

# EE894

## Digital Sensor Module for CO<sub>2</sub>, Temperature, Humidity and Ambient Pressure

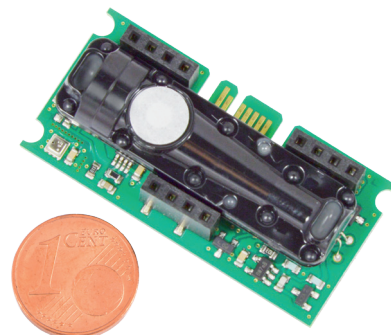
The EE894 module is ideal for demand controlled ventilation and building automation. It incorporates the E+E dual wavelength NDIR CO<sub>2</sub> sensor, which compensates for ageing effects, is highly insensitive to pollution and offers outstanding long term stability. Beside CO<sub>2</sub>, the module measures also relative humidity (RH), temperature (T) and ambient pressure (p).

A multiple point CO<sub>2</sub> and T factory adjustment procedure leads to excellent CO<sub>2</sub> measurement accuracy over the entire T working range. The pressure compensation minimizes the impact of altitude and ambient pressure variations onto the CO<sub>2</sub> measured data.

The measured data, with a range of up to 1% CO<sub>2</sub>, is available on the I<sup>2</sup>C or the E2 digital interface. The EE894 is available in two sizes and with electrical connection via contact pins and pads, which facilitate the design-in.

The measured data with a measuring range of up to 1 % CO<sub>2</sub> (10 000 ppm) is available on the digital interface I<sup>2</sup>C or E2.

An optional kit for the E2 interface facilitates easy configuration of the module and the adjustment of the CO<sub>2</sub>, RH, T and p measurement. The CO<sub>2</sub> measurement interval can be set according to the application requirements; by this the average current consumption can be reduced to 420 µA, ideal for battery-operated devices.



### Typical Applications

**Demand controlled ventilation**  
**Building automation**  
**Data loggers and hand helds**  
**Wireless transmitters**

### Key features

**Autocalibration**  
**Outstanding long-term stability**  
**Temperature and pressure compensated**  
**Low power consumption**  
**Small size**

### Technical Data

#### Measured values

##### CO<sub>2</sub>

Measurement principle	Dual wavelength NDIR (non-dispersive infrared technology)
Working range	0...2000 / 5000 / 10000 ppm
Accuracy at 25 °C and 1013 mbar <sup>1)</sup> (77 °F and 14.69 psi)	0...2000 ppm: < ± (50 ppm +2% of the measured value) 0...5000 ppm: < ± (50 ppm +3% of the measured value) 0...10000 ppm: < ± (100 ppm +5% of the measured value)
Response time t <sub>90</sub>	105 s with measured data averaging (smooth output) 60 s without measured data averaging <sup>2)</sup>
Temperature dependency, typ	± (1 + CO <sub>2</sub> concentration [ppm] / 1000) ppm/°C (-20...45 °C) (-4...113 °F)
Pressure dependency	0.014 % of the measured value / mbar (ref. to 1013 mbar)
Calibration interval <sup>3)</sup>	>5 years
Sampling interval	from 15 s (factory setup) up to 1 h; user selectable

##### Relative humidity

Working range	0...95 %RH (non-condensing)
Accuracy at 25 °C (77 °F) and 20...80 %RH, incl. hysteresis, typ.	±3 %RH

##### Pressure

Working range	700...1100 mbar (10.15...15.95 psi)
Accuracy at 25 °C (77 °F), typ.	±2 mbar (20...80 %RH)
Temperature dependency	±0.015 mbar/K

##### Temperature

Working range	-40...60 °C (-40...140 °F)
Accuracy at 25 °C (77 °F), typ.	±0.5 °C (± 0.9 °F)

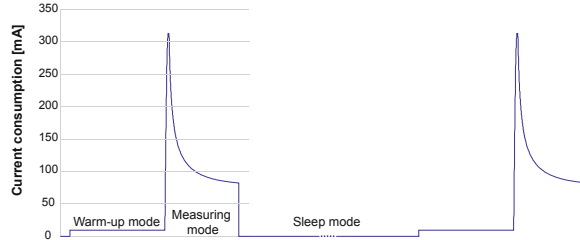
1) With data averaging (smooth output) for averaging output.

2) Available only for I<sup>2</sup>C.

3) Recommended under normal operating conditions in building automation.

**General**

Digital interface	I <sup>2</sup> C or E2
Supply voltage	4.75 - 7.5 V DC
Average current <sup>4)</sup> at 25 °C (77 °F) and 5 V supply	420 µA (at 1 h sampling interval) 3.2 mA (at 15 s sampling interval)
Peak Current	

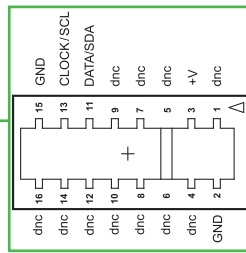
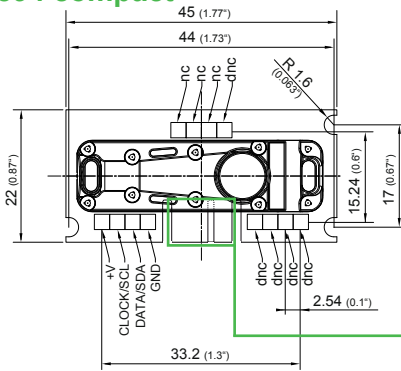


Electrical connection	Contact pins and edge card socket
Working and storage conditions	-40...60 °C (-40...140 °F) 0...95 %RH (non-condensing) 700...1100 mbar (10.15...15.95 psi)

4) The average current depends on the CO<sub>2</sub> sampling interval.

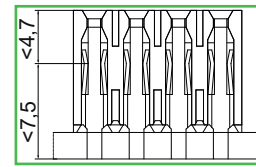
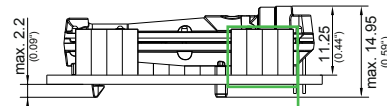
**Connection Diagram / Dimensions in mm (inch)**

**EE894 compact**



edge card socket  
(e.g. MEC1-108-02, Samtec)

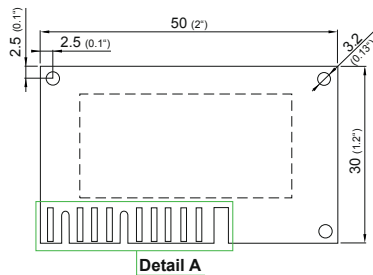
nc..... not connected  
dnc..... do not connect



Female connector strip for 0.64 mm pins  
contact spacing 2.54 mm (0.1")

**EE894 standard**

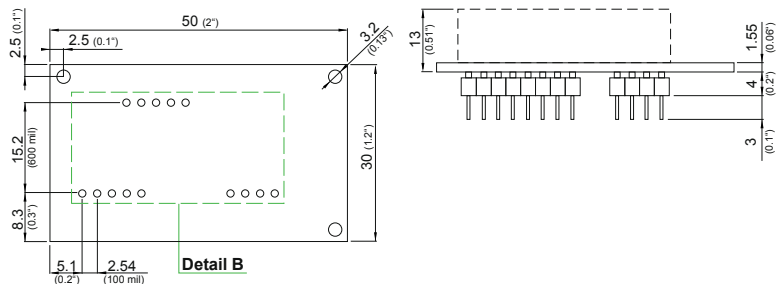
**Contact Pads**



**Detail A**

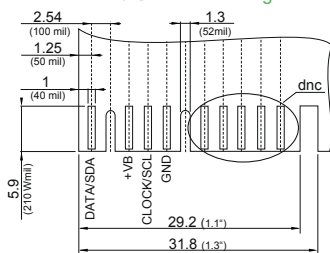
**Contact Pins**

for DIP-28 wide IC socket 28-pin or for soldering

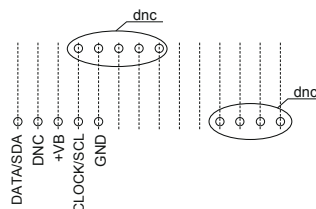


**Detail B**

**Detail A / Connection Diagram:**

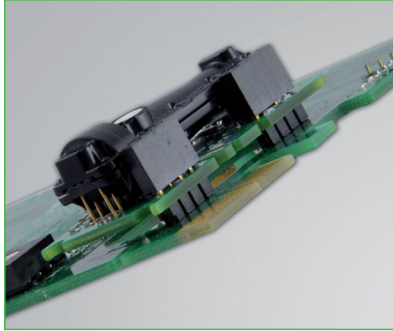


**Detail B / Connection Diagram:**

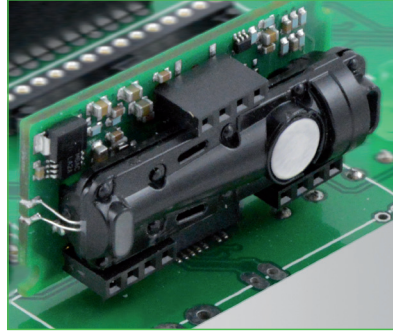


nc..... not connected  
dnc..... do not connect

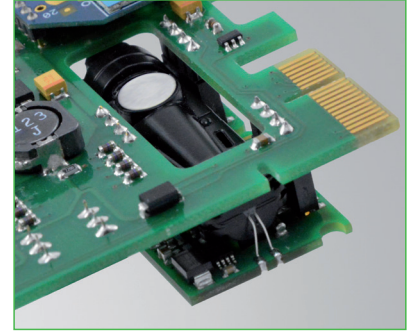
## Mounting Examples



Top mount



Connection with edge card socket



Space saving assembly

## Ordering Guide

<b>Model</b>	CO <sub>2</sub> + T + RH + p	<b>EE894-</b>	
<b>CO<sub>2</sub> measuring range</b>	0...2000 ppm 0...5000 ppm 0...10000 ppm	no code HV1 HV2 HV3	
<b>Size</b>	Compact Standard	no code	PCB8
<b>Connection</b>	Contact pads Contact pins		E25 E26
<b>Interface</b>	I <sup>2</sup> C E2	no code J2	

## Order Example

### EE894-HV1J2

Model: CO<sub>2</sub> + T + RH + p  
CO<sub>2</sub> measuring range: 0...2000 ppm  
Size: Compact  
Interface: E2

### EE894-HV2PCB8E25

Model: CO<sub>2</sub> + T + RH + p  
CO<sub>2</sub> measuring range: 0...5000 ppm  
Size: Standard  
Connection: Contact pads  
Interface: I<sup>2</sup>C

## Support Literature

[www.epluse.com/ee894](http://www.epluse.com/ee894)

Find Arduino and Raspberry Pi sample codes and more information for easy communication with the EE894 on [www.github.com/Epluse](http://www.github.com/Epluse).