I/O MANAGEMENT MODULE
XJM60D

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 up to 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

menu / 1	(**MENU**) To enter the "MENU" menu If manual relay status is enabled, it allow to activate and deactivate the relay 1
SECTION / 2	To enter the "SECTION" menu. If manual relay status is enabled, it allow to activate and deactivate the relay 2
▽ / 3	(**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
△ / 4	(**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
SET	(**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.
⏻	(**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 is proper SET-POINT which is only used to control the **relative** alarms. No regulation is performed from this module.

SET	1. Press the **SET** key: the value of the SET-POINT of the first active section is displayed 2. The icon indicates the **S1/S6** reference section 3. The upper display shows the unit of measure and the Energy Saving value 4. Keep the SET button pressed for 2 sec to change the value of any **SETx** set point. Use either **UP** or **DOWN** buttons to modify the stored values. 5. Press the **SET** button to store the new value 6. Press the **SET** button to exit the SET-POINT menu

3.7 MAIN MENU

Allow activating some special function of the device.

menu	1. Press the **MENU** button to enter the function list. Select the function of interest by using the **UP** or **DOWN** buttons 2. **ALrM** menu: Press **SET** to access the full list of all active alarms. Use **UP** or **DOWN** buttons to scroll through the items of this list. Press **SET** to exit. NOTE: if no alarm is present, the menu will be empty. **CLr** menu: Press **SET** to enter the reset menu for the pulse counters. Use **UP** or **DOWN** to choose the counter to reset. Press **SET** to erase the storage value of the selected counter. Press **SET** to exit. **CoPY** menu: used to copy settings from a section to another. Press **SET** to enter the copy command menu. Choose the source section using **UP** or **DOWN**. Press **SET** to confirm and move to the choice of the destination section using **UP** or **DOWN**. Press **SET** 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 **SET** to exit. **HOt** menu: is used to copy the complete configuration (all parameters) of an XJM in a HO-TKEY. Press **SET** to confirm the copy operation. 3. Press **MENU** to exit the **MAIN** menu.

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.

SECTION	1. Press **SECTION** button and select the section of interest with either **UP** or **DOWN** buttons. Any enabled section shows the "On" label on the lower display together with the section number. 2. Press **ONOFF** button for 3 sec to turn on or off on the current section. NOTE: this function is not active for section 0 3. Press the **SET** button to enter the programming mode (parameters Pr1) 4. The device will show the label of the first parameter present in Pr1 level 5. To exit the menu of the current section press **SECTION**. 6. Press again to exit the **SECTION** menu

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

⏻	Keep the ONOFF button pressed for 5 sec in order to activate the function linked from the parameter **onF**. **OnF=oFF:** 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. **OnF=ES:** to activate the energy saving mode. The ECO icon will be lit. **OnF=diS:** button function disabled, any action on the button will produce no change

3.12 I TASTI RELE'

1 + 4	The manual activation of the relays is enabled by keeping both **1+4** 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 **rLCx=MAn**

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 has all I/O and all parameters available.

4.2 3 SECTIONS: nSEC=3

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

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

(*): not available for model with power supply 90-260VAC

4.3 6 SECTIONS: nSEC=6

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

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

(*): not available for model with power supply 90-260VAC

4.4 MODBUS ADRESSING

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	4	1
90-260Vac	6 configurable	6	3	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	•	•	•	•	•	•
NTC-US	•	•	•	•	•	•
4-20mA	•	•	•			
0-10V	•	•	•			
0-5V	•	•	•			
Dig-in	•	•	•	•	•	•
Pulse				•	•	•

5.2 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	**CtC**	NTC-US temperature probe	Analogue input
6	**4-20**	Current sensor, 4-20mA type	Analogue input
7	**0-10**	Voltage sensor, 0-10Vdc type	Analogue input
8	**0-5**	Ratio metric probe, 0-5Vdc	Analogue input
9	**SonF**	Switch ON and OFF signal for the relative section	Digital input
10	**StAt**	Command signal (Status) to activate the linked relay	Digital input

11	**ALrd**	Delayed alarm signal (par. ALdx)	Digital input
12	**ALr**	Immediate generic alarm signal	Digital input
13	**PrSA**	Immediate pressure alarm signal	Digital input
14	**door**	Door open signal	Digital input
15	**EnS**	Energy saving function activation	Digital input
16	**dFr**	Defrost signal	Digital input
17	**rES**	Pulse counter reset	Digital input
18	**roF**	Remote ON OFF	Digital input
19	**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)

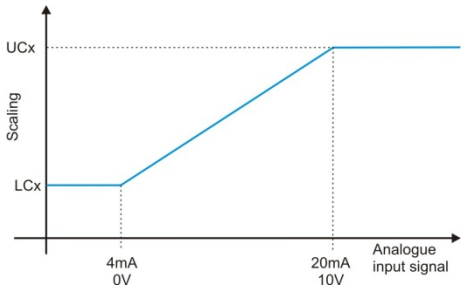
5.5 INSULATED DIGITAL INPUTS: in7...in12

The inputs identified with par **in7**...**in12** can be set as:
- Insulated digital inputs, they can accept high voltage signals only (both 110VAC or 230VAC levels are supported)

NOTE: **in12** will be automatically disabled in case of using pulse counter function.

6. ANALOGUE TRANSDUCER MANAGEMENT

It is possible to modify the functional range of the analogue transducers (connected to **in1**, **in2** or **in3**) by using par. **LCix** and **UCix** (x=1,2,3). It is possible to use pressure, humidity and general purpose analogue sensors with 4-20mA or 0-10Vdc outputs. It is also possible to modify the range of the analogue output value of the used transducer by using par. **UAiX** and **LAix** (x=1,2,3).



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=dor** (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) and a conversion ratio (par. **CrPx**, x=4, 5, 6) which are used to assign the correct value to any detected pulse.

mULx	Multiplier	mULx	Multiplier
E0	value * 1	**E-2**	value * 0.01
E-1	value * 0.1	**E-3**	value * 0.001

The maximum number showed on the display is 9999999.9 [UoM]. The related parameters (**MULx** and **CrPx**) are used to define the weight of any received pulse.

The conversion from number of pulses [N-PUL] to dimensional physical magnitude (VAL) is obtained from the following formula:

VAL(x) = N-PUL(x) * mULx * CrPx

where "x" is the pulse counter under analysis.

The pulse source must generate pulses with the following structure (according to EN62052-31):
- from 100ms to 120msec when status is ON
- higher or equal to 120ms when status is OFF

The main power supply must be connected to **in12** to manage power loss conditions. In that way, the power loss will be properly detected and the counters will be saved into memory without losing some pulses. Please note that **in12** is automatically excluded from standard digital input functions as soon as one of the available pulse counters is enabled.

7.9.1 EXAMPLE

Here is an example of how to set the related parameters to properly count a pulse source.
- the external source is linked to digital input 4 (**in4=PUL**)
- the source will issue 100 PULSES for kWh (means having a resolution of [1 PULSE = 10Wh]
  - the operator sets the par. **MUL4=E-2** (means 10exp[-2]=0.01) and **CrP4=1**
  - the associated counters (counter 4) will have the meaning of "energy consumption in kWh"
  - the showed value (on the display) will be increased of 1 [UOM] after receiving 10 pulses

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.
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=MStA**: 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 t 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
ALEx	Section alarm enabled
ALCx	Absolut or relative alarms
ALUx	Maximum Temperature Alarm threshold
ALPx	High Temperature Alarm threshold
ALLx	Low Temperature Alarm threshold
AFHx	Differential for alarm deactivation
Adx	Delay in alarm activation
dAdx	Delay in alarm activation after a defrost operation
SPbx	Temperature probe belonging to the section

10.1 LOW TEMPERATURE ALARM - LAx

This alarm is activated if:
- **SPbx =< ALLx** if **ALCx=Ab (absolute)**
- **SPbx =< SEtx - 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 >= ALPx** se **ALCx=Ab (absolute)**
- **SPbx >= 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 >= ALUx** se **ALCx=Ab (absolute)**
- **SPbx >= 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 (MStA or SECA) will be deactivated if par. **tbA=Y**
- The relay set as alarm (MStA 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.

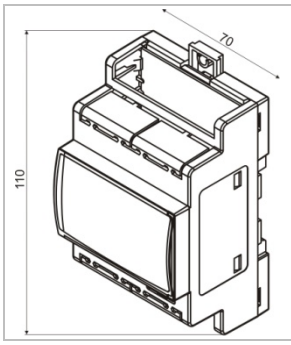
Parameter	Value	Relay	AoUt=UoLt	AoUt=MA
ouSE	oFF (00:00)	Deactivated	0V	4mA
ouSE	00:10 to 99min50sec (res. 10 sec)	Retains its previous status for the set time, then deactivated	Retains its previous status for the set time, then forced to 0V	Retains its previous status for the set time, then forced to 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 mm². 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.

13.1 CAB/KXV1 – REMOTE KEYBOARD CABLE

CAB/KXV1

Cable to be used with blind model and remote keyboard. The wiring polarity follows:
WHITE → GND (-)
GREEN → COMM (+)

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

The usage of the remote keyboard on the blind model precludes the use of the HOTKEY for read/write operations. If so, the RS485 serial port must be used for read/write operations.

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. 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 ≤2.5mm²
Power supply: 24Vac/dc ±10%; 90-260Vac 50/60Hz
Power consumption: 10 VA max
Display: 2 rows, 4 digits, multicolor LED
Analogue inputs: up to 6 PT1000, PTC, NTC, NTC-US, 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: -10 to +60°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 +300°C
NTC-US probe: -40 to +110°C
Resolution for NTC, NTC-US 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, NTC-US, PTC or PT1000: ±0.7°C ±1 digit

16.1 UL MARK

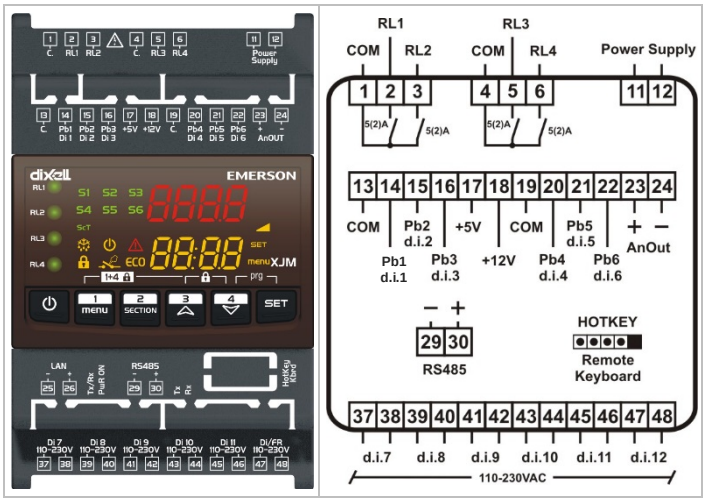
16.1.1 Relay ratings (RL1, RL2, RL3 and RL4):
- 4AMP, 240VAC, Resistive, 30k cycles
- 4AMP, 240VAC, General Use, 30k cycles
- 1.9FLA/11.4LRA, 240VAC, Motor Load, 30k cycles
- D300, Pilot Duty, 30k cycles

16.1.2 External fuse:
LITTELFUSE INC (E10480), type 02171.25MXP, rated 1.25A, 250 Vac.
SCHURTER AG (E41599), type FSF 5x20, rated 1.25A, 250Vac.
BEL FUSE (E20624), type 5MF 1.25-R, rated 1.25A, 250Vac.
SIBA GMBH & CO KG (E167295), type 179020, rated 1.25A, 250Vac.

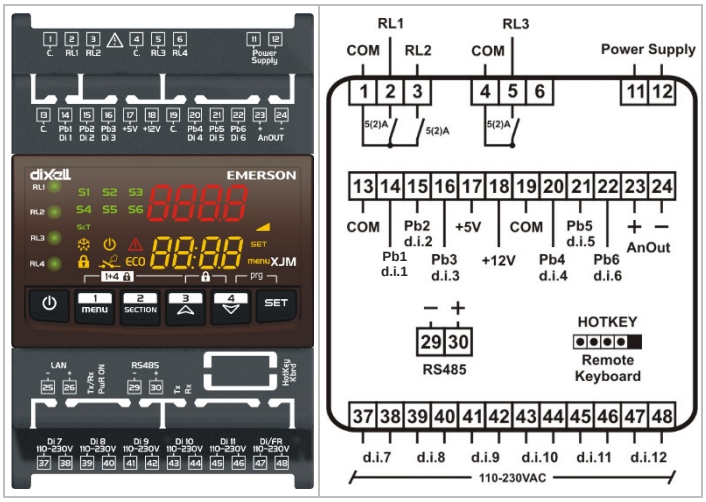
16.1.3 Fuseholders:
Cartridge type, manufactured by LITTELFUSE INC (E14721) type 150274. Rated 10 A, 350Vac/dc maximum, Max. 105°C, for Use With Fuse Size 2AG or 5 x 20 mm Supplemental.
Plug-fuse type, manufactured by PHOENIX CONTACT GMBH & CO. KG type ST4-HESI (6.3X32). Rated 15A, 300V.

17. WIRING DIAGRAMS

17.1 POWER SUPPLY: 24VAC/DC



17.2 POWER SUPPLY: 90-260VAC, 50/60HZ



18. PARAMETERS

SECTION ZERO – S0

Adr	**Serial address of the module:** 1 to 247
nSEC	**Number of sections:** 1, 3 or 6
tbA	**Alarm relay deactivation:** (n;Y)
rLC1...4	**Relay configuration: MStA**=device alarm; **SECA**=section alarm; **di**=digital input status; **MAn**=manual activation; **rEM**=remote controlled; **notU**=not used
CF	**Temperature measurement unit: °C**=Celsius degree; **°F**=Fahrenheit degree
rES	**Resolution (only for °C): in**=integer; **dE**=decimal
PrMu	**Pressure measurement unit:** bAr, PSI, MPA
PrMd	**Pressure mode measurement: AbS**=absolute; **rEL**=relative
PrdY	**Mode of pressure visualization: tEM**=temperature; **PrE**=pressure
GAS	**Gas type:** (r22; r404; r507; r134; r717; co2; r410; r407; r290) gas conversion table for pressure-temperature visualization
dYS1	**Main display visualization: Pbx** (x=1...4)=temperature probe; **dix** (x=1...12)=digital input function
dYS2	**Secondary display visualization: Pbx** (x=1...4)=temperature probe; **dix** (x=1...12)=digital input function
ouSE	**Output status in case of serial communication error: oFF**=switched off; **PrEV**=previous state; 00:10 to 99min50sec=previous state for this time, then deactivated
ddrE	**Digital input delay resolution: min**=delay in minutes; **sec**=delay in seconds
AdrE	**Pressure/temperature alarm delay resolution: min**=delay in minutes; **sec**=delay in seconds
SEn1...6	**Section "N" enabled:** (n;Y)
onF	**ONOFF button configuration: oFF**=device ON and OFF; **ES**=energy saving mode activation; **diS**=disabled
FdY	**Firmware release: day**
FMt	**Firmware release: month**
FYr	**Firmware release: year**
rEL	**Software release:** read only
Ptb	**Parameter map code:** read only

SECTIONS 1 TO 6

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	**Type of temperature / analogue / digital input** (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) - **CtC**=NTC-US 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**=dalayed 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): PrES**=pressure sensor; **rHuM**=relative humidity sensor; **GEn**=general purpose sensor
dPx	**Digital input polarity (x=1...12): oP**=enabled if contact open; **CL**=enabled if contact closed
ddx	**Digital input activation delay (x=1...12):** delay before activating the function related to the digital input. - **ddr=SEC** → delay from 0 to 255sec - **ddr=Min** → delay from 0h00min to 23h50min
UCix	**Upper scale value for analogue transducer input (x=1,2,3):** scaling for physical input - [PrMU =bAr] LCix to 50.0 bar - [PrMU =PSI] LCix to 725 PSI - [PrMU =MPA] LCix to 5.0 MPA - [ainx=rHuM] LCix to 100% - [ainx =GEnP] LCix to 999.9
LCix	**Low scale value for analogue transducer input (x=1,2,3):** scaling for physical input - [PrMU =bAr] -1.0/0.0 bar to UCix - [PrMU =PSI] -14/0 PSI to UCix - [PrMU =MPA] -0.1/0 MPA to UCix - [ainx=rHuM] 0% to UCix - [ainx =GEnP] -199.9 to UCix
UAix	**Upper scale value for analogue transducer output (x=1,2,3):** analogue value corresponding to UCix - inx= 4-20 [LAix to 20.0] - inx= 0-10 [LAix to 10.0] - inx= 0-5 [LAix to 5.0]
LAix	**Lower scale value for analogue transducer output (x=1,2,3):** analogue value corresponding to LCix - inx= 4-20 [4.0 to UAix] - inx= 0-10 [0.0 to UAix] - inx= 0-5 [0.0 to UAix]
oPbx	**Probe calibration (x=1...6):** - [CF=°C] -12.0 to 12.0°C - [CF=°F] -21 to 21°F - [PrMU =bAr] -12.0 to 12.0 bar - [PrMU =PSI] -120 to 120 PSI - [PrMU =MPA] -1.2 to 1.2 MPA - [ainx=rHuM] -12.5 to 12.5% - [ainx =GEnP] -12.5 to 12.5

SEtx	**Section Set-Point (x=1...6):** - [CF=°C] -100.0 to 300.0°C - [CF=°F] -148 to 572°F - [PrMU =bAr] -1.0/0.0 to 50.0bar - [PrMU =PSI] -14/0 to 725 PSI - [PrMU =MPA] -0.1/0 toa 5.0 MPA - [ainx=rHuM] 0.0 to 100.0% - [ainx =GEnP] -199.9 to 999.9
HESx	**Differential for energy Saving mode (x=1...6)**: - [CF=°C] -30.0 to 30.0°C - [CF=°F] -54 to 54°F - [PrMU =bAr] -12.0 to 12.0bar - [PrMU =PSI] -120 to 120 PSI - [PrMU =MPA] -1.2 to 1.2 MPA - [ainx=rHuM] -30 to 30% - [ainx =GEnP] -100 to 100
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 **ALCx=Ab** (absolute alarm): - [CF=°C] ALLx to 300.0°C - [CF=°F] ALLx to 572°F - [PrMU =bAr] ALLx to 50.0bar - [PrMU =PSI] ALLx to 725 PSI - [PrMU =MPA] ALLx to 5.0 MPA - [ainx=rHuM] ALLx to 100% - [ainx =GEnP] ALLx to 999.9 If **ALCx=rE** (relative alarm): - [CF=°C] 0.0 to 50.0°C - [CF=°F] 0.0 to 90°F - [PrMU =bAr] 0 to 30 bar - [PrMU =PSI] 0 to 350 PSI - [PrMU =MPA] 0 to 2.5 MPA - [ainx=rHuM] 0 to 50 % - [ainx =GEnP] 0 to 500.0
ALPx	**High temperature threshold for alarm (x=1...6):** If **ALCx=Ab**: ALLx to ALUx If **ALCx=rE**: 0 to ALUx
ALLx	**Low temperature threshold for alarm (x=1...6):** If **ALCx=Ab** (allarme di tipo assoluto): - [CF=°C] -100°C to ALUx - [CF=°F] -148°F to ALUx - [PrMU =bAr] -1.0bar to ALUx - [PrMU =PSI] -14PSI to ALUx - [PrMU =MPA] -0.1 to ALUx - [ainx=rHuM] 0% to ALUx - [ainx =GEnP] -199.9 to aLUx If **ALCx=rE** (allarme di tipo relativo): - [CF=°C] 0.0 to 50.0°C - [CF=°F] 0.0 to 90°F - [PrMU =bAr] 0 to 30 bar - [PrMU =PSI] 0 to 350 PSI - [PrMU =MPA] 0 to 2.5 MPA - [ainx=rHuM] 0 to 50 % - [ainx =GEnP] 0 to 500.0
AFHx	**Alarm differential (x=1...6):** - [CF=°C] 0.1 to 25.5°C - [CF=°F] 1 to 45°F - [PrMU =bAr] 0.1 to 10.0bar - [PrMU =PSI] 0 to 145PSI - [PrMU =MPA] 0.1 to 1.0MPA - [ainx=rHuM] 0 to 20% - [ainx =GEnP] 0.1 to 200.0
Adx	**Alarm delay for probe "x" (x=1...6):** delay for alarm signaling - Ad.rE=SEC → 0 to 255 sec - Ad.rE=Min → 0 to 255 min
dAdx	**Temperature alarm delay after any defrost operation (x=1...6):** - Ad.rE=SEC → 0 to 255 sec - Ad.rE=Min → 0 to 255 min
nPSx	**Number of activation of the pressure switch of sections (x=1...6):** (0 to 15) number of activation of the pressure switch before signaling an alarm. 0=alarm disabled.
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.
MULx	**Multiplying factor for pulse counters:** (E-3; E-2; E-1; E0) multiplier for counters
CrPx	**Conversion ratio for pulse counters:** 1 to 9999
rLdx	**Digital input linked to relay "x" (x=1, 2, 3, 4):** which digital input is linked to the related relay
rLPx	**Relay "x" polarity (x=1, 2, 3, 4): CL**=relay activated for closing of the contact; **oP**=relay activated for opening of the contact
AoUt	**Analogue output type:** uoLt=voltage (0-10V); MA=current (4-20mA)
AoCF	**Analogue output configuration: rEM**=remote controlled; **Pbx**=repeater; **MAn**=manual controlled
AoMn	**Analogue output value (if in manual mode):** 0 to 100% of the full scale
AotY	**Proportional or inverse mode for analogue output: dir**=proportional; **inV**=inversely proportional
AoLo	**Start of the scale equivalent to the 0%:** - [CF=°C] -100°C to AoHi - [CF=°F] -148°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] -199.9 to AoHi
AoHi	**End of the scale equivalent to the 100%:** - [CF=°C] AoLo to 300.0°C - [CF=°F] AoLo to 572°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 999.9

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