

13 REMOTE MODULES

13.1 GENERAL INFORMATION

With **Remote Modules**, I/O modules which are situated at greater distances can be connected to the CPU. Up to 32 stations (1 Remote Master and 31 Remote Slaves) are connected with a bus cable (see Chapter "Planning and Installation" in section "System Configuration and Power Supply"). A new I/O bus begins with every Remote Slave, on which a maximum of 99 I/O modules can be addressed.

Pay attention to the following:

- The Remote Master is a system module and therefore must be situated left of the CPU on the system bus. The module address is set with the number switch.
- The Remote Slave is always located in the left-most slot of a bus segment.
- A separate special base plate module (BP202) is required for the Remote Slave.

13.2 TECHNICAL DATA



Module ID	EX100 Remote Master	EX200 Remote Slave
Model Number	2EX100.50-1	2EX200.50-1
Description	2010 Remote I/O Master, 2 elect. isolated RS485 interface for Connection to Remote I/O Bus	2010 Remote I/O Slave, 2 elect. isolated RS485 interface for Connection to Remote I/O Bus
C-UL-US Listed	Yes	Yes
B&R ID Code	\$01	----
Module Type	System module	I/O module
Base Plate Module	BP101, BP110	BP202
Serial Interface Type Electrical Isolation Baudrates 100 kBit/sec 181 kBit/sec 500 kBit/sec 1000 kBit/sec 2000 kBit/sec	2 x RS485 2 x 9 pin D-type sockets Yes Depends on distance Max. 1200 m Max. 1000 m Max. 400 m Max. 200 m Max. 100 m	
Remote I/O Bus Max. Number of Remote I/O Masters on the System Bus Number of Slaves Access Topology Connection to the Bus Transfer Media Termination Resistance	8 Max. 31 (without repeater)	---- ---- Master/slave principle Physical bus Direct Shielded, twisted pair External
Diagnosis LED	Yes	

Module ID	EX100 Remote Master	EX200 Remote Slave
Number Switch	Module address setting	----
NODE#	Slave address setting	
Power Consumption	Max. 12 W	
Dimensions (H, W, D) [mm]	285, 40, 185	

13.3 HARDWARE ERROR

RUN	Remote module is in operation
I/O ERROR	An error occurred during I/O data transfer
BUS B	This LED has no function at this time
Tx	Data is being transmitted
Rx	Data is being received



Remote Master

Remote Slave

13.4 NUMBER SWITCH

Remote Master / Module Address

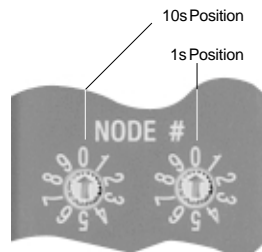
The module address of the remote master on the system bus is set using the number dial. The installed address is shown on the 7 segment display. Please ensure that no address is used twice on the system bus.



Remote Slave / Slave Address

The slave address of the remote master or slave is set using the number dial. The remote slave is always in the left-most slot of the I/O bus. Communication with the slave is carried out using this address. The I/O module addresses on the bus carry on from here.

Dynamic addressing is activated by using the slave address 99. This address selection forces the remote slave to read its address from the first I/O module (digital input module) of the remote station. The first eight digital inputs of the module are interpreted as a binary number and installed as the address.



Intelligent Slave

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

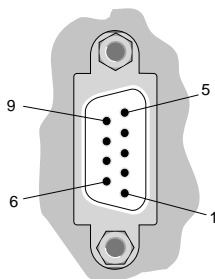
Using ISLs greatly reduces the load on the master CPU. ISL CPUs are complete CPU modules (B&R 2005 or B&R 2010) with the same task class system. They can run nearly independent from the master CPU and only send responses to the master as required.

Hardware: The RIO master remains unchanged (B&R 2005 or B&R 2010). The hardware configuration for the intelligent slave is the same as for a masters: RIO master module (EX100), CPU and I/O. Physically, it is a two master System. The connection is made in the same way as a "normal" master/slave system.

Number Switch: Because this module is a system module, the module address must be set (see "Remote Master/Module Address"). The slave address is set with the two number switches labelled NODE# (see "Remote Slave/Slave Address"). Dynamic addressing does not functions on the ISL!

13.5 RS485 - INTERFACES

Two electrically isolated RS485 interfaces are located behind the module door.



9 Pin D-Type
Connector (F)

Pin	Desc.	Function
1	Shield	
2		
3	DATA	
4	CNTRL	Transmit Enable
5	GND	Electrically isolated supply
6	+5 V / 200 mA	Electrically isolated supply
7		
8	DATA	
9	CNTRL	Transmit Enable

The lower interface is used for normal operation of a remote system. The module is for redundant operation, whereas the upper interface is used to construct a second network.



13.6 CABLING A REMOTE SYSTEM

Information concerning specifications for the bus cable and the connections can be found in Chapter 2 "Planning and Installation" in section "System Configuration and Power Supply" (Remote I/O Bus).

13.7 SETTING UP A REMOTE SYSTEM

Procedures for setting up a Remote System:

- 1) Cable the entire Remote Systems (see chapter "Planning and Installation" in section "System Configuration and Power Supply").
- 2) Attach termination resistors at the beginning and the end of the Remote Bus (especially with higher baudrates, the bus termination placing must be properly done!).
- 3) Set all slave addresses (no doubled addresses; 0 may not be used; address 99 activates dynamic addressing).
- 4) Switch on all stations. The slaves automatically accept the baudrate of the master at power-on. The switch-on sequence is not important for boot behavior or functionality!

Selecting or setting the baudrate is done in the CPU with the PG2000 utility program PCC Configurator (see "B&R 2000 Software User's Manual" Chapter "PCC Configurator"). 500 kBaud is set as default during manufacture.

Automatic Baudrate Recognition

- All Slaves are equipped with automatic baudrate recognition.
- If a Remote Slave is switched on, which is not connected to the Remote Bus, the LEDs **Run** and **I/O Error** begin blinking. This only means that the slave is trying to determine the baudrate of the master.
- If the slave is connected to the master with the bus cable, the **Run** and **I/O Error** LEDs switch off automatically as soon as the slave recognizes the baudrate of the master (to recognize the baudrate, all telegrams on the Remote Bus are evaluated).
- If the slave doesn't receive the baudrate telegram from the master after a certain period of time, it switches back to automatic baudrate recognition (the same as after a Power On).