

JetWeb

JX2-OA4

Operator's Manual



Edition 1.1

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This Operator's Manual is an Integral Part of the JetWeb-Module JX2-OA4:

Model: _____
Serial No: _____
Year of Manufacture: _____
Order No: _____



To be entered by the customer:

Inventory No: _____
Place of operation: _____

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Significance of this Operator's Manual

This manual is an integral part of the JX2-OA4 module, and

- must be kept in a way that it is always at hand until the JX2-OA4 module will be disposed of;
- if the JX2-OA4 module is sold, alienated or loaned, this manual must be handed over.

In any case you encounter difficulties to clearly understand the manual, please contact the manufacturer.

We would appreciate any kind of suggestion and contributions on your part and would ask you to inform or write us. This will help us to produce manuals that are more user-friendly and to address your wishes and requirements.

From this JX2-OA4 module may result unavoidable residual risks to persons and property. For this reason, any person who has to deal with the operation, transport, installation, maintenance and repair of the JX2-OA4 module must have been familiarised with it and must be aware of these dangers.

Therefore, this person must carefully read, understand and observe this manual, and especially the safety instructions.

Missing or inadequate knowledge of the manual results in the loss of any claim of liability on part of Jetter AG. Therefore, the operating company is recommended to have the instruction of the persons concerned confirmed in writing.

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1 Safety Instructions

The JX2-OA4 module is in line with the current state of the art. The JX2-OA4 module complies with the safety regulations and standards in effect. Special emphasis was given to the safety of the users.

Of course, the following regulations apply to the user:

- relevant accident prevention regulations;
- accepted safety rules;
- EC guidelines and other country-specific regulations.

Usage as Agreed Upon

Usage as agreed upon includes operation in accordance with the operating instructions.

The JX2-OA4 module is used to control machinery, such as conveyors, production machines, and handling machines.

The supply voltage of the JX2-OA4 module is DC 24 V . This operating voltage is classified as SELV (Safety Extra Low Voltage). The JX2-OA4 module is therefore not subject to the EU Low Voltage Directive.

The JX2-OA4 module may only be operated within the limits of the stated data.

Usage Other Than Agreed Upon

The JX2-OA4 module must not be used in technical systems which to a high degree have to be fail-safe, e.g. ropeways and aeroplanes.

If the JX2-OA4 module is to be run under surrounding conditions, which differ from the conditions mentioned in chapter 3: "Operating Parameters, page 13,, the manufacturer is to be contacted beforehand.

Who is Permitted to Operate the JX2-OA4 Module?

Only instructed, trained and authorised persons are permitted to operate the JX2-OA4 module.

Mounting and backfitting may only be carried out by specially trained personnel, as specific know-how will be required.

Maintaining the JX2-OA4 Module

The JX2-OA4 module is maintenance-free. Therefore, for the operation of the module no inspection or maintenance are required.

Decommissioning and Disposal of the JX2-OA4 Module

Decommissioning and disposal of the JX2-OA4 module are subject to the environmental legislation of the respective country in effect for the operator's premises.

Descriptions of Symbols



Danger

This sign is to indicate a possible impending danger of serious physical damage or death.



Caution

This sign is to indicate a possible impending danger of light physical damage. This sign is also to warn you of material damage.



Important!

This sign is to indicate a possible impending situation which might bring damage to the product or to its surroundings.



Note!

You will be informed of various possible applications and will receive further useful suggestions.

. / -

Enumerations are marked by full stops, strokes or scores.



Operating instructions are marked by this arrow.



Automatically running processes or results to be achieved are marked by this arrow.



Illustration of PC and user interface keys.

1.1 Ensure Your Own Safety

- Disconnect the JX2-OA4 module from the mains to carry out maintenance work. By doing so, you will prevent accidents resulting from electric voltage and moving parts.
- Safety and protective devices, e.g. the barrier and cover of the terminal box must never be shunted or by-passed.
- Dismantled protective equipment must be reattached prior to commissioning and checked for proper functioning.

Modifications and Alterations to the Module

For safety reasons, no modifications and changes to the JX2-OA4 module and its functions are permitted. Any modifications to the module not expressly authorised by the manufacturer will result in a loss of any liability claims to Jetter AG.

The original parts are specially designed for the JX2-OA4 module. Parts and equipment of other manufacturers are not tested on our part, and are, therefore, not released by us. The installation of such parts may impair the safety and the proper functioning of the JX2-OA4 module.

For any damages resulting from the use of non original parts and equipment any claims with respect to liability of Jetter AG are excluded.

Malfunctions

- Malfunctions or other damages are to be reported to an authorised person immediately.
- Safeguard the JX2-OA4 module against misuse or accidental use.
- Only qualified experts are allowed to carry out repairs.

Information Signs and Labels

- Writings, information signs, and labels always have to be observed and kept readable.
- Damaged or unreadable information signs and labels are to be exchanged.

1.2 Instructions on EMI

The noise immunity of a system corresponds to the weakest component of the system. For this reason, correct wiring and shielding of the cables is important.



Important!

Measures for increasing immunity to interference:

- On principle, physical separation should be maintained between signal and voltage lines.
- Shield both sides of the cable.
- The entire shield must be drawn behind the isolation, and then be clamped under an earthed strain relief with the greatest possible surface area.

When male connectors are used:

- Only use metallised connectors, e.g. SUB-D with metallised housing. Please take care of direct connection of the strain relief with the housing here as well (refer to Fig. 1).

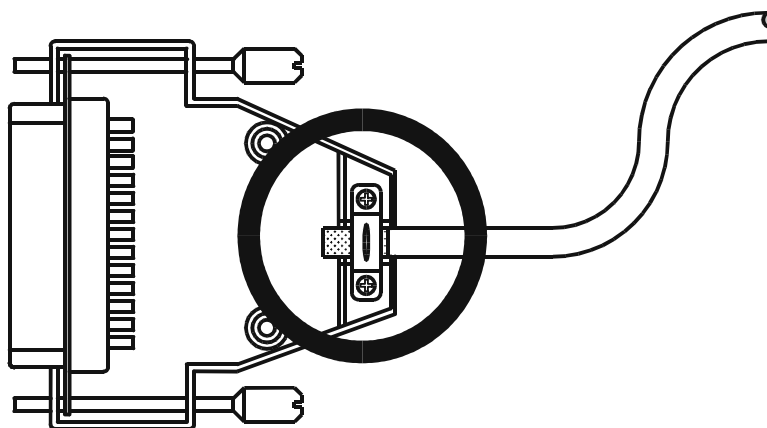


Fig. 1: Shielding of SUB-D connectors in conformity with the EMC standards.

2 Physical Dimensions

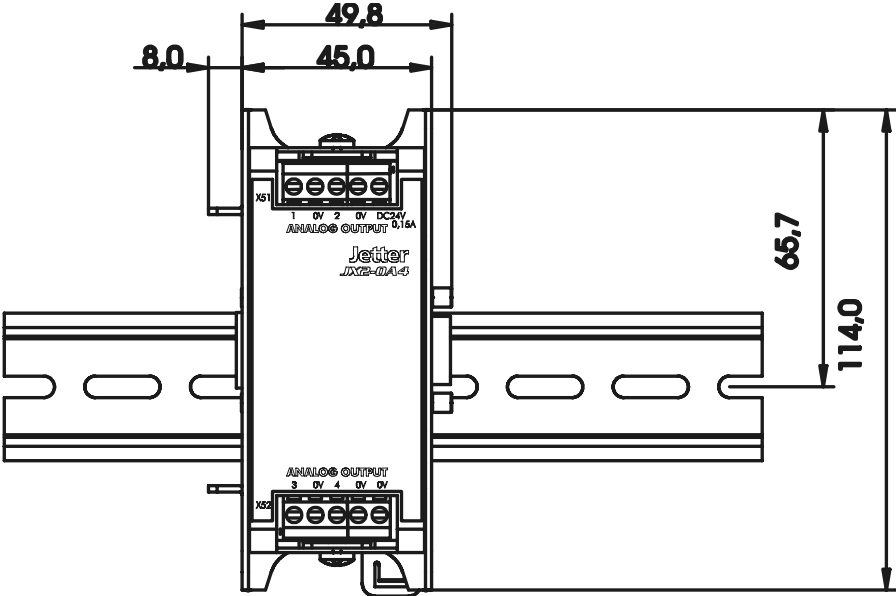


Fig. 2: Front View - JX2-OA4

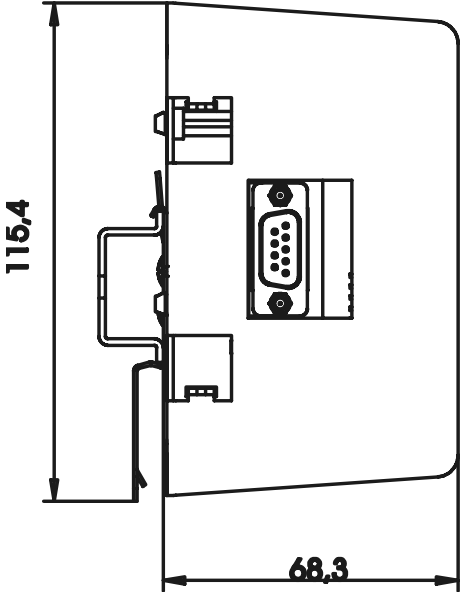


Fig. 3: Side View - JX2-OA4

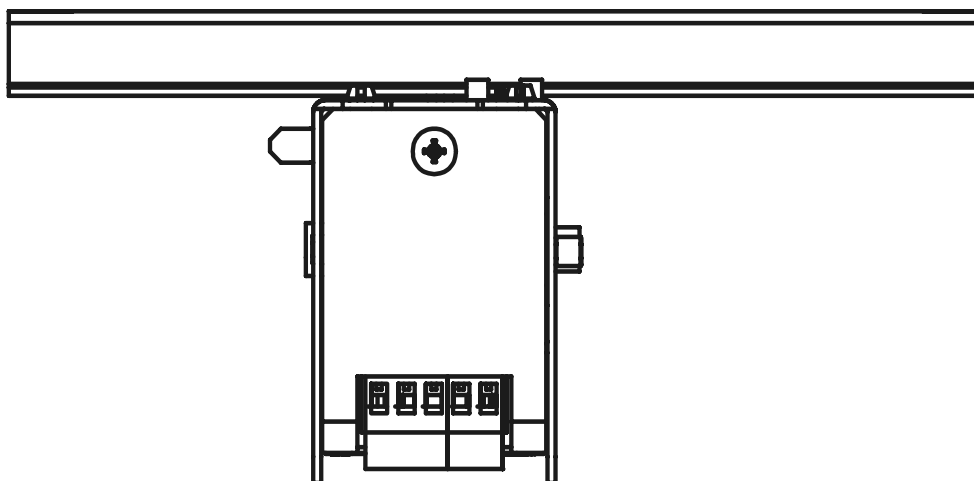


Fig. 4: Top View - JX2-OA4

3 Operating Parameters

| Environmental Operating Parameters | | |
|--|--|--|
| Parameter | Value | Reference |
| Operating Temperature Range | 0 °C through 50 °C | |
| Storage Temperature Range | -25 °C through +70 °C | DIN EN 61131-2 DIN EN 60068-2-1 DIN EN 60068-2-2 |
| Air Humidity / Humidity Rating | 5 % to 95 % No condensing | DIN EN 61131-2 |
| Pollution Degree | 2 | DIN EN 61131-2 |
| Corrosion Immunity/ Chemical Resistance | No special protection against corrosion. Ambient air must be free from higher concentrations of acids, alkaline solutions, corrosive agents, salts, metal vapours, or other corrosive or electroconductive contaminants. | |
| Operating Altitude | Up to 2000 m above sea level | DIN EN 61131-2 |

| Mechanical Operating Parameters | | |
|---------------------------------|---|-------------------------------------|
| Parameter | Value | Reference |
| Free Falls Withstanding Test | Height of fall (units within packing): 1 m | DIN EN 61131-2 DIN EN 60068-2-32 |
| Vibration Resistance | 10 Hz - 57 Hz: with an amplitude of 0.0375 mm for continuous operation (peak amplitude of 0.075 mm) 57 Hz -150 Hz: 0.5 g constant acceleration for continuous operation (1 g constant acceleration as peak value), 1 octave per minute, 10 frequency sweeps (sinusoidal), all spatial axes | DIN EN 61131-2 IEC 68-2-6 |
| Shock Resistance | 15 g occasionally, 11 ms, sinusoidal half-wave, 2 shocks in all three spatial axes | DIN EN 61131-2 IEC 68-2-27 |
| Degree of Protection | IP20, rear: IP10 | DIN EN 60529 |
| Mounting Position | Any position, snapped on DIN Rail | |

| Operating Parameters - Electrical Safety | | |
|--|--|----------------|
| Parameter | Value | Reference |
| Class of Protection | III | DIN EN 61131-2 |
| Dielectric Test Voltage | Functional ground is connected to chassis ground internally. | DIN EN 61131-2 |
| Overvoltage Category | II | DIN EN 61131-2 |

| Operating Parameters (EMC) - Emitted Interference | | |
|---|--|--|
| Parameter | Value | Reference |
| Enclosure | Frequency 30 -230 MHz, limit 30 dB ($\mu\text{V}/\text{m}$) at 10 m distance frequency band 230-1000 MHz, limit 37 dB ($\mu\text{V}/\text{m}$) at 10 m distance (class B) | DIN EN 50081-1 DIN EN 55011 DIN EN 50081-2 |

| Operating Parameters (EMC) - Immunity to Interference of Housing | | |
|--|--|--|
| Parameter | Value | Reference |
| Magnetic Field with Mains Frequency | 50 Hz, 60 Hz 30 A/m | DIN EN 61000-6-2 DIN EN 61000-4-8 |
| RF Field, amplitude-modulated | Frequency band 27 - 1000 MHz Test field strength 10 V/m AM 80 % with 1 kHz Criterion A | DIN EN 61131-2 DIN EN 61000-6-2 DIN EN 61000-4-3 |
| ESD | Discharge through air: Test peak voltage 15 kV (Humidity Rating RH-2 / ESD-4) Contact Discharge: Test peak voltage 4 kV (severity level 2) Criterion A | DIN EN 61000-6-2 DIN EN 61131-2 DIN EN 61000-4-2 |

| Operating Parameters (EMC) - Immunity to Interference of Signal Ports | | |
|---|---|--|
| Parameter | Value | Reference |
| Asymmetric RF, amplitude-modulated | Frequency band 0.15 -80 MHz Test voltage 10 V AM 80 % with 1 kHz Source impedance 150 Ohm Criterion A | DIN EN 61000-6-2 DIN EN 61000-4-6 |
| Burst | Test voltage 1 kV tr/tn 5/50 ns Repetition rate 5 kHz Criterion A | DIN EN 61131-2 DIN EN 61000-6-2 DIN EN 61000-4-4 |

| Operating Parameters (EMC) - Immunity to Interference of DC Power Supply In- and Outputs | | |
|--|---|--|
| Parameter | Value | Reference |
| Asymmetric RF, amplitude-modulated | Frequency band 0.15 -80 MHz Test voltage 10 V AM 80 % with 1 kHz Source impedance 150 Ohm Criterion A | DIN EN 61000-6-2 DIN EN 61000-4-6 |
| Burst | Test voltage 2 kV tr/tn 5/50 ns Repetition rate 5 kHz Criterion A | DIN EN 61131-2 DIN EN 61000-6-2 DIN EN 61000-4-4 |

4 Technical Data

| Technical Data - JX2-OA4 | |
|--|--|
| Power Supply | <ul style="list-style-type: none"> centralised arrangement: via basic unit decentralised arrangement: via power supply module JX2-PS1. |
| Connections to the basic unit via system bus | Male connector SUB-D, 9 pins |
| Output terminals | Plug-in terminal blocks |
| Enclosure | Aluminium, painted |
| Dimensions (H x W x D in mm) | 115 x 45 x 69 |
| Weight | 200 g |
| Mounting | DIN Rail |
| Amount of Outputs | 4 channels: - U ₁₋₄ for voltage |
| Voltage Range - Bipolar | DC -10 +10 V |
| Value Range | |
| Voltage - Bipolar | -2048 ... 2047 |
| Resolution (voltage) | 12 Bit |
| Voltage supply of analog outputs | DC 24 V -15% through +20%, 150 mA (maximum) |
| Output Current | max. 10 mA |
| Delay Time | < 4 ms |
| Electrical Isolation | None |
| Heat loss of CPU logic circuit | 0.3 W |

| Output Voltage Accuracy Classes of the JX2-OA4 Module | | | |
|--|----------------------------|------------------------------------|--------------|
| Type of Error | Input Configuration | Maximum Error ^{*)} | |
| | | in LSB | in mV |
| Zero Error | Bipolar | ± 6 LSB | 29.3 mV |
| Gain Error | Bipolar | ± 6 LSB | 29.3 mV |

^{*)} The typical measuring accuracy is higher.

5 JX2-OA4 Module - Analog Outputs

The JX2-OA4 module is for outputting analog voltages. These voltage values are used as manipulated variables, for example, for actuators etc. Such voltage values are defined in a user program, and are output by the module according to definition.

5.1 Description of Connections

On the expansion module 4 channels have been provided for outputs. Each channel can be switched individually and provides bipolar voltage values of ± 10 V. All voltage signals relate to the 0 V connection. Within the module, the 0 V signal is connected to ground internally via the enclosure.

Terminal Specifications

- 5-pole terminal block COMBICON RM 5.08 (for printed circuit boards)
- Cable cross-sectional area: 0.25 - 2.5 mm²
- Torque (for input plug screws): 0.5 .. 0.6 Nm
- The maximum stripping length for input lines is 7 mm
- The accepted VDE guidelines have to be observed
- Flat-bladed screwdriver: 0.6 x 3.5 x 100 mm

Connecting Cable Specifications

- Not required

Cable Shielding

- Make sure that the signal lines are shielded (see following figure)



Important!

The supply voltage for analog outputs must not exceed 28.8 Volt (150 mA). This will prevent the JX2-OA4 module and the actuator, possibly connected to it, from being destroyed.

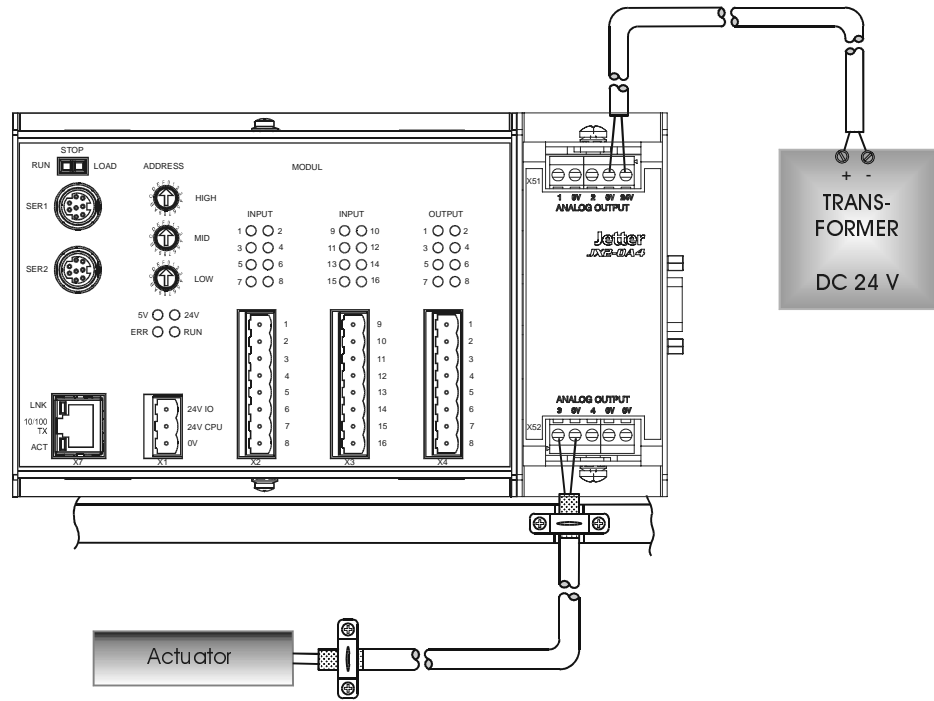
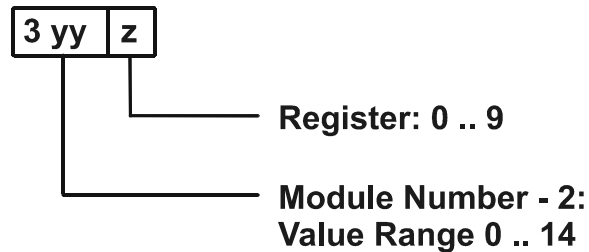


Fig. 5: Example: Output Wiring of a JX2-OA4 Module

5.2 Registers of the JX2-OA4 Module

Coding of the registers:



Note!

For determination of the module number, only the non-intelligent modules will be counted. Intelligent modules, such as SV, SM, PID, etc., located among the modules, are not being taken into consideration.

Module number 1 is always assigned to the basic control unit. Starting from there, the module numbers are being counted left to right.

For communication with the CPU, 5 registers have been provided by the JX2-OA4 module. The operating system version number of the module can always be read from register 9. The other module registers are being defined by the function of the module. The registers are addressed as follows:

`Register number = 3000 + (module number - 2) * 10 + local register number`

Example: Determination of the register numbers

The number of the third expansion module's register is determined as follows:

Module number = 4

Local register number = 9

Register number = $3029 + (4-2) * 10 + 9 = 3003$

For communication, 5 registers have been provided by the JX2-OA4 module. The operating system version number of the module can always be read from register 9. The registers are addressed as follows:

| JX2-OA4 Module: Register assignment for analog outputs | | |
|---|-------------------------------|----------------------------|
| Outputs | D/A value Register | Voltage Bipolar |
| Channel # 1 | 3yy0 | -10 V through +10 V |
| Channel # 2 | 3yy1 | -10 V through +10 V |
| Channel # 3 | 3yy2 | -10 V through +10 V |
| Channel # 4 | 3yy3 | -10 V through +10 V |

The voltage values are output to the actuators via output channels # 1 through 4.

Example: Definition of Output Voltage

Value 1534 is assigned to channel 1 (register 3yy0). The resulting voltage is 7.5 volt.

| Register 3yy0: Channel # 1 - Output Voltage | |
|--|---|
| Function | Description |
| Read | Present value of the output voltage Value following reset: 0 |
| Write | New output voltage |
| Value Range | Voltage - bipolar: -2048 ... 2047 |

| Register 3yy1: Channel # 2 - Output Voltage | |
|--|---|
| Function | Description |
| Read | Present value of the output voltage Value following reset: 0 |
| Write | New output voltage |
| Value Range | Voltage - bipolar: -2048 ... 2047 |

| Register 3yy2: Channel # 3 - Output Voltage | |
|--|---|
| Function | Description |
| Read | Present value of the output voltage Value following reset: 0 |
| Write | New output voltage |
| Value Range | Voltage - bipolar: -2048 ... 2047 |

| Register 3yy3: Channel # 4 - Output Voltage | |
|--|---|
| Function | Description |
| Read | Present value of the output voltage Value following reset: 0 |
| Write | New output voltage |
| Value Range | Voltage - bipolar: -2048 ... 2047 |

| Register 3yy9: Version Number of the Operating System | |
|--|--|
| Function | Description |
| Read | Version number of the operating system e.g. 101= V 1.01 |
| Write | Illegal |
| Value Range | 32-bit-signed integer |