



Technical Description

4XP0000.00-K41

Date: 08 July 2013

Short text: cHMI 4 add-on keyboard / X2X E-stop

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I Version information

Version	Date	Comment	Author
1.0	15.04.2008	First edition	Manuel Edtmayr
1.1	08.07.2008	Key- and LEDmatrix	Manuel Edtmayr
1.2	08.07.2013	Correction of faults	Anna Sigl

Table 1: Versions

II Distributors

Name	Company, Department	Amount	Comment
Günter Schuster	Bernecker + Rainer, cHMI Technical Manager	1	
Perschl Bernhard	Bernecker + Rainer, cHMI Project Development	1	

Table 2: Distributors

III Organization of safety notices

Safety guidelines in this document are organized as follows:

Safety notice	Description
Danger!	Disregarding the safety regulations and guidelines can be life-threatening.
Warning!	Disregarding the safety regulations and guidelines can result in severe injury or major damage to material.
Caution!	Disregarding the safety regulations and guidelines can result in injury or damage to material.
Information:	Important information for preventing errors.

Table 3: Safety notices

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1 General information

1.1 Safety notices

1.1.1 Introduction

Programmable logic controllers (PLCs), operating and monitoring devices (industrial PC's, Power Panels, Mobile Panels, etc.) as well as the B&R uninterruptible power supplies have been designed, developed or manufactured for conventional use in industry. They were not designed, developed and manufactured for any use involving serious risks or hazards that could lead to death, injury, serious physical damage, or loss of any kind without the implementation of exceptionally stringent safety precautions. In particular, these risks and hazards include using these devices when monitoring flight control systems or nuclear reactions in nuclear power plants, in flight safety, controlling mass transportation systems, in medical life support systems, and controlling weapons systems.

When using programmable logic controllers and operating/monitoring devices as control systems together with a Soft PLC (e.g. B&R Automation Runtime or comparable products) or a Slot PLC (e.g. B&R LS251 or comparable products), safety precautions that apply to industrial control systems (e.g. the use of safety devices such as E-stop circuits, etc.) must be observed in accordance with applicable national and international regulations. The same applies for all other devices connected to the system, such as drives. All tasks such as installation, commissioning, and service may only be carried out by qualified personnel. Qualified personnel are persons familiar with transport, mounting, installation, commissioning, and operation of the product who also have the respective qualifications (e.g. IEC 60364). National accident prevention guidelines must be followed.

The safety guidelines, connection descriptions (rating plate and documentation) and limit values listed in the technical data must be read carefully and must be observed before installation and commissioning.

1.1.2 Intended use

Electronic devices are generally not failsafe. In the event of a failure on the programmable control system, operating or monitoring device, or uninterruptible power supply, the user is responsible for ensuring that other devices that may be connected, e.g. motors, are in a secure state.

1.1.3 Transport and storage

During transport and storage, devices must be protected from excessive stress (mechanical load, temperature, humidity, aggressive atmosphere, etc.).

1.1.4 Installation

- Installation must take place according to the documentation, using suitable equipment and tools.
- Devices must be installed without voltage applied and by qualified personnel.
- General safety regulations and national accident prevention guidelines must be observed.
- Electrical installation must be carried out according to the relevant guidelines (e.g. line cross section, fuse, protective ground connection).

1.1.5 Operation

1.1.5.1 Protection against touching electrical parts

To operate programmable logic controllers, operating and monitoring devices, and uninterruptible power supplies, certain components must carry dangerous voltage levels over 42 VDC. A life-threatening electrical shock could occur if you come into contact with these parts. This could result in death, severe injury or material damage.

Before turning on the programmable logic controller, the operating and monitoring devices and the uninterruptible power supply, ensure that the housing is properly grounded (PE rail). Ground connections must be established when testing the operating and monitoring devices or the uninterruptible power supply, even when operating them for only a short time!

Before turning the device on, make sure that all voltage-carrying parts are securely covered. During operation, all covers must remain closed.

1.2 Model numbers

1.2.1 X2X Panel

Model number	Description
4XP0000.00-K41	cHMI 4 add-on keyboard / X2X E-stop X2X keyboard module 6 B&R illuminated ring keys (square), 3 colors (red, green, yellow), X2X interface, E-stop button, 24 VDC supply, IP65 protection (from front), order terminal block 1 x 0TB1108.8110 and 1 x 0TB1104.8100 separately.

Table 4: Model number - X2X Panel

1.3 General information

The 4XP0000.00-K41 is an X2X keyboard with 6 B&R illuminated ring keys (square). This add-on keyboard is 170mm x 80 mm (WxH) and has an anodized aluminum front with a cord gasket all the way around. The keyboard also has an E-stop with 2 normally closed contacts placed directly on the terminal blocks. Additionally, the front is covered by a membrane in Pantone 427 and the luminous fields have an embossed rim. Each luminous field can have up to 3 different colors (yellow, red, green). The keyboard is delivered with legend strips, which can be printed by the customer as needed. The operator panel can be attached using mounting clamps. Power supply and X2X are connected via terminal blocks. (Supply plug is included in accessories)

ATTENTION!

The keys and LEDs only function with a 24VDC connection.

1.4 Views

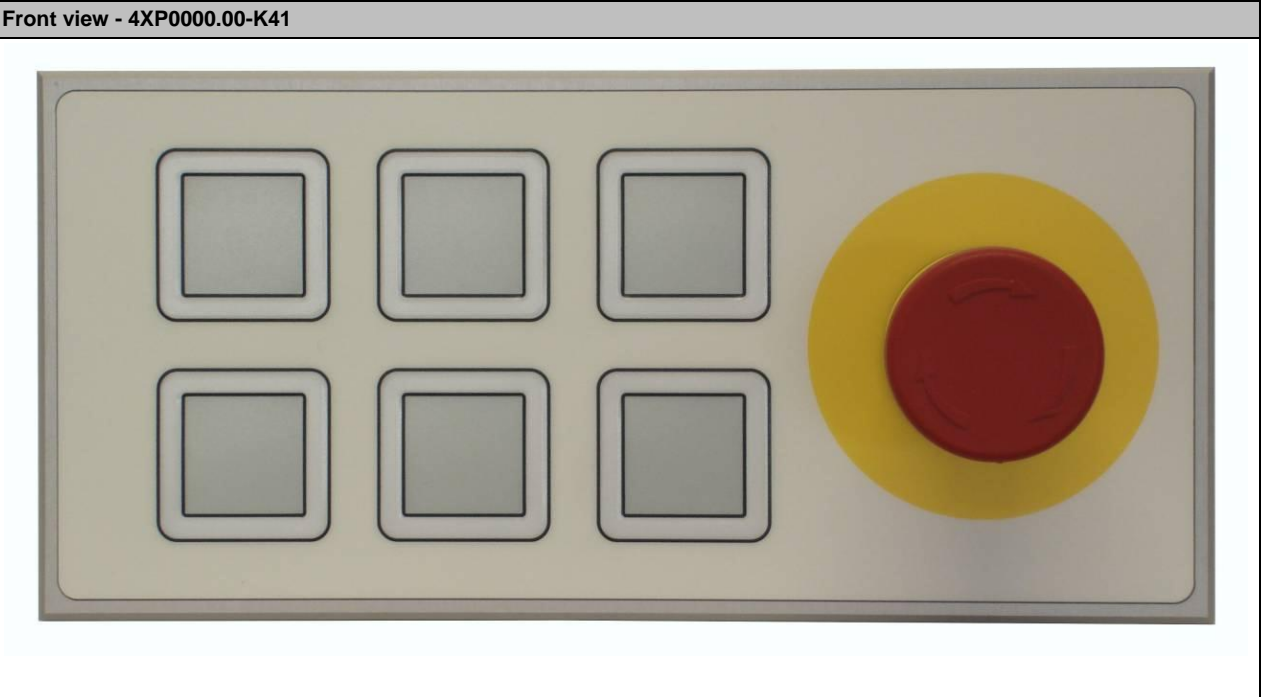


Figure 1: Front view

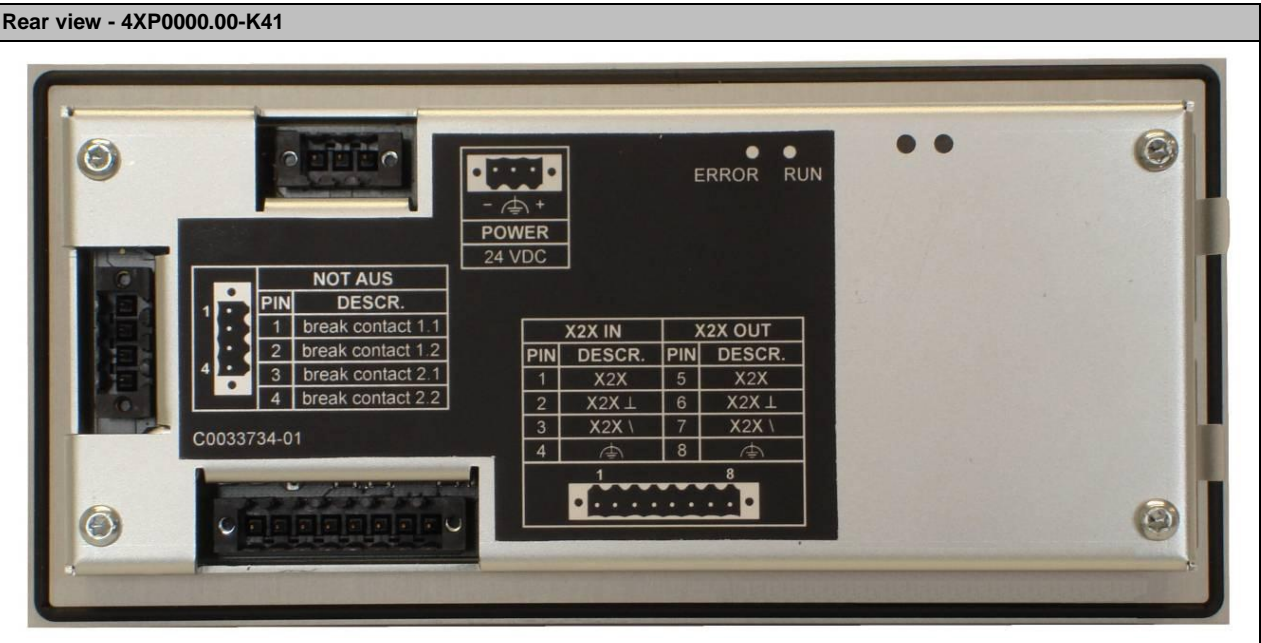


Figure 2: Rear view

1.5 Dimensions

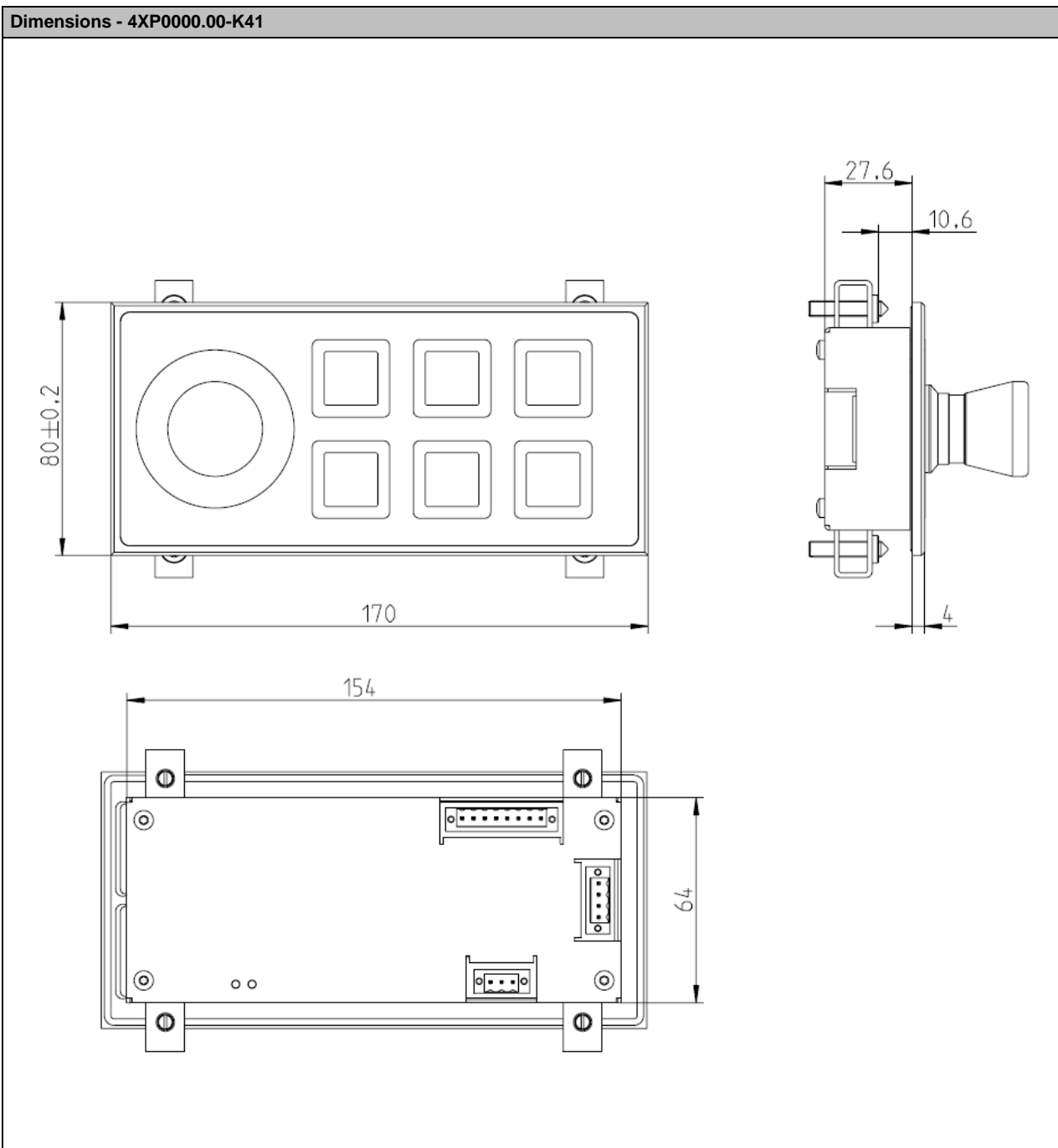


Figure 3: Dimensions

1.6 Mylar design

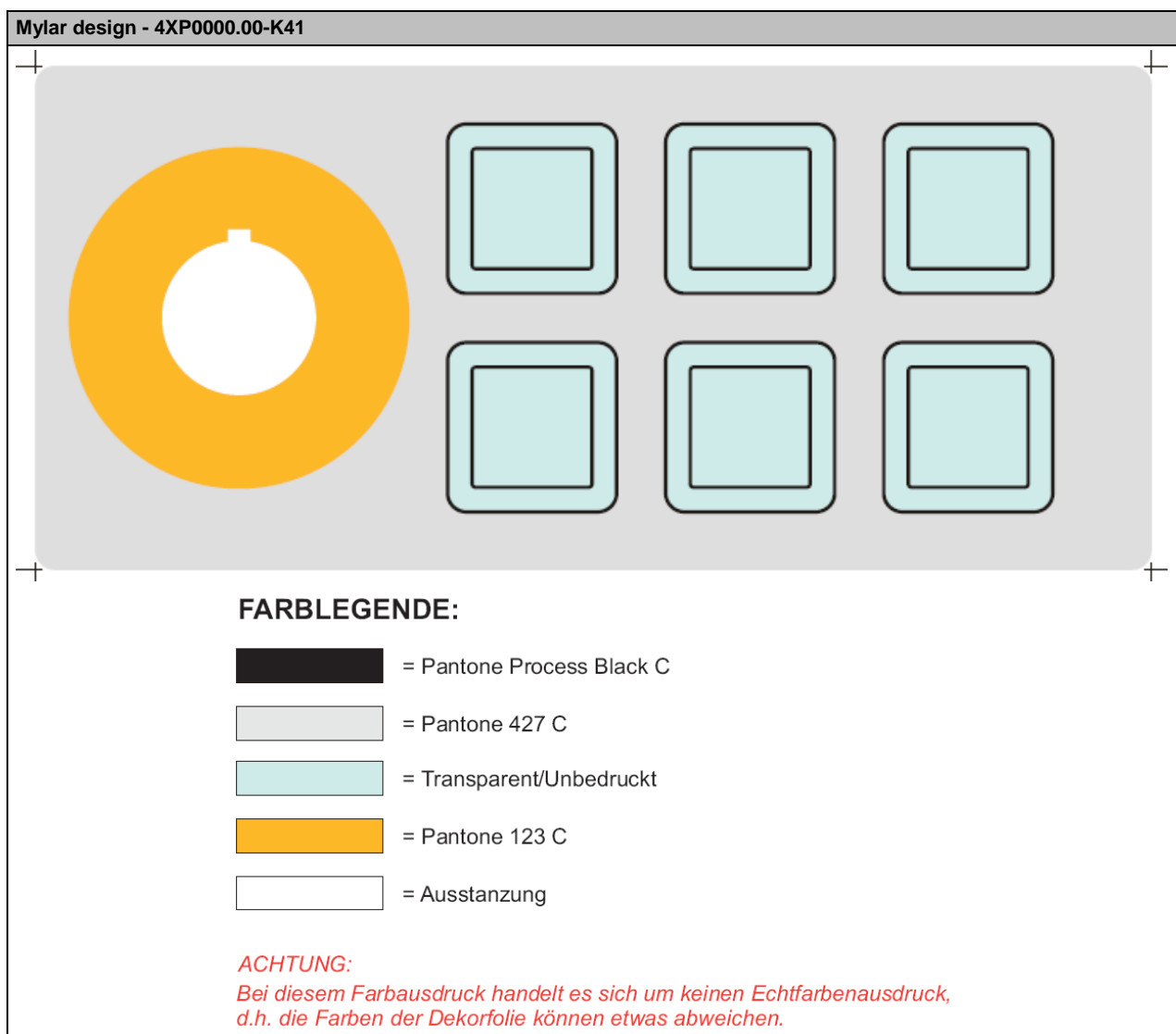


Figure 4: Mylar design

1.7 Cutout installation

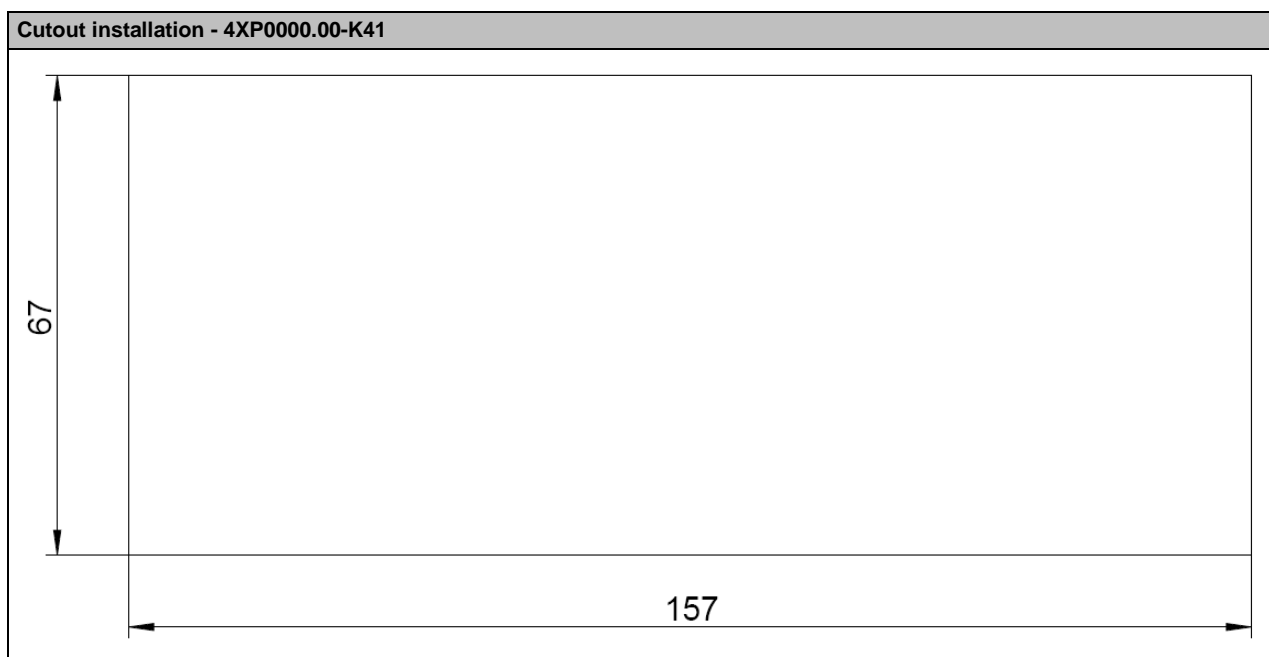


Figure 5: Cutout installation

2 Device interfaces

2.1 X2Xinterface

2.1.1 Interface

The 8-pin socket required for the Interface connection is not included in delivery.

X2X-IN & OUT (8-pin Terminal block)	
Pin	Description
1	X2X
2	X2X ⊥
3	X2X\
4	SHLD
5	X2X
6	X2X ⊥
7	X2X\
8	SHLD
Accessories	
Connectors	0TB1108.8110



Figure 6: X2X interface

2.1.2 E-stop

The 4XP0000.00-K41 is equipped with an E-stop switching element.
The two normally closed contacts are wired directly to a 4-pin terminal block.
The 4-pin socket required for the E-stop connection is not included in delivery.

E-stop	
Connection	Description
1	break contact 1.1
2	break contact 1.2
3	break contact 2.1
4	break contact 2.2



Figure 7: E-stop contact

2.1.3 Status LEDs

Status LEDs		
LEDs	Color	Function
Run	Green	Connection was established to the X2X bus
Error	Red	No connection possible to the X2X bus



Figure 8: Status LEDs

2.1.4 Supply voltage

Input voltage: 24 VDC \pm 25%

The 3-pin socket required for the supply voltage connection is included in delivery.

The supply voltage is internally protected so that the device cannot be damaged if there is an overload or if the voltage supply is connected incorrectly.

Pin assignments can be found either in the following table or on the device's sticker.



Supply voltage (3-pin terminal block)		
Pin	Description	
1	+	
2		
3	-	
Accessory (included in delivery)		
0TB703.81	Plug 24VDC 3.5mm 3-pin cage clamps	

Figure 9: Supply voltage

Information

The panel does not have a power supply to provide bus voltage to additional devices.

2.2 Stickers

2.2.1 Device label

The following label is attached to the back of the operator panel. It shows brief descriptions for all of the interfaces:

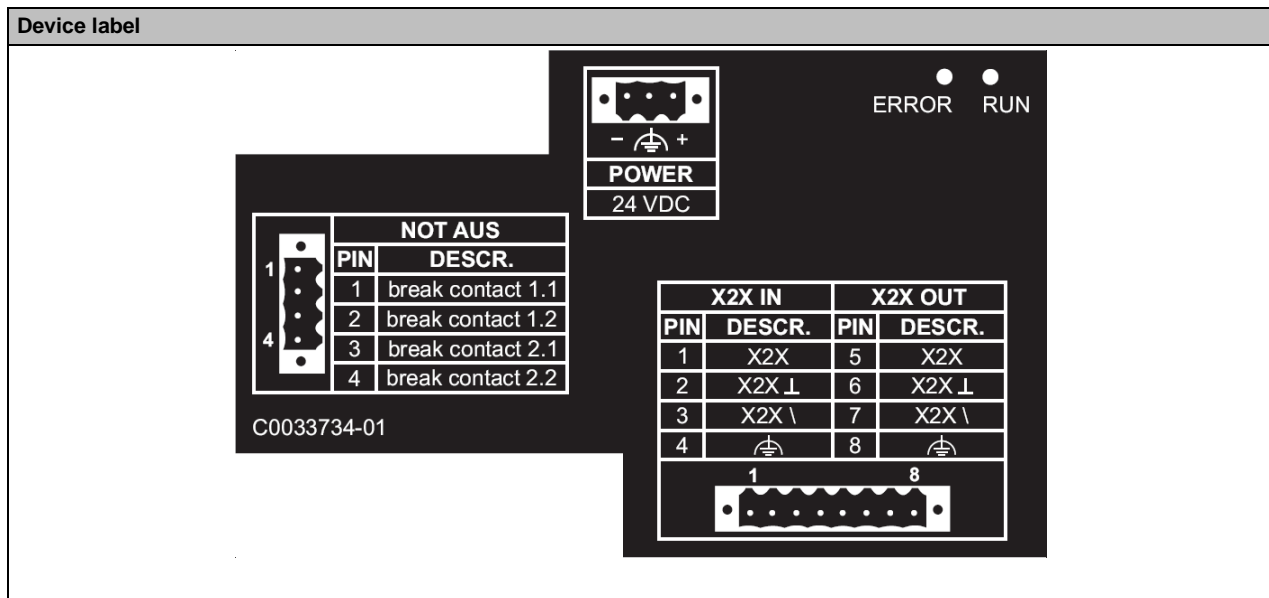


Figure 10: Device label

2.2.2 Serial number sticker

2.2.2.1 General information

Each B&R device is given a unique serial number sticker with a barcode that allows the device to be clearly identified.

2.2.2.2 Design/Dimensions

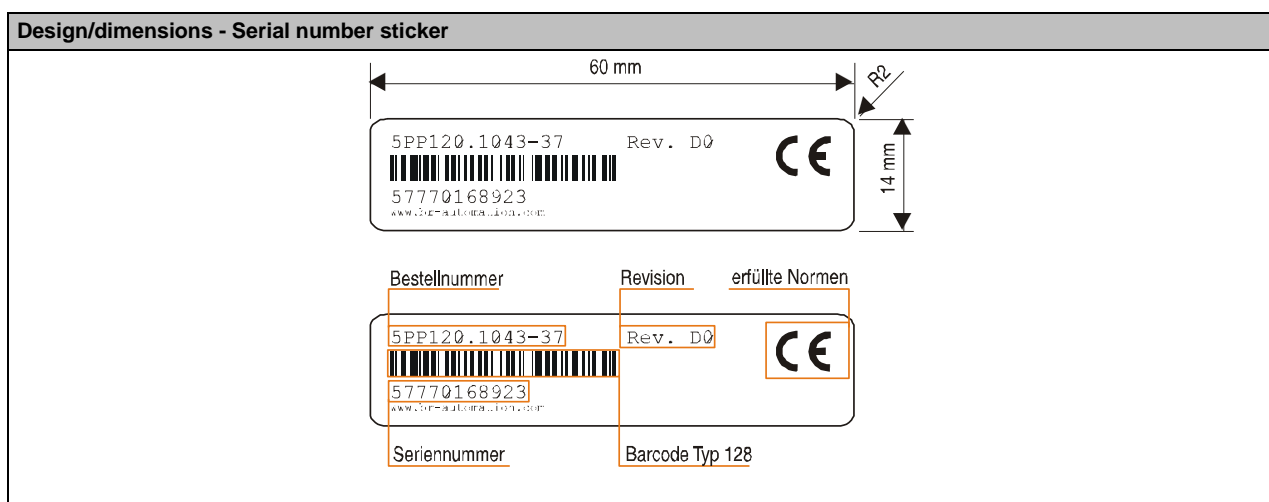


Figure 11: Design/dimensions - Serial number sticker

2.3 Technical data

Features	4XP0000.00-K41
X2X interface	
Type	X2X slave
Electrical isolation	No
Design	8-pin multipoint connector
Distance between 2 stations	100m
Internal bus supply	Yes
LEDs	1x Run (green), 1x Error (red)
Keys	
Short-stroke key	6 B&R illuminated ring keys (square)
Illuminated ring colors	red, green, yellow
Mechanical switching elements	
E-stop	2 normally closed
Electrical characteristics	4XP0000.00-K41
Power supply	
Rated voltage	24 VDC \pm 25%
Starting current	Max. 20 A for < 1 ms
Power consumption	240 mA
Mechanical characteristics	4XP0000.00-K41
Front	
Frame	Naturally anodized aluminum
Membrane	Polyester
Design	Pantone 427 C
Gasket	Flat gasket around display front
Housing	Metal
Outer dimensions	
Width	170 mm
Height	80 mm
Depth	32 mm
Weight	0,43 kg
Environmental characteristics	4XP0000.00-K41
Ambient temperature	
Operation	0 .. 50 °C
Storage	-20 .. 60 °C
Transport	-20 .. 60 °C
Relative humidity	5 .. 85%, non-condensing
Operation	T \leq 40°C: 5% to 90%, non-condensing
Storage	T > 40°C: < 75 %, non-condensing
Transport	T \leq 40°C: 5% to 90%, non-condensing T > 40°C: < 75 %, non-condensing
Protection type	IP20 back side IP65, dust and sprayed water protection (from front)
Altitude	Max. 3000 m

Table 5: Technical data

2.4 Contents of delivery

Model number	Description
1	Operator panel4XP0000.00-K41
1	24 VDC supply plug
4	Retaining clips

Table 6: Contents of delivery

2.5 Key- and LEDmatrix

Key- and LEDmatrix																
	TC0	TC1	TC2	TC3	TC4	TC5	TC6	TC7	TC8	TC9	TC10	TC11	TC12	TC13	TC14	TC15
RT0	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free
RT1	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free
RT2	T1	T2	T3	T4	T5	T6	free	free	free	free	free	free	free	free	free	free
RT3	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free
RT4	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free
RT5	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free
RT6	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free
RT7	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free

	LC0	LC1	LC2	LC3	LC4	LC5	LC6	LC7	LC8	LC9	LC10	LC11	LC12	LC13	LC14	LC15
RL0	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	free	free	free	free
RL1	L13	L14	L15	L16	L17	L18	free	free	free	free	free	free	free	free	free	free
RL2	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free
RL3	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free
RL4	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free
RL5	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free
RL6	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free
RL7	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free	free

Figure 12: Key- and LEDmatrix

2.6 Adding the customer-specific device to Automation Studio

2.6.1 Reloading components over the internet

To reload components over the internet, you first need to start Automation Studio and open the project in which the new components (hardware modules, motion libraries, Visual Components Runtime, Automation Runtime) will be used. Selecting the menu option **Tools / Upgrades...** opens a dialog box which shows the upgrades currently available on the B&R homepage:

The following is shown in the columns:

- Component name
- Component version
- [Automation Studio Version](#) Shows the earliest AS version with which the upgrade can be used. This column is only shown if the button **Show upgrades for newer Automation Studio versions** has been activated.
- Size of data to be loaded
- Description of components, which also contains information about corrected errors. If there is a more detailed description for the upgrade available on the B&R homepage, the text in the description column is shown in blue and underlined. Clicking on this link opens it in the user's default web browser.

By marking the component and then confirming the selection by clicking on the **OK** button, the files required for the selected module (HWC, bitmaps, firmware) are copied to the Automation Studio installation. If the installation already contains files with the same names, these are replaced without any warning. Afterward, the user can insert the new hardware modules in the project's hardware tree and configure them as usual. The Automation Runtime version does not need to be changed. During the build, two additional B&R modules are created (ArFW.br for the firmware and ArHWD.br for the hardware definition) and then transferred to the target system. In order for AR to implement the changed HWD and configuration, a warm restart is executed automatically.

Information:

In order to successfully reload hardware modules, Automation Runtime V2.92 or higher must be installed.

A minimum version (or possibly a higher one, if additional code changes were necessary in AR to support this module) is listed in all reloadable HWC files. An error is generated during the build if the AR version being used is too old.

If the user selects a motion library it is copied into the installation. The new version of the motion library can now be created in the project as usual. The same applies for Visual Components Runtime and Automation Runtime versions.

Upgrades can also be installed without a project being open.

If two modules with the same model number and different version numbers are in the list of reloadable hardware modules, the one with the highest version number is shown. The same applies for Visual Components Runtime.

Selecting the checkbox **Show Upgrades for newer Automation Studio versions** displays additional upgrades that cannot be installed with the current version of Automation Studio since they require a newer version. The "Automation Studio" column lists the minimum version of Automation Studio required to install each upgrade.

These upgrades can not be selected, however. The minimum versions are only shown to indicate that a newer version of Automation Studio is required in order to be able to use these components. If an upgrade has requirements that depend on other upgrades, these are shown under the respective upgrades. This is the case, for example, when a new Automation Runtime version has certain minimum firmware requirements for the hardware modules. These are only required under certain conditions, since the hardware upgrades are only necessary when the corresponding hardware modules are actually used in the project. These upgrades are therefore not downloaded automatically.

2.6.2 Version conflict when inserting modules

If some of the hardware modules in the current project have a higher version than the currently open Automation Studio, or if they are missing in the current installation, the following dialog box is shown:

Please use menu item Tools/Upgrades... to install the upgrades for the modules shown in the dialog box.

2.6.3 Customer-specific upgrades:

If you would also like to see available customer-specific upgrades (e.g. for custom modules), you select the checkbox **Show customer specific upgrades**. After you have logged in with your user name and password in the dialog box that appears, the upgrades for custom modules are shown.

2.6.4 Reloading components from local storage

If the workstation does not have internet access, the upgrades can be loaded to another location from the B&R homepage and saved in local storage. In the Automation Studio upgrade dialog box, you can use the button **Browse for local storage...** (**Browse for local storage...**) to load and install them from a local storage device.

2.6.5 When editing an existing project

If a component that is being used in an existing project is updated, when this project is then opened and compiled the newly reloaded hardware module files (HWC, bitmap, firmware), motion libraries, Visual Components Runtime, and Automation Runtime are used. This only applies for motion libraries and Automation Runtime if the same version of these is set in the project. The version is not automatically changed.

2.6.6 Display of reloaded components in Automation Studio

Information about which reloaded components have been installed can be accessed via the "About" dialog box in Automation Studio Help / About Automation Studio, where, after clicking on the button Upgrades, all installed upgrades are shown.

3 Overview of standards

Standard	Description
EN 61000-6-4	Electromagnetic compatibility (EMC); Generic standard - emission standard Part 2: Industrial environments (EN 50081-2 has been replaced by EN/IEC 61000-6-4)
IEC/CISPR 11	Industrial, scientific and medical high-frequency device radio disturbances limits and measuring procedures
EN 61000-6-2	Electromagnetic compatibility (EMC) - Generic standard, emission standard Part 2: Industrial environments (EN 50082-2 has been replaced by EN/IEC 61000-6-2)
EN 61131-2 Edition 2	Programmable logic controllers Part 2: equipment requirements and tests
UL 508	Industrial control equipment, (UL = Underwriters Laboratories)
EN 60204-1	Safety of machinery - electrical equipment on machines Part 1: General requirements
EN 60529	IP20 protection

Table 7: Overview of standards

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