Application, characteristics and technical data have to be taken from the hardware data sheet:

520CSD01 Data sheet  1KGT 150 922

Operation

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.

Processing functions

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, 1 Bit (BSO1)

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 RTUS20 communication unit the module is interfaced to the RTUS20 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.

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Default</th>
<th>Parameter location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command pulse length</td>
<td>1 sec</td>
<td>SCO, DCO, RCO - PDP parameters</td>
</tr>
<tr>
<td></td>
<td>value range: 0.1... 25.5 sec</td>
<td></td>
</tr>
</tbody>
</table>

Output monitoring and supervision

The sequence of a (1 out of n) check and the following pulse output is as follows. The 520CSD01 board receives a request from the CMU to do a (1 out of n) check and force the output.

Than the 520CSD01 will do the following steps:
- Check that no output is active.
- Adjustment of the measuring logic with the reference resistor.
- Activate check circuit (activate relay "CHECK" R09)
- Measuring of the resistance of the selected interposing relay (outside the module).
- Compare the measured resistance value against the parameterised upper and lower limit (see also RTUtil parameter).
- Check the relay voltage X3 (24 VDC) is available.
- Stop all other steps if the result is negative (negative acknowledge to CMU).
- Changeover from "CHECK" to "SWITCH" position.
- Activate output pulse by switching relay the "GO" relay.
- Inform CMU that output is active.
- Monitoring that X3 is present during output.
- Stop output after the pulse duration time has elapsed by releasing the "GO" relay (see also RTUtil parameter).
- Stop output pulse if a failure is detected during output (Communication time out on the I/O bus)
- Switch "CHECK" relays off.
- Inform CMU that the output is finished.
Settings

The device has no switches or jumpers.

Signaling

LED ERR

The module monitors and checks the own functionality as well as the dialog via the I/O bus. Detected errors are indicated by the red LED ERR on the front plate and transmitted via the I/O bus to the communication unit (CMU). Additional diagnostic messages are available using the Web-Server on the CMU.

The LED ERR indicates module errors or I/O bus errors:
- module runs initialization procedure
- module is performing a cold or warm start
- module has detected a memory error (RAM or Flash)
- micro-controller is faulty
- no dialog via the I/O bus for at least 2 minutes. The module is not polled by the CMU.

LED BO1... BO4

The 520CSD01 has 4 yellow LED's on the front plate indicating the state of the outputs.

The LEDs are ON for the time an output is active (pulse or persistent).

LED ‘PER’

The red LED indicates that the 24V input (U_E) for the output relays are missing.

LED ‘PGO’

Die grüne LED zeigt an, dass die Prozess-Spannung (U_P) eingeschaltet ist und die Prozessausgabe erfolgt.

Connections

I/O bus connection

The module is connected to the RTU I/O bus via the connectors X1 and X2.

ADVICE

To prevent damage on the connected modules de-energize the system before plugging or unplugging the I/O bus connectors.

To prevent unintended disconnection of the I/O bus connectors end stops (e. g. BAM3 1SNK900001R0000) shall be used at both ends of the I/O assembly.

Power supply U_E

The electronic circuits on the process side are supplied by an external 24 V DC voltage input U_E. The voltage input U_E is connected at.

ADVICE

For the operation of the module 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 U_E connector.

Process Connection

The command output will be connected to the screw terminals X4b.

The process voltage input (UPin) and the process voltage output (UPout) will be connected to the screw terminals X4a (see Fig. 3).

The 1 pole connection is described in Fig. 9.

The 1.5 pole connection with (1 out of n) check is described in Fig. 8.
Safety instructions

Dangerous process voltages

⚠️ DANGER

Hazardous voltage.

Contact with live circuits will cause electric shock or burn.

Verify that all terminals feeding dangerous contact voltages (supply voltage, input or output channels) is in secure OFF state before connecting or withdrawing the terminals.

Process voltage > 60 V DC

**ADVICE**

For process voltages > 60 V DC it is mandatory to use a galvanic isolated power supply (OCII e.g. 560PSU40). Connecting with other SELV circuits is not allowed.
Figure 2: 520CSD01 Front plate

Figure 3: Position of the connections and settings elements

Figure 4: RTU520 DIN rail mounting - step 1
1 Insert upper edge into DIN rail and push downwards
2 Push lower edge towards DIN rail and snap in the module

Figure 5: RTU520 DIN rail mounting - step 2
3 + 4: Shift one module connector into the other starting from right to left

Figure 6: RTU520 DIN rail mounting - step 3
5 + 6: Mount end stops at the left and right side
Figure 7: 520CSD01 connection diagram
Figure 8: 1.5 pole connection with (1 out of n) control

Figure 9: 1 pole connection without (1 out of n) control
Figure 10: connection with (1 out of n) control and 520BOD01 (Up = UE = 24 V DC)
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