

## Binary input 560BIR01

### RTU560 product line



Binary input module with 16 channels, to be used for single indications, double indications, digital measurands and pulse counters

- Resolution: 1ms
- Process voltage: 24...60 V DC / 110...125 V DC
- LED signal for each input
- Common return per 8 inputs

#### Application

The module 560BIR01 of the RTU560 product line 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 four versions (rubrics):

- 560BIR01 R0001: process voltage 24 to 60 V DC. LED signaling for each input, common return per 8 inputs.
- 560BIR01 R0101: process voltage 24 to 60 V DC. LED signaling for each input, common return per 8 inputs., Pin and function compatible with R0001, only a alternative IO controller is used.
- 560BIR01 R0002: process voltage 110 to 125 V DC. LED signaling for each input, common return per 8 inputs.
- 560BIR01 R0102: process voltage 110 to 125 V DC. LED signaling for each input, common return per 8 inputs., pin and function compatible with R0002, only a alternative IO controller is used.

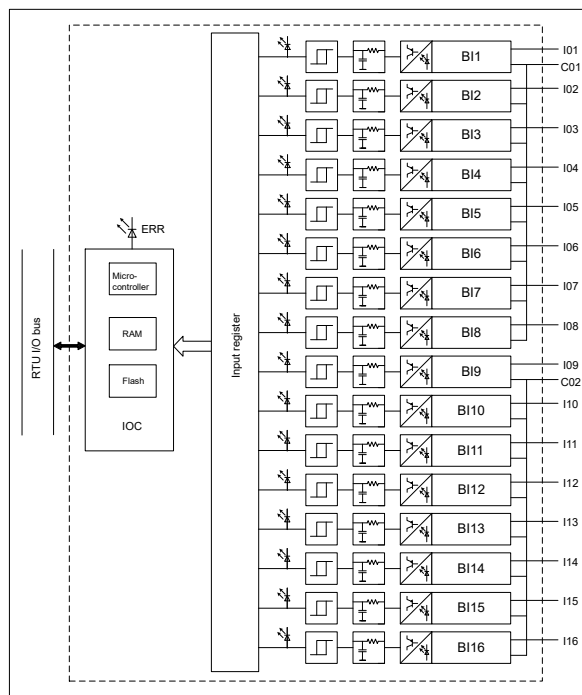


Figure 1: Block diagram 560BIR01

## 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 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 (MPU) on the module processes all time critical I/O tasks of the parameterized processing functions. Moreover it carries out the interactive communication with the I/O bus. All configuration data and processing parameters are loaded by the communication unit via the RTU560 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 executes 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 a common fault signal by a red LED. A failure of the connected module(s) is detected and signaled by the communication unit.

## Technical data

In addition to the RTU500 series general technical data, the following applies:

### Binary input channels 560BIR01 R0001 and R0101

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 and R0102

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

### Binary inputs - immunity and insulation tests

Electrical fast transient / Burst, IEC 61000-4-4	4 kV (level 4), criterion A
Surge 1.2/50 µs, IEC 61000-4-5	4 kV (level 4)
Conducted disturbances, induced by radio-frequency fields, IEC 61000-4-6	10 V (level 3), criterion A
Ring wave, IEC 61000-4-12	2.5 kV line to earth, 1 kV line to line (level 3)
Conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz, IEC 61000-4-16	30 V continuous disturbance/ 300 V short duration disturbance (level 4), criterion A
Damped oscillatory wave, IEC 61000-4-18	2.5kV line to earth, 1 kV line to line (level 3), criterion A
AC dielectric voltage test, IEC 60255-27, IEC 61000-4-16, IEC 60870-2-1 (class VW3)	2.5 kV, 50 Hz, 1 min

### Binary inputs - immunity and insulation tests

Impulse voltage withstand test of insulation, IEC 60255-27, IEC 60870-2-1 (class VW3)	5 kV (1.2 / 50 µs)
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### Current consumption for power supplied via RTU560 backplane

5 V DC	100 mA
24 V DC	--

### 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
Mounting	I/O voltage ≤ 60 V DC: for mounting in all RTU560 racks I/O voltage ≥ 110 V DC: for mounting only in 560MPR03 and 560SFR02 racks
Weight	0.2 kg

### Connection type

RTU560 backplane connector	48 pole type F DIN 41612
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### Insulation tests

Insulation classification according to	IEC 60664-1 <ul style="list-style-type: none"><li>• Pollution degree 2</li><li>• Over voltage category II</li><li>• Altitude: ≤ 3,000 m</li></ul> Pollution degree 2  Over voltage category II  Altitude: ≤ 3,000 m
AC dielectric voltage test, IEC 60255-27, IEC 61000-4-16, IEC 60870-2-1 (class VW3)	2.5 kV, 50 Hz Test duration: 1 min
Impulse voltage withstand test of insulation, IEC 60255-27, IEC 60870-2-1 (class VW3)	5 kV (1.2 / 50 µs)
Insulation resistance, IEC 60255-27	> 100 MΩ at 500 V DC
Insulation resistance to earth at 500 V DC, IEC 60255-27	500 V DC isolated for 1 min

Insulation tests	
Inverted polarity and voltage 1 V/ min ramp delay, IEC 60255-27	

Immunity test	
Electrostatic discharge IEC 61000-4-2	8 kV air / 6 kV contact (level 3)  Performance criteria A
Radiated radio-frequency Electromagnetic field IEC 61000-4-3	20 V/m (level x)  Performance criteria A
Electrical fast transient / Burst IEC 61000-4-4	4 kV (level 4)  Performance criteria A
Surge IEC 61000-4-5	4 kV (level 4)  Performance criteria A
Impulse magnetic field IEC 61000-4-9	100 A/m (level 3)  Performance criteria A
Damped oscillatory wave IEC 61000-4-18	2.5 / 1 kV (level 3)  Performance criteria A

Environmental conditions - climatic	
Operating temperature EN 60068-2-14	-25 °C ... 70 °C
Start up EN 60068-2-1	-40 °C
Max. operating temperature, +85 °C max. 96h EN 60068-2-2	
Relative humidity EN 60068-2-30	5 ... 95 % (non condensing)

Ordering information	
560BIR01 R0001	1KGT034000R0001
560BIR01 R0002	1KGT034000R0002
560BIR01 R0101	1KGT034000R0101
560BIR01 R0102	1KGT034000R0102