INTERCONNECTION MODULES

JANUS MJBOX

GENERAL INFORMATION

The JANUS MJBOX modules are accessory devices designed to make the wiring of JANUS J and J TRX, JANUS M and M TRX light curtains fast and safe, and to provide the main controls necessary for their operation close to the protected gate.

In addition to the guided contacts safety relays piloted and monitored by the light curtain, terminal boards for connecting the cables, bridges and dip-switch for the configuration of the light curtain itself are also present inside.

DESCRIPTION

Externally both models have:

1. Connectors for connecting with the light curtain *(M23 for RX and M12 for TX)*.
2. Fairlead for passage of cables towards the machine for:
   - power supply;
   - connection with output contacts of the internal safety relays and static outputs of the light curtain;
   - Muting enable signals from the outside;
   - output signals which indicate the status of the safety light curtain.

The MJB1/MJB3 models also present:

1. Lighted restart button and output status / weak signal led.
2. Key selector switch for *Override* function.
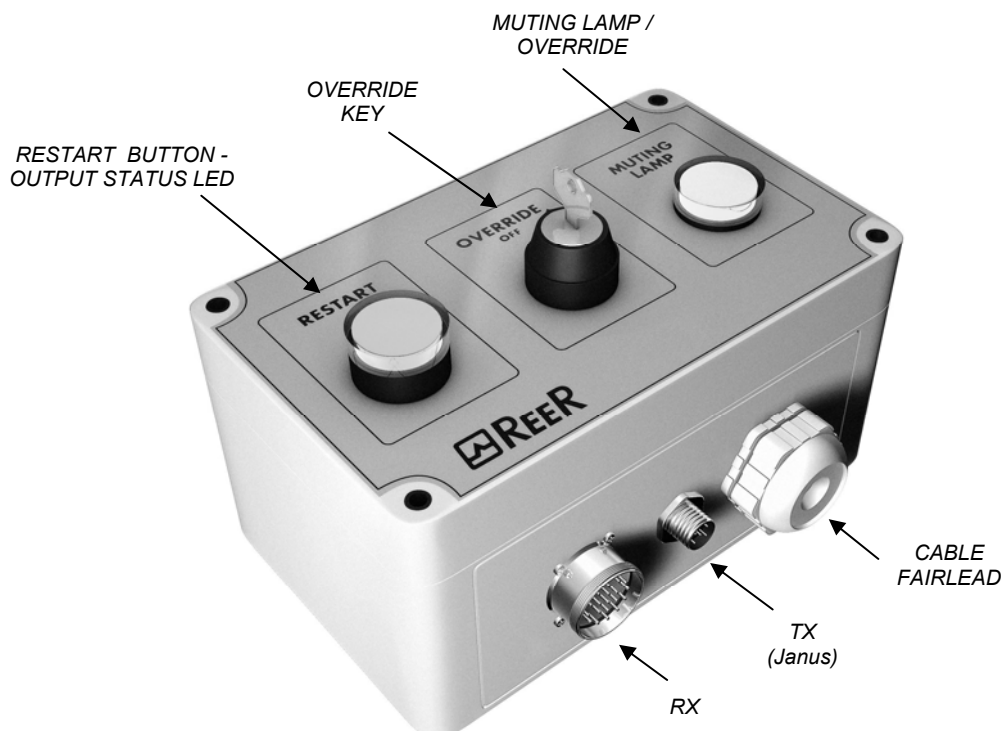3. Lamp to signal *Muting/Override* active.

Figure 1 - MJB1/MJB3

![ReeR logo]

The *MJB2 /MJB4* model has:

1. Lighted restart button and output status / weak signal led.

RESTART BUTTON –
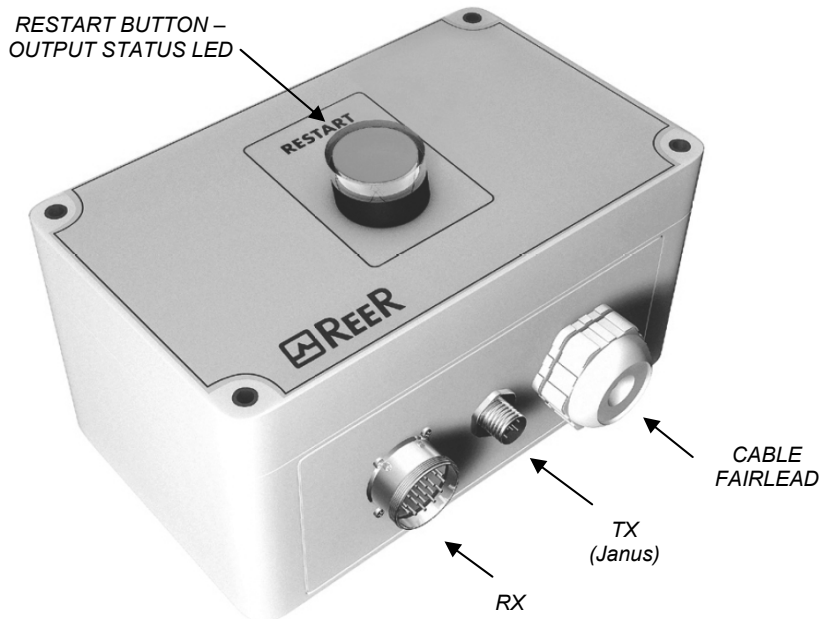*OUTPUT STATUS LED*

CABLE
FAIRLEAD

TX
(Janus)

RX

Figure 2 - MJB2/MJB4

➜ It is also possible to match the MJB2 and MJB4 models (without muting lamp and override command) with **muting** light curtains as they are fitted with the required settings.

➜ If connecting an MJB1 or MJB3 model to a JANUS J series safety barrier (without Muting function), the following connections must be disregarded: **SW1 (pins 1,2,3,4), CJ5, CJ7 (pins 7,8) and CJ9**.

➜ For the JANUS, MI, ML, MT versions use of a muting lamp (internal or external) (0.5÷5W) is obligatory for correct functioning of the light curtains.

➜ Where the risk analysis of the application requires it, the light curtain permits connection of an external lamp to signal active Muting (0.5÷5W). Perform a check of the operation of this lamp periodically verifying its turning on during the Muting or Override phase.

CONFIGURATION

With the aid of the figures of the main board of the single models, the configuration of the methods of the operating modes is described below.

This configuration is performed, following the descriptions of the following tables, setting the various jumpers, connectors and dip-switches present on the same card.
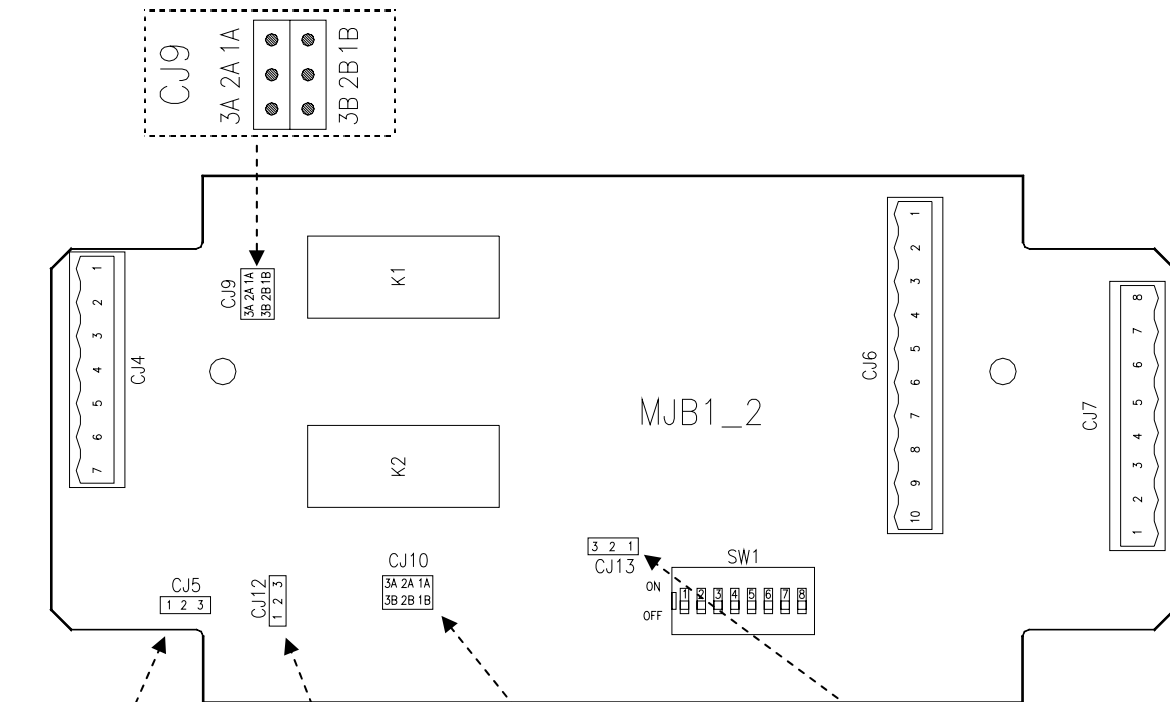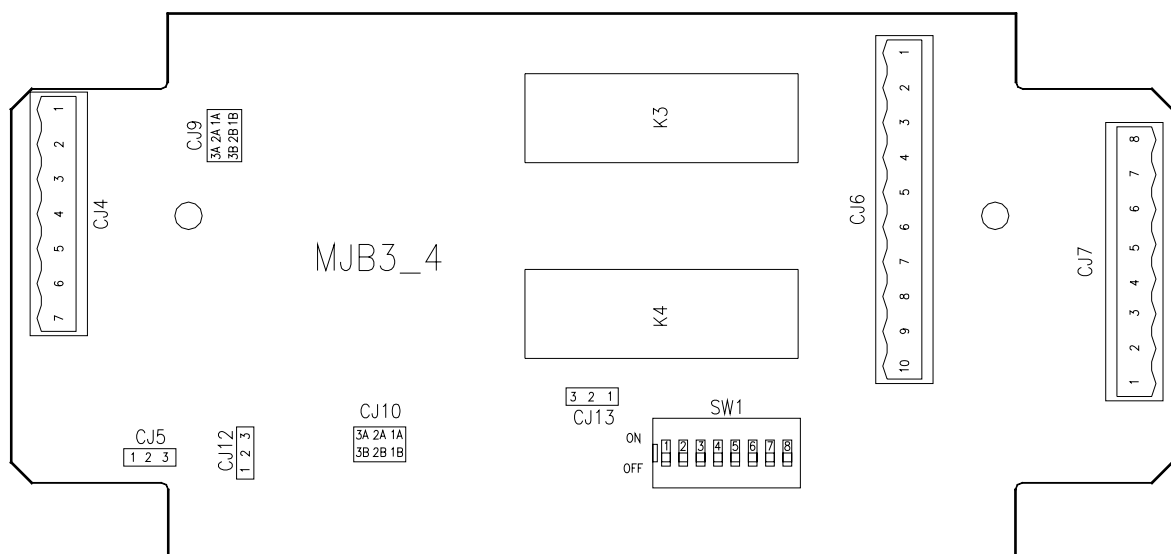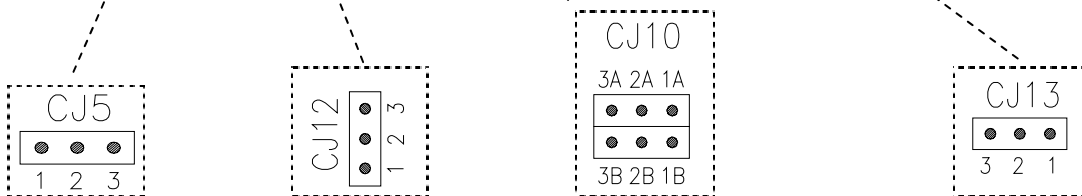

Figure 3 - Models MJB1/MJB2 main board

Figure 4 - Models MJB3/MJB4 main board

⊞ReeR

SELECTION OF MUTING MODE AND TIMEOUT MUTING (dip-switch SW1)

Mode	Dip-switch (1-8)	Result
MI (2 sensors)	1 2 3 4 — 5 6 7 8 see paragraphs below	CONCURRENT timeout = 30 sec
MI (2 sensors)	1 2 3 4 — 5 6 7 8 see paragraphs below	CONCURRENT timeout = 90 min
MI ("L" logic)	1 2 3 4 — 5 6 7 8 see paragraphs below	CONCURRENT timeout = 30 sec
MI ("L" logic)	1 2 3 4 — 5 6 7 8 selection pre-set	CONCURRENT timeout = 90 min
MI 4 sensors MT S4	1 2 3 4 — 5 6 7 8 see paragraphs below	CONCURRENT timeout = 30 sec
MI 4 sensors MT S4	1 2 3 4 — 5 6 7 8 see paragraphs below	CONCURRENT timeout = ∞
MI 4 sensors MT S4	1 2 3 4 — 5 6 7 8 see paragraphs below	Sequential timeout = 30 sec
MI 4 sensors MT S4	1 2 3 4 — 5 6 7 8 see paragraphs below	Sequential timeout = ∞
ML - MT - MLS2	1 2 3 4 5 6 7 8 — see paragraphs below	timeout = 30 sec
ML - MT - MLS2	1 2 3 4 5 6 7 8 — see paragraphs below	timeout = 90 min

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⚡ **If a time out limit of 90min is a too short time for a particular machine cycle, the configuration without time monitoring (t=∞) can be selected. In this case alternative solutions or additional measures shall be implemented to detected the condition of a muting function permanently active caused by accumulation of faults or by the muting sensors activated all the time. For example for the application of guarding the openings of a conveyor system (palletizers) by monitoring appropriate signals generated by the transport system to determinate if and when a pallet is in the detection zone.**

⚡ **Perform a specific risk analysis of the application if the timeout t = ∞ is selected.**

MANUAL /AUTOMATIC MODE SELECTION (dip-switch SW1)

		1 2 3 4 5 6	7 8	
ALL MODELS	on off	see preceding paragraph	see par. below	*Automatic*

		1 2 3 4 5 6	7 8	
ALL MODELS	on off	see preceding paragraph	see par. below	*Manual*

OTHER CONFIGURATIONS NOT PERMITTED

RANGE AND TEST SELECTION (dip-switch SW1)

		1 2 3 4 5 6	7 8	
JANUS J *JANUS MI*	on off	see preceding paragraphs		*Low range* *

		1 2 3 4 5 6	7 8	
JANUS J *JANUS MI*	on off	see preceding paragraphs		*High range* *

		1 2 3 4 5 6	7 8	
ALL MODELS *(excluding versions TRX)*	on off	see preceding paragraphs		*TEST*

OTHER CONFIGURATIONS NOT PERMITTED

* IF TO SELECT THE RANGE OF OPERATION **SEL_RANGE1** AND **SEL_RANGE2** (PIN 1 and 6 TERMINAL BOARD CJ7) ARE USED, SET DIP 7 and 8 on **OFF-OFF** (TEST)
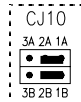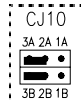
SELECTION OF INTERNAL /EXTERNAL MUTING LAMP

JUMPER	PIN	DESCRIPTION	SELECTION PRESET
CJ5 1 2 3	**1 – 2**	**External** lamp enabled	*Internal lamp enabled*
CJ5 1 2 3	**2 – 3**	**Internal** lamp enabled	

SELECTION TYPE OF OVERRIDE

JUMPER	PIN	DESCRIPTION	SELECTION PRESET
CJ9 3A 2A 1A 3B 2B 1B	**1A – 2A 1B – 2B**	Override **1** (with continuous action)	*Override 1* *(with continuous action)*
CJ9 3A 2A 1A 3B 2B 1B	**2A – 3A 2B – 3B**	Override **2** (with pulse)	

SELECTION STATIC OUTPUTS/RELAYS

JUMPER	PIN	DESCRIPTION	SELECTION PRESET
CJ10 3A 2A 1A 3B 2B 1B	1A – 2A 1B – 2B	Static outputs	**Relay**
CJ10 3A 2A 1A 3B 2B 1B	2A – 3A 2B – 3B	Relay	

READ FEEDBACK ENABLE

JUMPER	PIN	DESCRIPTION	SELECTION PRESET
CJ12	1 – 2	Read feedback not enabled	**Read feedback enabled**
CJ12	2 –3	Read feedback enabled	

SELECTION FEEDBACK INTERNAL/EXTERNAL RELAYS

JUMPER	PIN	DESCRIPTION	SELECTION PRESET
CJ13 3 2 1	1 – 2	Feedback **external** relays	**Feedback internal relays**
CJ13 3 2 1	2 – 3	Feedback **internal** relays	

INSTALLATION AND ELECTRIC CONNECTIONS

- The JANUS MJBOX modules can be fixed to the wall, using the proper plastic brackets inserted in the holes placed on the box rear side corners. These brackets can easily rotate to reach 90°.
- The light curtain must be connected to the respective connectors M23 and M12 (Fig. 1 and 2) using the cables.
- The cables coming out from the fairlead (PG21) must be connected - depending on its utilization - to the connectors CJ6 e CJ7.

Terminal board CJ6		
CLAMP	NAME	DESCRIPTION
1	**+24Vdc**	24 $\pm$ 20%
2	**0V**	0 Vdc
3	**PE**	Earth clamp
4	**SYSTEM STATUS**	Ref to JANUS instruction manual
5	**NA2_B**	Ends of the contact normally open n. 2
6	**NA2_A**	
7	**NA1_B**	Ends of the contact normally open n. 1
8	**NA1_A**	
9	**NCB**	Ends of contacts normally closed, in parallel
10	**NCA**	**(present only in models MJB3 and MJB4)**

Terminal board CJ7		
CLAMP	NAME	DESCRIPTION
1	SEL_RANGE1	Range selection external control
2	EXT LAMP	Output of External MUTING lamp (24V; max 5W)
3	OSSD1	Safety static output 1
4	OSSD2	Safety static output 2
5	K1_K2	Input Feedback external relays K1/K2
6	SEL_RANGE2	Range selection external control
7	MUTING_STATUS	Output condition of muting function (only for cur. M TRX)
8	MUTING_ENABLE	Input of Muting enable (only for cur. M TRX)
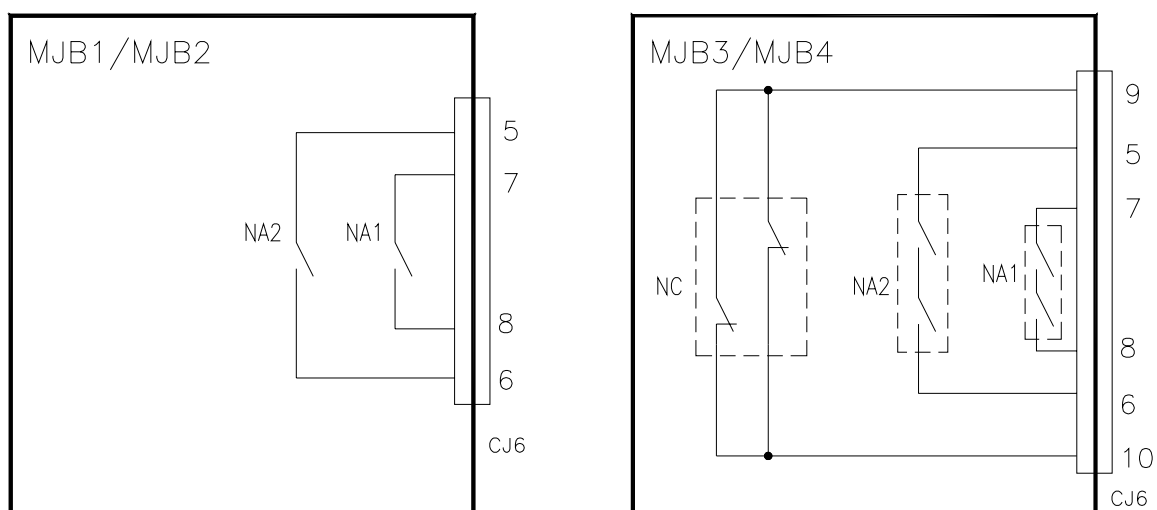
Figure 5 - Internal scheme of contacts available on safety relays of MJB1/MJB2 and MJB3/MJB4

SIGNALS

SIGNAL	MJB1/MJB3		MJB2/MJB4	
	CONDITION	MEANING	CONDIZIONE	MEANING
OUTPUT STATUS **(Green)**	ON	Outputs active	ON	Outputs active
	Flashing	Optical signal received weak * (Ref. to JANUS instruction manual)	Flashing	Optical signal received weak * (Ref to JANUS instruction manual)
	OFF	Light curtain occupied : outputs disabled	OFF	Light curtain occupied : outputs disabled
MUTING OVERRIDE **(Yellow)**	ON	Muting function (or of Override) active		
	OFF	Normal functioning		

* ACTIVE ONLY WITH JANUS LIGHT CURTAIN

REeR

CHARACTERISTICS OF OUTPUT RELAYS

The modules use two guided contacts safety relays *(pin 5-6 and 7-8 of CJ6 on **MJB1 and MJB2**)*, *(pin 5-6, 7-8 and 9-10 of CJ6 on **MJB3 and MJB4**)*, for the output circuit.

These relays are specified by the manufacturer for voltages and currents greater than what is indicated in the technical data; nevertheless to guarantee correct insulation and avoid damage or premature aging, protect each output line with a **3.15 A delayed fuse** and verify that the features of the load conform to the indications on the following table.

	MJB1/MJB2	MJB3/MJB4	
Relay category (according to EN60947-5-1)	AC15 / DC13	AC15 / DC13	
Number of contacts	2 N.A.	2N.A. - 1N.C.	
Max commutable voltage	250Vac	250Vac, 30Vdc	
Min commutable voltage	10Vac/10Vdc	10Vac/10Vdc	
Max commutable current	2A	2A	
Min commutable current	15mA@24Vdc	15mA@24Vdc	
Number of commutations (life)	$\geq 50*10^6$	$\geq 10^5$ (el)	$\geq 10^7$ (mech)