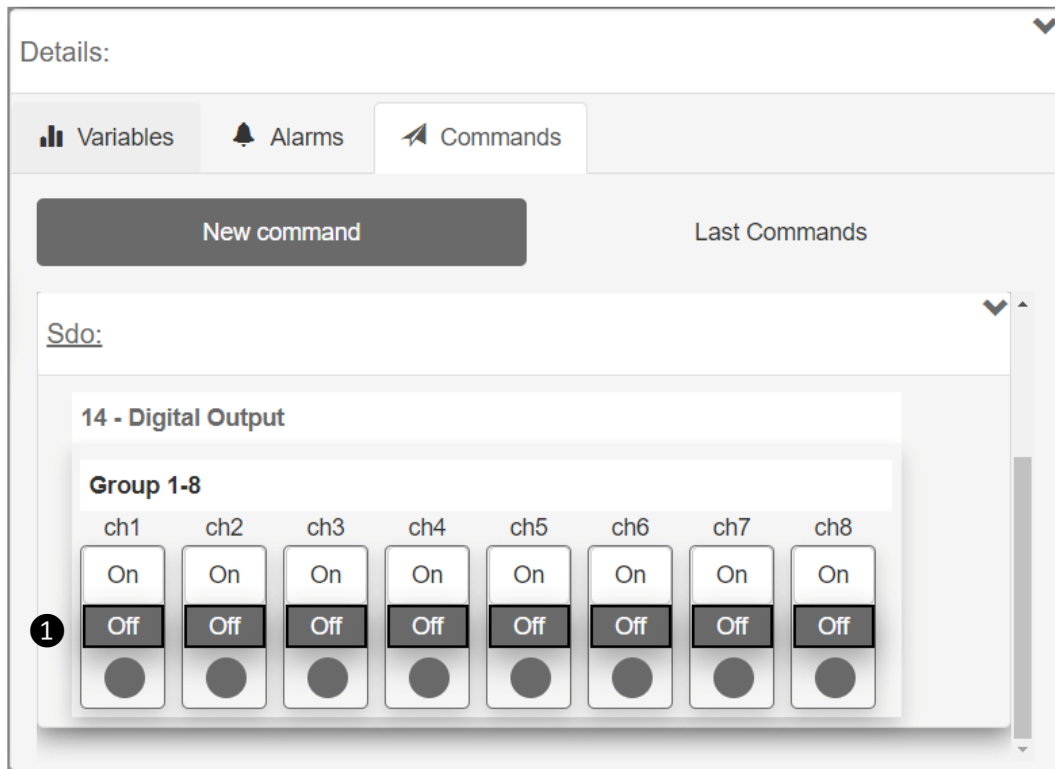
- **2** Alarm - communication failure between the digital input module and the CX4 module.
- **3** Alarm - configuration of module parameters.
- **4** No external power supply, required to power the digital outputs.
- **5** The supply voltage is less than 4.5V.
- **6** Circuit open on an output channel.
- **7** Short circuit on an output channel.

Details: <span>▼</span>		
<div> <div> Variables</div> <div> Alarms</div> </div>		
Event Name	Status ▼	Event Onset
Communication alarm <b>2</b>		
Configuration alarm <b>3</b>		
Zero Voltage Power Supply <b>4</b>		
Under Voltage Power Supply <b>5</b>		
Open Load Channel 1		
Open Load Channel 2		
Open Load Channel 3		
Open Load Channel 4		
Open Load Channel 5 <b>6</b>		
Open Load Channel 6		
Open Load Channel 7		
Open Load Channel 8		
Short Circuit Channel 1		
Short Circuit Channel 2		
Short Circuit Channel 3		
Short Circuit Channel 4		
Short Circuit Channel 5 <b>7</b>		
Short Circuit Channel 6		
Short Circuit Channel 7		
Short Circuit Channel 8		



### 9.4.3 Commands

On the main page of the CX4 module (par.9.1.2.2) there is a tab showing the commands to pilot the individual channels of the digital outputs **1**. This tab is only visible in manual mode and if it has at least one digital output module.



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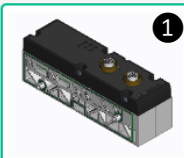
## 9.5 Analogue Input Modules

### 9.5.1 Status information

On the first page of UVIX, select one of the analogue inputs connected to the CX4 module to view the general information of the accessory module.

- ❶ Identification images of the analogue input module.
- ❷ Module position assigned after mapping.
- ❸ Name of the accessory module family: *Analogue Input*.
- ❹ Subtype of the family of the analogue input module: RTD, Thermocouple, Bridge, Voltage/Current.
- ❺ Firmware version.
- ❻ Date and time of the last transmission of the variables between the module and UVIX.
- ❼ General status of the module: ● *Not available*, ● *OK*, ● *Alarm*.
- ❽ Operating status of the module:
  - *Init* → initialization (mapping and configuration of parameters).
  - *Work* → normal operation.
  - *Error* → module error.

Status information: ▼



❶

❷ Position: 8

❸ Family name: Analog Input

❹ Subtype: RTD

❺ Firmware: 1.07

❻ Last data transmission: 2022-09-21 08:59:51

❼ Status: ●

❽ Operational status: Work

❹ Configuration

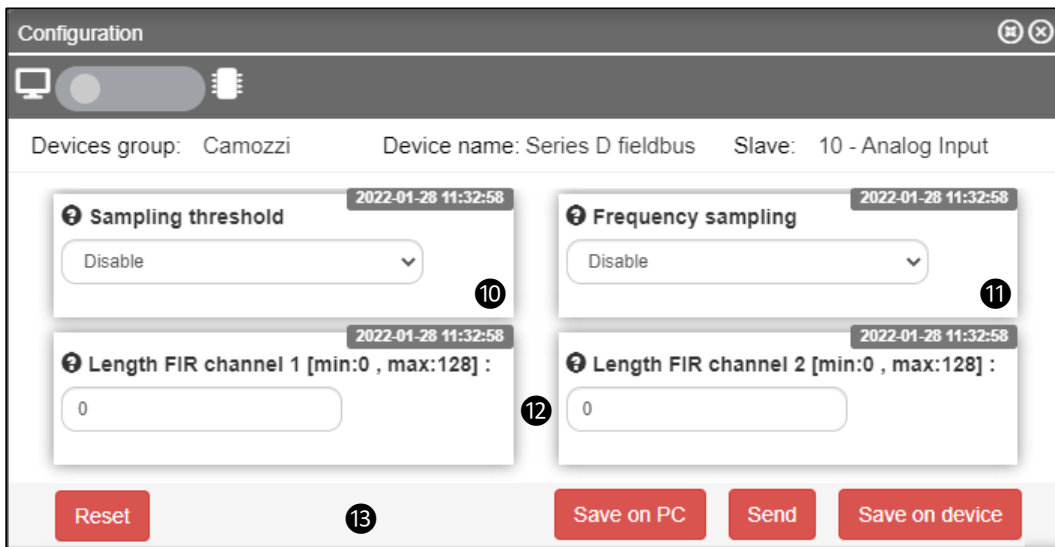
	<b>Series D Valve Island Fieldbus and Series CX4</b>  <b>CANopen</b>	5000041280
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#### 9.5.1.1 Configuration of analogue input modules

From the status information page, you can configure certain operating-related parameters of the analogue input modules ⑨.

Some of these parameters are specific to individual subtypes, while others are common to all subtypes of the analogue input family.

- ⑩ Enable threshold-based transmission (default: *Disable*).
- ⑪ Enable frequency-based transmission (default: *Disable*).
- ⑫ Length of the impulse response of the FIR filter on channel 1 and channel 2.
- ⑬ Using the buttons in the bottom bar of the configuration window, the configured parameters can be sent to the module, saved on the PC, saved on the device or reset to default values.



The screenshot shows the 'Configuration' window for a CAMOZZI device. At the top, it identifies the 'Devices group' as 'Camozzi', the 'Device name' as 'Series D fieldbus', and the 'Slave' as '10 - Analog Input'. Below this, there are four configuration panels, each with a timestamp of '2022-01-28 11:32:58'. The first panel, 'Sampling threshold' (⑩), has a dropdown menu set to 'Disable'. The second panel, 'Frequency sampling' (⑪), also has a dropdown menu set to 'Disable'. The third panel, 'Length FIR channel 1 [min:0 , max:128] : ' (⑫), has a text input field set to '0'. The fourth panel, 'Length FIR channel 2 [min:0 , max:128] : ' (⑫), also has a text input field set to '0'. At the bottom of the window, there is a bar with four buttons: 'Reset' (⑬), 'Save on PC', 'Send', and 'Save on device'.

- ⑭ Type of RTD for channel 1 and for channel 2
- ⑮ Number of wires for the RTD sensor on channel 1 and channel 1.
- ⑯ Type of Thermocouple for channel 1 and for channel 2.
- ⑰ Type of Bridge for channel 1 and for channel 2.
- ⑱ Type of Voltage/Current module for channel 1 and for channel 2

Configuration

Devices group: Camozzi Device name: Series D fieldbus Slave: 10 - Analog Input

2022-01-28 11:32:58

Sensor Type RTD channel 1

PT1000 (385)

2022-01-28 11:32:58

Sensor Type RTD channel 2

PT100 (385)

2022-01-28 11:32:58

Number of wires RTD channel 1

2 wires

2022-01-28 11:32:58

Number of wires RTD channel 2

4 wires

Reset Save on PC Send Save on device

Configuration

Devices group: Camozzi Device name: Series D fieldbus Slave: 11 - Analog Input

2022-01-28 11:32:58

Sensor Type TH channel 1

K

2022-01-28 11:32:58

Sensor Type TH channel 2

T

Reset Save on PC Send Save on device

Configuration

Devices group: default group Device name: Series D fieldbus Slave: 3 - Analog Input

2022-09-14 13:24:09

Bridge factor channel 1 [min:0 , max:255] :

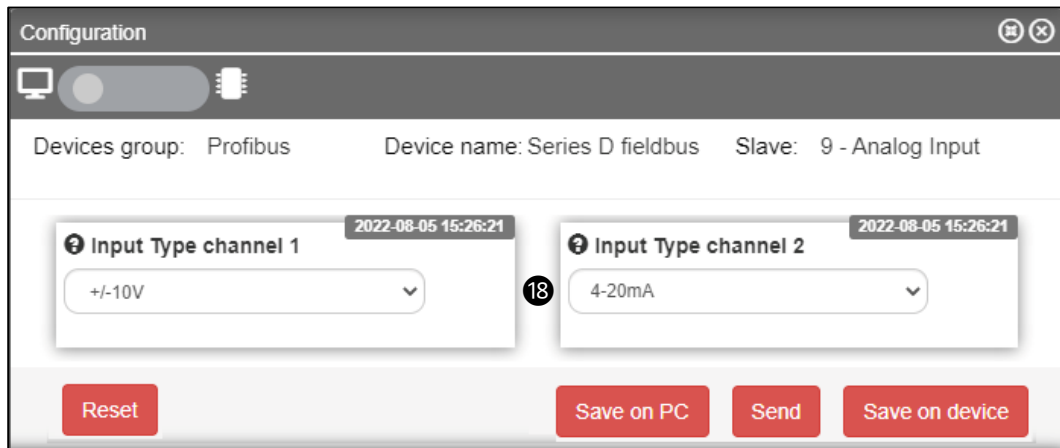
0

2022-09-14 13:24:09

Bridge factor channel 2 [min:0 , max:255] :

0

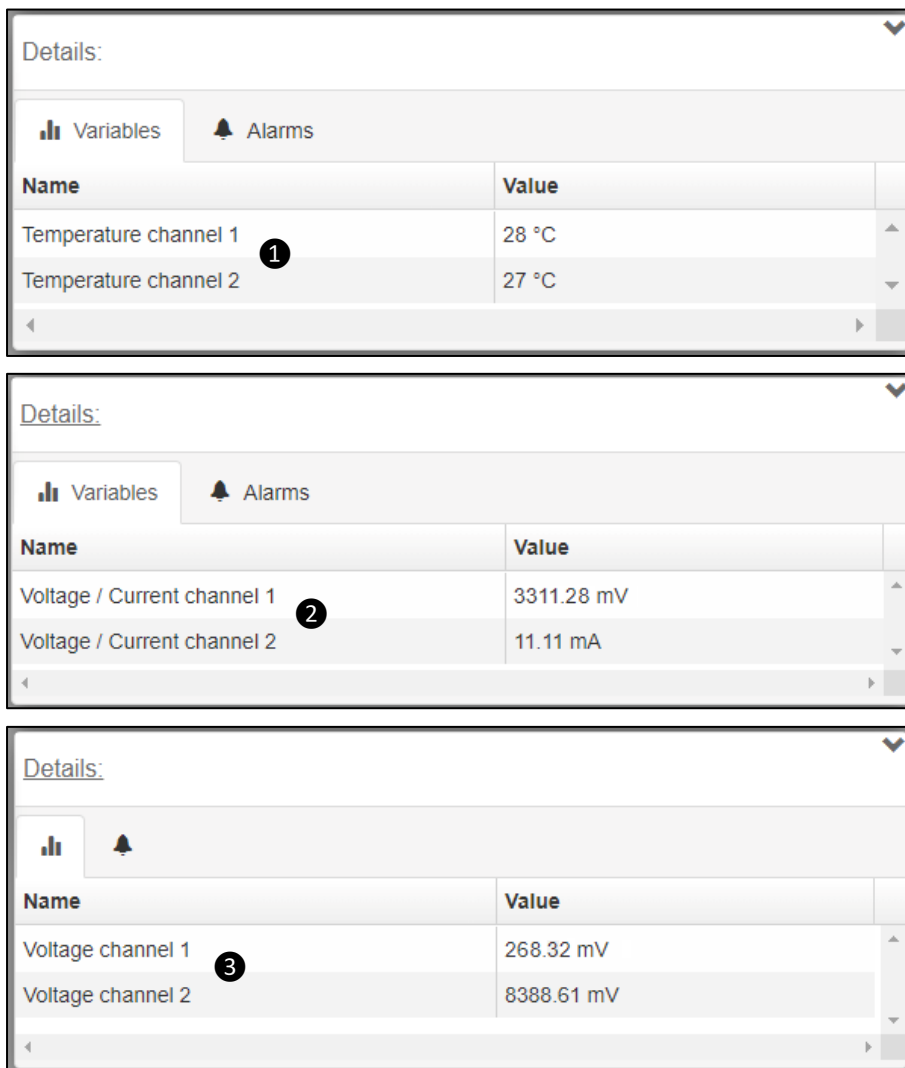
Reset Save on PC Send Save on device



## 9.5.2 Details

### 9.5.2.1 Variables

The first tab on the details page displays the variables monitored by the analogue input module for both channels: temperatures **1** for RTD and Thermocouples, currents or voltages **2** for Voltage/Current modules and voltages **3** for the Bridges.



### 9.5.2.2 Alarms

The second details tab displays the alarms of the analogue input module.

- ④ Malfunction of the sensor connected to channel 1.
- ⑤ Bridge sensor connected to channel 1 missing or faulty (alarm for bridges only).
- ⑥ Communication error with the internal ADC converter, which measures the relevant physical quantities.
- ⑦ Error in 3.3V logic supply voltage.
- ⑧ Malfunction of the sensor connected to channel 2.
- ⑨ Bridge sensor connected to channel 2 missing or faulty (alarm for bridges only).
- ⑩ Alarm of communication between the analogue input module and the CX4 module.
- ⑪ Alarm - configuration during parameterization.

Details:

<div> Variables Alarms </div>		
Event Name	Status ▾	Event Onset
Sensor fault channel 1 ④	!	
Missing bridge channel 1 ⑤	!	
ADC communication error ⑥	!	
RESDCDC error ⑦	!	
Sensor fault channel 2 ⑧	!	
Missing bridge channel 2 ⑨	!	
Communication alarm ⑩	!	
Configuration alarm ⑪	!	

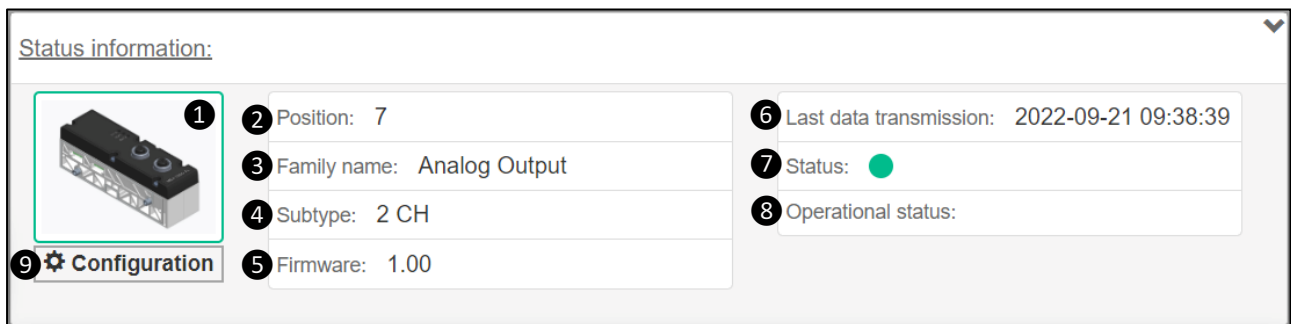
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## 9.6 Analogue Output Modules

### 9.6.1 Status information

On the first page of UVIX, select one of the analogue outputs connected to the CX4 module to view the general information of the accessory module.

- ❶ Identification images of the analogue output module.
- ❷ Module position assigned after mapping.
- ❸ Name of the accessory module family: *Analogue Output*.
- ❹ Subtype of the family of the analogue output module: 2 CH.
- ❺ Firmware version.
- ❻ Date and time of the last transmission of the variables between the analogue output module and UVIX.
- ❼ Date and time of the last transmission of the variables between the module and UVIX.
- ❽ General status of the module: ● *Not available*, ● *OK*, ● *Alarm*.
- ❾ Operating status of the module:
  - *Init* → initialization (mapping and configuration of parameters).
  - *Work* → normal operation.
  - *Error* → module error.


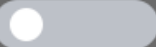




#### 9.6.1.1 Configuration of analogue output modules

From the status information page, you can configure certain operating-related parameters of the digital output modules ❾.

- ❿ Type of analogue output (voltage or current) on channel 1.
- ⓫ Type of analogue output (voltage or current) on channel 2.
- ⓬ Enable Failsafe for channel 1: Yes enabled, No disabled (default).
- ⓭ Enable Failsafe for channel 2: Yes enabled, No disabled (default).
- ⓮ Failsafe value if enabled on the corresponding channel (mV/mA).

Configuration

Devices group: Camozzi
Device name: Series D fieldbus
Slave: 7 - Analog Output

Function channel 1
2022-09-14 08:55:29

☐ Off  
☒ 0..10V  
☐ 0..5V  
☐ 4..20mA  
☐ 0..20mA


10

Function channel 2
2022-09-14 08:55:29

☐ Off  
☐ 0..10V  
☐ 0..5V  
☒ 4..20mA  
☐ 0..20mA


11

Failsafe enable channel 1
2022-09-14 08:55:29

No  Yes


12

Failsafe enable channel 2
2022-09-14 08:55:29

No  Yes

13

Failsafe value channel 1 [min:0 , max:10000] :
2022-09-14 08:55:29

0 4433 10000


14



Reset
Save on PC
Send
Save on device

## 9.6.2 Details

### 9.6.2.1 Variables

The first tab on the details page displays the analogue output module variables for both channels depending on how they are configured **1**.

Details:

Name	Value
Channel 1 <b>1</b>	3200.0 mV
Channel 2	11.700 mA




### 9.6.2.2 Alarms

The second tab on the details page displays the alarms of the analogue input module.

- ② Alarm of communication between the analogue output module and the CX4 module.
- ③ Alarm - configuration during parameterization.
- ④ Alarm - open circuit on channel 1.
- ⑤ Alarm - open circuit on channel 2.
- ⑥ Alarm - overheating of analogue output module.
- ⑦ Alarm - short circuit of module supply voltage.
- ⑧ Alarm - module supply voltage too low.
- ⑨ Internal error.

Details:

<div> Variables Alarms </div>		
Event Name	Status ▾	Event Onset
Communication alarm ②	!	
Configuration alarm ③	!	
Channel 1 Open Load ④	!	
Channel 2 Open Load ⑤	!	
Board Over Heating ⑥	!	
Power Supply Short Circuit ⑦	!	
Power Supply Under Threshold ⑧	!	
Internal Error ⑨	!	

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### 9.6.3 Commands

On the main page of the CX4 module (par.9.1.2.2), there is a tab showing the commands for piloting the analogue output channels (① and ②) by setting the value of the output in the corresponding unit of measurement. This tab is only visible in manual mode and if it has at least one analogue output module.

Details:

Variables

Alarms

Commands

New command

Last Commands

Sao:

7 - Analog Output

Set Voltage / Current Ch1

Current value:

\* New value [min: , max:]:

0

Send

①

Set Voltage / Current Ch2

Current value:

\* New value [min: , max:]:

0

Send

②

141

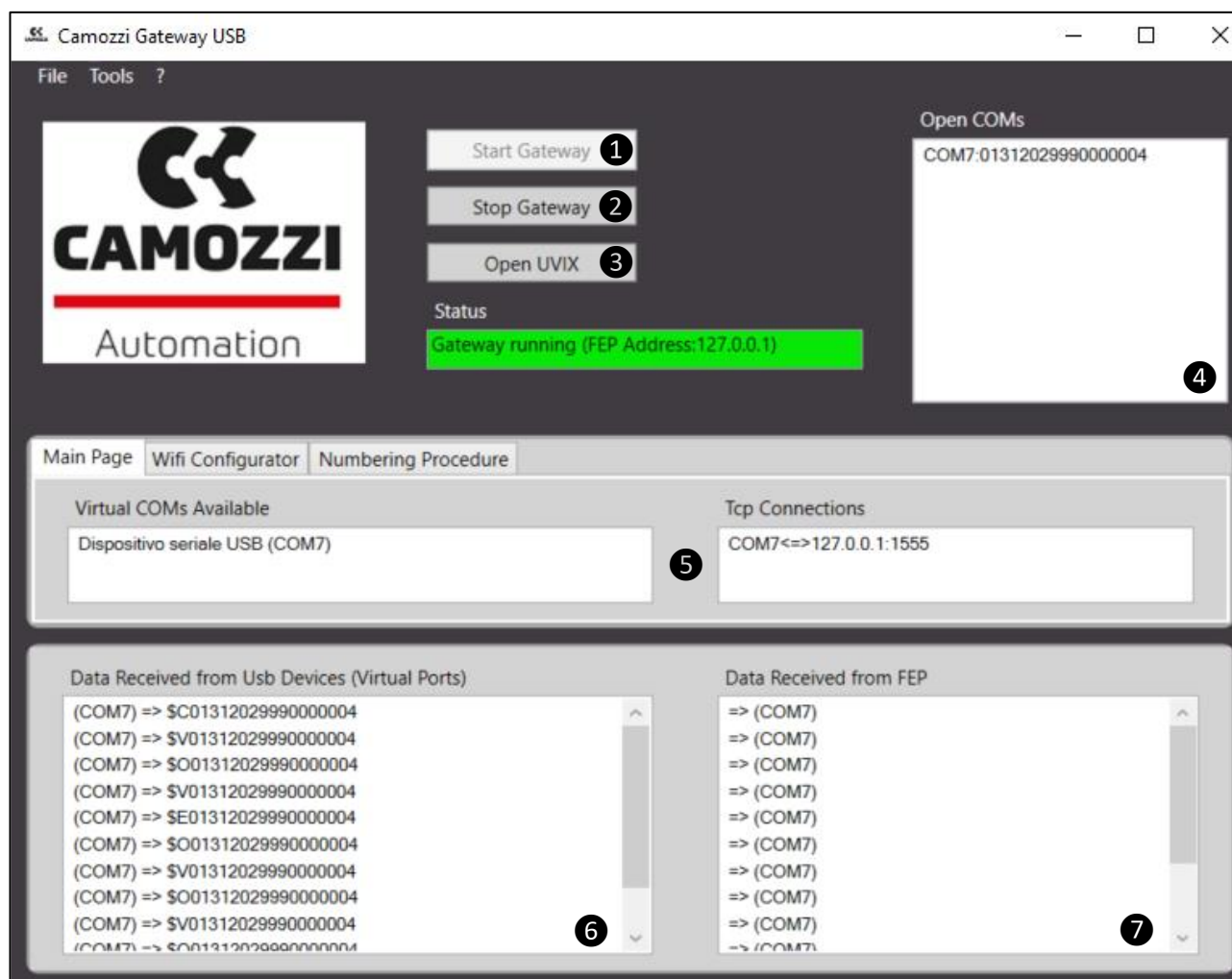
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## 9.7 UVIX USB Gateway

The CX4 module can be connected to a PC via a USB cable. This connection - subject to prior installation of UVIX on the PC - allows you to communicate with the module through the Camozzi USB Gateway.

### 9.7.1 Main page

- ① Button to start up the USB Gateway and start communicating with the CX4 module.
- ② Button to stop communication with the CX4 module.
- ③ Button to access the UVIX Browser interface (par. Errore. L'origine riferimento non è stata trovata.).
- ④ COM ports connecting the CX4 modules.
- ⑤ Virtual COM ports available and addresses of TCP connection for the connected COM ports.
- ⑥ Data received from the COM port
- ⑦ Data received on the FEP of the UVIX system.



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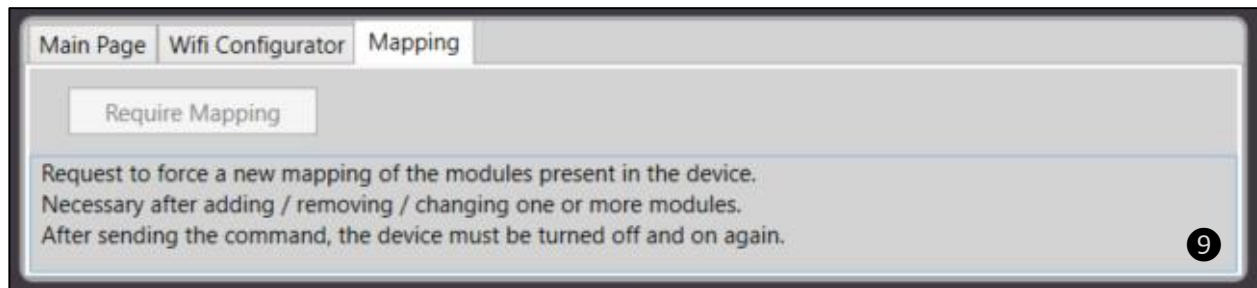
### 9.7.2 WiFi network configurator

In the tab for configuring the WiFi connection **8** (if available), you can read the parameters of the current connection and write any new ones for a new connection.



### 9.7.3 Mapping

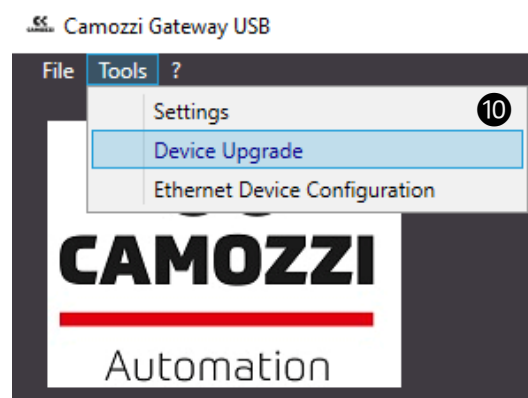
In the last tab that can be consulted via the USB gateway, you can send a mapping request to the CX4 module. The *Require Mapping* button remains pending until the next restart of the CX4 module.



### 9.7.4 Firmware update

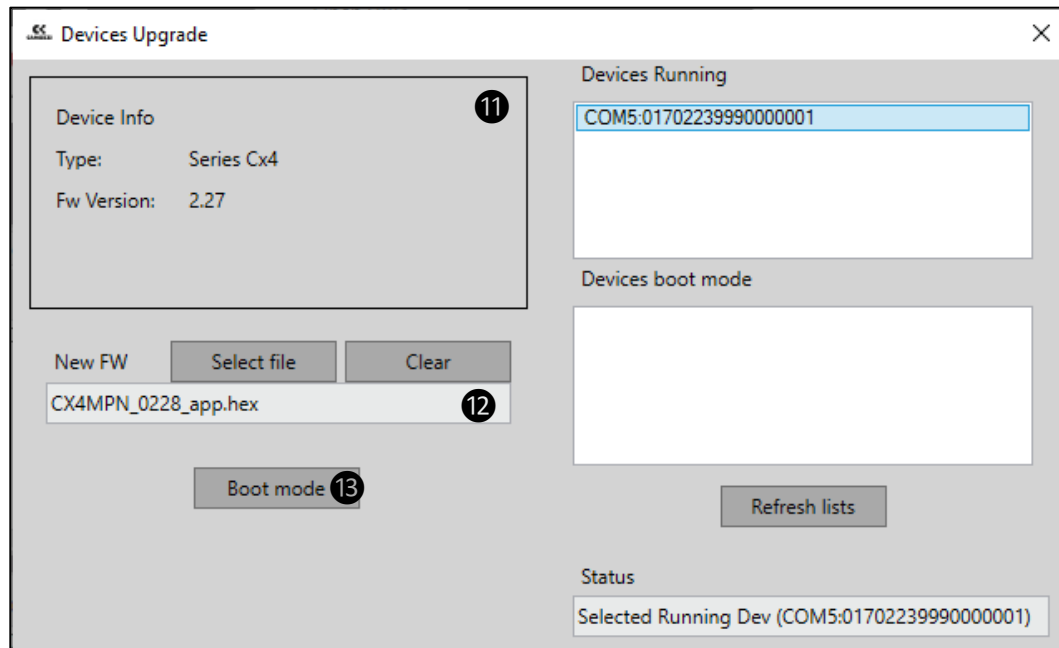
**NOTE.** Before carrying out this operation, you must contact Camozzi support.

The USB Gateway allows you to update the firmware of the CX4 module through the window found under Tools > Device Upgrade **10**.

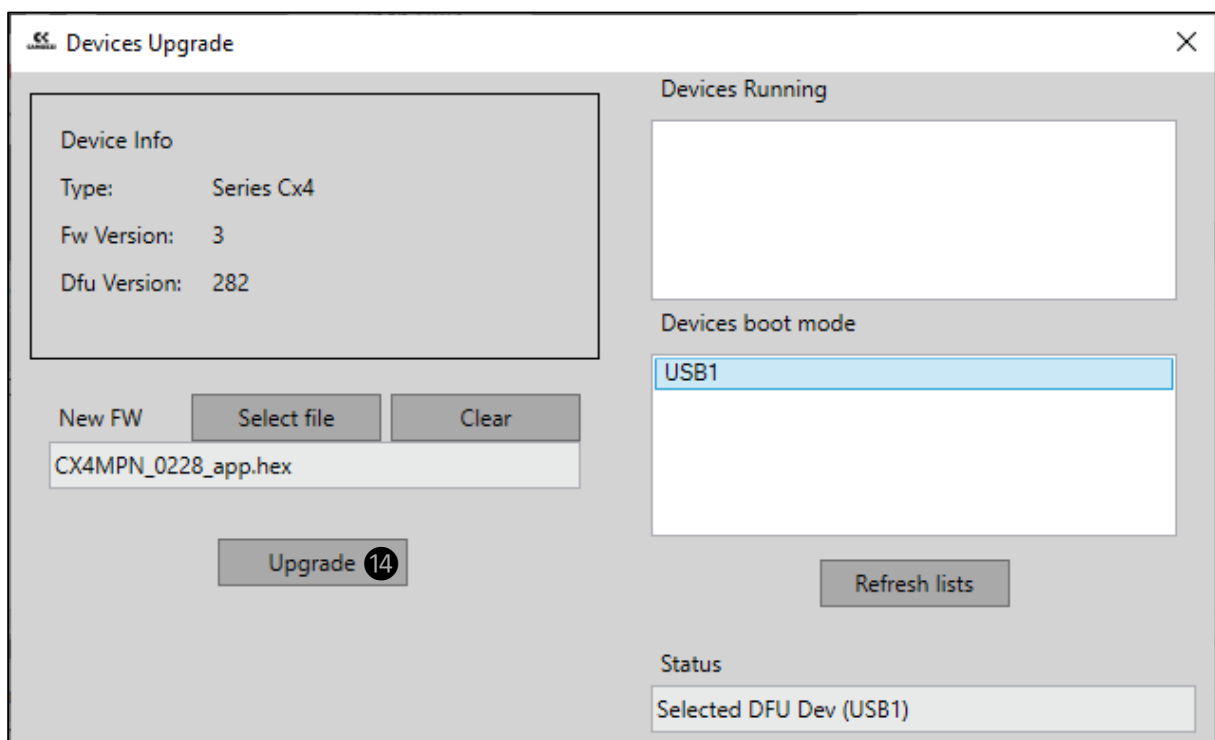


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The firmware update window indicates the current version **11** and allows you to select the new executable to upload to the module **12**. You must then put the device in Boot mode **13**.




Once in Boot mode, the module is ready to load the new firmware into memory **14**.

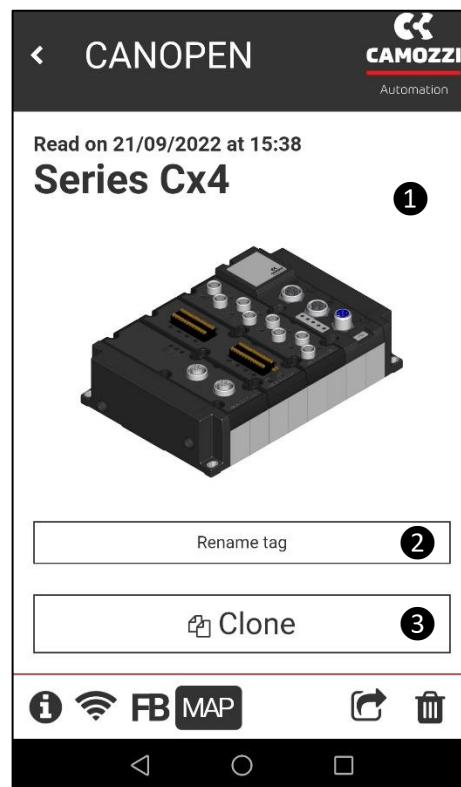


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## 10 NFCamApp

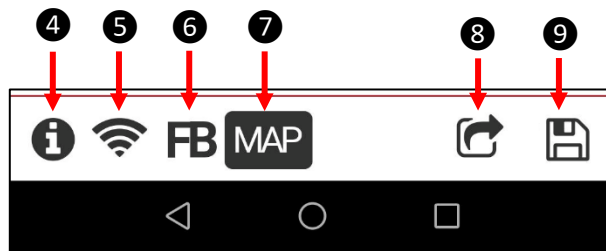
### 10.1 Main overview

NFCamApp is an app for smartphones (Android and iOS) which allows you to communicate - via NFC technology - with the CX4 module to obtain general information on the module and on the valve island (if configured as such). You can also use the app for module configuration. Once the CX4 module has been scanned, on the homepage, alongside the antenna positioned under the symbol , you can view the Camozzi series of the device **1** (*Series CX4*), assign a name to the device **2** and clone **3** the entire configuration (parameters of the CX4, the IO modules and the solenoid valve sub-bases) of the system, both in Stand Alone mode and as a Valve Island, to another system with a CX4 module compatible with the same fieldbus.



You can also access other pages of the app via the icons at the bottom of the homepage.

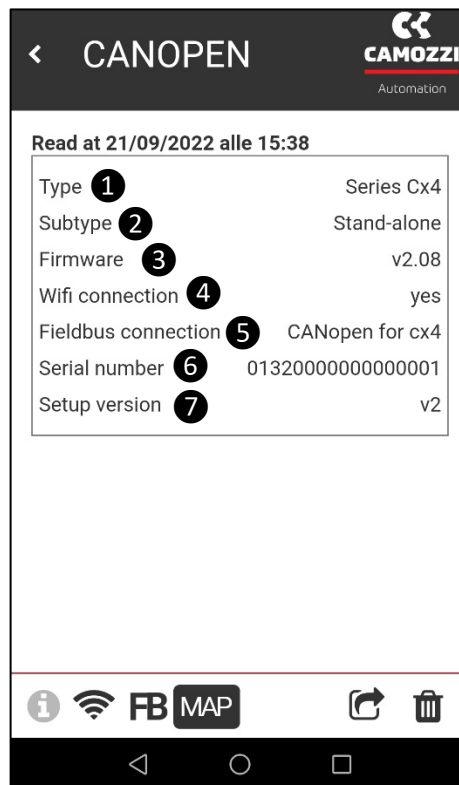
- **4** General module information page.
- **5** WiFi network information page (if available).
- **6** Bus information page.
- **7** Page to request new mapping.
- **8** Share module and/or island configuration.
- **9** Save the configuration of the scanned module or island.



## 10.2 General information


The first selectable page  displays general information about the scanned CX4 module.

- **1** Device family: *Series CX4*.
- **2** Subtype of the CX4 module family: *Stand-alone, D1, D2, D4 e D5*.
- **3** Firmware version.
- **4** Status of the WiFi connection: *Yes* - WiFi module present, *No* – no WiFi module.
- **5** Type of fieldbus: *CANopen*.
- **6** The serial number consists of 17 characters.
- **7** Version of the app.

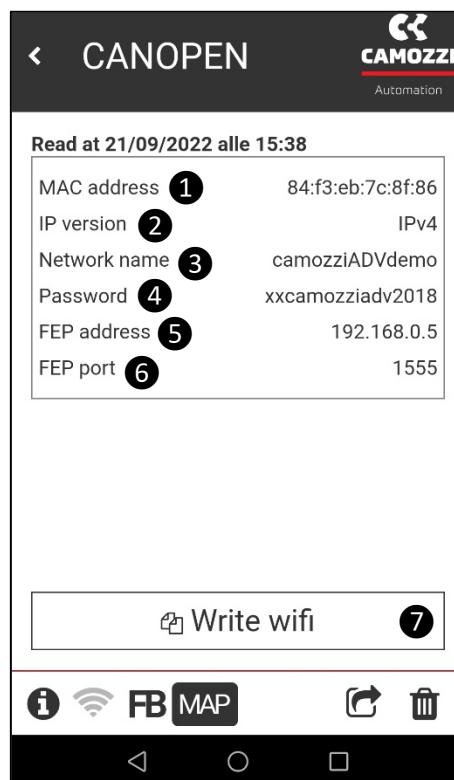


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### 10.3 WiFi information

The WiFi connection information page  is found only if there is a WiFi module connected inside the CX4 module, otherwise it is not displayed.

- ① MAC address of the WiFi module.
- ② IP version of the WiFi connection.
- ③ Name of the WiFi network to which the device is connected.
- ④ WiFi network password.
- ⑤ FEP address to which the devices are connected.
- ⑥ FEP port to which the device is connected.
- ⑦ Button for changing the data of the WiFi network to which you want to connect the module.

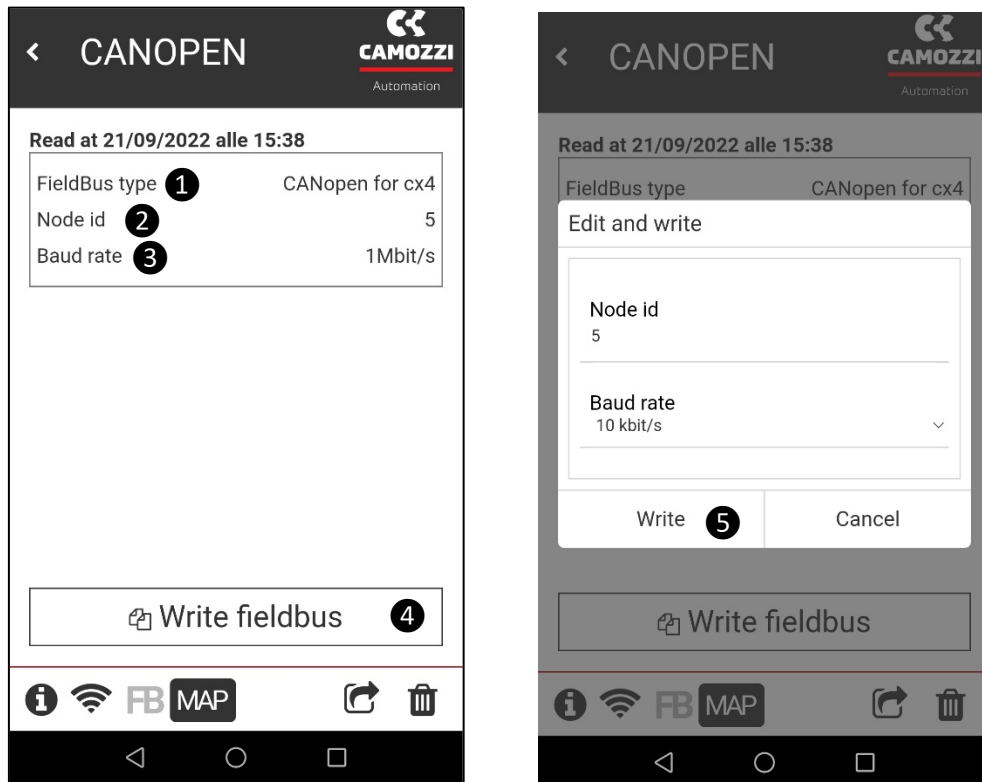




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## 10.4 Fieldbus configuration

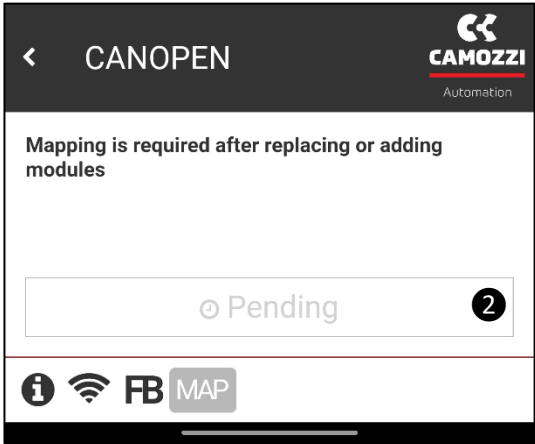
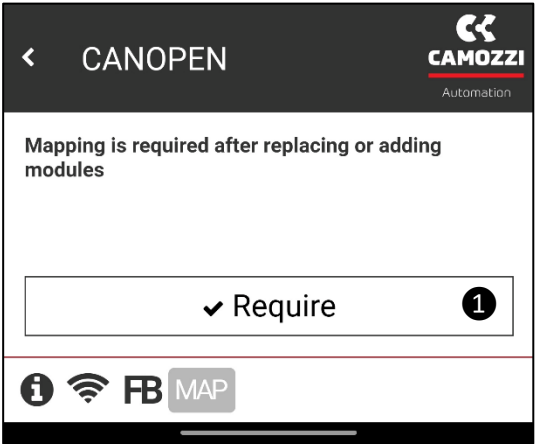
The CANopen protocol information page **FB** displays the name of the fieldbus **1**, and also the *Node id* **2** and the *baud rate* **3**. These parameters are configurable (par. Errore. L'origine riferimento non è stata trovata.) using the write button **4** and writing an NFC **5** through the app.



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### 10.5 Mapping request

The last available page  in the app, you can request a new system mapping using the button *Require* **1**. Once the request has been made, it remains pending (the button will change to *Pending* **2**) until the next restart of the CX4 module.



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