

Level Control Unit with wide range power supply for conductive level probes

Manual

SNG-UC



Automatisierungstechnik

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Electrical Connection

Installation Advices

The choice of cable, the installation, and securing the electrical connection must conform to the requirements of VDE 0100 „Regulations on the installation of power installations with nominal voltages under 1000 V“ or the applicable national regulations.



The electrical connection may be performed by qualified personnel.

Protect the device in the installation and operation of electrostatic discharge.

Improper installation, as well as incorrectly parameter settings could have bad affects to the application or can cause damages. Therefore it should always exist independent safety devides. Settings must be performed by qualified personnel.

The connected load circuit must be protected to the maximum output current, to prevent a welding of the output relais in the case of short circuit.

When working on the devices that are under voltage the unit must be disconnected from the grid with 2 poles.



The supply voltage is electrically isolated from the ground of the sensor.

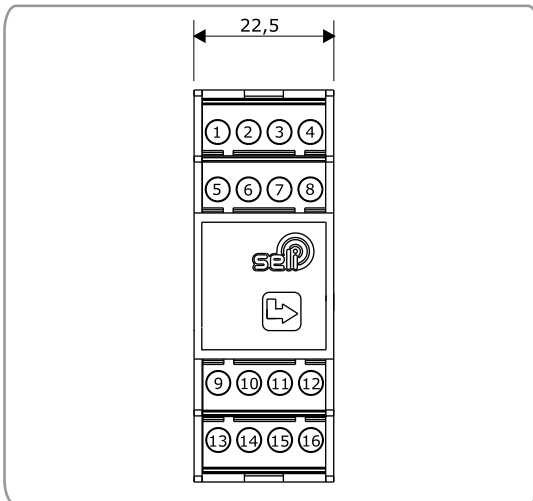
Please Note!

Please install the software first before connecting the USB-Interface SMW-PA with the USB-Port of the computer.



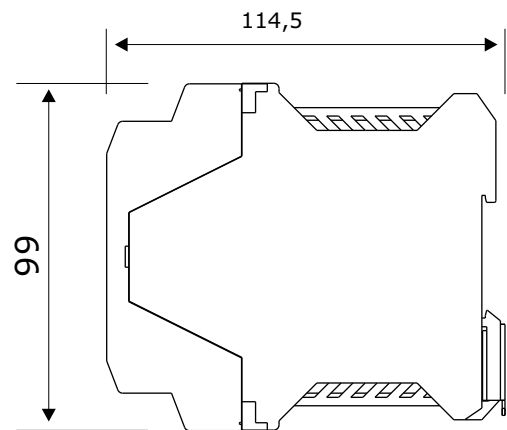
It is very important to watch for that the USB-Interface SMW-PA is connected with a USB-Port on the computer, before connecting the unit SNG-UC and the software will be started.

Pin Configuration

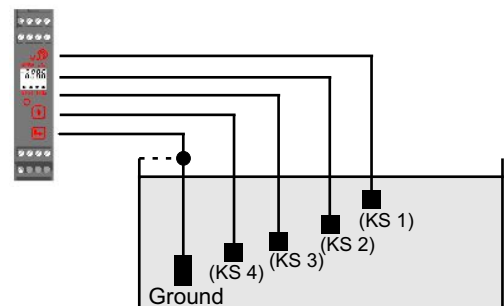


| Connection | Description |
|------------|---|
| 1 | Probe-Input 1 E1 (KS 1) |
| 2 | Probe-Input 2 E2 (KS 2) |
| 3 | Probe-Input 3 E3 (KS 3) |
| 4 | Probe-Input 4 E4 (KS 4) |
| 5 | Electrode - Ground / 0 VDC Electr. Output |
| 6 | --- |
| 7 | Electronic Output 1 (24V ; 35mA ; PNP) |
| 8 | Electronic Output 2 (24V ; 35mA ; PNP) |
| 9 | Relay-Output 1 (NO) ; IN |
| 10 | Relay-Output 1 ; OUT |
| 11 | --- |
| 12 | --- |
| 13 | Relay-Output (NO) ; IN |
| 14 | Relay-Output 2 ; OUT |
| 15 | Supply 24-250V (AC/DC+) N |
| 16 | Supply 24-250V (AC/DC-) L1 |

Housing Dimensions



Example of a connection



Quick Adjustment

Please Note!

The setting of the device can be done in two levels:

1. Quick Adjustment

Here only the parameter power on values and On-/Off-Delay can be adjusted

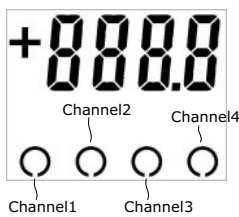
2. Main Menu

Here are all parameters and functions adjustable (look parameter-description).

The unit is supplied preset.

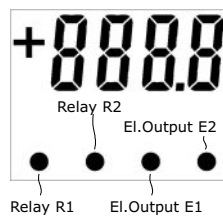
Display Description

Actual Display Channel:



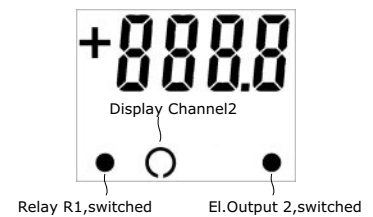
Mit der 'OBEN'- Taste wird die Aktuelle Anzeige des Displays gewechselt.

Output Display:



Der Zustand der Ausgänge wird mittels Punkten angezeigt.

Example:



Quick Adjustment

| Key | Description | Display |
|-----|--|--------------|
| | 'ENTER' push shortly Quick Adjustment | sign blinks |
| | 'UP' Choose Parameter | sign blinks |
| | 'ENTER' Value Adjustment | digit blinks |
| | 'UP' Change Values | digit blinks |
| | 'ENTER' Confirm Adjustment | sign blinks |
| | 'UP' Maybe choose next parameter | sign blinks |
| | 'ENTER' Value Adjustment | digit blinks |
| | 'UP' Change Values | digit blinks |
| | etc... | |



When 15 seconds long will be done no input or the 'up' button is pressed for more than 1 sec, the unit will skip automatically to the measuring mode

Parameter Description

Value-Area

| | | |
|-----------|--|---|
| L | Input-Value in $K\Omega$; switching hysteresis between L and H is adjusted in the main menu and is maintained when entering a new value for L [300] | 0,2...9,9K Ω 10...990K Ω |
| d | Enable delay- in sec. [0,1] | 0,0...99,9sec |
| \bar{d} | Disbale delay in sec. [0,1] | 0,0...99,9sec |









[] = factory setting

Main Menu






| The Main Menu | | |
|---------------|--|---|
| Key | Description | Display |
| | 'ENTER' push 5 sec. Main Menu | Zeichen blinkt |
| | 'Up' Choose Parameter | Zeichen blinkt |
| | 'ENTER' Value Adjustment | Ziffer blinkt |
| | 'Up' Change Values | Ziffer blinkt |
| | 'ENTER' Confirm Adjustments | Zeichen blinkt |
| | 'Up' Maybe choose next parameter | Zeichen blinkt |
| | 'ENTER' Factory Setting | Ziffer blinkt |
| | 'Up' Change Values | Ziffer blinkt |
| | etc... | |
| | When 15 seconds long will be done no input or the 'up' button is pressed for more than 1 sec, the unit will skip automatically to the measuring mode | |
| Parameter | Description | Wertebereich |
| | Activate Channel (1= Measuring range 10K Ω ; 2= Measuring Range 1000K Ω) !! Sampling-time: Channel 1,2,3,4 = 10k -> 50ms ; min. One channel 1000k -> 110ms !! | [1] 1=0,2...9,9K Ω 2=10...990K Ω |
| | Input Value in K Ω | [300] 0,2...9,9K Ω 10...990K Ω |
| | Output- Value in K Ω | [400] 0,2...9,9K Ω 10...990K Ω |
| | Enable delay in sec. | [0,1] 0,0...99,9sec |
| | Disable delay in sec. | [0,1] 0,0...99,9sec |
| | Logic of output (1= inverted ; 2=Wire break detection <i>br</i> with parallel resistance \leq 470K Ω) | [0] <i>br</i> =50...470K Ω |
| | Output Selection 1 | [1] r1 r2 e1 e2 |
| | Output Selectionl 2 | [0] r1 r2 e1 e2 |
| | (Logic- Functions) Level Control : 0=inactive; 1=Niv.-control for channel 1 2=Niv.-control for channel 2 3=Niv.-control for channel 3 4=Niv.-control for channel 4 5=Parameter-switchover channel 1 6=Parameter-switchover channel 2 7=Parameter-switchover channel 3 8=Parameter-switchover channel 4 | [0] 1,2,3,4,5,6,7,8 |
| | The level control function and the parameter-switchover-function can not relate to the current channel and therefore is not shown for these. Example: Main Menu Channel 1 ; Display of the values 0, 2, 3, 4, 6, 7, 8 | |

[] = factory setting

Factory Setting


| The Factory Setting | | |
|---|---|---|
| Key | Description | Display |
|  | 'Up' push 10 sec.  Factory Setting |  |
|  | 'Up'  Chose Parameter |  |
|  | 'enter'  Confirm Adjustment | |
| | etc... | |
| | | |
| | | |
| | | |

Parameter Description (Depending on version 2- or 4-channel)

| | |
|---|---|
|  | No Factory Setting was done |
|  | 2 or 4x Level-Detection Factory setting / Delivery Condition |
|  | 1x Level-Control (counter electrode channel 4) 3x Level-Detection |
|  | 2x Level-Control (counter electrode channel 4) 2x Level-Detection |
|  | 3x Level-Control (Counter Action channel channel 4) 3x Level-Detection |

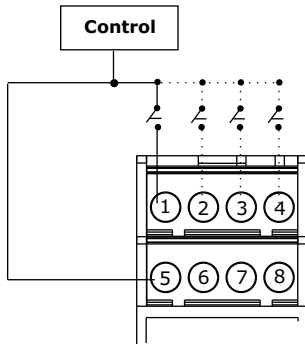
Note!

When changing the setting, the display shows  if the menu item "Factory Setting" is activated again.

The adjusted values are to see in the main menu, menu item 

Parameter-Switchover

Parameter-Switchover Connection and Function




The parameter switchover allows an externally controlled sensitivity and Delay switching. Typical applications in this context are e.g. Foam detections in the dairy industry.

The switch may be triggered by an electrically isolated switch contact, or isolated electronic contact of the measurement-mass to the selected Channel.



Wiring configurations which can not be isolated may not be used in no case.

If the input is activated, the "reversible" parameter is written in the destination channel. If the input is deactivated again, the original values of the destination channel counts. The destination channel is selected via the parameter F.

| Parameter | Description | Range |
|-----------|---|-----------------|
| F | <p>(Logic- Functions) Level-Control: 0=inactive; 1=Level Control Channel 1 2=Level Control Channel 2 3=Level Control Channel 3 4=Level Control Channel 4</p> <p>5=Parameter-switchover channel 1 6=Parameter-switchover channel 2 7=Parameter-switchover channel 3 8=Parameter-switchover channel 4</p> <p> The level control functions and parameter-switchover can not refer to the current channel, therefore they are not shown for these. Example: Main Menu Channel 1 ; Display of the values 0, 2, 3, 4, 6, 7, 8</p> | 1,2,3,4,5,6,7,8 |

Note!

In case of parameter-switchover: In each of the actuated channel switching parameters can not be used as a probe input.

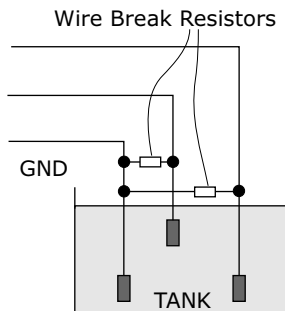
When wire break detection is enabled no more parameter-switching is possible!

Example: The channel 1 is the measuring channel. (The probe is connected). The parameters of channel 2 shall now be overridden in the channel 1.

- In channel 2 the parameters will be adjusted as desired. Than the point "Parameter-Switchover K1" must be chosen. The potential-free contact is placed to channel 2. The parameters will now be overridden into channel 1.

Wire Break Detection

Wire Break Detection Connection and Function



With the setting wire break detection will be verified in a measurement cycle of less than 0.5 sec., whether a wire break resistor is connected to the channel. The chosen resistor should typical have 50 ... 470kOhm.

Once a circuit is activated with wire break detection, then the output logic to all Channels is inverted, so switching to LOW.

Is the wire break detection is not successful , that means the wire is broken, so all outputs of the unit will deenergize.

The relay R2 is scheduled for wire break detection. No other Output can be set for this purpose.

Each channel can be adjusted to wire break detection seperately, but the wire break signal is always R2.

When the detection is activated no channel can access to R2.

Alarm Message

Wire breakage is recognised.

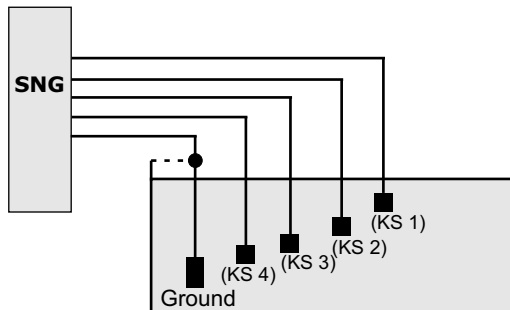


Note!

When wire break detection is enabled no more parameter-switching is possible!

Level Logic

Level Logic Connection and Function



Level Detection

The corresponding output of a channel is switched on, once the ON value is reached and switched off when the OFF value is exceeded.

Every change of condition with the delay "d" or "t"



Even if one channel is used as level control, it remains the opportunity on the designated channel to give out level detection on a different output.

Level Control

When filling the tank the related output is activated (e. g. Channel1- Output-selection 1), once e.g. electrode K3 comes up and powers off when e.g. electrode K1 immerses. When emptying the tank the output remains as long off until K3 comes up. Then the output is switched on again.

Every change of condition always after time "d" or "t" .

To activate this function for a channel, the user must indicate the channel of the "down"-electrode in the Parameter F. In this example the user would have to input "F3" in the channel 1, for the Electrode K3. The current channel can not be selected as an electrode.

Further it's possible that the user defines up to three channels with the level-control, in this example the channels for electrodes K4,K2,K1 could be defined "F3" in the menus.

Type SNG-UC

basic @ level

Level control unit with wide-range-power supply for conductive level probes

Basic features

- ▶ Processor controlled unit
- ▶ Up to 4 level probes + ground probe
 - single limit
 - limit control
 - wire breakage protection
 - parameter switching
- ▶ Wide range power supply (universal voltage)
- ▶ PC-configurable (optional)
 - process-monitoring + documentation incl.

Technical features

- ▶ Version: 22,5 mm top-hat rail housing
- ▶ Supply voltage : 24-250V (AC/DC)
- ▶ Protection class: IP 20
- ▶ Working temperature: -10°C up to +50°C
- ▶ Storage temperature: -20°C up to +70°C
- ▶ Inputs: 2 resp. 4 independent for electrodes
 - resp. fill level
 - 1 (Ground electrode resp. tank)
- ▶ Sensitivity:
 - 2 arrays 0,2 KΩ...9,9 KΩ/990 KΩ;
 - free selectable for electrode
- ▶ Outputs:
 - 2x relay-output (3A/230V)
 - (NO ; per software to NC)
 - 2x electronics-output 22...24V DC;
 - 35mA; PNP invertible
 - short-circuit current 10mA max.
- ▶ Time Delay: turn on-/off-delay
 - 0,0 to 99,9sec; free selectable
 - for each output

Favoured fields of application are e.g:

- ▶ Low- / high alarm in containers
- ▶ Media registration in pipes as pump protection
- ▶ Filling / emptying of tanks with level control



Accessories (optional)

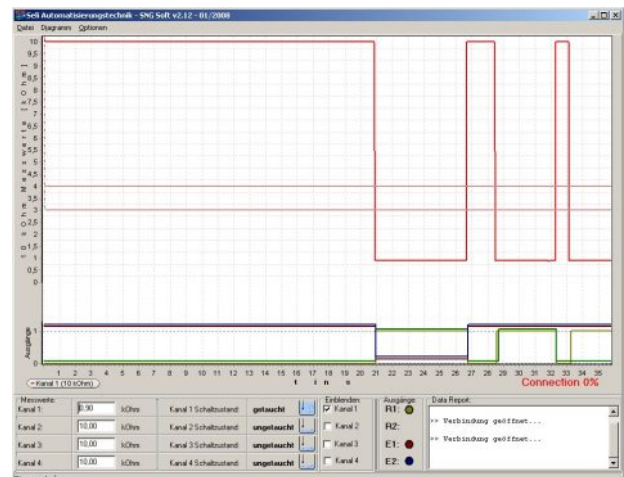


SMW-PA



SNG-PA

Visualization via PC-USB interface incl. software for readout, parametrization and documentation

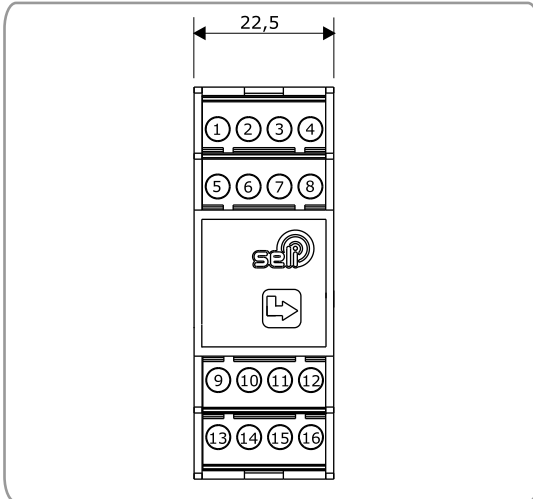


Type SNG-UC

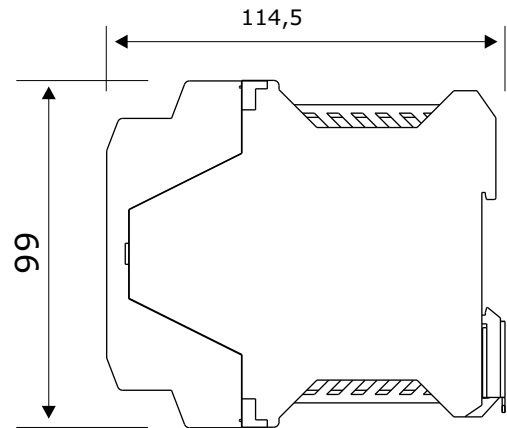
basic @ level

Level control unit with wide-range-power supply for conductive level probes

Terminal Assignment

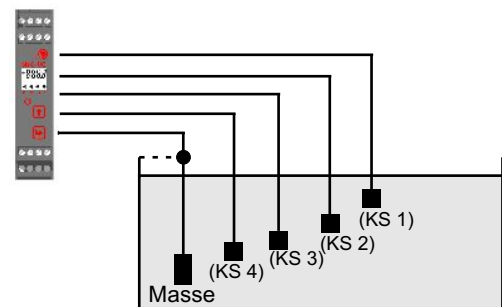


Dimension of housing

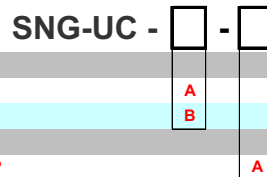


| connection | description |
|------------|---|
| 1 | Probe-Input 1 E1 (KS 1) |
| 2 | Probe-Input 2 E2 (KS 2) |
| 3 | Probe-Input 3 E3 (KS 3) |
| 4 | Probe-Input 4 E4 (KS 4) |
| 5 | Ground of electrode / 0 VDC electronic-output |
| 6 | --- |
| 7 | Electronic Output 1 (24V ; 35mA ; PNP) |
| 8 | Electronic Output 2 (24V ; 35mA ; PNP) |
| 9 | Relay-Output 1 (NO) ; IN |
| 10 | Relay-Output 1 ; OUT |
| 11 | --- |
| 12 | --- |
| 13 | Relay-Output 2 (NO) ; IN |
| 14 | Relay-Output 2 ; OUT |
| 15 | Supply 24-250V (AC/DC+) N |
| 16 | Supply 24-250V (AC/DC-) L1 |

Example of connection



Order Code



For the parametrization with the software you need following accessories

Order Code Accessories

Parameterise-adapter + software-package

SNG-PA

For the connection with the PC-USB Interface SMW-PA

PC-USB-Interface incl. software for connection with the PC

SMW-PA

For Reading out and parameterise of seli fill level measurement

The red marked items are preferred types!

09/2009