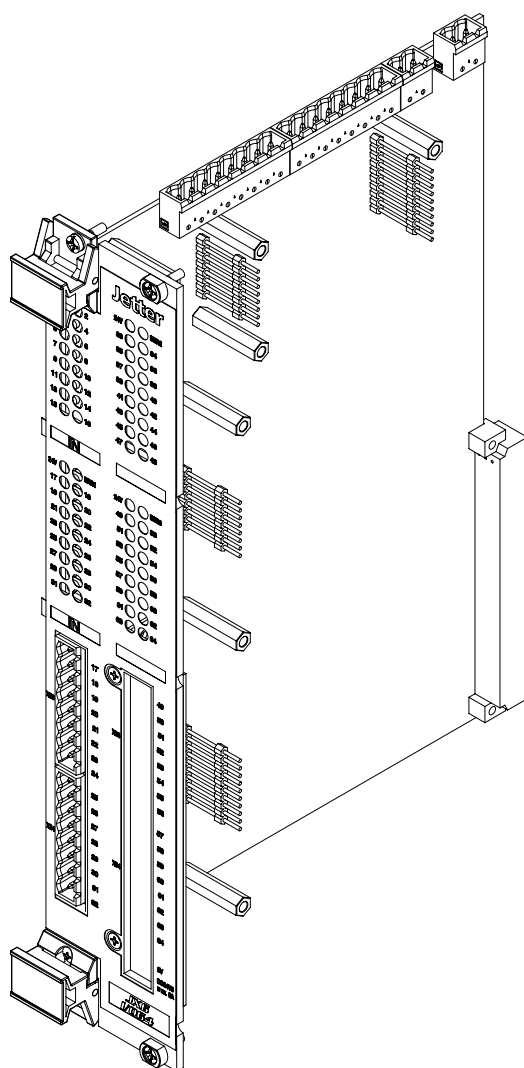# JX6-I064

I/O Module

Operator's Manual

Edition 1.02

Jetter AG reserves the right to make alterations to its products in the interest of technical progress. These alterations need not be documented in every single case.

This manual and the information contained herein have been compiled with due diligence. However, Jetter AG assumes no liability for printing or other errors or damages arising from such errors.

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This Operator's Manual is an Integral Part of the JetWeb-Module JX6-IO64:

Model: _____

Serial #: _____

Year of Manufacture: _____

Order #: _____

To be entered by the customer:

Inventory #: _____

Place of operation: _____

Significance of this Operator's Manual

This manual is an integral part of the JX6-IO64 module, and

*   and must be kept in a way that it is always at hand until the JX6-IO64 module will be disposed of.
*   if the JX6-IO64 module is sold, alienated or loaned, this manual must be handed over.

In any case you encounter difficulties to clearly understand this manual, please contact the manufacturer.
We would appreciate any suggestions and contributions on your part and would ask you to contact us. This will help us to produce manuals that are more user-friendly and to address your wishes and requirements.

This manual contains important information on how to transport, erect, install, operate, maintain and repair the JX6-IO64 module.
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.

History

Edition	Comment
1.00	Changes cannot be traced back anymore
1.01	Changes cannot be traced back anymore
1.02	See "Recent Revisions" on page 70.

Description of Symbols

Warning

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

Caution

This sign is to indicate a possible impending danger of light injury. 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.
It also identifies requirements necessary to ensure faultless operation.

Note

You will be informed of various possible applications and will receive further useful suggestions.
It also gives you words of advice on how to efficiently use hardware and software in order to avoid unnecessary efforts.

· / -   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.

PC and user interface keys.

This symbol informs you of additional references (data sheets, literature, etc.) associated with the given subject, product, etc. It also helps you to find your way around this manual.

Table of Contents

List of Appendices

1   Safety Instructions

The JX6-IO-IO64 module complies with the safety regulations and standards in effect. Special emphasis was given to the safety of the users.

Of course, the user should adhere to the following regulations:

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

Usage as Agreed Upon

Usage as agreed upon includes operation in accordance with the operating instructions.
The JX6-IO64 module is used to control machinery, such as conveyors, production machines, and handling machines.
The supply voltage of the JX6-IO64 module is DC 24 V . This operating voltage is classified as SELV (Safety Extra Low Voltage). The JX6-IO64 module is therefore not subject to the EU Low Voltage Directive.

The JX6-IO64 module can only be operated in conjunction with a controller, such as JC-647, installed together in the same rack. The JX6-IO64 module provides additional digital inputs and outputs.

The JX6-IO64 module may only be operated within the limits of the stated data.

Usage Other Than Agreed Upon

The JX6-IO64 module must not be used in technical systems which to a high degree have to be fail-save, e.g. ropeways and aeroplanes.

If the JX6-IO64 module is to be run under surrounding conditions, which differ from the conditions mentioned in chapter 3: "Operating Conditions, page 17", the manufacturer is to be contacted beforehand.

Who is Permitted to Operate the JX6-IO64 Module?

Only instructed, trained and authorised persons are permitted to operate the JX6-IO64 module.

Transport:	Only by personnel with knowledge in handling electrostatically sensitive components.
Installation	Only by specialists with training in electrical engineering.
Commissioning:	Only by specialists with extensive knowledge of and experience with electrical engineering / drive technology.

Modifications and Alterations to the Module

For safety reasons, no modifications and changes to the JX6-IO64 module and its functions are permitted. Any modifications to the JX6-IO64 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 JX6-IO64 module. Third-party parts and equipment 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 JX6-IO64 module.

Any liability on the part of Jetter AG for any damages resulting from the use of non original parts and equipment is excluded.

Maintaining the JX6-IO64 Module

The JX6-IO64 module is maintenance-free. Therefore, no inspection or maintenance works are required for the operation of the module.

Repairing the JX6-IO64 Module

The JX6-IO64 module must not be repaired by the operator itself. The JX6-IO64 module does not contain any parts which can be repaired by the operator.
If the JX6-IO64 module needs repairing, please send it to Jetter AG.

Decommissioning and Disposal of the JX6-IO64 Module

Decommissioning and disposal of the JX6-IO64 module are subject to the environmental legislation of the respective country in effect for the operator's premises.

1.1   Ensure Your Own Safety

➢   Disconnect the JX6-IO64 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 safety devices must be reattached prior to commissioning and checked for proper functioning.

Malfunctions

➢   Malfunctions or other damages are to be reported to an authorized person immediately.

➢   Safeguard the JX6-IO64 module against misuse or accidental use.

Information Signs and Labels

➢   Nameplates, information signs, and labels always have to be observed and kept readable.

➢   Damaged or unreadable information signs and labels are to be exchanged.

Earthing procedure

➢   Screw down the rack to a highly conductive and earthed plate.

➢   On the top face of the rack an earth-terminal screw with a M4 thread is
    located.
    This earthing screw must electrically be connected to a PE terminal in the
    electric cabinet by means of a PE conductor (conductor area: 1.5 mm^2,
    color: green-yellow) (refer to Fig. 1).
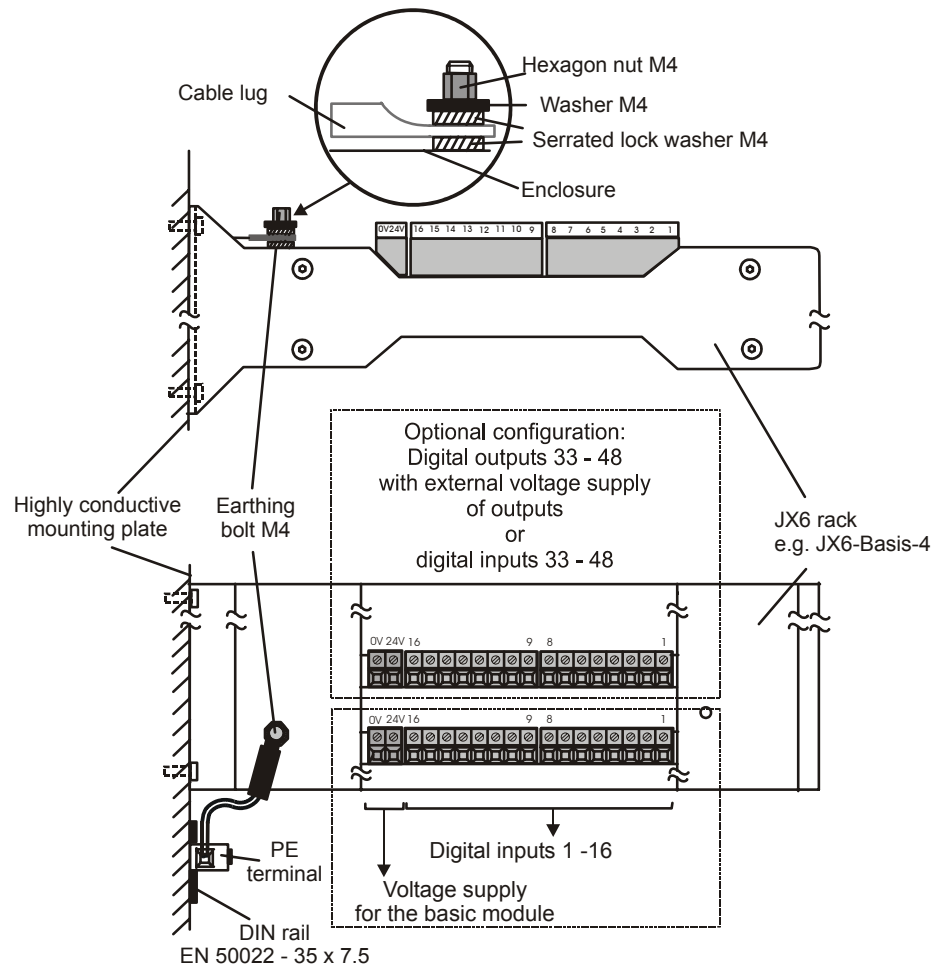
Fig. 1: Earthing, rack

1.2   Instructions on EMI

In terms of emitted interference the JX6-IO64 module is a product belonging to EMC class A. This module may cause radio interferences in residential areas. This module is operated at the operator's own risk.

The noise immunity of a system is only as high as the noise immunity of its weakest component. For this reason, correct wiring and shielding of cables is of paramount importantance.

Important !

Measures for increasing immunity to interference:

➢   Attach the JX6-IO64 module firmly to the rack (see Page 62).

➢   Follow the instructions given in Application Note 016 "EMC-Compatible Installation of the Electric Cabinet" published by Jetter AG.

The following instructions are excerpts from Application Note 016:

➢   It is of great importance that the JX6 rack is screwed down to a highly conductive mounting plate.

➢   As a rule, physical separation should be maintained between signal and power lines. We recommend spacings greater than 20 cm. Cables and lines should cross each other at an angle of 90°.

➢   Shield cables on both ends.

➢   The entire shield must be drawn behind the isolation, and then be clamped under an earthed strain relief with the greatest possible surface area.

2   Description of Functions

The JX6-IO64 module provides additional digital inputs and outputs. It can be plugged into module slots 2 to 8 of the JX6 rack.

The basic configuration of the JX6-IO64 module consists of the basic module JX6-I32 with 32 digital inputs. The basic module can be extended by additional digital inputs and outputs by plugging the submodules JX6-I16, JX6-I16F, JX6-O16 or JX6-O16F into it.

The following combinations are allowed:

Number of inputs	Number of outputs	JX6-IO64 consisting of:
32	0	JX6-I32
32	16	JX6-I32 + JX6-O16
32	16	JX6-I32 + JX6-O16F
32	32	JX6-I32 + JX6-O16 + JX6-O16F
48	0	JX6-I32 + JX6-I16
48	0	JX6-I32 + JX6-I16F
48	16	JX6-I32 + JX6-I16 + JX6-O16F
48	16	JX6-I32 + JX6-I16F + JX6-O16
64	0	JX6-I32 + JX6-I16 + JX6-I16F

3 Operating Conditions

Operating parameters of the JX6-IO64 module installed in a JX6-Basis-x rack

Input power

Features	Value(s) (depending on the product)	Preferable reference standard(s) (depending on the product)
Requirements on Power Supply Unit	DC 24 V (20 .. 30 V) Residual ripple < 5 % filtered	
Power consumption without digital outputs	approx. 1.5 W	
Voltage dips	Duration of voltage dips <= 10 ms Time interval between two voltage dips >= 1 s Severity level PS2	DIN EN 61131-2

Environment

Features	Value(s) (depending on the product)	Preferable reference standard(s) (depending on the product)
Operating temperature range	0 °C - +50 °C	-
Storage temperature range	-25 °C - +70 °C	DIN EN 61131-2 DIN EN 60068-2-1 DIN EN 60068-2-2
Air humidity	5 % - 95 %, Non-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, alcaline solutions, corrosive agents, salts, metal vapours, or other corrosive or electro-conductive contaminants	General specification
Atmospheric pressure	2000 m	DIN EN 61131-2

Mechanical parameters

Features	Value(s) (depending on the product)	Preferable reference standard(s) (depending on the product)
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: 0.0375 mm - continuous amplitude (0.075 mm peak amplitude) 57 Hz -150 Hz: 0.5 constant acceleration for continuous operation (1 g constant acceleration occasionally) 1 octave/minute, 10 frequency sweeps (sinusoidal), all 3 spatial axes	DIN EN 61131-2 DIN EN 60068-2-6
Shock resistance	15 g occasionally, 11 ms, sinusoidal half-wave, 2 shocks in all three spatial axes	DIN EN 61131-2 DIN EN 60068-2-27
Degree of protection	Module itself: IP 00 When correctly installed in the rack: IP 20	DIN EN 60529
Mounting position	Vertical. To be installed in a rack.	

Electrical Safety

Features	Value(s) (depending on the product)	Preferable reference standard(s) (depending on the product)
Protection class	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

EMI
Emitted interference

Features	Value(s) (depending on the product)	Preferable reference standard(s) (depending on the product)
Rack	Frequency band 30 -230 MHz, limit 30 dB (μV/m) at 30 m Frequency band 230 -1000 MHz, limit 37 dB (μV/m) at 30 m (class A)	DIN EN 50081-1 DIN EN 50081-2 DIN EN 55011

EMI
Immunity to Interference
- Rack

Features	Value(s) (depending on the product)	Preferable reference standard(s) (depending on the product)
RF-Field, amplitude-modulated	Frequency band 26-1000 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
Electromagnetic RF-field, pulse-modulated	Frequency 900 +/-5 MHz Test field strength 10 V/m 50 % ON period Repetition rate 200 Hz criterion A	DIN EN 50082-2 DIN EN 61000-4-3
ESD	Discharge through air: Test peak voltage 8 kV Contact discharge: Test peak voltage 4 kV criterion A	DIN EN 61131-2 DIN EN 61000-6-2 DIN EN 61000-4-2

EMI
Immunity to interference
- Signal ports

Features	Value(s) (depending on the product)	Preferable reference standard(s) (depending on the product)
Asymmetric RF, amplitude-modulated	Frequency band 0.15 - 80 MHz Test voltage 10 V AM 80 % with 1 kHz Source impedance 150 ohms Criterion A	DIN EN 61000-6-2 DIN EN 61000-4-6
Burst mit schnellen Transienten (fast transients)	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

EMI
Immunity to interference
- Process, measuring and control lines

Features	Value(s) (depending on the product)	Preferable reference standard(s) (depending on the product)
Asymmetric RF, amplitude-modulated	Frequency band 0.15 - 80 MHz Test voltage 10 V AM 80 % with 1 kHz Source impedance 150 ohms Criterion A	DIN EN 50082-2 DIN EN 61000-4-6
Burst mit schnellen Transienten (fast transients)	Test voltage 2 kV tr/tn 5/50 ns Repetition rate 5 kHz Criterion A	DIN EN 50082-2 DIN EN 61131-2 DIN EN 61000-4-4

EMI
Immunity to interference
- DC and AC power supply I/Os

Features	Value(s) (depending on the product)	Preferable reference standard(s) (depending on the product)
RF, asymmetric	Frequency band 0.15 - 80 MHz Test voltage 10 V AM 80 % with 1 kHz Source impedance 150 ohms Criterion A	DIN EN 61000-6-2 DIN EN 61000-4-6
Bursts	Test voltage 2 kV tr/tn 5/50 ns Repetition rate 5 kHz Criterion A	DIN EN 61000-6-2 DIN EN 61131-2 DIN EN 61000-4-4

4   Power Supply

4.1   Requirements

Requirements on Power Supply Unit	
Voltage range	DC 24 V (20 ... 30 V) Residual ripple< 5 % filtered
Power consumption without digital outputs	approx. 1.5 W

Important !

Caution

- The maximum supply voltage must not exceed DC 30 V since a higher supply voltage may cause damages to the JX6-IO64 module.
- If the JX6-IO64 module is not supplied with sufficient power (under-voltage), malfunctions may occur.

4.2   Description of Connections

The connection terminals of the voltage supply of the JX6-IO64 module are located on the basic module JX6-I32. If the module is installed in the JX6 rack, the connection terminals are on the top side of the rack.
These terminals are green Phoenix combicon screw-clamping terminals with a contact spacing of 5.08.

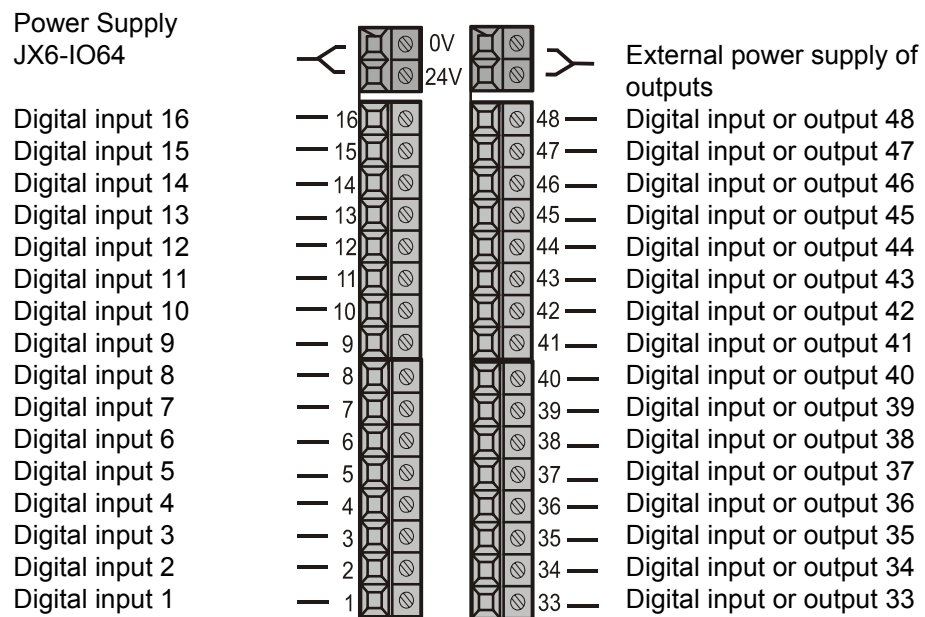In Fig. 2 you will find an explanation of the contact assignment. In the left-hand column the supply terminal of the JX6-IO64 module and the digital inputs are shown.

Power Supply JX6-IO64			0V		External power supply of outputs
			24V		
Digital input 16	16			48	Digital input or output 48
Digital input 15	15			47	Digital input or output 47
Digital input 14	14			46	Digital input or output 46
Digital input 13	13			45	Digital input or output 45
Digital input 12	12			44	Digital input or output 44
Digital input 11	11			43	Digital input or output 43
Digital input 10	10			42	Digital input or output 42
Digital input 9	9			41	Digital input or output 41
Digital input 8	8			40	Digital input or output 40
Digital input 7	7			39	Digital input or output 39
Digital input 6	6			38	Digital input or output 38
Digital input 5	5			37	Digital input or output 37
Digital input 4	4			36	Digital input or output 36
Digital input 3	3			35	Digital input or output 35
Digital input 2	2			34	Digital input or output 34
Digital input 1	1			33	Digital input or output 33

Fig. 2: Description of power supply connections

Pin Assignment of 2-Pin Plug for Terminal Blocks			
View	**Pin**	**Signal**	**Comment**
	0 V	GND	
	+24 V	DC 24 V (20 ... 30 V)	

5   Basic Module JX6-I32

5.1   Physical Dimensions
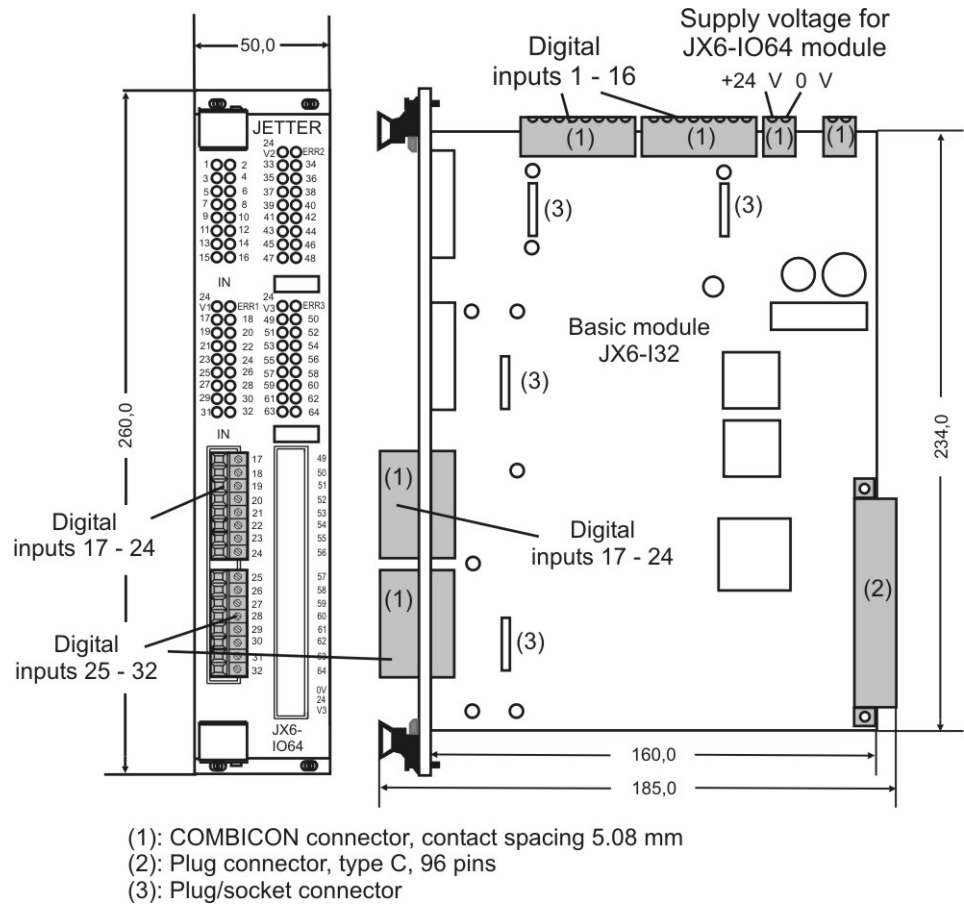
Fig. 3: Front and side view, basic module JX6-I32

Design	
Dimensions (H x W x D in mm)	260 x 50 x 185
Components of the JX6-IO64 module	
Basic module JX6-I32 with 32 digital inputs	This module can be plugged into slot # 2 to 8 of the JX6 rack.
Submodule JX6-I16 with additional 16 digital inputs Submodule JX6-I16F with additional 16 digital inputs Submodule JX6-O16 with additional 16 digital outputs Submodule JX6-O16F with additional 16 digital outputs	These modules can be plugged into basic module JX6-I32

5.2 Technical Data

Functional Data	
Number of inputs	32 digital inputs
Rated voltage	24 V DC

Electrical Data	
Voltage range	15 ... 27 V DC
Signal voltage ON	min. 15 V
Signal voltage OFF	max. 10 V
Input current	approx. 8 mA
Input resistance	3.0 kΩ
Input delay time	approx. 3 ms
Electrical isolation	None

Important !

If a line with reverse polarity is connected to a digital input, the input will be destroyed.

Caution

5.3   Meaning of LEDs

Digital inputs 1 to 16
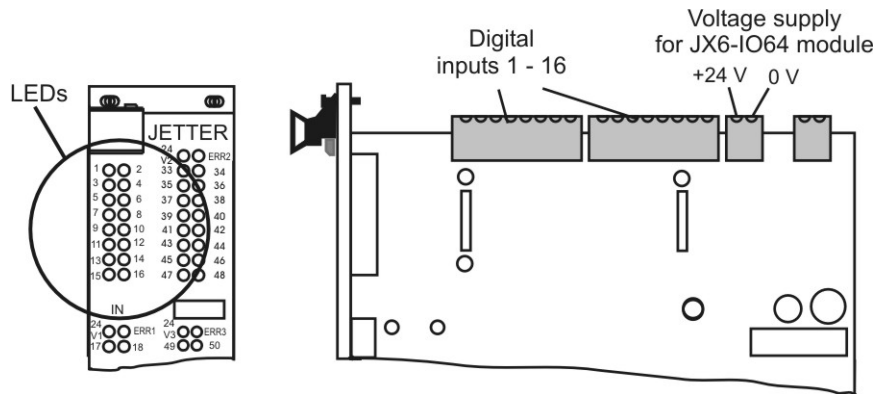
Fig. 4: LEDs of the digital inputs 1 to 16

LEDs of the Digital Inputs		
Designation	Color	Function
IN 1 ... 16	yellow	Digital inputs 1 through 16 **ON:** Signal voltage ON **OFF:** Signal voltage OFF

Digital inputs 17 to 32
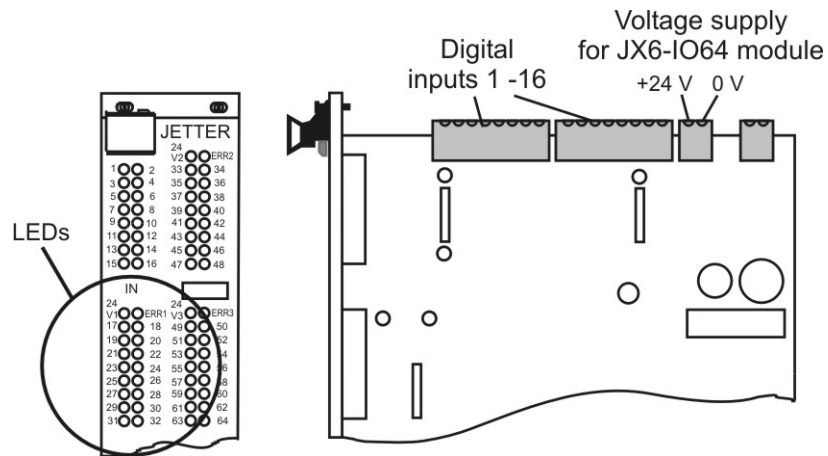
Fig. 5: LEDs of the digital inputs 17 to 32

LEDs of the Digital Inputs		
Designation	Color	Function
IN 17 ... 32	Yellow	Digital inputs 17 through 32 **ON:** Signal voltage ON **OFF:** Signal voltage OFF

5.4 Description of Connections

Digital inputs 1 to 16

In Fig. 6 you will find an explanation of the Contact Assignment. The JX6 rack has two recesses on the upper side at every module slot. If the basic module D-I32 is plugged into a module slot, the connection terminals of the digital inputs 1 to 16 are in the left recess. These terminals are green Phoenix combicon screw-clamping terminals with a contact spacing of 5.08.
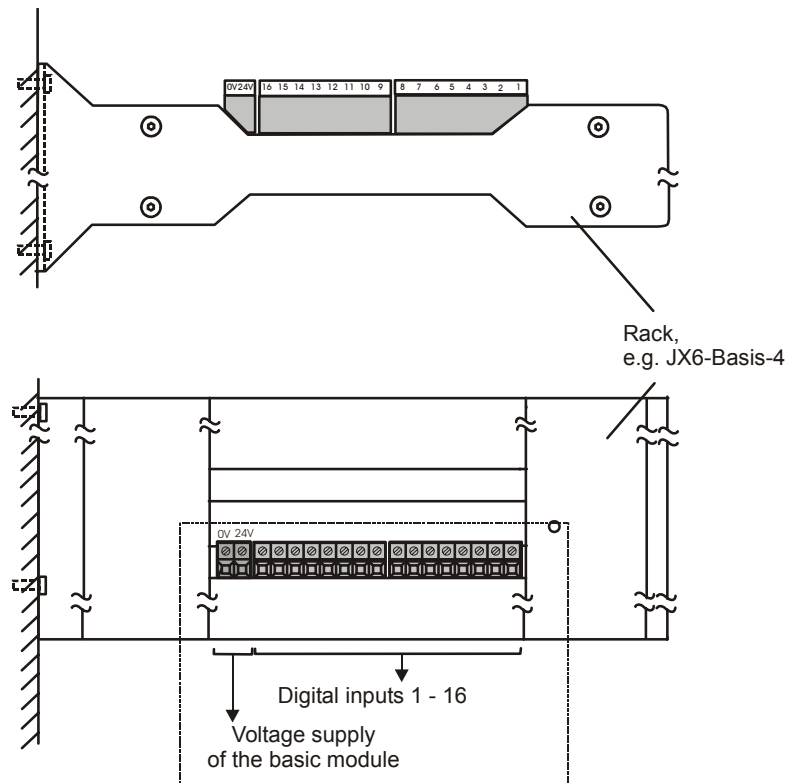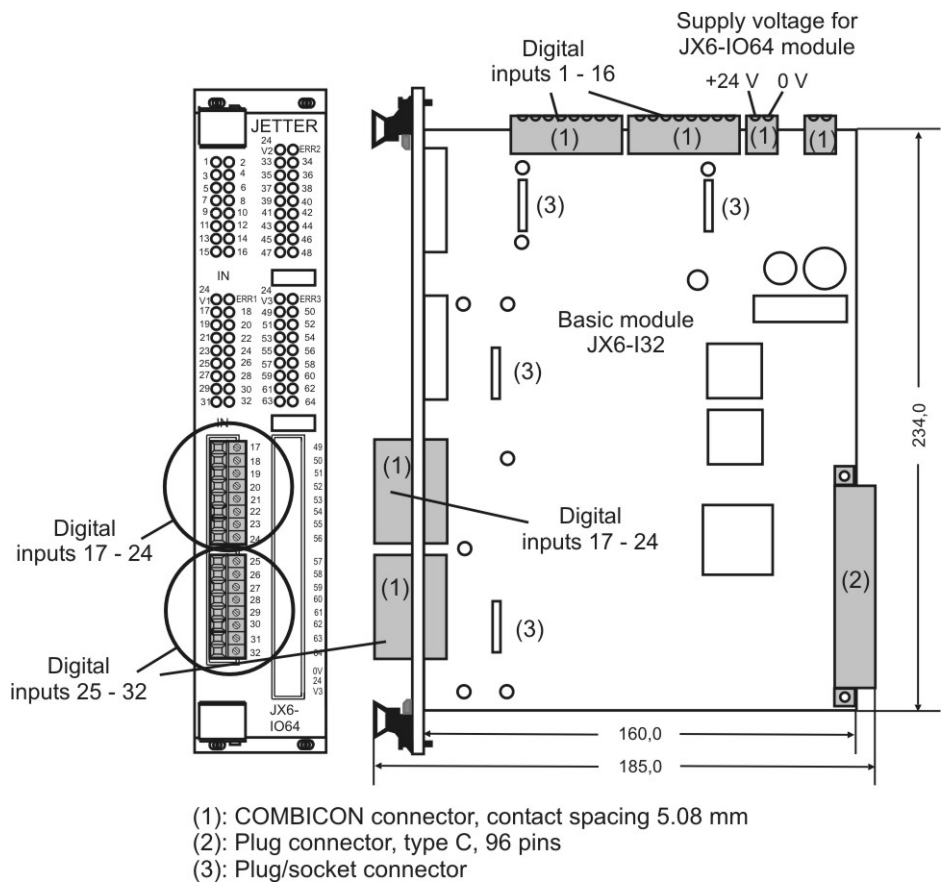

Fig. 6: Pin Assignment, Digital Inputs 1 to 16
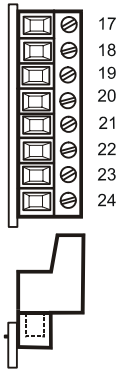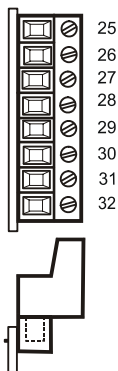
Terminal Specifications

- 8-pin terminal block COMBICON RM 5.08 (for printed circuit boards)
- Cable cross-sectional area: 0.25 -2.5 mm^2
- Bladed screw-driver: 0.6 x 3.5 x 100 mm

Connecting Cable Specifications

- Not needed

Cable shielding

- Not needed
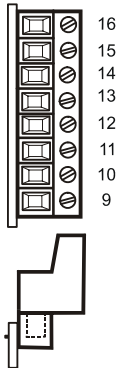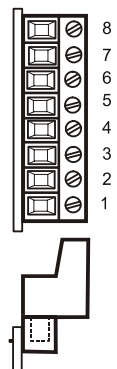
Pin Assignment of 8-Pin Plug for Terminal Blocks			
View	**Pin**	**Signal**	**Comment**
	16	Digital input 16	
	15	Digital input 15	
	14	Digital input 14	
	13	Digital input 13	
	12	Digital input 12	
	11	Digital input 11	
	10	Digital input 10	
	9	Digital input 9	
	8	Digital input 8	
	7	Digital input 7	
	6	Digital input 6	
	5	Digital input 5	
	4	Digital input 4	
	3	Digital input 3	
	2	Digital input 2	
	1	Digital input 1	

Fig. 7 shows the connection of the digital inputs. Reference point is the 0 V terminal to which the 0 V signal is connected-up.
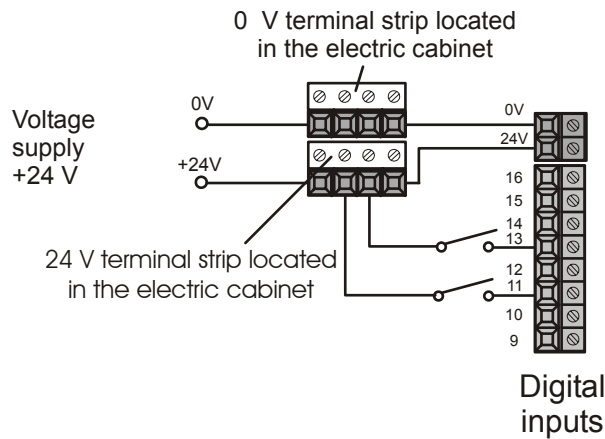
Fig. 7: External Circuit of the Digital Inputs 11 and 13

Digital inputs 17 to 32

The assignment of the connection terminals of the digital inputs 17 to 32 is shown in Fig. 8. These terminals are green Phoenix combicon screw-clamping terminals with a contact spacing of 5.08.

(1): COMBICON connector, contact spacing 5.08 mm
(2): Plug connector, type C, 96 pins
(3): Plug/socket connector

Fig. 8: Pin Assignment, Digital Inputs 17 to 32

Terminal Specifications

- 8-pin terminal block COMBICON RM 5.08 (for printed circuit boards)
- Cable cross-sectional area: 0.25 -2.5 mm^2
- Bladed screw-driver: 0.6 x 3.5 x 100 mm

Connecting Cable Specifications

- Not needed

Cable shielding

- Not needed

Pin Assignment of 8-Pin Plug for Terminal Blocks			
View	**Pin**	**Signal**	**Comment**
	17	Digital input 17	
	18	Digital input 18	
	19	Digital input 19	
	20	Digital input 20	
	21	Digital input 21	
	22	Digital input 22	
	23	Digital input 23	
	24	Digital input 24	
	25	Digital input 25	
	26	Digital input 26	
	27	Digital input 27	
	28	Digital input 28	
	29	Digital input 29	
	30	Digital input 30	
	31	Digital input 31	
	32	Digital input 32	

5.5   Numbering of Digital Inputs

Numbering of Digital Inputs	
Input 1	Module position * 100 +1
Input 2	Module position * 100 +2
...	...
Input 31	Module position * 100 +31
Input 32	Module position * 100 +32

Example:

- The input 31 is to be interrogated. If it is set, output 2 on the D-CPU is to be set.
- The JX6-IO64 module installed in module slot # 4.

```
0: TASK 0 ----------------------------------------

1: ...

2:  IF

3:     E 431                              ; input 431 set?

4:     THEN

5:     A 102                              ; Set output 102

6: ....

7:     GOTO 0
```

6   Submodule JX6-I16

6.1   Technical Data
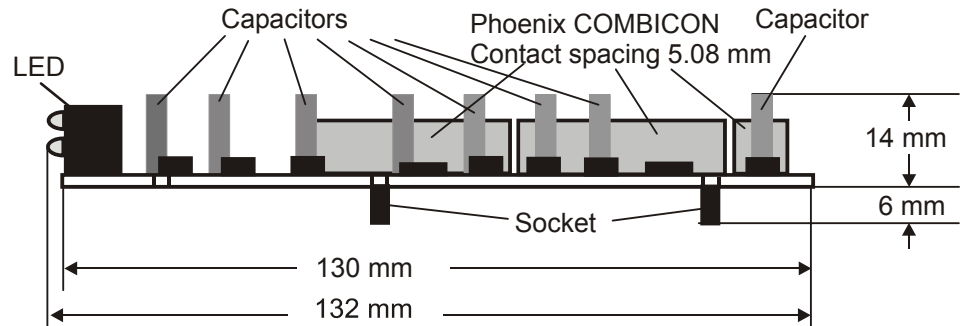
Fig. 9: Side View, Submodule JX6-I16
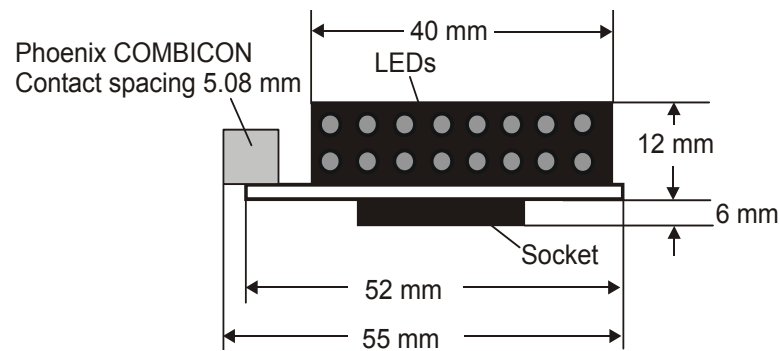
Fig. 10: Front View, Submodule JX6-I16

Design	
Dimensions (H x W x D in mm)	12.0 x 52.0 x 130.0
Installation	to be plugged into basic module JX6-I32 (see Fig. 11)

Functional Data	
Number of outputs	16 digital inputs
Rated voltage	24 V DC

Electrical Data	
Voltage range	15 ... 27 V DC
Signal voltage ON	min. 15 V
Signal voltage OFF	max. 10 V
Input current	approx. 8 mA
Input resistance	3.0 kΩ
Input delay time	approx. 3 ms
Electrical isolation	None

Important !

!

Caution

If a line with reverse polarity is connected to a digital input, the input will be destroyed.

6.2   Meaning of LEDs
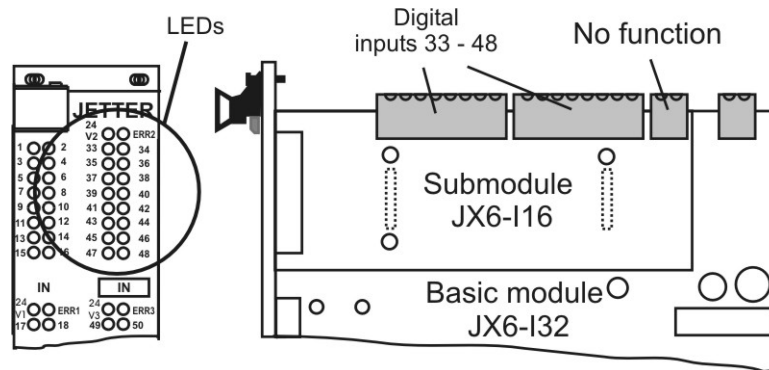
Fig. 11: LEDs of the submodule JX6-I16

LEDs of the submodule JX6-I16		
Designation	Color	Function
IN 33 ... 48	Yellow	Digital inputs 33 through 48 **ON:** Signal voltage ON **OFF:** Signal voltage OFF

6.3 Description of Connections

The connection terminals of the digital inputs 33 to 48 on the JX6-I16 are located on the top side of the JX6 rack (see Fig. 1 and Fig. 11). These terminals are green Phoenix combicon screw-clamping terminals with a contact spacing of 5.08.

In Fig. 12 you will find an explanation of the contact assignment. The connection terminals of the submodule JX6-I16 (digital inputs 33 to 48) are shown in the right column. The connection terminals of the digital inputs 1 to 16 of the basic module JX6-I32 are shown in the left column.

Power Supply JX6-IO64		0V 24V		External power supply of outputs
Digital input 16	16		48	Digital input 48
Digital input 15	15		47	Digital input 47
Digital input 14	14		46	Digital input 46
Digital input 13	13		45	Digital input 45
Digital input 12	12		44	Digital input 44
Digital input 11	11		43	Digital input 43
Digital input 10	10		42	Digital input 42
Digital input 9	9		41	Digital input 41
Digital input 8	8		40	Digital input 40
Digital input 7	7		39	Digital input 39
Digital input 6	6		38	Digital input 38
Digital input 5	5		37	Digital input 37
Digital input 4	4		36	Digital input 36
Digital input 3	3		35	Digital input 35
Digital input 2	2		34	Digital input 34
Digital input 1	1		33	Digital input 33

Fig. 12: Pin Assignment, Digital Inputs 33 to 48

Fig. 13 shows the connection of the digital inputs. Reference point is the 0 V terminal to which the 0 V signal is connected-up.
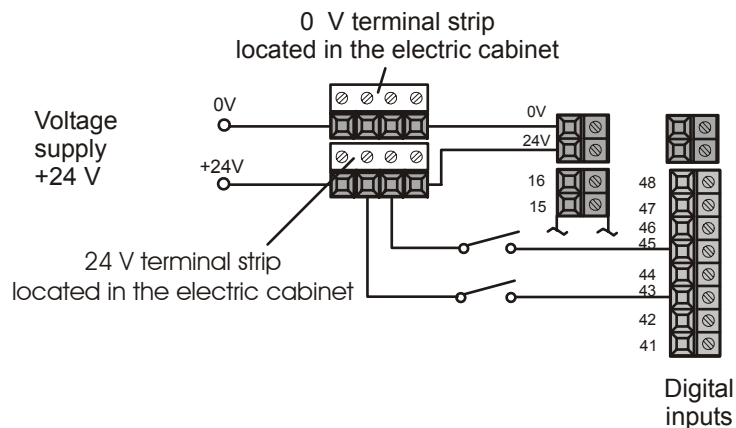
Fig. 13: External Circuit of the Digital Inputs 43 and 45

Terminal Specifications
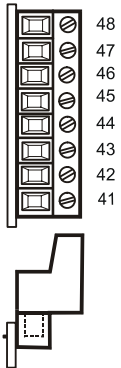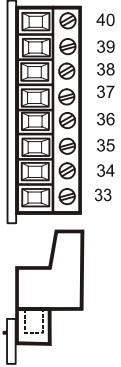
- 8-pin terminal block COMBICON RM 5.08 (for printed circuit boards)
- Cable cross-sectional area: 0.25 -2.5 mm^2
- Bladed screw-driver: 0.6 x 3.5 x 100 mm

Connecting Cable Specifications

- Not needed

Cable shielding

- Not needed

Pin Assignment of 8-Pin Plug for Terminal Blocks			
View	**Pin**	**Signal**	**Comment**
	48	Digital input 48	
	47	Digital input 47	
	46	Digital input 46	
	45	Digital input 45	
	44	Digital input 44	
	43	Digital input 43	
	42	Digital input 42	
	41	Digital input 41	
	40	Digital input 40	
	39	Digital input 39	
	38	Digital input 38	
	37	Digital input 37	
	36	Digital input 36	
	35	Digital input 35	
	34	Digital input 34	
	33	Digital input 33	

6.4   Numbering of Digital Inputs

Numbering of Digital Inputs	
Input 33	Module position * 100 +33
Input 34	Module position * 100 +34
...	...
Input 47	Module position * 100 +47
Input 48	Module position * 100 +48

Example:

- The input 38 is to be interrogated. If it is set, output 5 on the D-CPU is to be set.
- The JX6-IO64 module installed in module slot # 3.

```
0: TASK 0 ----------------------------------------

1: ...

2:   IF

3:     E 338                                ; input 338 set?

4:     THEN

5:     A 105                                ; Set output 105

6: ....

7:     GOTO 0
```

7   Submodule JX6-I16F

7.1   Technical Data
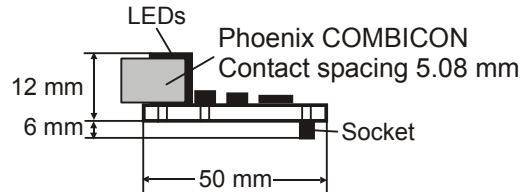
Fig. 14: Side View, Submodule JX6-I16F
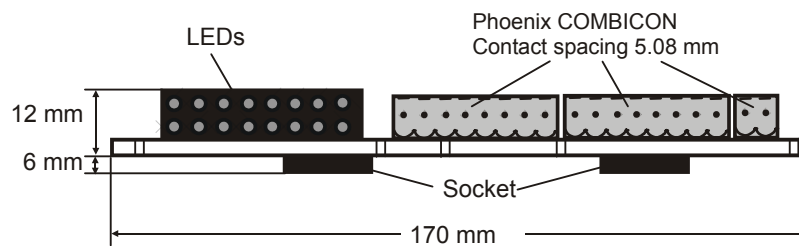
Fig. 15: Front View, Submodule JX6-I16F

Design	
Dimensions (H x W x D in mm)	12.0 x 50.0 x 170.0
Installation	to be plugged into basic module JX6-I32 (see Fig. 17)

Functional Data	
Number of outputs	16 digital inputs
Rated voltage	24 V DC

Electrical Data	
Voltage range	15 ... 27 V DC
Signal voltage ON	min. 15 V
Signal voltage OFF	max. 10 V
Input current	approx. 8 mA
Input resistance	3.0 kΩ
Input delay time	approx. 3 ms
Electrical isolation	None

Important !

Caution

If a line with reverse polarity is connected to a digital input, the input will be destroyed.

7.2   Meaning of LEDs
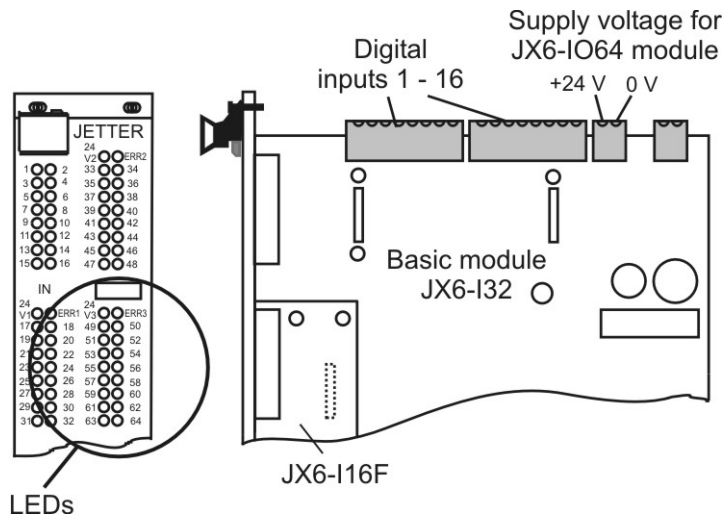
Fig. 16: LEDs of the submodule JX6-I16F

LEDs of the submodule JX6-I16F		
Designation	Color	Function
IN 49 ... 64	Yellow	Digital inputs 49 through 64 **ON:** Signal voltage ON **OFF:** Signal voltage OFF

7.3   Description of Connections

The assignment of the connection terminals of the digital inputs 49 to 64 is shown in Fig. 17. These terminals are green Phoenix combicon screw-clamping terminals with a contact spacing of 5.08.

(1): COMBICON connector, contact spacing 5.08 mm
(2): Plug connector, type C, 96 pins
(3): Plug/socket connector
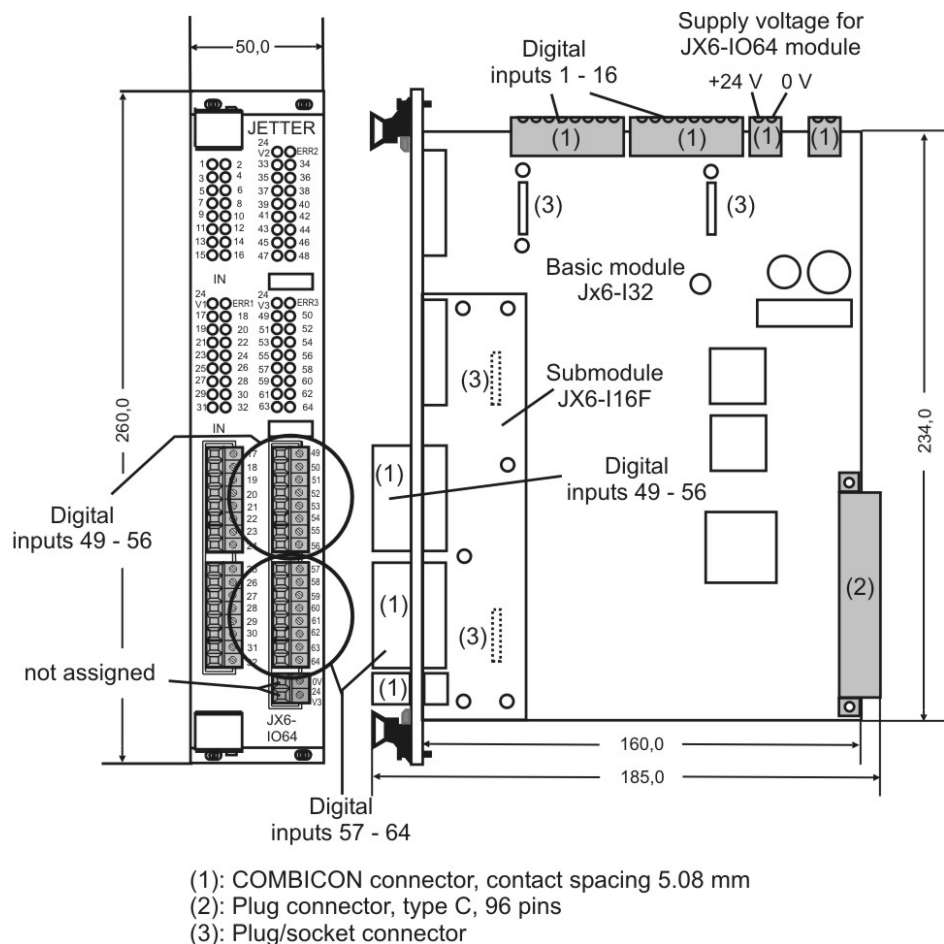
Fig. 17: Pin Assignment, Digital Inputs 49 to 64

Terminal Specifications
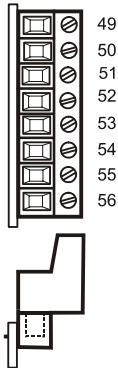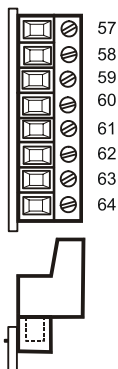
- 8-pole terminal block COMBICON RM 5.08 (for printed circuit boards) or 2-pin terminal block COMBICON RM 5.08 (for printed circuit boards)
- Cable cross-sectional area: 0.25 -2.5 mm^2
- Bladed screw-driver: 0.6 x 3.5 x 100 mm

Connecting Cable Specifications

- Not needed

Cable shielding

- Not needed

Pin Assignment of 8-Pin Plug for Terminal Blocks			
View	**Pin**	**Signal**	**Comment**
	49	Digital input 49	
	50	Digital input 50	
	51	Digital input 51	
	52	Digital input 52	
	53	Digital input 53	
	54	Digital input 54	
	55	Digital input 55	
	56	Digital input 56	
	57	Digital input 57	
	58	Digital input 58	
	59	Digital input 59	
	60	Digital input 60	
	61	Digital input 61	
	62	Digital input 62	
	63	Digital input 63	
	64	Digital input 64	

Pin Assignment of 2-Pin Plug for Terminal Blocks			
View	**Pin**	**Signal**	**Comment**
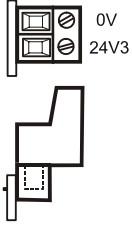
Pin Assignment of 2-Pin Plug for Terminal Blocks		
	0 V	Not assigned	
	24 V3	Not assigned	

Fig. 18 shows the connection of the digital inputs. Reference point is the 0 V terminal to which the 0 V signal of the +24V power supply unit is connected-up.
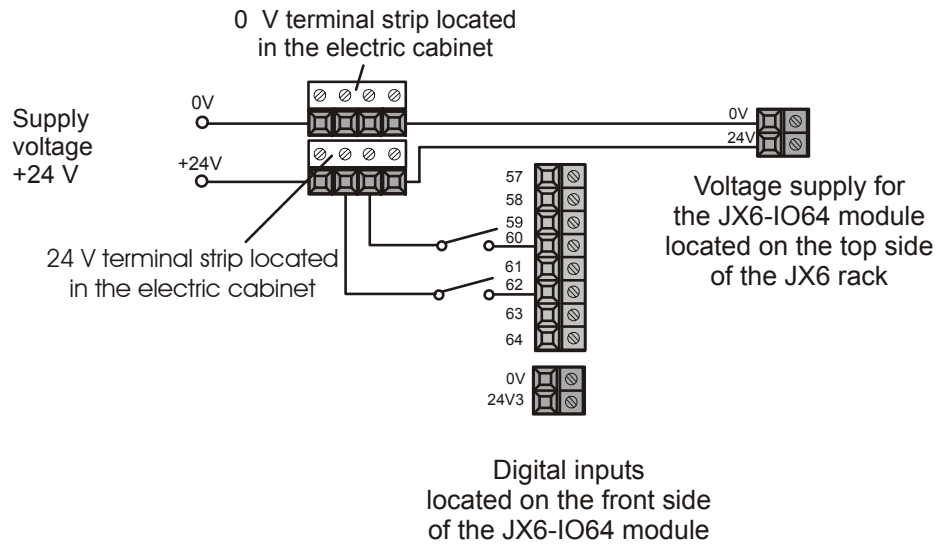
Fig. 18: External Circuit of the Digital Inputs 60 and 62

7.4   Numbering of Digital Inputs

Numbering of Digital Inputs	
Input 49	Module position * 100 +49
Input 50	Module position * 100 +50
...	...
Input 63	Module position * 100 +63
Input 64	Module position * 100 +64

Example:

- The input 54 is to be interrogated. If it is set, output 2 on the D-CPU is to be set.
- The JX6-IO64 module installed in module slot # 4.

```
0: TASK 0 ----------------------------------------

1: ...

2:   IF

3:     E 454                                ; input 454 set?

4:     THEN

5:     A 102                                ; Set output 102

6: ....

7:     GOTO 0
```

8 Submodule JX6-O16

8.1 Technical Data
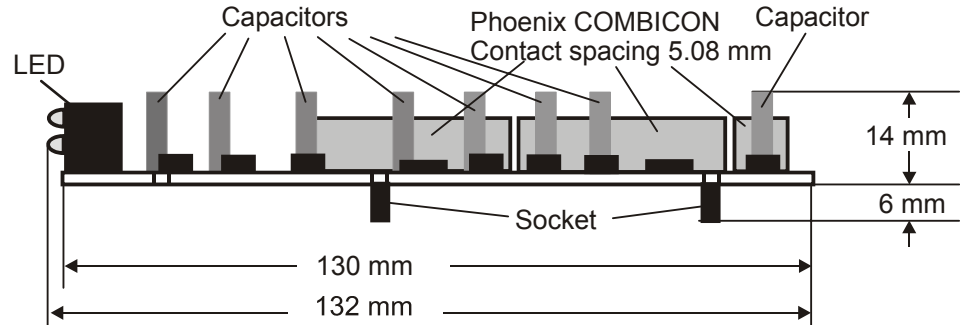
Fig. 19: Side View of the JX6-O16 Submodule
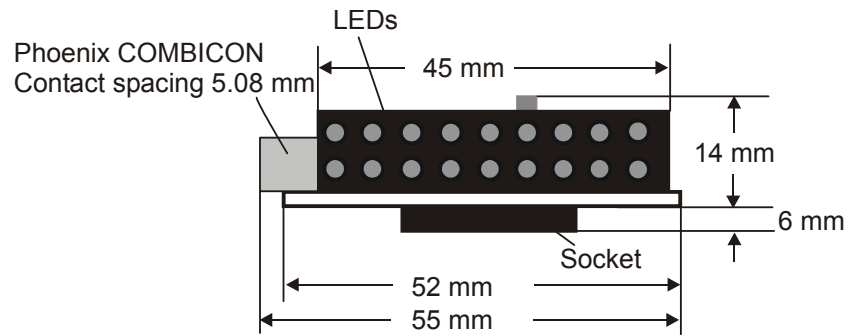
Fig. 20: Front View of the JX6-O16 Submodule

Design	
Dimensions (H x W x D in mm)	14.0 x 52.0 x 130.0
Installation	to be plugged into basic module JX6-I32 (see Fig. 21)

Functional Data	
Number of outputs	16 digital outputs
Rated voltage	24 V DC
Output type	Transistor, pnp

Electrical Data	
External power supply	required
Voltage range	20 ... 30 V DC
Signal voltage ON	typ. V_{supply} - 05 V
Signal voltage OFF	typ. 0.8 V
Maximum load current	0.5 A / output
Electrical isolation	None
Protective circuits against	Overload, overvoltage, overtemperature indicated by the red LED ERR2
Protection against inductive loads	Yes

8.2   Meaning of LEDs
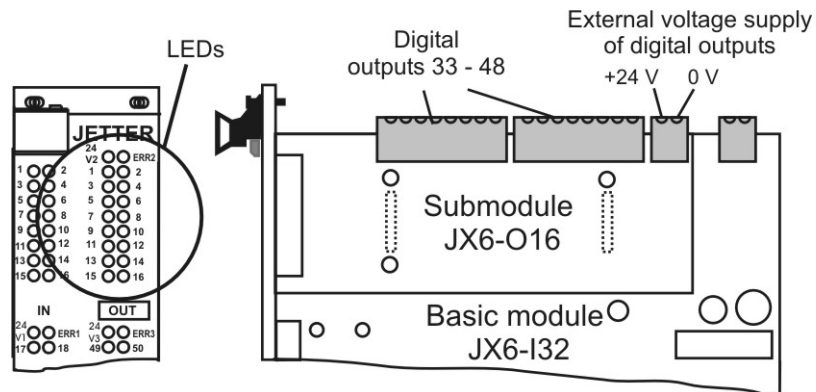
Fig. 21: LEDs of the JX6-O16 Submodule

LEDs of the JX6-O16 Submodule		
Designation	Color	Function
OUT 33 ... 48	yellow	Digital outputs 33 through 48 **ON:** Signal voltage ON **OFF:** Signal voltage OFF
ERR2	red	**ON:** Overload, overtemperature, cable breakage of one or more outputs (< 10 mA)
24V2	green	**ON:** External voltage supply of the digital outputs is provided

8.3   Description of Connections

The connection terminals of the digital outputs 33 to 48 on the JX6-O16 are located on the top side of the JX6 rack (see Fig. 1 and Fig. 21). These terminals are green Phoenix combicon screw-clamping terminals with a contact spacing of 5.08.

In Fig. 22 you will find an explanation of the contact assignment. In the right-hand column (outputs) the terminals of the JX6-O16 are shown. The connection terminals of the digital inputs 1 to 16 of the basic module JX6-I32 are shown in the left column (inputs).

Power Supply JX6-IO64			0V		External power supply of outputs
			24V		
Digital input 16	16			48	Digital output 48
Digital input 15	15			47	Digital output 47
Digital input 14	14			46	Digital output 46
Digital input 13	13			45	Digital output 45
Digital input 12	12			44	Digital output 44
Digital input 11	11			43	Digital output 43
Digital input 10	10			42	Digital output 42
Digital input 9	9			41	Digital output 41
Digital input 8	8			40	Digital output 40
Digital input 7	7			39	Digital output 39
Digital input 6	6			38	Digital output 38
Digital input 5	5			37	Digital output 37
Digital input 4	4			36	Digital output 36
Digital input 3	3			35	Digital output 35
Digital input 2	2			34	Digital output 34
Digital input 1	1			33	Digital output 33

Fig. 22: Connection assignment, digital outputs 33 to 48

The connection of the digital outputs of the JX6-O16 is shown in Fig. 23. The 0 V terminal strip to which the 0 V signal is applied is located in the switch cabinet.
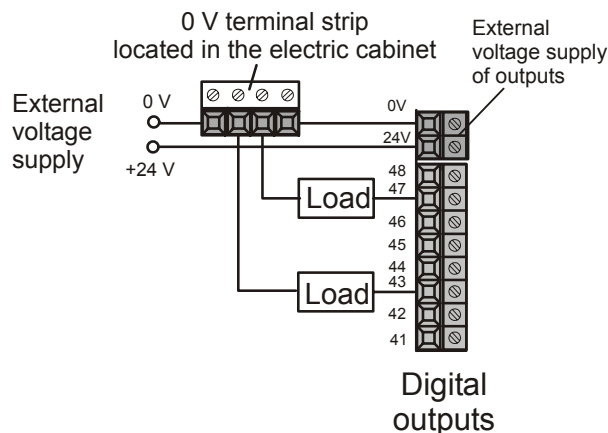
Fig. 23: External Circuit of Digital Outputs 43 and 47

Terminal Specifications
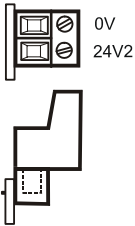
- 8-pin terminal block COMBICON RM 5.08 (for printed circuit boards) or
  2-pin terminal block COMBICON RM 5.08 (for printed circuit boards)
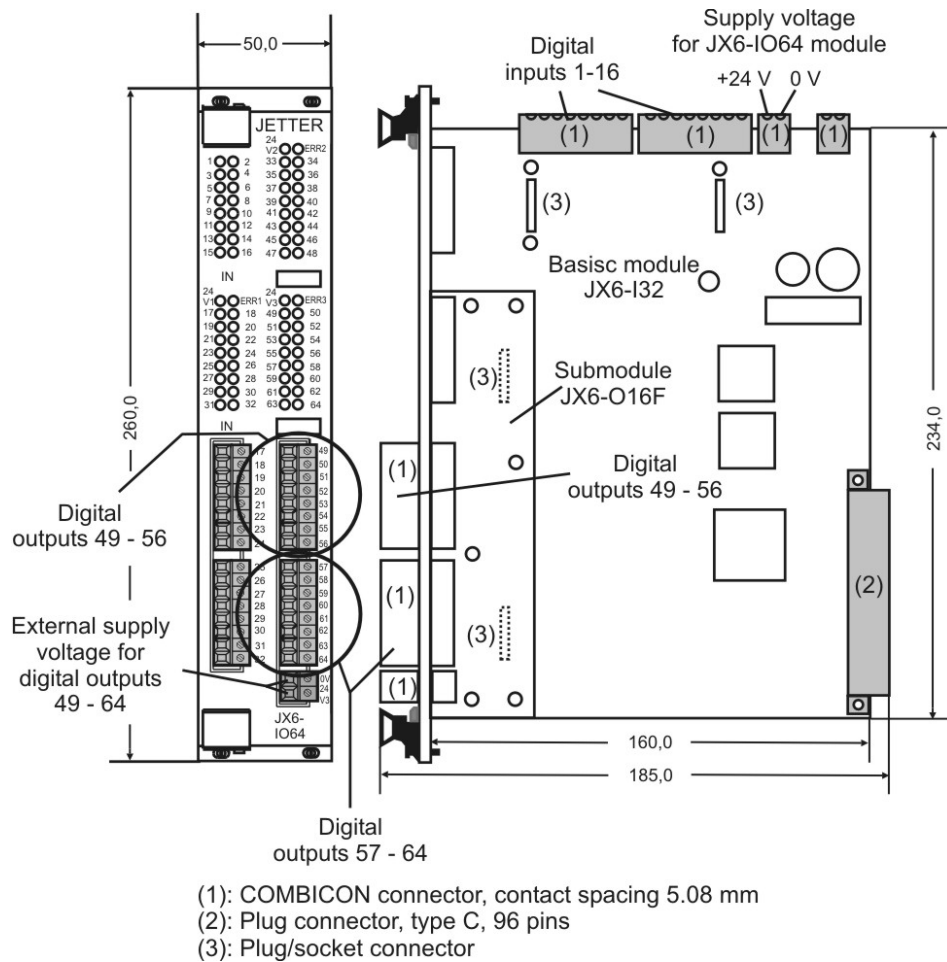- Cable cross-sectional area: 0.25 -2.5 mm^2
- Bladed screw-driver: 0.6 x 3.5 x 100 mm
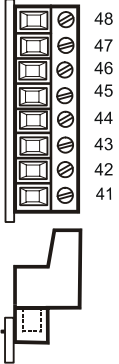
Connecting Cable Specifications
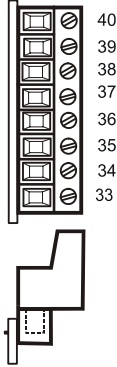
- Not needed

Cable shielding

- Not needed

Pin Assignment of 2-Pin Plug for Terminal Blocks			
View	Pin	Signal	Comment
	0 V	GND	
	24 V2	External power supply of digital outputs (+24 volts)	

Pin Assignment of 8-Pin Plug for Terminal Blocks			
View	Pin	Signal	Comment
	48	Digital Output 48	
	47	Digital Output 47	
	46	Digital Output 46	
	45	Digital Output 45	
	44	Digital Output 44	
	43	Digital Output 43	
	42	Digital Output 42	
	41	Digital Output 41	

Pin Assignment of 8-Pin Plug for Terminal Blocks			
	40	Digital Output 40	
	39	Digital Output 39	
	38	Digital Output 38	
	37	Digital Output 37	
	36	Digital Output 36	
	35	Digital Output 35	
	34	Digital Output 34	
	33	Digital Output 33	

8.4   Numbering of Digital Outputs

Numbering of Digital Outputs	
Output 33	Module position * 100 +33
Output 34	Module position * 100 +34
...	...
Output 47	Module position * 100 +47
Output 48	Module position * 100 +48

Example:

- The input 16 on the JX6-IO64 module is to be interrogated. If it is set, output 45 on the JX6-IO64 module is to be set.
- The JX6-IO64 module installed in module slot # 2.

```
0: TASK 0 -----------------------------------------

1: ...

2:   IF

3:      E 216                              ; input 216 set?

4:     THEN

5:      A 245                              ; Set output 245

6: ....

7:        GOTO 0
```

9   Submodule JX6-O16F

9.1   Technical Data
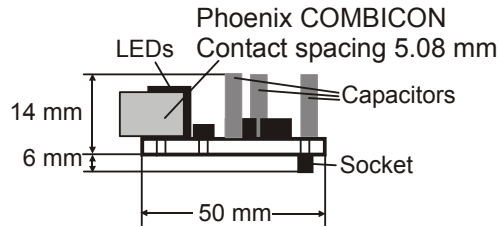
Fig. 24: Side View of the JX6-O16F Submodule
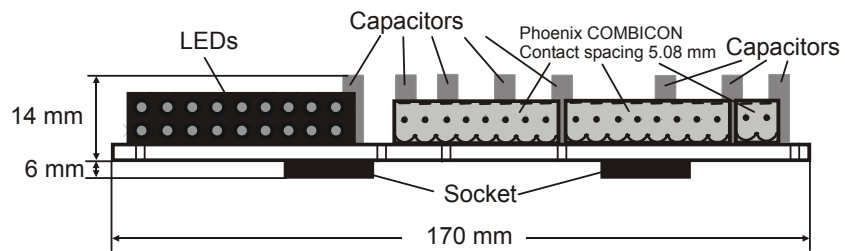
Fig. 25: Front View of the JX6-O16F Submodule

Design	
Dimensions (H x W x D in mm)	14.0 x 50.0 x 170.0
Installation	to be plugged into basic module JX6-I32 (see Fig. 26)

Functional Data	
Number of outputs	16 digital outputs
Rated voltage	24 V DC
Output type	Transistor, pnp

Electrical Data	
External power supply	required
Voltage range	20 ... 30 V DC
Signal voltage ON	typ. V_{supply} - 0.5 V
Signal voltage OFF	typ. 0.8 V
Maximum load current	0.5 A / output
Electrical isolation	None
Protective circuits against	Overload, overvoltage, overtemperature A fault trip will be indicated with the red LED ERR3
Protection against inductive loads	Yes

9.2 Meaning of LEDs
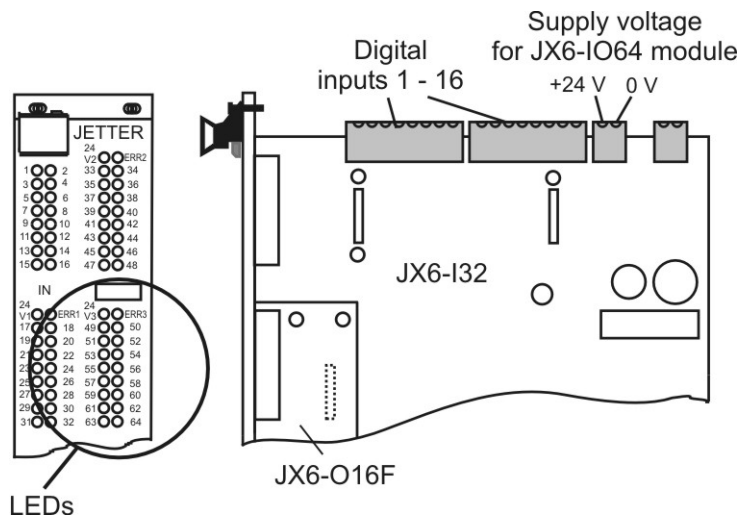
Fig. 26: LEDs of the JX6-O16F Submodule

LEDs of the JX6-O16F Submodule		
Designation	Color	Function
OUT 49 ... 64	yellow	Digital outputs 49 through 64 **ON:** Signal voltage ON **OFF:** Signal voltage OFF
ERR3	red	**ON:** Overload, overtemperature, cable breakage of one or more outputs (< 10 mA)
24V3	green	**ON:** External voltage supply of the digital outputs is provided

9.3 Description of Connections

The assignment of the connection terminals of the digital outputs 49 to 64 is shown in Fig. 27. These terminals are green Phoenix combicon screw-clamping terminals with a contact spacing of 5.08.

(1): COMBICON connector, contact spacing 5.08 mm
(2): Plug connector, type C, 96 pins
(3): Plug/socket connector

Fig. 27: Connection assignment, digital outputs 49 to 64

Terminal Specifications
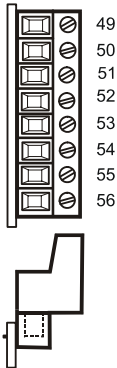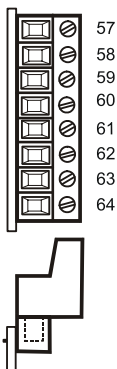
- 8-pin terminal block COMBICON RM 5.08 (for printed circuit boards) or
  2-pin terminal block COMBICON RM 5.08 (for printed circuit boards)
- Cable cross-sectional area: 0.25 -2.5 mm^2
- Bladed screw-driver: 0.6 x 3.5 x 100 mm

Connecting Cable Specifications
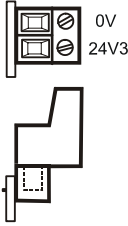
- Not needed

Cable shielding

- Not needed

Pin Assignment of 8-Pin Plug for Terminal Blocks			
View	Pin	Signal	Comment
	49	Digital Output 49	
	50	Digital Output 50	
	51	Digital Output 51	
	52	Digital Output 52	
	53	Digital Output 53	
	54	Digital Output 54	
	55	Digital Output 55	
	56	Digital Output 56	
	57	Digital Output 57	
	58	Digital Output 58	
	59	Digital Output 59	
	60	Digital Output 60	
	61	Digital Output 61	
	62	Digital Output 62	
	63	Digital Output 63	
	64	Digital Output 64	

Pin Assignment of 2-Pin Plug for Terminal Blocks			
View	Pin	Signal	Comment

Pin Assignment of 2-Pin Plug for Terminal Blocks			
	0 V	GND	
	24 V3	External power supply of digital outputs (+24 volts)	

The connection of the digital outputs of the JX6-O16F is shown in Fig. 28.
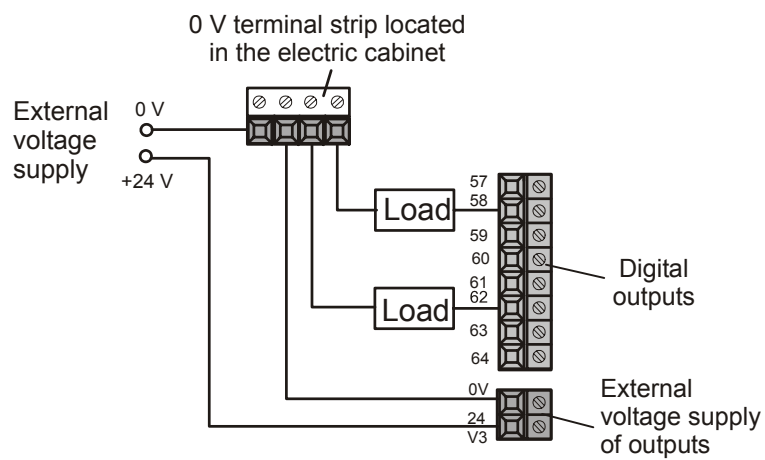
Fig. 28: External Circuit of Digital Outputs 58 and 62

9.4　　Numbering of Digital Outputs

Numbering of Digital Outputs	
Output 49	Module position * 100 +49
Output 50	Module position * 100 +50
...	...
Output 63	Module position * 100 +63
Output 64	Module position * 100 +64

Example:

- The input 16 on the JX6-IO64 module is to be interrogated. If it is set, output 64 on the JX6-IO64 module is to be set.
- The JX6-IO64 module installed in module slot # 2.

```
0: TASK 0 ----------------------------------------

1: ...

2:   IF

3:     E 216                                 ; input 216 set?

4:     THEN

5:     A 264                                 ; Set output 264

6: ....

7:     GOTO 0
```

10   Installation Guide

10.1   Removing the JX6-IO64 Module

Procedure

> ➢   Switch off the power supply.

> ➢   Remove the 2-pin terminal (1) of the power supply for the JX6-IO64 module (see Fig. 29).

> ➢   Remove the two 8-pin terminals (2) of the digital inputs 1 to 16, which are on the JX6-IO64 module, (see Fig. 29).

> ➢   If applicable:
> Remove the 2-pin terminal (3) of the external voltage supply of the outputs and the two 8-pin terminals (3) of the digital outputs 33 to 48
> or
> the two 8-pin terminals (4) of the digital inputs 33 to 48 (see Fig. 29).
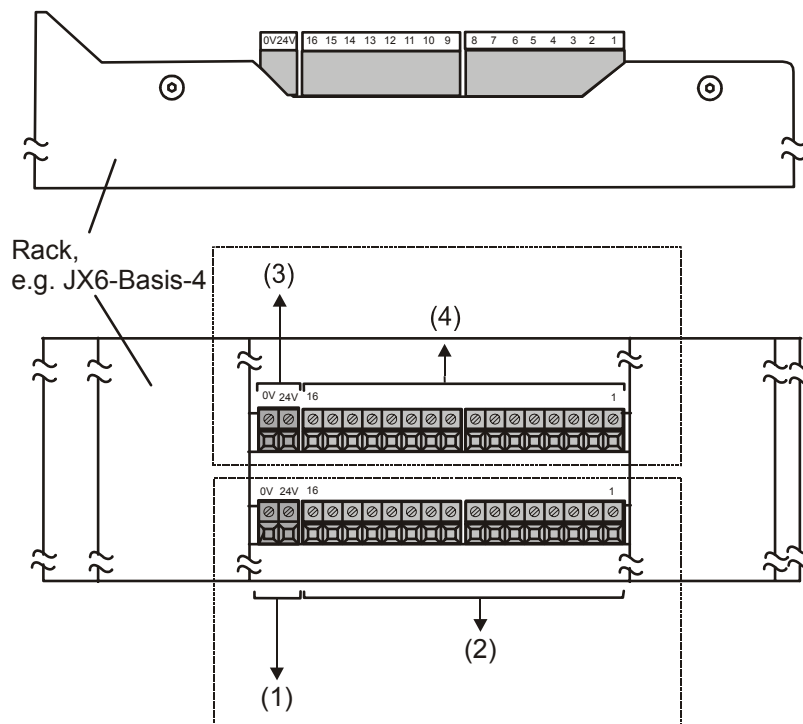
(1): Voltage supply of the JX6-IO64 module
(2): Digital inputs 1 - 16
(3): External voltage supply of digital outputs
(4): Digital inputs 33 - 48 or digital outputs 33 - 48

Fig. 29: Top and Side Views of the JX6 Rack

> ➢ Remove the two 8-pin terminals (5) of the digital inputs 17 to 32, which are on the JX6-IO64 module, (see Fig. 30).

> ➢ If applicable:
> Remove the 2-pin terminal (6) of the external voltage supply of the outputs and the two 8-pin terminals (6) of the digital outputs 49 to 64
> or
> the two 8-pin terminals (6) of the digital inputs 49 to 64 (see Fig. 30).

> ➢ Use a screwdriver to loosen the four screws (6) connecting the JX6-IO64 module with the JX6 rack (refer to Fig. 30).

> ➢ Pull the JX6-IO64 module out of the JX6 rack using the handles (8) (refer to Fig. 30).
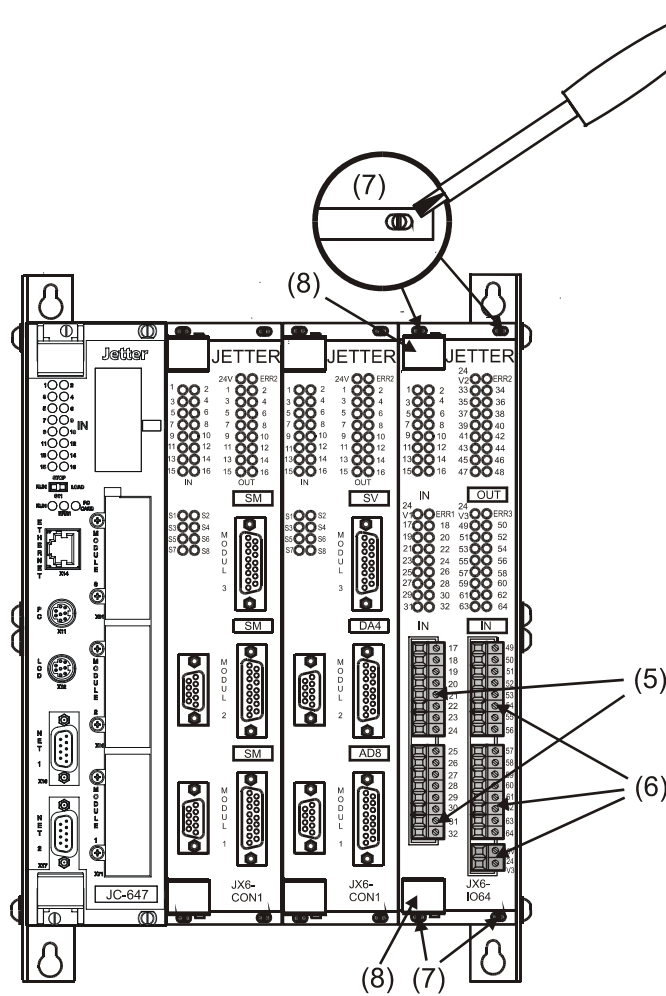
Fig. 30: Front View of the JX6 Rack equipped with Modules

10.2   Installing the JX6-IO64 Module

Procedure

Install in reverse order of deinstallation.

Important !

Be sure to plug the green Phoenix brand screw plug connectors, COMBICON, into the correct receptacles.
Connectors plugged into the wrong socket may cause malfunctions and even may destroy the control system.

There is a danger that connectors, by mistake, are plugged into the wrong sockets especially if they are located next to each other.
To avoid this, Jetter AG provides a package of keying pins as standard with each control system. When properly installed, these keying pins prevent from plugging connectors incorrectly.

A suggestion for inserting the keying pins is described in chapter 10.3 "Using the keying pins" on page 64.

Important !

Be sure to supply the JX6-IO64 module with voltage after the installation of same in the JX6 rack.
Otherwise, the control system will not be ready for operation.

10.3   Using the keying pins

A package of keying pins is provided with the control system. These keys are intended to guard against incorrect seating of Phoenix connectors.

Important !

Screw terminals plugged into the wrong socket may result in malfunctions and even may destroy the control system.

The proper usage of keying pins is described below.

Appearance

The keying pin consists of two parts, For an illustration of these two parts see Fig. 31.

Keying pin, part 1, for Phoenix COMBICON plugs, contact spacing 5.08 mm
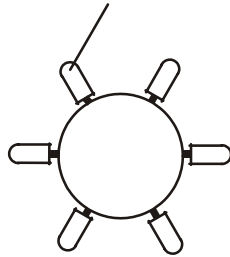
Keying pin, part 2, for Phoenix COMBICON headers, contact spacing 5.08 mm
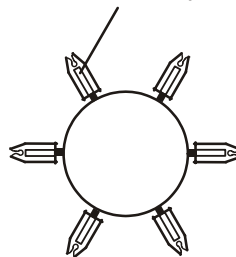
Fig. 31: Wheel of keying pins provided with the control system

Coding a plug connector

Fig. 32 gives an example of the keying procedure.

Plug-in terminal COMBICON

Header COMBICON

Keying pin, part 1

Keying pin, part 2
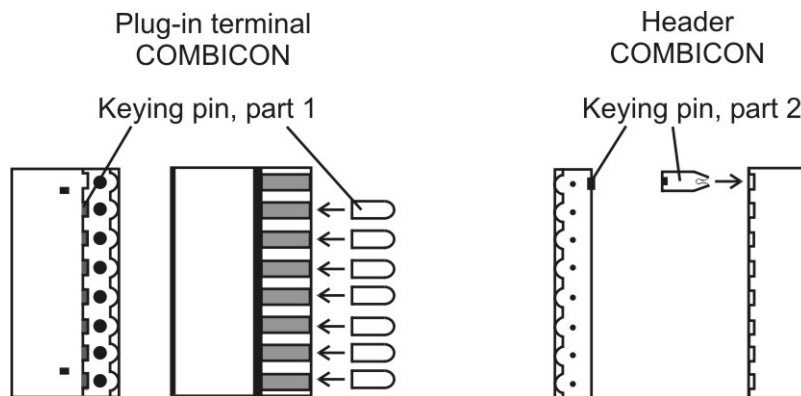
Fig. 32: Usage of keying pins

Suggestion for keying

In Fig. 33 a suggestion is given, how keying of Phoenix connectors can be carried out.
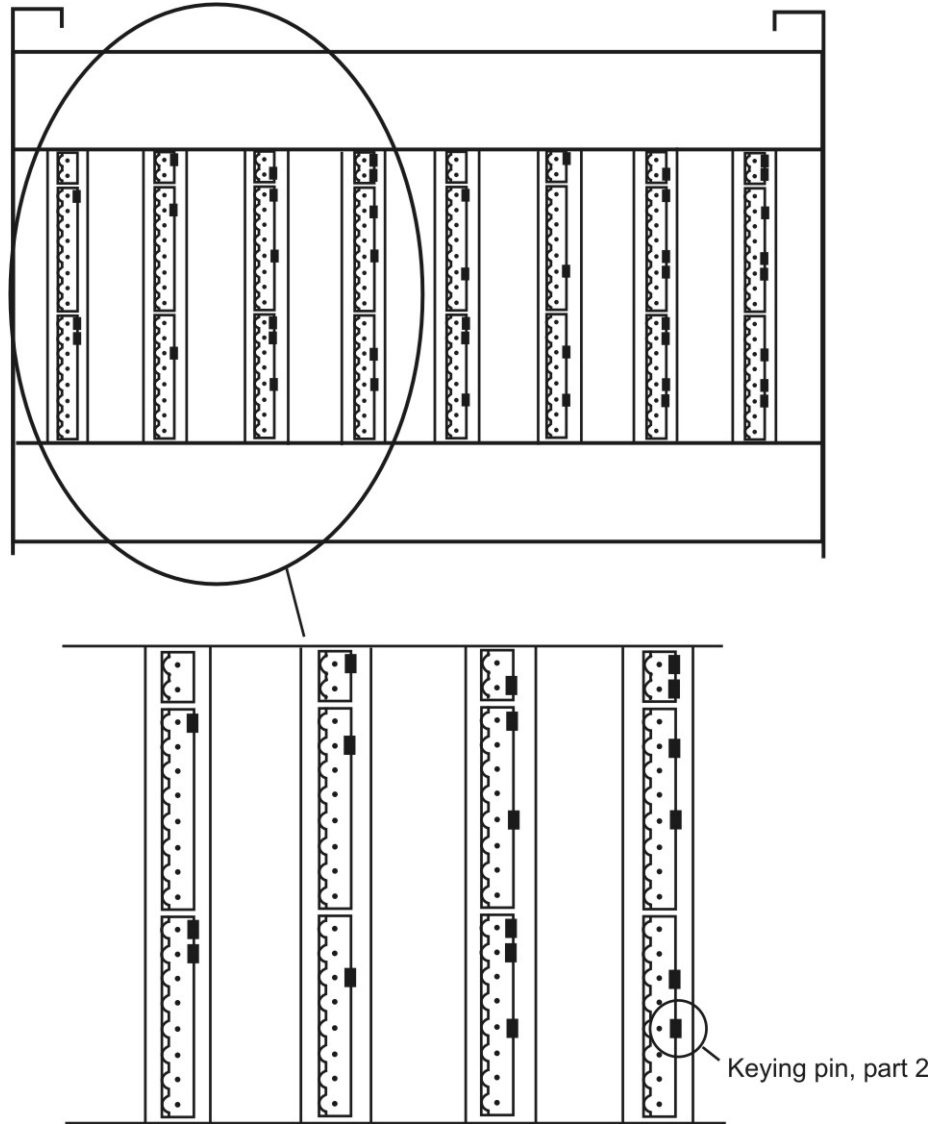
Fig. 33: Top view of the JX6-Basis-4 rack with keyed connectors.

10.4   Removing Submodules

Removing a submodule from its socket

The submodules JX6-I16, JX6-I16F, JX6-O16 or JX6-O16F are electrically connected to the basic module JX6-I32 via socket connectors (socket).

In addition, the submodule is mechanically secured to the basic module JX6-I32 with four to six screws.

➢   Unscrew these screws (9) with a screwdriver (see Fig. 34).
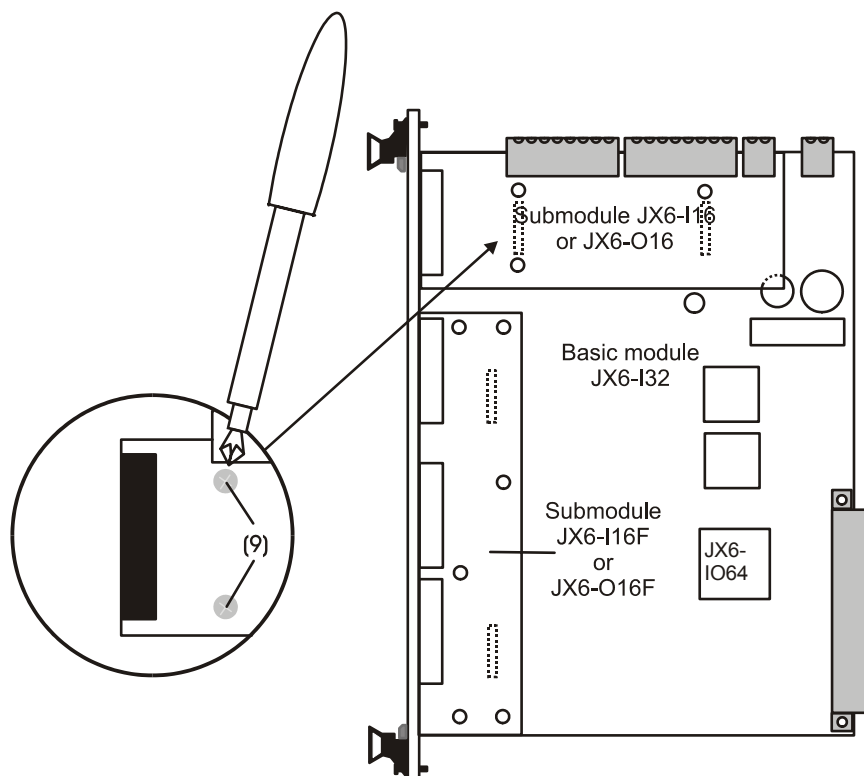
Fig. 34: Removing a submodule from the basic module JX6-I32

Note!

Once the submodule has been removed, attach a slot cover to cover the opening
in the front panel in front of the submodule socket.
For this job use a socket wrench 5.5.

Jetter AG

Appendix

Appendix A:Recent Revisions

Chapter	Comment	Revised	Added	Deleted
Introduction	Word of advise on this manual	✓		
	Revision history		✓	
	Description of Symbols		✓	
Chapter 1	Who is permitted to operate ...	✓		
	Repair and maintenance	✓		
	Description of Symbols			✓
Chapter 1.1	Malfunctions	✓		
Chapter 1.3	Instructions on EMI	✓		
Addresses		✓		

Appendix B: Glossary

Analog	A parameter, e.g. voltage, which is steplessly adjustable. In contrast to digital.
Contact spacing	Standardized spacing between two contacts of a connector (male/female) adjacent to each other.
Digital	Binary presentation of a parameter, e.g. time. This parameter in digital representation can be changed in given steps only, that is in binary mode. Contrast to analog.
EEC Low Voltage Recommendation	To be considered when using electric devices of a rated voltage between 50 and 1.000 V AC and between 75 and 1.500 V DC.
Electro-Magnetic Compatibility	Definition according to EMC regulations: "EMC is the ability of a device to function in a satisfactory way in electro-magnetic surroundings without causing electromagnetic disturbances itself, which would be unbearable for other devices in these surroundings."
Electrical isolation	With potential separation, the sensor mat is electrically isolated from the internal ground (GND) of the controller.

Ripple - Smoothing - Filtering

	Ripple:	The percentage of AC left on a DC signal after rectifying.
	Filtering:	Circuit configuration with a RC or LC component in order to achieve more smoothness or a lower ripple of the DC voltage.

TASK	An individual application or sub-program which can be executed as an independent unit.
Vibration resistance	The device can permanently or shockwise be exposed to a vibration defined in the standard.

Appendix C: List of Abbreviations

AC	**A**lternating **C**urrent
CE	**C**ommunautés **E**uropéennes, that is: European Union
DC	**D**irect **C**urrent
EU	**E**uropean**U**nion
EMI	**E**lectro **M**agnetic **I**mmunity
EN	**E**uropäische **N**orm, that is: European Standard
GND	**G**rou**nd**
IEC	**I**nternational **E**lectrotechnical **C**ommission
LED	**L**ight - **E**mitting **D**iode
PE	**P**rotective **E**arth
SELV	Safe Extra Low Voltage: Voltage, which, under all operating conditions will not exceed a peak or DC voltage of 42.4 V. This voltage is either measured between two conductors or between one conductor and earth. The circuit, in which this voltage occurs, must be separated from the mains power supply by a safety isolating transformer or some equivalent.
SUB-D	Type name of a plug-in connector

Appendix D: List of Illustrations

Jetter AG

Appendix E: Index

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