Application

The 89FR01/R0100 fieldbus repeater is used in conjunction with fieldbus repeater terminal unit 89FR02/R0100, /R0110 or /R0210

- as a repeater for single extensions of the PROCONTROL fieldbus,
- as a branch-off in the switchgear cabinet for connecting up to 32 smart motor control centers,
- as a branch-off for connecting a smart electric actuator.

For each extension or branch, two modules type 89FR01/R0100 (for channel A and B) are necessary.

Features

The fieldbus repeater requires a 24 V supply voltage.

When used for fieldbus extension, the module receives a double power supply from fieldbus-coupling module 87TC50-E/R1210.

When used for fieldbus branching in the switchgear cabinet, the module receives double supply from an independent power supply system.

As a fieldbus branch for a smart electric actuator, power supply is provided single-fold from the drive.

The module is plugged onto reserved slots on the fieldbus repeater terminal units type 89FR02/R0100, /R0110 or /R0210. The fieldbus cable and the power supply cables are connected to the terminals of the terminal unit.

A green LED on the module indicates active repeater operation.

Note

When replacing a module manufactured earlier than versions "9039/xxx" or with a hardware index lower than "D" (cf. name-plate) with a new module version, the 89FR01/R0100 module for the second channel needs to be replaced as well, for reasons of equipment symmetry.
The fieldbus coupling module is suitable for a max. of 63 fieldbus modules.

One bus segment is suitable for a max. of 32 participants.

Inside the switchgear cabinets 33 participants are admissible.

Participants: Fieldbus coupling module
Fieldbus module
Fieldbus repeater
Fieldbus repeater terminal unit 89FR02/R0100

Bus branch (max. length 50 m) to the smart electric actuator or to the smart motor control centers

Max. length 400 m
(extension) Fieldbus channel A

Max. length 400 m
(extension) Fieldbus channel B

T = bus termination

1st bus segment

2nd bus segment

T

T
Functions

The fieldbus repeater includes the following function modules:
- Filter and suppressor circuit
- Interfacing
- Arbitration, interlocking and bit regeneration
- Isolation
- Power supply

At the interfaces for the participants, termination resistors of 220 ohms are installed.

The module can be in one of two operating states: 'idling' or 'active operation'.

Idling

The 'idling' state is entered, if no start bit has been detected on neither one of the two interfaces for at least 11 bit time units.

In this operating state, the transmitters of both interfaces are given a high-resistance bias.

Active operation

In the idling state, the repeater scans cyclically at an 8-fold bit rate to obtain the logic state of both interfaces. The 'idling' state is left only if a start bit has been detected on at least one of the interfaces.

The repeater interprets a start bit if with two successive scans an error voltage < -0.2 V, corresponding to logic '0', has been detected.

If a start bit is recognized on an interface, the transmitter of the other interface is switched over to the active state, the repeater is interlocked for 11 bit time units, and the data flow is transferred there, synchronized with the clock.

If a start bit is recognized on both interfaces at the same time, there will be no defined interlocking. This case is possible only under disturbance conditions.

During the 11th bit time unit, when the stop bit is being transmitted (logic '1'), the interlocking condition is always cancelled and the transmitter is given a high-resistance bias again. This means, in the case of longer telegrams, the repeater will go into interlocking mode whenever a byte is to be transferred.

The repeater logic makes sure that the logic state of the bus always corresponds to an active logic '1' before a high-resistance bias is given. This way, faulty arbitrations due to high-resistance biasing are excluded.
Mechanical design

Module dimensions: approx. 82 x 80 x 18 mm (L x W x H)
Connector X1: 15-pole pin-type connector
Weight: approx. 0.040 kg

The fieldbus repeater is equipped with a 15-pole plug X1 which is used for connecting the fieldbusses as well as the voltage supply.

For connecting the cables, please refer to the module description of fieldbus repeater terminal unit 89FR02.
Technical data

In addition to the system data, the following values apply:

**Power supply**
- Operating voltage USA/USB: 19.5 ... 30 V, typ. 24 V
- Current consumption at USA/USB = 24 V: ≤ 70 mA

**Transmission**
- Data rate: 750 KBit

**Electrical environment**
- Electrostatic discharge: 4 kV (contact discharge) [DIN EN 61000-4-2, IEC 1000-4-2]
- Fast transients/pulses (burst): 2 kV [DIN EN 61000-4-4, IEC 1000-4-4]
- Surge voltage (surge): 2 kV [DIN V ENV 50142, IEC 1000-4-5]

**ORDERING DATA**
- Type designation: 89FR01/R0100
- Order number: GJR2397600R0100

Technical data are subject to change without notice!