

Configurable BITBUS repeater, splitter, switch BBR S

The configurable BITBUS repeater, splitter (switch) **BBRS** offers expansion of BITBUS network configurations with RS485, or with RS485 optical fibre for the absolutely interference free isolation of some network segments. The following table shows the possibilities for network expansion. With a lot of interface modules it is very easy to make optimale network configurations only with changing interface modules. Also in a well working network it is possible to change interface modules very quickly, for example changing RS 485 to optical fibre to realize new network topologies. **The speciality of the BBR S modules is given to design BITBUS networks with ring topology for redundant work.**



Functional description

This BBR S repeater, splitter coupler is a BITBUS protocol controlled self directing type (in accordance with IEEE 1118), so the whole network can be installed with only two wires. . Against some universal repeaters with analog level detection the most important feature of this type is that no reduction of the frame length has to be done. Only a delay of time typically 1/2 bit clock time is inserted. This offers the great advantage that theoretically any number (several umpteen) of repeater - couplers may be cascaded without disturbance in transmission. The function of a repeater is only to expand one network segment. Therefore only two connections are in use. At network configurations using ramifications or star topologies the number of repeaters and connections increases rapidly. To reduce the number the BBR S splitter(switch) has up to three connectors(see applications). The difference between splitter and switch is as follows. At the splitter incoming BITBUS frames on each connector (R1-R3) are transferred to the both other connectors. The function of switch is directing the frames. The incoming BITBUS frames on the master side (R1) comes out of the two other connectors of the slave side (R2,R3). Incoming frames on the slave side connectors (R2,R3) are directed only to the master side (R1). At each repeater – coupler a protocol refreshment by digital crystal controlled PLL is done. Also the inputs are designed as Schmitt Trigger, this offers a great immunity against noise and pulse train distortion.

The selection of different interface modules can be seen in " **Technical Data of interface modules**".

For applications of networks with high redundancy the ring topology is the best offer. The BBR modules make a unique design with plastic or glass optical fibre in a cost effective and reliable way possible. At breakdown of one segment in a network with ring topology no error signalisation is done. Therefore it is expedient to use an optional configurable segment monitoring. This optional configurable network segment monitoring is also possible for detecting errors like broken wires in a segment at other network configurations. The error is indicated with LED and relay contact for external use.

Technical data – Main

Datarate	Segment-length RS 485	Number of repeaters	Network length RS 485	Number of couplers with plastic or glass fibre cable in Ring Network
* 1.5 MBd	30m	>10	>0,3 km	-----
375 kBd	300m	>50	>15 km	ap. 40
62.5 kBd	1200m	>50	>60 km	ap. 80

* not normed in IEEE 1118

- LEDS: Power supply, outgoing messages, segment error (Option)
- Segmentmonitoring: (Option) Configurable segments 1-3, Monitoring-time 0.5 - 80s
- Measurement: 105 x 45 x 70mm (WxDxH), Al – housing
- Mounting: DIN - rail
- Operating temperature: 0-50 °C
- Weight: ap. 300g

Technical data of plugin modules

1. POWERSUPPLY MODULE

Input Voltage:

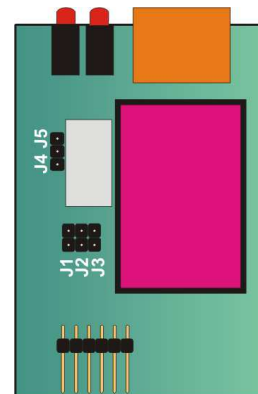
- Standard 18-36V=, 100mA
- Other voltages on request

Configuration of segmentmonitoring:

- for each segment (Option)
- Relaisoutput for error (Option)

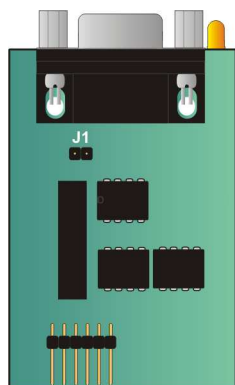
LED's:

- 1x Green for power
- 3x Red for error segmentmonitoring (Option)



2. INTERFACE MODULES

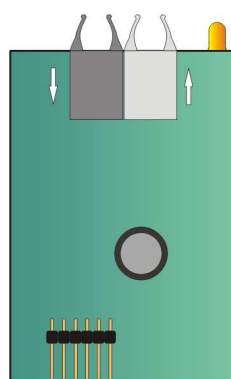
RS 485 Interface



Segmentlength:
 from 30m at 1,5 MBd
 to 1200m at 62,5 kBd
 Galvanc isolation
 1000V = (3000, 6000 V Option)
 against intern electronics
Interfaceconnector:
 9 pol.female D-Sub (Standard)
 120 Ω termination resistor
 available with jumper

Optic. fibre interface

Plastic fibre

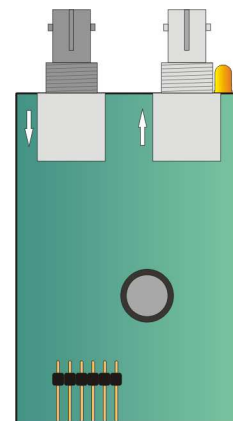


Segmentlength:
 max. 200m with 1mm plastic
 fibre

Preferred are

HFBR 15xx for transmitter and
 HFBR 25xx for receiver

Glass fibre



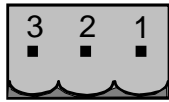
Segmentlength:
 From 2000. to 10000m
 dependent of type of
 transmitter, receiver and type of
 glass fibre.

Preferred for
 transmission distances of
 ap. 3000m are:
 HFBR 14xx for transmitter and
 HFBR 24xx for receiver

On customers request different interface modules can be easy and economical designed.

Connectors

Power supply: 3 pole screw-clamp terminal 5,08mm



- 1: V+ 18-36V=, pole security
- 2: Error relais output.(Option)
- 3: Ground

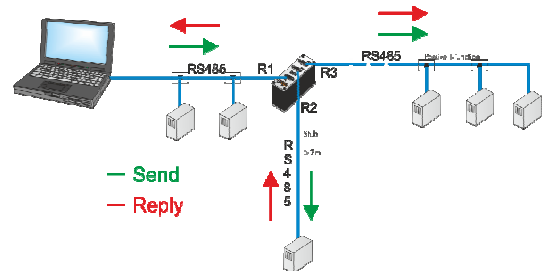
BITBUS RS485: 9 pole female D-Sub

Pin	Descript.	Pin	Descript.
1	---	6	---
2	GND	7	---
3	Data -	8	Data +
4	---	9	---
5	---		

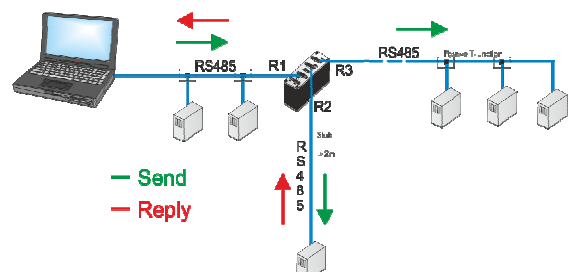
Applications

The connection lines for slaves from passive T-stubs should not be more than 2 meters, because of reflexions on the line. The BBRs splitter or switch solves this problem. Besides there is an automatic repeater function for the other segments of network.

- Example with splitter (T-coupler) and figure with typical dataflow

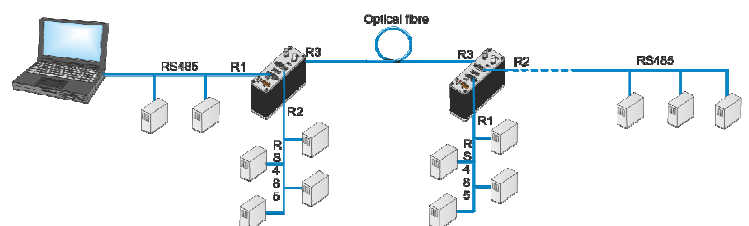


- Example with switch (T-coupler) and figure with typical dataflow.

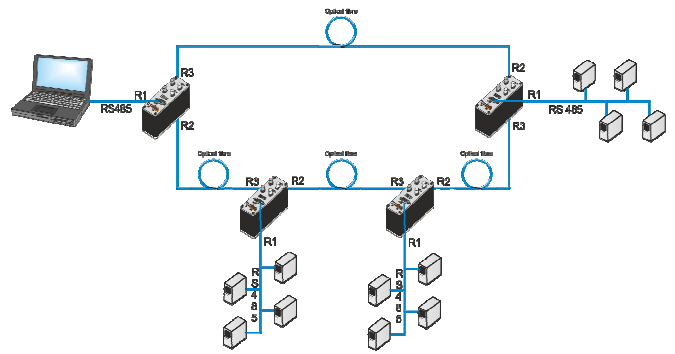


Realisation of a distributed network with the necessity of installing some segments with optical fibre.

The reason for this is, isolation, bridging of large distances or EMR immunisation.

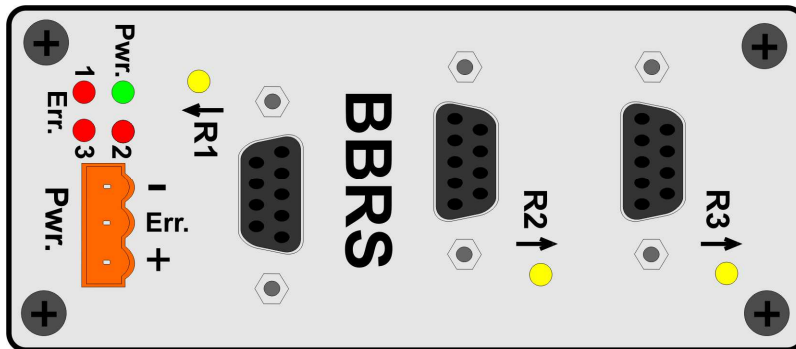


Realisation of an optical fibre ring topology for high availability. Some RS485 segments are connected together with an optical fibre ring. At interruption of one optical fibre segment there is no loss in data transfer. With an optional segment monitoring a perfect process monitoring will be established.

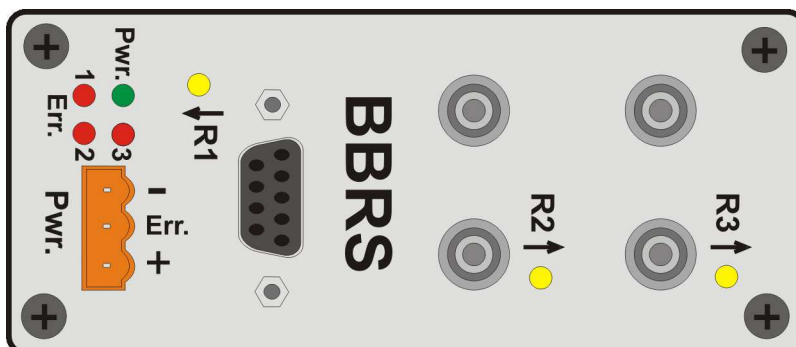


Front view

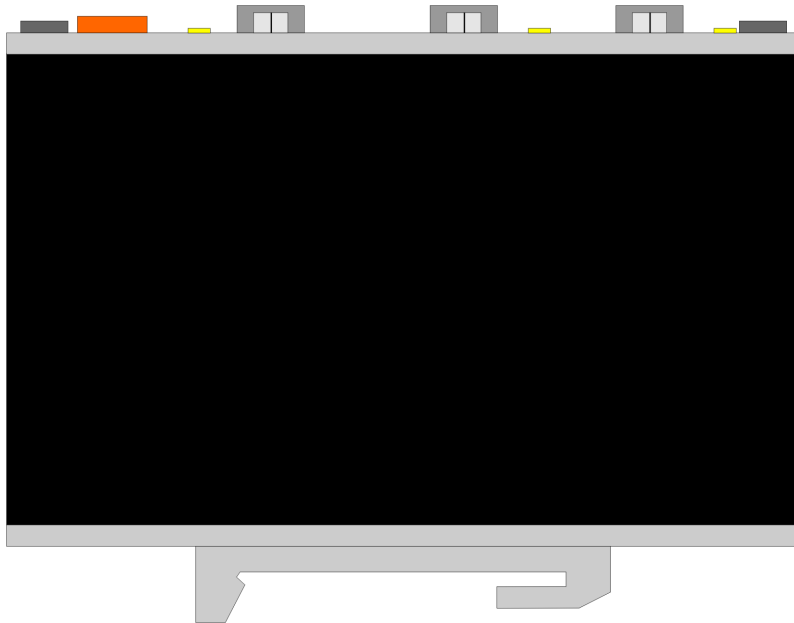
Front panel 3 Segments RS485



Front panel 1 Segment RS485 and 2 Segments Glass optical fibre



Side view



Subject to change