The EE210 transmitter by E+E Elektronik meets the highest requirements in demanding climate control applications. Besides the accurate measurement of relative humidity (RH) and temperature (T), EE210 calculates various RH related parameters such as dew point, temperature, absolute humidity and mixing ratio. All measured and calculated values are available on the BACnet MS/TP or Modbus RTU interface, two of them are available on the analogue voltage or current outputs, while up to three values can be shown simultaneously on the optional display.

Excellent performance of EE210 in polluted or aggressive environment is ensured by the encapsulated measurement electronics inside the sensing probe and the long-term stable HCT01 sensor with E+E proprietary coating.

EE210 is available as wall or duct mounted version as well as with remote probe. The IP65 / NEMA 4 enclosure minimizes installation costs and provides outstanding protection against contamination and condensation.

With an optional configuration kit, the user can set the RS485 interface parameters, the output scaling and perform one or two point adjustment for RH and T.

Applications
- agriculture
- stables, incubators, hatchers
- green houses
- storage rooms, cooling chambers
- indoor pools
- demanding climate control

Features
- Appropriate for US mounting requirements
  » Knockout for ½" conduit fitting
- External mounting holes
  » Mounting with closed cover
  » Electronics protected against construction site pollution
  » Easy and fast mounting
- Electronics on the underside of the PCB
  » Optimum protection against mechanical damage during installation
- Bayonet Screws
  » Open/closed with a ¼ rotation
- Cast Electronics
  » Mechanical protection
  » Condensation-resistant
- E+E Humidity sensor HCT01
  » Long-term stability
  » Protected solder pads
  » Tested according to automotive standard AEC-Q200
- Display
  » Selectable display layout
  » Measurands freely selectable
  » Backlight optional
- Smooth cover surface
  » No accumulation of dust in protruding edges
- IP65 / NEMA 4 Enclosure
  » Watertight cable outlet
Protective Sensor Coating

The E+E proprietary sensor coating is a hygroscopic layer applied to the active surface of the HCT01 sensing element. The coating extends substantially the life-time and the measurement performance of the E+E sensor in corrosive environment (salts, off-shore applications). Additionally, it improves the sensor’s long term stability in dusty, dirty or oily applications by preventing stray impedances caused by deposits on the active sensor surface.

Technical Data

Measured Values

Relative Humidity (RH)

<table>
<thead>
<tr>
<th>Sensor</th>
<th>E+E Sensor HCT01-00D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working range</td>
<td>0...100 % RH</td>
</tr>
</tbody>
</table>

RH accuracy\textsuperscript{1) \textit{(incl. hysteresis, non-linearity and repeatability)}}

Wall & duct version:
-15...40 °C (5...104 °F) ≤90 % RH ±(1.3 + 0.003*measured value) % RH
-15...40 °C (5...104 °F) >90 % RH ± 2.3 % RH
-40...60 °C (-40...140 °F) ±(1.5 + 0.015*measured value) % RH

Remote probe version
at 20 °C (68 °F) ±2.5 % RH

Temperature (T)

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Pt1000 (tolerance class B, DIN EN 60751) integrated in HCT01</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-accuracy</td>
<td>wall &amp; duct; remote probe</td>
</tr>
</tbody>
</table>

Outputs

Analogue output
- 0-5 V / 0-10 V -1 mA < IL < 1 mA
- 4-20 mA (2-wire) RL ≤ 500 Ohm
- 0-20 mA (3-wire) RL ≤ 500 Ohm

Digital output
- RS485 (BACnet MS/TP or Modbus RTU), max. 32 EE210 in one bus

General

Power supply
- for 4-20 mA, 2-wire 10 V + R L x 20 mA < V+ < 30 V DC
- for 0-20 mA, 3-wire 15-35 V DC\textsuperscript{2)} or 24V AC ±20 %

Current consumption at 24 V
- Voltage output DC supply max. 12 mA; with display max. 23 mA
- AC supply max. 34 mA\textsubscript{rms}; with display max. 49 mA\textsubscript{rms}
- Current output
  - 2-wire DC supply max. 40 mA; with display max. 40 mA
  - 3-wire DC supply typ. 33 mA; with display max. 44 mA
  - AC supply typ. 65 mA\textsubscript{rms}; with display max. 84 mA\textsubscript{rms}
- Digital interface
  - DC supply typ. 5 mA; with display max. 20 mA
  - AC supply typ. 15 mA\textsubscript{rms}; with display max. 35 mA\textsubscript{rms}

\textsuperscript{1)} Traceable to intern. standards, administrated by NIST, PTB, BEV... 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).

\textsuperscript{2)} USA & Canada: class 2 supply required, max. supply voltage 30 V
Display: 1, 2 or 3 lines, user configurable, optional with backlight
Connection: Screw terminals, max. 1.5 mm²
Housing material: Polycarbonate, UL94V-0 (with Display UL94HB) approved
Protection class: IP65 / NEMA 4
Cable gland: M16 x 1.5
Probe cable (type C): PVC, Ø 4.3 mm, 4 x 0.25 mm², Length: 1.5 or 3 m (4.9 or 9.8 ft)
Sensor protection: E+E Coating
Electromagnetic compatibility: EN61326-1 EN61326-2-3
Industrial Environment
Temperature ranges:
- Operating: -40...60 °C (-40...140 °F) (-40...80 °C for remote probe EE210P)
- Storage: -40...60 °C (-40...140 °F)
Temperature ranges with display:
- Operating: -20...50 °C (-4...122 °F) (-40...80 °C for remote probe EE210P)
- Storage: -20...60 °C (-4...140 °F)

Dimensions (mm/inch)

**Typ A**

**Typ B**

**Typ C**

**EE210P**

**Connection Diagram**

**EE210-HT2/3/5**

- 15...35 V DC
- 24 V AC ±20 %
- Output: 0...5 V, 0...10 V, 0...20 mA

**EE210-HT6**

- 20...30 V DC, R<500 Ohm
- 11...30 V DC, R<50 Ohm
- Output: 4...20 mA

**EE210-HTx3**

- 15...35 V DC
- 24 V AC ±20 %
- Output: Modbus RTU or BACnet MS/TP

**EE210P remote probe (for HT6/HTx3)**

- White: 1...
- Green: 2...
- Yellow: 3...
- Brown: 4...

Display: 1, 2 or 3 lines, user configurable, optional with backlight
Connection: Screw terminals, max. 1.5 mm²
Housing material: Polycarbonate, UL94V-0 (with Display UL94HB) approved
Protection class: IP65 / NEMA 4
Cable gland: M16 x 1.5
Probe cable (type C): PVC, Ø 4.3 mm, 4 x 0.25 mm², Length: 1.5 or 3 m (4.9 or 9.8 ft)
Sensor protection: E+E Coating
Electromagnetic compatibility: EN61326-1 EN61326-2-3
Industrial Environment
Temperature ranges:
- Operating: -40...60 °C (-40...140 °F) (-40...80 °C for remote probe EE210P)
- Storage: -40...60 °C (-40...140 °F)
Temperature ranges with display:
- Operating: -20...50 °C (-4...122 °F) (-40...80 °C for remote probe EE210P)
- Storage: -20...60 °C (-4...140 °F)

Dimensions (mm/inch)

**Typ A**

**Typ B**

**Typ C**

**EE210P**

**Connection Diagram**

**EE210-HT2/3/5**

- 15...35 V DC
- 24 V AC ±20 %
- Output: 0...5 V, 0...10 V, 0...20 mA

**EE210-HT6**

- 20...30 V DC, R<500 Ohm
- 11...30 V DC, R<50 Ohm
- Output: 4...20 mA

**EE210-HTx3**

- 15...35 V DC
- 24 V AC ±20 %
- Output: Modbus RTU or BACnet MS/TP

**EE210P remote probe (for HT6/HTx3)**

- White: 1...
- Green: 2...
- Yellow: 3...
- Brown: 4...
### Ordering Guide

#### Analogue outputs (2x, 3x, 6x) setup

<table>
<thead>
<tr>
<th>OUTPUT 1</th>
<th>SCALING 1)</th>
<th>OUTPUT 2</th>
<th>SCALING 2)</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>relative humidity (Uw)</td>
<td>-40...60 (002)</td>
<td>relative humidity (Uw)</td>
<td>-40...60 (002)</td>
<td>metric (M)</td>
</tr>
<tr>
<td>temperature (Tx)</td>
<td>-10...50 (003)</td>
<td>temperature (Tx)</td>
<td>-10...50 (003)</td>
<td>non-metric (N)</td>
</tr>
<tr>
<td>dew point temperature (TD)</td>
<td>0...50 (004)</td>
<td>dew point temperature (TD)</td>
<td>0...50 (004)</td>
<td></td>
</tr>
<tr>
<td>frost point temperature (TF)</td>
<td>0...100 (005)</td>
<td>frost point temperature (TF)</td>
<td>0...100 (005)</td>
<td></td>
</tr>
<tr>
<td>water vapour partial pressure (Ex)</td>
<td>32...122 (076)</td>
<td>water vapour partial pressure (Ex)</td>
<td>32...122 (076)</td>
<td></td>
</tr>
<tr>
<td>mixing ratio (Rx)</td>
<td>-40...140 (083)</td>
<td>mixing ratio (Rx)</td>
<td>-40...140 (083)</td>
<td></td>
</tr>
<tr>
<td>absolute humidity (DV)</td>
<td>-40...140 (083)</td>
<td>absolute humidity (DV)</td>
<td>-40...140 (083)</td>
<td></td>
</tr>
<tr>
<td>specific enthalpy (Hx)</td>
<td>-40...140 (083)</td>
<td>specific enthalpy (Hx)</td>
<td>-40...140 (083)</td>
<td></td>
</tr>
</tbody>
</table>

1) Selectable probe length only for duct mount version available; see dimensions
3) Factory setup:
   - For analogue output versions the display shows the measurands selected for output 1 and output 2.
   - For digital output versions the display shows RH and T
4) Not with output 5x
5) Not with output 6x
6) Factory Scaling

#### Remote probe for EE210 Type C:

<table>
<thead>
<tr>
<th>MODEL</th>
<th>CABLE LENGTH</th>
<th>FILTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>humidity + temperature (HT)</td>
<td>1.5 m (4.9 ft)</td>
<td>membrane (B)</td>
</tr>
<tr>
<td>humidity + temperature (HT)</td>
<td>3 m (9.8 ft)</td>
<td>stainless steel sintered (D)</td>
</tr>
</tbody>
</table>

#### Digital output (x3) setup

<table>
<thead>
<tr>
<th>PROTOCOL</th>
<th>BAUDRATE</th>
<th>PARITY</th>
<th>STOPBITS</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modbus RTU (1)</td>
<td>9600 (A)</td>
<td>odd (O)</td>
<td>1 stopbit (1)</td>
<td>metric (M)</td>
</tr>
<tr>
<td>Modbus RTU (2)</td>
<td>19200 (B)</td>
<td>even (E)</td>
<td>2 stopbit (2)</td>
<td>non-metric (N)</td>
</tr>
<tr>
<td>BACnet MS/TP (3)</td>
<td>38400 (C)</td>
<td>no parity (N)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>57600 (D)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>76800 (E)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>115200 (F)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Order Examples

**Type A and B**

<table>
<thead>
<tr>
<th>EE210-HT3xPxAxEB-UwTx005M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model: Humidity + Temperature</td>
</tr>
<tr>
<td>Output: 0-10 V</td>
</tr>
<tr>
<td>Type: wall mount</td>
</tr>
<tr>
<td>Display: with backlight</td>
</tr>
<tr>
<td>Filter: membrane</td>
</tr>
<tr>
<td>Output scaling 1: relative humidity</td>
</tr>
<tr>
<td>Scaling 1: 0...100 °C</td>
</tr>
<tr>
<td>Output scaling 2: temperature</td>
</tr>
<tr>
<td>Scaling 2: 0...100 °C</td>
</tr>
<tr>
<td>Unit: metric</td>
</tr>
</tbody>
</table>

**Type C**

**Position 1:**

<table>
<thead>
<tr>
<th>EE210-HT6xPCxxx-UwTx005M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model: Humidity + Temperature Basic Device</td>
</tr>
<tr>
<td>Output: 4-20 mA</td>
</tr>
<tr>
<td>Type: remote probe (Pos. 2)</td>
</tr>
<tr>
<td>Display: none</td>
</tr>
<tr>
<td>Output scaling 1: relative humidity</td>
</tr>
<tr>
<td>Scaling 1: 0...100 °C</td>
</tr>
<tr>
<td>Output scaling 2: temperature</td>
</tr>
<tr>
<td>Scaling 2: 0...100 °C</td>
</tr>
<tr>
<td>Unit: metric</td>
</tr>
</tbody>
</table>

**Position 2:**

<table>
<thead>
<tr>
<th>EE210P-HTCB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model: Humidity + Temperature Probe</td>
</tr>
<tr>
<td>Cable length: 1.5 m</td>
</tr>
<tr>
<td>Filter: membrane</td>
</tr>
</tbody>
</table>
## Scope of supply

<table>
<thead>
<tr>
<th>EE210</th>
<th>Wall mount (Type A)</th>
<th>Duct mount (Type B)</th>
<th>Remote version (Type C)*</th>
<th>EE210-P Remote probe* for Type C</th>
<th>Additionally for models with RS485 interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE210 according ordering guide</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cable gland</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Mounting kit</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Mounting flange</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Inspection certificate according to DIN EN10204-3.1</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Quick Guide - EE210 RS485 Setup</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

* EE210-P is not included in the Scope of Supply of the EE210 Type C

## Accessories

- **Product configuration adapter**: see data sheet EE-PCA
- **Product configuration software**: EE-PCS (free download: www.eplus.com/EE210)
- **Power supply adapter**: V03 (see data sheet Accessories)
- **Protection cap for 12 mm probe**: HA010783