

# JetWeb

## JX2-PRN1

### Operator's Manual



Edition 1.1

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## This Manual is an Integral Part of the JetWeb Module JX2-PRN1:

Model: \_\_\_\_\_  
Serial Number: \_\_\_\_\_  
Year of Manufacture: \_\_\_\_\_  
Order Number: \_\_\_\_\_



To be entered by the customer:

Inventory Number: \_\_\_\_\_  
Place of Operation: \_\_\_\_\_

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## Significance of this Operator's Manual

This manual is an integral part of the JX2-PRN1 module, and

- must be kept in a way that it is always at hand until the JX2-PRN1 module will be disposed of;
- if the JX2-PRN1 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-PRN1 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-PRN1 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-PRN1 module is in line with the current state of the art. The JX2-PRN1 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-PRN1 module is used to control machinery, such as conveyors, production machines, and handling machines.

The supply voltage of the JX2-PRN1 module is DC 24 V . This operating voltage is classified as SELV (Safety Extra Low Voltage). The JX2-PRN1 module is therefore not subject to the EU Low Voltage Directive.

The JX2-PRN1 module may only be operated within the limits of the stated data.

## Usage Other Than Agreed Upon

The JX2-PRN1 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-PRN1 module is to be run under surrounding conditions, which differ from the conditions mentioned in chapter 3 "Operating Parameters" on page 13, the manufacturer is to be contacted beforehand.

## Who is Permitted to Operate the JX2-PRN1 Module?

Only instructed, trained and authorised persons are permitted to operate the JX2-PRN1 module.

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

## Maintaining the JX2-PRN1 Module

The JX2-PRN1 module is maintenance-free. Therefore, for the operation of the module no inspection or maintenance are required.

## Decommissioning and Disposal of the JX2-PRN1 Module

Decommissioning and disposal of the JX2-PRN1 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.

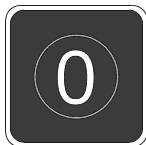


Illustration of PC and user interface keys.



## 1.1 Ensure Your Own Safety

- Disconnect the JX2-PRN1 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-PRN1 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-PRN1 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-PRN1 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-PRN1 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).

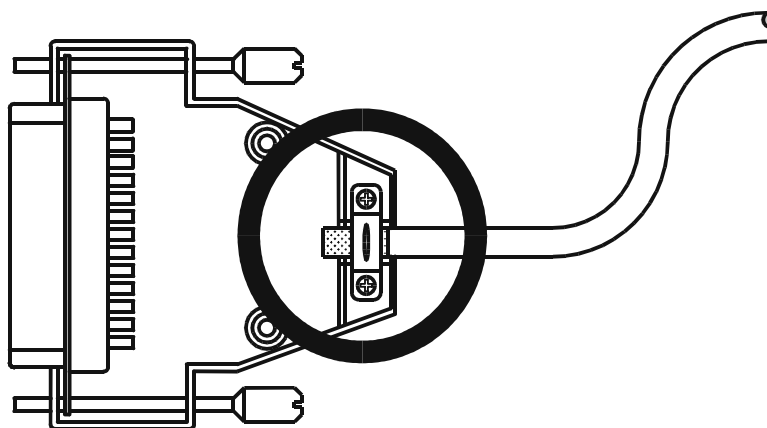


Fig. 1: Shielding of SUB-D connectors in conformity with the EMC standards.

## 2 Physical Dimensions

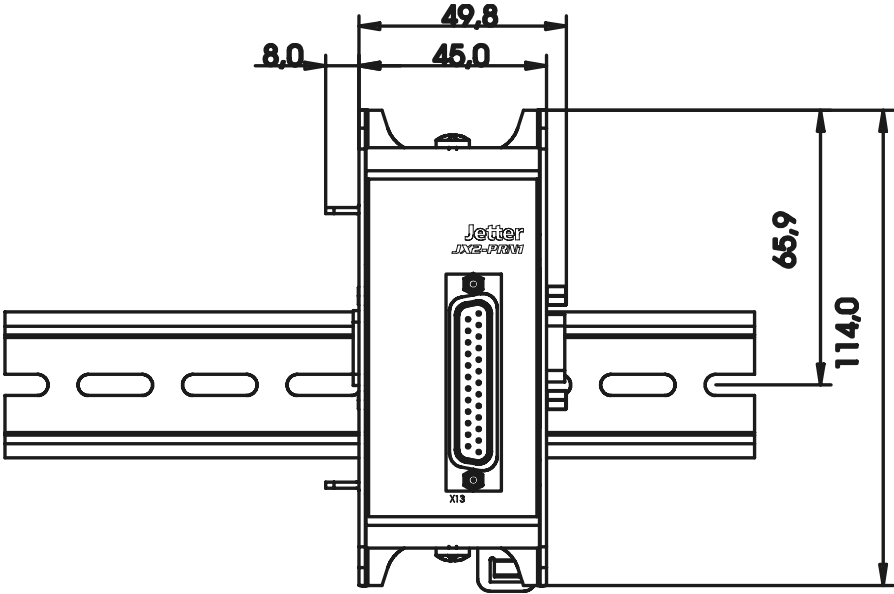


Fig. 2: Front View - JX2-PRN1

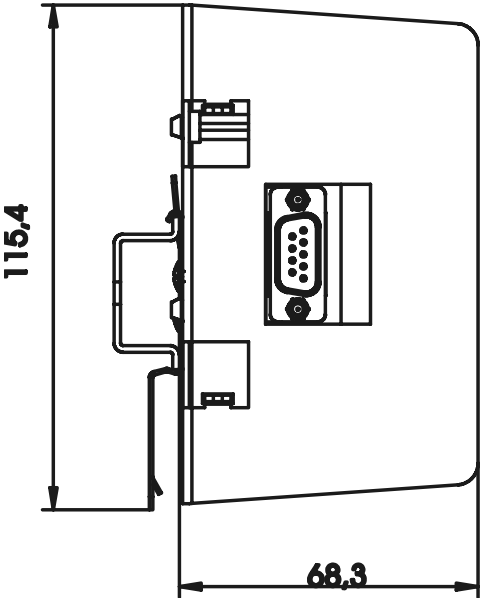


Fig. 3: Side View - JX2-PRN1

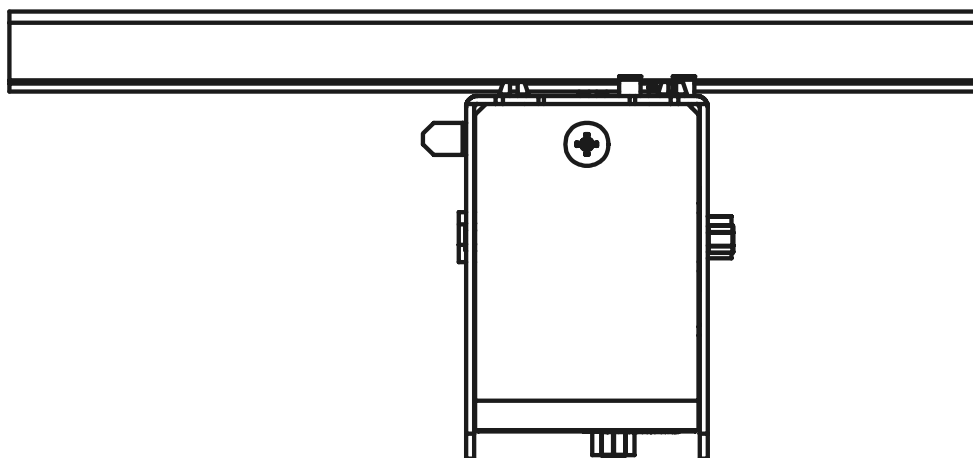


Fig. 4: Top View - JX2-PRN1

### 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

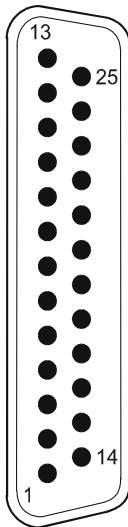
Technical Data - JX2-PRN1	
Power Supply	<ul style="list-style-type: none"> <li>centralised arrangement: via basic unit;</li> <li>decentralised arrangement: via power supply module JX2-PS1</li> </ul>
Connections to the basic unit via JETTER system bus	Male connector SUB-D, 9 pins
Parallel interface port	Male connector SUB-D, 25 pins
Enclosure	Aluminium, powder coated, black
Dimensions (H x W x D in mm)	114 x 45 x 69
Weight	192 g
Mounting	DIN Rail
Centronics Interface	25-pin socket
Electrical Isolation	None
Heat loss of CPU logic circuit	0.35 Watt
Rated current consumption	approx. 35 mA



## 5 Serial Interface Module JX2-PRN1

The JX2-PRN 1 module allows data and control information to be output to a printer and status information to be read out of the printer. Output of data is carried out via a CENTRONICS interface.

### 5.1 Description of Connections



Pin Assignment - 25 pin male SUB-D connector			
PIN	Signal	Meaning	Signal Direction
1	STROBE	Signal to start data transfer	to the printer
2	DATA 1	Data bit 1	to the printer
3	DATA 2	Data bit 2	to the printer
4	DATA 3	Data bit 3	to the printer
5	DATA 4	Data bit 4	to the printer
6	DATA 5	Data bit 5	to the printer
7	DATA 6	Data bit 6	to the printer
8	DATA 7	Data bit 7	to the printer
9	DATA 8	Data bit 8	to the printer
10	ACKNLG	Acknowledgement signal	from the printer
11	BUSY	Printer is busy	from the printer
12	PAPER END	Paper tray is empty	from the printer
13	SELECT	Printer is on-/off-line	from the printer
14	AUTO FEED	Line feed	to the printer
15	ERROR	Fault message	from the printer
16	INIT	Initialisation	to the printer
17	SELECT IN	Switch printer on-line	to the printer
18	GND	Parallel ground line	
19	GND	Parallel ground line	
20	GND	Parallel ground line	
21	GND	Parallel ground line	
22	GND	Parallel ground line	
23	GND	Parallel ground line	
24	GND	Parallel ground line	
25	GND	Parallel ground line	

**Important!**

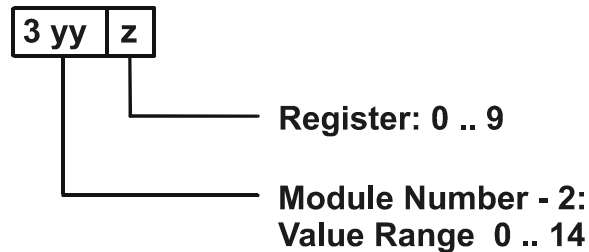
- In case you buy a printer cable or fabricate your own cable, the following minimum requirements, also with a view to EMC, must be met:
  1. Number of cores: 25
  2. Core cross-sectional area: 0.25 mm<sup>2</sup>
  3. Connector (male): SUB-D, metallised
  4. Maximum cable length: 2 m
  5. Shield: complete shielding, no paired shielding
- The shield must be connected to the metallised connector housings on both ends of the cable with the greatest possible surface area. The braided shield has to be made of tin-coated copper wires with a minimum degree of coverage of 85 %.

**Interface with the Application Program**

The interface between the module and the user's program is made up of three registers. These registers are for configuring of the modules and for querying status information.

**Register Addressing**

The register address is made up of the module number and the respective register number.

**Coding of the registers: 3yyz****Note!**

For determination of the module number, only the non-intelligent modules will be counted. Intelligent modules, such as SV1, SM1D, PID1, 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, 3 registers have been provided by the JX2-PRN1 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`

**Examples: Determination of the register numbers**

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

Module number = 2

Local register number = 3 (control register)

Register number =  $3000 + (2-2) * 10 + 3 = 3003$

## 5.1.1 Register Description

### Note!



With the JX2-PRN1 module, register 3yy0 has got no function.

Register 3yy1: Data Register	
Function	Description
Read	Last sent character Value following reset: 0
Write	Sending the character to the printer <sup>*)</sup>
Value Range	0 .. 255

<sup>\*)</sup> Once a character is entered into this register, this character is sent to the printer. Prior to sending this character, a STROBE pulse with a pulse length of 5  $\mu$ s is generated and sent.

Register 3yy2: Status register	
Function	Description
Read	present interface state  Bit 0: 1 = No function Bit 1: 1 = No function Bit 2: 1 = No function Bit 3: 0 = Error message Bit 4: 1 = Printer is online Bit 5: 1 = Paper tray is empty Bit 6: 0 = Acknowledge Bit 7: 0 = Printer is busy  Value following reset: Depending on printer status
Write	Illegal
Value Range	0 .. 255

The status register is bit-coded, i.e. each bit indicates a specific state. The status register is cleared when reading.

### Note!



In case the printer is ready, register 3yy2 contains the value 223 (0xDF)

<b>Register 3yy3: Control Register</b>	
<b>Function</b>	<b>Description</b>
Read	Status of the control lines  Value following reset: 0
Write	Setting the status of the control line  Bit 0: 1 = Signal for starting data transmission is activated Bit 1: 1 = Line feed Bit 2: 0 = Printer reset Bit 3: 0 = Select printer Bit 4: 0 = No function Bit 5: 0 = No function Bit 6: 0 = No function Bit 7: 0 = No function
Value Range	0 .. 15

**Note!**

Following reset, the value 4 should be written into register 3yy3 to select the printer and to terminate the reset state.

<b>Register 3yy9: Version Number of the Operating System</b>	
<b>Function</b>	<b>Description</b>
Read	Version number of the operating system e.g. 101 = V 1.01  Value following reset: Version number of the operating system
Write	Illegal
Value Range	0 .. 8388607

## 5.1.2 Sample Program

The usage of the N-PRN 1 module will be illustrated by the following exemplary program.

### Program Listing

```

0:      ;*****
1:      ;* Output of the characters A through Z          *
2:      ;* on the printer by the program                *
3:      ; *****
4:      ; ++++++
5:      ; + The function Print sends                    +
6:      ; + a character to the printer                 +
7:      ; ++++++
8:      ; DEF_FUNCTION [Print, PR]
          Par: rChar
9:      WHEN                                           ;Wait until the
                                           ;printer is ready
10:     BIT_SET [REG=rStatus, Bit=zbBusy] ;Busy?
11:     THEN
12:     REGISTER_LOAD [rData with R(rChar)] ;Output of character
13:     THEN
14:     RETURN
15: END_DEF
16:     ;
17: TASK tPrinter -----
18:                                           ;Terminate reset and
                                           ;select printer
19:     REGISTER_LOAD [rControl with 4] ;Reset=1, Select=0
20:     ;
21:     REGISTER_LOAD [rChar with zFirst- ;First character
          Char]
22: MARKE sPrnLoop
23:     IF
24:     REG rChar ;Check character
25:     <
26:     zLastChar ;Last character?
27:     THEN
28:     Print [rChar=R(rChar)] ;Output of character
29:     REGINC rChar ;Next character
30:     GOTO sPrnLoop ;Repeat
31:     ELSE ;Received character
32:     Print [rChar=10] ;Line feed
33:     Print [rChar=13] ;Carriag return
34:     THEN ;End of program
35:     LABEL sPrnLoop1
36:     GOTO sPrnLoop1
End of program

```



## Sybolisting

```

;***** Task *****
tPrinter 0

;***** Labels *****

sPrnLoop      !
sPrnLoop1     !

;***** Registers *****

;The following register values are for a module located
;on the first module position after the NANO-B controller!

rData          3001      ;Data register
rStatus        3002      ;Status register
rControl       3003      ;Control register

rChar          100       ;Character

;***** Numbers *****
zbBusy         7         ;Busy bit (0=Busy)
zbError        3         ;Error bit in the status register
                  (0=Error)
zFirstChar     65        ;First character (A)
zLastChar      90        ;Last character (Z)

```