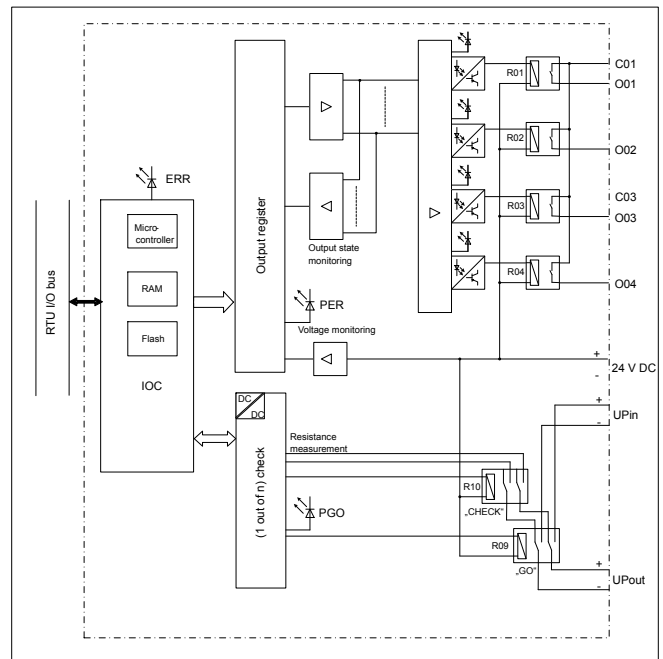# Binary output and supervision 520CSD01
Data sheet

Figure 1: 520CSD01 block diagram

Application

The command output and supervision module 520CSD01 can be used for the control of 4 binary process commands using relay contacts. In addition it can be used if the output circuit of an object command has to be checked before the actual command is given. The 520CSD01 board executes a (1 out of n) check. It checks if only one interposing relay will be activated in the output circuit. Therefore all interposing relays connected to the check circuit must have the same resistance value.

The module 520CSD01 is able to process the following types of signals:
– Single or double commands (SCO or DCO) with 1 pole output without (1 out of n) check
– Single or double commands (SCO or DCO) with 1.5 pole output with (1 out of n) check
– Regulation step command (RCO), 1 pole
– Bitstring output, 1Bit (BSO1)

The command outputs of the 520CSD01 allows switching voltages up to 72 V DC or max. 5 A continuous current. The (1 out of n) test circuit can be used for voltage up to 150 V DC in combination with the command output relays of the 520BOD01.

Characteristics

(1 out of n) check circuit

The check circuit for measuring the resistance of the relay coil is galvanic isolated against the other electronic voltage and against the switching voltage (UP) of the interposing relays.

The essential features are:
– Galvanic isolation of the check circuit done by means of a galvanic isolated DC/DC-converter and optocouplers
– Suppression of line frequency during resistance measuring

The (1 out of n) check of the 520CSD01 module measures the resistance value in the output circuit and compares this value with the configured upper and lower limit values. If the resistance value is within the limits the selected interposing relay can be activated. The object command will be acknowledged positively. If the measured resistance value is outside the tolerance limits the 520CSD01 blocks the output and indicates the error to the communication unit (CMU).

After one command relays (B01..B04 or on another 520BOD01) has switched on, the 520CSD01 gets the order to check and process the object command. The 520CSD01 switches the out-

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put circuit to the check circuit via the "check" relay (R10). The resistance is determined by the arising measuring circuit voltage by output of a constant current. If the measured resistance value is within the tolerance range, the "check" relay is switched. After that the "GO" relay (R09) switches the selected interposing relay and releases the object command.
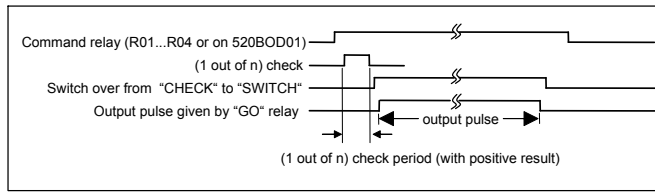

Figure 2: Time diagram of the (1 out of n) check circuit

To ensure correct output the board carries out several monitoring functions before and during command output:
– Monitoring of output duration and reset in case of fault
– Monitoring of switching voltage before and during the command output

Binary outputs

Relay contacts are used for the binary outputs.

The 4 outputs are combined into one group with a common return. The outputs are isolated from the internal electronic.

Before and during command output the module 520CSD01 carries out several command monitoring functions. These tests ensure correct output.

If the command monitoring detects fault the command will be canceled.

Power supply input

The required power for the module is supplied via the RTU520 I/O bus connector. In addition 24 V DC (U_E) is required (e. g. from 560PSU40/41). This voltage U_E has to be supplied from external and wired to the X3 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 output unit can execute the following processing functions on the individual signal types:
– Control of the command output duration

Command monitoring functions:
– monitoring of the output bit patterns by reading back the output state
– switching voltage monitoring (24 V DC coil voltage) before and during output only together with (1 out of n) control module
– command output duration monitoring

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:

Characteristics (1 out of n) test circuit

No. of check circuits per device	1
No. of check circuits per system	32
Measuring range of the test circuit	100 ... 10000 Ω
Resolution	10 Ω
Measuring current	1 mA
Input voltage range of the measuring circuit	0.1 ... 10 V
Maximum switching voltage (UP)	150 V DC
Max. switching capacity (resistive load)	120 W
Max. switching capacity (inductive load)	50 VA (L/R= 40 ms)

Binary output characteristics

Outputs	4 Relay contacts, single pole, normal open
Max. switching voltage	72 V DC
Continuous current	5 A
Max breaking current (resistive load)	5 A ≤ 55 V DC 4 A @ 60 V DC
Max. breaking capacity (inductive load)	50 VA (L/R= 40 ms)

Supply voltage input 24 V DC (U$_E$)

Input voltage range	24 V DC (+/- 20%)
Current consumption	40 mA + 20 mA per active relais

Current consumption for power supplied via WRB bus

5 V DC	70 mA
±15 V DC	--
18/ 24 V DC	1 mA

Signaling by LEDs

ERR (red)	Common fault information for the module
PER (red)	24V failure for the output relays
PGO (green)	Signalisation of the active "GO" relay
BO1…BO4 (yellow)	LED displays the active output relays

Mechanical layout

Dimensions	47 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	0.3 kg

Connection type

Process connector	5.08 mm pluggable screw 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

520CSD01 R0001	1KGT034800R0001

ABB AG
Power Systems Division
P.O. Box 10 03 51
68128 Mannheim, Germany

www.abb.com/remote-terminal-units

Note:

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