HDH-FL Wireless Room CO₂, Temperature and Humidity Transmitters

HDH-FL transmitters are designed to detect carbon dioxide concentration, temperature and relative humidity in the room spaces. The HDH-FL transmitters have built-in wireless interface transmitting the measurements to FLTA receiver. The CO₂ sensor will become self-calibrated regularly by using patented ABCLogic™ method. Local outputs, linear 0-10V signals related to CO₂-concentration, temperature and humidity, can be used for demand controlled ventilation locally.

HDH-FL wireless range uses 868.30 MHz frequency with FSK modulation to transmit data reliably. The transmission distance without repeaters is typically 40 to 100m in buildings, up to 500m line of sight. Up to 99 wireless sensors can be used in a single FLTA network. FLTA receivers have 0..10Vdc outputs as well as Modbus RTU communication built-in.

HDH-FL-N is like HDH-FL, but with a display. As a factory setting, the display is scanning between temperature and CO₂ every 2 seconds. By pressing the button inside the desired display mode can be selected.

### Model Type

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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<tbody>
<tr>
<td>HDH-FL</td>
<td>Wireless Room CO₂ and Temperature Transmitter</td>
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<tr>
<td>HDH-FL-N</td>
<td>Wireless Room CO₂ and Temperature Transmitter with Display</td>
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<tr>
<td>HDH-FL-RH</td>
<td>Wireless Room CO₂, rH Humidity and Temperature Transmitter</td>
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<tr>
<td>HDH-FL-RH-N</td>
<td>Wireless Room CO₂, rH Humidity and Temperature Transmitter with Display</td>
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</tbody>
</table>

### Technical Data

- **Power supply**: 24Vac (15...28V) / 1VA  
  24Vdc (15...36V) / 1W
- **Range (HDH-FL models):**  
  CO₂: 0...2000ppm CO₂  
  Temperature: 0...50°C
- **Range (HDH-FL-RH models):**  
  CO₂: 0...2000ppm CO₂  
  Temperature: 0...50°C  
  Humidity: 0...100%rH
- **Accuracy - CO₂**: ± 40ppm + 3% of the reading @ 25°C (ABCLogic™)
- **Accuracy - Temperature**: ±0.5°C
- **Stability / Year**: <2% FS (ABCLogic™)
- **Temperature dependence**: 0.2% FS / °C
- **Pressure dependence**: 0.17% reading/mbar
- **Operating temperature**: 0°C...+50°C
- **Ambient humidity**: 0...95%rh (non-cond.)
- **Response time (0...90%)**: <1min
- **Warm-up time**: <10 min
- **Outputs**: 0..10V < 2mA
- **Housing**: ABS-plastic, IP 20
HDH-FL Wireless Network Addressing

HDH-FL wireless transmitters operate at 868.30Mhz frequency and are transmitting measurements to the FLTA receivers. Each HDH_FL transmitter is required to be configured to operate in the specific FLTA network. Up to 99 wireless transmitters (HDH-FL, TEFL, TEU-FL, LA-FL, KLU-FL) can operate in a single FLTA network.

CONFIGURING HDH-FL WIRELESS CO2 TRANSMITTER NETWORK ADDRESSES

To configure the addresses FLSER service tool is required. This tool is used for addressing, device configuration, testing signal strengths and it can act as a temporary repeater for the wireless network design.

Please follow the following steps to address the HDH-FL transmitters:-
1. Position FLSER service tool close to HDH-FL transmitter. Select MID position on the FLSER service tool. Select using +/- buttons the required Master ID (MID 1..63).

Note: Typically the master ID is set as 1 if only one wireless FLTA network exists in the building. The matching master ID is set on the FLTA.

2. Please select S-RID on the FLSER service tool switch. SID is displayed on the screen. (Note: SID = OFF means that the sensor address has not been assigned and the sensor is dormant).

- Remove the HDH-FL sensor cover.
- Select sensor SID address by pressing + and - buttons on the FLSER tool.
- Press OK button on FLSER after which the "WAIT" text starts to flash for 30 seconds on the FLSER service tool. Bring the FLSER service tool close to the HDH-FL and press S button on the HDH wireless card.

4. FLSER service tool sets the address of the HDH-FL sensor/transmitter. Once the HDH-FL has been successfully addressed the FLSER display shows OK.

5. The FLSER service tool now shows the signal strength from the HDH-FL to the service tool and back. Signal strength RSSI 1-2 = low signal quality, RSSI 3-5 = acceptable, RSSI 6-9 = good signal strength. The large number illustrates the FLSER service tool signal strength and the small number the HDH-FL signal strength.

6. Finally switch the FLSER switch to OFF position. Now the HDH-FL returns to normal mode and starts to communicate to the FLTA receiver.

Wireless Data Transmission

HDH-FL room CO2 and temperature transmitters send information to the FLTA every 1 minute.

Wireless FLTA Receiver Data Outputs (HDH-FL acts as a KLU-FL)

<table>
<thead>
<tr>
<th>Outputs</th>
<th>CO2 Measurement: 0...2,000 ppm = 0..10Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 x 0..10Vdc Outputs</td>
<td>Temperature 0...50°C = 0...10V</td>
</tr>
<tr>
<td>Humidity 0...100% = 0...10V</td>
<td></td>
</tr>
</tbody>
</table>

Modbus RS485

<table>
<thead>
<tr>
<th>Modbus Function Code 04 - Input Registers</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 Measurement: 0...2,000 ppm = 0...2,000 (0..2,000 ppm)</td>
</tr>
<tr>
<td>Temperature -50...150°C = -500...1,500 (-50.0..+150°C)</td>
</tr>
<tr>
<td>Humidity 0...100% = 0...1,000 (0..100% rH)</td>
</tr>
</tbody>
</table>
Communication Diagram
Example for Wireless Network

- HDH-FL-N
- Radio Signal: 868.30 MHz
- Up to 99 Sensors per FLTA module
- Optional up to 8 Repeaters per FLTA network
- FLREP
- Radio Signal: 868.30 MHz
- FLREP-U
- Radio Signal: 868.30 MHz
- HDH-FL
- Range (between 2 wireless devices):
  - In buildings: 20…500m (depending on wall structures)
  - Line of sight: Up to 500m
- With Repeaters the overall distance can be extended.
- Optional up to 8 Repeaters per FLTA network
- Up to 99 Sensors per FLTA module
- TEU-FL-DI
- HDH-FL-N
- External Pt1000 Temperature Sensor (Option)
- ON/OFF SIGNALS
  - e.g. level switch, plant status etc.

Dimensions

- HDH-FL
  - 87mm
  - 86mm
  - 32mm
- HDH-FL-N
  - 87mm
  - 86mm
  - 32mm