

4.2 EX150

4.2.1 General Information

Remote Master

The remote master is a system module that can be used to connect I/O modules to the CPU over long distances. The remote master and up to 31 remote slaves are connected with a bus cable (see Chapter 2 "Installation", Section 2 "System Configuration and Power Supply", on page 54).

Remote Slave

A B&R SYSTEM 2005 is integrated into a remote I/O bus as a slave station with the EX250 bus controller. The EX250 bus controller is operated in an expansion slot on power supply module PS465.

4.2.2 Order Data

Model Number	Short Description	Image
	Remote I/O Master	
3EX150.60-1	2005 remote I/O master, electrically isolated RS485 interface for connection to a remote I/O bus	
	Accessories	
0G1000.00-090	Bus connector, RS485, for PROFIBUS networks, remote I/O	
0AC916.9	Bus termination, RS485, active, for PROFIBUS networks, remote I/O, standard mounting rail installation, supply voltage: 120 / 230 VAC	

Table 36: EX150 order data

4.2.3 Technical Data

Product ID	EX150
C-UL-US Listed	Yes
B&R ID Code	\$01
Serial Interface	RS485
Design	9-pin DSUB socket
Electrical Isolation	Yes
Baud Rates	Depends on the distance
100 kBit/s	Max. 1,200 m
181 kBit/s	Max. 1,000 m
500 kBit/s	Max. 400 m
1000 kBit/s	Max. 200 m
2000 kBit/s	Max. 100 m
Remote I/O Bus	
Access Procedure	Master-slave principle
Maximum No. of Remote I/O Masters	8
Number of Slaves	Max. 31 (without repeater)
Topology	Physical bus
Connection to the Bus	Direct
Transfer Media	Shielded, twisted pair
Terminating Resistance	External
Power Consumption	
5 V	Max. 5.5 W
24 V	---
Total	Max. 5.5 W
Dimensions	B&R 2005 single-width

Table 37: EX150 technical data

4.2.4 Status LEDs

Image	LED	Description
	RUN	An I/O data transfer is running on the remote bus
	ERROR	The remote master has been reset
	Tx	Data is being sent
	Rx	Data is being received

Table 38: EX150 status LEDs

4.2.5 Operational and Connection Elements

The number switch for setting the slave address and the connection socket for the RS485 interface are located behind the module door.

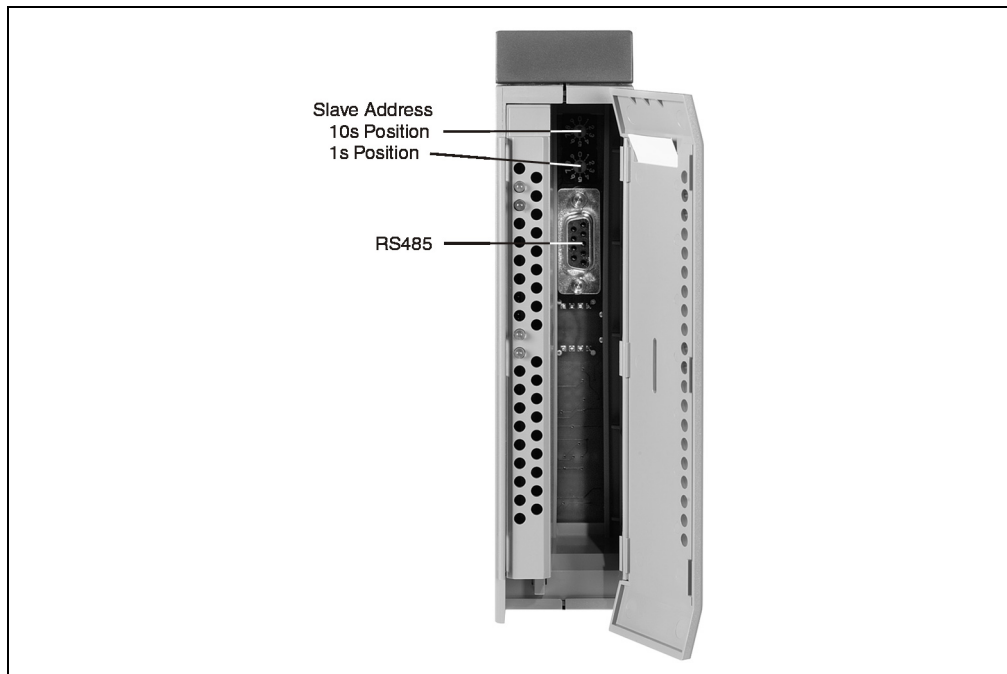


Table 39: EX150 operational and connection elements

4.2.6 RS485 Interface

The interface is electrically isolated. The status LEDs Rx and Tx are lit during data transfer via the RS485 interface.

Maximum Transfer Rate: 2 MBit/s

Max. Distance: 1,200 m

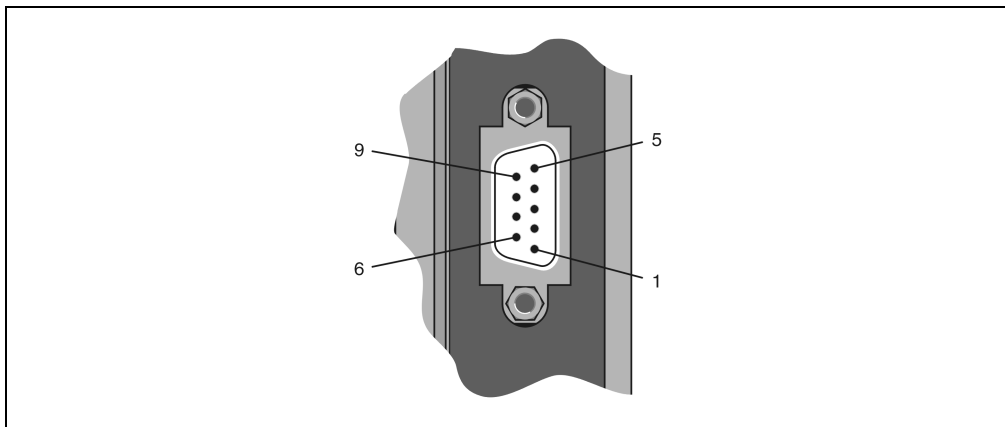


Figure 51: EX150 RS485 interface

Pin	Assignment	Function
1	Shield	
2		
3	DATA	Data
4	CTRL	Transmit enable
5	GND	Electrically isolated supply
6	5 V / 200 mA	Electrically isolated supply
7		
8	DATA\	Data\
9	CTRL\	Transmit Enable\

4.2.7 Cabling a Remote System

Information concerning specifications for the bus cable and cabling can be found in Chapter 2 "Installation", Section 2.1.3 "Remote I/O Bus", on page 58.

4.2.8 Intelligent Slave

An intelligent slave (ISL) is an RIO slave with its own CPU. The CPU on the ISL can make calculations or prepare data before it is sent back to the master. This data does not absolutely have to be inputs or outputs. ISL CPU internal variables are also possible.

Using ISLs can greatly reduce the load on the master's CPU. ISL CPUs are complete CPU modules (B&R SYSTEM 2005 or B&R SYSTEM 2010) with the same task class system. They can run nearly independent of the master CPU and send responses to the master when required.

Hardware: The RIO master remains unchanged (B&R SYSTEM 2005 or B&R SYSTEM 2010). The hardware configuration of the intelligent slave is the same as for the master: RIO master module (EX150), CPU and diverse I/O. Physically, it is a two master system. Cabling is carried out in the same way as on a "normal" master/slave system.

Number Switch: The setting for the slave address is made with both number switches. Addresses in the range from 1 to 98 are allowed. However, a maximum of 31 remote slaves can be connected to a remote master (without repeater). Dynamic addressing does not work on an ISL!

4.2.9 Commissioning a Remote System

Procedure when commissioning a remote system:

- 1) Cable the entire remote system (see Chapter 2 "Installation", Section 2 "System Configuration and Power Supply", on page 54).
- 2) Install the terminating resistors at the beginning and end of the remote buses (correct placement of bus terminators is very important when using high baud rates).
- 3) Set all slave addresses (no doubled addresses; 0 may not be used; dynamic addressing is activated using address 99, see Section 4.3 "EX250", on page 109).
- 4) Switch on all stations. The slaves automatically determine the baud rate of the master each time the system is switched on. Automatic baud rate recognition for remote slaves is described in Section 4.3 "EX250", on page 109. The start-up sequence is not important for function and boot procedure.

Setting the baud rate is made on the CPU using B&R Automation Studio™. The default setting is 500 kBaud.