Remote Terminal Units - Data sheet

Binary input 560BIR01
RTU560 product line

Binary input, 16 channels, LED's. To be used for single indications, double indications, digital measurands and pulse counters.

- Resolution: 1 ms
- Process voltage: 24...60 V DC and 110...125 V DC
- LED signal for each input

**Application**

The module 560BIR01 provides 16 galvanic isolated inputs for up to 16 binary process signals. Scanning and processing of the inputs are executed with the high time resolution of 1 ms. The allocation of an input signal to the processing functions can be done according to the rules of configuration.

The module 560BIR01 is able to process the following types of signals or a combination of them:

- 16 single point information with time stamp (SPI)
- 8 double point information with time stamp (DPI)
- 2 digital measured values each with 8 bit (DMI8)
- 1 digital measured value with 16 bit (DMI16)
- 16 integrated totals (max. 120 Hz) (ITI)
- 2 step position information each with 8 bit (STI)
- 2 bitstring input each with 8 bit (BSI8)
- 1 bitstring input with 16 bit (BSI16)
- or combinations of this signal types

The module is available in two versions (rubrics):

- 560BIR01 R0001: process voltage 24 to 60 V DC. LED signaling for each input, common return per 8 inputs.
- 560BIR01 R0002: process voltage 110 to 125 V DC. LED signaling for each input, common return per 8 inputs.

**Figure 1: Block diagram 560BIR01**
**Characteristics**

**Binary inputs**
The inputs are galvanic isolated by means of optical couplers. 8 inputs are building a group with a common return. The input circuit is designed to keep the input current constant by using current regulative diodes.

The binary input channels are protected against reverse voltage installation. If the input signal is installed with wrong polarity the input current will be zero.

The module has 16 LEDs to indicate the signal state at the inputs. The LEDs follow direct the input signal.

The maximum permissible frequency for counter pulses is 120 Hz.

**Power supply input**
The required power for the module is supplied via the RTU560 backplane.

**I/O controller (IOC)**
The micro-controller on the module processes all time critical tasks of the parameterized processing functions. Moreover it carries out the interactive communication with the RTU I/O bus. All configuration data and processing parameters are loaded by the communication unit via the RTU I/O bus.

The module is equipped with a serial interface to the RTU560 I/O bus on the backplane.

The binary input unit can execute the following processing functions for the different types of signals:
- Digital filtering to suppress contact bounce
- Suppression of oscillating signals caused by the process
- Validity check and suppression of intermediate input states for double indications
- Consistency check for all channels allocated to digital measured values or step position information
- Summation of increment pulses to form integrated totals in registers of 31 bit resolution
- Copying of integrated totals values into freezing registers for data conservation

The module provides a data buffer for temporally storing of up to 50 event messages including time stamps. The events are stored in chronological order designated for transmission to the communication unit (CMU).

During initialization and operation the module carries out a number of tests. If a fault occurs it is reported to the communication unit. All fault conditions impairing the function of the module are displayed as common fault signal by a red LED. A failure of the module is detected by the communication unit.
Technical data
In addition to the RTU500 series general technical data, the following applies:

**Binary input channels 560BIR01 R0001**

**Inputs**
16 channels,
common return for 2
groups of 8 channels,
isolated by opto-couplers

Nominal input voltage
24... 60 V DC (+/- 20%)

Max. input voltage
72 V DC

Input current
1.8... 2.2 mA constant

Logical '1' definitely detected
≥ 18 V DC

Logical '0' definitely detected
≤ 9 V DC

Reverse voltage protection
yes

Max. input frequency for integrated totals
120 Hz

**Binary input channels 560BIR01 R0002**

**Inputs**
16 channels,
common return for 2
groups of 8 channels,
isolated by opto-couplers

Nominal input voltage
110... 125 V DC (+/- 20%)

Max. input voltage
150 V DC

Input current
1.0... 1.6 mA constant

Logical '1' definitely detected
≥ 85 V DC

Logical '0' definitely detected
≤ 45 V DC

Reverse voltage protection
yes

Max. input frequency for integrated totals
120 Hz

**Current consumption for power supplied via RTU560 backplane**

5 V DC
100 mA

24 V DC
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**Signaling by LEDs**

ERR (red)
Common fault information for the module

1… 16
LED displays the active inputs

**Mechanical layout**

Dimensions
160 mm x 100 mm, 3HE
euro card format
4R (20 mm) front panel

Housing type
Printed circuit board

**Insulation tests**

AC test voltage
IEC 61000-4-16
IEC 60870-2-1 (class VW3)
2.5 kV, 50 Hz
Test duration: 1 min

Impulse voltage withstand test
IEC 60255-5
IEC 60870-2-1 (class VW 3)
5 kV (1.2 / 50 µs)

Insulation resistance
IEC 60255-5
> 100 MΩ at 500 V DC

**Immunity test**

Electrostatic discharge
IEC 61000-4-2
8 kV air / 6 kV contact
(levl 3)
Performance criteria A

Radiated Radio-Frequency Electromagnetic Field
IEC 61000-4-3
10 V/m (level 3)
Performance criteria A

Electrical Fast Transient / Burst
IEC 61000-4-4
4 kV (level X)
Performance criteria A

Surge
IEC 61000-4-5
4 kV (level 4)
Performance criteria A

Conducted Disturbances, induced by Radio-Frequency Fields
IEC 61000-4-6
10 V (level 3)
Performance criteria A

Damped oscillatory wave
IEC 61000-4-18
2.5 / 1 kV (level 3)
Performance criteria A

**Environmental conditions**

Nominal operating temperature range:
-25°C... 70°C
Start up:
-40 °C
Max. operating temperature, max. 96h:
+85 °C

EN 60068-2-1, -2-2, -2-14

Relative humidity
EN 60068-2-30
5 ... 95 %
(non condensing)
Ordering information

560BIR01 R0001  1KGT034000R0001

560BIR01 R0002  1KGT034000R0002