COMET T0210 Transmitter Instruction Manual

Contents

COMET T0210 Transmitter

It is prohibited to copy and make any changes in this manual, without the explicit agreement of the company COMET SYSTEM, Ltd. All rights reserved. COMET SYSTEM, Ltd. makes constant development and improvement of their products. The manufacturer reserves the right to make technical changes to the device without previous notice. Misprints reserved.

Instruction manual for use of T0210 transmitter

The transmitter is designed for the measurement of ambient air temperature at °C or °F and relative humidity of air without aggressive ingredients by computing one of the following values: dew point temperature, absolute humidity, specific humidity, mixing ratio, and specific enthalpy. Measuring temperature and relative humidity sensors are non-removable instrument parts. Measured and computed values are displayed on the dual-line LCD display. The first line displays the temperature. The value displayed on the second line is selectable among relative humidity and computed value. It is also possible to display both readings with cyclic overwriting in 4 seconds intervals. It is possible to switch OFF the LCD at all. It is possible to assign measured or computed values to output Uout1 or output Uout2. Both voltage outputs have common ground with a power source (GND terminal).

All transmitter setting is performed by means of the PC connected via the optional SP003 communication cable (not included in delivery). Program Tensor for transmitter setting is available to download free at **www.cometsystem.com**. The program enables to the assignment of each output measured value (temperature, relative humidity, computed value) and its range. It supports making the adjustment of the device too. This procedure is described in the file „Calibration manual.pdf“ which is installed commonly with the software. It is also possible to assign both outputs to the same value (with the same range), if two evaluation devices are necessary to connect. Transmitter version TxxxxL with a watertight male connector instead of a cable gland is designed for easy connection/disconnection of the output cable. The protection of the male Lumberg connector RSFM4 is IP67. Models marked TxxxxZ are non-standard versions of the transmitters. The description is not included in this manual. Please read the instruction manual before the first device connection.

Device setting from the manufacturer

The transmitter is set by the manufacturer to the following parameters:

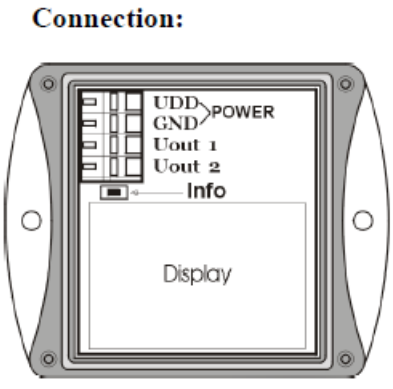
- value at output Uout1: relative humidity, range 0 – 10 V corresponds 0 to 100 %
- RH value at output Uout2: temperature, range 0 – 10 V
- corresponds -30 to +80 °C display: switched ON the value displayed at line 2: relative humidity only

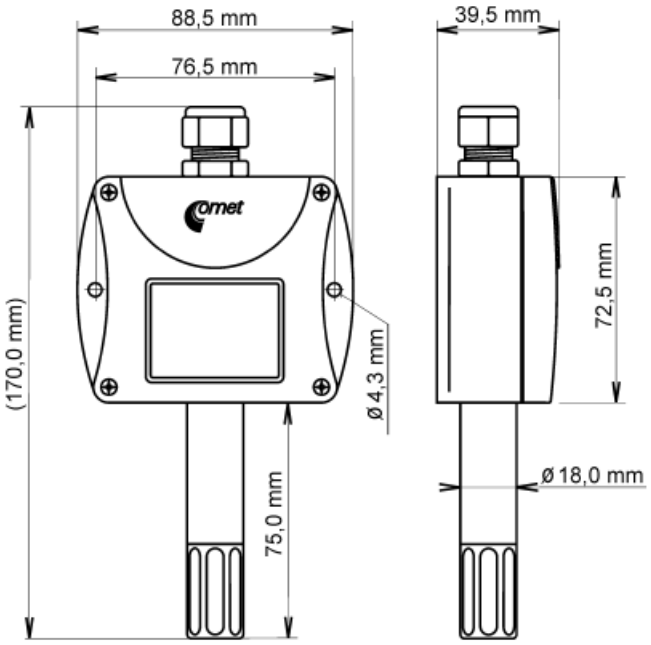
Modification of the setting is possible to do by means of the PC using the procedure described at the end of this document.

Installation of the transmitter
The transmitter is designed for wall mounting. There are two mounting holes at the sides of the case. It is NOT recommended to use the device for a long time under condensation conditions. It could be the cause of water steam condensation inside the sensor's cover into the water phase. This liquid phase stays inside the sensor's cover and can't escape from the cover easily. It can dramatically increase response time to relative humidity change. If water condensation occurs for a long time it can cause sensor damage. A similar effect can occur underwater aerosol conditions. Don't connect the transmitter while the power supply voltage is on. Interconnection terminals of T0210 are accessible after unscrewing four screws and removing the lid. Lace the cable through a gland at the case wall. Connect the cable to terminals with respecting the signal polarity (see figure). Terminals are self-clamping and can be opened by a suitable screwdriver. For the opening, insert the screwdriver to the upper terminal hole and lever by him. Do not remember to tighten glands and case lid with inserted packing after the cables connect. It is necessary for warranting of protection IP65. Connect the complementary female connector for the T0210L transmitter in accordance with the table in Appendix A of this manual.

It is recommended to use a shielded twisted copper cable, a maximal length 15m. The cable must be located at indoor rooms. The cable should not be led in parallel along the power cabling. Safety distance is up to 0.5 m, otherwise undesirable induction of interference signals can appear. The outside diameter of the cable for the T0210 device must be from 3,5 to 8 mm (e.g. SYKFY), for device T0210L with respect to the female connector. Do NOT connect shielding at the connector side. Electrical system (wiring) may do only by workers with the required qualifications by rules in operation.

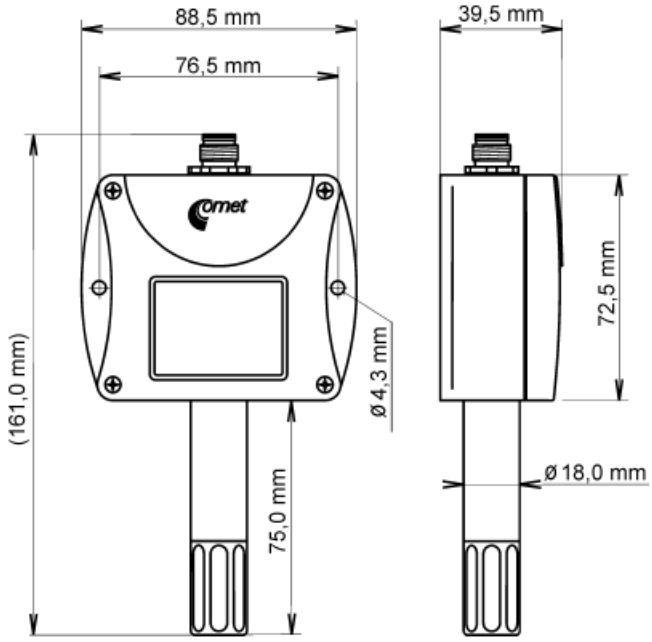
Dimensions -T0210





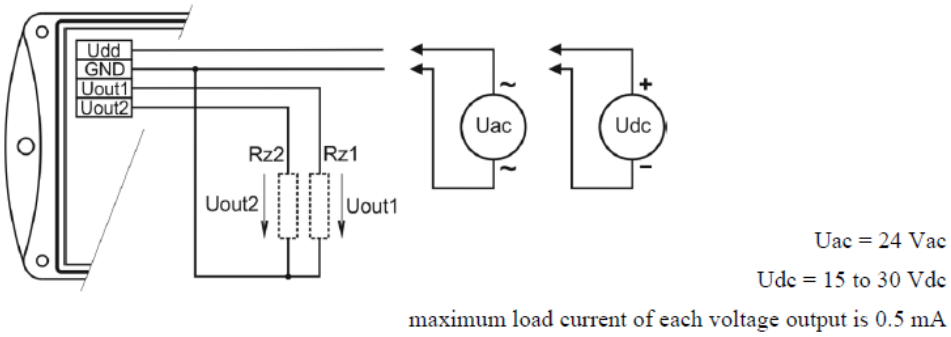
Dimensions -T0210L

Connection: see Appendix A



Specifications are subject to change without notice.

Typical application wiring



Uac = 24 Vac

Udc = 15 to 30 Vdc

maximum load current of each voltage output is 0.5 mA

LCD Info mode

Several settings of the installed transmitter is possible to verify without the use of the computer. It is necessary to connect the power. Unscrew the transmitter lid and shortly press the button between the display and interconnection terminals by means of a tool (e.g. screwdriver).

1. Range and type of value for output 1 (About 1 = symbol „1“on display). The type of value, assigned to output 1, is indicated by the displayed unit (here %RH = relative humidity). The upper line displays the voltage value corresponding to the measured value (lower line).
2. Press the button again to get the value for the upper point (same output, same value) similarly as at the previous point. Here 10 V corresponds to 100 %RH.
3. Press the button again to display the range and type of value for output 2 (symbol „2“). Here it is the ambient temperature („°C“), when 0 V corresponds to -30 °C.
4. After the next press of the button value for the upper point appears, here 10 V corresponds to ambient temperature +80 °C.
5. Press the button again to end info mode and display actual measured values.

Notice: during info mode, no measurement and no output voltage generation proceed. The transmitter stays at info mode 15 s, and then automatically goes back to the measuring cycle.

Readings on the LCD display

°C, °F
Reading next to this symbol is the measured temperature or error state of value.

%RH
Reading next to this symbol is measured relative humidity or error state of value.

°C / °F DP
Reading next to this symbol is the calculated dew point temperature or error state of value.

g/m3
Reading next to this symbol is calculated absolute humidity or error state of value.

g/kg
Reading next to this symbol is the calculated specific humidity or mixing ratio (depending on the device setting) or error state of value. If specific enthalpy is selected, there is shown only the value (number) is without the corresponding unit!

Technical parameters

Accuracy data shown are for value displayed on LCD display. For value on analog output is valid too, if the selected output range is set inside the measuring range.

Analog outputs

- Two outputs with a range from 0 to 10 V with common ground Output load capability: min. 20 k
- The voltage output in case of error: approximately –0.1 V or >10.5 V

Power

- 15 to 30 Vdc
- 24 Vac

Measuring parameters

- Ambient temperature (internal RTD sensor Pt1000/3850ppm):Measuring range: -30 to +80 °C
- Display resolution: 0.1 °C
- Accuracy: ± 0.4 °C
- Relative humidity (RH reading is compensated at the entire temperature range): Measuring range: 0 to 100 %RH (see Installation of the transmitter)
- Display resolution: 0.1 %RH
- Accuracy: ± 2.5 %RH from 5 to 95 %RH at 23 °C

The value computed from ambient temperature and relative humidity

- Display resolution: 0,1 °C
- You can choose one of the next values: Dew point temperature
- Accuracy: ±1,5 °C at ambient temperature T < 25°C and RH >30%
- Range: -60 to +80 °C
- Absolute humidity
- Accuracy: ±3g/m3 at ambient temperature T < 40°C
- Range: 0 to 400 g/m3

Specific humidity1

- Accuracy: ±2g/kg at ambient temperature T < 35°C

- Range: 0 to 550 g/kg

Mixing ratio1

- Accuracy: ±2g/kg at ambient temperature T < 35°C
- Range: 0 to 995 g/kg
- Specific enthalpy1
- Accuracy: ± 3kJ/kg at ambient temperature T < 25°C
- Range: 0 to 995 kJ/kg 2

Response time (air flow approximately 1 m/s): temperature (temperature step 20°C)

- with stainless steel mesh sensor cover (F5200) t90 < 7 min
- with bronze sensor cover (F0000 – selectable option) t90 < 9 min relative humidity: t90 < 30 s (humidity step 65 %RH, constant temperature)
- The recommended interval of calibration: 1 year
- Measuring interval and LCD display refresh: 0.5 s
- Communication with computer: via USB port by means of USB communication cable SP003

Protection: electronics IP65, sensors are located in cover with IP40 protection

- Air filter: filtering ability 0.025 mm
- Operating conditions:
- Operating temperature range: -30 to +80 °C, over +70°C switch LCD display OFF
- Operating humidity range: 0 to 100 %RH
- Outer characteristics in accordance with Czech National Standard 33-2000-3: a normal environment with the specifications: AE1, AN1, BE1
- Working position: the stem downwards Electromagnetic compatibility: complies with EN 61326-1
- Not allowed manipulations: It is not allowed to operate the device under other than specified conditions in technical parameters. Devices are not designed for locations with chemically aggressive environments. Temperature and humidity sensors must not be exposed to direct contact to water or other liquids. It is not allowed to remove the sensor cover to avoid any mechanical damage to the sensors.
- Storing conditions: temperature -30 to +80 °C
- humidity 0 to 100 %RH without condensation
- Dimensions: see dimensional drawings
- Weight: approximately 150 g
- Material of the case: ASA

This value depends on the atmospheric pressure. For computing is used constant value is stored inside the device’s memory. The default value preset by the manufacturer is 1013hPa and can be changed by the user’s software. This maximum is reached under conditions about 70°C/100%RH or 80°C/70%RH

The procedure of modification of transmitter adjustment

- Device adjustment is performed by means of the optional SP003 communication cable, connected to the USB

port of the PC.

- It is necessary to have installed the configuration program Tensor on the PC. It is free to download at **www.cometsystem.com**. During installation please take care of the installation of driver for USB communication cable.
- Connect SP003 communication cable to the PC. Installed USB driver detect connected cable and create virtual COM port inside the PC.
- Unscrew four screws of the device lid remove the lid. If the device is already installed to the measuring system, disconnect leads from terminals.
- Connect SP003 communication cable to the device. The display must light up, or at least must light up all symbols for one second (if LCD was switched OFF by program before).
- Run the installed Tsensor program and select the corresponding communication COM port (as described above).
- When new setting is saved and finished, disconnect the cable from the device, connect leads into its terminals and place the lid back to the device.

Error states of the device

- Device continuously checks its state during operation. In case error is found LCD displays the corresponding error code:

  Error 0
- First line displays „Err0“.
- Check sum error of stored setting inside device’s memory. Output value is <-0.1 V. This error appears if an incorrect writing procedure to device’s memory occurred or if damage of calibration data appeared. At this state device does not measure and calculate values. It is a serious error, contact the distributor of the instrument to fix.

  Error 1
- The measured (calculated) value is over the upper limit of the allowed full-scale range. There is a reading „Err1“ on LCD display. Output value is about 10.5 V. This state appears in case of:
  - Measured temperature is higher than approximately 600°C (i.e. high non-measurable resistance of temperature sensor, probably opened circuit).
  - Relative humidity is higher than 100%, i.e. damaged humidity sensor, or humidity calculation of humidity is not possible (due to error during temperature measurement).
  - Computed value – calculation of the value is not possible (error during measurement of temperature or relative humidity or value is over range).
- **Error 2**

  There is a reading „Err2“ on LCD display. Measured (calculated) value is below lower limit of allowed full-scale range. Output value is about -0.1 V. This state appears in case of:
  - Measured temperature is lower than approximately -210°C (i.e. low resistance of temperature sensor, probably short circuit).
  - Relative humidity is lower than 0%, i.e. damaged sensor for measurement of relative humidity, or calculation of humidity is not possible (due to error during temperature measurement).
  - Computed value – calculation of computed value is not possible (error during measurement of temperature or relative humidity).

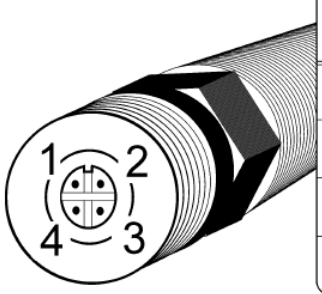
- **Error 3**

  There is a reading „Err3“ on LCD display upper line.
- Error of internal A/D converter appeared (converter does not respond, probably damage of A/D converter). No measurement and calculations of values proceed. The output value is about -0.1 V. It is a serious error, contact the distributor of the instrument.

End of operation
The device itself (after its life) is necessary to liquidate ecologically!

Technical support and service

Technical support and service is provided by the distributor. For contact see the warranty certificate.



Female Lumberg connector	Transmitter Tx1xxL with 4-20mA outputs	Transmitter Tx2xxL with 0-10V outputs	Transmitter Tx3xxL with RS232 output	Transmitter Tx4xxL with RS485 output
1	+I1	Udd	RTS	+U
2	+I2	Uout1	Rx	A
3	-I2	Uout2	Tx	B
4	-I1	GND	GND	GND

Specifications are subject to change without notice. IE-SNC-T0210-09

Documents / Resources

	COMET T0210 Transmitter [pdf] Instruction Manual T0210 Transmitter, T0210, Transmitter

References

- Manufacturer of Dataloggers, Thermometers, Hygrometers,CO2 meters
- Manufacturer of Dataloggers, Thermometers, Hygrometers,CO2 meters

Manuals+,