JAB6610 Input/Output Module
Manual and Installation Instructions
JAB6610

Applications

The **JAB6610** module is an input/output expansion module compatible with the Johnson Controls family of Field Controllers and Network Controllers. It is designed to provide additional inputs and outputs for all compatible controllers that are programmed with the controller configuration tool (CCT). The **JAB6610** is designed to provide an additional 2 Binary Inputs, 2 Binary Outputs, 4 Analog Inputs and 4 Analog Outputs.

The rail mounted module **JAB6610** provides the physical I/O points. The module communicates with the host controller via the controllers SA (sensor/actuator) bus. Configuring and commissioning of the **JAB6610** module is done using the Controller Configuration Tool (CCT).

JAB6610

Article Numbers and Designations

Part-No.	Designation	Description
00002746	JAB6610	Rail mounted Input/Output module

Parts Included

- One JAB6610 Input/Output Module with removable Terminal Plugs.
- One Installation Instructions sheet.

Installation

Observe these guidelines when installing the JAB6610 module:
- Transport the modules in the original container to minimize vibration and shock damage to the devices.
- Do not drop the JAB device or subject it to physical shock.
- Verify that all parts shipped with the JAB modules.

Mounting

Follow these guidelines when mounting JAB6610 modules:
- Mount the JAB6610 module in areas free of corrosive vapours and observe the environmental limitations listed in the *Technical Specifications* section.
- Do not mount the JAB6610 module on surfaces that are prone to vibration.
- Do not mount the JAB6610 module in areas where electromagnetic emissions from other devices or wiring can interfere with JAB6610 module communication.
- Mount the JAB6610 module so that no other parts or devices obstruct ventilation of or radiate heat into the module´s housing.

Materials and Special Tools Needed

- One 45 mm (1.8 in.) [or longer] piece of DIN rail and appropriate hardware for mounting the DIN rail.
- Small straight blade screwdriver for securing the wires in the terminal blocks.
- Straight blade screwdriver for loosening the device from the DIN rail.

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DIN Rail Mount Applications (JAB6610)

To mount the JAB6610 module on a DIN rail:

1. Securely mount a 45 mm (1.8 in.) [or longer] section of DIN rail horizontally and centred in the required space. Allow sufficient space for cable and wire connections (minimum of 50 mm [2 inches] above and below the module, i.e. a total height of approximately 200 mm [8 inches]).
2. Hang the JAB6610 module by the DIN rail hook on the top track of the DIN rail, and position the JAB6610 module DIN rail channel snugly against the tracks of the DIN rail.
3. The bottom mounting clip must click into place to fix the JAB6610 module securely on the DIN rail.
4. To remove the JAB6610 module from the DIN rail, pull the bottom DIN clip carefully down to the extended position and lift the JAB6610 module off the DIN rail.

Wiring

Please pay attention to all specifications and guidelines documented by Johnson Controls concerning devices running with the MS/TP-Bus, e.g. refer to the *MS/TP Communications Bus Overview Technical Bulletin (LIT-12011034).*

To wire the JAB6610 module:

1. Terminate wiring per engineering drawings (see Figure 1).
2. Wire other devices to the SA Bus, as the case may be.
3. Wire the SA Bus in a daisy chain.
   Note: If multiple Input/Output Modules are used, and the JAB6610 module is located at one end of the SA Bus daisy chain, set the End-of-Line (EOL) switch on the last Module (also see Fig. 3).
4. Ensure the device address DIP switches are set to the appropriate hardware address (in the range of 128-254). See *Setup and Adjustments*.
5. Connect power to the JAB6610 module.
6. Download and commission the JAB6610 module. See *Commissioning*. Once the controller has detected the JAB6610 module, the configuration will be downloaded to the JAB6610 if the controller has already been put into operation by means of the CCT tool.
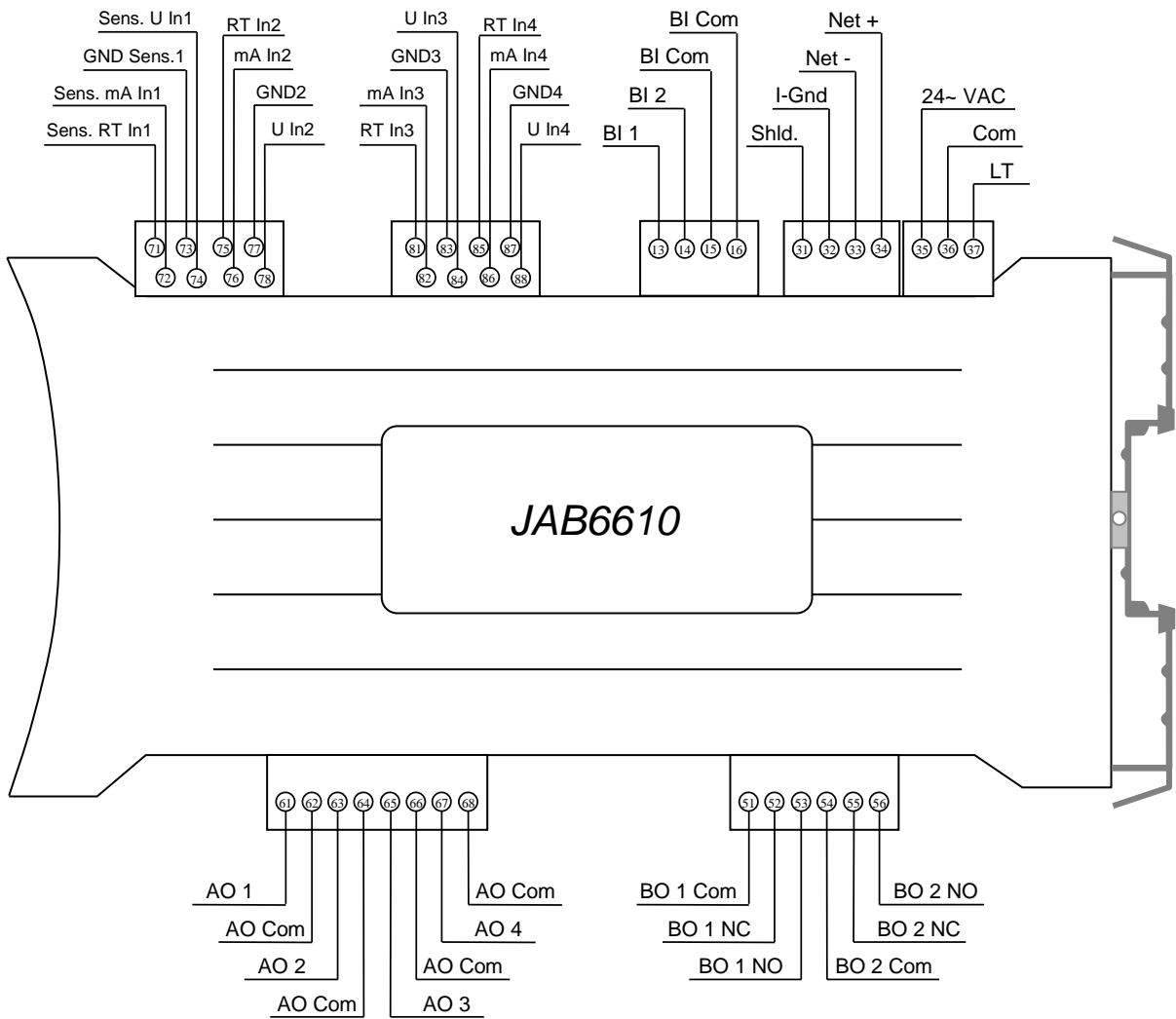
Figure 1: JAB6610 Module Wiring Interface

⚠️ **Note:** The SHLD terminal on the SA Bus neither provides an electrically grounded connection nor sources power for other devices on the SA Bus. It is for daisy-chaining purposes only.

Table 1: Romutec I/O-Modules Family Wiring List (Part 1 of 2):

Terminal Block	Label in Wiring Interface	Function and Electrical Ratings/Requirements	Wiring Requirements
Analog IN	AI *n*	Analog Input, Voltage Mode Accepts a 0-10 VDC input signal, internal 75 kΩ pull-down	A
		Analog Input, Current Mode Accepts a 0-20 mA input signal, internal 100 Ω load impedance	B
		Analog Input, Resistive Mode Accepts a 0-600 kΩ input signal, internal 12V, 15 kΩ pull-up RTD: 1k Nickel [L & G], 1k Nickel [DIN], 1k Platinum, A99B Silicon Temperature Sensor)	A
	AI Com	The signal common for all Analog IN terminals; combined with BI-, AO- and power supply terminal commons	same as AI
Binary IN	BI *n*	Binary Input, Dry Contact Maintained Mode 0.01 s minimum pulse width (50 Hz at 50% duty cycle) Internal 35 V, 2.7kΩ pull-up	A
	BI Com	The signal common for all Binary IN terminals; combined with AI-, AO- and power supply terminal commons	
Analog OUT	AO *n*	Analog Output, Voltage mode, sources 0-10 VDC output voltage External 1kΩ minimum load required 10 VDC maximum output voltage, 10 mA maximum output current	A
	AO Com	The signal common for all Analog OUT terminals; combined with AI-, BI- and power supply terminal commons	
Binary OUT	BO *n* NO	Binary Output, up to 250 VAC Relay Contact Connects BO *n* NO to BO Com when activated Characteristics (Resistive Load): Initial contact resistance 100mΩ (at 1A / 24 VDC) Rated load 5 A at 250 VAC, 5 A at 30 VDC, 10 A at 125 VAC Max. switching voltage 277 VAC, 30 VDC Max. switching capacity 1250 VA (AC), 150 W (DC) Endurance 1×10^5 ops (Rated Load), 1×10^7 ops (no Load)	0.5-1.5 mm² (20-16 AWG) stranded cable
	BO *n* NC	Binary Output, up to 250 VAC Relay Contact Disconnects BO *n* NC from BO Com when activated Characteristics (Resistive Load): Initial contact resistance 100mΩ (at 1A / 24 VDC) Rated load 3 A at 250 VAC, 3 A at 30 VDC, 5 A at 125 VAC Max. switching voltage 277 VAC, 30 VDC Max. switching capacity 750 VA (AC), 90 W (DC) Endurance 1×10^5 ops (Rated Load), 1×10^7 ops (no Load)	
	BO *n* Com	The output signal common for Binary OUT terminals; isolated from all other terminal commons, including BO terminal commons	

Table 2: Romutec I/O-Modules Family Wiring List (Part 2 of 2):

Terminal Block / Function Group	Label in Wiring Interface	Function and Electrical Ratings / Requirements	Wiring Requirements
SA Bus[1]	Net + Net – I-Gnd	Provides SA Bus communication network	Daisy-chained 366 m maximum length
	Shield	Terminal for the shield of the SA Bus cable	0.5 mm² to 1.5 mm² [0.75 mm² recommended]
24~ Power	24~ Hot	AC Supply Input, Supply 24 VAC ± 10%	0.75 mm² to 1.5 mm² [1.0 mm² recommended]
	Com	The 24~ Power common; combined with AI-, AO- and BI- terminal commons	
LED Test Input	LT	Input to activate a check of all LEDs Input LT will be activated by Com	0.5 mm² to 1.5 mm² [0.75 mm² recommended]

[1] The SA Bus specifications in this table are for MS/TP bus communications at 38.4k. For more information, refer to the *MS/TP Communications Bus Technical Bulletin (LIT-12011034)* which is available from Johnson Controls.

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Table 3: Wire Gauge and Length Guidelines

Guideline	Cable Size	Maximum Length	Assumptions
A	1.5 mm² (16 AWG)	457.2 m (1,500 ft)	100 mV maximum voltage drop
	1.0 mm² (17 AWG)	304.8 m (1000 ft)	
	0.75 mm² (18 AWG)	228.6 m (750 ft)	
	0.5 mm² (20 AWG)	152.4 m (500 ft)	
B	1.5 mm² (16 AWG)	228.6 m (750 ft)	100 mV maximum voltage drop
	1.0 mm² (17 AWG)	152.4 m (500 ft)	
	0.75 mm² (18 AWG)	114.2 m (375 ft)	
	0.5 mm² (20 AWG)	76.2 m (250 ft)	

Setup and Adjustments

Determining the SA Bus Address

The SA bus address switch sets a unique address for this module on the SA bus. The default address setting is 255 (all ON). You must change this address.
Set consecutive addresses, 128 through 254, for JDB and JAB modules and other subordinate devices on the SA bus.

Set the address of the JAB6610 module using the Dual Inline Package (DIP) switches on the face of the JAB6610 module. The address equals the sum of the numbers set to ON. For example, if the second (2), the fifth (16), and the eighth (128) DIP switches are set to ON, the device address is 146 (2 + 16 + 128 = 146). See Figure 2.

Table 4: FC-/SA Bus Address Summary

| Address	Description
0	Reserved for supervisory controller
1-3	Reserved (e.g. for NCE´s local display, address fixed = 3)
4-127	Illegal addresses for Romutec I/O modules – Reserved for field equipment controllers (FEC) and Metasys® IOM master devices. NCE´s address fixed = 4
128-254	**Valid range of addresses-for Romutec I/O-Modules (Subordinate devices)**
255	Default address – must be changed
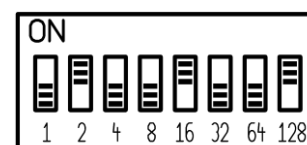
**Fig. 2:
Setting the Address DIP switches**

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SA Bus termination and selecting use of Front Panel
Using the quad dip switch (fig. 3), it is possible to decide about the use of a front panel (not relevant in conjunction with the JAB6610 module) and to designate the JAB6610 module as the end of the SA Bus. Valid values of the adjustments are marked in table 5 below.

Dip switches 1...3: SA-Bus Termination
The SA Bus End-of-Line termination switch allows you to designate the JAB6610 module as the end of the SA Bus. The default position is OFF, i.e. not terminated, as shown in figure 3 (factory setting). If the JAB6610 module is at the end of a daisy chain of devices on the SA Bus, set **all** the three EOL switches to the ON position. Doing so, this will avoid the occurrence of reflections at the end of the line.
Note: Either all the switches 1 ... 3 are set to the ON position or none. See figure 3.

Dip switch 4: Application with or without Front Panel
The fourth DIP switch of the JAB6610 module shall be set to the OFF position because there is no front panel available for this type of module.

Table 5: Valid values for EOL switches and Front Panel Mode Adjustment

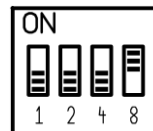| Value	Description
0	**not terminated, without Front Panel**
1-6	adjustment not valid
7	**terminated, without Front Panel**
8-15	adjustment not valid

**Fig. 3:
Setting EOL switches and selecting Front Panel Mode**

Configuring the Analog Inputs
Activating of internal impedances/loads for each mode (i.e. current-, voltage- or resistive measuring mode) is done automatically when configuration data is sent to the JAB6610 module by the NCE controller. There are no other adjustments required.
Note: The factory setting for all Analog Inputs is „Voltage Mode 0...10 VDC".

Important: If one or more analog inputs shall be configured for resistive measuring mode, the following rule has to be observed:

The four analog inputs are arranged in two groups, each consisting of two inputs (AI 1 + 2 and AI 3 + 4). A Resistance Temperature Device (RTD) has to be planned first for operation with inputs AI 2 or AI 4; the other input of the group then can be configured arbitrarily for any mode, i.e. current or voltage mode as well as resistive measuring mode.

Configuring and Commissioning
The parameters for configuring the JAB6610 are defined using the CCT Tool and will be stored together with the other controller application data in the *.caf file (Controller Application File). During commissioning this data is downloaded to the controller. Once the host controller has detected the JAB6610 with the appropriate address, it will send the configuration data to this module.

For more information concerning the Controller Configuration Tool software (CCT), please refer to the CCT *Help,* (LIT-12011147).

Troubleshooting

Use Table 6 to troubleshoot the JAB6610 module.

Table 6: Status LEDs of the JAB6610 module

Name	Color	Normal	Descriptions
Power	Green	On Steady	Off Steady = No Power, 24V AC missing On Steady = Power is Supplied by Primary Voltage 24V AC
Fault	Red	Off Steady	Blink - 2 Hz = Download or startup in progress, not ready for normal operation Blink - 4 Hz = Fault or missing Front Panel Off Steady = No Faults On Steady = Device Fault
SA/FC Bus	Orange	Flicker	Flicker = Data Transmission (send, normal communication) Off Steady = No Data Transmission or auto baud in progress

Technical Specifications
JAB6610 I-/O-Module

Product Code Numbers	JAB6610 Input/Output Module
Supply Voltage	24 VAC ± 10% at 50 or 60 Hz
Power Consumption	12 VA maximum
Ambient Operating Conditions	0 to 50°C (32 to 122°F); 10 to 90% RH non-condensing
Ambient Storage Conditions	0 to 70°C (32 to 158°F); 10 to 90% RH non-condensing
Terminations	Spring-type terminals for I/Os Spring-type or Screw terminals for power supply and MS/TP Bus
Device Addressing	DIP switch set (128-254). Addresses 0-127, 255 are reserved
Communications Bus	BACnet® MS/TP; 4-wire SA Bus[1] (only 3 wires used)
Mounting	35 mm DIN rail
Standards Compliance	CE Directive 2014/30/EU CE Directive 2014/35/EU
Dimensions (H x W x D)	116 x 32 x 166 mm (4.6 x 1.3 x 6.5 in.) Minimum space for mounting: 210 x 40 x 180 mm (8.3 x 1.6 x 7.1 in.)
Housing	Plastic housing, Plastic material: PA6.6 25%GF Protection: IP20 (IEC529)
Weight	JAB6610: 0.222 kg (0.49 lb)

[1] For more information, refer to the *MS/TP Communications Bus Technical Bulletin (LIT-12011034)* which is available from Johnson Controls.

The performance specifications are nominal and conform to acceptable industry standard. For application at conditions beyond these specifications, consult the local Romutec office. Romutec GmbH shall not be liable for damages resulting from misapplication or misuse of its products.

Latest Information and Firmware Updates will be available on the website
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