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**Technical description**

**ADDIVARIOUS PX 9100**

**Screw terminal board**

2<sup>st</sup> edition 07/1998

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- if the board has not been used for the intended purpose
- improper installation, operation and maintenance of the board
- if the board has been operated with defective safety devices or with not appropriate or nonfunctioning safety equipment
- nonobservance of the instructions concerning: transport, storage, inserting the board, use, limit values, maintenance, device drivers
- altering the board at the user's own initiative
- altering the source files at the user's own initiative
- not checking properly the parts which are subject to wear
- disasters caused by the intrusion of foreign bodies and by influence beyond the user's control.

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***The original version of this manual is in German. You can obtain it on request.***

# WARNING

**In case of wrong uses and if the board is not used for the purpose it is intended:**

**people may be injured**

**the board, PC and peripheral may be destroyed**

**the environment may be polluted**

**«««« Protect yourself, the others and the environment««««**

- **Read carefully the safety leaflet (yellow)!**

If this leaflet is not with the documentation , please contact us and ask for it.

- **Observe the instructions of the manual!**

Make sure that you do not forget or skip any step. We are not liable for damages resulting from a wrong use of the board.

- **Used symbols**

**WARNING!**

It designates a possibly dangerous situation.

If the instructions are ignored **the board, PC and/or peripheral may be destroyed.**

**IMPORTANT!**

designates hints and other useful information.

- **Any question?**

Our technical support is at your disposal



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# 1 INTENDED PURPOSE OF THE BOARD

The board **PX 9100** is intended to transfer the signals from the controller board **PA 1508** via the SUB-D connector and a cable to the screw terminals of the terminal board. The **PX 9100** allows the transfer of information between the machine and the controller through 16 status LEDs and indicate the switching state of input and output signals.

The screw terminal receiving input signals will be described as input. The output will figure the connection of output signals.

When the screw terminal board is connected to the **PA 1508** board, 2 red diagnosis LED indicate the error states of the power driver.

The green LED only lights when the **PA 1508** is supplied with 24 V.

The different connections are displayed through different colors.

**Table 1-1: Connections**

Current circuit	Type	Wiring
Load current circuit	Output	yellow LED, parallel to load
Error current circuit	Output	red LED, serial to signal transmitter
Acquisition current circuit	Input	orange LED, serial to input
Supply voltage	Input	green LED, parallel to supply circuit

The use of the board according to its intended purpose includes observing all advices given in this manual and in the safety leaflet. Uses beyond these specifications are not allowed. The manufacturer is not liable for any damages which would result from the non-observance of this clause.

## 1.1 Limits of use

Please consider the installation indications as follows:

- Insert the screw terminal board in a closed metal housing (switch cabinet, metal housing)
- Distance from interference sources (eg. converters) and high tension lines of min. 200 mm.
- Long connection lines equipped with overvoltage protection
- No operation of radio-telephone, mobile phones or any other emitter device within a distance of min. 2 m.
- Protect the supply voltage with an overvoltage protection module
- Conduct separately the input and output lines in cable channels
- Connection cable is to be distant from sensitive sensors or analog channels
- Shielded connection of the supply voltage through the separate cable ST010\_S
- Earth the cable shield through the shield connection terminal

Please observe the limit values of the board.

Make sure that the board remains in the protective bag **until it is used**.

Do not remove or alter the identification numbers of the board.  
If you do, the guarantee expires.



## **2 USER**

### **2.1 Qualification**

Only persons trained in electronics are entitled to perform the following tasks:

- Installation,
- putting into operation,
- use,
- maintenance.

### **2.2 Personal protection**

Consider the country-specific regulations about

- the prevention of accidents
- electrical and mechanical installations
- radio interference suppression.

### 3 HANDLING THE BOARD

- **Discharge yourself** before touching the screw terminal board.
  
- Seize the board **on its edge or by the housing**.



**Input channels:****Acquisition current circuit****PX 9100**

Max. input current: ..... 6 mA

Max. input voltage: ..... 30 V

Diodes voltage max.

switching threshold increased: ..... 1 V<sup>1</sup>**PA 1508**

Switching threshold of the inputs: ..... 18.2 V

Switching threshold of the light displays: ..... 15 V

**Important:** if the input voltage falls under 18 V, the **PA 1508** signals a "0" state.

The luminosity of the LEDs rapidly falls. By 15 V they do not light any more

**Supply voltage****PX 9100**

Max. supply voltage: ..... 30 V

Max. current of the supply: ..... 2 A<sup>2</sup>**PA 1508**

Supply voltage min.: ..... 20 V

Switching (On/Off) threshold: ..... 6.5 V

Switching threshold of the status indicators: ... 15 V

**Important:** if the supply voltage falls under 20 V, the **PA 1508** can no longer transmit the error state. Under 15 V the green LED switches off. Under 6.5 V the power drivers switch the outputs off.

**Output channels**

- Load current circuit

Max output current: ..... 1 A

Max. output voltage: ..... 30 V

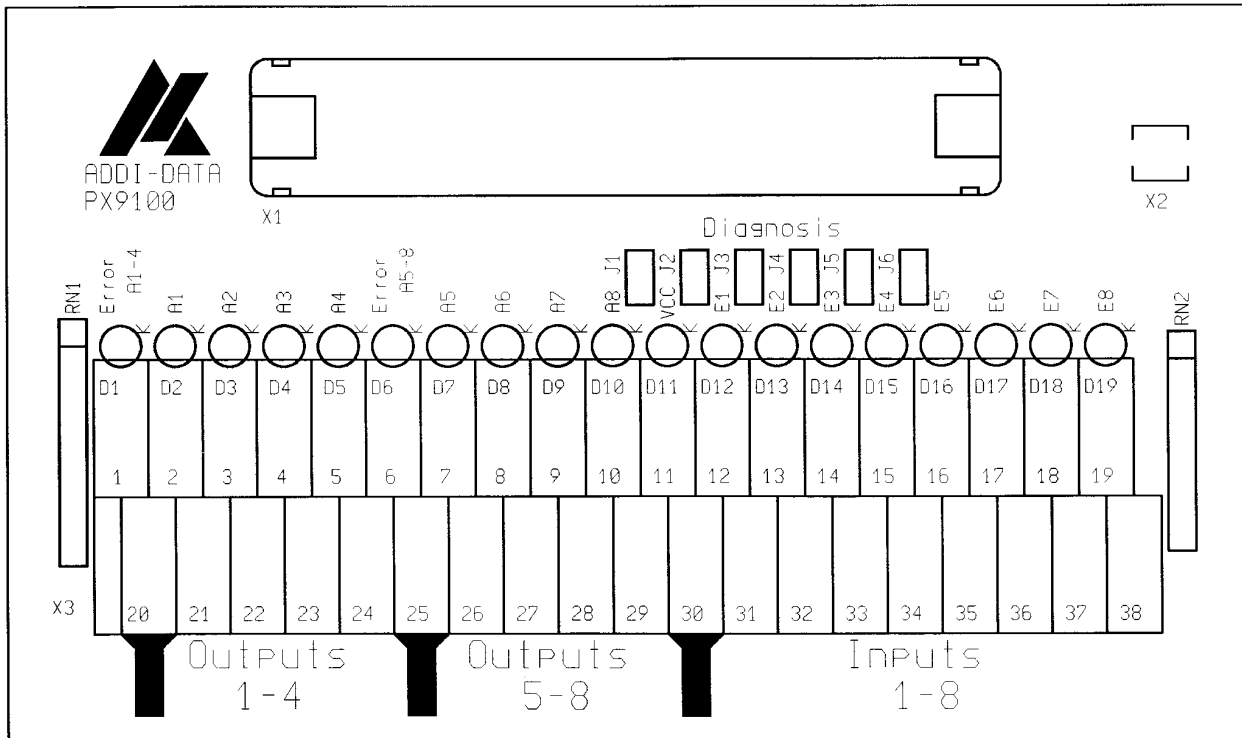
Switching current of the diagnosis outputs: ..... 10 mA

<sup>1</sup> The switching threshold of the input channels is increased of the diode voltage through the serial input status LED.

<sup>2</sup> For high supply currents the power supply is to occur through our standard cable ST010\_S

### 4.3 Component scheme

Fig. 4-1: component scheme of the screw terminal board PX9100



## 5 CONNECTION

### 5.1 Connection principle

- Insert the controlling board **PA 1508** as indicated in the corresponding technical description
- Connect the screw terminal board through the power cable ST010(\_S)

#### **WARNING!**

Interferences are emitted and coupled through the connection cable. A wrong cable would damage the operating and functions safeties of your system.

We recommend to use our standard connection cable.

Make sure by the installation of the connection cable that:

- it is installed within a sufficient distance from sensitive analog signals
- the distance from potential interference sources (eg.: frequency converters, supply circuits) is as long as possible.
- Connect the 24 V supply voltage to the green and white cable leads of the power cable ST010\_S. In case 2 connections are not available on the + pole, please use distribution terminals.  
The brown cable lead is to be connected to the - pole
- Set a connection between the screw terminal 30 and the - pole of the supply voltage. In case 2 connections are not available on the + pole, please use distribution terminals.
- Earth the cable shield: set a low ohmic connection from the shield earthing terminal X2 to the ground. Connect also the the cable shield of the 24 V supply voltage to the ground.
- Switch on the 24 V supply voltage. The green LED D11 is to be lighting. The LEDs D1 and D6 are off.
- We recommend using single cable lead with wire end ferrules for the connection to the peripheral. Please refer to the VDE 0298 norm (part 2) for the current carrying capacity.

The line cross section and length are to be considered for the resistance of the connection cable. If the voltage has fallen of more then 4 V by a 24 V signal transmitter, no signal acquisition occurs .

High currents can flow through the outputs. In this case the voltage fall on the connection cable can amount high values. Do calculate the length and cross section of your connection cable according to te maximum permissible voltage fall  $U_{max}$ .

$$R_{loop} = 2 \times l \times \rho / A$$

$$\rho \text{ (cupper)} = 0.01724$$

Conditions

$$R_{loop} \times I < U_{max}$$

$$U_{max} = 0.3448 \frac{\Omega \times \text{mm}^2}{\text{m}} \times \frac{l_{max}}{A \times I}$$

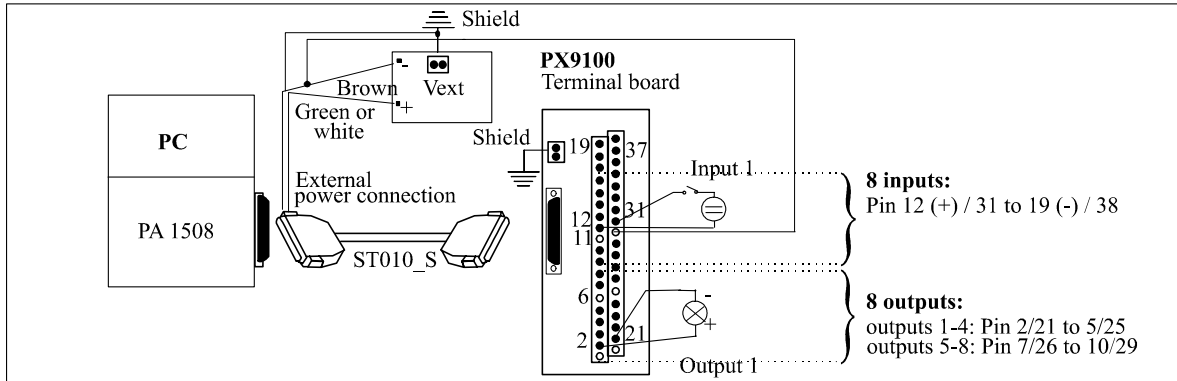
$$l_{max} = \frac{A \times U_{max}}{0.3448 \frac{\Omega \times \text{mm}^2}{\text{m}} \times I}$$

I = Current through the conductor in Ampère

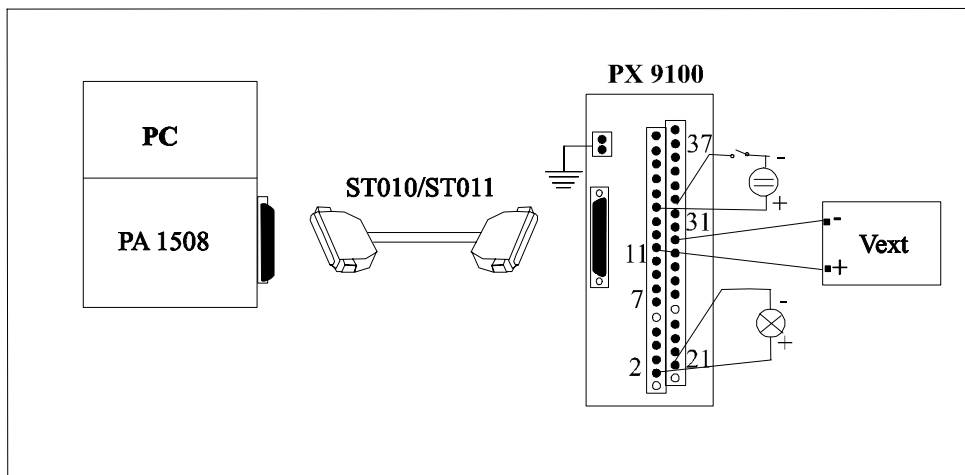
A = Cross section of the conductor in  $\text{mm}^2$

## 5.2 Connection to the PA 1508 board

**Fig. 5-1: Connection to the PA 1508 board;  
low ohmic power connection**



**Fig. 5-2: Connection to the PA 1508 board;  
low cost solution for low currents**





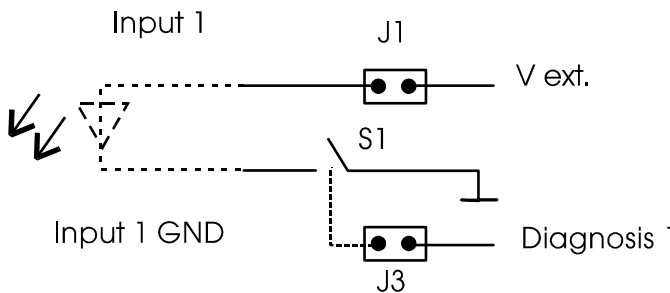
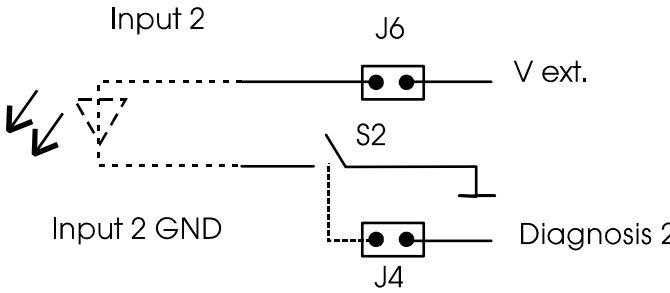
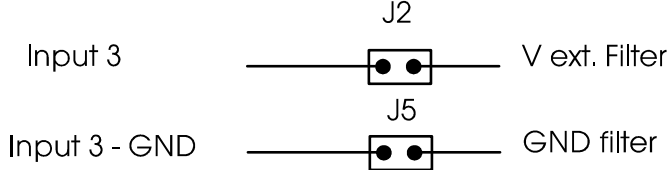
### 5.3 Terminal assignment

Terminal number	Signal	on SUB-D connector
1	Diagnosis 1: Error A1-4	21
2	Output 1	1
3	Output 2	2
4	Output 3	3
5	Output 4	4
6	Diagnosis 2: Error A5-4	25
7	Output 5	5
8	Output 6	6
9	Output 7	7
10	Output 8	8
11	V ext.	9, 26, 27, 28
12	Input 1	11
13	Input 2	12
14	Input 3	13
15	Input 4	14
16	Input 5	15
17	Input 6	16
18	Input 7	17
19	Input 8	18
20	Diagnosis- GND 1	10, 29
21	Output 1- GND	10, 29
22	Output 2- GND	10, 29
23	Output 3- GND	10, 29
24	Output 4- GND	10, 29
25	Diagnosis -GND 2	10, 29
26	Output 5- GND	10, 29
27	Output 6- GND	10, 29
28	Output 7- GND	10, 29
29	Output 8- GND	10, 29
30	GND ext.	10, 29
31	Input 1- GND	30
32	Input 2- GND	31
33	Input 3- GND	32
34	Input 4- GND	33
35	Input 5- GND	34
36	Input 6- GND	35
37	Input 7- GND	36
38	Input 8- GND	37




SUB-D pins which are internally connected: 22, 23

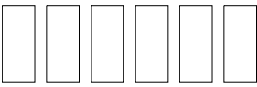

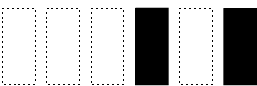


Not occupied: SUB-D pin number 19

## 6 JUMPERS

<p><b>J1, J3</b></p>	<p>Input 1 is operating as the diagnosis of the outputs 1-4</p>  <p>By setting the jumpers J1 and J3, the common diagnosis signal of the outputs 1-4 can be conducted on the input 1. The input 1 is no more available for the signal transmission through the terminal 12. The switch S1 closes once the diagnosis signal is active. a logical "1" is read on input 1.</p>
<p><b>J4, J6</b></p>	<p>Input 2 is operating as the diagnosis of the outputs 5-8</p>  <p>By setting the jumpers J2 and J6, the common diagnosis signal of the outputs 5-8 can be conducted on the input 2. The input 2 is no more available for the signal transmission through the terminal 13. The switch S2 closes once the diagnosis signal is active. a logical "1" is read on input 2.</p>
<p><b>J2, J5</b></p>	 <p>Wenn both Jumper J2 und J5 are set, the status of the filtered supply voltage (protection of 3 A) can be read back through input 3.</p>

## 6.1 Jumper settings

-  jumper is set
-  jumper is not set
-  independant jumper (do not consider)

Jumper settings J1 J2 J3 J4 J5 J6	Diagnosis	Input channels already occupied <sup>1</sup>	free input channels <sup>2</sup>
	Diagnosis cannot be read back	-	1-8
	D1 and D12 light when the power drivers of outputs 1-4 have overheated. In case of error an "1" is read on input 1	1	2- 8
	D6 and D13 light when the power drivers of the outputs 5-8 have overheated. In case of error an "1" is read on input 2	2	1,3- 8
	D1 and D12 light, when the power drivers of the outputs 1-4 have overheated. D6 and D13 light when the power drivers of the outputs 5-8 have overheated.. in case of error an "1" is read on input 1 and 2.	1+2	3 - 8
	D11 and D14 are off when no external supply voltage is connected or when the 24 V safety of the board has blown. In case of error "0" is read on input 3	3	1,2,4-8

<sup>1</sup> No input signal is to be connected to the the terminals of the occupied input channels.

<sup>2</sup> An input signal must be connected to the terminals of the free input channels.