Perfection in Automation
www.br-automation.com

Technical Description
4XP0000.00-K84

Date: 15. May 2017

Short text: cHMI 2 Handheld / X2X

I Version information

Version	Date	Comment	Author
1.0	18.07.2012	First edition	Anna Sigl
1.1	09.04.2013	Correction of errors	Anna Sigl
1.2	13.06.2013	Description incremental encoder	Anna Sigl
1.3	19.09.2013	Correction of errors	Anna Sigl
1.4	18.10.2013	Change the description of the panel	Anna Sigl
1.5	27.11.2014	The Material can be used with 5AP980.1505-B10 too	Anna Sigl
1.6	12.02.2015	Insert the length of cable	Anna Sigl
1.7	15.05.2017	Views from the AS updated, datasheet updated	Nadine Koch

Table 1: Versions

II Distributors

Name	Company, Department	Amount	Comment
Günter Schuster	Bernecker + Rainer, cHMI	1	
Michael Hochländer	Bernecker + Rainer, cHMI	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

Attention!

The 4XP0000.00-K84 may only be used in conjunction with the Power Panel 4PP480.1505-K04 and 5AP980.1505-B10.

IV Table of contents

1 General information 4
1.1 Safety notices 4
1.1.1 Introduction 4
1.1.2 Intended use 4
1.1.3 Transport and storage 4
1.1.4 Installation 4
1.1.5 Operation 5
1.2 Model number 6
1.3 General information 6
1.4 Views 4XP0000.00-K84 7
1.5 Dimensions 10
1.6 Foil design 11
1.7 Device interfaces 12
1.7.1 Cable specifications 12
Hardware 13
1.7.2 Covered keys 13
1.7.3 E-stop 13
1.7.4 Start button 13
1.7.5 Stop button 14
1.7.6 Selection switch 14
1.7.7 Selection switch 14
1.7.8 Incremental encoder 15
1.8 Stickers 16
1.8.1 Serial number sticker 16
1.9 Technical data 17
1.10 Contents of delivery 18
1.10.1 View wall mount 18
1.10.2 Dimensions wall mount 19
1.11 Key and LED configuration 20
1.12 Adding the customer-specific device to Automation Studio 21
1.12.1 Reloading components over the internet 21
1.12.2 Version conflict when inserting modules 22
1.12.3 Customer-specific upgrades: 22
1.12.4 Reloading components from local storage 22
1.12.5 Editing an existing project 22
1.12.6 Display of reloaded components in Automation Studio 22
1.12.7 Inserting the 4XP0000.00-K84 in AS 23

2 Overview of standards 23

3 Figure index 24

4 Table index 24

5 Index 25

1 General information

1.1 Safety notices

1.1.1 Introduction

Programmable logic controllers (PLCs), operating and monitoring devices (industrial PCs, Power Panels, Mobile Panels, etc.) as well as B&R uninterruptible power supplies have been designed, developed, and 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, such risks and hazards include the use of these devices to monitor nuclear reactions in nuclear power plants, as well as flight control systems, flight safety, the control of mass transit systems, medical life support systems and the control of weapons systems.
Both when using programmable logic controllers and when using operating and monitoring devices as control systems in conjunction 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), the safety precautions applying to industrial control systems (e.g. the provision of safety devices such as emergency 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 maintenance are only permitted to be carried out by qualified personnel. Qualified personnel are persons who are familiar with the transport, mounting, installation, commissioning, and operation of the product and who have the appropriate qualifications (e.g. IEC 60364). National accident prevention guidelines must be followed.

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

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 atmospheres, 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 nationally applicable 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 of 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). The ground connection 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 parts with voltage applied are securely covered. During operation, all covers must remain closed.

1.2 Model number

Model number	Description
4XP0000.00-K84	**cHMI Handheld / X2X**

Table 4: Model number - X2X Panel

1.3 General information

The 4XP0000.00-K84 is a custom hand operated device for CNC applications, and is constructed as follows:

- Rose Pilot 250 housing
- B&R standard décor foil
- 12 covered keys with LED
- 2 buttons, 3 rotary switches
- 1 incremental encoder
- Evaluation with X2X electronics
- E-stop, direct wiring
- ~ 4m connection cable

Attention!

The 4XP0000.00-K84 may only be used in conjunction with the Power Panel 4PP480.1505-K04 and 5AP980.1505-B10.

Information:

- **For the incremental encoder must be an own upgrade (4XPENCODER-01) inserted.**
- **In the hardware tree in the automation studio must the incremental encoder be inserted AFTER the 4XP0000.00-K84.**

1.4 Views 4XP0000.00-K84

Catalog photo 4XP0000.00-K84


Figure 1: Catalog photo

Front view 4XP0000.00-K84

Figure 2: Front view

Rear view 4XP0000.00-K84

Figure 3: Rear view

1.5 Dimensions

Dimensions - 4XP0000.00-K84

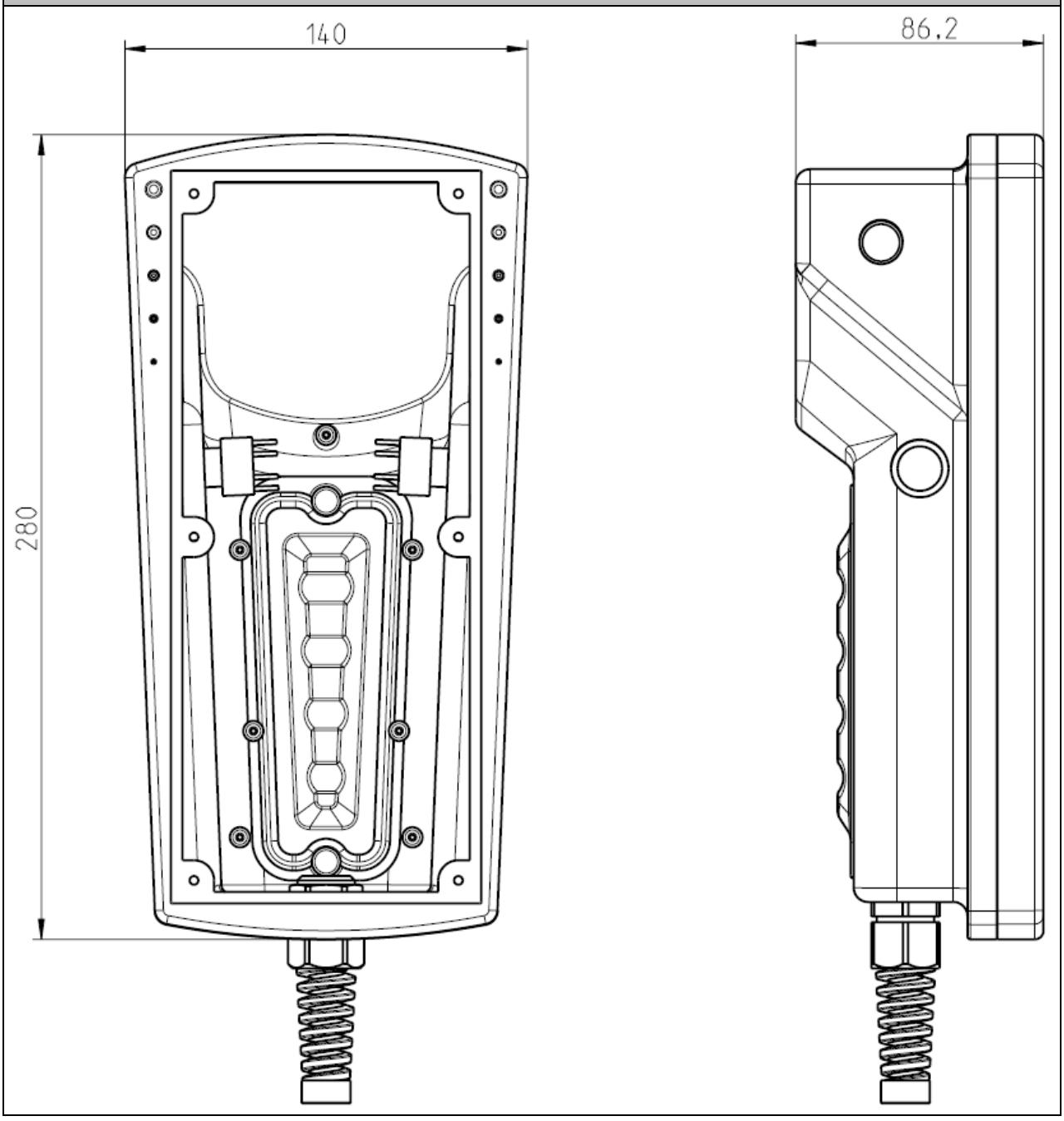
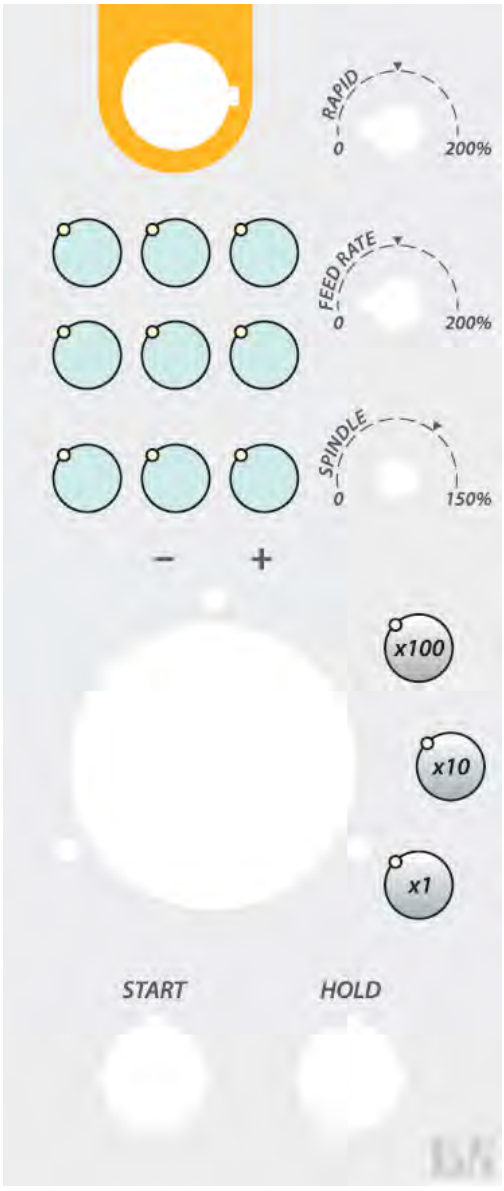


Figure 4: Dimensions

1.6 Foil design

Foil design - 4XP0000.00-K84



COLOR DESCRIPTION:

- = Pantone 427 C
- = Pantone 428 C
- = Pantone Cool Gray 11 C
- = Pantone Process Black C
- = Color gradient, linear (50%)
  Pantone Trans. White C on Pantone 429 C
- = Pantone 123 C
- = Streufeldweiß B&R 017
- = Transparent
- = Cutout

ATTENTION:
This is not a true color printing. This means: The color can deviate a little bit!

Figure 5: Foil design

1.7 Device interfaces

1.7.1 Cable specifications

Connection cable	
Cables	**Description**
Pink	24 VDC
Black	GND
Blue	X2X
Orange	X2X ⊥
White	X2X\
Yellow	E-stop N.C. contact 1 (11)
Gray	E-stop N.C. contact 1 (12)
Green	E-stop N.C. contact 2 (21)
Brown	E-stop N.C. contact 2 (22)
Red/Blue	Push buttons on side (11)
Gray/Pink	Push buttons on side (12)
Shielding mesh	⏚

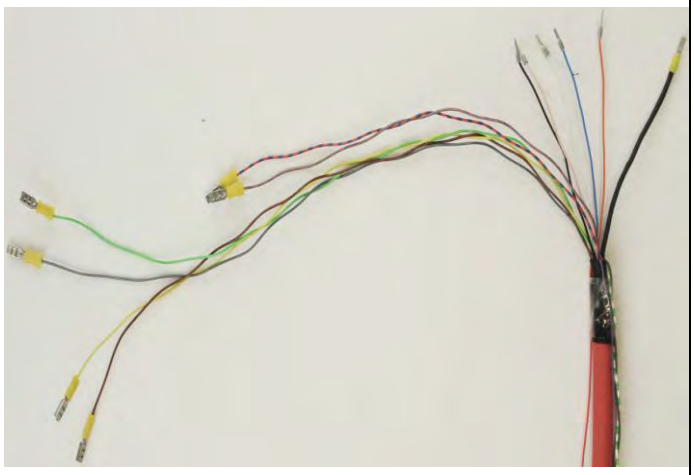


Figure 6: Cable assignments

Hardware

1.7.2 Covered keys

Covered keys	
Features	**Description**
Type	10mm snap-action disks
Amount	12 (all with yellow status LED)
Evaluation	X2X

Figure 7: Covered keys

1.7.3 E-stop

E-stop	
	
Features	**Description**
Type	Rafix 22FS
Amount	1
Evaluation	Direct wiring via connection cable
Contact element	2x N.C. (wires: pink/gray & brown/green)

Figure 8: E-stop

1.7.4 Start button

Start button	
	
Features	**Description**
Color	Green
Front ring	Metal plated
Contact element	1x N.O.
Evaluation	X2X

Figure 9: Start button

1.7.5 Stop button

Stop button	
	
Features	**Description**
Color	Red, high
Front ring	Metal plated
Contact element	1x N.O.
Evaluation	X2X

Figure 10: Stop button

1.7.6 Selection switch

Selection switch	
	
Features	**Description**
Type	Elma Typ04
Amount	2
Evaluation	X2X
Limits	To 15 positions

Figure 11: Selection switch

1.7.7 Selection switch

Selection switch	
	
Features	**Description**
Type	Elma Typ01
Amount	1
Evaluation	X2X
Limits	To 7 positions

Figure 12: Selection switch

1.7.8 Incremental encoder

Incremental encoder (4XPENCODER-01)	
Features	**Description**
Type	ESO77-4-0100-05-D-RK from Ducoder
Amount	1
Data Type	DINT -2.147.483.648 to 2.147.483.647
Evaluation	X2X

Figure 13: Incremental encoder

1.7.8.1 Configuration in automation studio

The following configurations are required in Automation Studio:

Configuration in automation studio

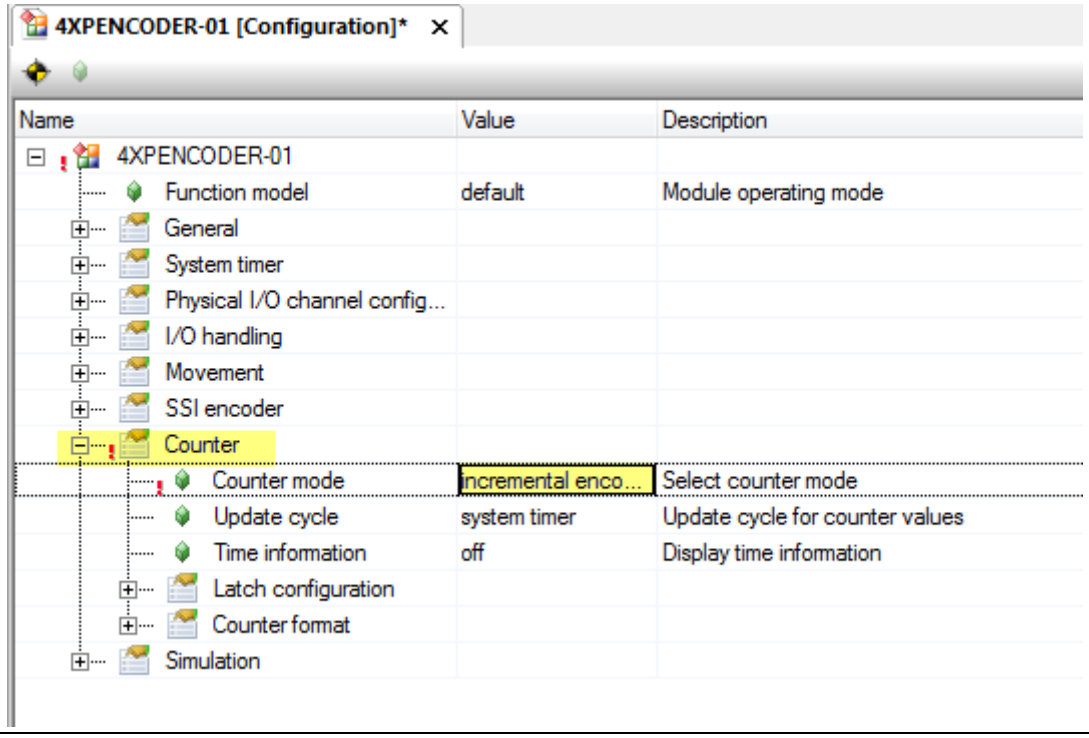


Figure 14: Configuration in automation studio

1.8 Stickers

1.8.1 Serial number sticker

1.8.1.1 General information

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

1.8.1.2 Design / dimensions

Design / dimensions - Serial number sticker

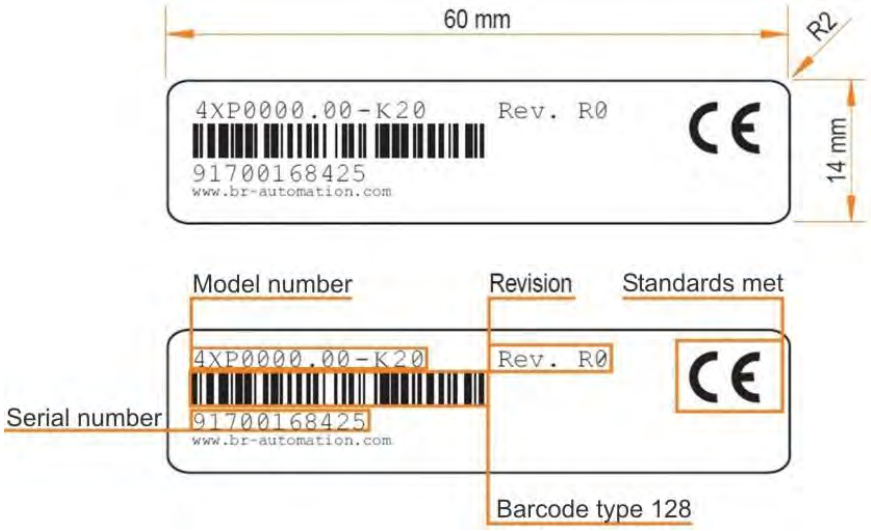


Figure 15: Design / dimensions - Serial number sticker

1.9 Technical data

Features	4XP0000.00-K84
X2X interface	
Type	X2X slave
Electrical isolation	Yes
Design	12-pin connection cable
Distance between 2 stations	Must be used as the last station. Cannot be routed further.
Internal bus supply	Yes
LEDs	1x Run (green), 1x Error (red) On the interior of the handheld device
Keys	Covered keys
Number of keys	12 pcs.
Push buttons	2
Selection switch	3
E-stop	1
Incremental encoder	1
Electrical characteristics	
Power supply	
Rated voltage	24 VDC ±25%
Starting current	Max. 20 A for < 1 ms
Power consumption	170 mA
Mechanical characteristics	
Front	
Frame	Plastic
Membrane	Polyester
Design	B&R Standard
Housing	Plastic
Outer dimensions	
Width	280 mm
Height	140 mm
Depth	86.2 mm
Weight	4,1 kg
Environmental characteristics	
Ambient temperature	
Operation	0 .. 50°C (non-condensing)
Storage	-20 .. 60°C (non-condensing)
Transport	-20 .. 60°C (non-condensing)
Relative humidity	
Operation / Storage / Transport	T <= 40°C: 5% to 90%, non-condensing T > 40°C: 5% to 75%, non-condensing
Protection type	IP54
Altitude	Max. 3000 m

Table 5: Technical data

1.10 Contents of delivery

Number of pieces	Description
1	4XP0000.00-K84
1	Accessory set 4XP0000.00-K84 (Wall mount)

Table 6: Contents of delivery

1.10.1 View wall mount

View wall mount

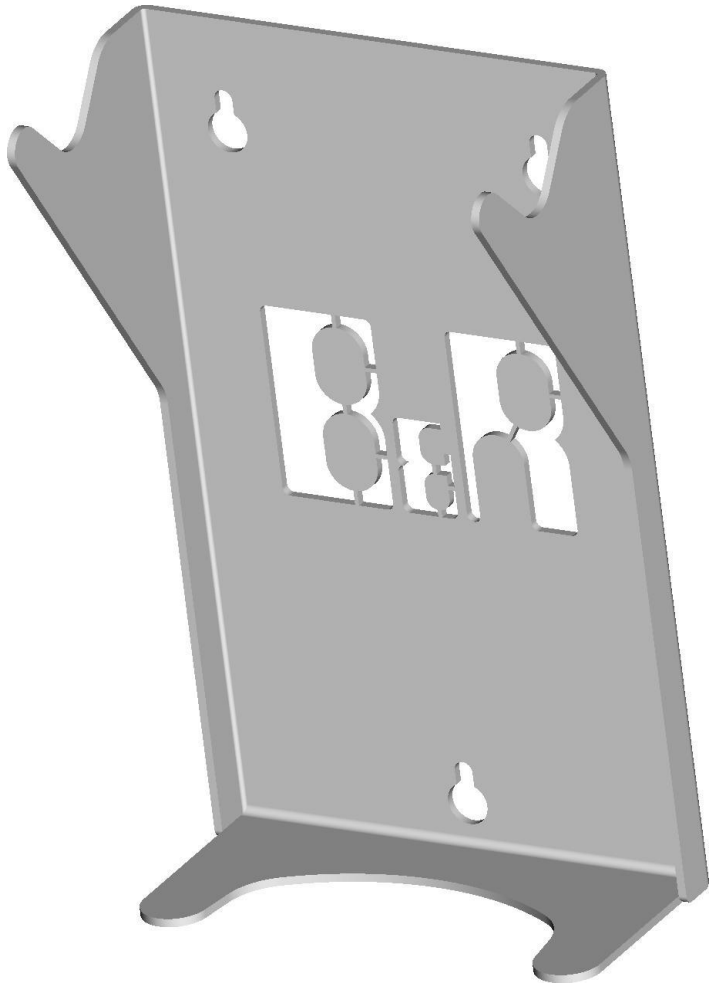


Figure 16: View wall mount

1.10.2 Dimensions wall mount

Dimensions wall mount

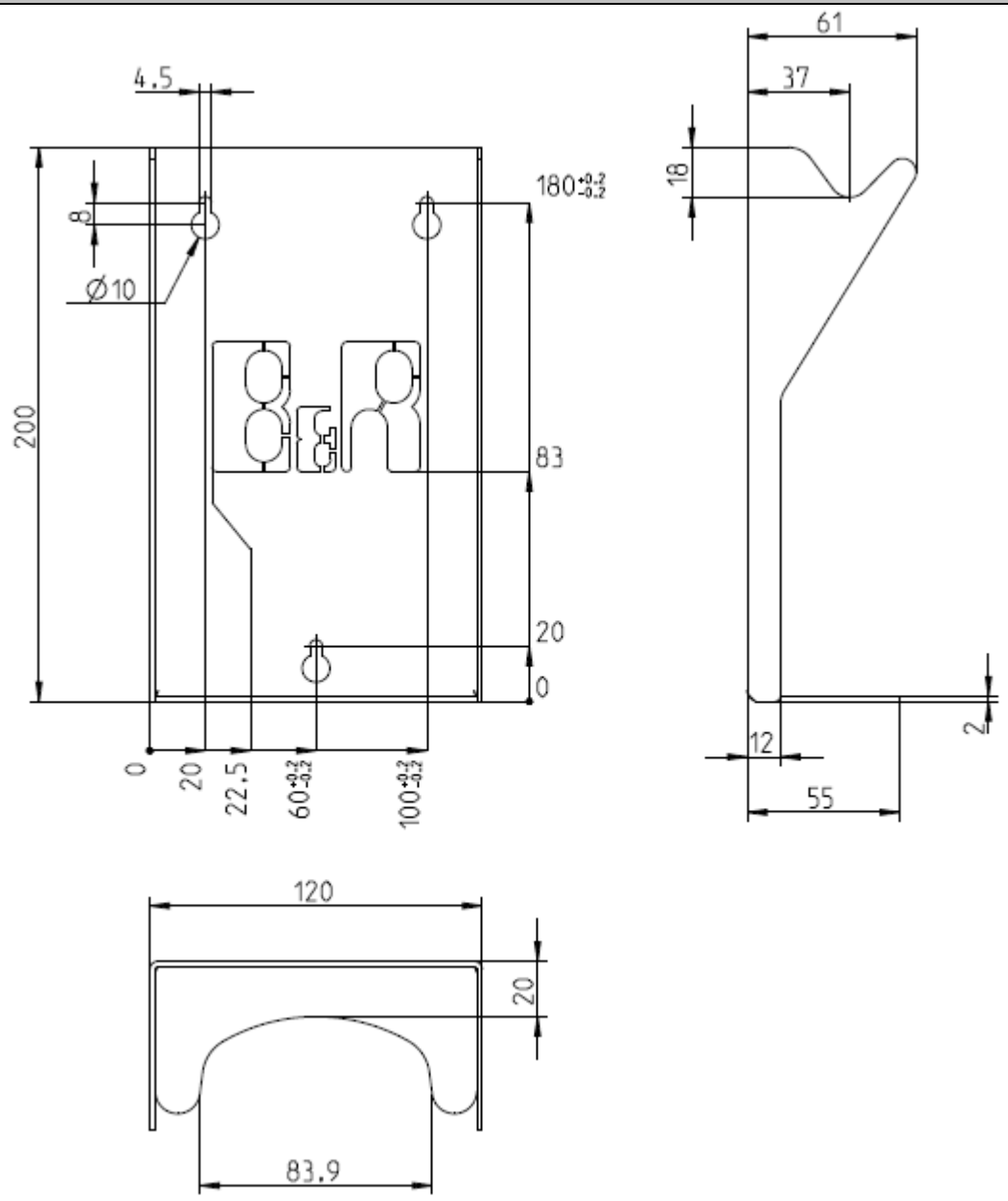


Figure 17: Dimensions wall mount

1.11 Key and LED configuration

Key and LED configuration - 4XP0000.00-K84

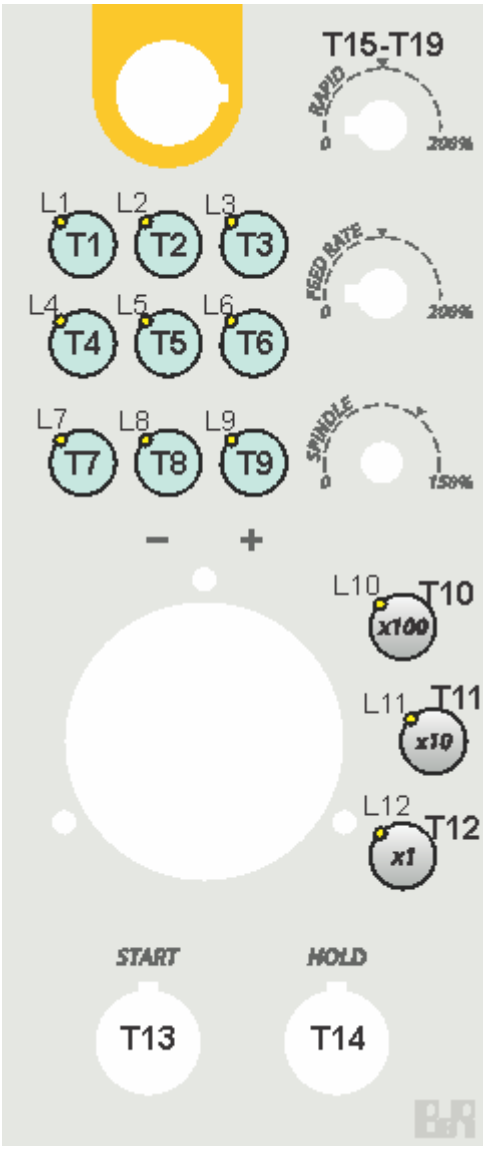


Figure 18: Key and LED configuration

1.12 Adding the customer-specific device to Automation Studio

1.12.1 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 that lists the add-ons that are currently available from 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 cannot 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 upgrades depend on other upgrades, they are shown under the corresponding 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.

1.12.2 Version conflict when inserting modules

If some of the hardware modules in the current project have a higher version than the ones currently open in 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.

1.12.3 Customer-specific upgrades:

If you would also like to see available customer-specific upgrades (e.g. for custom modules), 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.

1.12.4 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 on a local storage device. In the upgrade dialog box in Automation Studio, these can be loaded and installed from a local storage device using the **Browse for local storage...** button.

1.12.5 Editing an existing project

If a component that is being used in an existing project is updated, the newly reloaded hardware module files (HWC, bitmap, firmware), motion libraries, Visual Components Runtime, and Automation Runtime are used when this project is then opened and compiled. 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.

1.12.6 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 **Upgrades** button, all installed upgrades are shown.

1.12.7 Inserting the 4XP0000.00-K84 in AS

The 4XP0000.00-K84 has 2 internal X2X nodes, which must both be inserted in AS in the correct order. The first part of the handheld device can be found in AS under the normal device name (4XP0000.00-K84). The second part evaluates the incremental encoder, which can be found in AS under the name **4XPENCODER-01**. The two devices must be inserted in succession.

The 4XP0000.00-K84 in AS

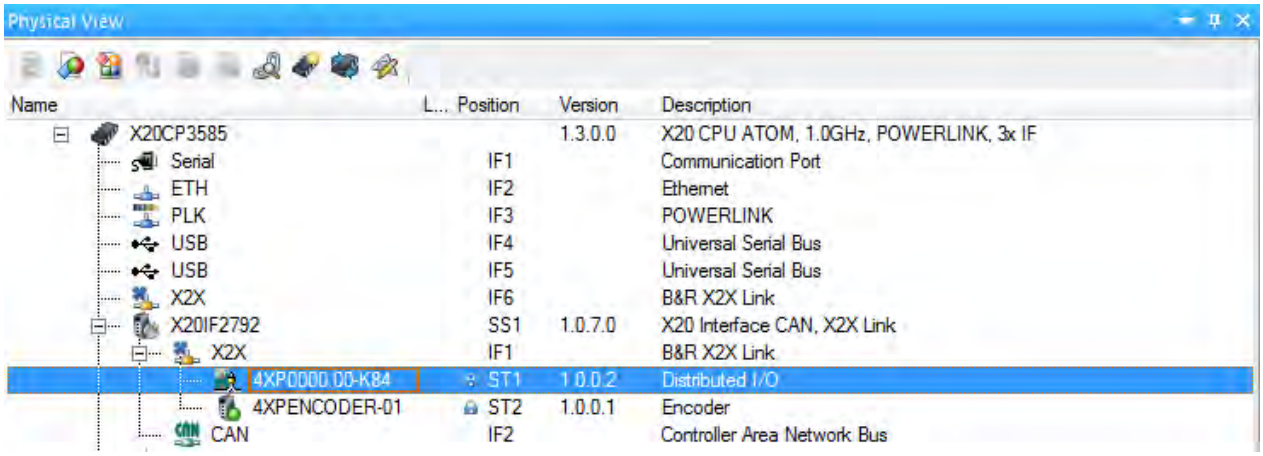


Figure 19: The 4XP0000.00-K84 in AS

2 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

3 Figure index

Figure 1: Catalog photo 7
Figure 2: Front view 8
Figure 3: Rear view 9
Figure 4: Dimensions 10
Figure 5: Foil design 11
Figure 6: Cable assignments 12
Figure 7: Covered keys 13
Figure 8: E-stop 13
Figure 9: Start button 13
Figure 10: Stop button 14
Figure 11: Selection switch 14
Figure 12: Selection switch 14
Figure 13: Incremental encoder 15
Figure 14: Configuration in automation studio 15
Figure 15: Design / dimensions - Serial number sticker 16
Figure 16: View wall mount 18
Figure 17: Dimensions wall mount 19
Figure 18: Key and LED configuration 20
Figure 19: The 4XP0000.00-K84 in AS 23

4 Table index

Table 1: Versions 2
Table 2: Distributors 2
Table 3: Safety notices 2
Table 4: Model number - X2X Panel 6
Table 5: Technical data 17
Table 6: Contents of delivery 18
Table 7: Overview of standards 23

5 Index

D

Distribution 2

F

Figure index 24

I

Index 25

O

Overview of standards 23

S

Safety notices 2

T

Table index 24
Table of contents 3

V

Version information 2