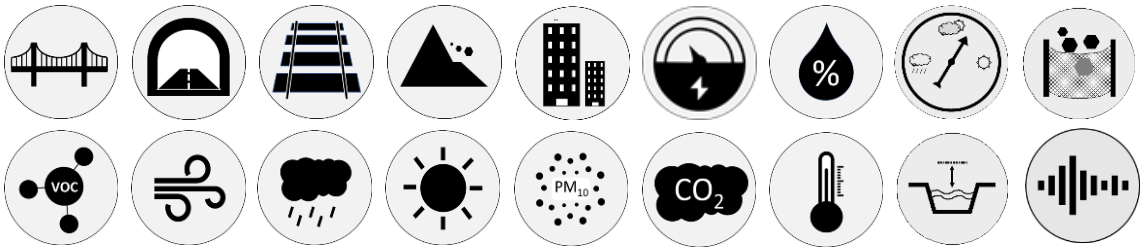


EXP4IO-xx

User Manual

Capetti ELETTRONICA

WineCap LoRa®

WineCap PRO

General warnings.

- The following information must be read and understood before proceeding with the installation, commissioning and maintenance of the devices described in this document.
- ATTENTION! Any omission or failure to follow these instructions scrupulously can cause danger.
- ATTENTION! Explosion hazard. In case of batteries substitution, make sure that the type is compatible and complies with the specifications indicated by the manufacturer.
- In case of batteries substitution, DO NOT disconnect the flat cable which connect the electronic boards without removing batteries before
- ALWAYS substitute all the batteries, also in case of one single battery exhausted.
- If the device is powered by a fixed network, make sure you have disconnected the power supply before carrying out any type of intervention. Failure to comply with this indication can cause damage to people and/or property.
- Follow the manufacturer's suggested warm-up time (*time required to obtain a reliable measurement*) of the transducer.
- Follow the manufacturer's suggested electric wiring of the transducer to measure (*ground shields at a single point, cable length and section*); voltage measures on distances exceed 15/20 meters are subjected to electromagnetic disturbances. 0÷25mA inputs have a superior electromagnetic compatibility (*EMC*).
- Avoid passage in cavities with power or high voltage cables.
- The protection and safety measures and the warranty provided by the Manufacturer with the equipment may be compromised if it's used in a manner that does not comply with this user manual.
- This equipment complies with CE regulations.
- Modifications or tampering not expressly approved by the Manufacturer could void the user's authorization to operate the equipment.
- This equipment must be installed by qualified personnel and in accordance with national regulations and/or related local requirements.
- Make sure that the object is properly fixed to supports/infrastructures capable of withstanding this load. Make sure proper methods and materials are used when fixing the equipment to a wall.
- Only personnel expressly authorized by the manufacturer can open the container. There are no user serviceable parts inside.

1. Description.

Picture 1 - Product image

EXP4IO expansions allow interfacing of "M" series gateways with four INPUT/OUTPUT channels that can be configured in pairs: analogue, digital, NTC and "open collector" contacts.

Developed to increase the functionality of wireless gateways (*analogue and digital inputs and outputs*), they are I/O expansion units to be connected directly to the expansion bus on the gateways themselves.

Expansions are configured using the *WineCapManager* software.

To connect expansions to the gateway and configure the system for exporting quantities to the outputs, please refer to the document '*WineCap System - User Manual R31*'.

2. EXP4IO Expansion types.

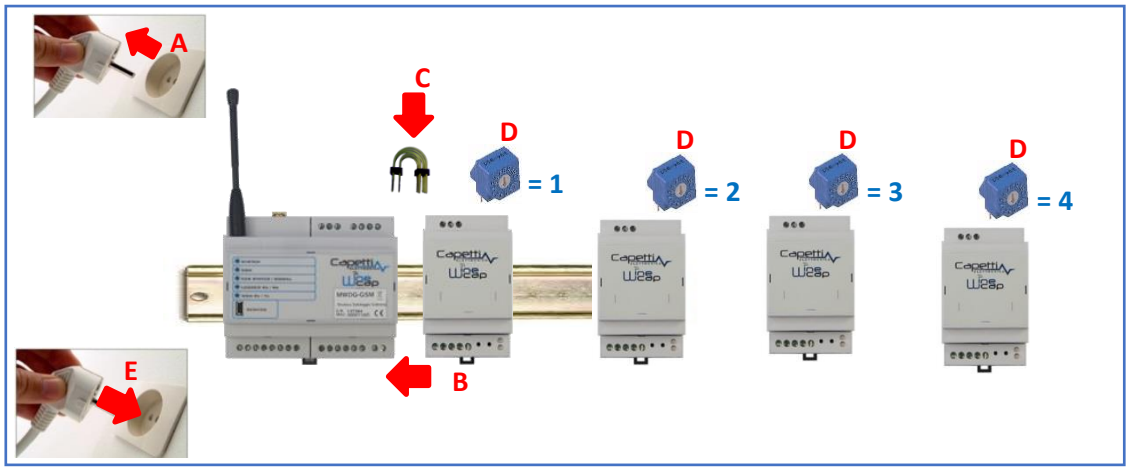
- EXP4IO-00: Expansion with 4 NTC10K output channels for coupling to COSTER control units.
- EXP4IO-33: Expansion with 4 input channels 0÷10Vdc.

A maximum of 4 expansion I/O modules can be connected per MWDG gateway.

Each module makes four channels available.

The addresses, selectable with rotary switches, range from position number 1 to position number 4; it is advisable to arrange the various expansion modules in ascending order of address.

3. EXP4IO expansion installation.

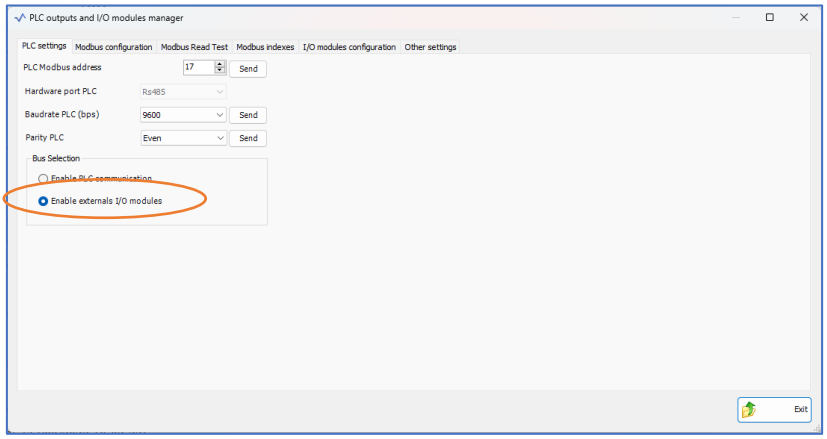


Picture 2 - EXP4IO expansion Installation

A. The connection must be made with the devices unpowered, so switch off the gateway first if it is switched on.
B. Plug the EXP4IO-xx expansion module to the right of the MWDG gateway onto a DIN rail.
C. Remove the upper terminal block protectors of both devices to be connected and use the supplied jumper.
D. Select the address of the expansion module, using a flat screwdriver and acting on the rotary switch, starting with the value "1" for the first expansion element and in the case of several devices to be added, assign addresses in ascending order up to a maximum of four modules in total.
E. Powering the devices.

To connect I/O modules, the RS485 communication channel from the external port to the internal bus must be changed.
This means that the use of the modules precludes the simultaneous use of a PLC peripheral connected to the external RS485 terminal.

- Go to the 'Gateway' drop-down menu and select 'PLC output and I/O modules management'.
- Select the 'Enable external I/O modules' option.



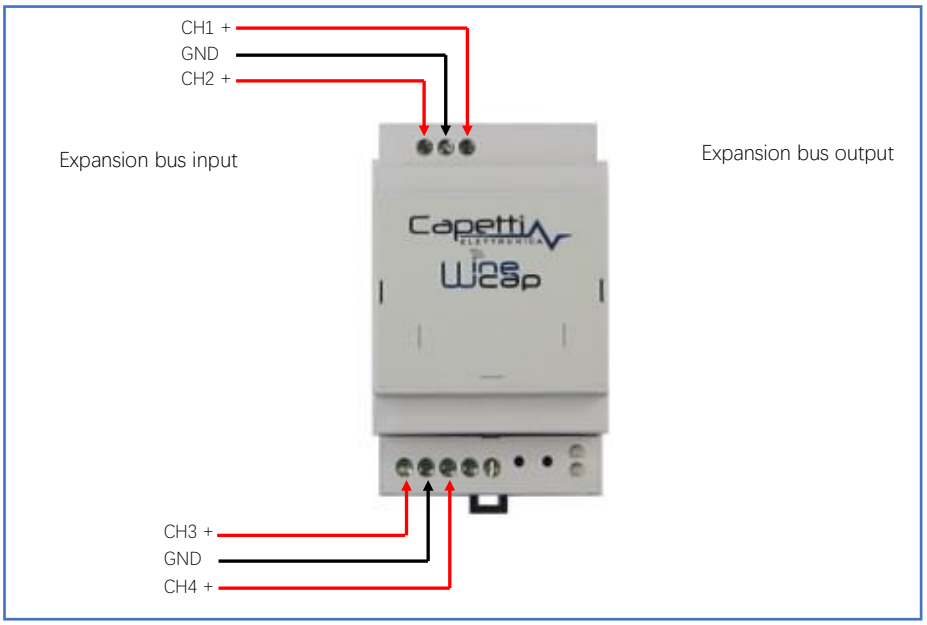
Picture 3 - EXP4IO expansion installation

After this operation it is possible to proceed with the recognition and configuration of additional modules connected to the gateway.

This operation is not to be carried out if the gateway to which the module is connected is the MWDG-MB as it is not necessary.

In this case the option 'Enable external I/O modules' will not be present on the 'PLC outputs and I/O modules management' screen of *WineCapManager*.

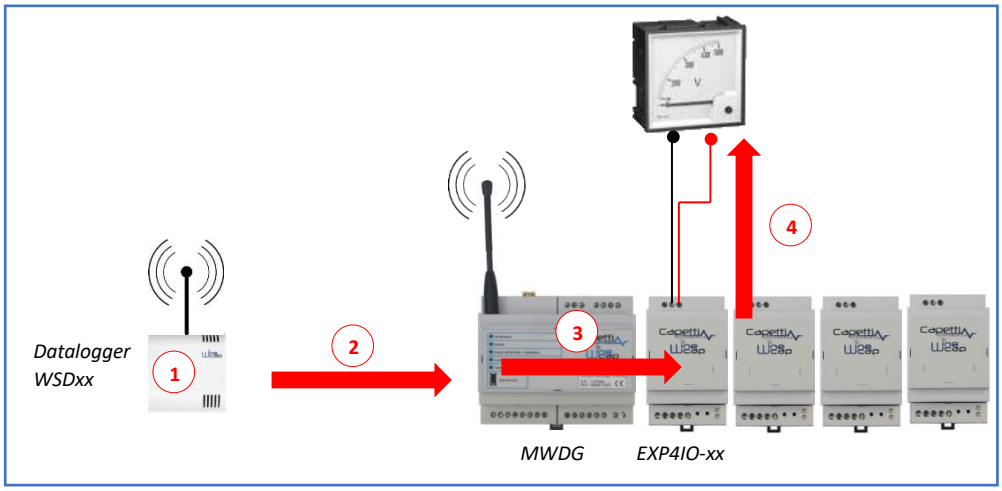
4. Link layout.



Picture 4 – Link layout

5. EXP4IO - OUTPUT expansions (EXP4IO-00).

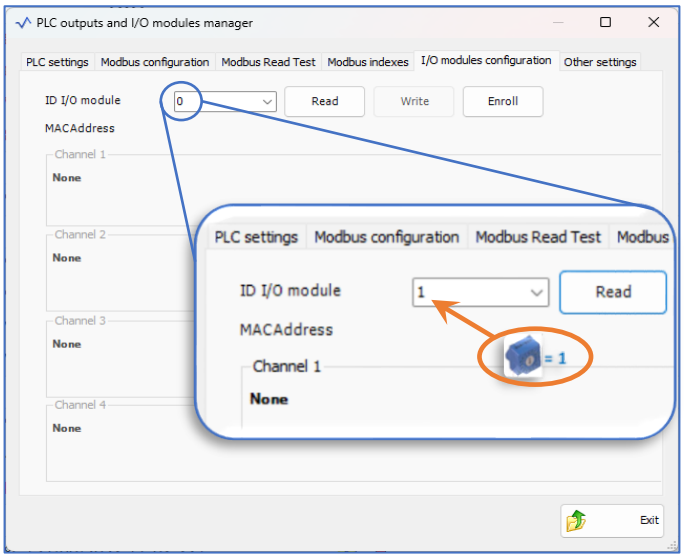
Using the EXP4IO output expansion the gateway can convert a physical quantity (temperature, humidity etc.) into an analogue signal between 0 and 10Vdc or into a resistive value.



Picture 5 – Output expansions

Example:

1. The WSDxx datalogger measures a physical phenomenon (*temperature, humidity*).
2. The datalogger transmits the measurement via radio to the MWDG gateway.
3. MWDG gateway sends measurement to EXP4IO-00 expansion module.
4. The expansion module transforms this information into a voltage level between 0 and 10Vdc.



Procedure:

1. Select 'PLC Outputs and I/O Modules Management' from the 'Gateway' drop-down menu. Then select the 'I/O Modules Configuration' tab.

   Output management panels and I/O modules have the characteristic of not retaining data in memory once they are closed; therefore, each time such a window is reopened, it is strongly recommended to press the 'Read' button to check the contents of the previously set data before performing any other operation.

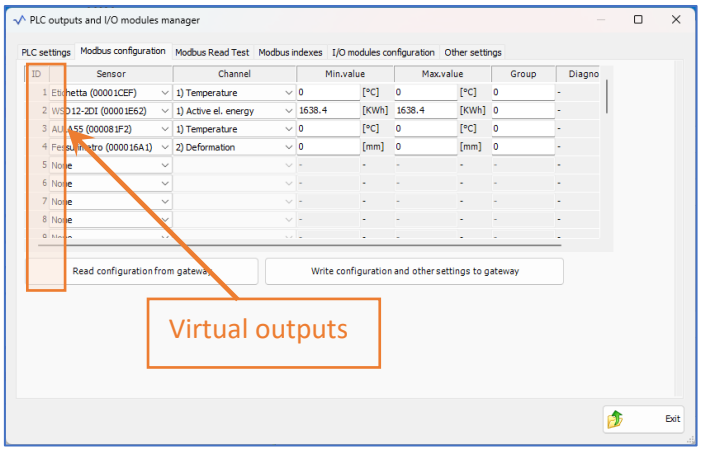
   'Write' and 'Enroll' operations overwrite data irreversibly.
2. Enter the address of the expansion device (the one configured with the rotary switch) inside the box labelled 'I/O module ID', then press the 'Enroll' button first.

   The 'Enroll' command must be used each time a new expansion module is connected, or its address is changed.

   If the 'Enroll' command of a previously programmed module is accidentally pressed, it is necessary to reconfigure the logical channels, as this restores them to default mode (channel with value '0'), i.e., logical channel not assigned.

   The 'Read' command is used to check whether a module with an assigned address has been previously configured, or whether the 'Enroll' command was successful.

   The 'Write' command is used to change module parameters; for example, change the connection between logical and virtual channels, enable it with a new channel or simply disable it by setting it to '0'.
3. Select from the 'Gateway' drop-down menu the 'PLC Outputs and I/O Modules Management' item. By selecting the 'Configuration' tab, the virtual channel configuration window will appear.

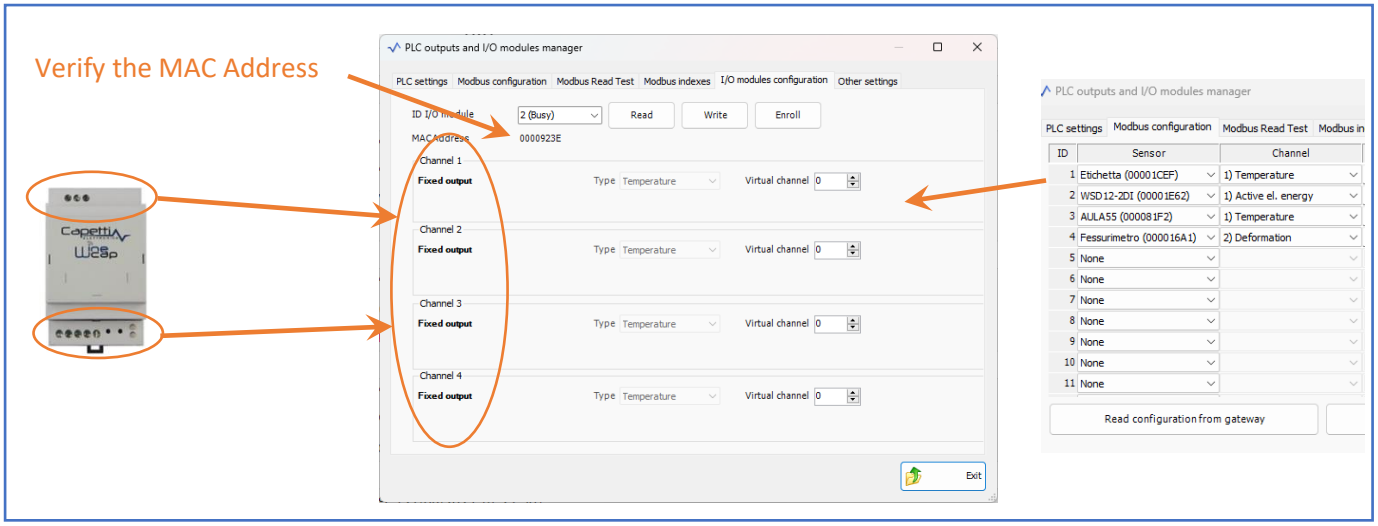


4. Select the datalogger/probe (sensor), via its MAC address, and the measurement channel on the line corresponding to the selected virtual output, to configure the virtual outputs associated with the measurements from the probes belonging to the network.

   In the example opposite, the temperature channel of datalogger 00001CEF has been associated with the first virtual channel (*Id no. 1*).

5. Once all virtual outputs and probes/dataloggers (sensors) associations have been defined, press the 'Write configuration and other settings to gateway' button on the bottom right panel and wait for the parameters to be written.

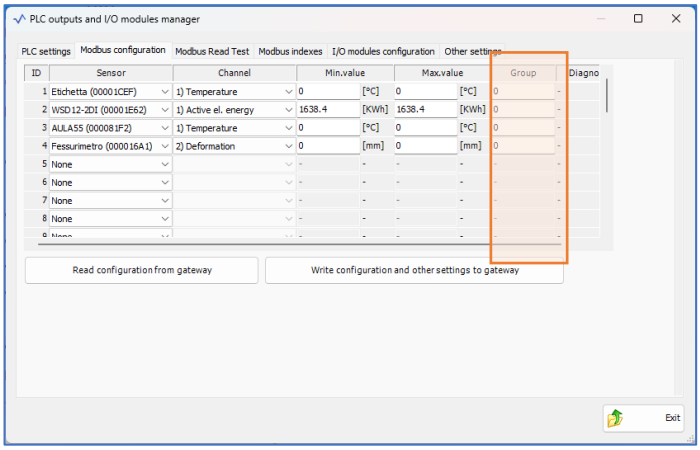
6. Select the 'I/O Modules' tab by pressing the tag of the same name at the top right, the following window will appear:



Check that the 'MAC address' corresponds to the one written on the label of the expansion device; then associate the expansion's analogue outputs (Channel 1,2,3 and 4) with the virtual outputs defined in step 4 and press the 'Write' button to save the new configuration.

a. Average value for output expansions:

Output expansions can be set to allow subdivision into groups via a special column (*Picture 6 - 'Group' column*).



Picture 6 - 'Group' column

This subdivision allows you to modify the output value relative to the channels in the same group, applying an average according to the following logic:

- *Group 0*: media disabled; this is the default setting, all channels belonging to this group will maintain total independence in sending measurements.
- *Groups 1 – 20*: If the probes are part of one of these groups, should one of the probes be in a state of OFFLINE or INVALID MEASUREMENT, the value of the relative output will be the arithmetic mean of the values of the other probes belonging to the same group. If there is not even one probe online in that group, a fault value will be sent to the device connected to EXP4IO.
- *Groups 21 – 40*: unlike the previous family of groups, in this case the average value will be applied to each of the probes in the same group, regardless of its status. As in the previous case, if there are no probes online in the group, a fault value will be sent to the device connected to EXP4IO.

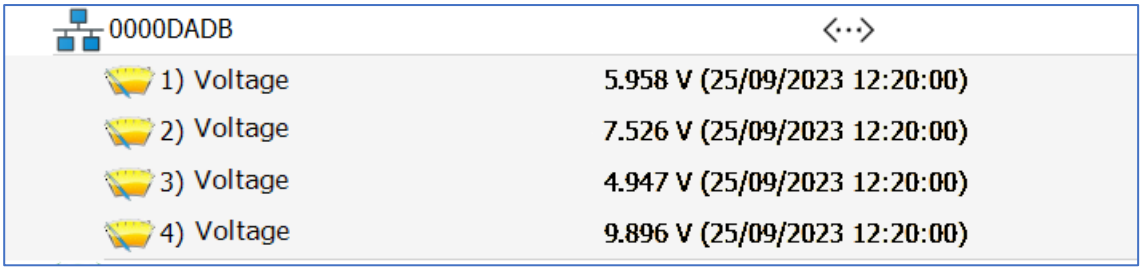
In case you wish to deactivate this feature, simply return the desired channels to group 0, or set each channel to a different group. In both cases, at the first available event, averages will cease to be calculated.

6. EXP4IO - Input expansions (EXP4IO-33).

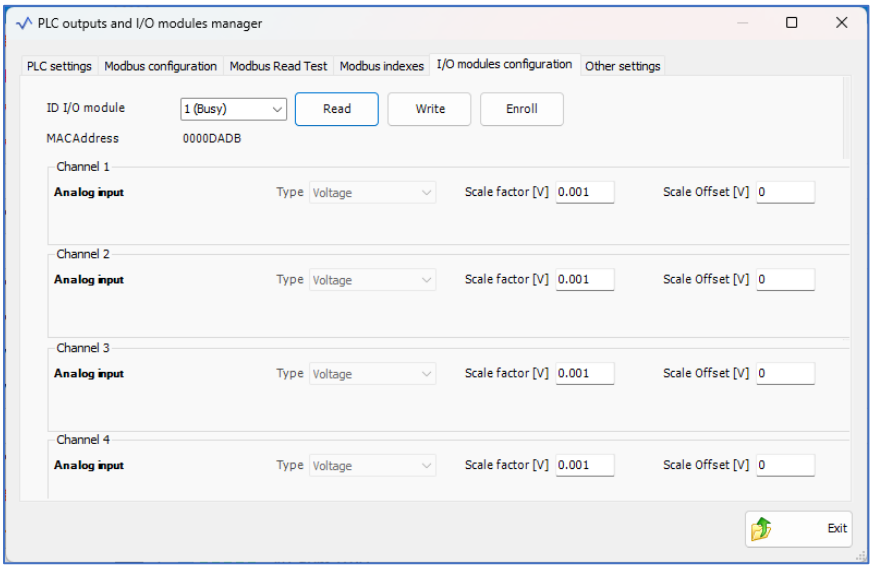
Via the EXP4IO input expansion, the gateway can acquire a physical quantity (pulse, voltage or current) via a virtual data logger with up to 4 channels.

In appearance, such a datalogger behaves like a normal wireless datalogger, so it records values and it is possible to change parameters such as name, sampling time or thresholds.

The special feature is that it has an identical MAC code to the EXP4IO-xx module and that the battery signal and radio range will always be 7 and 0dBm respectively.



Picture 7 – Virtual datalogger visualization



Procedure:

1. Select 'PLC Outputs and I/O Modules Management' from the 'Gateway' drop-down menu. Then select the 'I/O Modules Configuration' tab.

   Output management panels and I/O modules have the characteristic of not retaining data in memory once they are closed; therefore, each time such a window is reopened, it is strongly recommended to press the 'Read' button to check the contents of the previously set data before performing any other operation.

   The 'Write' and 'Enroll' operations overwrite the data irreversibly.
2. Enter the address of the expansion device (the one configured with the rotary switch) inside the box labelled 'I/O module ID', then press the 'Enroll' button first.
3. In some cases, it is possible to change the type of input (*contact, energy, pulse*).
4. It is also permissible to change the scaling factor and offset to adapt the measured value from the measurement channel to the dynamics of the input value.

   The coefficient to be introduced must first be multiplied by the initial scaling factor and entered in the on-screen field 'Scale offset [*V*]'.

   The system will multiply this value with the measured measurement. The initial scaling factor, by default, corresponds to the resolution of the instrument, i.e., the minimum readable unit.
5. The 'Write' command is used to modify the parameters of the form and make them definitive.
6. Rereading the system configuration "Gateway" ➔ "Read sensor configuration" the virtual datalogger will appear in the list and will be operational to acquire the received values.

7. EXP4IO-00 installation.

The EXP4IO-00 expansion includes a SELF-APPROVED procedure to recognise the type of input to which it is connected (*voltage and current of the reading circuit*).

After physically connecting the module outputs to their inputs and switching on all equipment, perform the following procedure:

1. Connect the *COSTER* control unit inputs to the EXP4IO expansion outputs.
2. Power-up the whole system.
3. Keep **SW1** and **SW2** pressed for two seconds, LEDs **LD1** and **LD2** will switch off.
4. Press **SW1** for one second. LED **LD1** flashes GREEN and the self-recognition procedure for channel 1 begins. LED **LD2** is OFF. At the end of the procedure, steady **LD1** will indicate the outcome of the self-recognition: GREEN= PASS, RED= FAIL.
5. Press **SW1** again, the procedure repeats by flashing **LD1** but learns channel 2.
6. Press **SW2** for one second. LED **LD2** flashes GREEN and the self-recognition procedure for channel 3 begins. LED **LD1** is off. At the end of the procedure, steady **LD2** will indicate the outcome of the self-recognition: GREEN= PASS, RED= FAIL.
7. Press **SW2** again, the procedure repeats by flashing **LD2** but learns channel 4.
8. Hold down the **SW1** and **SW2** buttons for two seconds to exit the self-recognition procedure. The **LD1** and **LD2** LEDs will remain lit steady green.

Invalid measuring condition or probe offline.

If an INVALID measurement condition occur on the wireless probe/datalogger (damaged transducer) or if the probe/datalogger itself be in a radio OFFLINE condition (insufficient radio range or dead batteries), the EXP4IO module places the outputs in a high impedance state to simulate the physical disconnection of the NTC from the corresponding input on the COSTER device.

This condition can be detected as a malfunction and therefore can be managed by appropriately programming the controller and possibly highlighting the fail state.

This condition is also present when the device is switched on and remains until measurements are received from the probes/dataloggers, which update the status of the outputs to the desired value.

8. Technical Information.

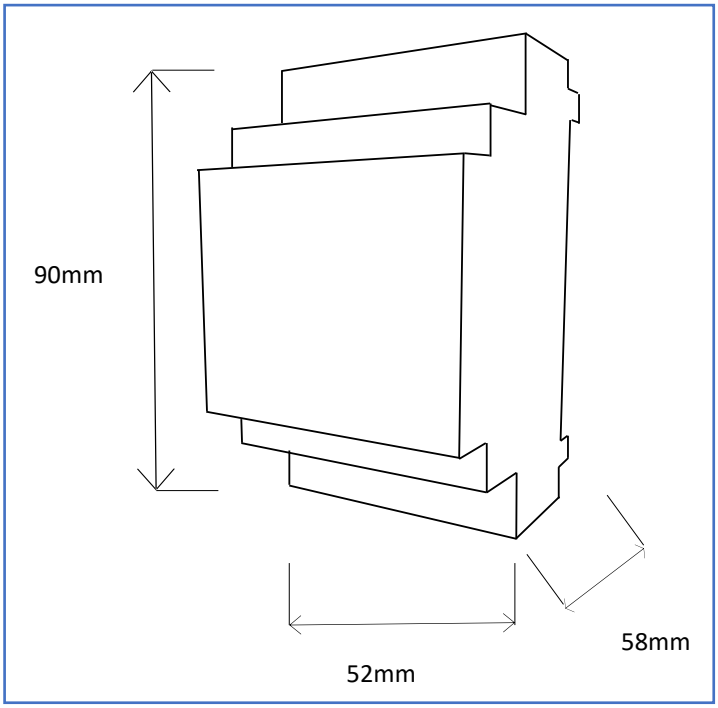
Power supply	24Vdc from gateway
Configurable input/output	1. 4 analog inputs 0÷10Vdc • 4 NTC outputs in 10K and 1K 'Coster' emulation
Sealing	IP30
Dimensions	90x52x58mm
Weight	50g
Case material	ABS
Mounting	Via DIN rail
Expansion connection	Via dedicated connector
Connections	Through screw terminal block
Copper wire section	0,05÷2,5mm² / ÷ 14 AWG

9. Order code nomenclature.

EXP4IO -	n	n	
	0		CH1 e CH2 → NTC10K outputs SAB010
	3		CH1 e CH2 → analog inputs 0÷10Vdc
		0	CH3 e CH4 → NTC10K outputs SAB010
		3	CH3 e CH4 → analog inputs 0÷10Vdc

Picture 8 - Code nomenclature

10. Mechanical dimensions.



Picture 9 - Mechanical Dimensions

11. Disclaimer.

- Specifications are subject to change without notice and should not be interpreted as a commitment on the part of Capetti Elettronica S.r.l.
- Capetti Elettronica S.r.l. assumes no responsibility for possibly errors that may appear in this document. In no case Capetti Elettronica S.r.l. will be liable for incidental or consequential damages resulting from the use of this document or the systems described in this document.
- All Contents published or distributed by Capetti Elettronica S.r.l. are made available for general information purposes.
- It is not permitted to publish or use, in whole or in part, such contents for commercial purposes without the explicit written consent of Capetti Elettronica S.r.l.
- The reproduction, duplication, modification, sale or resale of this material or part of it is not permitted without the explicit written consent of Capetti Elettronica S.r.l.
- The product is not intended for use in applications where safety is critical, such as life-security systems or medical-related applications.
- If a channel is saturated or disrupted "Frequency hopping" transmitting method allows data integrity and security, but correct functioning of the product in environments with high radio activity is not guaranteed.

12. Reference standards.

EN 61010 -1

For electromagnetic compatibility

EN 61000 - 3 - 2
EN 61000 - 3 - 3
EN 300 220 -2
EN 301 489 - 03
EN 61000 - 6 -1

This symbol indicates that this product is compliant with the European Directive 2011/65/CE that restricts the use of substances in the manufacturing of electronic devices.

RoHs
2011/65/CE

The “WEEE” logo on the label indicates that this product is compliant with the "WEEE" EC Directive. This symbol (valid only in the European Union countries) indicates that the product it is applied to, MUST NOT be discarded with ordinary household or industrial waste, but must be sent to an authorized reception point. The end user should contact the device provider, either the manufacturer or the reseller, to agree a collection and disposal process, after having checked the terms and conditions of sale.

IT19020000001116

CE

SCAN ME