

TSX Momentum  
Interbus Fiber Optic Communications  
Adapter  
User Manual

870 USE 006 00

07/99

33001508.00

**Width: 178 mm**  
**Height: 216 mm**

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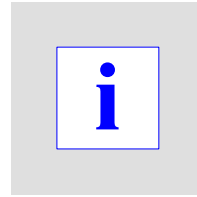
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## Info



### Caution

The relevant regulations must be observed for control applications involving safety requirements.

For reasons of safety and to ensure compliance with documented system data, repairs to components should be performed only by the manufacturer.

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## Terminology

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### Note

This symbol emphasizes very important facts.



### Caution

This symbol refers to frequently appearing error sources.



### Warning

This symbol points to sources of danger that may cause financial and health damages or may have other aggravating consequences.



### Expert

This symbol is used when a more detailed information is given, which is intended exclusively for experts (special training required). Skipping this information does not interfere with understanding the publication and does not restrict standard application of the product.



### Tip

This symbol is used for Tips & Tricks.

### Example

This symbol emphasizes the beginning of an example.



### Proceed as follows:

This marks the beginning of a series of applications that must execute in order to achieve a certain product function.

**Related Documents:**

This symbol indicates manuals or other sources which elaborate on the addressed topic in more detail.

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**Related Documentation**

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Title	Order-No.
I/O Module Bases for TSX Momentum, User Manual	870 USE 002 00





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## Interbus with TSX Momentum



# 1

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The following topics will be reviewed in this chapter:

- General Interbus Information
- Interbus Configuration with TSX Momentum
- Configuration Limits

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## General Interbus Information

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Interbus is an open communications standard currently supported by over 200 equipment manufacturers offering a wide spectrum of diverse products. The Interbus is a high-speed network designed to couple I/O modules, sensors, actuators, and control devices with PLC's and large-scale computer systems.

Interbus operates as a master/slave network, optimized for efficient I/O data exchange. It can support up to 256 nodes over a distance of roughly 13 km using twisted-pair cabling, and is able to read 1024 inputs and write 1024 outputs within 4 ms. It thus offers an optimum of control device configuration flexibility with respect to the number of drop stations and transmission distances. In spite of its extraordinary configuration flexibility, the Interbus makes no compromises in regard to system performance or I/O data reliability. As a result of the open system architecture, TIO and Momentum I/O modules can be cost-effectively integrated into a control system with ease, together with Interbus-compatible products of other manufacturers. Such a typical system configuration with TIO and Momentum I/O modules is shown in

Figure 1 (page 10).

The 170 INT 120 00 Interbus communications adapter forms the communication interface between the I/O bases and the Interbus network. It can be plugged directly into any Momentum I/O base, with which it then forms a fully functional I/O module on the Interbus.

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## 1.2 **170 INT 120 00 Communications Adapter Basics**

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### 1.2.1 **Environmental Conditions**

The communications adapter's environmental specification conforms to that of the I/O bases upon which it can be mounted. Specifics can be found within the system data presented in the 870 USE 002 02 User Manual for TSX Momentum I/O Bases.

### 1.2.2 **Communications Adapter Installation**

The communications adapter (executed in the IP20 safety classification) connects to the I/O base through a single connector. The adapter is locked firmly in place by spring clips, and can be easily removed with a screwdriver.

A label inlay is supplied with the I/O base and fits directly into the recessed area at the front of the adapter. The signal names given to the connected sensors and actuators can be identified directly upon the label. A small opening at the right side of the label inlay keeps the bus adapter's name visible.

### 1.2.3 **Function**

The bus adapter is equipped with 2 Interbus ports (incoming and outgoing remote bus) for fiber optic cable conforming to the Interbus standards DIN 19258.

Each Interbus node updates & regenerates the incoming message stream before passing it on to the next node. Message handling includes the extraction of output data destined for the adapters host I/O base, and the addition of any collected input data.

### 1.2.4 **Error Control Procedures**

The internal power supply (Vcc) required by the adapter is provided by the host I/O base. Vcc is monitored, generating a reset signal whenever Vcc is out of tolerance.

The INT 120 00 also performs quality monitoring of the optical transmission medium. The light level at the incoming and outgoing remote bus optical receivers is measured and compared with a preset threshold value. Any lesser values are

reported to the master. This condition is visually signalled through the status LEDs (WG, WR), also refer to the LED status displays table (page 22).

Any I/O error reported by an I/O base is sent as a module error to the bus master through the Interbus.

### 1.2.5 **Light Level Test Function**

The "Test" push-button can verify optical transmission quality without the need for an additional measuring instrument. With the Interbus properly installed, a press of the push-button starts testing. This causes the incoming light level to be registered and qualitatively evaluated. If neither the WR nor the WG status LED lights when the push-button is pressed, then the incoming light level is at least -22 dBm.

#### **Possible causes if either the WR or WG status LED should light when the push-button is pressed:**

- The transmission path is too long → select another type of medium/adapter, or make use of a repeater
- The bending radius is too small → choose a larger radius
- Bad connector quality, dirty lens (needs cleaning), or fiber end scratched (polish)
- Broken fiber

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## Interbus Configuration with TSX Momentum

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A brief summary of Interbus topology and configuration follows:

The Interbus is composed of both remote and peripheral bus segments. All bus segments convey the same signals, but make use of different electrical levels.

**Remote Bus** The remote bus supports data transmission over long distances (refer to the Technical Specifications). The first remote bus segment starts at the Interbus bus master. The remote bus cable does not carry a supply voltage, and operates full-duplex at 500 Kbps. Typical remote bus nodes are Momentum I/O modules, TIO modules, or bus taps. The portions between two remote bus nodes are referred to as remote bus "segments".

**Local Remote Bus** The local remote bus is derived from a bus tap (e.g. 170 BNO 681 00, or 170 BNO 671 00). The bus tap is itself a remote bus node in the Interbus network. The Momentum I/O modules on the local remote bus are the same as those for the remote bus.

**Field Bus** The field bus is derived from special bus taps. The bus tap is itself a remote bus node. The field bus I/O modules are special, and cannot be utilized on the remote bus.

**Note**

References to IP 65 modules can be found in the 870 USE 100 02 manual (170 ENO 396 00, 170 EDI 346 00, and 170 EDO 346 00)

**Note**

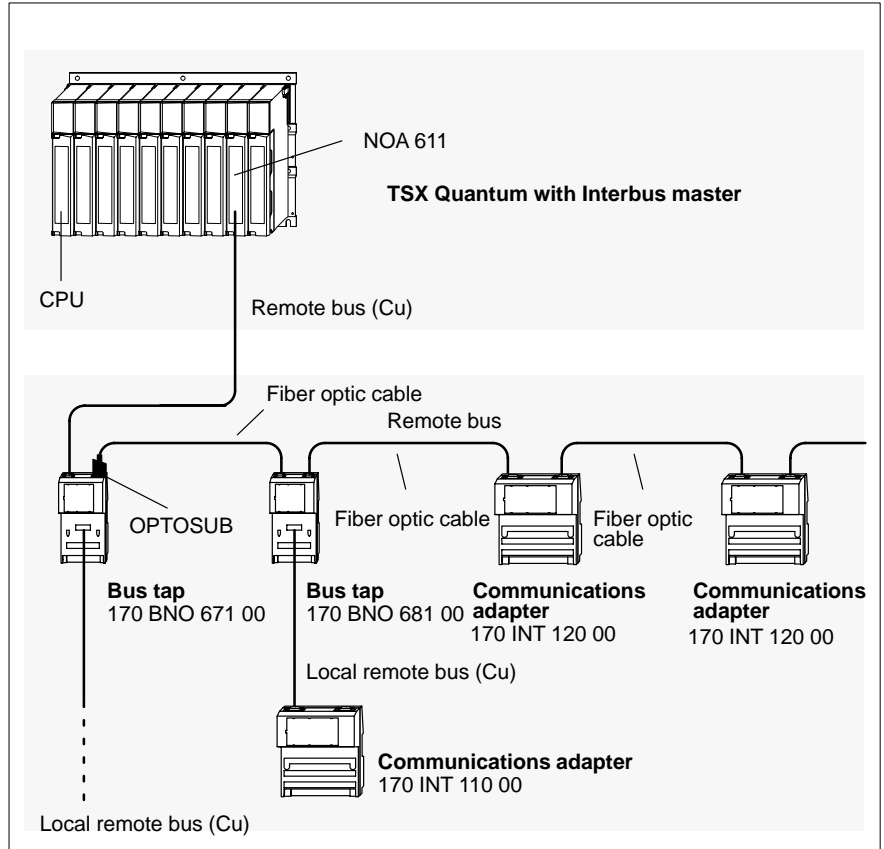
TSX Momentum I/O modules may only be employed with the remote bus and local remote bus. This does include the field bus, but not the previously mentioned peripheral bus.

**Remark:** Two commercially available converters are available for the transition from fiber optic cable <-> RS-485:

- OPTOSUB (requires an external power supply)
- OPTOSUB PLUS (requires no external power)

Module	OPTOSUB	OPTOSUB PLUS
BNO 671 00	Yes	Yes
BDM 346 20	Yes	Yes
BAM 096 00	No	Yes
BAI 036 00	Yes	Yes
BAO 126 00	Yes	Yes
Any TSX Momentum with a 170 INT 110 0X	Yes	Yes
All remaining TIOs	No	Yes

Figure 1 Example of an Interbus configuration with Momentum I/O modules



## Configuration Limits

**Table 1 Interbus expansion limits for standard controllers (e.g. TSX Quantum)**

Parameters	Limitations
Max. number of nodes (slaves)	256
Max. distance between 2 nodes	Shielded, twisted pair = 400 m
Max. distance between 2 nodes	HCS fiber optic cable (200/230 $\mu\text{m}$ )= 300 m 1*)
Max. distance between 2 nodes	Polymer fiber optic cable (980/1000 $\mu\text{m}$ )= 50 m 1*)
Max. network length	13 km
Max. number of I/O points	4096
Transmission rate	500 Kbps
Data throughput for 1,000 I/O points	~ 4 ms

1\*) Minimum length 1 m (except for INT→INT, or BNO, and vice versa, then 0.1 m).





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## Communications Adapter Register Mapping

# 2

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The following topics will be reviewed in this chapter:

- I/O Words and ID Code
- Register Mapping for I/O Bases

## I/O Words and ID Code

The first bus adapter action after power-up is to automatically read the I/O base's ID code. The ID code provides the Interbus master with the I/O base type (inputs or/and outputs) and the number of words it requires in the Interbus message. Once the Interbus master has obtained and evaluated the ID codes of all the I/O modules, it automatically begins with the exchange of data in real time.

Lengths are expressed in I- (input) or O- words (output); with the higher number being the decisive factor as to the number of words required within the Interbus message. The following value set can be seen: 1 ... 10, 12, 14, 16, 24, or 32 words.

**Example**

The ID code for the 170 ADM 350 10 is hex 0103.

- 01 = length means: the module requires one word (I- or/and O-word) for data exchanges
- 03 = module type means: this module has inputs and outputs

**Table 2 Word numbers and ID codes (analog I/O bases and counters)**

Identifier	Functionality	I-words	O-words	ID code
170 AAI 030 00	16 input channels	8	2	hex 0633 dec. 0651
170 AAI 140 00	16 input channels	16	4	hex 1233 dec. 1851
170 AAI 520 40	4 input channels, RTD, thermocouples	4	4	hex 0433 dec. 0451
170 AAO 120 00	4 output channels, 0 ... 20 mA		5	hex 0531 dec. 0549
170 AAO 921 00	4 output channels, 4 ... 20 mA		5	hex 0531 dec. 0549
170 AEC 920 00	Counter unit with 2 hardware counters	8	8	hex 0633 dec. 0651
170 AMM 090 00	discrete channels, 4 inputs, 2 outputs analog channels, 4 inputs, 2 outputs	1 4	1 4	hex 0533 dec. 0551

**Table 3 Word numbers and ID codes (discrete I/O bases)**

Identifier	Functionality	I-words	O-words	ID code
170 ADI 340 00	16 inputs	1	0	0102
170 ADI 350 00	32 inputs	2	0	0202
170 ADI 370 50	16 inputs	1	0	0102
170 ADI 540 50	16 inputs	1	0	0102
170 ADO 340 00	16 outputs	0	1	0101
170 ADO 350 00	32 outputs	0	2	0201
170 ADO 530 50	8 outputs	0	1	0101
170 ADO 540 50	16 outputs	0	1	0101
170 ADO 730 50	8 outputs	0	1	0101
170 ADO 740 50	16 outputs	0	1	0101
170 ADM 350 10	16 inputs, 16 outputs	1	1	0103
170 ADM 350 11	16 inputs, 16 outputs	1	1	0103
170 ADM 370 10	16 inputs, 8 outputs	1	1	0103
170 ADM 390 10	16 inputs, 12 outputs	3 (1 discrete and 2 diagnosis)	1	0303
170 ADM 390 30	10 inputs, 8 outputs	1	1	0103
170 ADM 690 50	10 inputs, 8 outputs	1	1	0103
170 ADM 690 51	10 inputs, 8 outputs	1	1	0103
170 ARM 370 30	10 inputs, 8 outputs	1	1	0103

## 2.2 Register Mapping for I/O Bases

### 2.2.1 Addressing for Discrete I/O Bases

Addressing is according to IEC. Data exchange between the I/O base and communications adapter takes place 1 : 1.

The I/O points at the periphery terminals of the discrete TSX Momentum modules are mapped according to the following principles:

- Values are always mapped to full words (max. of 2 for 32 inputs or 32 outputs).
- The higher value word (MSW) is the first to be sent or received.
- Those words sent to the I/O base (output words) from the communications adapter represent the output values and parameters.
- Words sent to the communications adapter (input words) from the I/O base represent input values and statuses.

An example of register mapping for two discrete I/O bases is shown:

**Register mapping for the 170 ADI 350 00 (32 inputs) and 170 ADO 350 00 (32 outputs)**

170 ADI 350 00 input data	170 ADO 350 00 output data
<b>MSW = word 2</b> <span style="border: 1px solid black; padding: 2px;">Inputs 17 ... 32</span>	<b>MSW = word 2</b> <span style="border: 1px solid black; padding: 2px;">Outputs 17 ... 32</span>
<b>LSW = word 1</b> <span style="border: 1px solid black; padding: 2px;">Inputs 1 ... 16</span>	<b>LSW = word 1</b> <span style="border: 1px solid black; padding: 2px;">Outputs 1 ... 16</span>



**Additional Documentation:** Further information can be found in the **870 USE 002 00 User Manual**.

2.2.2 **Addressing for Analog I/O Bases**

I/O data sent to and from the bus master is mapped to the terminals of analog I/O bases in the following manner:

- Each analog value is mapped to a single word.
- The higher value word (MSW) is the first to be sent or received.
- Those words sent to the I/O base (output words) from the communications adapter represent the output values and parameters.
- Words sent to the communications adapter (input words) from the I/O base represent input values and statuses.

An example of register mapping for an analog I/O base is shown:

**Register mapping for the 170 AAI 140 00 (16 input channels)**

170 AAI 140 00 input data	170 AAI 140 00 output data
MSW = word 16 <input type="text" value="Channel 16 value"/>	MSW = word 16 <input type="text" value="No value"/>
Word 15 <input type="text" value="Channel 15 value"/>	Word 15 <input type="text" value="No value"/>
to	to
Word 5 <input type="text" value="Channel 5 value"/>	Word 5 <input type="text" value="No value"/>
Word 4 <input type="text" value="Channel 4 value"/>	Word 4 <input type="text" value="Channel 13 ... 16 parameters"/>
Word 3 <input type="text" value="Channel 3 value"/>	Word 3 <input type="text" value="Channel 9 ... 12 parameters"/>
Word 2 <input type="text" value="Channel 2 value"/>	Word 2 <input type="text" value="Channel 5 ... 8 parameters"/>
LSW = word 1 <input type="text" value="Channel 1 value"/>	LSW = word 1 <input type="text" value="Channel 1 ... 4 parameters"/>



**Additional Documentation: Further information can be found in the 870 USE 002 00 User Manual.**



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## 170 INT 120 00 Module Description

# 3

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The following topics will be reviewed in this chapter:

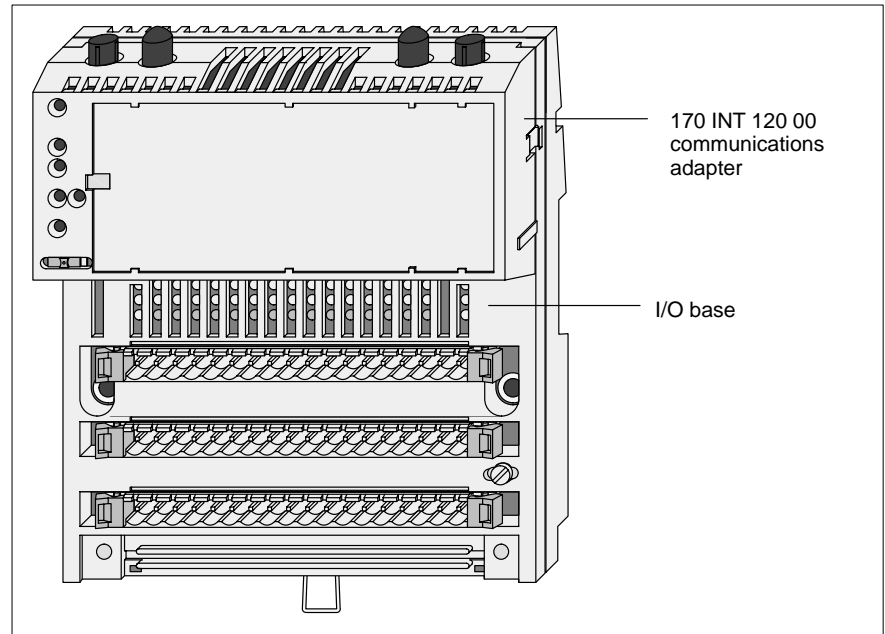
- 170 INT 120 00 Communications Adapter General Specifications
- Communications Adapter Overview
- LED Status Displays
- Technical Specifications

## 3.1

## 170 INT 120 00 Communications Adapter General Specifications

The 170 INT 120 00 communications adapter can be easily combined with any I/O base. It can be plugged directly into any I/O base, with which it then forms a fully functional I/O module, capable of Interbus communication. The design of TSX Momentum I/O modules restricts their use to the Interbus remote bus.

**Figure 2 View of a TSX Momentum Interbus I/O module**



TSX Momentum I/O modules are operable with any Interbus-certified Interbus master.

The PCP protocol is not supported by the 170 INT 120 00 communications adapter.

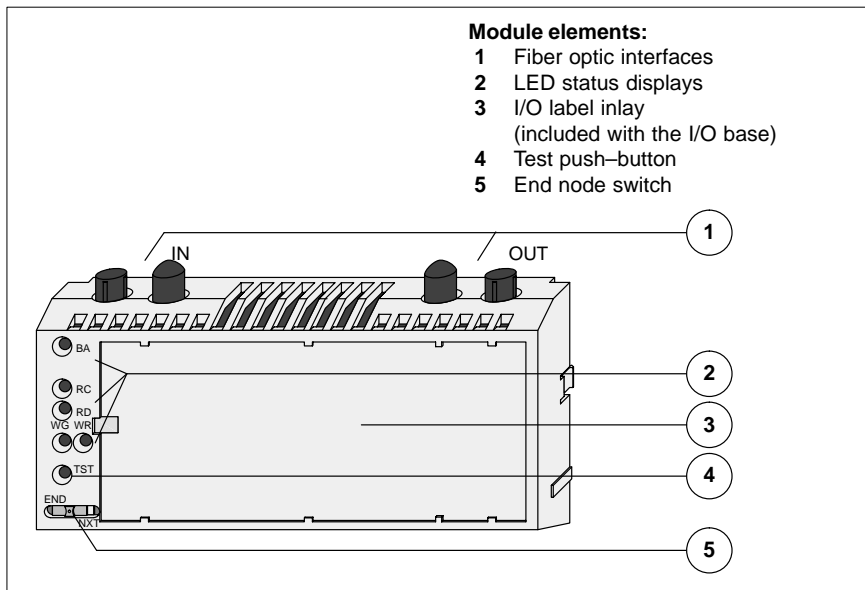
The 170 INT 120 00 communications adapter is operable with all TSX Momentum I/O bases.



## 3.2

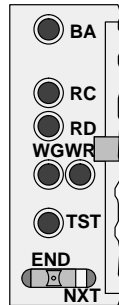
## Communications Adapter Overview

Module type	Interbus fiber optic communications adapter, restricted to the remote bus, or local remote bus
Transmitted light wave length	660 nm
Module operating voltage	5 VDC / 250 mA (from the host I/O base)
Transmission rate	500 Kbps
Bus lengths	50 m with polymer (max. module separation) 300 m for HCS (max. module separation) 13 km (overall bus length)



## 3.3

## LED Status Displays



**Table 4 LED status displays**

LED	Status	Meaning
BA	Green	Bus Active. Data telegrams are being transferred.
	Off	There is no data telegram transfer.
RC	Green	Remote bus Check: The module's incoming remote bus is connected correctly, and the bus master device is not sending a bus reset signal.
	Off	The incoming remote bus is not connected correctly, or the bus master device is sending a bus reset signal.
RD	Red	Remote bus Disabled. The outgoing remote bus is disabled.
	Off	The outgoing remote bus is enabled.
WG	On (red)	The incoming remote bus light level is below tolerance.
WR	On (red)	The outgoing remote bus light level is below tolerance.

An "END/NEXT" slide switch tells the INT if it is the last remote bus node.

**"NEXT"** Additional nodes follow

**"END"** Last node



**Note**

The 170 INT 120 00 fulfills the IP20 safety class specifications. These modules must be installed in closed service cabinets within electrical equipment bays. During work on the service cabinets the user must follow the appropriate maintenance precautions to prevent module damage through electrostatic discharge.

3.4

## Technical Specifications

<b>General</b>	
<b>Power consumption</b>	< 230 mA for 5 VDC (supplied by the I/O base)
<b>Power dissipation</b>	Typically 1.0 W not including the fiber-optic adapter
<b>Potential Isolation</b>	
Fiber optic interface (incoming)	Isolated from the remaining logic
Fiber optic interface (outgoing)	Isolated from the remaining logic
<b>Error Detection</b>	
Data exchange	Red status LED for bus errors (RD) and I/O base error message (for module faults).
<b>Fusing</b>	
Supply voltage Vcc	Internal (for the communications adapter) – none external (for the I/O base) – to be provided in accord with the specifications for the corresponding I/O base
<b>Interbus Data Interface</b>	
<b>Connection Style</b>	
FSMA plugs	IEC 874–2 or DIN 47258
<b>Bus Lengths</b>	<b>Transfer Rate</b>
13 km max. overall bus length	500 Kbps
Max. with 50 m polymer between 2 modules max. for 300 m HCS between 2 modules	500 Kbps
IBS protocol chip	SUPI 3
<b>Order Details:</b>	
<b>Description</b>	<b>Order No.</b>
Interbus fiber optic communications adapter	170 INT 120 00
Set of 10 label inlays	170 XCP 100 00



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## 170 BNO 681 00 Module Description

# 4

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The 170 BNO 681 00 bus tap is an Interbus remote bus node and serves as the coupler to a local remote bus having the same expansion limitations as a remote bus. This opens the following application possibilities:

- Remote bus structuring using the local remote bus
- Local remote busses can be enabled/disabled by the bus master of a running bus

The compact module is executed in the IP20 safety classification and requires a 24 VDC supply.

## 4.1

## 170 BNO 681 00 Bus Tap General Specifications

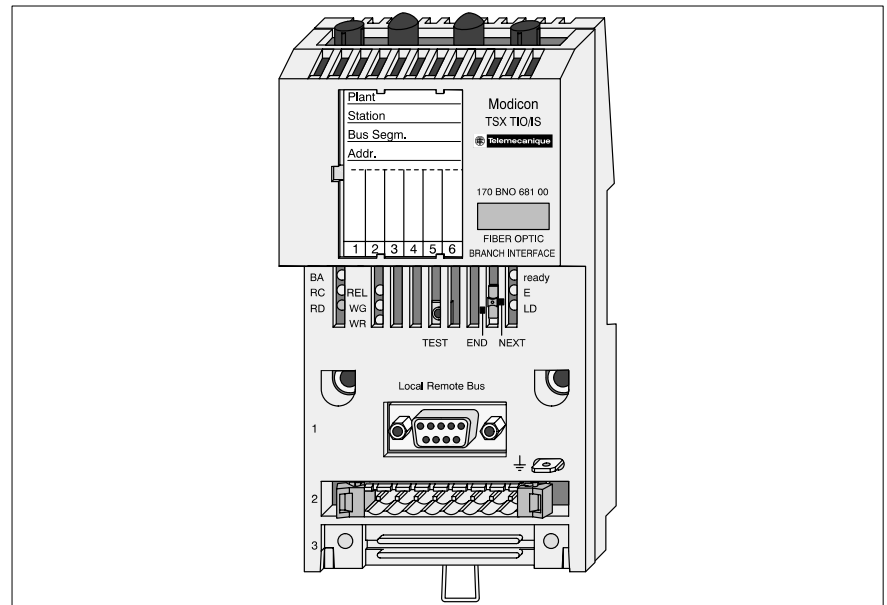
The connections to the incoming power supply, relay output connection, and a reconfiguration push-button are made through an 8-pole terminal block connector.

The terminal block is available in screw-in and spring tension terminal styles.

Below the type identifier is the single-colored function designation marking:

- Yellow to light green for special purpose modules

**Figure 3 170 BNO 681 00 module front view**



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## Mechanical Design

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The modules have a flat plastic housing that can be affixed on a DIN mounting rail, or be fastened with only 2 screws to a wall or machine housing. The housing is narrower than the other Momentum modules. With the mounting rail installation additional fixation measures are unnecessary, as a stopper mounted in the housing back panel prevents sideward slippage. A spring integrated in the back panel accomplishes the electrical grounding to the mounting rail.

There are ventilation slits above and below the identification inlay, so that sufficient natural cooling convection is provided for vertical mounting.

The following diagnostic and status LEDs are located in the slits below the identification inlay (for the position and significance refer to Figure 4 "170 BNO 681 00 status LEDs"):

- 1 LED shows the state of the relay output (REL)
- 5 LEDs for bus diagnosis (BA, RC, RD, LD, E)
- 1 LED for power monitoring (ready)
- 2 LEDs indicating light level (WR, WG)

The device can be exchanged simply on failure, as the cabled terminal strips can be unplugged without tools. The identification inlay can be easily loosened with a screwdriver and exchanged to the replacement device.

**Note**

The 170 BNO 681 00 fulfills the IP20 safety class specifications. These modules must be installed in closed service cabinets within electrical equipment bays. During work on the service cabinets the user must follow the appropriate maintenance precautions to prevent module damage through electrostatic discharge.

## 4.3 **Function**

---

The 170 BNO 681 00 bus tap possesses the following hardware functions:

### 4.3.1 **Power Supply**

The supply voltage amounts to UB = 24 VDC. The logic supply (VCC = 5 VDC) is derived from the 24 VDC and is monitored. A green LED (ready) lights while the voltage is within the tolerance range. A reset is initiated when the voltage falls out of tolerance.

### 4.3.2 **Bus Interfaces**

The module is equipped with three Interbus interfaces. The incoming and outgoing interfaces are conceived for the connection of fiber optic cable. The local remote bus is connected through a Sub-D9 plug. This port is suitable for OPTOSUB use.

A slide switch tells the BNO if it is the last remote bus node.

**"NEXT"** Additional nodes follow

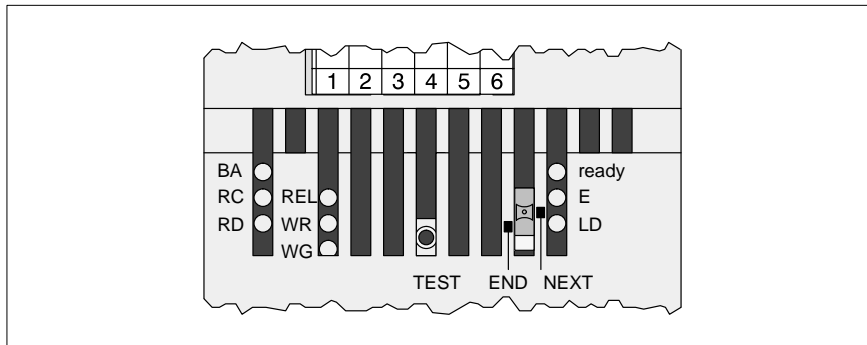
**"END"** Last node

### 4.3.3 **8-Pole Terminal Block**

The terminal block carries a connection to a reconfiguration push-button with which the local remote bus can be reset. In addition a relay output is present which can signal a local remote bus failure (the relay has a change-over contact assembly).



Figure 4 170 BNO 681 00 status LEDs



Name	Color	Meaning
ready	Green	Ready for service: On: The internal logic supply voltage UB is within the tolerance range, and the module is not in reset Off: Supply voltage UB is absent or outside the permissible range, or the module is in reset
BA	Green	Bus Active: On: Data telegrams are being transferred Off: There is no data telegram transfer
RC	Green	Remote bus Check: On: The module's incoming remote bus is connected correctly, and the bus master device is not sending a bus reset signal Off: The incoming remote bus is not connected correctly, or the bus master device is sending a bus reset signal.
RD	Red	Remote bus Disabled: On: The outgoing remote bus is disabled Off: The outgoing remote bus is enabled
LD	Red	Local remote bus Disabled: On: Local remote bus is disabled at the bus tap Off: Local remote bus is not disabled at the bus tap
E	Red	Local remote bus error: On: Error on the local remote bus Off: The local remote bus is error-free
REL	Green	Relay output: On: The relay output is active, i.e. set Off: The relay output is inactive, i.e. reset
WG	Red	The light level at the incoming remote bus optical receiver is below tolerance (-26 dBm)
WR	Red	The light level at the outgoing remote bus optical receiver is below tolerance (-26 dBm)

## 4.4

## Interbus Connection

Either polymer or HCS fiber optic cable (refer to accessories) may be used for the incoming and outgoing Interbus connections. The necessary cable is available in bulk.



### Note

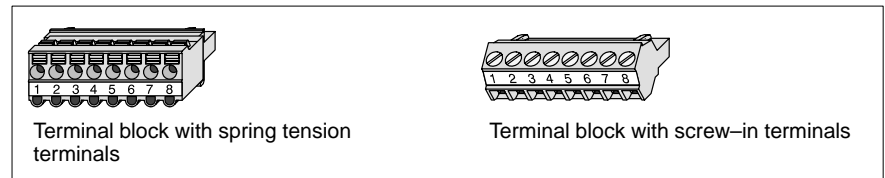
Either polymer or HCS fiber optic cable (refer to accessories) may be used for the incoming and outgoing Interbus connections.

## 4.4.1

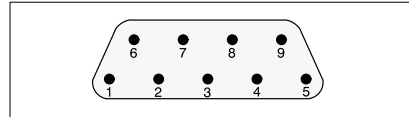
### Terminal Style Selection

The connection of I/O peripherals and the module supply is accomplished through an 8-pole terminal block. This is available as a 3-piece set in two variations:

- With screw-in terminals, for cable cross sections up to 2.5 mm<sup>2</sup>
- With spring tension terminals, for cable cross sections up to 1.5 mm<sup>2</sup>



**Figure 5** Outgoing local remote bus: socket connector



Jumper terminals 5 and 9 of the outgoing remote bus plug.

The following supplementary components are required for bus cable fabrication:

170 XTS 009 00	Interbus connector set
Socket/plug, Sub-D9	
Interbus cable (bulk)	

**Table 5 Remote bus connection**

Outgoing connection	Color	Identifier	Function
1	Yellow	DO2	Transmitted data
2	Gray	DI2	Received data
3	Brown	GND	Reference conductor
4		GND	Reference conductor, fiber-optic adapter
5		Vcc	Fiber-optic adapter auxillary supply
6	Green	DON2	Transmitted data
7	Pink	DIN2	Received data
8		Vcc	Fiber-optic adapter auxillary supply
9		RBST	Plug identifier

#### 4.4.2 Terminal Block Coding and Mounting

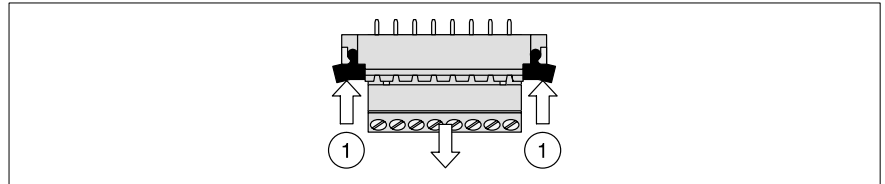
##### Terminal Block Coding

Code the terminal block and the module's receptacle so that inadvertent exchanges among the terminal blocks are prevented. Coding keys and combs are contained in the 170 XCP 200 00 set.

##### Terminal Block Mounting, Removal

Mounting the terminal block is accomplished by pressing it firmly into the module's pin connector. Press both extractors (1) to loosen the terminal block.

Figure 6 Terminal block mounting and removal



##### Caution

Mounting and removal of the terminal block may only be carried out while the module is without power.

## 4.4.3

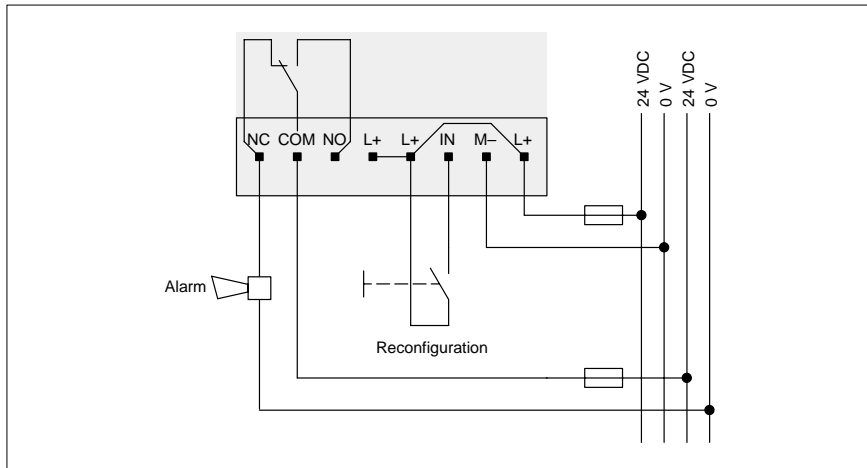
**Wiring Example**

The following voltages must be fed externally:

- UB to supply the internal logic (terminals 8, 5, 4, and 7)
- US supplying the relay output (terminals 2 and 1, or 3)

UB and US have potential isolation from the incoming remote bus, and to one another.

**Figure 7 170 BNO 681 00 terminal assignments**



**Table 6 Terminal block connections**

Terminal	Signal	Function
1	NC	Normally closed contact
2	COM	Common for relay contacts
3	NO	Normally open contact
4, 5, 8	UB	Module operating voltage
6	IN	Interrogation input for reconfiguration
7	M	Reference potential

During cabling the following protective measures must be observed:

- Fuses should be dimensioned appropriately for the connected consumers.
- For large loads, particularly inductive loads, the relay output contacts must be provided with appropriate, directly adjacent installed, suppressor circuitry (RC-network, varistor, or a clamping diode for DC).
- Up to two 2.2 nF to PE per contact may be necessary for suppression. This is of course dependent upon the degree of environmental disturbance encountered (7 capacitors of this type reside in the "GND 001" capacitive by-pass terminal for A120 accessories).
- The reconfiguration request input is not isolated from the VCC logic voltage and hence only conceived for use with push-buttons.

## Technical Specifications

<b>Assignment</b>	
Node type	Interbus (remote bus, local remote bus)
Installation	Mounting rail, or alternatively mounting to a wall or machine housing
Identcode	000C hex
<b>Module Operating Voltage</b>	
Supply voltage	U = 24 VDC
Power consumption	100 mA
Reference potential	MB
External fusing	200 mA fast-blow
<b>Relay Output Mechanical and Electrical Data</b>	
Relay output style	Potential-free relay contact assembly (not certified however for line voltage potential differences to the coil)
Relay working voltage	Max. 24 VDC
Contact switched current	Min. 10 mA (only applies to new contacts)
Resistive load	2 A for 24 VDC
Bulb load	0.2 A for 24 VDC
Switching cycles	Mechanical $1 * 10^8$ , 3/s Electrical: 1 * $10^5$ , 20/min. (2 A/30 VDC resistive load) 5 * $10^5$ , 20/min. (1 A/30 VDC resistive load) An external suppressor circuit is necessary for large loads.
<b>Reconfiguration Input Electrical Data</b>	
Reconfiguration input style	2-pole, isolated
Signal level	"0" signal -30 VDC ... +5 VDC "1" signal +15 VDC ... +30 VDC
Input current	3 mA for 24 VDC
<b>Connection Styles</b>	
Incoming remote bus	2 FSMA plugs (IEC 874-2 or DIN 47258)
Outgoing remote bus	2 FSMA plugs (IEC 874-2 or DIN 47258)
Local remote bus	Sub-D9 plug (socket connector equipotential)
Reconfiguration push-button	8-pole terminal block (terminals UB, IN)
Relay output	8-pole terminal block (terminals NC, COM, and NO)
<b>Potential Relationships</b>	
Potential isolation	L+, L- to each other and from the remote bus

<b>Interbus Data Interface</b>	
Transmission rate	500 Kbps
Wave length	660 nm
Permissible line lengths	Refer to system data
<b>Mechanical Design</b>	
Module	In standard housing
Dimensions (W x H x D)	75 x 142 x 44 mm*
Weight	150 g
<b>Environmental Conditions</b>	
Regulations	Meets VDE 0160, UL 508
Safety classification	IP20
Ventilation	Module hanging, natural convection
System data	Refer to the Interbus Component User Manual, "Technical Specifications" chapter
Ambient temperature	0 ... 60 °C
Power dissipation	Typically 2 W

\* Supplier: Phoenix Contact GmbH & Co, D-32819 Blomberg, Germany  
(or under <http://www.phoenixcontact.de>)



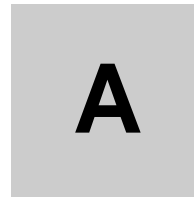
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## Appendix





## Accessories



<b>Order details:</b>	
Terminal blocks 170 XTS 011 00 170 XTS 012 00	Terminal block with screw-in terminals, Qty. 3, 2.5 mm <sup>2</sup> Terminal block with spring tension terminals, Qty. 3, 1.5 mm <sup>2</sup>
<b>Cables and Connectors</b>	
170 XTS 009 00	InterBus connector set, socket/plug, Sub-D9
170 MCI 007 00	InterBus cable, flat, fabricated, 11 cm
170 MCI 008 00	InterBus cable, fabricated, 8 cm
170 MCI 025 00	InterBus cable, fabricated, 25 cm
170 MCI 100 01	InterBus cable, fabricated, 100 m
KAB-3225-LI	InterBus cable, bulk,
<b>Accessories*</b>	
Polymer cable	PSM-LWL/KDL/O, bulk
HCS cable	PSM-LWL/HCS/O, bulk
Polymer connector set,	PSM-SET-FSMA/4
HCS connector set,	PSM-SET-FSMA/4-HCS
Polishing kit	PSM-SET-FSMA-POLISH
Polymer cable with connectors	PSM-LWL/KDL/2, bulk
HCS cable with connectors	PSM-LWL/HCS/2, bulk
Fiber-optic adapter with auxillary power supply	OPTOSUB
Fiber-optic adapter without auxillary power supply	OPTOSUB-PLUS

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