4XP0000.00-K43

Technical documentation

Version: **1.10 (May 2017)**
4XP0000.00-K43

Table of contents

1 Views

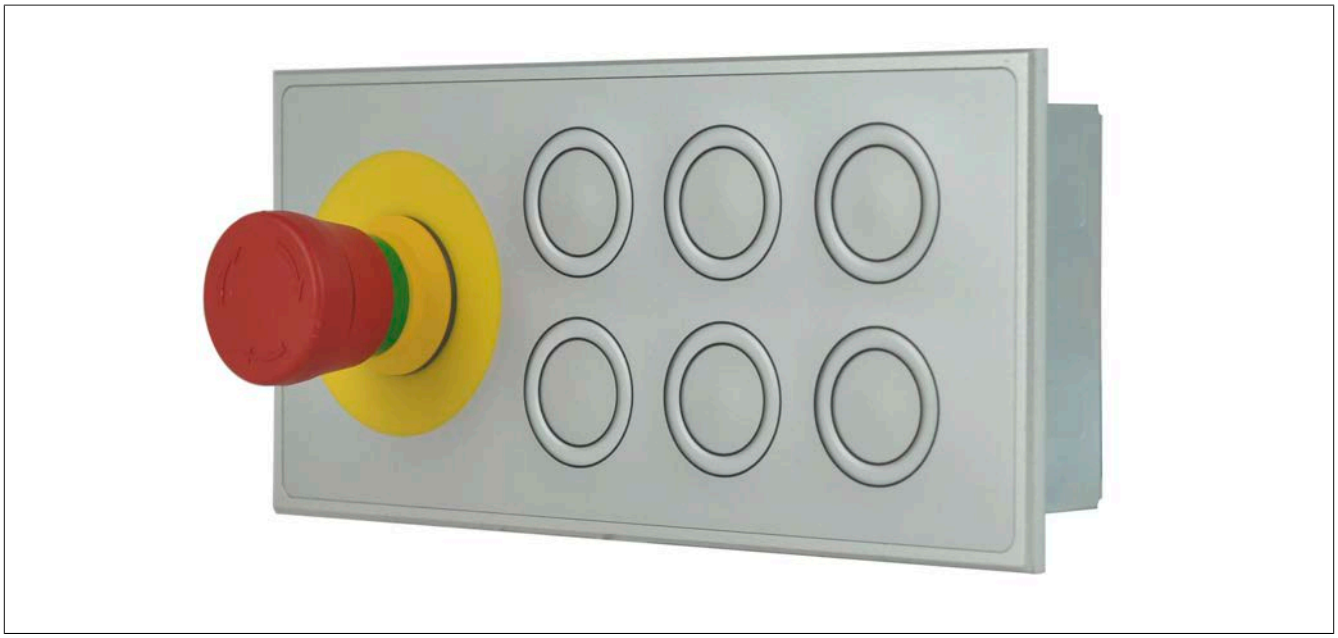


Figure 1: 4XP0000.00-K43 - Oblique view

Figure 2: 4XP0000.00-K43 - Rear view

2 General information

Information:

B&R makes every effort to keep technical descriptions as current as possible. The latest version of this technical description can be downloaded in PDF format from the B&R website at www.br-automation.com.

This user's manual is not intended for end customers! It is the responsibility of the machine manufacturer or system provider to provide the safety guidelines relevant to end customers in the operating instructions for the end customer in the respective local language.

2.1 Order data

Model number	Short description	Figure
	Keypad modules	
4XP0000.00-K43	X2X keypad module, 6 B&R illuminated ring keys / 2x 4 colors (red, green, yellow, white)/ 1x 4 colors (red, green, yellow, blue)/ 3x 3 colors (red, green, yellow), X2X interface, emergency stop button, 24 VDC power supply, IP65 protection (from front), order terminal block 1x 0TB1108.8110 and 1x 0TB1104.8100 separately	
	Required accessories	
	Terminal blocks	
0TB1104.8100	Accessory terminal block(3.5), 4 pins cage clamp 1,5 sq. mm protected against vibration by the screw flange	
0TB1108.8110	Accessory terminal block, 8-pin, cage clamp, 1.5 mm², protected against vibration by the screw flange	
	Im Lieferumfang enthalten	
0TB703.81	Accessory 3-pin cage clamp, RM 3.5	

Table 1: 4XP0000.00-K43 - Order data

2.1.1 Description

4XP0000.00-K43 is a generally available add-on keypad with the following specifications:

- B&R panel overlay design
- Aluminum front with anodized surface
- Emergency stop for direct wiring
- 1 B&R illuminated ring key, with 4-color illumination (red, yellow, green, blue)
- 3 B&R illuminated ring keys, each with 3-color illumination (red, yellow, green)
- 2 B&R illuminated ring keys, each with 4-color illumination (red, yellow, green, white)
- All keys can be marked with slide-in labels and evaluated using B&R X2X electronics

2.1.2 Version information

Version	Date	Comment	Responsible
1.00 (starting with Rev. A0)	2010-04-12	First edition	Manuel Edtmayr
1.10	2017-05-03	Updated data sheet.	Nadine Koch

Table 2: Version information

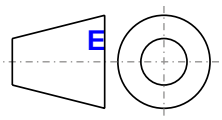
2.2 Organization of safety notices

Safety notices in this manual are organized as follows:

Safety notice	Description
Danger!	Disregarding these safety guidelines and notices can be life-threatening.
Caution!	Disregarding these safety guidelines and notices can result in severe injury or substantial damage to property.
Warning!	Disregarding these safety guidelines and notices can result in injury or damage to property.
Information:	This information is important for preventing errors.

Table 3: Organization of safety notices

2.3 Guidelines



European dimension standards apply to all dimension diagrams in this document.

All dimensions are specified in mm.

Unless otherwise specified, the following general tolerances apply:

Range of nominal sizes	General tolerance according to DIN ISO 2768 (medium)
Up to 6 mm	±0.1 mm
For 6 to 30 mm	±0.2 mm
For 30 to 120 mm	±0.3 mm
For 120 to 400 mm	±0.5 mm
For 400 to 1000 mm	±0.8 mm

Table 4: Range of nominal sizes

3 Complete system - Technical data

3.1 +24 VDC power supply

Input voltage: 24 VDC ±25%

The pinout is listed in the following table and printed on the sticker. The supply is internally protected so that the device cannot be damaged if there is an overload or if the voltage supply is connected incorrectly. When dimensioning the power supply, the maximum power consumption of the Automation Panel being used must be taken into consideration.

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

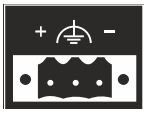
Power supply		
Protected against reverse polarity		3-pin, male
Pin	**Description**	
1	+	
2	Functional ground	
3	-	
Accessories		
0TB703.81	Accessory 3-pin cage clamp, RM 3.5	

Table 5: 24 VDC power supply interface

3.2 Status LED

Status LED		
LED	**Color**	**Description**
Run	Green	Connection to X2X bus established
Error	Red	No connection to X2X bus possible
		

Table 6: Status LED

3.3 X2X interface

The panel is equipped with one X2X interface. The 8-pin male multipoint connector is electrically isolated.

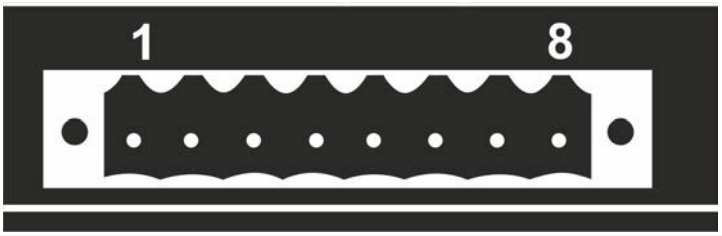
			X2X interface
Connection	**Description**		
1	X2X	X2X IN	
2	X2X ⊥		
3	X2X\		
4	SHLD		
5	X2X	X2X OUT	
6	X2X ⊥		
7	X2X \		
8	SHLD		
Accessories			
0TB1108.8110	8-pin cage clamp terminal block (3.5)		

Table 7: X2X interface

3.4 Emergency stop 1.30.273.511/0300

Emergency stop RAFIX 22FS+		
Manufacturer	RAFI	
Type	RAFIX 22FS+	
Manufacturer number	1.30.273.511/0300	
Contact function	Maintained	
Resetting	By rotating to the right	
Service life	50,000 actuations	
Illumination	No	

Table 8: Emergency stop 1.30.273.511/0300

Note:

Additional technical data can be found on the manufacturer's website: www.rafi.de.

3.5 Technical data

Model number	4XP0000.00-K43
General information	
LED status indicators	1x Run, 1x Error (red)
Certification	
CE	Yes
UL	cULus E115267 Industrial Control Equipment
Interfaces	
X2X	
Type	X2X slave
Design	8-pin male multipoint connector
Internal bus supply	Yes
Distance between 2 stations	100 m
Electrical isolation	No
Keys	
Illuminated ring keys	6x B&R illuminated ring keys (round)
Illuminated ring keys	
Color	2x (red, yellow, green, white) 3x (red, yellow, green) 1x (red, yellow, green, blue)
Features	
Emergency stop	
Type	Rafix 22FS+, 1.30.273.511/0300
Contact element	2x normally closed contact
Electrical characteristics	
Nominal voltage	24 VDC ±25%, electrically isolated
Inrush current	Max. 20 A for <1 ms
Power consumption	240 mA
Operating conditions	
EN 60529 protection	Back: IP20 Front: IP65
UL 50 protection	Front: NEMA 250 type 4X, dust and sprayed water protection
Environmental conditions	
Temperature	
Operation	0 to +50°C
Storage	-20 to +60°C
Transport	-20 to +60°C
Relative humidity	
Operation	T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: < 75%, non-condensing
Storage	T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: < 75%, non-condensing
Transport	T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: < 75%, non-condensing
Elevation	
Operation	Max. 3000 m
Mechanical characteristics	
Housing	
Material	Metal
Front	
Frame	Naturally anodized aluminum
Design	RAL 9006
Panel overlay	
Material	Polyester
Gasket	Flat gasket around display front
Dimensions	
Width	170 mm
Height	80 mm
Depth	32 mm
Weight	430 g

Table 9: 4XP0000.00-K43 - Technical data

3.6 Dimensions

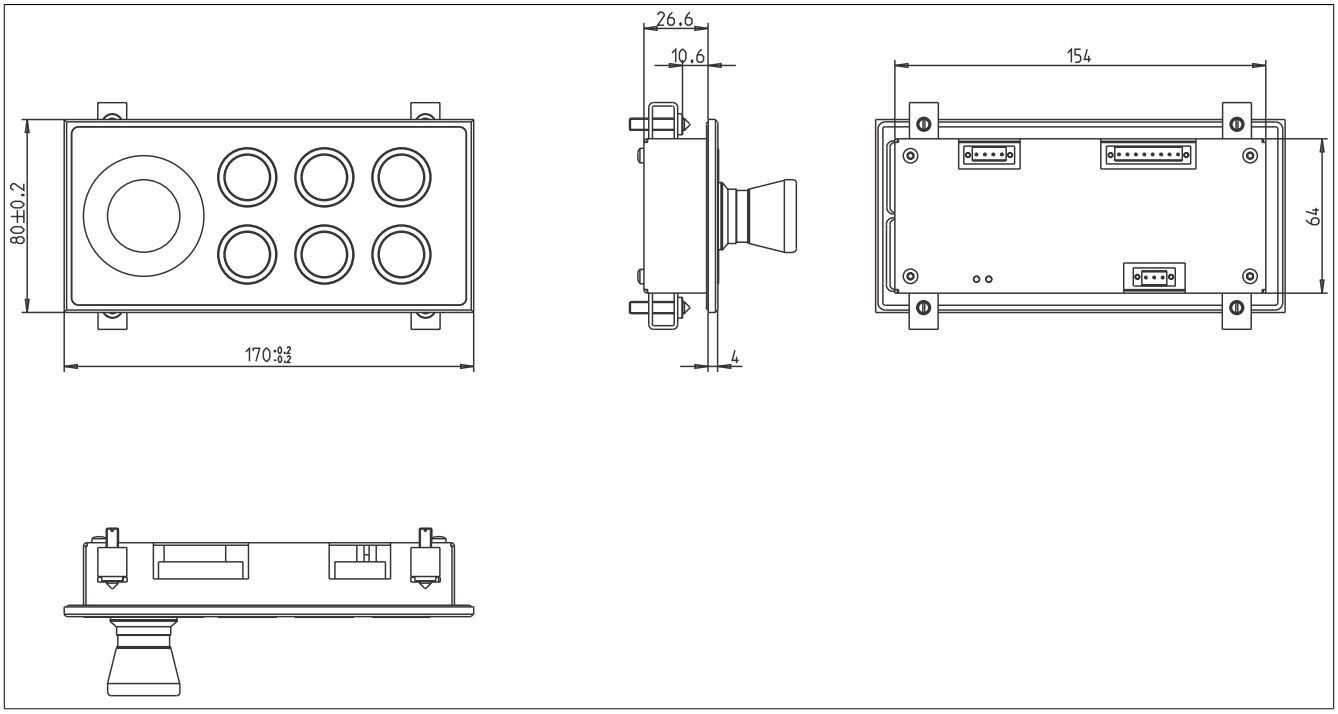


Figure 3: 4XP0000.00-K43 - Dimensions

Information:

Cutout dimensions: 67 ± 0.5 mm x 157 ± 0.5 mm

3.7 Panel overlay design

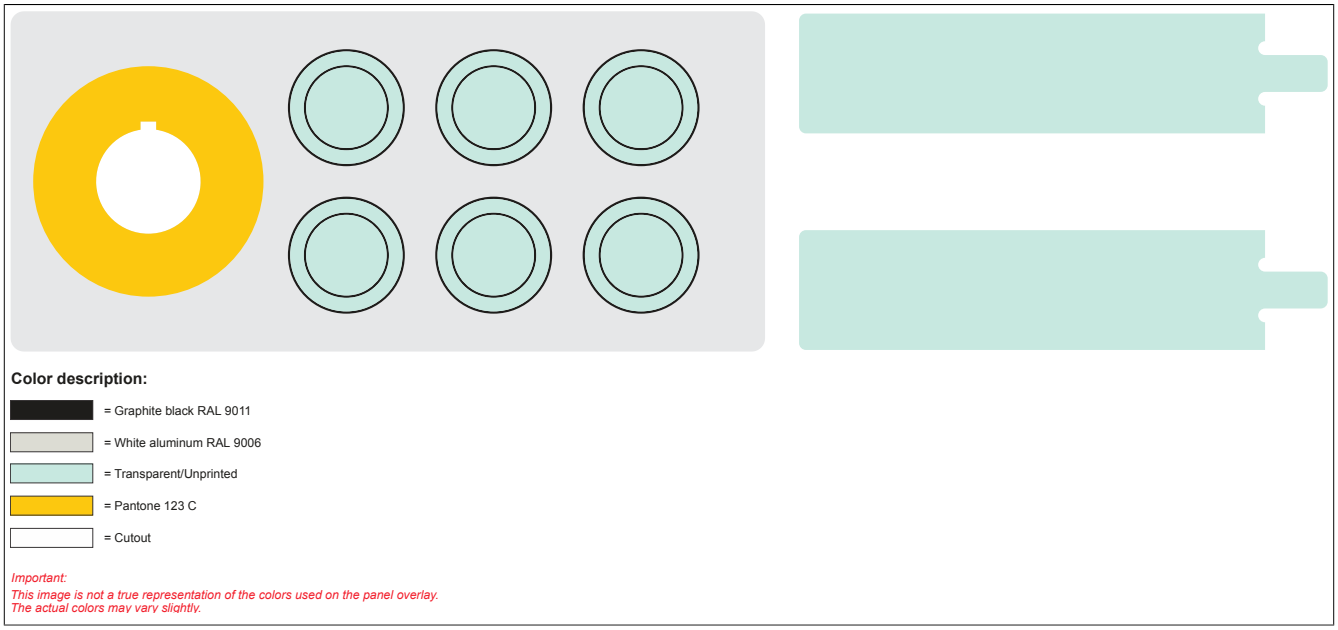


Figure 4: 4XP0000.00-K43 - Panel overlay design and slide-in label design

3.8 Device label

This label is attached to the back as a way to identify the interfaces.

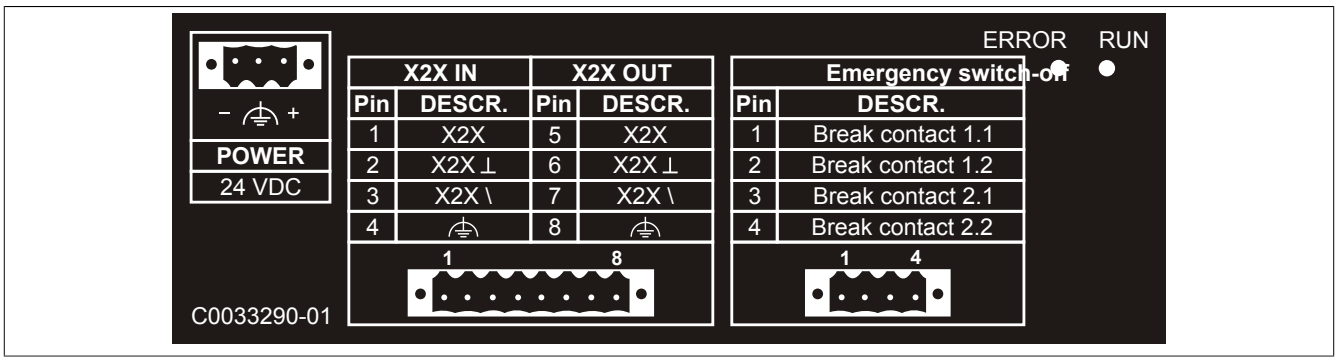


Figure 5: 4XP0000.00-K43 - Device label

3.9 Key and LED configuration

Figure 6: 4XP0000.00-K43 - Key and LED matrix

4 Safety guidelines

4.1 Intended use

Programmable logic controllers (PLCs), operating/monitoring devices (industrial PCs, Power Panels, Mobile Panels, etc.) and B&R uninterruptible power supplies have been designed, developed and manufactured for conventional use in industrial environments. 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, their use in flight control or flight safety systems as well as in the control of mass transportation systems, medical life support systems or weapons systems.

4.2 Protection against electrostatic discharge

Electrical components that can be damaged by electrostatic discharge (ESD) must be handled accordingly.

4.2.1 Packaging

- **Electrical components with a housing**
  ...do not require special ESD packaging but must be handled properly (see "Electrical components with a housing").
- **Electrical components without a housing**
  …are protected by ESD-suitable packaging.

4.2.2 Guidelines for proper ESD handling

Electrical components with a housing

- Do not touch the connector contacts on connected cables.
- Do not touch the contact tips on circuit boards.

Electrical components without a housing

The following points apply in addition to the points listed under "Electrical components with a housing":

- Any persons handling electrical components or devices with installed electrical components must be grounded.
- Components are only permitted to be touched on their narrow sides or front plate.
- Components should always be stored in a suitable medium (ESD packaging, conductive foam, etc.). Metallic surfaces are not suitable storage surfaces!
- Components should not be subjected to electrostatic discharge (e.g. through the use of charged plastics).
- Ensure a minimum distance of 10 cm from monitors and TV sets.
- Measuring instruments and equipment must be grounded.
- Probes on potential-free measuring instruments must be discharged on sufficiently grounded surfaces before taking measurements.

Individual components

- ESD protective measures for individual components are thoroughly integrated at B&R (conductive floors, footwear, arm bands, etc.).
- These increased ESD protective measures for individual components are not necessary for customers handling B&R products.

4.3 Policies and procedures

Electronic devices are never completely failsafe. If the programmable control system, operating/monitoring device or uninterruptible power supply fails, the user is responsible for ensuring that other connected devices, e.g. motors, are brought to a secure state.

When using programmable logic controllers or operating/monitoring devices as control systems together with a soft PLC (e.g. B&R Automation Runtime or comparable product) or slot PLC (e.g. B&R LS251 or comparable product), safety precautions relevant to industrial control systems (e.g. the provision of safety devices such as emergency stop, 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 the installation, commissioning and servicing of devices are only permitted to be carried out by qualified personnel. Qualified personnel are those familiar with the transport, mounting, installation, commissioning and operation of devices who also have the appropriate qualifications (e.g. IEC 60364). National accident prevention regulations must be observed.
The safety notices, 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.

4.4 Transport and storage

During transport and storage, devices must be protected against undue stress (mechanical loads, temperature, moisture, corrosive atmospheres, etc.).

4.5 Installation

- These devices are not ready for use upon delivery and must be installed and wired according to the specifications in this documentation in order for the EMC limit values to apply.
- Installation must be performed according to this documentation using suitable equipment and tools.
- Devices are only permitted to be installed by qualified personnel without voltage applied. Before installation, voltage to the control cabinet must be switched off and prevented from being switched on again.
- General safety guidelines and national accident prevention regulations must be observed.
- Electrical installation must be carried out in accordance with applicable guidelines (e.g. line cross sections, fuses, protective ground connections).

4.6 Operation

4.6.1 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. Touching one of these parts can result in a life-threatening electric shock. This could lead to death, severe injury or damage to property.

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

Before switching on the device, all parts that carry voltage must be securely covered. During operation, all covers must remain closed.

4.6.2 Environmental conditions - Dust, moisture, corrosive gases

The use of operating/monitoring devices (e.g. industrial PCs, Power Panels, Mobile Panels, etc.) and uninterruptible power supplies in very dusty environments should be avoided. Dust collection on the devices can affect functionality and may prevent sufficient cooling, especially in systems with active cooling systems (fans).

The presence of corrosive gases can also lead to malfunctions. When combined with high temperature and humidity, corrosive gases – e.g. with sulfur, nitrogen and chlorine components – can induce chemical reactions that can damage electronic components very quickly. Signs of the presence of corrosive gases are blackened copper surfaces and cable ends on existing equipment.

For operation in dusty or moist conditions, correctly installed (e.g. cutout installations) operating/monitoring devices like the Automation Panel or Power Panel are protected on the front. The back of all devices must be protected from dust and moisture and cleaned at suitable intervals.

4.6.3 Viruses and dangerous programs

This system is subject to potential risk each time data is exchanged or software is installed from a data medium (e.g. diskette, CD-ROM, USB flash drive, etc.), a network connection or the Internet. The user is responsible for assessing these dangers, implementing preventive measures such as virus protection programs, firewalls, etc. and making sure that software is only obtained from trusted sources.

4.7 Environmentally friendly disposal

All B&R programmable controllers, operating/monitoring devices and uninterruptible power supplies are designed to inflict as little harm as possible on the environment.

4.7.1 Separation of materials

It is necessary to separate different materials so the device can undergo an environmentally friendly recycling process.

Component	Disposal
Programmable logic controllers Operating/Monitoring devices Uninterruptible power supply Batteries and rechargeable batteries Cables	Electronics recycling
Cardboard box / Paper packaging	Cardboard box / Paper recycling
Plastic packaging	Plastic recycling

Table 10: Environmentally friendly disposal

Disposal must comply with applicable legal regulations.

5 Adding a customized device in Automation Studio

5.1 Downloading components from the Internet

In order to download components from the Internet, it is first necessary to launch Automation Studio and open the project in which the new components (hardware modules, motion libraries, Visual Components Runtime, Automation Runtime) will be used. Selecting Tools / Upgrades from the main menu opens a window that lists the upgrades currently available on the B&R website:

The columns list the following information:

- Component name
- Component version
- Version of Automation Studio: 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 enabled.
- Size of the data to be downloaded
- Descriptive text for the component that should also contain information about corrected errors. If there is a more detailed description for the upgrade available on the B&R website, 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.

Selecting the component and then confirming the selection by clicking on the OK button copies the files required for the selected module (HWC, bitmaps, firmware) to the Automation Studio installation. If the installation already contains files with the same names, these are replaced without warning. Once this is done, the user can add the new hardware modules to 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 hardware definition and configuration, a warm restart is performed automatically.

Information:

Automation Runtime V2.92 (SG4) must be installed in order to successfully download hardware modules.

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

If the user selects a motion library, it will be 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 subsequently loadable 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 dependencies exist between upgrades, they are shown under the respective upgrades. This is the case, for example, if 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 being used in the project. These upgrades are therefore not downloaded automatically.

5.2 Version conflict when adding 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 message is shown:

"Please select Tools/Upgrades from the main menu to install the upgrades for the modules shown in the window."

5.3 Customized upgrades

If customized upgrades should also be displayed (e.g. for customized modules), checkbox "Show customer-specific upgrades" must be enabled. Upgrades for the customized modules are shown after a successful login using username and password.

5.4 Subsequently loading components from a data storage device

If the workstation does not have Internet access, the upgrades can be downloaded to another location from the B&R homepage and then saved to a data storage device. They can then be loaded and installed from the data storage device in the upgrade window in Automation Studio by clicking on "Browse for local storage".

5.5 Behavior when editing existing projects

If components being used in an existing project are updated, then the subsequently loaded hardware module files (hardware configuration, bitmap, firmware), motion libraries, Visual Components Runtime and Automation Runtime will be used when the project is opened and compiled. This only applies to motion libraries and Automation Runtime, however, if the same version of the motion library or Automation Runtime is configured in the project. The version is not changed automatically.

5.6 Displaying subsequently loaded components in Automation Studio

Information about which subsequently loaded components have been installed can be accessed by clicking on the "Upgrades" button in the "About" window in Automation Studio (Help / About Automation Studio).

5.7 Overview of standards

Overview of standards	
Standard	Description
EN 61000-6-4	Electromagnetic compatibility (EMC) - Part 2 - Generic standards - Emission standard for industrial environments (EN 50081-2 has been replaced by EN 61000-6-4)
IEC/CISPR 11	Industrial, scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement
EN 61000-6-2	Electromagnetic compatibility (EMC) - Part 2 - Generic standards - Immunity for industrial environments (EN 50082-2 has been replaced by EN 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 of machines - Part 1: General requirements
EN 60529	IP20 protection

Table 11: Overview of standards

6 Maintenance and servicing

This chapter describes servicing / maintenance work that can be carried out by a qualified end user.

6.1 Cleaning

Danger!

Switch off this device before cleaning in order to prevent unintended functions from being triggered when handling the touch screen or pressing keys.

Use a moist cloth to clean this device. Only use water with detergent, a screen cleaning agent or alcohol (ethanol) to moisten the cloth. Apply the cleaning agent to the cloth beforehand; do not spray it directly on the device! Never use aggressive solvents, chemicals, scouring agents, pressurized air or steam jets.

6.2 Surface resistance of the panel overlay

The panel overlay conforms to DIN 42115 (Part 2). This means it is resistant to exposure to the following chemicals for a 24-hour period with no visible signs of damage:

Ethanol Cyclohexanol Diacetone alcohol Glycol Isopropanol Glycerine Methanol Triacetin Dowandol DRM/PM	Formaldehyde 37%-42% Acetaldehyde Aliphatic hydrocarbons Toluene Xylene White spirits	Trichloroethane Ethyl acetate Diethyl ether n-Butyl acetate Amyl acetate Butylcellosolve Ether
Acetone Methyl ethyl ketone Dioxan Cyclohexanone Methylisobutylketone (MIBK) Isophorone	Formic acid <50% Acetic acid <50% Phosphoric acid <30% Hydrochloric acid <36% Nitric acid <10% Trichloracetic acid <50% Sulphuric acid <10%	Sodium chloride <20% Hydrogen peroxide <25% Potassium carbonate Washing agents Tenside Fabric conditioner Iron (II) chloride Iron (III) chloride Dibutyl phthalate Dioctyl phthalate Sodium carbonate
Ammonia <40% Caustic soda <40% Potassium hydroxide Alkali carbonate Bichromate Potassium Acetonitrile Sodium bisulphate	Cutting oil Diesel oil Linseed oil Paraffin oil Ricinus oil Silicon oil Turpentine oil substitute Brake fluid Aviation fuel Gasoline Water Sea water Decon	

Information:

The specified characteristics, features and limit values only apply to this individual component and can deviate from those specified for the complete system. For the complete system in which this individual component is used, refer to the data given specifically for that device.

The panel overlay conforms to DIN 42115 Part 2 for exposure to glacial acetic acid for less than one hour without visible damage.

Figure index