

## 1. Safety instructions

### 1.1 Symbols

The symbols in these instructions point out risks and have the following meaning:



Smooth and safe operation requires that these operating instructions be read and understood!  
Warning in case of risks.

Non-observance can result in malfunctioning.



Non-observance can result in malfunctioning and personal injury.



Information on proper product handling.

### 1.2 Intended use

- The purpose of the SINEAX TV815 isolating amplifier is to galvanically isolate input signals from output signals, to amplify them and/or transform them to another level or another signal type (current or voltage).
- The device is intended for installation in industrial plants and meets the requirements of EN 61010-1.
- Manufacturer is not liable for any damage caused by inappropriate handling, modification or any application not according to the intended purpose.

### 1.3 Commissioning



- Installation, assembly, setup and commissioning of the device has to be carried out exclusively by skilled workers.
- Observe manufacturer's operating instructions. Do not operate the device outside of the limit values stated in the operating instructions. Check all electric connections prior to commissioning the plant.
- Safety measures should be taken to avoid any danger to persons, any damage of the plant and any damage of the equipment due to breakdown or malfunctioning of the device.
- Decommission the device if its safe operation is no longer possible (e.g. in case of visible damages). Disconnect all connections. Send the device to our plant or to one of our authorised service centres.

### 1.4 Repair work and modifications



Repair work and modifications shall exclusively be carried out by the manufacturer. In case of any tampering with the device, the guaranty and warranty claim shall lapse. We reserve the right of changing the product to improve it.

### 1.5 Disposal



The disposal of devices and components may only be realised in accordance with good professional practice observing the country-specific regulations (applicable within the European Union and other European countries with a separate collection system).

### 1.6 Transport and storage



Transport and store the devices exclusively in their original packaging. Do not drop devices or expose them to substantial shocks.

## 2. Scope of delivery

- 1 Isolating amplifier SINEAX TV815
- 1 Operating instructions in German, French and English

## 3. General features

- Input: Voltage, current.
- Power supply of the sensor in 2-wire technology: 20 V DC stabilised, max. 20 mA protected against short circuits.
- Measurement on galvanically isolated analog output with active/passive output for voltage and current.
- Selection of input type, START-END, output mode (zero determination, scale reversal), output type (mA or V) by means of DIP switch.
- Indication of available power supply, of scale exceedance or setup error on the front side via LED.
- Galvanic 3-way isolation: Test voltage 1500 V AC.

## 4. Technical data

### 4.1 General

Power supply	10...40 V DC, 19...28 V AC, 50...60 Hz, max. 2,5 W; 1,6 W at 24 V DC with output 20 mA
Input	Voltage: -20 ... +20 V, input impedance 1 M $\Omega$ , max. resolution 15 bit + sign Current: -20 ... +20 mA, input impedance ~50 $\Omega$ , max. resolution 1 $\mu$ A
Output	Voltage: 0...10 V / 2...10 V, minimum load 2 k $\Omega$ Current: 0...20 / 4...20 mA, maximum load 600 $\Omega$
Resolution	1.25 mV for voltage output / 2.5 $\mu$ A for current output
Sample rate	240 sps at a resolution of 11 bit + sign
Response time	35 ms at a resolution of 11 bit

### 4.2 Accuracy data

Reference conditions	Ambient temperature	25 $^{\circ}$ C
	Power supply	24 V
Error in relation to maximum measuring range:	Voltage/current input	Voltage output (*1)
Basic accuracy (at reference)	0.1 %	0.3 %
Temperature influence	0.01 % / $^{\circ}$ K	0.01 % / $^{\circ}$ K
Linearisation error	0.05 %	0.01 %
Other	EMI (*2): < 1 %	
Data memory	EEPROM for all configuration data; memory period >40 years	

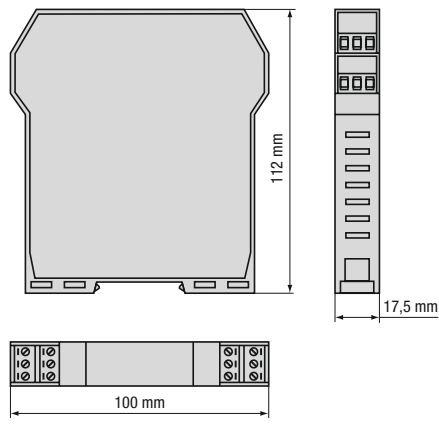
(\*1) Values to be added to the errors relating to the input selected

(\*2) EMI: Electromagnetic interference

### 4.3 Installation data

Design	Top-hat rail housing
Material	PBT (black)
Connections	Coded, pluggable screw terminals 0.2...2.5 mm <sup>2</sup>
Housing ingress protection	IP20
Weight	200 g

#### Dimensions



## 4.4 Environmental conditions

Operating temperature	-20...+60 $^{\circ}$ C
Storage temperature	-40...+85 $^{\circ}$ C
Humidity	30...90 % at 40 $^{\circ}$ C (non-condensing)
Area of application	Indoor areas up to 2000 m above sea level
Degree of pollution	2
Voltage supply	Class 2

## 4.5 Severe operating conditions


Severe operating conditions are:

- High power supply voltage (> 30 V DC / > 26 V AC)
- Power supply of the input sensor
- Use of the output on generated current (active).

When the modules are installed side by side, it may be necessary to separate them by at least 5mm in the following cases:

- If control box temperature exceeds 45  $^{\circ}$ C and at least one of the severe operating conditions exists
- If control box temperature exceeds 35  $^{\circ}$ C and at least two of the severe operating conditions exist.

## 4.6 Regulations

 The device complies with the following standards:	EN 61000-4-5 (Surge protection of inputs, outputs/power supplies)
	EN 61000-6-4/2002 (Electromagnetic interference, industrial environments)
	EN 61000-6-2/2005 (Electromagnetic compatibility, industrial environments)
	EN 61010-1/2001 (Safety) All circuits have to be insulated with double insulation against circuits carrying hazardous voltages.




If using a galvanically isolated power supply unit, a fuse of max. 2.5 A should be installed.

## 5. Mounting instructions

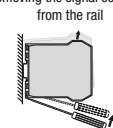
The signal converter is designed to be mounted on rails according to DIN 46277.

**Mounting of signal converter on the rail**



- Place the signal converter onto the top part of the rail.
- Press the signal converter downwards.

**Removing the signal converter from the rail**



- Use a screwdriver (as shown in the figure) as a lever.
- Turn the signal converter downwards.



For optimum function and longevity, ensure adequate ventilation of the signal. We recommend installation in vertical position. Avoid installing the signal converter above devices generating heat. We recommend installing it at the bottom of the switch cabinet.

## 6. Installation instructions

### 6.1 Input selection

The input type is selected by setting the DIP switch group SW1.

Each input type corresponds to a certain number of scale start and end values which may be selected by setting DIP switch group SW2.

The table below lists the possible START and END values according to the input type selected.



Note for all tables:  
The symbol  $\bullet$  indicates that the DIP switch is in ON position.  
No entry means the DIP switch is in OFF position!

## SW1: INPUT TYPES

Input types			
1	2	3	4
			V
$\bullet$			mA

## SW2: START / END

START		END		Type			
1	2	3	4	5	6	Voltage	Current
		$\bullet$				0 V	0 mA
	$\bullet$					400 mV	1 mA
		$\bullet$				1 V	4 mA
$\bullet$						2 V	-1 mA
$\bullet$		$\bullet$				-5 V	-5 mA
$\bullet$						-10 V	-10 mA
$\bullet$	$\bullet$					-20 V	-20 mA
				$\bullet$		100 mV	1 mA
				$\bullet$		200 mV	2 mA
				$\bullet$	$\bullet$	500 mV	3 mA
		$\bullet$				1 V	4 mA
		$\bullet$	$\bullet$			5 V	5 mA
		$\bullet$	$\bullet$			10 V	10 mA
		$\bullet$	$\bullet$	$\bullet$		20 V	20 mA

Note: Set the DIP switches while module is powered down. This avoids electrostatic discharges which might damage the module.

## 6.2 Free setting of START and END for measuring

The START and END keys allow the free setting of the start and end values of the scale within the measuring range set by means of the DIP switches. This procedure requires a suitable signal generator which is able to provide the desired end or start values of the scale.

The procedure is as follows:

- Use the respective DIP switches to set the desired input type as well as START and END for the measurement which contain the desired scale start and end value for the measurement.
- Switch on power supply.
- Attach a generator or calibrator for the signal to be measured or transmitted.
- Set the generator to the desired scale start value.
- Press the START key for at least 3 s. The green LED on the front panel will flash to indicate that the value has been stored.
- Repeat step 4 and 5 for the desired END value.
- Remove power supply of the module and set the DIP switches of group SW2 for the setting of START and END values to the OFF position.

Now the module is configured for the desired start and end value of the scale. To reprogram it, also for other input types, simply repeat the entire process.

## 6.3 Output selection

DIP switches Nos. 7 and 8 of the SW2 group allow the setting of the respective output with or without zero determination, and normal or reversed output. The DIP switch group SW3 lets you select the output type.



Note: Set the DIP switches while module is powered down. This avoids electrostatic discharges which might damage the module.

## SW2: OUTPUT MODE

7	8	Output type
		0...20 mA / 0...10 V
$\bullet$		4...20 mA / 2...10 V
		Normal
	$\bullet$	Reversed

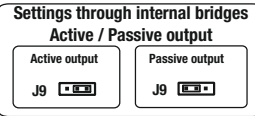
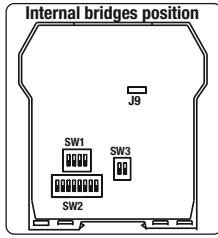
## SW3: OUTPUT TYPES

1	2	Output
$\bullet$		Voltage
	$\bullet$	Current

## 6.4 LED indications on the front panel

LED (green)	Meaning
Fast flashing (Freq.: 1 flash/s)	Outside measuring range or internal fault
Slow flashing (Freq. = 2 flash./s)	DIP switch setting error
Continuously on	Indicates presence of power supply

## 6.5 Settings with internal bridges



## 7. Electric connections

Make sure you adhere to the data on the type plate.

The country-specific provisions (e.g. for Germany, VDE 0100 «Conditions for setting up high-voltage systems with nominal voltages below 1000 Volt») are to be observed during installation and material selection for electric lines.



In order to meet the immunity requirements, we advise using shielded cables to connect the signals. The shield has to be connected to primary grounding for instrumentation. Moreover, it is favourable not to route conductors near power appliances such as inverters, motors, induction ovens, etc.



It is imperative to ensure that all lines are de-energised when connecting!

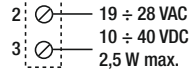
**High voltage may cause danger.**

To connect electric lines, the signal converter has screw terminals suitable for wire cross sections up to a maximum of 2.5 mm<sup>2</sup>. When connecting cables, please observe the following:

1. Remove approx. 0.8 cm of the cable insulation.
2. Insert the cable in the round opening.
3. Tighten the screw terminal firmly using a screwdriver.
4. Check if the cable is attached securely.

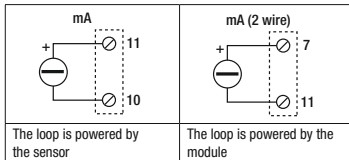
### 7.1 Power supply

Power supply has to range between 10 and 40 VDC (irrespective of polarity) or 19 and 28 VAC; see also the section «Installation instructions».

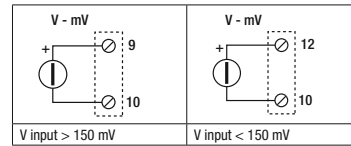


**The upper limits must not be exceeded to avoid serious damage of the module. Protect the power supply source to avoid possible damage of the module by using a fuse of suitable size.**

### 7.2 Current input



## 7.3 Voltage input



### 7.4 Output

Voltage	Generated current (*3)	External power supply current (*4)
The loop is powered by the sensor	active	passive

(\*3) Already powered, active output to be connected to passive inputs.

(\*4) Non-powered, passive output to be connected to active inputs. For selection see «Settings with internal bridges».

## 8. Maintenance

The signal converter is maintenance-free. Any repair work may only be performed by authorised bodies. Any warranty claim will lapse in case of violation.

## 9. Terms of warranty

Camille Bauer AG warrants the flawless condition of the product with respect to material, manufacturing and function and offers a standard warranty of 36 months. Such warranty becomes effective upon delivery of the product to the customer. Camille Bauer AG reserves the right to amend the terms of warranty any time with future effect.

Any defects shall be communicated by the buyer immediately after discovery. The rejected products shall be sent in proper packaging and with sufficient transport protection to one of our authorised service centres. The sender shall bear the shipping risk.

Any defects arising due to improper treatment, faulty installation, mechanical damage, failure to perform maintenance work, inappropriate use and connection to improper power supply shall be excluded from any kind of warranty.

In case of repair work, alterations or tampering on the part of the buyer or any unauthorised third parties, any warranty claim shall lapse.

## 10. Order information

Description		Article-No.
SINEAX TV815	Voltage / current isolating amplifier	172677

## 11. Declaration of conformity



Dokument-Nr./ Document.No.: TV815\_CE-konf.DOC

Hersteller/ Manufacturer: Camille Bauer Metrawatt AG Switzerland

Anschrift / Address: Aargauerstrasse 7 CH-5610 Wohlen

Produktbezeichnung/ Product name: Strom-/Spannungs-Trennverstärker Voltage/current signal converter

Typ / Type: SINEAX TV815

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinien überein, nachgewiesen durch die Einhaltung folgender Normen:

The above mentioned product has been manufactured according to the regulations of the following European directives proven through compliance with the following standards:

<b>Richtlinie / Directive</b>	2004/108/EG(EMC) Elektromagnetische Verträglichkeit - EMV-Richtlinie Electromagnetic compatibility - EMC directive
<b>Norm / Standard</b>	EN 61000-6-4: 2007 Fachgrundnormen - Störaussendung für Industriebetriebe Generic standards - Emission standard for industrial environments EN 61000-6-2: 2005 Fachgrundnormen - Störfestigkeit für Industriebereiche Generic standards - Immunity for industrial environments
<b>Prüfungen / Tests</b>	IEC 61000-4-5
<b>Richtlinie / Directive</b>	2006/95/EG(CE) Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen - Niederspannungsrichtlinie - CE-Kennzeichnung : 95 Electrical equipment for use within certain voltage limits - Low Voltage Directive - Attachment of CE marking : 95
<b>Norm / Standard</b>	EN 61010-1: 2001 Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte - Teil 1: Allgemeine Anforderungen Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

Ort, Datum / Place, date: Wohlen, 13. Mai 2014

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