

I/O MANAGEMENT MODULE

XJM60D

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1. GENERAL WARNING

1.1 PLEASE READ BEFORE USING THIS MANUAL

- This manual is part of the product and should be kept near the instrument for easy and quick reference.
- The instrument shall not be used for purposes different from those described hereunder. It cannot be used as a safety device.
- Check the application limits before proceeding.
- Dixell s.r.l. reserves the right to change the composition of its products, even without notice, ensuring the same and unchanged functionality.

1.2 SAFETY PRECAUTIONS

- Check the supply voltage is correct before connecting the instrument.
- Do not expose to water or moisture: use the controller only within the operating limits avoiding sudden temperature changes with high atmospheric humidity to prevent formation of condensation
- **Warning:** disconnect all electrical connections before any kind of maintenance.
- Fit the probe where it is not accessible by the End User. The instrument must not be opened.
- In case of failure or faulty operation send the instrument back to the distributor or to "Dixell s.r.l." (see address) with a detailed description of the fault.
- Consider the maximum current which can be applied to each relay (see Technical Data).
- Ensure that the wires for probes, loads and the power supply are separated and far enough from each other, without crossing or intertwining.
- In case of applications in industrial environments, the use of mains filters (our mod. FT1) in parallel with inductive loads could be useful.

2. GENERAL DESCRIPTION

The XJM devices (4-DIN) are intended to be used in applications (refrigeration, air-conditioning, automation, etc.) where is required the readings and the monitoring of some analogue variables, such as temperature, pressure and humidity. The XJM module can use a wide range of analogue sensors: NTC, PTC, PT1000 and current or ratio metric sensors. It is also able to manage both insulated and not insulated digital input contacts, which can be interpreted as states or alarms. The XJM implements multiple threshold controls (both upper and lower type). The available I/O resources can be divided in subgroups named "Sections" (from 1 to 6 sections can be enabled). Every Section has its dedicated Modbus address and its resources are automatically allocated from the XJM module. The XJM is equipped with 1 or 4 relay outputs that can be linked to internal alarms or manually activated by keyboard or specific serial command. The XJM has an analogue output, 0 -10V or 4 -20mA type, which can be linked to a specific input (e.g. a temperature variable) or automatically driven via serial command. This device is natively supported from XWEB monitoring systems. It is equipped with an HOTKEY port to be easily programmed. The XJM is available with integrated display and keypad or with blind front panel and remote keypad.

3. USER INTERFACE

3.1 KEYBOARD

<b>menu / 1</b>	(MENU) To enter the "MENU" menu If manual relay status is enabled, it allow to activate and deactivate the relay 1
<b>SECTION / 2</b>	To enter the "SECTION" menu. If manual relay status is enabled, it allow to activate and deactivate the relay 2
<b>▽ / 3</b>	(DOWN) To browse the I/O status. When in programming mode, it browses the parameters and modifies their value. If manual relay status is enabled, it allow to activate and deactivate the relay 3
<b>△ / 4</b>	(UP) To browse the I/O status. When in programming mode, it browses the parameters and modifies their value. If manual relay status is enabled, it allow to activate and deactivate the relay 4
<b>SET</b>	(SET) It allows to see and modify the working SET-POINT. In programming mode it is used to see and modify the value of the parameters.
<b>⏻</b>	(ONOFF) Keep it pressed for 3 sec in order to place the device in ON or OFF mode. If the energy saving function is enabled, it allows changing from normal to energy saving mode.

3.2 DISPLAY MODEL



Display and keyboard available

3.3 BLIND MODEL



Blind module without keyboard nor display

Remote display and keyboard

3.4 LED LEGENDA

The following table collects the meaning of any available LED or icon.

LED	MODE	FUNCTION
RL1 / RL4	ON	Relative relay is activated
ScT	ON	Menu SECTION
S1 / S6	ON	The visualized parameter is related to the selected section
	Blinking	On of the alarms of the selected section is active
❄️	ON	A defrost operation is running in the selected section
	Blinking	A post-defrost operation is running in the selected section
⚠️	ON	Alarm active
⏻	ON	Device or section in STAND-BY
ECO	ON	Energy Saving mode activated
🔒	ON	Keyboard locked
🔧	Blinking	Relay manual activation enabled
▲	Blinking	The blinking frequency indicates the output percentage value.
	ON	Analogue output at 100%
SET	ON	SET menu entered
MENU	ON	MENU menu entered

KEY COMBINATION

▽ + ▲	To lock and unlock the keyboard
MENU + ▽	To enable the manual activation of the relays
SET + ▲	To exit from any menu

The XJM has 4 menus for variable visualization and device configuration. All of them are accessible by using dedicated buttons: MENU, SECTION, SET, UP or DOWN.

3.5 I/O VISUALIZATION MENU

1. Press UP or DOWN button to visualize the first I/O (in1)
2. Browse the I/O by pressing UP or DOWN button. The upper display will show the label while the lower display will show the related value
3. Press both SET+DOWN buttons to exit from this menu

3.6 SET POINT MENU

Any enabled section has its proper SET-POINT which is only used to control the **relative** alarms. No regulation is performed from this module.

<b>SET</b>	<ol style="list-style-type: none"> <li>1. Press the <b>SET</b> key: the value of the SET-POINT of the first active section is displayed</li> <li>2. The icon indicates the <b>S1/S6</b> reference section</li> <li>3. The upper display shows the unit of measure and the Energy Saving value</li> <li>4. Keep the SET button pressed for 2 sec to change the value of any <b>SETx</b> set point. Use either <b>UP</b> or <b>DOWN</b> buttons to modify the stored values.</li> <li>5. Press the <b>SET</b> button to store the new value</li> <li>6. Press the <b>SET</b> button to exit the SET-POINT menu</li> </ol>
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3.7 MAIN MENU

Allow to activate some special function of the device.

<b>MENU</b>	<ol style="list-style-type: none"> <li>1. Press the <b>MENU</b> button to enter the function list. Select the function of interest by using the <b>UP</b> or <b>DOWN</b> buttons</li> <li>2. <b>ALrM</b> menu: Press <b>SET</b> to access the full list of all active alarms. Use <b>UP</b> or <b>DOWN</b> buttons to scroll through the items of this list. Press <b>SET</b> to exit. NOTE: if no alarm is present, the menu will be empty. <b>CLr</b> menu: Press <b>SET</b> to enter the reset menu for the pulse counters. Use <b>UP</b> or <b>DOWN</b> to choose the counter to reset. Press <b>SET</b> to erase the storage value of the selected counter. Press <b>SET</b> to exit. <b>CoPY</b> menu: used to copy settings from a section to another. Press <b>SET</b> to enter the copy command menu. Choose the source section using <b>UP</b> or <b>DOWN</b>. Press <b>SET</b> to confirm and move to the choice of the destination section using <b>UP</b> or <b>DOWN</b>. Press <b>SET</b> to copy the configuration from the source to the destination. When the copy operation is finished the label "End" will appear. It is always preferable to turn off and on the device at the end of any copy operation. Press <b>SET</b> to exit. <b>HOt</b> menu: is used to copy the complete configuration (all parameters) of an XJM in a HO-TKEY. Press <b>SET</b> to confirm the copy operation.</li> <li>3. Press <b>MENU</b> to exit the <b>MAIN</b> menu.</li> </ol>
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3.8 SECTION MENU

With this menu it is possible to enter to the device parameter list (Section "S0") and to the parameters of any other section.

<b>SECTION</b>	<ol style="list-style-type: none"> <li>1. Press <b>SECTION</b> button and select the section of interest with either <b>UP</b> or <b>DOWN</b> buttons. Any enabled section shows the "On" label on the lower display together with the section number.</li> <li>2. Press <b>ONOFF</b> button for 3 sec to turn on or off on the current section. NOTE: this function is not active for section 0</li> <li>3. Press the <b>SET</b> button to enter the programming mode (parameters Pr1)</li> <li>4. The device will show the label of the first parameter present in Pr1 level</li> <li>5. To exit the menu of the current section press <b>SECTION</b>.</li> <li>6. Press again to exit the <b>SECTION</b> menu</li> </ol>
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3.9 HOW TO ENTER PR2 PROGRAMMING LEVEL

1. Enter the "Pr1" programming level of the required section
2. Select the label "Pr2" and press the **SET** button. The display will show the "- - -" with first element blinking.
3. Use **UP** or **DOWN** button to enter the value "321" and confirm each step by pressing the **SET** button.
4. If the introduced code is correct, the Pr2 level programming will be entered.


**NOTE:** each parameter can be moved from Pr1 to Pr2 level and vice versa by pressing both **SET+DOWN** buttons. If in Pr2 level, any parameter placed in Pr1 will show the decimal point on the label.

3.10 HOW TO CHANGE ANY PARAMETER VALUE


1. Enter the programming parameter menu (Pr1 or Pr2)
2. Select the desired parameter by using either **UP** or **DOWN** buttons.
3. Press the **SET** button and the actual value will start blinking
4. Change the stored value by using the **UP** or **DOWN** buttons
5. Press the **SET** button to store the new value (it will flash briefly) and to move to the next parameter
6. Press both **SET+UP** buttons or wait for the timeout without pressing any key to exit from the programming menu and come back to the main display.
7. Press the **SECTION** button to exit only from the programming menu relative to the current section

**NOTE:** the new value is stored also in case of exiting from the programming menu.

3.11 ON/OFF BUTTON

	<p>Keep the ONOFF button pressed for 5 sec in order to activate the function linked from the parameter <b>onF</b>.</p> <p><b>onF=offF:</b> to power on and off the device. The display will show the "OFF" label. In this condition all the relays are deactivated and the alarms are disabled. If connected to a monitoring system, it will not record any relevant information and no alarm condition exists.</p> <p><b>onF=ES:</b> to activate the energy saving mode. The <b>ECO</b> icon will be lit.</p> <p><b>onF=diS:</b> button function disabled, any action on the button will produce no change</p>
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3.12 I TASTI RELE'

<b>1 + 4</b>	<p>The manual activation of the relays is enabled by keeping both <b>1+4</b> buttons pressed for 5 sec. The special operating mode is indicated from the blinking icon . Any relay is activated and deactivated by using the relative button and only if <b>rLCx=MA</b>n</p>
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4. SECTION CONFIGURATION

The I/O resources of the XJM can be divided in sub groups named sections. Each section will have a different and consecutive Modbus address. An XJM can be configured for having 1, 3 or 6 sections (S1 to S6, each individually enabled) in addition to the main section S0. Each section can be considered as independent part, having a different serial address and a specific parameter map. Each section has its own set of configuration parameters while the section S0 contains all the general configuration parameters. If the instrument is configured for having only one section, then the sections S0 and S1 will contain all the available parameters. From the point of view of communication Modbus, section S0 responds to the address assigned to the instrument while sections S1 to S6 will respond to the next addresses.

4.1 ONLY A SECTION PRESENT AND ENABLED: nSEC=1

Section 1 will have all I/O available and all parameters.

4.2 3 SECTIONS: nSEC=3

Any section will have 2 probes and 2 digital inputs and at least a relay output. Only section S1 will have 2 relays and the analogue output available.

I/O	S1	S2	S3
<b>Probes</b>	Pb1, Pb4	Pb2, Pb5	Pb3, Pb6
<b>Digital Inputs</b>	DI1, DI4, DI7, DI10	DI2, DI5, DI8, DI11	DI3, DI6, DI9, DI12
<b>Relays</b>	RL1, RL4	RL2	RL3
<b>Analogue output</b>	AO		

4.3 6 SECTIONS: nSEC=6

Any section will have 1 probe and 1 digital input. Only the sections S1, S2, S3 and S4 will have a relay output. Only section S1 will have the analogue output.

I/O	S1	S2	S3	S4	S5	S6
<b>Probes</b>	Pb1	Pb2	Pb3	Pb4	Pb5	Pb6
<b>Digital Inputs</b>	DI1, DI7	DI2, DI8	DI3, DI9	DI4, DI10	DI5, DI11	DI6, DI12
<b>Relays</b>	RL1	RL2	RL3	RL4		
<b>Analogue output</b>	AO					

4.4 MODBUS ADDRESSING

After being configured, the sections must be enabled by using the corresponding parameter **SEnx=YES** in order to receive a unique Modbus address to access their hardware resources. The addresses associated with the enabled sections are those consecutive section to that of S0. For example, if **nSEC=3** and the address of the section S0 is **Adr=1**, then the addresses of the three sections will be, respectively: **S1\_add=2**, and **S2\_add=3** and **S3\_add=4**. The hardware resources of each section will be available to an external monitoring system by using special commands to read / write to the address assigned to the relative section.

5. I/O CONFIGURATION

The XJM has 12 configurable inputs. The first six can be used as analogue inputs (temperature probes, current or ratio metric sensors) or as not insulated digital inputs. The other ones can be used only as insulated digital inputs.

Power supply	Probes / Not insulated digital inputs	Insulated digital inputs	Relay	Analogue output 0-10V o 4-20mA
24Vac	6 configurable	6	1 o 4	1

Any analogue input can be independently configured from the other ones. The available options for any input are listed in the following table.

5.1 ANALOGUE INPUT CONFIGURATION

	PB1/DI1	PB2/DI2	PB3/DI3	PB4/DI4	PB5/DI5	PB6/DI6
NTC	•	•	•	•	•	•
PTC	•	•	•	•	•	•
PT1000	•	•	•	•	•	•
4-20mA	•	•	•	•	•	•
0-10V	•	•	•	•	•	•
0-5V	•	•	•	•	•	•
Dig-in	•	•	•	•	•	•
Pulse	•	•	•	•	•	•

5.2 DIGITAL INPUT CONFIGURATION

The available options for the first 6 digital inputs can be set by using parameters **in1..in6**, while the other 6 digital inputs can be configured by using parameters **in7..in12**. The available options for any input are listed in the following table

CFG	inx	Function	Type of input
1	diS	Input disabled	
2	ntC	NTC temperature probe	Analogue input
3	PtC	PTC temperature probe	Analogue input
4	Pt1	PT1000 temperature probe	Analogue input
5	4-20	Current sensor, 4-20mA type	Analogue input
6	0-10	Voltage sensor, 0-10Vdc type	Analogue input
7	0-5	Ratio metric probe, 0-5Vdc	Analogue input
8	SonF	Switch ON and OFF signal for the relative section	Digital input
9	StAt	Command signal (Status) to activate the linked relay	Digital input

10	ALrd	Delayed alarm signal (par. ALdx)	Digital input
11	ALr	Immediate generic alarm signal	Digital input
12	PrSA	Immediate pressure alarm signal	Digital input
13	door	Door open signal	Digital input
14	EnS	Energy saving function activation	Digital input
15	dFr	Defrost signal	Digital input
16	rES	Pulse counter reset	Digital input
17	roF	Remote ON OFF	Digital input
18	PUL	Pulse counter function	Digital input

**5.3 ANALOGUE / DIGITAL INPUTS: in1, in2 AND in3**

The inputs identified with par **in1**, **in2** and **in3** can be set as:

- Analogue inputs to use temperature probes or current/voltage sensors
- Non insulated digital inputs

**5.4 ANALOGUE / DIGITAL INPUTS: in4, in5 AND in6**

The inputs identified with par **in4**, **in5** and **in6** can be set as:

- Analogue inputs to use temperature probes
- Non insulated digital inputs
- Pulse counter inputs (32 bit counters)

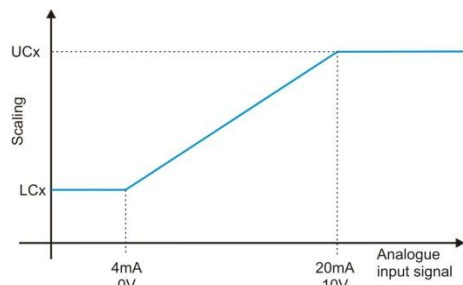
**5.5 INSULATED DIGITAL INPUTS: in7...in12**

The inputs identified with par **in7...in12** can be set as:

- Insulated digital inputs, they can accept high voltage signals (both 110VAC or 230VAC)

**6. ANALOGUE TRANSDUCER MANAGEMENT**

It is possible to modify the functional range of the analogue transducers (**in1**, **in2** and **in3**) by using par. **LCix** and **UCix** (x=1...3). It is possible to use pressure, humidity and general purpose analogue sensors with 4-20mA or 0-10Vdc outputs.



**7. DIGITAL INPUT FUNCTIONS**

**7.1 ON OFF OF THE BELONGING SECTION - SonF**

Setting par. **inx=SonF** (x=1...12) it will be possible to switch on and off the related section.

**7.2 DIGITAL INPUT STATUS - StAt**

Setting par. **inx=StAt** (x=1...12), it will be possible to monitor the digital input status (Low oh High) and activate the linked relay output (**rLCx=di**)

**7.3 DELAYED ALARM - ALrd**

Setting par. **inx=ALrd** (x=1...12), the activation of the digital input will raise a delayed alarm. The delay can be set with par. **ddx** (x=1...12). The device will show this condition with the blinking label "EA".

**7.4 ALARM - ALr**

Setting par. **inx=ALr** (x=1...12), the activation of the digital input will raise an immediate alarm. The device will show this condition with the blinking label "CA".

**7.5 PRESSURE ALARM - PrSA**

Setting par. **inx=PrSA** (x=1...12), the activation of the digital input will raise a pressure alarm. The device will show this condition with the blinking label "CA".

If par. **nPSx>1** (x=1...6), then the pressure alarm will be signaled after counting **nPSx** alarms in the interval of time defined from par. **ddx** (x=1...12). The device will show this condition with the blinking label "CA".

- If **nPSx=1**, then the pressure alarm will be signaled at the first event.
- If **ddx=0**, then the pressure alarm will be signaled at the first event.

**7.6 DOOR SWITCH - door**

Setting par. **inx=door** (x=1...12), if the related digital input stay active more than the time set in the par. **ddx** (x=1...12), then a door open alarm will be signaled. allora verrà generato un allarme porta aperta. The device will show this condition with the blinking label "dA".

**7.7 ENERGY SAVING MODE ACTIVATION - EnS**

Setting par. **inx=EnS** (x=1...12), the activation of the related digital input will move the status of the belonging section from normal to energy saving mode and vice-versa. The energy saving mode modifies the alarm thresholds of every enabled section of the **HESx** (x=1...6) value.

**7.8 DEFROST CONTROL - dFr**

Setting par. **inx=dFr** (x=1...12), the activation of the related digital input will be used to monitor the defrost operation of the section under control. If the defrost operation lasts more than the time set in the par. **ddx** (x=1...12) and if defrost duration control is enabled with par. **Eddx=YES** (x=1...6), then an alarm will be signaled (blinking label "Ed"). This alarm will be automatically reset after starting the next defrost operation. NOTE: during a defrost phase all temperature alarms will be disabled.

**7.9 PULSE COUNTER - PUL**

Setting par. **inx=PUL** (x=4, 5, 6), the activation of the digital input will increment the related 32-bit counter. Every pulse input has a proper multiplier (par. **mULx**, x=4, 5, 6) which is used to assign the correct value to any detected pulse.

mULx	Multiplier	mULx	Multiplier
0	value * 0.01	3	value * 10
1	value * 0.1	4	value * 100
2	value * 1	5	value * 1000

**NOTE:** all counter values are updated in the non-volatile memory every 30 min. In case of a power loss the stored value could be different from the generated one.

**7.10 PULSE COUNTER RESET**

Setting par. **inx=rES** (x=1...12) to use the activation of the related digital input to reset the pulse counter (belonging to the same section).

**7.11 REMOTE ON-OFF FUNCTION**

Setting par. **inx=roF**(x=1...12), to use the activation of the digital input to switch on and off the device. **NOTE:** set only one of the available digital inputs as remote ON OFF function.

**8. ANALOGUE OUTPUT**

The XJM has an analogue output which can be set as:

- **Aout=MA**, to issue a 4-20mA signal
- **Aout=uoLt**, to issue a 0-10Vdc signal

The analogue output can be modified in the following ways:

- Remotely, via Modbus command (par. **AoCF**)
- Linked to one of the available analogue inputs (par. **AoCF**)
- Manually (par. **AoCF**), by using par. **AoMn** and from 0 to 100% of the scale.

If the analogue output is remotely controlled via Modbus command, the value of the related internal register (from 0 to 1000) will be converted in the equivalent analogue value in a proportional way. **NOTE:** the internal register needs to be updated every 120 sec.

If the analogue is linked to one of the input variables (for example to a temperature probe) it will work as proportional repeater (depending on the preset limits).

**9. RELAY CONFIGURATION**

The XJM has 4 configurable relays which can be linked to the enabled sections as for the previous description.

**9.1 WORKING MODE**

Any relay can work following the function set with par. **rLCx**. Follows the description of the available functions:

- **rLCx=MSIA**: general alarm, related to the device
- **rLCx=SECA**: alarm related to the belonging section
- **rLCx=di**: digital input activation (se **inx=StAt**)
- **rLCx=MAN**: manual activation
- **rLCx=rEM**: remote control relay
- **rLCx=notU**: not used

**9.2 DIGITAL INPUT ACTIVATION**

If **rLCx=di** the relay status will change with the linked digital input (par. **inx=StAt**)

**NOTE:** par. **ddx** (x=1...12) is used to introduce a delay in relay activation.

**9.3 MANUAL ACTIVATION**

If **rLCx=MAN** it will be possible to change the relay status in a manual way by using the related button on the keyboard. To enable this function it is required to unlock the button functions by keeping both **MENU+DOWN** pressed for 5 sec.

**9.4 REMOTE CONTROL RELAY**

It is possible to control the relay by using a Modbus command if **rLCx=rEM**.

**10. TEMPERATURE ALARM**

The XJM implements 3 different temperature alarms for any section:

- Low Temperature Alarm **ALLx** (x=1...6)
- High Temperature Alarm **ALPx** (x=1...6)
- Maximum Temperature Alarm **ALUx** (x=1...6)

**NOTE:** the High Temperature Alarm threshold needs to be lower than the Maximum Temperature Alarm: **ALP<ALU**.

Parameter (x=1...6)	Function
<b>ALEx</b>	Section alarm enabled
<b>ALCx</b>	Absolut or relative alarms
<b>ALUx</b>	Maximum Temperature Alarm threshold
<b>ALPx</b>	High Temperature Alarm threshold
<b>ALLx</b>	Low Temperature Alarm threshold
<b>AFHx</b>	Differential for alarm deactivation
<b>Adx</b>	Delay in alarm activation
<b>dAdx</b>	Delay in alarm activation after a defrost operation
<b>SPbx</b>	Temperature probe belonging to the section

**10.1 LOW TEMPERATURE ALARM - LAX**

This alarm is activated if:

- **SPbx =< ALLx** if **ALCx=Ab** (absolute)
- **SPbx =< SEIx - ALLx** se **ALCx=rE** (relative)

This alarm is automatically deactivated if:

- **SPbx > ALLx + AFHx** se **ALCx=Ab** (absolute)

-  $SPbx > SETx + ALLx + AFHx$  se  $ALCx=rE$  (relative)

**10.2 HIGH TEMPERATURE ALARM - HAPx**

This alarm is activated if:

- $SPbx \geq ALPx$  se  $ALCx=Ab$  (absolute)
- $SPbx \geq SETx + ALPx$  se  $ALCx=rE$  (relative)

This alarm is automatically deactivated if:

- $SPbx < ALPx - AFHx$  se  $ALCx=Ab$  (absolute)
- $SPbx < SETx + ALPx - AFHx$  se  $ALCx=rE$  (relative)

**10.3 MAXIMUM TEMPERATURE ALARM - HAx**

This alarm is activated if:

- $SPbx \geq ALUx$  se  $ALCx=Ab$  (absolute)
- $SPbx \geq SETx + ALUx$  se  $ALCx=rE$  (relative)

This alarm is automatically deactivated if:

- $SPbx < ALUx - AFHx$  se  $ALCx=Ab$  (absolute)
- $SPbx < SETx + ALUx - AFHx$  se  $ALCx=rE$  (relative)

**11. DISPLAY MESSAGES**

The following table reports all the messages related to alarms of particular working conditions:

LABEL	MEANING	MODE
PoF	Keyboard locked	Blinking (3 sec)
Pon	Keyboard unlocked	Blinking (3 sec)
rst	Reset alarms	Blinking (3 sec)
noPx	Probe not present	Blinking
Px	Error probe	Blinking
HAx	Maximum temperature alarm	Alternated with probe value
HAPx	High temperature alarm	Alternated with probe value
LAX	Low temperature alarm	Alternated with probe value
EAX	External alarm	Alternated with probe value
CAX	Pressure alarm	Alternated with probe value
PLx	Pressure switch	Alternated with probe value
dAx	Door open	Alternated with probe value
EE	EEPROM alarm	Alternated with probe value
MbuS	Missing Modbus communication	Alternated with probe value

**11.1 MANUAL RESET OF ALARMS**

It is possible to reset any alarm by pressing any button. After that:

- "rSt" label will blink on the display for 3 sec
- The alarm label will blink on the display till the end of the alarm condition
- The relay set as alarm (MSIA or SECA) will be deactivated if par. **tbA=Y**
- The relay set as alarm (MSIA or SECA) will stay active if par. **tbA=n**

**11.2 RESET VIA MODBUS COMMAND**

A special Modbus command allows resetting the alarm condition.

**11.3 ADVISE IN CASE OF CHANGING OF THE CONFIGURATION PARAMETERS**

It is possible to monitor any manual modification of the configuration parameters via Modbus.

**11.4 MISSING MODBUS COMMUNICATION**

The par. **ouSE** allows fixing the behavior of the outputs (both analogue and digital) in case of missing or error in Modbus communication.

Parameter	Value	Relay	AoUt=UoLt	AoUt=MA
ouSE	oFF (00:00)	Deactivated	0V	4mA
ouSE	00:10 to 99min50sec (res. 10 sec)	Retains its previous status for the set time, then deactivated	Retains its previous status for the set time, then forced to 0V	Retains its previous status for the set time, then forced to 4mA
ouSE	PrEv	Retains its previous status	Retains its previous status	Retains its previous status

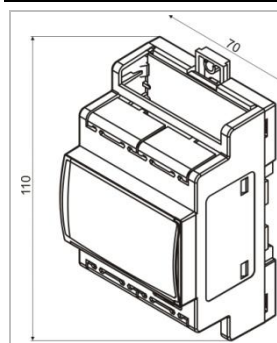
**NOTE:**

- if **ouSE=oFF**, then the missing Modbus command control is set to 120sec. After 120sec with no Modbus command received, the device will show the "Mbus" message.
- The status of any relay is stored into memory

**12. WIRINGS**

The instrument is equipped with plug-in screw terminals for connecting cables with a cross section up to 2.5 mm<sup>2</sup>. Use only heat resistant cables. Before connecting cables make sure the power supply complies with the instrument. Separate the wiring of the sensor inputs and digital inputs from the power supply cables and from the output cables. Do not exceed the maximum current allowed on each relay (see Technical Data). In case of heavier loads use a suitable external relay.

**13. MOUNTING**



The instruments are mounted on standard DIN rail inside a cabinet. The temperature range allowed for correct operation is 0 and 55 ° C. Avoid places subject to strong vibrations, corrosive gases, excessive dirt or humidity. The same recommendations apply to probes.

**14. SERIAL COMMUNICATION**

The XJM60D module is equipped with a serial communication port 2-wire and RS485 type. This port permits to connect the device to a network with ModBus communication protocol.

**15. HOT-KEY**

**15.1 CONFIGURATION UPLOAD (DEVICE → HOTKEY)**

1. Program an XJM with the required configuration.
2. Insert the HOT-KEY when the unit is ON, access the HOTKEY menu (Menu → HOT) and, from this menu, copy the complete configuration of the XJM in the HOTKEY; press **SET** to confirm the copy and wait for the end of the copy of the parameters from the XJM60 to the HOT-KEY.
3. At the end of the copy operation the instrument will display for 10 seconds:
  - a. "End" if the programming operation was successful.
  - b. "Err" if the programming operation was not successful. Press the **SET** button to restart the copy operation.

**15.2 CONFIGURATION DOWNLOAD (HOTKEY → DEVICE)**

To program the instrument with a pre-programmed HOT-KEY, proceed as follows:

1. Turn the instrument off or put it in standby mode from the keyboard.
2. Insert the programmed HOT-KEY.
3. Turn on the instrument: it automatically starts downloading data from the HOT-KEY flash drive to the instrument. The display will show "doL" flashing
4. At the end of the operation the instrument will show for 10 seconds:
  - a. "End" if the programming was successful (the regulation restarts).
  - b. "Err" if the programming was not successful. Repeat the operation or remove the key to start with the normal regulation.

**16. TECHNICAL DATA**

**Housing:** self-extinguish ABS

**Case:** 4 DIN, 70x135mm; depth 60mm

**Mounting:** DIN rail

**IP protection:** IP20

**Terminals:** pluggable terminal blocks, wirings ≤2.5mm<sup>2</sup>

**Power supply:** 24Vac/dc ±10%

**Power absorption:** 10 VA max

**Display:** 2 rows, 4 digits, multicolor LED

**Analogue inputs:** up to 6 PT1000, PTC, NTC, 4-20mA or 0-10V

**Digital inputs:** up to 6 not insulated and 6 insulated

**Pulse counters:** maximum input signal frequency 10 Hz

**Analogue output:** 0-10Vdc or 4-20mA

**Resolution for input 4-20mA:** 0.1 bar or 0.1MPa or 1 PSI

**Accuracy for input 4-20mA:** < 0.5% of the end of scale

**Resolution for input 0-10Vdc:** 0.1 bar or 0.1MPa or 1 PSI

**Accuracy for input 0-10V:** < 0.5% of the end of scale

**Digital output RL1, RL2, RL3, RL4:** relay SPST 5A; 250VAc

**Buzzer:** optional

**Data storing:** on the internal non-volatile memory (EEPROM)

**Kind of action:** 1B; **Pollution degree:** 2; **Software Class:** A

**Rated impulsive voltage:** 2500V; **Overvoltage category:** II

**Operating temperature:** 0 to 55°C

**Storage temperature:** -25 to 70°C

**Relative humidity:** 20 to 85% (not condensing)

**Measuring and regulation range:**

NTC probe: -40 to 110°C

PTC probe: -55 to 150°C

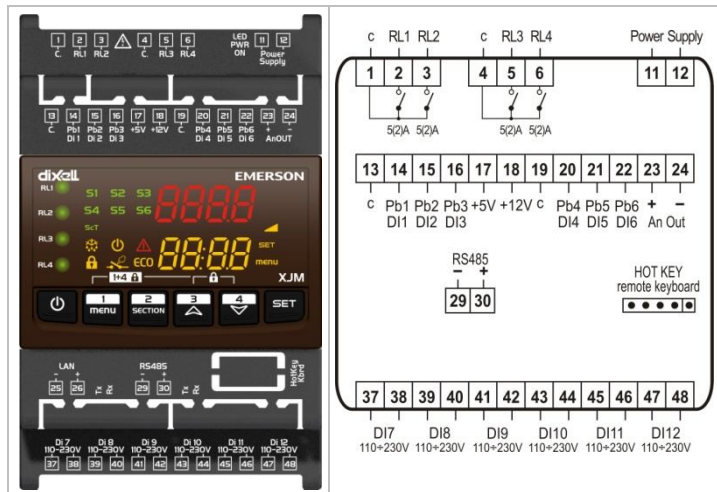
PT1000 probe: -100 to 200°C

**Resolution for NTC or PTC:** 0.1°C or 1°C or 1°F

**Resolution for PT1000 probe:** 0.1°C or 1°C or 1°F

**Accuracy at 25°C for NTC or PTC or PT1000:** ±0.7°C ±1 digit

17. WIRING DIAGRAMS



18. PARAMETERS

SECTION ZERO - S0

Adr	Serial address of the module: da 1 a 247
nSEC	Number of sections: 1, 3 oppure 6
tbA	Alarm relay deactivation: (n;Y)
rLC1...4	Relay configuration: <b>MSIA</b> =device alarm; <b>SECA</b> =section alarm; <b>di</b> =digital input status; <b>MAN</b> =manual activation; <b>noU</b> =not used
CF	Temperature measurement unit: °C=Celsius degree; °F=Fahrenheit degree
rES	Resolution (only for °C): <b>in</b> =integer; <b>dE</b> =decimal
PrMU	Pressure measurement unit: bAr, PSI, MPA
PrMd	Pressure mode measurement: <b>AbS</b> =absolute; <b>rEL</b> =relative
PrdV	Mode of pressure visualization: <b>TEM</b> =temperature; <b>PRE</b> =pressure
GAS	Gas type: (r22; r404; r507; r134; r717; co2; r410; r407; r290) gas conversion table for pressure-temperature visualization
dYS1	Upper display visualization: <b>Pbx</b> (x=1...4)=temperature probe; <b>dix</b> (x=1...12)=digital input function
dYS2	Lower display visualization: <b>Pbx</b> (x=1...4)=temperature probe; <b>dix</b> (x=1...12)=digital input function
ouSE	Output status in case of serial communication error: <b>oFF</b> =switched off; <b>PrEV</b> =previous state; 00:10 to 99min50sec=previous state for this time, then deactivated
onF	ONOFF button function: <b>oFF</b> =device ON and OFF; <b>ES</b> =energy saving mode activation
FdY	Firmware release: day
FMt	Firmware release: month
FYr	Firmware release: year
rEL	Software version: read only
Ptb	Parameter map code: read only

SECTIONS 1 TO 6

SEnx	Section x enabled (x=1...6): no=sezione disabilitata; YES=sezione abilitata.
Sid	Section progressive identification number: (1 to 6) to identify the address of the section (read only).
SAd	Section address: to identify the Modbus address of the section (read only)
dAo	Alarm exclusion delay after power on: (0.0 to 23h50min, res. 10min) temperature alarm delay after power on
inx	Input configuration (x=1...12):
	- diS=disabled
	- ntC=NTC temperature probe (x=1, 2, 3, 4, 5, 6)
	- PtC= PTC temperature probe (x=1, 2, 3, 4, 5, 6)
	- Pt1= PT1000 temperature probe (x=1, 2, 3, 4, 5, 6)
	- PUL= pulse counter
	- 4-20=analogue input 4-20mA (x=1, 2, 3)
	- 0-10=analogue input 0-10V (x=1, 2, 3)
	- 0-5=analogue input 0-5V (x=1, 2, 3)
	- SonF=to switch ON and OFF the related section
- StAt=digital input status	
- ALrd=delayed external alarm	
- ALr=external alarm	
- PrSA=pressure alarm	
- door=door ajar	
- EnS=energy saving mode active	
- dFr=defrost operation is running	
- rES=reset pulse counters	
- roFF=remote ON and OFF	
Ainx	Type of active sensor for analogue input (x=1,2,3): <b>PrES</b> =pressure sensor; <b>rHuM</b> =relative humidity sensor; <b>GE</b> n=general purpose sensor
dPx	Digital input polarity (x=1...12): <b>oP</b> =enabled if contact open; <b>CL</b> =enabled if contact closed
ddx	Digital input activation delay (x=1...12): (0.0 to 23h50min, res. 10 min) delay before activating the function related to the digital input

UCix	High scale value for analogue input (x=1...3): scaling for analogue input <ul style="list-style-type: none"> <li>- [PrMU =bAr] LCix to 50.0 bar</li> <li>- [PrMU =PSI] LCix to 725 PSI</li> <li>- [PrMU =MPA] LCix to 5.0 MPA</li> <li>- [ainx=rHuM] LCix to 100%</li> <li>- [ainx =GEEnP] LCix to 999</li> </ul>
LCix	Low scale value for analogue input (x=1...3): scaling for analogue input <ul style="list-style-type: none"> <li>- [PrMU =bAr] -1.0/0.0 bar to UCix</li> <li>- [PrMU =PSI] -14/0 PSI to UCix</li> <li>- [PrMU =MPA] -0.1/0 MPA to UCix</li> <li>- [ainx=rHuM] 0% to UCix</li> <li>- [ainx =GEEnP] -999 to UCix</li> </ul>
oPbx	Probe calibration (x=1...6): <ul style="list-style-type: none"> <li>- [CF=°C] -12.0 to 120.0°C</li> <li>- [CF=°F] -21 to 21°F</li> <li>- [PrMU =bAr] -12.0 to 12.0 bar</li> <li>- [PrMU =PSI] -120 to 120 PSI</li> <li>- [PrMU =MPA] -1.2 to 1.2 MPA</li> <li>- [ainx=rHuM] -30 to 30%</li> <li>- [ainx =GEEnP] -100 to 100</li> </ul>
SEtx	Section Set-Point (x=1...6): <ul style="list-style-type: none"> <li>- [CF=°C] -50.0 to 150.0°C</li> <li>- [CF=°F] -58 to 302°F</li> <li>- [PrMU =bAr] -1.0/0.0 to 50.0bar</li> <li>- [PrMU =PSI] -14/0 to 725 PSI</li> <li>- [PrMU =MPA] -0.1/0 toa 5.0 MPA</li> <li>- [ainx=rHuM] 0 to 100%</li> <li>- [ainx =GEEnP] -999 to 999</li> </ul>
HESx	Differential for energy saving mode (x=1...6): <ul style="list-style-type: none"> <li>- [CF=°C] -30.0 to 30.0°C</li> <li>- [CF=°F] -54 to 54°F</li> <li>- [PrMU =bAr] -12.0 to 12.0bar</li> <li>- [PrMU =PSI] -120 to 120 PSI</li> <li>- [PrMU =MPA] -1.2 to 1.2 MPA</li> <li>- [ainx=rHuM] -30 to 30%</li> <li>- [ainx =GEEnP] -100 to 100</li> </ul>
ALEx	Section alarms enabled (x=1...6): no=alarms disabled, YES=alarms enabled
FPAx	Faulty probe alarm enabled (x=1...6): no=alarms disabled, YES=alarms enabled
ALCx	Temperature alarm configuration (x=1...6): rE=relative to the Set-Point; Ab=relative to the absolute value
ALUx	Maximum temperature threshold for alarm (x=1...6): If <b>ALCx=Ab</b> (absolute alarm): <ul style="list-style-type: none"> <li>- [CF=°C] ALLx to 150.0°C</li> <li>- [CF=°F] ALLx to 302°F</li> <li>- [PrMU =bAr] ALLx to 50.0bar</li> <li>- [PrMU =PSI] ALLx to 725 PSI</li> <li>- [PrMU =MPA] ALLx to 5.0 MPA</li> <li>- [ainx=rHuM] ALLx to 100%</li> <li>- [ainx =GEEnP] ALLx to 999</li> </ul> If <b>ALCx=rE</b> (relative alarm): <ul style="list-style-type: none"> <li>- [CF=°C] 0.0 to 50.0°C</li> <li>- [CF=°F] 0.0 to 90°F</li> <li>- [PrMU =bAr] 0 to 30 bar</li> <li>- [PrMU =PSI] 0 to 350 PSI</li> <li>- [PrMU =MPA] 0 to 2.5 MPA</li> <li>- [ainx=rHuM] 0 to 50 %</li> <li>- [ainx =GEEnP] 0 to 500</li> </ul>
	ALPx
ALLx	Low temperature threshold for alarm (x=1...6): If <b>ALCx=Ab</b> (allarme di tipo assoluto): <ul style="list-style-type: none"> <li>- [CF=°C] -50°C to ALLx</li> <li>- [CF=°F] -58°F to ALLx</li> <li>- [PrMU =bAr] -1.0bar to ALLx</li> <li>- [PrMU =PSI] -14PSI to ALLx</li> <li>- [PrMU =MPA] -0.1 to ALLx</li> <li>- [ainx=rHuM] 0% to ALLx</li> <li>- [ainx =GEEnP] -999 to aLUx</li> </ul> If <b>ALCx=rE</b> (allarme di tipo relativo): <ul style="list-style-type: none"> <li>- [CF=°C] 0.0 to 50.0°C</li> <li>- [CF=°F] 0.0 to 90°F</li> <li>- [PrMU =bAr] 0 to 30 bar</li> <li>- [PrMU =PSI] 0 to 350 PSI</li> <li>- [PrMU =MPA] 0 to 2.5 MPA</li> <li>- [ainx=rHuM] 0 to 50 %</li> <li>- [ainx =GEEnP] 0 to 500</li> </ul>
	AFHx
Adx	Alarm delay for probe "x" (x=1...6): delay for alarm signaling
dAdx	Temperature alarm delay after any defrost operation (x=1...6): 0 to 255 min
nPSx	Number of activation of the pressure switch of sections (x=1...6): (1 to 15) number of activation of the pressure switch before signaling an alarm
Edd1	Enable maximum defrost duration (x=1...6): used to control the maximum defrost duration
SPbx	Probe used from section "x" (x=1...6): probe linked to the section.

<b>MULx</b>	<b>Multiplying factor for pulse counters:</b> (0 to 5) to use the correct increment value for counters for any detected pulse signal
<b>rLdx</b>	<b>Digital input linked to relay "x" (x=1, 2, 3, 4):</b> which digital input is linked to the related relay.
<b>rLPx</b>	<b>Relay "x" polarity (x=1, 2, 3, 4):</b> <b>CL</b> =relay activated for closing of the contact; <b>oP</b> =relay activated for opening of the contact.
<b>AoUt</b>	<b>Analogue output type:</b> <b>uoLt</b> =voltage (0-10V); <b>MA</b> =current (4-20mA)
<b>AoCF</b>	<b>Analogue output configuration:</b> <b>rEM</b> =remote controlled; <b>Pbx</b> =repeater; <b>MAN</b> =manual controlled
<b>AoMn</b>	<b>Analogue output value (if in manual mode):</b> 0 to 100% of the full scale
<b>AoTY</b>	<b>Azione dell'uscita analogica:</b> <b>dir</b> =proportional; <b>inV</b> =inversely proportional
<b>AoLo</b>	<b>Start of the scale equivalent to the 0%:</b> - [CF=°C] -50°C to AoHi - [CF=°F] -58°F to AoHi - [PrMU=bAr] -1.0bar to AoHi - [PrMU =PSI] -14PSI to AoHi - [PrMU =MPA] -0.1 to AoHi - [ainx=rHum] 0% to AoHi - [ainx =GEnP] -999 to AoHi
<b>AoHi</b>	<b>End of the scale equivalent to the 100%:</b> - [CF=°C] AoLo to 150.0°C - [CF=°F] AoLo to 302°F - [PrMU =bAr] AoLo to 50.0bar - [PrMU =PSI] AoLo to 725 PSI - [PrMU =MPA] AoLo to 5.0 MPA - [ainx=rHum] AoLo to 100% - [ainx =GEnP] AoLo to 999