



Series EE29/EE31

**HUMIDITY/TEMPERATURE
TRANSMITTER**

MANUAL

Hardware and Software

YOUR PARTNER IN SENSOR TECHNOLOGY

E+E
ELEKTRONIK®
Ges.m.b.H.

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USA

FCC notice:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the installation manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this device.

CANADIAN

ICES-003 notification:

This Device B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

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1. GENERAL

The manual is a part of the scope of supply and serves to ensure proper handling and optimum functioning of the instrument. For this reason, the manual must be read before start-up.

In addition, the manual is for all personnel who require knowledge concerning transport, setup, operation, maintenance and repair.

The manual must not be used for the purpose of competition without a written consent from E+E Elektronik® and must also not be forwarded to third parties. Copies for personal use are permitted. All information, technical data and illustrations contained in these instructions are based on information available at the time of publication.

1.1 Symbol assertion



This symbol indicates a safety instruction.

These safety instructions should always be followed carefully. By not following these instructions injuries of persons or material damage could happen. Therefore E+E Elektronik® does not accept liability.



This symbol indicates a note.

These notes should be observed to achieve optimum functioning of the equipment.

1.2 Safety instructions



General Safety Instructions

- Excessive mechanical loads and incorrect usage should always be avoided.
- Take care when unscrewing the filter cap as the sensor element could be damaged.
- The sensor is an Electro Static Discharge sensitive component (ESD). When touching the sensor element, ESD protective measures should be followed.
- Grip sensors only at the lead wires.
- Installation, electrical connection, maintenance and commissioning should be performed by qualified personnel only.
- The devices are constructed for the operation of separated extra-low voltage (SELV).



Safety instructions for use of the alarm module with voltages >50V

- To insulate the optional alarm module from the low-voltage side of the transmitter, the partition provided for this purpose must be fitted in the lower section.
- During operation of the instrument the modular housing must be completely closed.
- The protection class of an opened housing corresponds to IP00 and direct contact with components carrying dangerous voltages is therefore possible. In general, work on live components should be avoided and when absolutely necessary, should be performed by qualified personnel only.



Safety instructions for use of the integrated power supply (option V01)

- During operation of the instrument the modular housing must be completely closed.
- The protection class of an opened housing corresponds to IP00. In general, work on live components should be avoided and when absolutely necessary, should be performed by qualified personnel only.



1.3 Environmental aspects

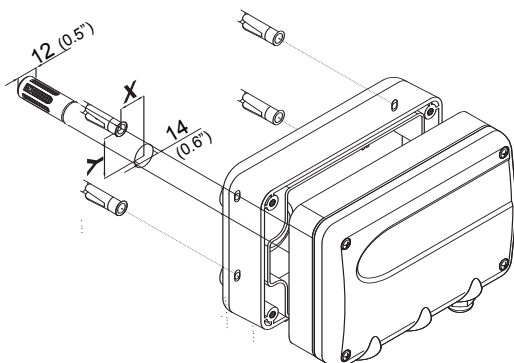
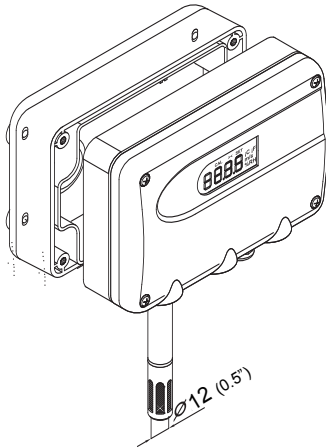
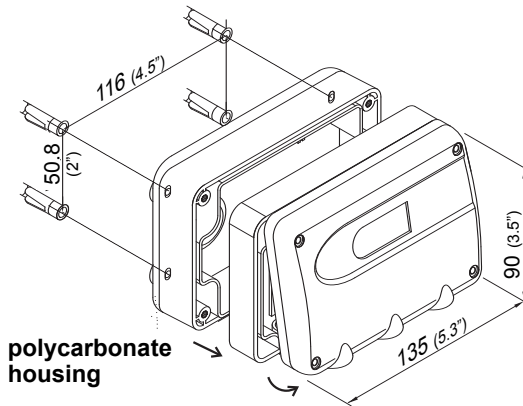
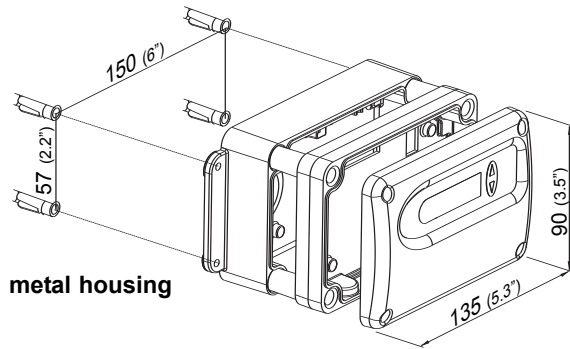
Equipment from E+E Elektronik® is developed with due consideration to all resultant environmental issues. When you dispose the equipment you should avoid environmental pollution.

For disposal of the transmitter the individual components must be sorted with care. The housing consists of recyclable polycarbonate or metal (aluminium, Al Si 9 Cu 3). The electronics must be collected as electronic scrap and disposed of according to the regulations in force.

2. PRODUCT DESCRIPTION

Humidity/temperature transmitters of the EE29/EE31 series provide multifunctionality, highest accuracy and simple installation and maintainance. The modular housing enables a user-friendly operation and a fast replacement of the sensor unit for service purposes. By selecting a suitable housing version the EE29/EE31 series can be used for the entire range of humidity measurement applications:

- Model A for wall mounting.
- Model B for duct mounting.
- Model D, model H with remote sensing probe
- Model E with remote sensing probe for pressure-tight applications up to 20bar (300psi)
- Model F for wall mounting with rear cable outlet.



3. INSTALLATION

Mounting of metal and polycarbonate housing

1. Drill the mounting holes according to the mounting template.
For the polycarbonate housing a special mounting set for installation onto mounting rails is available (see Hardware, chapter 10 "Replacement parts / Accessories").
2. The bottom part of the housing is mounted with 4 screws (screw diameter: < 4.2mm (0.2") ; not included in the scope of supply).
3. Connection of the transmitter (see Hardware, chapter 4 "Electrical connections").
4. Mounting of the middle part and cover with 4 screws (included in the scope of supply).

3.1 Mounting of model A (Wall mounting)

For mounting template for metal and polycarbonate housing see above.

Transmitters of the EE29/31-xAx series are designed for wall mounting.

Working range: -40...60°C (-40...140°F)

with display: -20...50°C (-4...122°F)



The transmitter must be mounted with the sensor probe pointing downwards!

3.2 Mounting of model B (Duct mounting)

For mounting template for metal and polycarbonate housing see above.

Positioning of bore holes top left to center line of the probe:

metal housing: x = 28.5mm (1.1") y = 37.5mm (1.5")

polycarbonate housing: x = 20.5mm (0.8") y = 25.4mm (1")

Transmitters of the EE29/31-xBx series are designed for duct mounting.

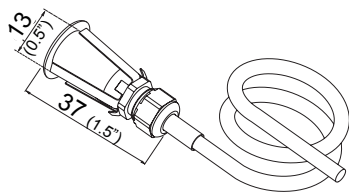
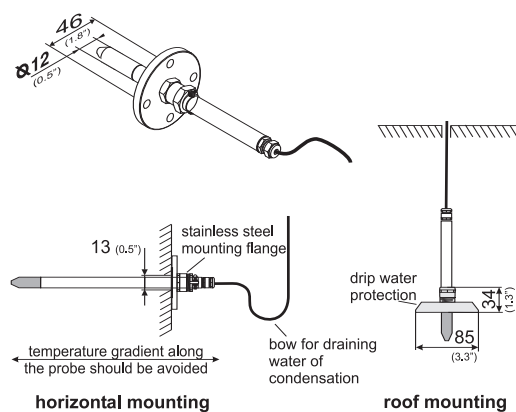
Working range: -40...80°C (-40...176°F)

with display: -20...50°C (-4...122°F)



The sensor probe must point horizontal or downwards in the duct.

dimensions in mm (")



3.3 Mounting of model D, model H (Remote sensing probe)

For mounting template for metal and polycarbonate housing see page 5. Transmitters of the EE29/31-xDx / EE31-xHx series are transmitters with remote sensing probes.

Working range of sensor probe: model D: -40...180°C (-40...356°F)
model H: -40...80°C (-40...176°F)

Working range of electronics: -40...60°C (-40...140°F)
with display: -20...50°C (-4...122°F)

Mounting of the remote sensing probe - model D (12mm):

Using the stainless steel mounting flange (refer to accessories) it is possible to mount the probe on the outer wall of the measuring chamber. The depth of immersion is adjustable.

For roof installations use the drip water protection (refer to accessories) to protect the sensor head and elements against condensed water.



The sensor probe must be mounted horizontally or vertically, pointing downwards. When possible, a drip sheet should be fitted for each mounting.

Mounting of the remote sensing probe - model H (5mm):

Incl. mounting fixture for concealed mounting or in tight spaces (e.g. in museums, door frame, etc...).

bore diameter: 13mm (0.5")

material thickness: min. 3mm (0.1")

3.4 Mounting of model E (with pressure-tight sensor)

For mounting template for metal and polycarbonate housing see page 5. Transmitters of the EE29/31-xEx series are transmitters with remote, pressure-tight sensor probes that are suitable for applications at pressures between 0.01...20bar (0.15...300psi).

Working range temperature: -40...180°C (-40...356°F)

pressure: 0.01...20bar (0.15...300psi)

Working range of electronics: -40...60°C (-40...140°F)

with display: -20...50°C (-4...122°F)



The sensor probe must be mounted horizontally or vertically pointing downwards. Where possible, a drip sheet should be fitted for each mounting.

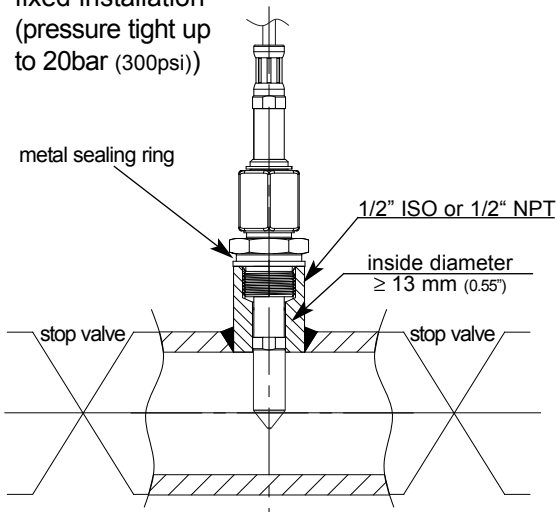


General safety instructions for installation

Because the sensing probe can be exposed to very high pressures in the measurement environment, there is the risk of sudden, unintentional expulsion of the probe during or after improper installation. Therefore, special precautions should be taken when working on the sensing probe or in its vicinity. Bending over the sensing probe should be avoided under any circumstances!

During the installation of the sensor probe, make sure that the surface of the sensing probe is not damaged! Damaging the probe could lead to damaged seals (consequence: leakage and pressure loss) and to problems during removal (jamming).

fixed installation
(pressure tight up
to 20bar (300psi))



Installation of the probe directly in the process

For direct probe installation, a stop valve should be provided on both sides of the probe insert. This allows the sensor probe to be removed for maintenance and calibration without any problems.

If the sensor probe is installed in a pressure chamber, make sure that the pressure in the chamber and the ambient pressure are in equilibrium before you remove the probe.

The temperature during installation may not vary more than $\pm 4^{\circ}\text{C}$ ($\pm 72^{\circ}\text{F}$) from the operating temperature.

1st step:

Install the probe with the stop valves closed.

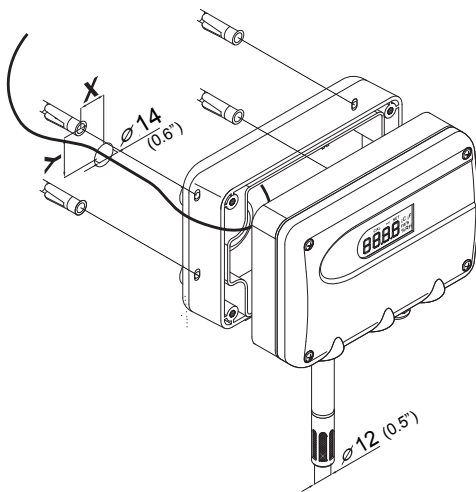
2nd step:

Insert the sensor probe into the process.

3rd step:

To ensure a secure installation of the probe, the lock nut must be tightened to a defined torque of 30 Nm.

If no torque-spanner is available tighten the lock nut by hand as far as possible. Continue to turn with an open-ended spanner $\sim 50^{\circ}$.



3.5 Mounting of model F (Wall mounting with rear cable outlet)

For mounting template for metal and polycarbonate housing see page 5.

Positioning of boreholes top left to center line of probe:

metal housing: x = 28.5mm (1.1") y = 37.5mm (1.5")

polycarbonate housing: x = 20.5mm (0.8") y = 25.4mm (1")

Transmitters of the EE29/31-xFx series are designed for wall mounting. Cable entry is from the rear side (e.g.: clean-room applications...).

Working range: $-40...60^{\circ}\text{C}$ ($-40...140^{\circ}\text{F}$)

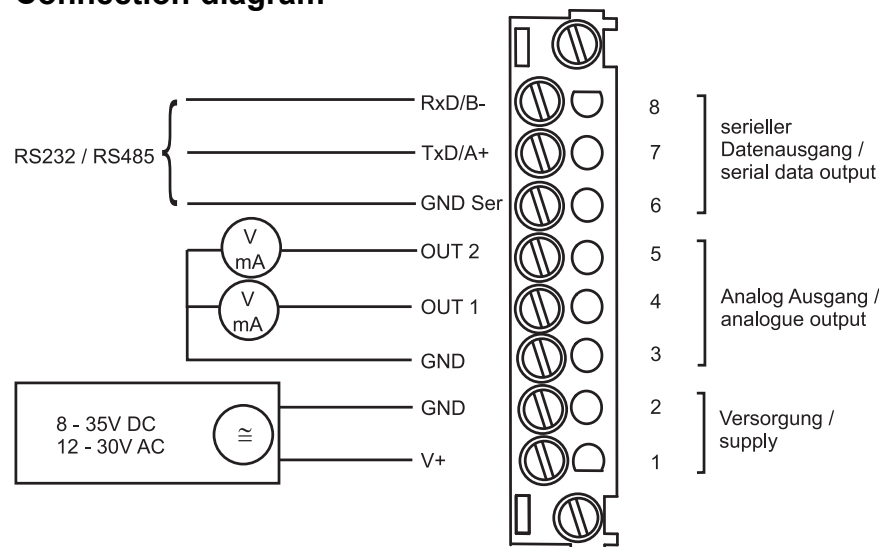
with display: $-20...50^{\circ}\text{C}$ ($-4...122^{\circ}\text{F}$)



The transmitter must be mounted with the sensor probe pointing downwards!

4. ELECTRICAL CONNECTIONS

4.1 Connection diagram

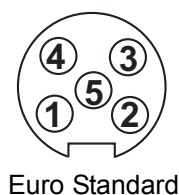


4.2 Alarm module connection diagram / Option



4.3 Connection configuration of bottom part of the housing with plug connections / 8...35V DC; 12...30V AC (option C03/C06/C07/C08)

Plug for supply and analogue output
(front view)



Description:
V+
GND
GND
OUT1
OUT2

Connection assignment:
5
4
3
2
1

Plug for RS232 resp.
RS484- connection
(front view)



Description :
GND-Ser
Rxd/B-
Txd/A+
not assigned

Connection assignment:
5
3
1
2.4



The cable should be connected according to the number stamped in the plug as shown in the above drawings!

4.4 Connection configuration interface cable RS232 / Option

Cable:
yellow
brown
white

Description:
GND
TXD
RXD

4.5 Connection configuration of bottom part of the housing with integrated power supply / 100...240V AC (option V01)

plug for RS232 and
analogue output
(front view)



Euro-Standard

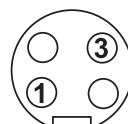
Description:	Connection assignment:
RxD / B-	5
TxD / A+	4
GND	3
OUT1	2
OUT2	1

plug for 100-240V
metal housing
(front view)



Description:	Connection assignment:
grounding	PE
phase (L1)	1
neutral wire (N)	3

plug for 100-240V
polycarbonate housing
(front view)



Description:	Connection assignment:
phase (L1)	1
neutral wire (N)	3



External diameter of supply cable: 10-12mm (0.39-0.47")

Maximum wire cross section: 1,5mm² (AWG 16)

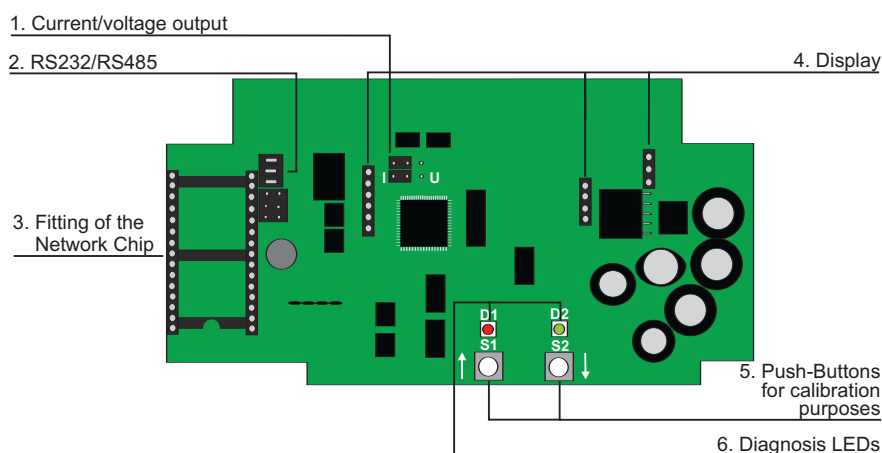
The protection of the supply cable against excess current and short-circuit shall be in accordance with national and local codes.

Bottom and centrepiece of the housing shall be grounded!

5. OPERATING COMPONENTS

5.1 Circuit board

After removal of the housing cover, the following operating components on the circuit board may be accessed for adaptation of the transmitter to the desired configuration.



1. Current/voltage output:

When the device will be switched from current to voltage output signals using the configuration software supplied, then two jumpers must also be positioned as follows.

for current signals:

for voltage signals:

2. RS232/RS485:

For the transition from RS232 to RS485 (network operation) these jumpers must be removed.

3. Fitting of the network chip:

For refitting to RS485, an IC must be used (available as an option).

The notch on the chip must match the receiver slot!

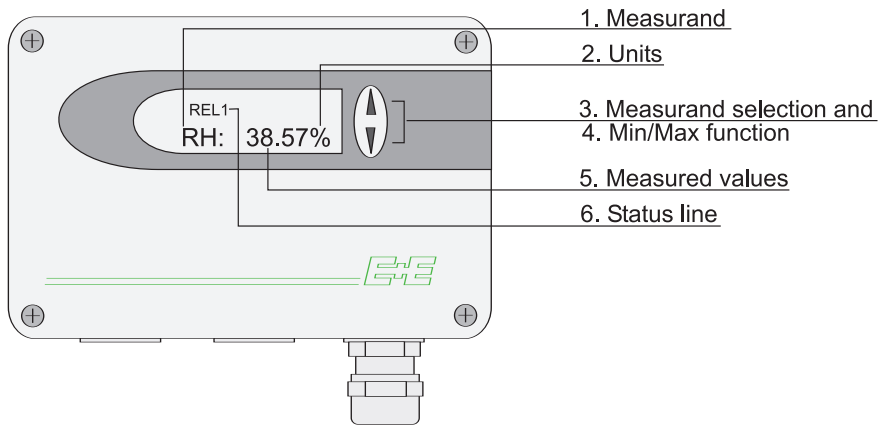
4. Display:

These pinboards are determined for connecting the display module.

5. Push-Buttons for calibration purposes: see Hardware, chapter 7 "Humidity/Temperature calibration"

6. Diagnosis LEDs: see Hardware, chapter 7 "Humidity/Temperature calibration," and chapter 8.3 "Self diagnosis and error messages"

5.2 Display module / Option:



1. MEASURAND:

2. UNITS:

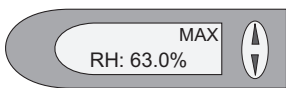
3. MEASURAND SELECTION:

SI		SI	US		
RH	Rel. humidity	%	%	 EE29	Press the Δ or ▽ button to select the desired physical quantity.
T	Temperature	degC	°F		
h	Enthalpy	kJ/kg	ftlb/lb	EE31	
r	Mixture ratio	g/kg	gr/lb		
dv	Absolute humidity	g/m³	gr/ft		
Tw	Wet-bulb temperature	degC	°F		
Td	Dew-point temperature	degC	°F		
e	Water vapour partial pres.	mbar	psi		

4. MIN / MAX FUNCTION:

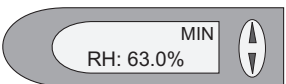
Transmitters of the EE29/31 series can display the highest and lowest measured value measured since the last reset.

Highest measured value:



1. Select the desired measurand.
2. To display the maximum value of the selected measurand, press the Δ button for at least five seconds.
- 3.1. To reset the instrument to its normal operating status, press the Δ button once again for five seconds.
- 3.2. If both buttons are pressed for at least five seconds while the maximum value is displayed → the "MAX" symbol disappears → the maximum value will be deleted (Reset).

Lowest measured value:



1. Select the desired measurand.
2. To display the minimum value of the selected quantity, press the ∇ button for at least five seconds.
- 3.1. To reset the instrument to its normal operating status, press the ∇ button once again for five seconds.
- 3.2. If both buttons are pressed for at least five seconds while the minimum value is displayed → the "MIN" symbol disappears → the minimum value will be deleted (Reset).

5. MEASURED VALUES:

The dominant value of the appropriate quantity is displayed in this field. For the factory configuration, the measured values may fall between the measurement ranges shown below.

		from	up to			units
Humidity	RH	0	EE31-A,F 100	EE31-B 100	EE31-D,E 100	% RH
Temperature	T	-40 (-40)	60 (140)	80 (176)	180 (356)	degC (°F)
Dew-point temperature	Td	-80 (-112)	60 (140)	80 (176)	100 (212)	degC (°F)
Frost-point temperature	Tf	-80 (-112)	0 (32)	0 (32)	0 (32)	degC (°F)
Wet-bulb temperature	Tw	0 (32)	60 (140)	80 (176)	100 (212)	degC (°F)
Water vapour partial pressure	e	0 (0)	200 (3)	500 (7.5)	1100 (15)	mbar (psi)
Mixture ratio	r	0 (0)	425 (2900)	999 (9999)	999 (9999)	g/kg (gr/lb)
Absolute humidity	dv	0 (0)	150 (60)	300 (120)	700 (300)	g/m ³ (gr/f ³)
Specific enthalpy	h	0 (0)	400 (50000)	1000 (375000)	2800 (999999)	kJ/kg (lbf/lb)

The measurement ranges indicated above can be set to individual requirements using the configuration software supplied (see Configuration software, chapter 5 "Index - Index Cards").

6. STATUS LINE:

- MIN; MAX: see Point "MIN/MAX Function", see Hardware, chapter 5.2 "Display module"
- CALIB LOW; CALIB HIGH: indicates the low or high humidity/temperature calibration point.
- REL1 / REL2: Status Relay
- "ERROR 01....04": see Hardware, chapter 8.3 "Self-diagnosis and error messages"

6. ALARM MODULE (optional)

The optional alarm module can be used for alarm and error issues and other simple control functions. This module can be configured using the configuration software supplied.

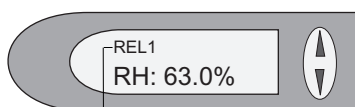
The user thus has the option of setting the measurand to be monitored (RH, T, Td,...) and the threshold hysteresis for each relay. (For the procedure, see the Configuration software, chapter 5.2 "Relay")

max. switched voltage / max. switched current: 250 VAC / 6A

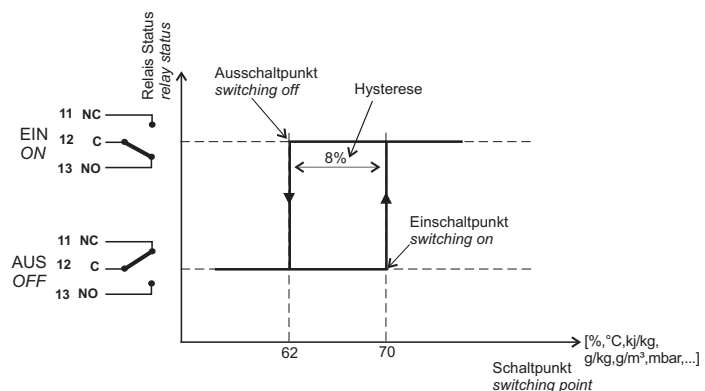
28 VDC / 6A

Minimum load: >100mA / 12V

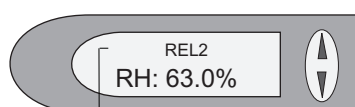
Switching relay 1:



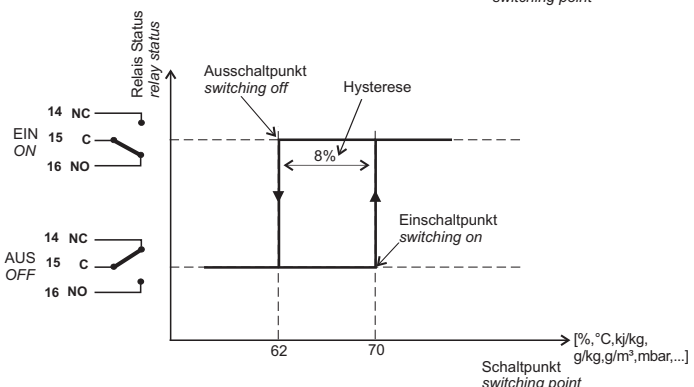
If relay 1 has tripped (ON), then REL1 is displayed.



Switching relay 2:



If relay 2 has tripped (ON), then REL2 is displayed.



7. HUMIDITY/TEMPERATURE CALIBRATION

The EE29/31 transmitter series can be calibrated in two ways.

- 1-point humidity/temperature calibration: quick and simple calibration on a defined humidity/temperature point (working point).
- 2-point humidity/temperature calibration: simple calibration for accurate measuring results over the whole humidity/temperature working range.



- To reach a temperature balance it is recommended to keep the transmitter and the reference chamber (e.g. HUMOR 20,...) for minimum 4 hours in the same room.
- During stabilisation period and calibration procedure it is important to keep the temperature constant in the reference climate chamber.
- For calibration the humidity sensor probe must be stabilised at least 20 minutes into the reference chamber.
- Replace a used dirty filter cap before calibration!

7.1 2-point humidity calibration

For accurate adjustment over the whole working range or in case of sensor exchanges a two point calibration is recommended.



- Start calibration at the low humidity calibration point!
- The humidity difference between the two points should be > 30%RH
- Low humidity point < high humidity point
- Two point calibration may be performed directly on the circuit board, or for convenience, using the configuration software supplied (for more details, see Configuration Software, chapter 5.4 "Calibration")

2-point humidity calibration procedure on the circuit board!

low calibration point:

1. Insert the sensor probe into the reference humidity 1 (low calibration point) and stabilise for at least 20 minutes.

D2  green



2. **BUTTON S2**: Pressing the button for 5 seconds starts the procedure for the calibration mode RH. The calibration mode is indicated by the lit LED "D2" on the circuit board.

D2  green



"CALIB LOW"

3. **BUTTON S2**: Pressing the button for 5 seconds starts the procedure for the low calibration point. The calibration mode is indicated by the lit LED "D2" and the symbol "CALIB LOW" will appear on the optional LC display.

D1  red



D2  green



4. **BUTTON S1 (up) and S2 (down)**: Pressing one of the two buttons will adjust the measuring value in steps of 0.1% up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output. As soon as the measured value is changed, "D1" is flashing.



D2  flashing green

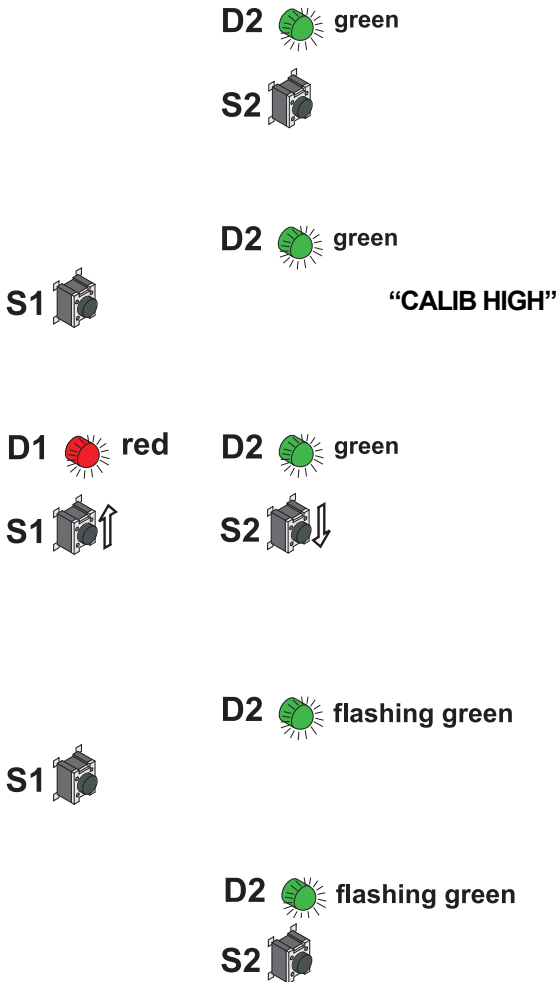
5. **BUTTON S1 (store)**: Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" will disappear from the optional LC display.

D2  flashing green



BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" will disappear from the optional LC display.

high calibration point:



6. Insert the sensor probe into the reference humidity 2 (high calibration point) and stabilise for at least 20 minutes.

7. **BUTTON S2**: Pressing the button for 5 seconds starts the procedure for the calibration mode RH. The calibration mode is indicated by the lit LED "D2" on the circuit board.

8. **BUTTON S1**: Pressing the button for 5 seconds starts the procedure for the high calibration point. The calibration mode is indicated by the lit LED "D2" and the symbol "CALIB HIGH" will appear on the optional LC display.

9. **BUTTON S1 (up) and S2 (down)**: Pressing one of the two buttons will adjust the measuring value in steps of 0.1% up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output. As soon as the measured value is changed, "D1" is flashing.

10. **BUTTON S1 (store)**: Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB HIGH" will disappear from the optional LC display.

BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB HIGH" will disappear from the optional LC display.

7.2 2-point temperature calibration



- Start calibration at the low calibration point!
- The temperature difference between the two points should be at least 30 degC (86°F)!
- Low temperature point < high temperature point
- Attention: A two point temperature calibration is not supported by the configuration software and must therefore be done directly on the circuit board! (see the following procedure)

2-point temperature calibration procedure on the circuit board!

low calibration point:

D1  red

S1 

S2 

"CALIB LOW"

D1  red

S1 

S2 

S1 

D2  flashing green

D2  flashing green

S2 

high calibration point:

D1  red

S1 

S1 

"CALIB HIGH"

D1  red

S1 

S2 

S1 

D2  flashing green

D2  flashing green

S2 

1. Insert the sensor probe into the reference temperature 1 (low calibration point) and stabilise for at least 10 minutes.

2. **BUTTON S1:** Pressing the button for 5 seconds starts the procedure for the calibration mode temperature. The calibration mode is indicated by the lit LED "D1" on the circuit board.

3. **BUTTON S2:** Pressing the button for 5 seconds starts the procedure for the low calibration point. The calibration mode is indicated by the symbol "CALIB LOW" on the optional LC display.

4. **BUTTON S1 (up) and S2 (down):** Pressing one of the two buttons will adjust the measuring value in steps of 0.1 degC up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output. As soon as the measured value is changed, "D1" is flashing.

5. **BUTTON S1 (store):** Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" will disappear from the optional LC display.

BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" will disappear from the optional LC display.

6. Insert the sensor probe into the reference temperature 2 (high calibration point) and stabilise for at least 10 minutes.

7. **BUTTON S1:** Pressing the button for 5 seconds starts the procedure for the calibration mode temperature. The calibration mode is indicated by the lit LED "D1" on the circuit board.

8. **BUTTON S1:** Pressing the button for 5 seconds starts the procedure for the high calibration point. The calibration mode is indicated by the symbol "CALIB HIGH" on the optional LC display.

9. **BUTTON S1 (up) and S2 (down):** Pressing one of the two buttons will adjust the measuring value in steps of 0.1 degC up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output. As soon as the measured value is changed, "D1" is flashing.

10. **BUTTON S1 (store):** Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB HIGH" will disappear from the optional LC display.

BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB HIGH" will disappear from the optional LC display.

7.3 1-point humidity calibration

When the working range is limited to a certain more narrow range, a calibration at one humidity point is absolutely sufficient.

- In accordance with the working range, either the high or low calibration point should be selected. (CP > or < 50% RH)
- This calibration causes an extra inaccuracy for the rest of the working range.
- The one point humidity calibration may be done directly on the circuit board, or for convenience, using the configuration software supplied. (for more details, see the Configuration software, 5.4 "Calibration" / 1-point humidity calibration)



1-point humidity calibration procedure on the circuit board!

1. Insert the sensor probe into the reference humidity (calibration point) and stabilise for at least 20 minutes.

2. **BUTTON S2:** Pressing the button for 5 seconds starts the procedure for the calibration mode RH. The calibration mode is indicated by the lit LED "D2" on the circuit board.

3. **BUTTON S1:** Pressing the button for 5 seconds starts the procedure. The calibration mode is indicated by the lit LED "D2" and the symbol "CALIB HIGH" will appear on the optional LC display (CP = 50% RH).

or
BUTTON S2: Pressing the button for 5 seconds starts the procedure. The calibration mode is indicated by the lit LED "D2" and the symbol "CALIB LOW" will appear on the optional LCD (CP < 50% RH).

4. **BUTTON S1 (up) and S2 (down):** Pressing one of the two buttons will adjust the measuring value in steps of 0.1% up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output.

5. **BUTTON S1 (store):** Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" or "CALIB HIGH" will disappear from the optional LC display.

BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" or "CALIB HIGH" will disappear from the optional LC display.

D2  green



D2  green

"CALIB HIGH"

D2  green

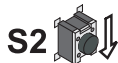


"CALIB LOW"



D1  red

D2  green



D2  flashing green

D2  flashing green



7.4 1-point temperature calibration on the circuit board

When the working range is limited to a certain more narrow range, a calibration at one temperature point is absolutely sufficient.



- In accordance with the working range, either the high or low calibration point should be selected. ($CP \geq$ or $< 45 \text{ degC} / 113^\circ\text{F}$)
- This calibration causes an extra inaccuracy for the rest of the working range.
- The one point temperature calibration may be performed directly on the circuit board, or for convenience, using the configuration software supplied. (for more details, see "Software" manual, 1-point temperature calibration)

1-point temperature calibration procedure on the circuit board!

1. Insert the sensor probe into the reference temperature (calibration point) and stabilise for at least 30 minutes.

D1  red

S1 

2. **BUTTON S1:** Pressing the button for 5 seconds starts the procedure for the calibration mode temperature. The calibration mode is indicated by the lit LED "D1" on the circuit board

S1 

"CALIB HIGH"

3. **BUTTON S1:** Pressing the button for 5 seconds starts the procedure. The calibration mode is indicated by the symbol "CALIB HIGH" on the optional LC display ($CP \geq 45 \text{ degC} / 113^\circ\text{F}$).
or

S2 

"CALIB LOW"

BUTTON S2: Pressing the button for 5 seconds starts the procedure. The calibration mode is indicated by the symbol "CALIB LOW" on the optional LC display ($CP \geq 45 \text{ degC} / 113^\circ\text{F}$).

D1  red

S1 

S2 

4. **BUTTON S1 (up) and S2 (down):** Pressing one of the two buttons will adjust the measuring value in steps of 0.1 degC up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output.

S1 

D2  flashing green

5. **BUTTON S1 (store):** Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" or "CALIB HIGH" will disappear from the optional LC display.

D2  flashing green

S2 

BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" or "CALIB HIGH" will disappear from the optional LC display.

7.5 Resetting the customer calibration to the factory calibration on the circuit board:

D1  short flash red



D2  flashing green



1. **RH + T RESET:** **BUTTON S1 and S2:** In neutral mode pressing both buttons simultaneously for 10 seconds customer calibration settings are reset to factory calibration. A short flash of the LED "D1" indicates the reset.

or

D2  green



2. **RH RESET:** **BUTTON S2:** Pressing the button for 5 seconds starts the procedure for the calibration mode RH. Pressing both buttons simultaneously for 10 seconds customer calibration settings are reset to factory calibration. A short flash of the LED "D1" indicates the reset.

or

D1  short flash red



D1  red



D2  short flash green



3. **Temp. RESET:** **BUTTON S1:** Pressing the button for 5 seconds starts the procedure for the calibration mode T. Pressing both buttons simultaneously for 10 seconds customer calibration settings are reset to factory calibration. A short flash of the LED "D2" indicates the reset.

8. MAINTENANCE

8.1 Sensor replacement

Under several circumstances, the capacitive humidity sensor element can get damaged. To avoid the costly return of the entire transmitter to the manufacturer, easy replacement of the sensor without re-adjustment is possible.

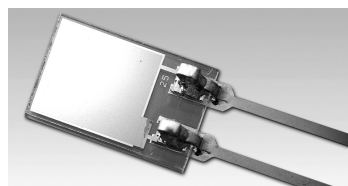
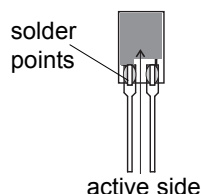
Note:

- This will invalidate the factory calibration.
- The sensor elements should be touched by the lead wires only. (use tweezers)

8.1.1 Sensor replacement of pluggable sensors

Sensor replacement procedure:

- 1) Switch off supply voltage.
- 2) Unscrew the filter cap carefully.
- 3) Pull out the humidity sensor element.
- 4) Put in the new humidity sensor, the active side has to face the inside (see drawing).
- 5) Screw the filter cap on again. (in case of pollution replace it by a new filter cap)
- 6) Establish connection to PC (RS232).
- 7) Switch on the supply voltage.
- 8) Start configuration software on PC.
- 9) For further instructions, see Configuration software, chapter 5.3 "Sensor/Probe replacement".

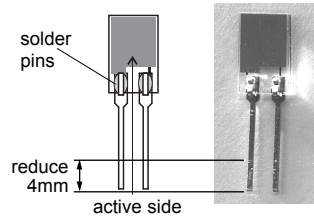


Hardware

8.1.1 Sensor replacement of soldered sensors

Sensor replacement procedure:

- 1) Switch off supply voltage.
- 2) Unscrew the filter cap carefully.
- 3) Desolder the humidity sensor element.
- 4) Shorten the sensor legs of the replacement sensor with a side cutter at 4mm (0.16") (from 10mm / 0.39" to 6mm / 0.24"), see drawing.
- 5) Solder in the new humidity sensor, the active side has to face the inside (see drawing).
- 6) Screw on the filter cap carefully (in case of pollution replace it by a new filter cap).
- 7) Establish connection to PC (RS232).
- 8) Switch on supply voltage.
- 9) Start configuration software on PC.
- 10) For further instructions, see Configuration software, chapter 5.3 "Sensor/Probe replacement".



8.2 Sensor probe replacement / optional

Transmitters of the EE29/31-xDx and xEx series are available with an optional remote sensor probe that can be plugged into the middle section of the housing. If the sensor probe gets damaged (damage to the cable, mechanical destruction of the sensor probe) it is possible to replace the probe without re-adjustment.



Note:
This will invalidate the factory calibration.

Sensor probe replacement procedure:

- 1) Switch off supply voltage.
- 2) Remove damaged sensor probe.
- 3) Plug replacement probe onto middle section of the housing.
- 4) Establish connection to PC (RS232).
- 5) Switch on power supply voltage.
- 6) Start configuration software on PC.
- 7) For further instructions, see Configuration software, chapter 5.3 "Sensor/Probe replacement"



8.3 Fuse replacement

If the green LED on the PCB is not flashing with the supply voltage switched on, check the fuse and replace if required.

Fuse secondary: 250mA / T UL248-14

Nominal voltage: 250V

Replacement types:

Series: MSTU 250

Manufacturer: Schurter

Order No.: 0034.7109

Series: 374

Manufacturer: Littelfuse

Order No.: 374 0250



8.4 Cleaning

E+E sensing elements are highly robust which makes cleaning very easy. Shake the sensing elements for max. 2 min. in industrial Isopropyl alcohol and after that in water. Let them dry free. Do not touch or rub the active surface of the sensing elements!

8.5 Self diagnosis and error messages:

Self diagnosis via LEDs on the circuit board:

- **Green LED**

flashing ⇒ Supply voltage applied / Microprocessor is active

- **Red LED**

constantly lit ⇒ Humidity sensor element damaged

flashing ⇒ Humidity sensor element accruing moist (condensation!)

Self diagnosis via display (where available):

Error 1 ⇒ Humidity sensor element damaged

Error 2 ⇒ Humidity sensor element moistened (condensation!)

Error 3 ⇒ Temperature sensor element damaged

Error 4 ⇒ Temperature input short circuit

Definitions:



- **Error**

possible cause

⇒ *Measures / Help*

- **Display shows incorrect values**

Error during re-adjustment of the transmitter

⇒ *Reset to factory calibration and repeat the calibration routine*

Filter soiled

⇒ *Replace filter*

Sensor defective

⇒ *Replace sensor*

Output configured incorrectly

⇒ *PC - Software*

- **Long response time**

Filter soiled

⇒ *Replace filter*

Incorrect filter type

⇒ *Filter type should match the application*

- **Transmitter failure**

no supply voltage

⇒ *Check wiring and supply voltage*

⇒ *only green LED is illuminated continuously ⇒ Electronics defect ⇒ contact the manufacturer*

- **High humidity values - red LED blinks**

Dew (condensation) in sensor probe head

⇒ *Dry probe head and check the sensor probe mounting type*

Incorrect filter type (e.g. storage of humidity after stainless steel sintered filter condensation)

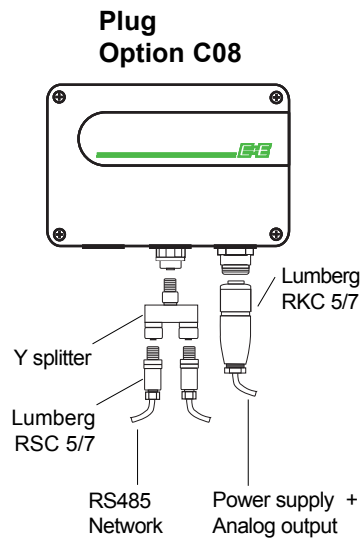
⇒ *Filter type should match the application*

Plug connectors:

To achieve a more flexible network configuration, the transmitters should be equipped with plug connectors.
(Option C08)

For the network configuration, the following plug connectors are also necessary:

- Y splitter: Siemens 6ES7 194-1KA01-0XA0
- Plug: Lumberg RSC 5/7



RS232/485 Converter:

To adapt the RS232 interface on the PC to the RS485 network protocol, a signal converter (see schematic, page 19, point 2) is required.

USB to RS232 converter:

For connecting an EE29/31 transmitter to an USB-interface, following USB to R232 converter had been tested under MS Windows 2000®:

- inside out networks: edgeport/1 1 port USB to RS-232 converter
- keyspan: high speed usb serial adapter (p/n: USA-19QW)

9.2 Ethernet - Module (Option)

An additional PCB, located in the bottom part of the housing, allows the EE31-series to be connected to a standardized 10/100 MBit-Ethernet network.

The standardized interface allows to integrate the transmitters in a network. It is then possible to communicate from several remote workstations and the central administration with different transmitters.



Attention:

Use the Harting RJ Industrial IP67 Push Pull Connector - in the scope of supply - or identical types only!

It is possible that the conventional RJ45 connectors, typically used in office environments, cannot be removed from RJ Industrial IP67 bushing!

9.2.1 Electrical Connection / Operating Components

Screw Terminals:

supply voltage: 8...48VDC / 12...35VAC

- 1 GND / ~
- 2 V+ / ~

Power - LED (Red):

LED glowing = power supply on

LNK (Link) - LED (Green):

LED glowing = connection with Ethernet switch established

ACT (Active)- LED (Green):

LED flashing = data transfer active

RESET- button:

Press reset button for 3-5 seconds and the Ethernet module will be reset (the microcontroller is restarted). The LNK-LED is temporary off.

DHCP / STATIC - Jumper:

The jumper setting (DHCP / Static) determines the way the IP-address is assigned.

DHCP: IP-address will be assigned automatically by the DHCP server

STATIC: IP-address will be assigned manually by the network administrator

What is preferred / technical possible, should be discussed with the network administrator.

For further details please refer to chapter "9.2.3 Ethernet-interface".



9.2.2 Technical data:

- 10/100 MBit Ethernet Interface RJ45 (Harting IP67 Push-Pull bushing)
- Cable length from transmitter to Ethernet-Switch: max. 100m
- Recommended type of cable: Harting ProfiNet Cat5-cable STP 2x2xAWG22/7
- Max. number of transmitters in a network: unlimited

9.2.3 Ethernet-interface

9.2.3.1 ComCenter

ComCenter (Communication Center) software is the communication link between the transmitter, the Ethernet-network and the existing EE31 configuration-, data logging- and visualization software.

The ComCenter provides the following functions:

Discovery tool:

ComCenter supports the detection and administration (Web-Interface) of all transmitters in the network.

Creation of virtual interfaces (Com-Ports):

ComCenter allows to assign each and every detected IP-address (e.g. transmitter) with a corresponding virtual interface (Com-Port). With MS Windows® not more than 255 virtual Com-Ports are possible!

Communication with existing EE31 configuration-, data logging and visualization software:

The created virtual Com-Ports can be addressed by the existing EE31 configuration-, data logging and visualization software, as long as the ComCenter software is running (active).

9.2.3.2 Installation of the ComCenter

- Insert Ethernet CD-Rom into your CD-ROM drive
- Choose "Install ComCenter Ethernet Software"
- Run the setup.exe
- Choose language and follow the installation wizard
- Complete installation



9.2.3.3 Ethernet Connection

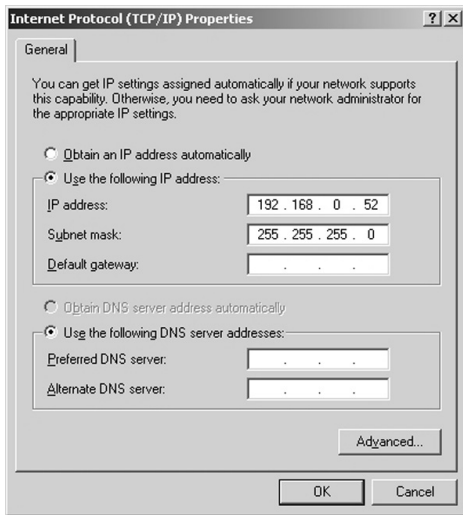
- Connect the transmitter to the Ethernet-network using the provided Harting RJ Industrial IP67 Push Pull Connector and a standardized Ethernet Cat5-cable.
- Hook up the Ethernet module with the supply voltage (8...48VDC / 12...35VAC), Power LED glowing, LNK - LED glowing.
- Choose mode of IP-address assignment (DHCP /STATIC) by jumper setting at the Ethernet module.

DHCP:

- Change jumper setting to DHCP.
- Press reset-button for 3-5 seconds (LNK - LED temporary off).
- Ethernet module changes to DHCP - mode and requests an IP - address from the DHCP server.
- Transmitter will be detected as soon as ComCenter is active.

STATIC:

- Default jumper setting is STATIC.
- Factory settings for the transmitters are the static IP - address 192.168.0.64 with the subnet-mask 255.255.255.0
- Networking settings of the used personal computer might need to be changed in order to use same subnet-mask (255.255.255.0) as the connected transmitter.

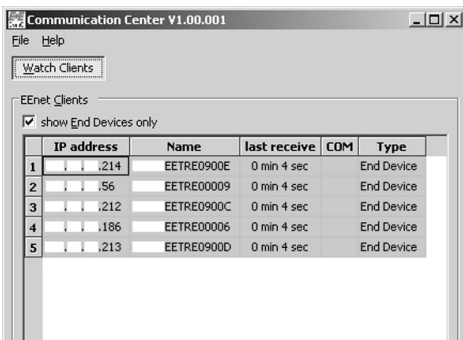


E.g. Windows XP - Start / Settings / Network Connections / Local Area Connection / General / Properties / Internet Protocol (TCP/IP) / Properties



Note:

In case of further questions about the assignment of IP-addresses in DHCP or STATIC mode kindly contact the network administrator. Otherwise please do not hesitate to contact E+E Elektronik for support.



9.2.3.4 Working with the ComCenter

Open ComCenter by either using the corresponding icon on the desktop or the path defined during the installation.

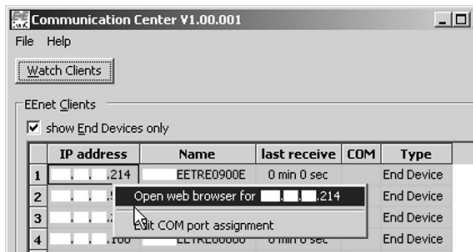
Check the box "show End Devices only". In the list only EE31 transmitters (End Devices) within the network will be shown.



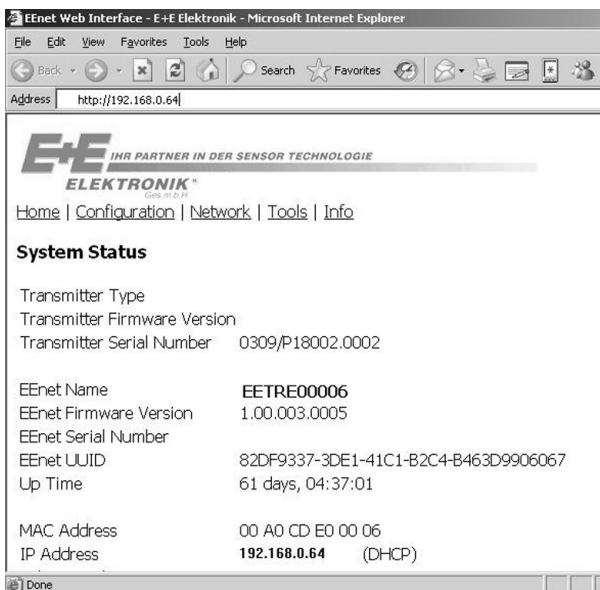
Note:

If the box "show End Devices only" is not checked the ComCenter will show all other network devices as well (e.g. PC's).

Press the button "Watch Clients" and the time passed since the last successful communication with each network device is recorded and listed. If a network device can not be reached, it will be highlighted in red!



With a click of the right mouse button either the web-interface or the editor for Com-Port assignment can be selected.



Web-Interface:

Home:

Overview of system settings

Configuration:

EENet Name: LAN name of the selected transmitter (End Device) can be defined / changed

Transmission Mode:

Transparent: fast transmission of data bytes via Ethernet (high network load)
 EE31 Protocol Frames: standard setting (low network load)

IP-Address Assignment:

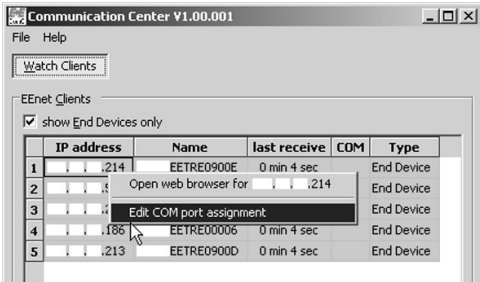
STATIC: IP-address is manually assigned
 DHCP: IP-address is assigned by DHCP server

Tools:

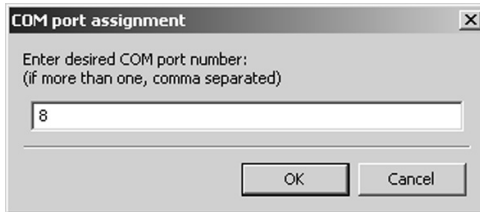
Possibility to either introduce or change the passwords for each and every transmitter (End Device)

Info:

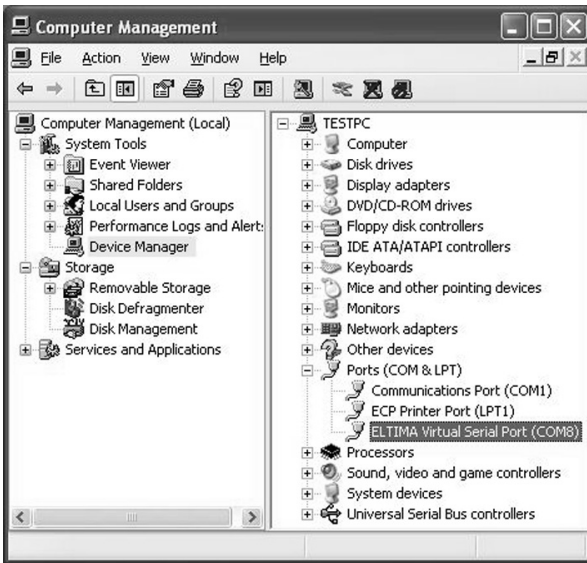
Contact address of the manufacturer



Edit COM Port assignment



Enter a desired Com-Port number (1...255). The Com-Port number will be assigned to the corresponding IP-address.



Note:

If a number of an existing Hardware Com-Port (COM1, COM2) is entered, than this will be assigned. Otherwise a virtual Com-Port will be created.



Attention:

ComCenter needs to be active (running) as long as the virtual Com-Ports are in use!

If the ComCenter window is minimized, it will be hidden in the "System Tray" (right bottom, next to the system time), but it remains active (running)!

9.2.3.5 Communication without ComCenter

Transmitters with an Ethernet module can also be used straight without the ComCenter.

Please contact E+E Elektronik if you need information regarding the EE31 protocol for Ethernet communication.

10. REPLACEMENT PARTS / ACCESSORIES:

Description	Order code
- Filter	
- Sintered stainless steel filter	HA010103
- PTFE Filter	HA010105
- Metal grid filter	HA010106
- Display + housing cover in metal	D05M
- Display + housing cover in polycarbonate	D05P
- Replacement probe	
- for EE29/31-xDx with 2 m cable	P02D
- for EE29/31-xDx with 5 m cable	P05D
- for EE29/31-xDx with 10 m cable	P10D
- for EE29/31-xDx with 20 m cable	P20D
- for EE29/31-xEx with 2 m cable	P02E
- for EE29/31-xEx with 5 m cable	P05E
- for EE29/31-xEx with 10 m cable	P10E
- for EE29/31-xEx with 20 m cable	P20E
- Replacement sensors	
- Replacement humidity sensor with sensor data	FE10
- Replacement humidity sensor with coating and sensor data	FE10-HC01
- Replacement temperature sensor with sensor data	TE38
- Interface cable for PCB	HA010304
- Interface cable for plug C06	HA010311
- Mounting flange (stainless steel)	HA010201
- Mounting flange 5mm (for EE31, model H only)	HA010208
- Bracket for fixing onto mounting rails	HA010203
- Drip water protection	HA010503
- 1% calibration	EE90/3H
- Datalogging and analysis software (for EE31 only)	HA010602
- RS485 Kit (HW + SW) for networking (for EE31 only)	HA010601

11 TECHNICAL DATA:

Technical Data EE31

Measurement values

Relative humidity

Humidity sensor¹⁾ HC1000-400 / HC105

Working range¹⁾ 0...100% RH

Accuracy²⁾ (including hysteresis, non-linearity and repeatability)

-15...40°C (5...104°F) ≤90% RH ± (1.3 + 0.3%*mv) % RH

-15...40°C (5...104°F) >90% RH ± 2.3% RH

-25...70°C (-13...158°F) ± (1.4 + 1%*mv) % RH

-40...180°C (-40...356°F) ± (1.5 + 1.5%*mv) % RH

Temperature dependence of electronics typ. ± 0.01% RH/°C (0.0055% RH/°F)

Response time with metal grid filter at 20°C / t₉₀ < 15s

Temperature

Temperature sensor element EE31-xA/B/C/F/Gx Pt1000 (Tolerance class A, DIN EN 60751)

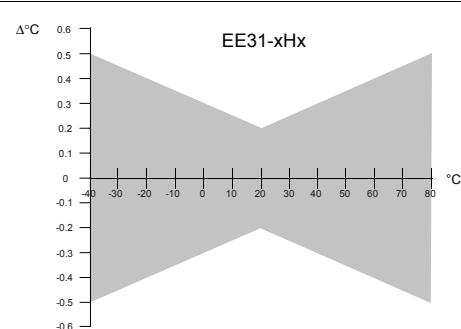
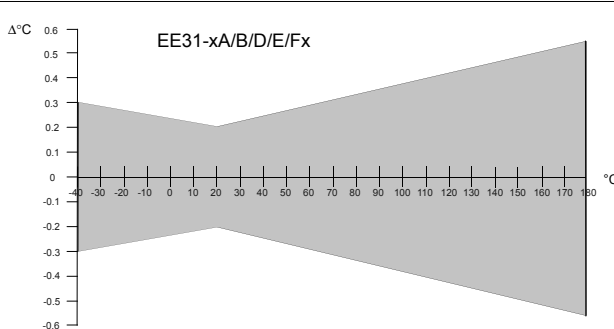
EE31-xHx Pt1000 (Tolerance class B, DIN EN 60751)

Working range sensing head EE31-xAx -40...60°C (-40...140°F) EE31-xBx -40...80°C (-40...176°F)

EE31-xDx -40...180°C (-40...356°F) EE31-xEx -40...180°C (-40...356°F)

EE31-xFx -40...60°C (-40...140°F) EE31-xHx -40...80°C (-40...176°F)

Accuracy (typ.)



Temperature dependence of electronics typ. ± 0.005°C/°C

Outputs²⁾

Two freely selectable and scaleable analogue outputs
0...100% RH / xx...yy°C respectively

0 - 5V -1mA < I_L < 1mA

0 - 10V -1mA < I_L < 1mA

4 - 20mA R_L < 500 Ohm

0 - 20mA R_L < 500 Ohm

Serial interface

RS232C

RS485 optional

Max. adjustable measurement range²⁾³⁾

		from	up to			units
Humidity	RH	0	100	EE31-A, F	EE31-B, H	% RH
Temperature	T	-40 (-40)	60 (140)	80 (176)	180 (356)	°C (°F)
Dew-point temperature	Td	-80 (-112)	60 (140)	80 (176)	100 (212)	°C (°F)
Frost-point temperature	Tf	-80 (-112)	0 (32)	0 (32)	0 (32)	°C (°F)
Wet-bulb temperature	Tw	0 (32)	60 (140)	80 (176)	100 (212)	°C (°F)
Water vapour partial pressure	e	0 (0)	200 (3)	500 (7.5)	1100 (15)	mbar (psi)
Mixture ratio	r	0 (0)	425 (2900)	999 (9999)	999 (9999)	g/kg (gr/lb)
Absolute humidity	dv	0 (0)	150 (60)	300 (120)	700 (300)	g/m ³ (gr/F ³)
Specific enthalpy	h	0 (0)	400 (50000)	1000 (375000)	2800 (999999)	kJ/kg (lbf/lb)

General

Supply voltage

SELV 8...35V DC

SELV = Safety Extra Low Voltage

SELV 12...30V AC

(optional 100...240V AC, 50/60Hz)

Current consumption - 2x voltage output
- 2x current output

for 24V DC/AC: typ. 40mA
typ. 80mA

for 100-240VAC: typ. 2VA

Pressure range for pressure tight probe

0.01...20bar (0.15...300psi)

System requirements for software

WINDOWS 2000 or later; serial interface

Housing / protection class

PC or Al Si 9 Cu 3 / IP65; Nema 4

Cable gland

M16 x 1.5 cable Ø 4.5 - 10 mm (0.18 - 0.39")

Electrical connection

screw terminals up to max. 1.5mm² (AWG 16)

Working and storage temperature range of electronics

-40...60°C (-40...140°F)

-20...50°C (-4...122°F) - housing with display

Electromagnetic compatibility according to

EN61326-1

EN61326-2-3

ICES-003 ClassB

Industrial Environment

FCC Part15 ClassB



¹⁾ Refer to the working range of the humidity sensor.

²⁾ Can be easily changed by software.

³⁾ Refer to accuracies of calculated values

*) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation). The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).

Technical Data EE29

Measurement values

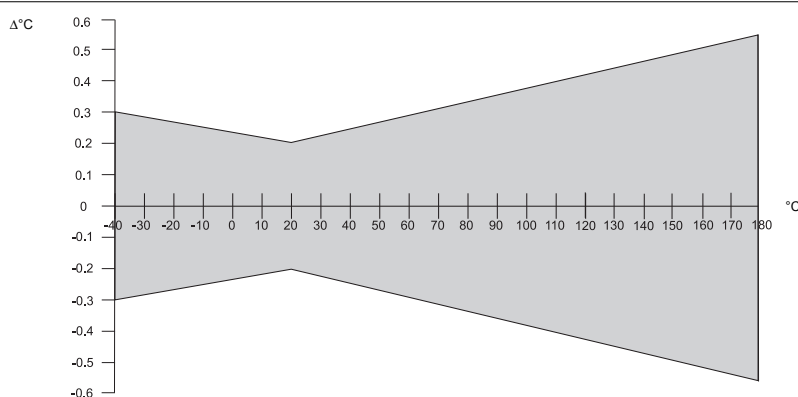
Relative humidity

Humidity sensor ¹⁾		HC1000-400
Working range ¹⁾		0...100% RH
Accuracy ¹⁾ (including hysteresis, non-linearity and repeatability)		
-15...40°C (5...104°F)	<90% RH	± (1.3 + 0.3%*mv) % RH
-15...40°C (5...104°F)	>90% RH	± 2.3% RH
-25...70°C (-13...158°F)		± (1.4 + 1%*mv) % RH
-40...180°C (-40...356°F)		± (1.5 + 1.5%*mv) % RH
Temperature dependence of electronics		typ. ± 0.01% RH /°C (0.0055% RH / °F)
Response time with metal grid filter at 20°C / t ₉₀		< 15s

Temperature

Temperature sensor element	Pt1000 (Tolerance class A, DIN EN 60751)	
Working range sensing head	EE29-xAx -40...60°C (-40...140°F)	EE29-xBx -40...80°C (-40...176°F)
	EE29-xDx -40...180°C (-40...356°F)	EE29-xEx -40...180°C (-40...356°F)
	EE29-xFx -40...60°C (-40...140°F)	

Accuracy (typ.)



Temperature dependence of electronics	typ. ± 0.005°C/°C
---------------------------------------	-------------------

Outputs²⁾

Two freely selectable and scaleable analogue outputs 0...100% RH / xx...yy°C respectively	0 - 5V	-1mA < I _L < 1mA
	0 - 10V	-1mA < I _L < 1mA
	4 - 20mA	R _L < 500 Ohm
	0 - 20mA	R _L < 500 Ohm

General

Supply voltage	SELV 8...35V DC	SELV = Safety Extra Low Voltage
	SELV 12...30V AC	(optional 100...240V AC, 50/60Hz)
Current consumption	- 2x Voltage output	for 24V DC/AC: typ. 40mA
	- 2x Current output	typ. 80mA
		for 100-240VAC: typ. 2VA
Pressure range for pressure tight sensor	0.01...20bar (0.15...300psi)	
System requirements for software	WINDOWS 98 or later; serial interface	
Housing / protection class	PC or Al Si 9 Cu 3 / IP65; Nema 4	
Cable gland	M16 x 1.5 cable Ø 4.5 - 10 mm (0.18 - 0.39")	
Electrical connection	screw terminals up to max. 1.5mm ² (AWG 16)	
Sensor protection	stainless steel sintered filter, PTFE filter or metal grid filter	
Working and storage temperature range of electronics	-40...60°C (-40...140°F)	
	-20...50°C (-4...122°F) - housing with display	
Electromagnetic compatibility according to	EN61000-6-2	EN61000-6-3
	EN61326-1+A1+A2	ICES-003 ClassB
		FCC Part15 ClassB



¹⁾ Refer to the working range of the humidity sensor.

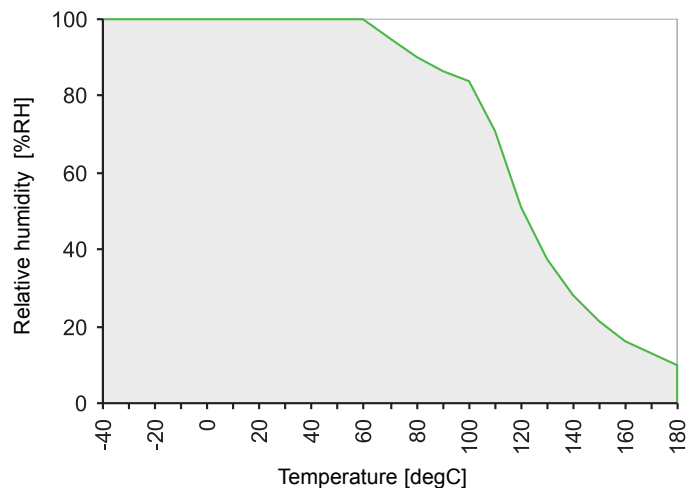
²⁾ Can easily be changed by software.

*) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation). The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).

Technical Data for Options EE29/EE31

Display	graphical LCD (128x32 pixels), with integrated push-buttons for selecting parameters and MIN/MAX function		
Integrated power supply	100...240V AC, 50/60Hz		
Alarm outputs	2 x 1 switch contact 250V AC / 6A 28V DC / 6A		
Threshold + hysteresis	can be adjusted with configuration software		
Switching parameters	freely selectable between:	EE29	EE31
	RH Relative humidity	✓	✓
	T Temperature	✓	✓
	Td Dew-point temperature		✓
	Tf Frost-point temperature		✓
	Tw Wet-bulb temperature		✓
	e Water vapour partial pressure		✓
	r Mixture ratio		✓
	dv Absolute humidity		✓
	h Specific enthalpy		✓

Operating range humidity sensor



The gray area shows the allowed measurement range for the humidity sensor.

Operating points outside of this range do not lead to destruction of the element, but the specified measurement accuracy cannot be guaranteed.

CONFIGURATION SOFTWARE

LIMITED LIABILITY

E+E Elektronik® is not liable for any damages or consequential damages (for example, but not restricted to loss of earnings, interruption of business, loss of information and data or any other pecuniary damages), that result from the installation, usage and also impossibility of usage of a software product from E+E Elektronik® and supportservices possibly associated with it or non-performance of support.

1. GENERAL INFORMATION

The configuration software was developed by E+E Elektronik Ges.m.b.H to allow fast and easy configuration of individual transmitters (EE29 / EE31) as well as of transmitter networks (only EE31).

This software tool is included in delivery.

System requirements: MS WINDOWS 98® or higher; RS232 serial interface

2. INSTALLATION

Insert the CD-ROM supplied with the transmitter into your PC and open the set-up application. Follow the instructions of the dialogue menus to set the desired language and all further parameter for installation. At the end of the routine, the software is installed and the Readme file or the program will be automatically opened.



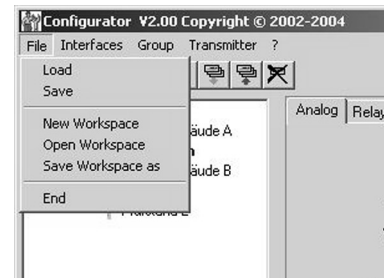
Note:

If the configuration software has already been installed, or for upgrade only, the older version must first be uninstalled (the User will be notified during the installation routine and the process will be interrupted automatically).

To remove the previous version, open the software folder in the system control panel. All of the programs installed on your system are located here. Uninstall the EE29/31 Configurator by clicking on the appropriate button and then install the upgrade.

3. ICONS ON THE TOOLS BAR

3.1 File



Load: Loads a file with a saved transmitter configuration.

Save: Saves the current transmitter configuration in a file.

New Workspace: Opens a file for a new tree (new network).

Open Workspace: Opens existing trees (networks).

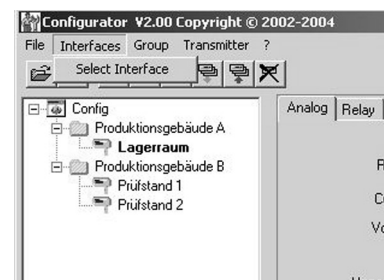
Save Workspace: Saves the current trees (networks) in an archive file.



Note:

The functions "Save Workspace" and "Open Workspace" apply to the tree structure only, not to the configurations of individual transmitters! Therefore only the network structure is saved. Transmitters configurations must be reloaded using the command "Read All Transmitters."

3.2 Interfaces



Select: Selects the serial interface (COM port) for communication with the transmitters. Following functions are available:

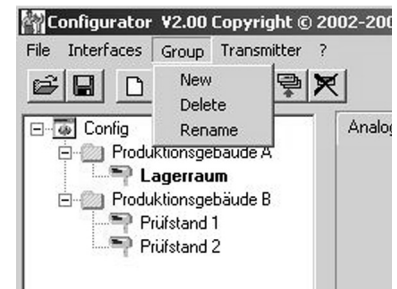
use / do not use: Marked COM ports are greyed out and deactivated for the configuration software (e.g., COM for integrated Notebook Modem).



Note:

A disabled interface (shaded = do not use), can be enabled by clicking on the "use" button.

3.3 Group



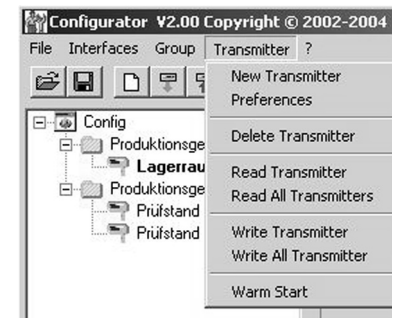
The icon "Group" provides the option of combining transmitters in groups. A group may consist of transmitters used in the same application, for instance assigned to a building (EE29/31), or belonging to the same transmitter network (EE31).

New: Creates a group or adds another group into an existing structure.

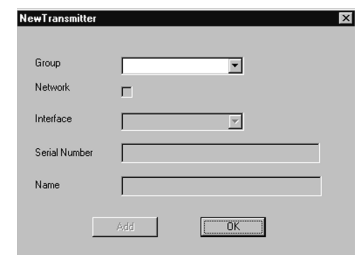
Delete: Deletes groups within a tree.

Rename: Changes the name of a transmitter group.

3.4 Transmitter



New transmitter:



A new transmitter is created in the tree. This procedure requires the input of a number of parameters:

Group: Assigns a transmitter to a group.

Network: The check box "network" must be selected when several transmitters are operated in a network (EE31 series).

Interface: Selects the interface for connecting the transmitter to the network. (For information on how to set up a COM port, see Configuration Software, Chapter 3.2 Interfaces).

Network address: Input of the network address for the EE31 transmitter for unique assignment within the network (see label on the transmitter housing).

Name: Assigns a meaningful name corresponding to the transmitter. This name is displayed in the tree under the relevant group (e.g., Clean Room).

Preferences:

Displays the preferences for all transmitters that have been set-up.
The preferences may also be changed here.

Delete transmitter:

Deletes from the tree structure the selected transmitters, or the selected groups.

Read:

Reads and displays the configuration parameters of the selected transmitter.

Read All:

Reads the configuration for all transmitters.



Note:

Only those parameters that have the same value for all transmitters of the network will be displayed. Other values are shaded and can not be selected or changed.

Write:

Writes the current configuration into the selected transmitter.

Write All:

Writes the current configuration to all selected transmitters.



Set the configuration for a transmitter, then select the appropriate network in the tree and write the configuration all transmitters of the target group using the command "Write All."

Warm Start:

Resets and restarts the microprocessor of the selected transmitter.

3.5 ? - Information

Version:

Displays the version number of the EE29/31 software currently installed and the contact information for E+E Elektronik.

4. ICON LIST



"Load File" (see Configuration Software, chapter 3.1 File)



"Save File" (see Configuration Software, chapter 3.1 File)



"New Transmitter" (see Configuration Software, chapter 3.4 Transmitter)



"Read Transmitter" (see Configuration Software, chapter 3.4 Transmitter)



"Save Transmitter" (see Configuration Software, chapter 3.4 Transmitter)



"Read All Transmitters" (see Configuration Software, chapter 3.4 Transmitter)



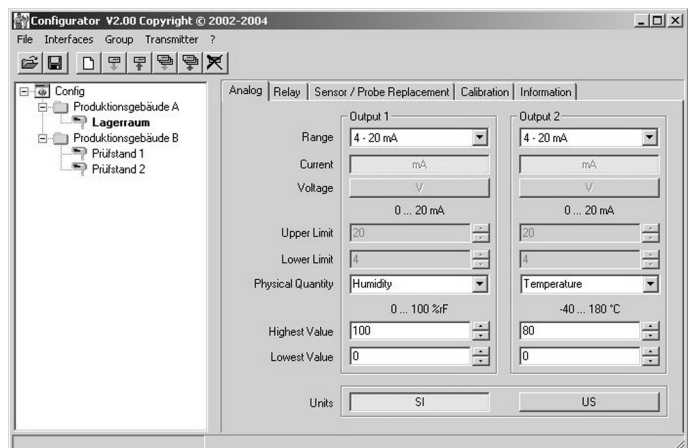
"Write All Transmitters" (see Configuration Software, chapter 3.4 Transmitter)



"Delete Transmitter" (see Configuration Software, chapter 3.4 Transmitter)

5. INDEX - INDEX CARDS

5.1 Analogue



For easy configuration of both analogue outputs.

Range:

Using the drop-down input field, select either a standardized output signal (0-5V, 0-10V, 0-20mA, 4-20mA) or a user-defined current/voltage output range (upper and lower limits may be selected as required between the limits indicated).

Physical Quantity:

Selects the output physical quantities.

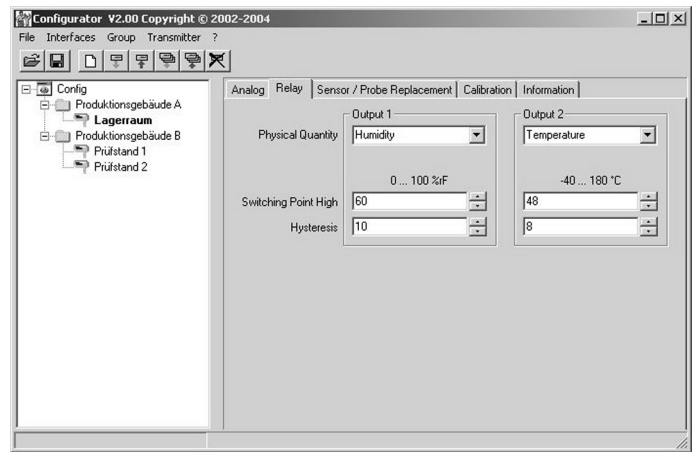
Upper / Lower Limit:

Sets the desired scaling of the output. The limits must fall within the operating range indicated above.

Units:

Selects between SI or US units.

5.2 Relay



It is used to set both optional alarm outputs.

Physical Quantity:

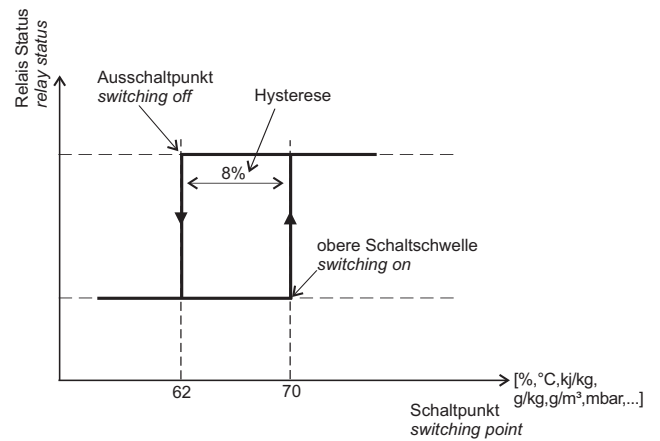
Selects the physical quantity for each alarm output.

Switching Point High:

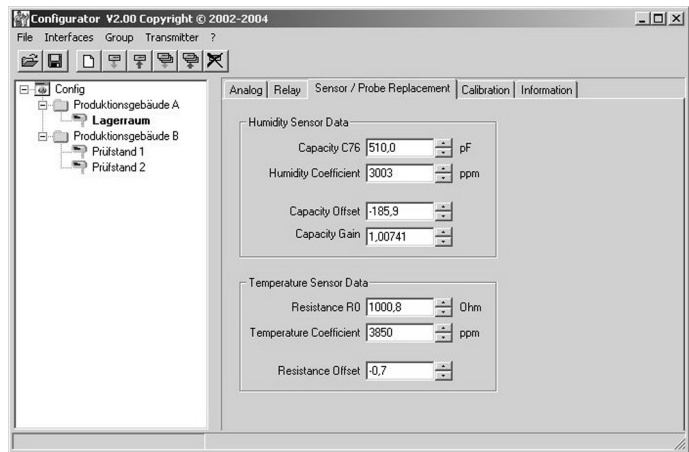
Sets the high switching point.

Hysteresis:

Sets the switching hysteresis that should be maintained each time the signal falls below the upper switching threshold.



5.3 Sensor / Probe Replacement

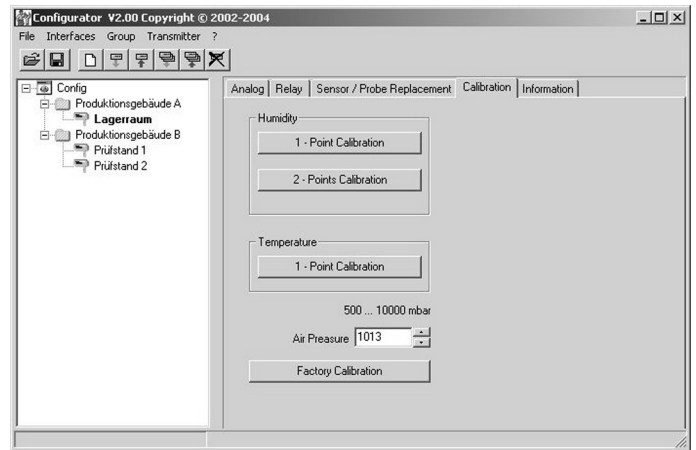


In case of sensor or probe replacement, the characteristic values for this sensor/probe must be saved in the transmitter, thereby the transmitter will operate within the specified accuracy range without the need for costly recalibration.

- Replacement - Humidity Sensor:
- 1) Open the configuration of the selected transmitter by clicking on the button "Read Transmitter".
 - 2) Replace the humidity sensor by a new one (see Hardware, chapter 8.1 Sensor Replacement).
 - 3) Enter the nominal capacity C76 and the humidity coefficient in the corresponding input fields.
 - 4) Save the settings by clicking on the button "Save Transmitter".

- Replacement - Probe:
- 1) Open the configuration of the selected transmitter by clicking on the button "Read Transmitter."
 - 2) Replace the humidity sensor by a new one (see Hardware, chapter 8.2 Probe Replacement).
 - 3) Enter the nominal capacity C76, the humidity coefficient, the offset, the gain, the resistor R0, the temperature coefficients, and the resistor offset in the corresponding input fields.
 - 4) Save the settings by clicking on the button "Save Transmitter."

5.4 Calibration



In addition to the manual calibration procedure on the circuit board (see Hardware, chapter 7 “Humidity/Temperature Calibration”), new calibrations can be performed using the EE29/31 software.



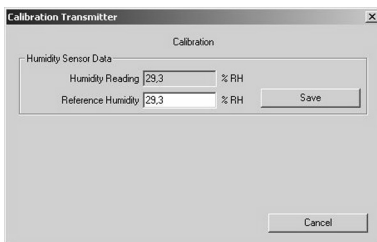
Note: A two-point calibration for temperature is only possible on the circuit board and is not supported by the software.

1-point calibration Humidity:

Fast and easy calibration for accurate measurement results at a defined working point (humidity point).



For calibration procedure see Hardware, chapter 7. “Humidity/Temperature Calibration”



- 1) Stabilise the probe of the desired humidity for min. 30 minutes.
- 2) Click on the Humidity "1-point calibration" button. The measured values will now appear in both input fields.
- 3) Replace the value in the input field "Humidity Reading" with the reference humidity (value of the saline solution or display of HUMOR 20).
- 4) By clicking on "Save", the humidity reading for the transmitter will be adjusted to the reference humidity.

2-point calibration Humidity:

Calibration for accurate results over the entire measurement range.



For calibration procedure, see Hardware, chapter 7 "Humidity/Temperature Calibration".

- 1) Place the probe at the reference humidity (lower point).
- 2) Click on the Humidity Two-Point Calibration button.
(In a separate window, the measured values will appear in both input fields)
- 3) Replace the value in the input field "Humidity Reading" with the reference humidity. (Value of the saline solution or display of HUMOR 20)
- 4) By clicking on "Save", the humidity reading of the transmitter will be adjusted to the reference humidity. Now the 30-minute stabilisation period starts.

- 5) Place the probe at the reference humidity (high point).
- 6) Before continuing wait till the 30-minute stabilisation period is over.
- 7) Replace the value in the input field "Humidity Reading" with the reference humidity. (Value of the saline solution or display of HUMOR 20)
- 8) By clicking on "Save", the humidity reading of the transmitter will be adjusted to the reference humidity.
- 9) The process is complete when the message "Two-point calibration successful" appears.

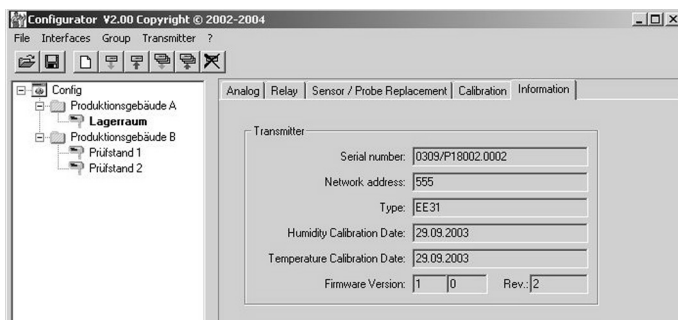
1-point calibration Temperature:

If the working range is limited to a narrow temperature range, one-point calibration will be sufficient within this working range.

- 1) Place the probe at the reference temperature and allow stabilisation for approx. 30 minutes.
- 2) Click on the Temperature 1-Point Calibration button.
The measured value will appear in both input fields. (see additional window)
- 3) Replace the value in the input field "Temperature Reading" with the reference temperature.
- 4) By clicking on "Save", the temperature reading of the transmitter will be adjusted to the reference temperature.
- 5) The process is complete when the message "Calibration Successful" appears.

5.5 Information

Here you will find information of the selected transmitter.



Network address:

Each measuring transmitter is assigned a unique network address at the factory for precise identification within the network.



Note:

This identification number is also issued for transmitters of the EE29 series, although transmitters of this series are not network compatible.

Type:

Specifies whether the transmitter belongs the EE29 or EE31 series.

Humidity Calibration Date:

Provides information on the date of the last humidity calibration, but only where this was performed using the configuration software.



Note:

Manual calibration processes performed directly on the circuit board are not recorded!

Temperature Calibration Date:

Provides information on the date of the last temperature calibration, but only where this was performed using the configuration software.



Note:

Manual calibration processes performed directly on the circuit board are not recorded here!

Productionnumber:

Used to track the manufacturing data of the transmitter.

Version / Revision:

Provides information on the software version implemented in the transmitter (internal).

6. OVERVIEW

6.1 How to set-up a new transmitter?

Menu "File" --> "New Workspace"

Assign a name to the file and select the location to save the file

Menu "Group" --> "New Group"

Assign and add a name, then click on "Finish"



Menu "Transmitter" --> "New Transmitter" or Button "New Transmitter"

Select the group for the transmitter using the pull-down menu "Group."

If the transmitter is from the EE31 series and will belong to a transmitter network, then select the box "Network" and enter the network address assigned by E+E (can be found on the housing label) in the "Network Address" field.

Specify the COM port (serial interface) of the PC / Notebook in the pull-down menu "Interface".

Enter the name for the transmitter in the "Name" field.

Complete the "New Transmitter" process by clicking on the button "Add".



6.2 How to read the configuration of a transmitter?

The current configuration of the selected transmitter can be read by clicking on the button "Read Transmitter" or by selecting "Transmitter" --> "Read Transmitter."

If the configuration is already loaded, the configuration data in the Index- index cards can be modified or adapted.



6.3 How to save the configuration in a transmitter?

A modified configuration in the Index - index cards can be saved to the selected transmitter by clicking on the button "Save Transmitter" or by selecting "Transmitter" --> "Save Transmitter."

Configuration software

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