1.1 IF787

1.1.1 General Information

The IF787 interface module is an aPCI module and can be installed in all corresponding interface module slots (e. g. in the CP360).

The IF787 is a Powerlink interface module. It can be used as a managing or controlled node. The connection is made via an RJ45 port.

The module is also equipped with a CAN bus interface, with its own object buffers in send and receive direction.

1.1.2 Order Data

Model Number	Short Description	Image
	Interface Module	
3IF787.9	aPCI interface module 1 ETHERNET Powerlink interface, managing or controlled node, 1 CAN bus interface, max. 500 kBit/s, object buffer in both send and receive directions, network capable, electrically isolated. Order 1 x TB704 terminal block separately!	
	Required Accessory	
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm²	
0TB704.91	Accessory terminal block, 4-pin, cage clamps, 2.5 mm²	

Table 1: IF787 order data

1.1.3 Technical Data

Product ID	IF787
Short Description	
Communication Module	1 x CAN bus, 1 x ETHERNET Powerlink managing or controlled node
interfaces	

Interface IF1
    Type
    Design
    Maximum Transfer Rate
	CAN bus
	4-pin multipoint connector
	500 kBit/sec

Interface IF2
    Fieldbus
    Type
    Design
    Transfer Rate
    Cable Length
	ETHERNET Powerlink
	100 Base-T (ANSI/IEEE 802.3)
	Shielded RJ45 port
	100 MBit/s
	Max. 100 m between two stations (segment length)

General Information	
Status Display	Send/receive data for IF1 Status of the Powerlink station, network activity, link/collision for IF2

Diagnostics
    Data Transfer (IF1)
    Station Status (IF2)
    Bus Function (IF2)
	Yes, with status LEDs and software status
	Yes, with status LED and software status
	Yes, with status LED and software status

Electrical Isolation
    PLC - IFx
    IF1 - IF2
	Yes
	Yes

Power Input
    3.3 V
    5 V
    Total
	2.5 W
	0.5 W
	3.0 W

Certification	CE, C-UL-US, GOST-R
Mechanical Characteristics	
Slot	Insert e.g. in CP360
Protection	IP20
Operating/Storage Temperature	0°C to +60°C / -25°C to +70 °C
Humidity	5 to 95% (non-condensing)
Note	Order 1 x TB704 terminal block separately

Table 2: IF787 technical data

1.1.4 Additional Technical Data

Name	IF787
IF1 Interface, CAN Bus	
Controller	Controller SJA 1000
Maximum Distance	1000 m

Maximum Transfer Rate
    Bus Length ≤60 m
    Bus Length ≤200 m
    Bus Length ≤1,000 m
	500 kBit/sec
	250 kBit/sec
	50 kBit/sec

Network Capable	Yes
Bus Termination Resistor	Externally wired (optional)
IF2 interface, ETHERNET Powerlink	
In/Out Buffer	20 KByte [1]

Table 3: IF787 additional technical data

1) Beginning with firmware version V 50. Before that 11 KByte.
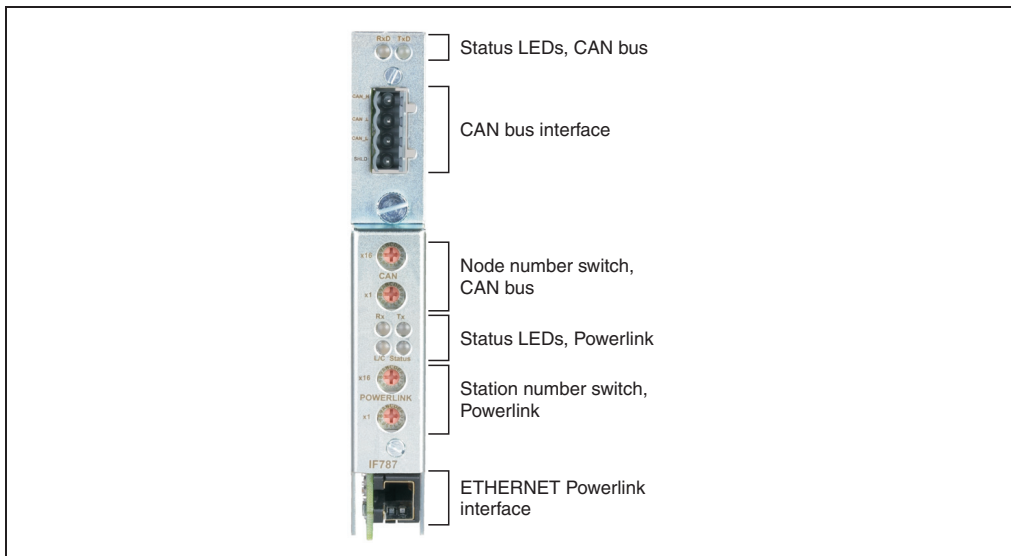
1.1.5 Operational and Connection Elements

Figure 1: IF787 operational and connection elements

1.1.6 Status Display, CAN Bus Interface

Image	LED	Color	Description
CAN bus	RXD	Orange	The module receives data via the CAN bus interface.
	TxD	Orange	The module sends data via the CAN bus interface.

Table 4: IF787 status display CAN bus interface

1.1.7 Status Display ETHERNET Powerlink Interface

Image	LED	Color	Description
ETHERNET Powerlink	Status	Red/Green	See section "Status LED", on Page 6.
	Tx	Orange	The Powerlink station is sending data.
	Rx	Orange	The Rx LED is always lit when Powerlink activity is present on the bus.
	L/C	Red/Green	Green ... Link Red ... Collision

Table 5: IF787 status display ETHERNET Powerlink interface

Status LED

Boot Phase

The red LED is lit during booting. After the initialization routines are executed without errors, the status LED changes from red to green.

Operation

During operation, the status LED indicates the following states:

Status LED		Status of the Powerlink Station
Green	**Red**	
On	Off	The Powerlink station is running with no errors.
Off	On	A fatal system error has occurred. The error type can be read using the PLC logbook. It concerns an irreparable problem. The system cannot properly carry out its tasks. This status can only be changed by resetting the module.
Blinking Alternately		The Powerlink managing node failed. This error code can only occur in controlled node operation. i.e. the set station number lies within the range $01 - $FD.
Off	Blinking	System failure. The red blinking LED signals an error code (see Section"System halt error codes", on Page 7).

Table 6: IF787 status LED

System halt error codes

The error is displayed via the red status LED using four switch-on phases. The switch-on phases are either 150 ms or 600 ms long. Error code outputs are repeated cyclically after 2 seconds has passed.

Legend: • ...   150 ms
                  – ...   600 ms
                  Pause ... 2 s delay

Error description	Error Code Displayed by Red Status LED									
Stack Overflow	•	•	•	•	Pause	•	•	•	•	Pause
RAM Error	•	•	•	–	Pause	•	•	•	–	Pause
Undefined Address: Access to a Non-Existent Address.	•	•	–	•	Pause	•	•	–	•	Pause
Instruction Fetch Memory Abort: Invalid Memory Access During Instruction Fetch (e. g. UINT access of an uneven address).	•	•	–	–	Pause	•	•	–	–	Pause
Data Access Memory Abort: Invalid Memory Access During Data Access (e. g. UINT access of an uneven address).	•	–	•	•	Pause	•	–	•	•	Pause
Error when Programming the FPGA.	•	–	–	•	Pause	•	–	–	•	Pause
Invalid Station Number (e. g. $FE or $FF)	•	–	–	–	Pause	•	–	–	–	Pause

Table 7: IF787 system failure error codes

1.1.8 ETHERNET Powerlink Station Number

Figure 2: IF787 ETHERNET Powerlink station number switch

The station number for the Powerlink station is set using both number switches. Station numbers are permitted between $00 and $FD.

Switch Position	Description
$00	Operation as managing node.
$01 - $FD	Station number for Powerlink station. Operation as controlled node.
$FE	Reserved, switch position is not permitted.
$FF	Reserved, switch position is not permitted.

Table 8: IF787 ETHERNET Powerlink station number
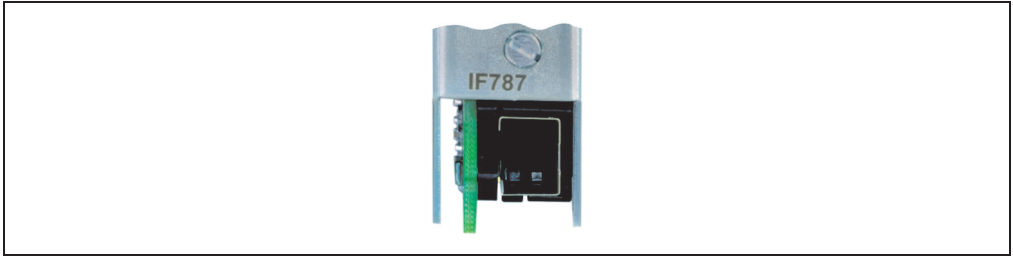
1.1.9 ETHERNET Powerlink Interface (IF2)

Figure 3: IF787 ETHERNET Powerlink interface (IF2)

Pin	Assignment	
1	RXD	Receive Data
2	RxD\	Receive Data\
3	TxD	Transmit Data
4	Termination	
5	Termination	
6	TxD\	Transmit Data\
7	Termination	
8	Termination	

Table 9: IF787 pin assignment for ETHERNET Powerlink interface (IF2)

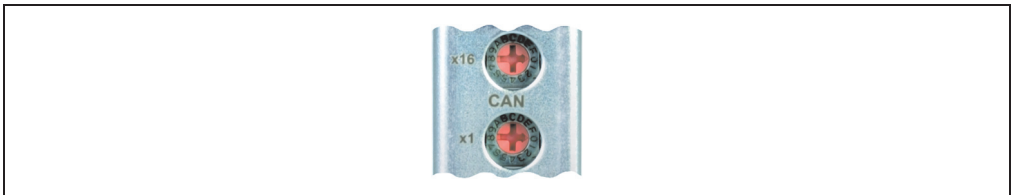### 1.1.10 CAN Bus Node Number

Figure 4: IF787 CAN bus node number switch

The node number for the CAN bus interface (IF1) is set with the two hex switches.

1.1.11 CAN Bus Interface (IF1)

A 120 Ω bus terminating resistor is included with delivery. The resistor can be inserted between pin 1 and pin 3.
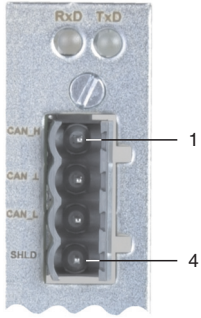
Interface	Description	Pin Assignments	
Application Interface CAN bus 4-pin multipoint connector	The electrically isolated CAN bus interface is a 4-pin multipoint connector. LEDs show on the interface whether data is being received (RxD) or sent (TxD). Maximum Transfer Rate: Bus length ≤60 m: 500 kBit/s Bus length ≤200 m: 250 kBit/s Bus length ≤1,000 m: 50 kBit/s	**Terminal**	**CAN bus**
		1	CAN_H
		2	CAN⊥
		3	CAN_L
		4	SHLD
		CAN⊥ ... CAN Ground SHLD ... Shield	

Table 10: IF787 CAN bus interface (IF1)

1.1.12 Firmware

SG3

The IF787 module is not supported. The IF686 module can be used for these targets.

SG4

The firmware is a component of the PLC operating system of B&R Automation Runtime™. It is loaded to the IF787 module during every restart.