RTU520 product line

Binary input 520BID01
Data sheet

Application

The module 520BID01 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 520BID01 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. 25 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):
- 520BID01 R0001: process voltage 24 to 60 V DC. LED signaling for each input, common return per 8 inputs.
- 520BID01 R0002: process voltage 110 to 125 V DC. LED signaling for each input, common return per 8 inputs.

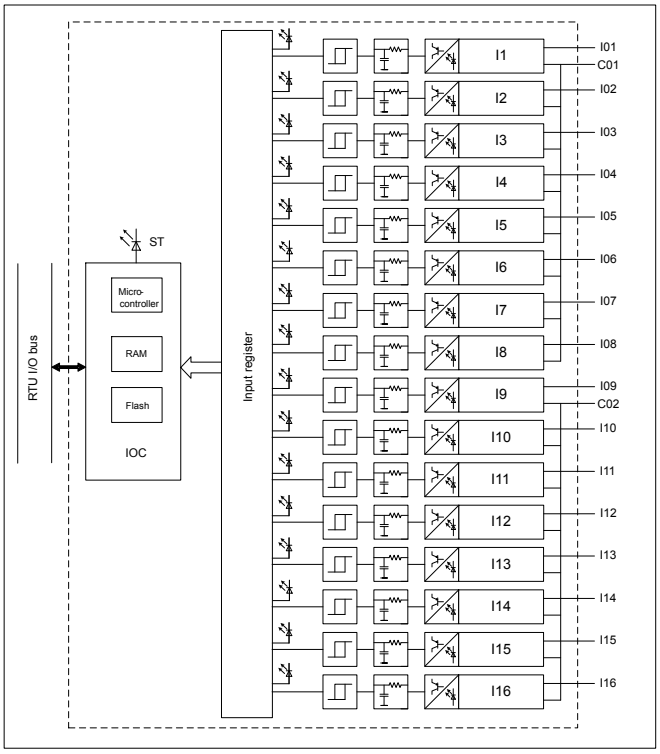

Figure 1: Block diagram 520BID01

Characteristics

Binary inputs

The inputs are galvanic isolated by means of optical couplers. 8 inputs are building a group with a common return.

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 are switched by the controller.

The maximum permissible frequency for counter pulses is 25 Hz.

Power supply input

The required power for the module is supplied via the RTU520 I/O bus connector.

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.

In connection with an I/O adapter (e. g. 520ADD01) or the RTU520 communication unit the module is interfaced to the RTU520 I/O bus.

The binary input unit can execute the following processing functions for the different types of signals:

- Digital filtering to suppress contact bounce
- Validity check and suppression of intermediate input states for double indications
- Consistancy 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 520BID01 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	1.5... 5 mA
Logical '1' definitely detected	≥ 18 V DC
Logical '0' definitely detected	≤ 9 V DC
Reverse voltage protection	yes
Max. input frequency for integrated totals	25 Hz

Binary input channels 520BID01 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	1.2... 2 mA
Logical '1' definitely detected	≥ 85 V DC
Logical '0' definitely detected	≤ 35 V DC
Reverse voltage protection	yes
Max. input frequency for integrated totals	25 Hz

Current consumption for power supplied via WRB bus	
5 V DC	50 mA
±15 V DC	--
18/ 24 V DC	--

Signaling by LEDs	
ERR (red)	Common fault information for the module
CH1… CH16	LED displays the active inputs

Mechanical layout	
Dimensions	35 mm x 98 mm x 117 mm (Width x Height x Depth)

Mechanical layout	
Housing type	Plastic housing (V-0), IP20, RAL 7035 light gray
Mounting	DIN rail mounting EN 50022 TS35: 35 mm x 15 mm or 35 mm x 7.5 mm
Weight	0.15 kg

Connection type	
Process connector	2 x 10 pole 5.08 mm pluggable spring terminals (included in delivery) 0.2... 2.5 mm²/ AWG 24 - AWG 12

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

Ordering information	
520BID01 R0001 24 V DC... 60 VDC process voltage	1KGT033200R0001
520BID01 R0002 110 V DC... 125 VDC process voltage	1KGT033200R0002

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