3.4 EX270

3.4.1 General Information

The CAN bus controller EX270 is not hung in the module rack, instead it is screwed on the module rack instead of the left side plate.

3.4.2 Technical Data

Terminal block is not included in the delivery.

Module ID	EX270
General Information	
Model Number	7EX270.50-1
Short Description	2003 CAN bus controller, 24 VDC, 4 W supply, 1 CAN interface, electrically isolated, network capable, Order terminal block TB712 separately!
C-UL-US Listed	in preparation
Module Type	B&R 2003 Controller
Module width	20 mm
Installation	The controller is screwed onto the module rack instead of the left side plate
Peripheral	
Diagnosis LED	Yes
I/O Bus Interface	9 pin D-type socket
Number Switch	Used to set the node number and baudrate

Module ID	EX270
Standard Communication Interface	
Application Interface Electrical Isolation Connection Max. Distance Max. baudrate	CAN Interface Yes 12 pin multipoint connector 1000 m 500 kBaud
Power Supply	
Input Voltage Minimum Nominal Maximum	 18 VDC 24 VDC 30 VDC
Power Consumption	Max. 5 W
Output Power for I/O Modules and Screw-in Module	Max. 4 W
Voltage Monitoring	The power supply is only activated starting with an input voltage of approx. +15 V. Therefore the status LED DC-OK is not required.

3.4.3 Status Display

LED	Meaning
STATUS (2 color)	
Red	Reset (Hold)
Green blinking during the boot phase	Boot phase (initialization and connection to the CAN network). If an error occurs during this phase, the green LED stops blinking. The error is indicated by periodic blinking of the red LED. In this case, a hardware reset (switch off/on) is required. The amount of pulses periodically output provides information about the cause of the error: 1 red pulse: Node switch set to 0 and configuration EEPROM is invalid 2 red pulses: Error initializing the CAN block
Green blinking with double pulse	The controller indicates when time monitoring responds and updates the digital and analog outputs. If a CAN object does not appear within the defined time (default: 640 ms), the effected outputs are reset and the green LED begins to blink (double pulse). After the first valid object arrives, the current values are immediately accepted. The green LED only returns to normal operation after a time delay of 30 s. The time delay is used to identify intermittent problems with the outputs. These problems are otherwise very difficult to recognize.
Green	Normal operation: data is being exchanged

LED	Meaning
STATUS (2 color)	
Orange	Faulty outputs. However, the CAN bus controller is still in network operation.
Orange blinking [1)]	Voltage alarm on a module
Orange blinking with double pulse	The total power for the module exceeds the power supply on the EX270. The basic load on the digital and analog modules is calculated once when booting. If a digital module is found which is not entered in the module list for the operating system, there is generally no power monitoring. If the power calculation was successful, the analog modules are continually monitored during operation. One screw-in module is tested per second.
Red blinking	Warning: The node number was changed during operation. The new node number setting is ignored; the node continues to function.

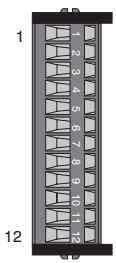
[1)] No longer evaluated by all digital mixed modules starting with Rev. D0.

3.4.4 Connections

The voltage supply and the CAN interface connections are made using a 12 pin terminal block.

The electrically isolated CAN interface is available twice on the plug. The individual CAN connections are linked with each other which allows a node to be easily connected to a CAN network (see section "Connection Examples").
For more information on wiring CAN field bus systems, see chapter 2, "Project Planning and Installation", section "CAN Field Bus".

The Bus controller EX270 is already equipped with a bus termination resistor. To activate it, a jumper must be placed between pin 1 and pin 2.

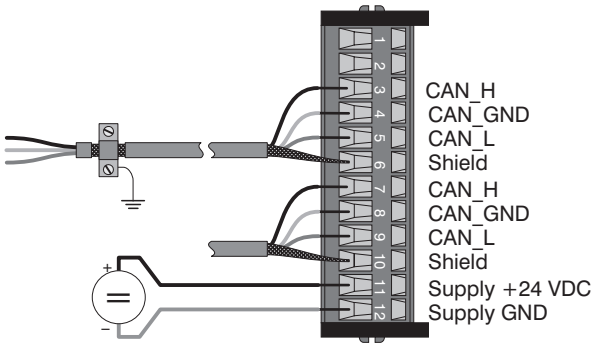


TB712

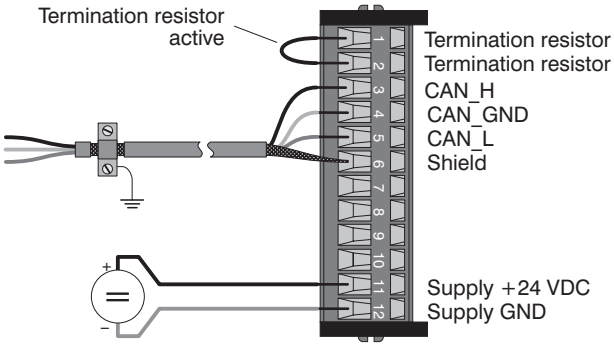
Pin	Assignment
1	Bridge for termination resistor
2	Bridge for termination resistor
3	CAN_H
4	CAN_GND
5	CAN_L
6	Shield
7	CAN_H
8	CAN_GND
9	CAN_L
10	Shield
11	Supply +24 VDC
12	Supply GND

3.4.5 Connection Examples

With Continued CAN Bus Connection

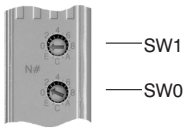


With Active Bus Termination Resistor



3.4.6 Node Number, Start Baudrate

The node number and start baudrate are set with the two number switches on the CAN bus controller: Start baudrate, see section "Automatic Baudrate Recognition".



SW1	SW0	Node Number	Start Baudrate [kBit/s]
0	0	S-EEPROM	S-EEPROM
0	1 ... F	1 ... 15	250
1	0 ... F	16 ... 31	250
2	0 ... F	32 ... 47	250
3	0 ... F	48 ... 63	250
4	0	S-EEPROM	S-EEPROM
4	1 ... F	1 ... 15	125
5	0 ... F	16 ... 31	125
6	0 ... F	32 ... 47	125
7	0 ... F	48 ... 63	125
8	0	S-EEPROM	S-EEPROM
8	1 ... F	1 ... 15	20
9	0 ... F	16 ... 31	20
A	0 ... F	32 ... 47	20
B	0 ... F	48 ... 63	20
C	0	S-EEPROM	S-EEPROM
C	1 ... F	1 ... 15	500
D	0 ... F	16 ... 31	500
E	0 ... F	32 ... 47	500
F	0 ... F	48 ... 63	500

Special Function - Node Number 0 !

If node number 0 is selected using number switch, the CAN bus controller uses the operating parameters from the internal S-EEPROM.
The S-EEPROM is programmed using the CAN Library for PG2000 and the CAN Configurator. The operating parameters are explained in chapter 5, "CAN Bus Controller Functions", section "Operating Parameters".

3.4.7 Automatic Baudrate Recognition

After booting, the bus controller EX270 goes into "Listen Only" Mode. That means the controller behaves passively on the bus and only listens.
The EX270 tries to receive valid objects. If an error occurs when receiving, the controller switches to the next baudrate from the search table.
If no objects are received, all baudrates are tested cyclically. This procedure is repeated until valid objects are received.

Start Baudrate

The bus controller begins the search with this baudrate. The start baudrate can be defined in three different ways:

- Set using the node number switch
- Read from the S-EEPROM (node number = 0)
- The last recognized baudrate is used to begin the search after a software reset (command code 20)

Search Table

The controller tests the baudrate according to this table. Beginning with the start baudrate, the baudrate is switched to the next lower value.
At the end of the table, the controller starts searching from the beginning again.

Baudrate
1000 kBaud
500 kBaud
250 kBaud
125 kBaud
50 kBaud
20 kBaud
10 kBaud