 ABB Schweiz AG  8201 Schaffhausen	<b>Technical Manual</b> <b>Functional Description for</b> <b>S800-RSU-H / S800W-RSU</b> <b>2CCC413022M0205</b>	<b>09.04.2014</b>	Page: 1 / 10

Please use also the assembly instruction [S800-RSU-H Remote Switching Unit for S800 2CCC413020M0204](#)

**SUBJECT TO ALTERATIONS**

## Index

<b>1</b>	<b>Functionality</b>	<b>2</b>
1.1	Operation and control	2
1.2	Environment	2
1.3	Functional Requirement	3
<b>2</b>	<b>External Connections</b>	<b>4</b>
2.1	Operating voltage	4
2.2	Inputs	4
2.3	Outputs	5
2.4	Circuit times	5
2.5	Pin assignment	6
2.5.1	In- and Output Allocation	6
2.5.2	Simplified Diagram of the control	7
<b>3</b>	<b>Timing diagrams</b>	<b>8</b>
3.1	OFF – ON / ON – OFF / ON – ON / OFF - OFF	8
3.2	Power up if contacts are open resp. closed	9
3.3	ON – Trip / Trip – OFF / Trip – ON / Power up - Trip	10

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# 1 Functionality

## 1.1 Operation and control

The intention is the fast, secure and energy-aware moving of the lever of S800 High Performance MCB. The controller interprets the two command inputs ON and OFF. The controller does a switching command when a positive edge at one of the two command inputs is detected and the signal is for at least 10ms stable. Once the home position is reached after switching operation, the corresponding feedback signal is activated. Once the home position is reached and the feedback signal is turned on, a new control command can be initiated.

When the S800 triggers due to overload, short circuit or manual activation, this is registered and issued by activating the "TRIP".

A "ON" or "OFF" switching command can be triggered directly from the "TRIP" position. When detection a trip movement the motor moves into OFF-position to secure the contact opening and to prevent a subsequent manually switching of the S800 via lever.

Under normal operation, it is always only one output active. If the motor is in motion, no output is active.

The motor switches powerless after executing the control command. Thus a twist of the spindle to snap the external safety lock or manual actuation by screwdriver is possible.

If the spindle is moved by more than one rotation from the current position, all outputs are turned on. If the spindle only slightly rotated manually (> 7.5°) for 10 seconds no commands will be accepted. The initialization takes place when a switching command is detected only. The switching command is executed after initialization. Until the beginning of the initialization, all outputs are active.

## 1.2 Environment

Operating Voltage	+24 VDC +10 % / -15 %
Current Consumption	2,5 A
	<i>ABB recommends:</i>
	<i>ABB switching power supply CP-S 24/5.0</i>
	<i>(The power supply needs at least a nominal current rating of 5A.</i>
	<i>Furthermore it must be able to cover short spikes above the rated current rating without decreasing the input voltage under 20V DC)</i>
Load Peaks	8A for 0.1ms at power up
	3.5A for 250ms during operation
Standby Current	< 50 mA
Ambient operation temperature	
Coldness	Up to -25 °C according to IEC 60068-2-1:2007
Dry heat	Up to +70 °C according to IEC 60068-2-2:2007
Damp heat	Up to +55°C by 95% rel. hum. acc. to IEC 60068-2-30:2005
Relative humidity	< 85 % at 45 °C (No bedewing)
Dimensions	
Depth	134,2 mm (5,28 in)
Height	100,6 mm (3,96 in)
Unit width	54 mm (2,13 in)
Contact trip indicator	Yes (ON – TRIP – OFF)
Trip position of actuating lever	Yes
Mechanical Fixing	Field mountable and wireable on High Performance MCBs S802..., S803..., S804 via Allen head screw size 3 and mounting bracket. Required tightening torque 3 Nm

Maximum Cable length	Power supply: up to 10m with 0.5 mm <sup>2</sup> (32 feet 9.7 in with AWG20) Control supply: up to 10m with 0.5 mm <sup>2</sup> (32 feet 9.7 in with AWG20)
Guidelines	RoHS
Reference standards	IEC 60947-2 Annex N - IEC 61000-4-2 - IEC 61000-4-3 - IEC 61000-4-4 - IEC 61000-4-5 - IEC 61000-4-6 - IEC 61000-4-11 IEC / CISPR 22 EN 61000-6-2 - IEC 61000-4-8 EN 61000-6-4 - IEC / CISPR 16-2-3 - IEC / CISPR 22 EN 61000-4-16 (from 20kHz) UL489 sections 14, 16 60068-2-1 60068-2-2 60068-2-30

### 1.3 Functional Requirement

Maintenance:	Maintenance free during lifetime
Maximum number of switching cycles:	10.000 mechanical switching operations if mounted on S800 High Performance MCB
Manual switch OFF:	If manual use is detected (> 7.5°), inputs will be deactivated for 10 seconds. Outputs remain unchanged. If spindle is being turned more than once, all outputs become active until next command is accepted. Intuitive manual switch-off via lever is possible.
Manual switch ON:	If manual use is detected (> 7.5°), inputs will be deactivated for 10 seconds. Outputs remain unchanged. If spindle is being turned more than once, all outputs become active until next command is accepted. Intuitive manual switch-on via lever is not possible.
Mechanical lock:	Mechanical fixation by secured lock slider blocking the actuation spindle independent of its position
Referencing by startup	By startup the S800-RSU-H / S800W-RSU refers unique
Referencing after voltage interruption	When operating voltage is restored a unique referencing take place. Regardless of the switching position of the High Performance MCB S800 the referencing held in the OFF position.

## 2 External Connections

### 2.1 Operating voltage

We recommend the use of a normal commercial power supply with 24 V nominal voltage and nominal current carrying capacity of 5 A as the power supply for the 4-pole version of S800. During simultaneous control of several S800-RSU-H / S800W-RSU, the power supply has to be configured concerning current carrying capacity.

The power supply must be able to cover short spikes above the nominal current carrying capacity without the input voltage at the controller dropping below 20 VDC. A power supply with a lower nominal current carrying capacity can be used for the 2 and 3 pole MCB variants. The maximum current is only needed during the switch-on movement. The earths of the power supply and the digital inputs and outputs are connected to each other.

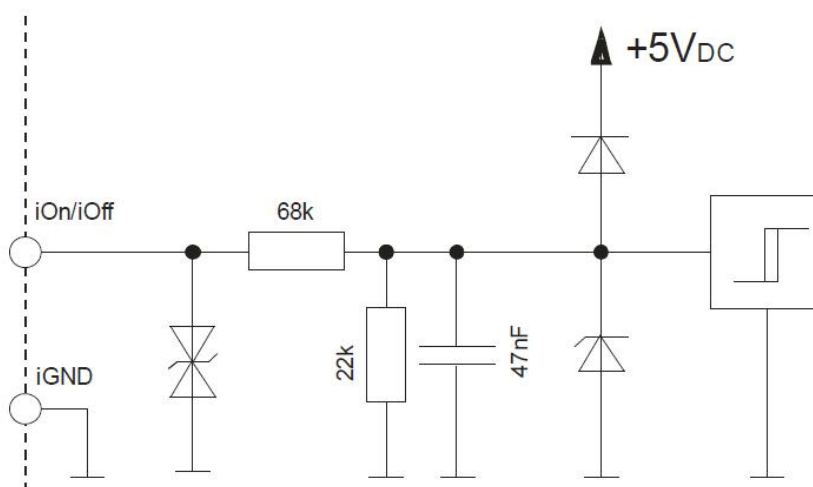
### 2.2 Inputs

The inputs are designed for connection to a standard PLC, which switches the positive side of the outputs. The inputs can be connected directly via a mechanical or electronic contact with the supply voltage to trigger a control command. An open, non-connected input is interpreted as a logic 0.

The masses of the digital inputs and the operating voltage supply are connected internally. The masses of different external power supplies must also be connected.

The input will be internally debounced with a time constant of about 10 ms. To recognize an operation command, the input signal has to be for at least 10ms logical 0 and then for at least 10 ms logical 1. Thus the software debouncing can be effectively and detects a level change from logic 0 to logic 1.

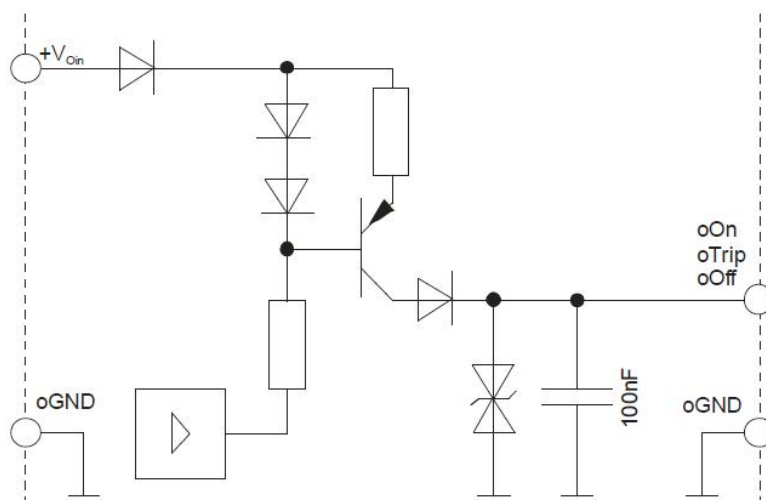
Function:	command ON, command OFF
Voltage range logic 0	0...4 V
Voltage range logic 1:	10...24 V
$t_{\min}$ :	ca. 20 ms
Input resistance:	ca. 93 k $\Omega$
Input current at 24 VDC:	ca. 260 $\mu$ A
Electric filter delay time:	0.5 ms
Overvoltage capability and inverse-polarity protection:	$\pm 27$ V



## 2.3 Outputs

The outputs are designed for connection to a standard PLC or the direct switching of small loads.

Function:	Feedbacks ON, OFF, TRIP
Voltage range:	12...26.4 VDC
Maximum load:	10 mA
Logic 0 leakage current	< 100 $\mu$ A
Output voltage at 24 VDC, 10 mA	> 23 VDC



## 2.4 Circuit times

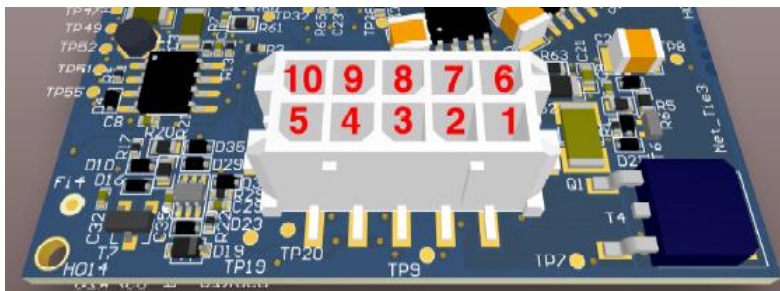
Duration of closing operation of S800 contacts from signal on (OFF→ON):	< 500 ms
Duration of opening operation of S800 contacts from signal on (ON→OFF):	< 250 ms
Duration of closing operation of S800 contacts from signal on (TRIP→OFF→ON):	< 1500 ms
Number of switching attempts in case of thermal or magnetic fault on S800 before lock:	15 minutes ( $\pm 5\%$ ) lock after three switching attempts without supply voltage interruption / switching-off
Number of switching attempts when lock slider is in locked position	One minute lock after one attempt per minute
Switching force:	ca. 120 N
Degree of protection:	IP20 if mounted

## 2.5 Pin assignment

The black Microfit female (e.g. Molex series 43045) is numbered from down right to top left as seen in the pictures below

### NOTE:

When connecting the cable please make sure that the individual strands are not exposed to mechanical stress.



### 2.5.1 In- and Output Allocation

#### Supply voltage:

Pin 1	+24 V d. c.:	Supply voltage, operating voltage 24V DC
Pin 6	GND:	Supply voltage, ground

#### Inputs:

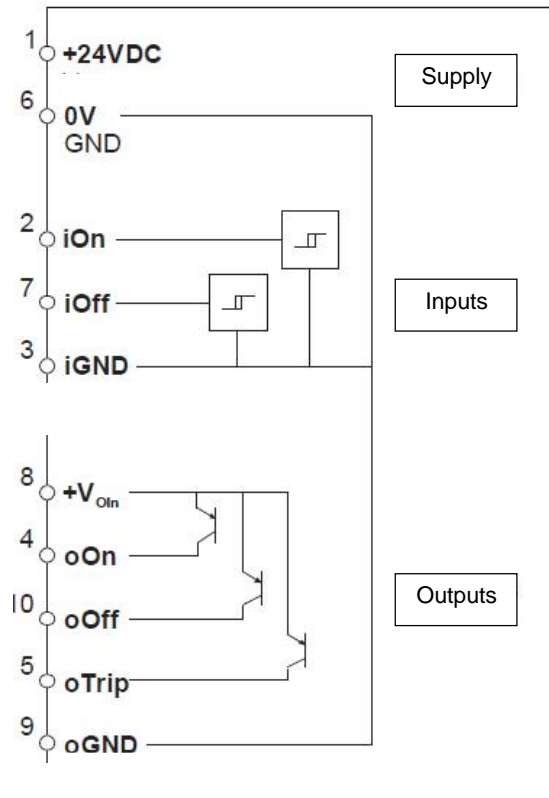
Pin 2	iOn:	Control input "ON"
Pin 7	iOff:	Control input "OFF"
Pin 3	iGND:	Control supply voltage, ground

#### Outputs:

Pin 4	oOn:	Feedback output "ON"
Pin 10	oOff:	Feedback output "OFF"
Pin 5	oTrip:	Feedback output "TRIP"
Pin 8	+VoIN:	Output supply voltage, operating voltage 24V DC
Pin 9	oGND:	Output supply voltage, ground

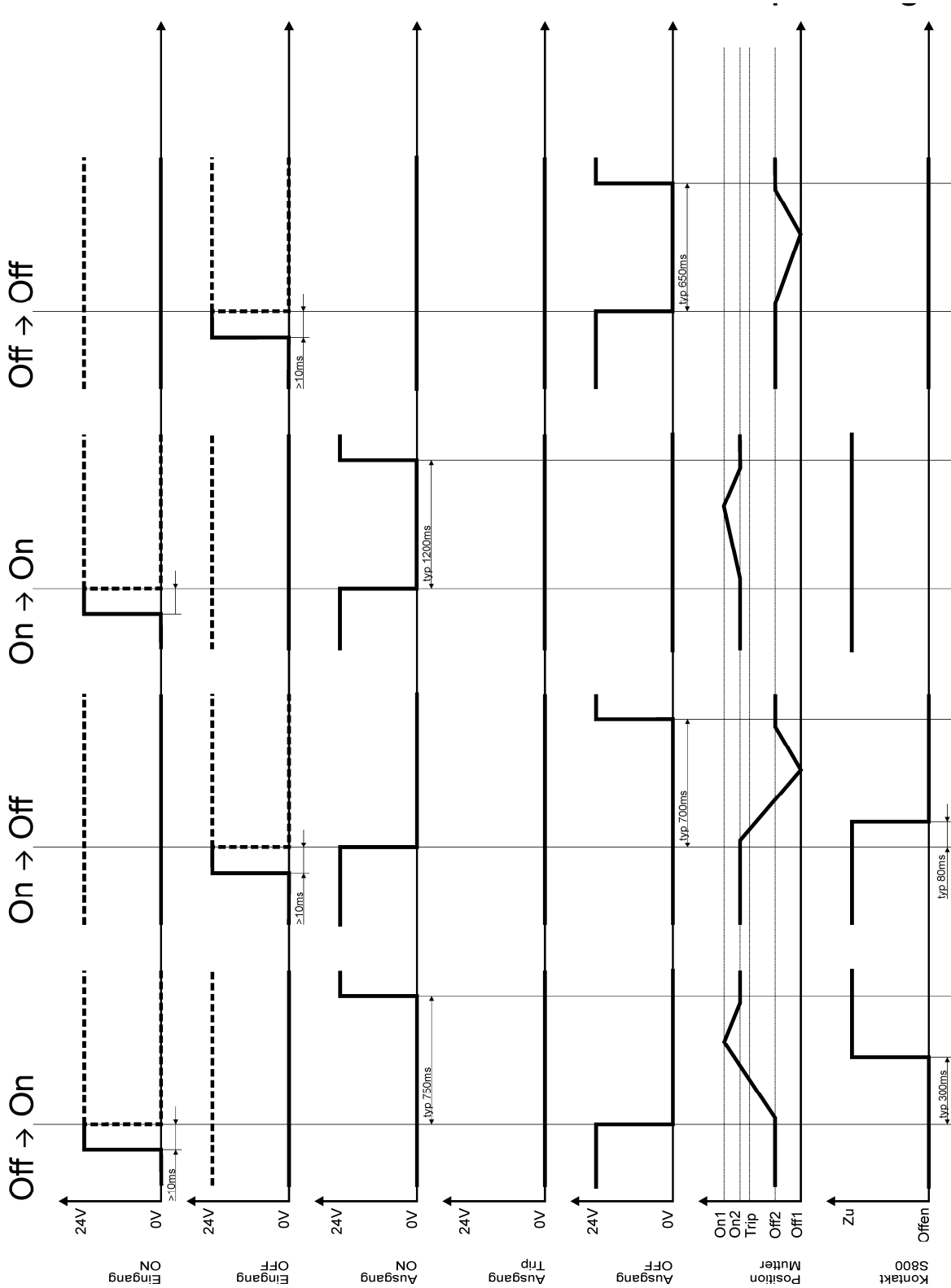
**Connections 3, 6 and 9 are internally connected.**

### 2.5.2 Simplified Diagram of the control



### 3 Exemplary Timing diagrams

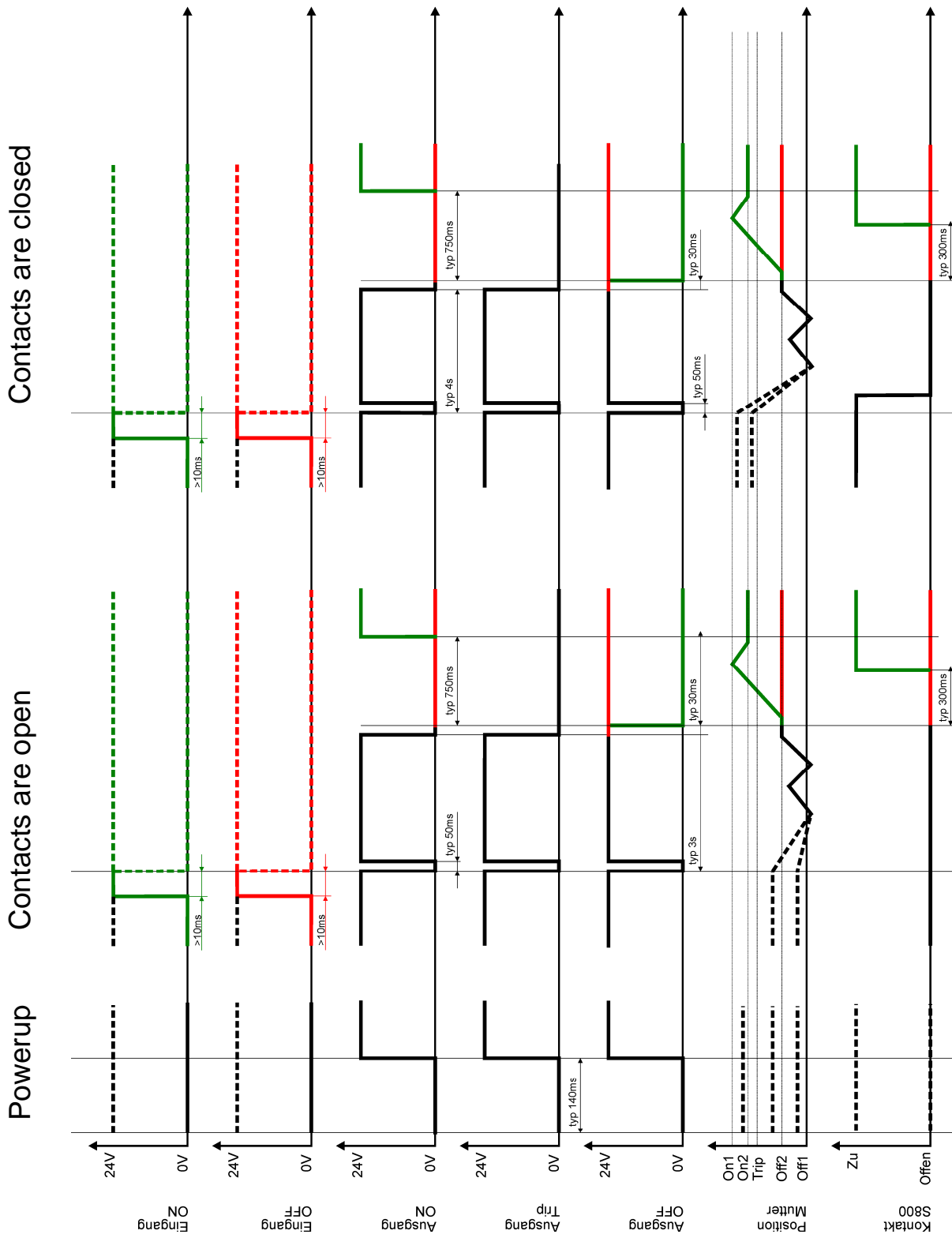
#### 3.1 OFF – ON / ON – OFF / ON – ON / OFF - OFF



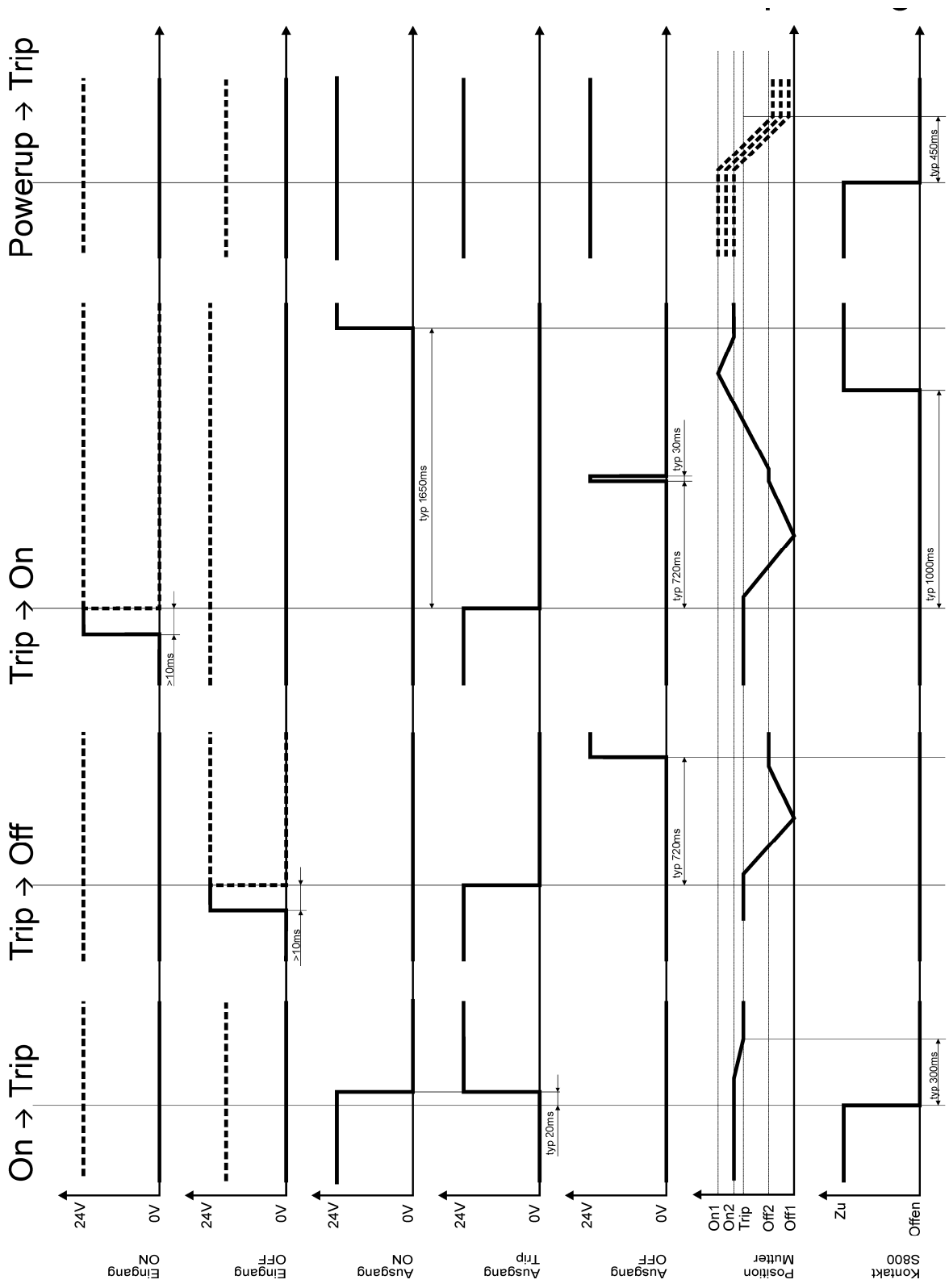
Ermittelt mit Software-Firmware - nmc DEC 242.2 Fernbedieneinheit (MMC\_FIRMWARE - 990187 - 1 - C3) vom 3. November 2009



### 3.2 Powerup if contacts are open resp. closed



### 3.3 ON – Trip / Trip – OFF / Trip – ON / Powerup - Trip



Ermittelt mit Software "Firmware - nmc DEC 242.2 Fernbedieneinheit (MMC\_FIRMWARE - 990187 - 1 - 03)" vom 3. November 2009