

## 2.3 BC4321 and BC4321-1

### 2.3.1 General information

CAN (Controller Area Network) has spread considerably in automation technology. CAN topology is based on a line structure and uses twisted pair wires for data transfer. CANopen is a higher-layer protocol based on CAN. This standardized protocol offers highly flexible configuration possibilities.

The BC4321 and BC4321-1 bus controllers make it possible to connect X2X Link I/O nodes to CANopen. Both bus controllers have automatic transfer rate detection and AutoMapping of the I/O modules connected with X2X Link. All CANopen operating modes such as synchronous, event, and polling are supported together with PDO linking, life-/node guarding, emergency objects, and much more.

Unlike the BC4321, the BC4321-1 bus controller offers the possibility of supplying the CAN interface via the M12 CAN bus plug. This eliminates the need for a voltage feed via the M8 supply plug.

- Fieldbus: CANopen
- 8 digital channels, can be configured as input or output
- Simple I/O configuration via the fieldbus
- Integrated connection to the local expansions via X2X Link for 39 additional modules
- Configurable cycle time for local expansion from 400 µs to 1.3 ms (default: 1 ms)

### Information:

**This bus controller only supports the default function model of multi-function modules. The default function model is explained in the description for each multi-function module.**

### 2.3.2 Order data

| Model number                                            | Short description                                                                                                                                                                                       | <div>Figure</div>  |
|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
|                                                         | CANopen bus controller                                                                                                                                                                                  |                                                                                                      |
| X67BC4321                                               | X67 CAN bus controller, X2X Link supply 3 W, 8 digital channels can be configured as input or output, 24 VDC, 0.5 A, configurable input filter, LED status indicators                                   |                                                                                                      |
| X67BC4321-1                                             | X67 CAN bus controller, X2X Link supply 3 W, 8 digital channels can be configured as input or output, 24 VDC, 0.5 A, configurable input filter, I/O supply possible via CAN plug, LED status indicators |                                                                                                      |
|                                                         | Required accessories                                                                                                                                                                                    |                                                                                                      |
| X67AC8C00                                               | X67 CAN bus Y-connector                                                                                                                                                                                 |                                                                                                      |
| X67AC9C03                                               | X67 CAN bus terminating resistor M12                                                                                                                                                                    |                                                                                                      |
| See 2.3.18 "Required cables and connectors" on page 105 |                                                                                                                                                                                                         |                                                                                                      |
|                                                         |                                                                                                                                                                                                         |                                                                                                      |

Table 20: BC4321 / BC4321-1 - Order data

### 2.3.3 Technical data

| Product ID                           | BC4321                                                                                                                                                     | BC4321-1 |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>Short description</b>             |                                                                                                                                                            |          |
| Bus controller                       | CANopen                                                                                                                                                    |          |
| Inputs/outputs                       | 8 digital channels, configured as inputs or outputs using software, inputs with special functions                                                          |          |
| Rated voltage                        | 24 VDC                                                                                                                                                     |          |
| <b>Fieldbus</b>                      |                                                                                                                                                            |          |
| Type                                 | CANopen                                                                                                                                                    |          |
| Design                               | M12 circular plugs (plug on the module)                                                                                                                    |          |
| Maximum distance                     | 1000 m                                                                                                                                                     |          |
| Maximum transfer rate                | 1 MBit/s, automatic transfer rate detection                                                                                                                |          |
| <b>Digital inputs</b>                |                                                                                                                                                            |          |
| Input filter<br>Hardware<br>Software | $\leq 10 \mu\text{s}$ (channels 1 - 4) / $\leq 70 \mu\text{s}$ (channels 5 - 8)<br>Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals |          |
| Input circuit                        | Sink                                                                                                                                                       |          |
| Additional functions for inputs      | 50 kHz event counting, gate measurement                                                                                                                    |          |

Table 21: BC4321 / BC4321-1 - Technical data

**X67 System modules • Bus controller modules • BC4321 and BC4321-1**

| Product ID                                                                        | BC4321                                                                                                                                           | BC4321-1                                                             |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| <b>Digital outputs</b>                                                            |                                                                                                                                                  |                                                                      |
| Rated output current                                                              | 0.5 A                                                                                                                                            |                                                                      |
| Total current                                                                     | 4.0 A                                                                                                                                            |                                                                      |
| Output circuit                                                                    | Source                                                                                                                                           |                                                                      |
| Output protection                                                                 | Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply |                                                                      |
| <b>General information</b>                                                        |                                                                                                                                                  |                                                                      |
| Status indicators                                                                 | I/O function for each channel, supply voltage, bus function                                                                                      |                                                                      |
| Diagnostics<br>I/O supply<br>Outputs                                              | Yes, with status LED and software status<br>Yes, with status LED and software status                                                             |                                                                      |
| Electrical isolation<br>Fieldbus - X2X Link<br>Channel - Bus<br>Channel - Channel | No<br>Yes (CAN and X2X)<br>No                                                                                                                    | Yes<br>No (CAN) / Yes (X2X)<br>No                                    |
| Sensor/actuator supply                                                            | 0.5 A total current                                                                                                                              |                                                                      |
| Power consumption<br>Fieldbus<br>I/O internal<br>X2X Link supply                  | 2.7 W<br>2.0 W<br>6.6 W at maximum power output for connected I/O modules                                                                        | 3.8 W<br>-<br>5.5 W at maximum power output for connected I/O module |
| Power output                                                                      | 3.0 W X2X Link supply for I/O modules                                                                                                            | 3.0 W X2X Link supply for I/O modules                                |
| Connection type<br>Fieldbus<br>X2X Link<br>Inputs/outputs<br>Module supply        | M12 (A-coded)<br>M12 (B-coded)<br>M8 (3-pin)<br>M8 (4-pin)                                                                                       |                                                                      |
| Certification<br>Ex zone 2                                                        | CE, cRUus, GOST-R<br>II 3G EEx nA II T5, IP67, Ta = 0 - 60°C                                                                                     |                                                                      |
| <b>Operational conditions</b>                                                     |                                                                                                                                                  |                                                                      |
| Operating temperature                                                             | 0 to +60°C                                                                                                                                       |                                                                      |
| Mounting orientation                                                              | Any                                                                                                                                              |                                                                      |
| Installation at altitudes above sea level<br>0 - 2000 m<br>>2000 m                | No derating<br>Reduction of ambient temperature by 0.5°C per 100 m                                                                               |                                                                      |
| Protection type                                                                   | IP67                                                                                                                                             |                                                                      |
| <b>Storage and transport conditions</b>                                           |                                                                                                                                                  |                                                                      |
| Temperature                                                                       | -25 to +85°C                                                                                                                                     |                                                                      |
| <b>Mechanical characteristics</b>                                                 |                                                                                                                                                  |                                                                      |
| Dimensions (W x H x D)                                                            | 53 x 85 x 42 mm                                                                                                                                  |                                                                      |
| Weight                                                                            | 195 g                                                                                                                                            |                                                                      |
| Torque for connections<br>M8<br>M12                                               | Max. 0.4 Nm<br>Max. 0.6 Nm                                                                                                                       |                                                                      |

Table 21: BC4321 / BC4321-1 - Technical data (Forts.)

## 2.3.4 Additional technical data

| Product ID                                             | BC4321                                                                                                                  | BC4321-1 |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------|
| Module supply                                          |                                                                                                                         |          |
| Rated voltage                                          | 24 VDC                                                                                                                  |          |
| Voltage range                                          | 18 - 30 VDC                                                                                                             |          |
| Integrated protection                                  | Reverse polarity protection                                                                                             |          |
| Power consumption<br>Sensor/actuator supply            | Max. 12 W <sup>1)</sup>                                                                                                 |          |
| Sensor/actuator supply                                 |                                                                                                                         |          |
| Voltage                                                | Module supply minus voltage drop for short circuit protection                                                           |          |
| Voltage drop for short circuit protection<br>at 500 mA | Max. 2 VDC                                                                                                              |          |
| Total current                                          | Max. 0.5 A                                                                                                              |          |
| Short circuit protection                               | Yes                                                                                                                     |          |
| Fieldbus                                               |                                                                                                                         |          |
| Controller                                             | SJA 1000 controller                                                                                                     |          |
| Processor                                              | 16-bit RISC processor                                                                                                   |          |
| Memory                                                 | 128 KB                                                                                                                  |          |
| Network-capable                                        | Yes                                                                                                                     |          |
| Bus termination resistor                               | Can be optionally screwed onto the Y-connector<br>(see Accessories chapter in the section 4.3 "Connectors" on page 722) |          |
| Digital inputs                                         |                                                                                                                         |          |
| Input voltage                                          | 18 - 30 VDC                                                                                                             |          |
| Input current at 24 VDC                                | Typ. 4 mA                                                                                                               |          |
| Input resistance                                       | Typ. 6 k $\Omega$                                                                                                       |          |
| Switching threshold<br>Low<br>High                     | <5 VDC<br>>15 VDC                                                                                                       |          |
| Event counter                                          |                                                                                                                         |          |
| Number of counters                                     | 2                                                                                                                       |          |
| Counter 1                                              | Input 1                                                                                                                 |          |
| Counter 2                                              | Input 3                                                                                                                 |          |
| Signal form                                            | Square wave pulse                                                                                                       |          |
| Input frequency                                        | Max. 50 kHz                                                                                                             |          |
| Counter frequency                                      | Max. 50 kHz                                                                                                             |          |
| Counter size                                           | 16-bit                                                                                                                  |          |
| Evaluation                                             | Each negative edge, cyclic counter                                                                                      |          |

Table 22: BC4321 / BC4321-1 - Additional technical data

**X67 System modules • Bus controller modules • BC4321 and BC4321-1**

| Product ID                                                | BC4321                                                                                            | BC4321-1 |
|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------|----------|
| <b>Gate measurement</b>                                   |                                                                                                   |          |
| Number of gate measurements                               | 1                                                                                                 |          |
| Gate measurement using                                    | Input 2 or Input 4                                                                                |          |
| Signal form                                               | Square wave pulse                                                                                 |          |
| Evaluation                                                | Positive edge - Negative edge                                                                     |          |
| Pulse length                                              | $\geq 20 \mu\text{s}$                                                                             |          |
| Length of pauses between pulses                           | $\geq 100 \mu\text{s}$                                                                            |          |
| Internal counter frequency                                | 48 MHz, 3 MHz, 187.5 kHz                                                                          |          |
| Counter size                                              | 16-bit                                                                                            |          |
| <b>Digital outputs</b>                                    |                                                                                                   |          |
| Design                                                    | FET positive switching                                                                            |          |
| Switching voltage                                         | Module supply minus residual voltage                                                              |          |
| Diagnostics status                                        | Output monitoring with 10 ms delay                                                                |          |
| Leakage current when switched off                         | 5 $\mu\text{A}$                                                                                   |          |
| Residual voltage                                          | $< 0.3 \text{ V @ } 0.5 \text{ A rated current}$                                                  |          |
| Short circuit peak current                                | $< 12 \text{ A}$                                                                                  |          |
| Switching on after overload cutoff                        | Approx. 10 ms<br>(depends on the module temperature)                                              |          |
| Switching delay<br>0 $\rightarrow$ 1<br>1 $\rightarrow$ 0 | $< 400 \mu\text{s}$<br>$< 400 \mu\text{s}$                                                        |          |
| Switching frequency<br>Resistive load<br>Inductive load   | Max. 100 Hz<br>See the section 6.2.13 "Switching inductive loads" on page 260 (at 90% duty cycle) |          |
| Braking voltage when switching off inductive loads        | 50 VDC                                                                                            |          |
| <b>General information</b>                                |                                                                                                   |          |
| Isolation voltage betw. channel and bus                   | 500 V <sub>eff</sub>                                                                              |          |
| B&R ID code                                               | \$17D4                                                                                            | \$A40E   |

Table 22: BC4321 / BC4321-1 - Additional technical data (Forts.)

- 1) The power consumption of the sensors and actuators connected to the module should not exceed 12 W.

## 2.3.5 Status LEDs

| Figure                                                                                                                                                                                          | LED                | Description                                                              |                                    |                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                 |                    | LED                                                                      | Status                             | Description                                                                                  |
| <p>Status indicator 1:<br/>left: green; right: red</p>  <p>Status indicator 2:<br/>left: green; right: red</p> | Status indicator 1 | Green                                                                    | Off                                | No power supply                                                                              |
|                                                                                                                                                                                                 |                    |                                                                          | Blinking (200 ms on / 200 ms off)  | Preoperational mode                                                                          |
|                                                                                                                                                                                                 |                    |                                                                          | On                                 | RUN mode                                                                                     |
|                                                                                                                                                                                                 |                    |                                                                          | Blinking (200 ms on / 1 s off)     | Stop mode                                                                                    |
|                                                                                                                                                                                                 |                    |                                                                          | Blinking (3 ms on / 500 ms off)    | Flash delete in progress                                                                     |
|                                                                                                                                                                                                 |                    | Red                                                                      | Off                                | No supply or everything is OK                                                                |
|                                                                                                                                                                                                 |                    |                                                                          | Blinking (200 ms on / 1 s off)     | Bus errors                                                                                   |
|                                                                                                                                                                                                 |                    |                                                                          | On                                 | Bus errors: Bus is off                                                                       |
|                                                                                                                                                                                                 |                    |                                                                          | Blinks 3 x and then is off for 1 s | Transfer rate selection                                                                      |
|                                                                                                                                                                                                 |                    |                                                                          | Blinking (400 ms on / 800 ms off)  | Invalid node switch position                                                                 |
|                                                                                                                                                                                                 |                    | Green/red                                                                | Flickering                         | Transfer rate detection in progress                                                          |
|                                                                                                                                                                                                 | 1 - 8              | Input / output status of the corresponding channel. The LEDs are orange. |                                    |                                                                                              |
|                                                                                                                                                                                                 | Status indicator 2 | Status indicator for module function.                                    |                                    |                                                                                              |
|                                                                                                                                                                                                 |                    | Green                                                                    | Off                                | Module supply not connected                                                                  |
|                                                                                                                                                                                                 |                    |                                                                          | Single flash                       | Reset mode                                                                                   |
|                                                                                                                                                                                                 |                    |                                                                          | Blinking                           | Preoperational mode                                                                          |
|                                                                                                                                                                                                 |                    |                                                                          | On                                 | RUN mode                                                                                     |
|                                                                                                                                                                                                 |                    | Red                                                                      | Off                                | Module supply not connected or everything is OK                                              |
|                                                                                                                                                                                                 |                    |                                                                          | On                                 | Error or reset state                                                                         |
|                                                                                                                                                                                                 |                    |                                                                          | Single flash                       | Warning / error for an I/O channel. Level monitoring for digital outputs has been triggered. |
|                                                                                                                                                                                                 |                    |                                                                          | Double flash                       | Supply voltage not in the valid range                                                        |

Table 23: BC4321 / BC4321-1 - Status LEDs

### 2.3.6 Connection elements

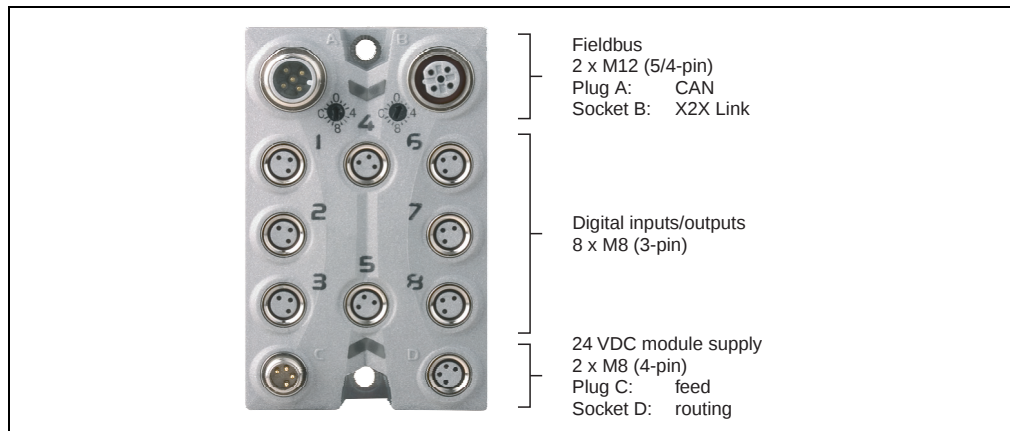


Figure 36: BC4321 / BC4321-1 - Connection elements

### 2.3.7 CAN interface

The BC4321 / BC4321-1 module is connected to the CAN fieldbus with pre-assembled cables. The connection is made using a circular plug (1 x M12, 5-pin).

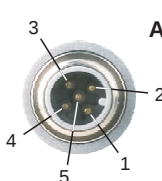
| Connection                                                                                                   | Pin assignments |                  |            |                  |            |
|--------------------------------------------------------------------------------------------------------------|-----------------|------------------|------------|------------------|------------|
|                                                                                                              | Pin             | CAN / BC4321     |            | CAN / BC4321-1   |            |
|                            | 1               | SHLD             | Shield     | SHLD             | Shield     |
|                                                                                                              | 2               | NC               | -          | +24 VDC          | I/O supply |
|                                                                                                              | 3               | CAN <sub>⊥</sub> | CAN ground | CAN <sub>⊥</sub> | CAN ground |
|                                                                                                              | 4               | CAN <sub>H</sub> | CAN high   | CAN <sub>H</sub> | CAN high   |
|                                                                                                              | 5               | CAN <sub>L</sub> | CAN low    | CAN <sub>L</sub> | CAN low    |
| A ... A-coded plug in the module, input<br>SHLD ... Shield connection made via threaded insert in the module |                 |                  |            |                  |            |

Table 24: BC4321 / BC4321-1 - CAN interface

The bus controller is connected to a CAN fieldbus using a Y-connector. This allows the bus controller to be exchanged without breaking the fieldbus connection.

The bus termination resistance is housed in a plug and screwed onto the Y-connector as needed.

For information about accessories and connection examples, see:

- 2.3.18 "Required cables and connectors" on page 105 in this section
- 14 "Overview of pin connections" on page 647 in this section
- In the chapter 5 "Accessories" on page 651

### 2.3.8 X2X Link

The BC4321 / BC4321-1 module is connected to the X2X Link with pre-assembled cables. The connection is made using a circular plug (1 x M12, 4-pin).

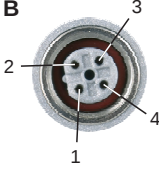
| Connection                                                                        | Pin assignments                                                                                                 |       |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-------|
|  | Pin                                                                                                             | Name  |
|                                                                                   | 1                                                                                                               | X2X+  |
|                                                                                   | 2                                                                                                               | X2X   |
|                                                                                   | 3                                                                                                               | X2X.L |
|                                                                                   | 4                                                                                                               | X2X\  |
|                                                                                   | B ... B-coded socket in the module, output<br>SHLD ... Shield connection made via threaded insert in the module |       |

Table 25: BC4321 / BC4321-1 X2X Link

### 2.3.9 Digital inputs/outputs

The digital inputs/outputs are connected using circular plugs (8 x M8, 3-pin).

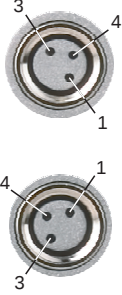
| Connection                                                                         | Pin assignments                                         |                                             |
|------------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------|
|  | Pin                                                     | Name                                        |
|                                                                                    | 1                                                       | 24 VDC sensor/actuator supply <sup>1)</sup> |
|                                                                                    | 3                                                       | GND                                         |
|                                                                                    | 4                                                       | Input / Output x                            |
|                                                                                    | 1) Sensors/actuators should not be supplied externally. |                                             |

Table 26: BC4321 / BC4321-1 - Digital inputs/outputs

### 2.3.10 24 VDC module supply

#### BC4321

The module supply connection is made using circular plugs (2 x M8, 4-pin). The supply feed is connected via plug C. Socket D is used for routing the supply to other modules (see also section 2.1.3 "Power supply" on page 88).

The maximum permitted current per supply is 4 A (sum 8 A).

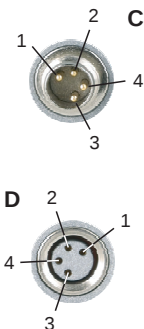
| Connection                                                                        | Pin assignments                                                                     |                 |            |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------|------------|
|                                                                                   | Pin                                                                                 | Plug C          | Socket D   |
|  | 1                                                                                   | 24 VDC fieldbus | 24 VDC I/O |
|                                                                                   | 2                                                                                   | 24 VDC I/O      | 24 VDC I/O |
|                                                                                   | 3                                                                                   | GND             | GND        |
|                                                                                   | 4                                                                                   | GND             | GND        |
|                                                                                   | C ... Plug on the module, supply feed<br>D ... Socket on the module, supply routing |                 |            |

Table 27: BC4321 - Module supply 24 VDC

**BC4321-1**

The module supply connection is made using circular plugs (2 x M8, 4-pin). The supply feed is connected via plug C. Socket D is used for routing the supply to other modules (see also section 2.1.3 "Power supply" on page 88). The X2X Link supply and the CAN and I/O supply are fed separately via pin 1 and 2

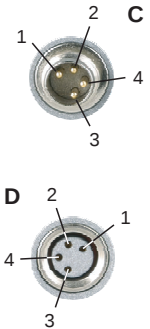
| Connection                                                                        | Pin assignments                                                                     |                    |            |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------|------------|
|                                                                                   | Pin                                                                                 | Plug C             | Socket D   |
|  | 1                                                                                   | 24 VDC X2X Link    | 24 VDC I/O |
|                                                                                   | 2                                                                                   | 24 VDC CAN and I/O | 24 VDC I/O |
|                                                                                   | 3                                                                                   | GND                | GND        |
|                                                                                   | 4                                                                                   | GND                | GND        |
|                                                                                   | C ... Plug on the module, supply feed<br>D ... Socket on the module, supply routing |                    |            |

Table 28: BC4321-1 - 24 VDC module supply

The electrically isolated power supply integrated on the module for supplying the X2X Link can supply up to four X67 modules without having to install an additional PS1300 system supply module.

Because the supply for CAN bus and I/O is not isolated on this bus controller, it is not possible to shut off the I/O supply using an E-stop switch and still maintain CAN or X2X Link communication.

It is possible to supply the module with +24 VDC solely via the CAN circular plug A (pin 2).

**Information:**

**There is no overload protection integrated here. An external 1.6 A fuse must therefore be installed to prevent damage to the module (e. g. caused by a short-circuit on the supply routing).**

The voltage transferred via pin 2 of the CAN plug is also available on pins 1 and 2 of the M8 circular socket D.

**Information:**

**When transferring voltage via pin 2 of the CAN plugs and routing via socket D ...**

- ... a maximum of one additional I/O module can be connected.
- ... a maximum load of 400 mA can be applied to the digital I/Os.

### 2.3.11 Node numbers and transfer rate

Node numbers and transfer rates are configured using both bus controller number switches.

The transfer rate can be defined in two ways:

- Automatic detection by the bus controller (see section 2.3.12 "Automatic transfer rate detection" on page 101)
- Fixed setting by the user (see section 2.3.13 "Setting a fixed transfer rate" on page 102)

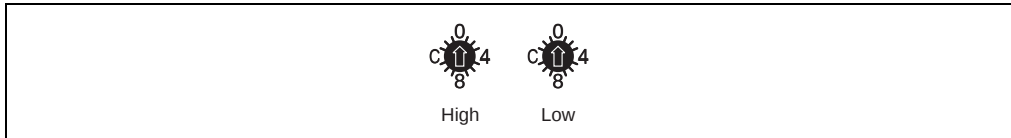


Figure 37: BC4321 / BC4321-1 - Number switches for node numbers and transfer rates

| Switch position | Node number                                                           | Transfer rate                                                                   |
|-----------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------|
| \$00            | Not allowed                                                           | -                                                                               |
| \$01 - \$7F     | 1 - 127                                                               | Automatically set by the bus controller (default) or fixed setting by the user. |
| \$80 - \$89     | -                                                                     | Setting a fixed transfer rate                                                   |
| \$8A - \$8F     | Not allowed                                                           | -                                                                               |
| \$90            | Delete parameter<br>See section 2.3.14 "Delete parameter" on page 103 | -                                                                               |
| \$91 - \$FF     | Not allowed                                                           | -                                                                               |

Table 29: BC4321 / BC4321-1 - Node numbers and transfer rates

### 2.3.12 Automatic transfer rate detection

After booting, the bus controller BC4321/BC4321-1 goes into "ListenOnly" mode. That means the bus controller behaves passively on the bus and only listens.

The BC4321/BC4321-1 tries to receive valid objects. If errors occur during receiving, the controller switches to the next transfer rate from the search table.

If no objects are received, all transfer rates are tested cyclically. This procedure is repeated until valid objects are received.

#### Search table

The controller tests the transfer rate according to this table. Beginning with the starting transfer rate (1000 kBit/s), the controller switches to the next lower transfer rate. At the end of the table, the bus controller starts searching from the beginning again.

| Transfer rate |
|---------------|
| 1000 kBit/s   |
| 800 kBit/s    |
| 500 kBit/s    |
| 250 kBit/s    |
| 125 kBit/s    |
| 100 kBit/s    |
| 50 kBit/s     |
| 20 kBit/s     |
| 10 kBit/s     |

Table 30: BC4321 / BC4321-1 - Transfer rate search table

### 2.3.13 Setting a fixed transfer rate

The default setting for the bus controller is automatic transfer rate detection. It is also possible to set a fixed transfer rate using switch positions \$80 - \$89.

| Switch position | Transfer rate                     |
|-----------------|-----------------------------------|
| \$80            | 1000 kBit/s                       |
| \$81            | 800 kBit/s                        |
| \$82            | 500 kBit/s                        |
| \$83            | 250 kBit/s                        |
| \$84            | 125 kBit/s                        |
| \$85            | 100 kBit/s                        |
| \$86            | 50 kBit/s                         |
| \$87            | 20 kBit/s                         |
| \$88            | 10 kBit/s                         |
| \$89            | Automatic transfer rate detection |

Table 31: BC4321 / BC4321-1 - Possible fixed transfer rates

#### Programming a fixed transfer rate

- 1) Turn off power supply to the bus controller
- 2) Define transfer rate to be programmed by setting the node numbers (\$80 - \$89)
- 3) Turn power supply to the bus controller back on
- 4) Wait until the *status indicator 1* LED blinks with a red triple-flash (transfer rate is now programmed).
- 5) Turn off power supply to the bus controller
- 6) Set desired node number (\$01 - \$7F)
- 7) Turn power supply to the bus controller back on
- 8) Bus controller boots with the set node number and the programmed transfer rate

### 2.3.14 Delete parameter

Multiple parameters can be stored in the bus controller flash memory:

- Communication parameters
- Application parameters
- Fixed transfer rates

Deleting the parameters using the switch position \$90 returns the bus controller to its factory settings.

#### Deleting the parameters listed above

- 1) Turn off power supply to the bus controller
- 2) Set the node number to \$90
- 3) Turn power supply to the bus controller back on
- 4) Wait until the *status indicator 1* LED blinks green for 5 s (100 ms on / 200 ms off). The node number switch must be set to \$00 and then back to \$90 within this time window.
- 5) Wait until the *status indicator 1* LED blinks with a red double-flash (parameters are now deleted).
- 6) Turn off power supply to the bus controller
- 7) Set desired node number (\$01 - \$7F)
- 8) Turn power supply to the bus controller back on
- 9) Bus controller boots with the set node number and automatic transfer rate detection

### 2.3.15 Further documentation and import files (EDS)

Further documentation about CANopen bus controller functions, as well as the necessary import files for the master engineering tool, are available for download from the B&R Homepage ([www.br-automation.com](http://www.br-automation.com)).

### 2.3.16 Digital section

The CANopen bus controller is equipped with a digital mixed module. The technical data and its operation are similar to the DM1321 digital mixed module (see the section 6.2 "DM1321" on page 252).

### 2.3.17 System configuration

A digital mixed module is already integrated in the bus controller.

| Module                        | Amount | Note                                        |
|-------------------------------|--------|---------------------------------------------|
| Digital and/or analog modules | 40     | 40 physical modules are supported in total. |

Table 32: BC4321 / BC4321-1 - System configuration, number of modules

## Information:

**3 W** are provided by the bus controller for additional X67 modules or other modules that are based on X2X Link.

A PS1300 system supply module is required to achieve higher performance. This system supply module also provides **15 W** for additional modules. It should be mounted in the middle of the modules that it will supply voltage to.

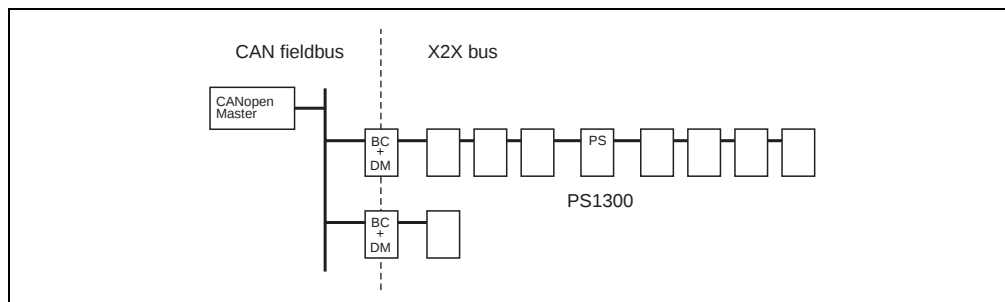


Figure 38: BC4321 / BC4321-1 - Integration in a CANopen network

### 2.3.18 Required cables and connectors

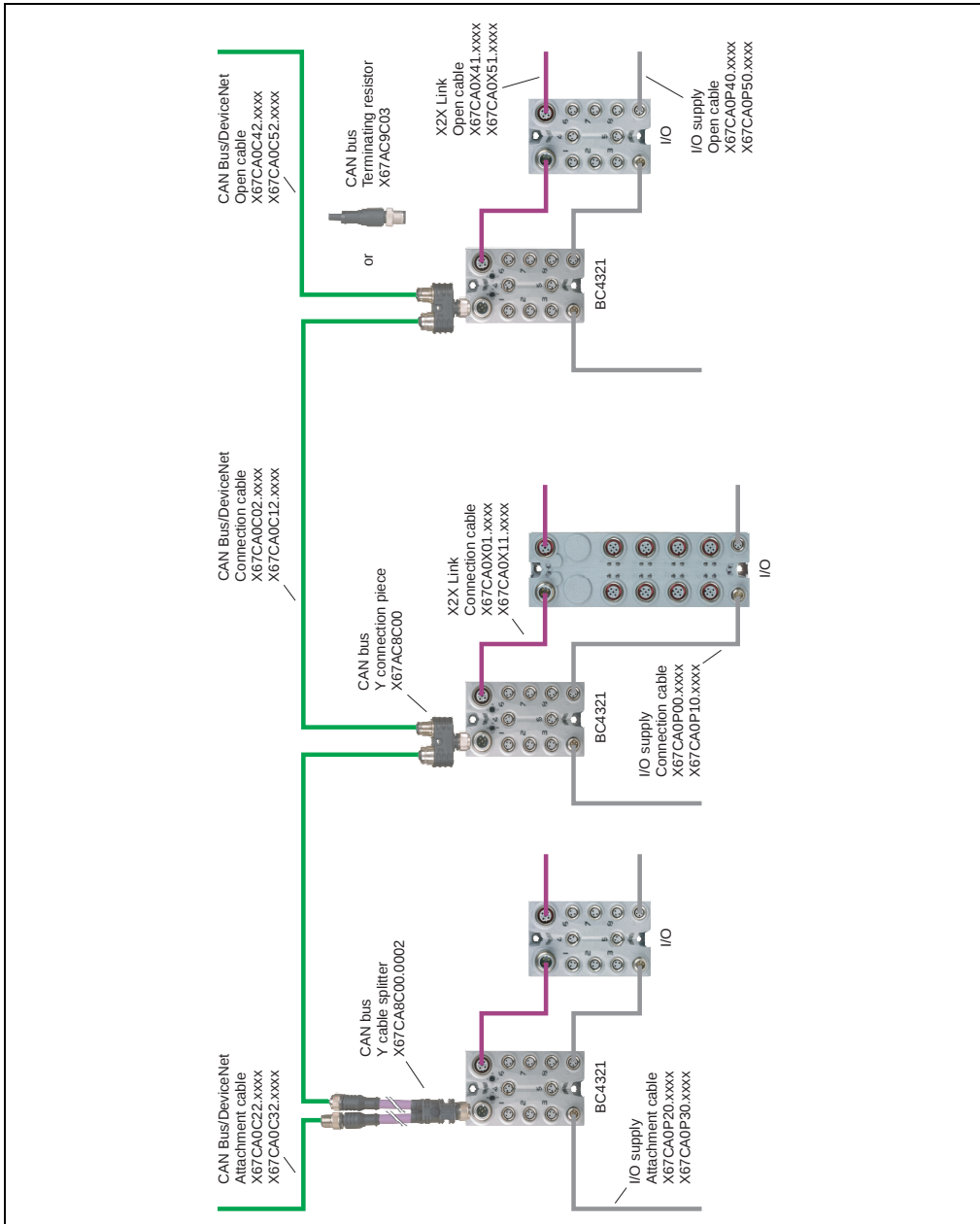


Figure 39: BC4321 / BC4321-1 - Required cables and connectors