X20IF1082

1 General information

The interface module can be used to expand the X20 CPU for specific applications. It is equipped with an POWERLINK interface.

The interface has two RJ45 sockets. Both connections lead to an integrated hub. This makes it easy to create daisy-chain connections using POWERLINK.

- POWERLINK V1/V2 for real-time Ethernet communication
- Integrated hub for efficient cabling
- Configurable ring redundancy

2 Order data

Model number	Short description	Figure
	X20 interface module communication	
X20IF1082	X20 interface module, 1 POWERLINK interface, managing or controlled node, integrated 2-port hub, ring redundancy function	

Table 1: X20IF1082 - Order data

Optional accessories

Model number	Short description
X20CA0E61.xxxxx	POWERLINK/Ethernet connection cable, RJ45 to RJ45, 0.2 to 20 m
X20CA0E61.xxxx	POWERLINK/Ethernet connection cable, RJ45 to RJ45, 20 m and longer

3 Technical data

Model number	X20IF1082
Short description	
Communication module	1x POWERLINK (V1/V2) managing or controlled node
General information	
B&R ID code	0x1F1F
Status indicators	Module status, bus function
Diagnostics	
Module status	Yes, using status LED and software
Bus function	Yes, using status LED and software
Power consumption	2 W
Additional power dissipation caused by the actuators (resistive) [W]	-
Electrical isolation	
PLC - X1	Yes
PLC - X2	Yes
Certification	
CE	Yes
KC	Yes
UL	cULus E115267 Industrial Control Equipment
HazLoc	cCSAus 244665 Process Control Equipment for Hazardous Locations Class I, Division 2, Groups ABCD, T5
ATEX	Zone 2, II 3G Ex nA nC IIA T5 Gc IP20, Ta = 0 - max. 60°C FTZÚ 09 ATEX 0083X
DNV GL	Temperature: **B** (0 - 55°C) Humidity: **B** (up to 100%) Vibration: **B** (4g) EMC: **B** (Bridge and open deck)
LR	ENV1
GOST-R	Yes
Interfaces	
Fieldbus	POWERLINK (V1/V2) managing or controlled node
Type	Type 3 [1)]
Design	2x shielded RJ45 (hub)
Cable length	Max. 100 m between 2 stations (segment length)
Transfer rate	100 Mbit/s
Transmission	
Physical layer	100BASE-TX
Half-duplex	Yes
Full-duplex	No
Autonegotiation	Yes
Auto-MDI / MDIX	Yes
Hub runtime	0.96 to 1 µs
Controller	POWERLINK MAC
Operating conditions	
Mounting orientation	
Horizontal	Yes
Vertical	Yes
Installation at elevations above sea level	
0 to 2000 m	No limitations
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
EN 60529 protection	IP20
Environmental conditions	
Temperature	
Operation	
Horizontal installation	-25 to 60°C
Vertical installation	-25 to 50°C
Derating	-
Storage	-40 to 85°C
Transport	-40 to 85°C
Relative humidity	
Operation	5 to 95%, non-condensing
Storage	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
Mechanical characteristics	
Slot	In the X20 CPU

Table 2: X20IF1082 - Technical data

1) See the POWERLINK help system under "General information, Hardware - IF/LS".

4 LED status indicators

Figure	LED	Color	Status	Description
	S/E	Green/Red		Status/Error LED. The LED indicators are described in section 4.1 ""S/E" LED".
	L/A IFx	Green	On	A link to the remote station has been established.
			Blinking	A link to the remote station has been established. Indicates Ethernet activity is taking place on the bus

4.1 "S/E" LED

The Status/Error LED is a green/red dual LED. The LED status can have different meanings depending on the operating mode.

4.1.1 Ethernet mode

In this mode, the interface is operated as an Ethernet interface.

Green - Status	Description
On	Interface being operated as an Ethernet interface

Table 3: Status/Error LED - Ethernet operating mode

4.1.2 POWERLINK V1

Status LED		Status of the POWERLINK node
Green	Red	
On	Off	The POWERLINK node is running with no errors.
Off	On	A system error has occurred. The type of error can be read using the PLC logbook. An irreparable problem has occurred. The system cannot properly carry out its tasks. This state can only be changed by resetting the module.
Blinking alternately		The POWERLINK managing node has failed. This error code can only occur when operated as a controlled node. This means that the configured node number lies within the range 0x01 - 0xFD.
Off	Blinking	System stop. The red blinking LED signals an error code (see section "System failure error codes" on page 5).
Off	Off	Module is: • Switched off • Starting up • Not configured correctly in Automation Studio • Defective

Table 4: Status/Error LED - POWERLINK V1 operating mode

4.1.3 POWERLINK V2

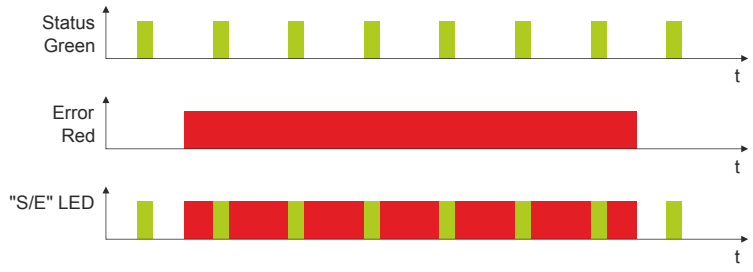
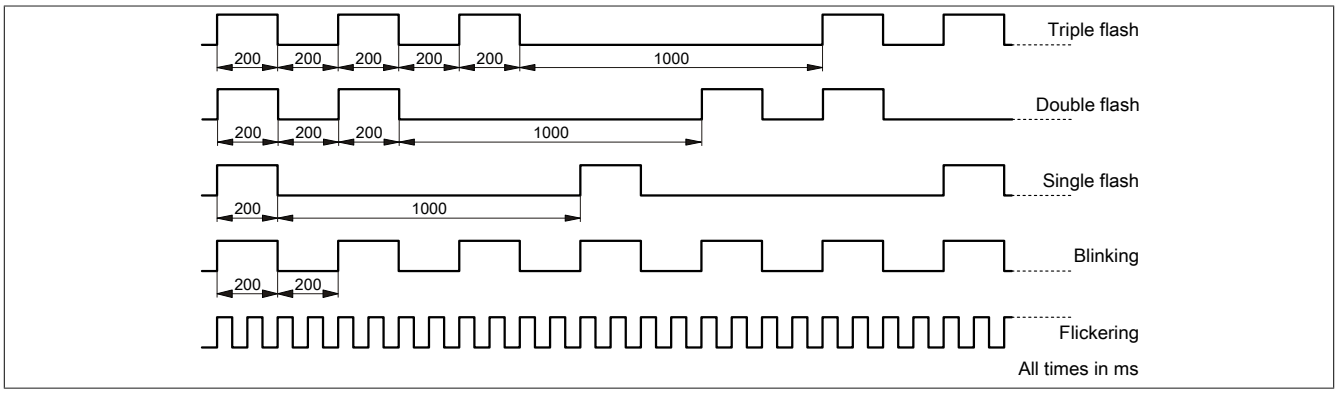
Red - Error	Description
On	The module is in an error mode (failed Ethernet frames, increased number of collisions on the network, etc.). If an error occurs in the following states, then the green LED blinks over the red LED: • PRE_OPERATIONAL_1 • PRE_OPERATIONAL_2 • READY_TO_OPERATE  Note: The LED blinks red several times immediately after startup. This is not an error, however.

Table 5: Status/Error LED as Error LED - POWERLINK operating mode

Green - Status	Description
Off	**Mode** The module is in NOT_ACTIVE mode or: • Switched off • Starting up • Not configured correctly in Automation Studio • Defective **Managing node (MN)** The bus is being monitored for POWERLINK frames. If a corresponding frame is not received within the defined time frame (timeout), then the module switches immediately to PRE_OPERATIONAL_1 mode. If POWERLINK communication is detected before the time expires, however, then the MN will not be started. **Controlled node (CN)** The bus is being monitored for POWERLINK frames. If a corresponding frame is not received within the defined time frame (timeout), then the module switches immediately to BASIC_ETHERNET mode. If POWERLINK communication is detected before this time expires, however, the module switches immediately to PRE_OPERATIONAL_1 mode.
Flickering green (approx. 10 Hz)	**Mode** The module is in BASIC_ETHERNET mode. The interface is being operated as an Ethernet TCP/IP interface. **Managing node (MN)** This state can only be changed by resetting the module. **Controlled node (CN)** If POWERLINK communication is detected while in this state, the module will transition to the PRE_OPERATIONAL_1 state.
Single flash (approx. 1 Hz)	**Mode** The module is in PRE_OPERATIONAL_1 mode. **Managing node (MN)** The MN starts "reduced cycle" operation. Cyclic communication is not yet taking place. **Controlled node (CN)** The module can be configured by the MN in this state. The CN waits until it receives an SoC frame and then switches to the PRE_OPERATIONAL_2 mode. An LED lit red in this state indicates failure of the MN.
Double flash (approx. 1 Hz)	**Mode** The module is in PRE_OPERATIONAL_2 mode. **Managing node (MN)** The MN begins cyclic communication (cyclic input data is not yet being evaluated). The CNs are configured in this state. **Controlled node (CN)** The module can be configured by the MN in this state. A command then switches the module to READY_TO_OPERATE mode. An LED lit red in this mode indicates failure of the MN.
Triple flash (approx. 1 Hz)	**Mode** The module is in the READY_TO_OPERATE state. **Managing node (MN)** Cyclic and asynchronous communication is taking place. Any received PDO data is ignored. **Controlled node (CN)** The configuration of the module is completed. Normal cyclic and asynchronous communication is taking place. The PDO data sent corresponds to the PDO mapping. Cyclic data is not yet being evaluated, however. An LED lit red in this mode indicates failure of the MN.
On	**Mode** The module is in mode OPERATIONAL. PDO mapping is active and cyclic data is being evaluated.
Blinking (approx. 2.5 Hz)	**Mode** The module is in mode STOPPED. **Managing node (MN)** This status is not possible for the MN. **Controlled node (CN)** No output data is produced or input data supplied. It is only possible to enter or leave this mode after the MN has given the appropriate command.

Table 6: Status/Error LED as Status LED - POWERLINK operating mode

LED status indicators - Blink times



4.1.4 System failure error codes

Incorrect configuration or defective hardware can cause a system stop error.

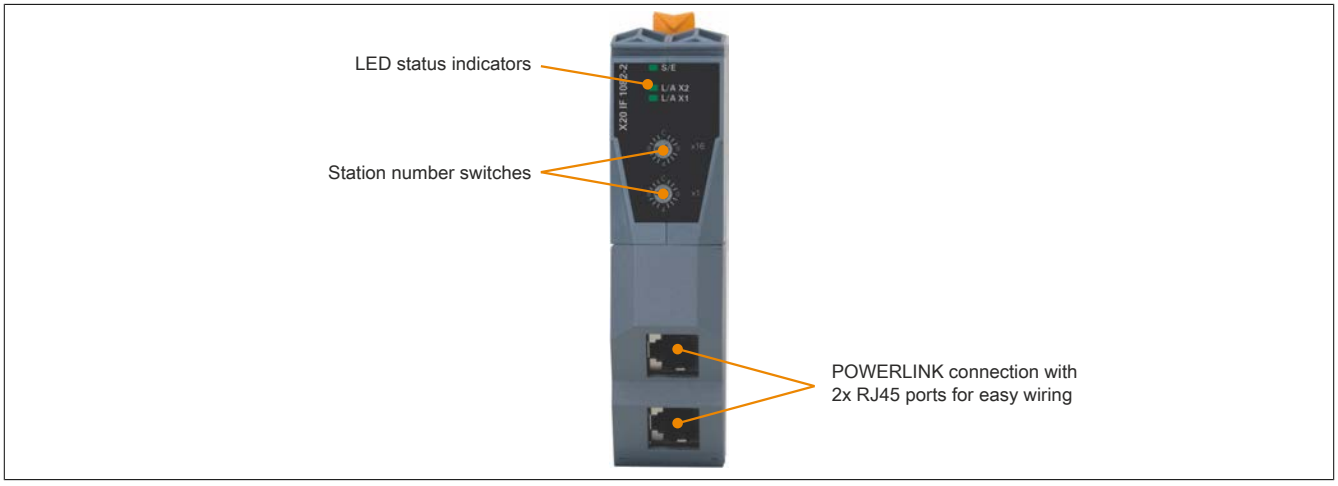
The error code is indicated by the red Error LED using 4 switch-on phases. Each switch-on phase has a duration of either 150 ms or 600 ms. The error code is repeated every 2 seconds.

Error description	Error code indicated by red "Status" LED									
RAM error: The module is defective and must be replaced.	•	•	•	-	Pause	•	•	•	-	Pause
Hardware error: The module or a system component is defective and must be replaced.	-	•	•	-	Pause	-	•	•	-	Pause

Table 7: Status/Error ("S/E") LED - System failure error codes

Key:
- • ... 150 ms
- - ... 600 ms
- Pause ... 2-second pause

5 Operating and connection elements



6 POWERLINK node number

The node number for the POWERLINK station is set using the two number switches. The node number can also be directly configured using Automation Studio.

6.1 POWERLINK V1

Switch position	Description
0x00	Operation as managing node.
0x01 - 0xFD	Node number of the POWERLINK node. Operation as controlled node.
0xFE - 0xFF	Reserved, switch position not permitted

6.2 POWERLINK V2

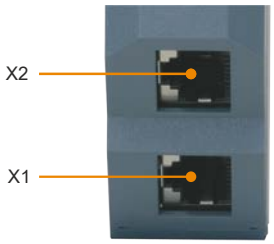
Switch position	Description
0x00	Reserved, switch position not permitted.
0x01 - 0xEF	Node number of the POWERLINK node. Operation as a controlled node.
0xF0	Operation as a managing node.
0xF1 - 0xFF	Reserved, switch position not permitted.

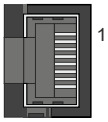
6.3 Ethernet mode

In this mode, the interface is operated as an Ethernet interface. The INA2000 station number can be set using the B&R Automation Studio software.

7 Ethernet interface

For information about wiring X20 modules with an Ethernet interface, see the download section for the module on the B&R website (www.br-automation.com).



Interface	Pinout		
	Pin	Ethernet	
 1 Shielded RJ45	1	RXD	Receive data
	2	RXD\	Receive data\
	3	TXD	Transmit data
	4	Termination	
	5	Termination	
	6	TXD\	Transmit data\
	7	Termination	
	8	Termination	

8 Firmware

The module comes with preinstalled firmware. The firmware is a component of Automation Studio. The module is updated to this version automatically.

To update the firmware included in Automation Studio, the hardware must be upgraded (see "Project management" / "Automation Studio upgrade" in Automation Help).