

Front-End FE02

All-in-one data capture system for:

- Temperature
- Relative Humidity
- Dew Point
- Barometric Pressure
- Irradiance
- Heat Flux



Each FE02 is a complete multi-channel acquisition system specifically designed for accurate measurements of surface temperatures and / or thermal fluxes. The device includes sensors for measurement, signal conditioning circuitry and circuitry to interface the radio modem.

A radio modem of RM01 family can be directly connected to the DB9 connector of FE02 and once connected, both devices are powered by the internal battery. Just add a radio modem to a FE02 device and you get a complete measurement node able to communicate with DL01 or DL02 dataloggers.

All the configuration parameters, such as the sampling time T_s , are stored into the internal non-volatile memory. Every T_s seconds, FE02 converts the sensor signals into digital signals and sends them into a data packet to the datalogger.

Thanks to a low-power electronic circuitry, each measurement node is able to operate with very high autonomy; the battery life can vary from one day ($T_s = 1$ s) up to several months ($T_s > 1$ min). The battery, internal to the radio modem, is rechargeable and can be fully restored within a couple of hours.

Each FE02 is capable of handling from 1 to 6 independent measuring channels. There are various models of FE02 with different number and type of the sensors used.

The FE02 devices are pre-calibrated and interchangeable with each other. Since the datalogger is able to automatically detect the number of channels and the related physical quantities, it is not requested by the operator any further configuration.

Ordering codes:

Code	Part	Description
8802700	FE02-3A	Front-End with 3 channels: - Temperature - Relative Humidity - Dew Point
8802705	FE02-3B	Front-End with 3 channels: - Irradiance - Temperature (cell) - Temperatura (air)
8802707	FE02-3C	Front-End with 3 channels: - Heat Flux + Temperature (surface) - Temperature (surface)
8802709	FE02-3E	Front-End with 3 channels: - Heat Flux + Temperature (surface) - Temperature (surface, removable)
8802710	FE02-1A	Front-End with 1 channel: - Barometric Pressure
8802712	FE02-2A	Front-End with 2 channels: - Temperature (surface) - Temperature (surface)
8802715	FE02-1B	Front-End with 1 channel: - Irradiance
8802720	FE02-4A	Front-End with 4 channels: - Temperature - Relative Humidity - Dew Point - Barometric Pressure
8802725	FE02-6A	Front-End with 6 channels: - Heat Flux + Temperature (surface) - Temperature (surface) - Temperature - Relative Humidity - Dew Point

Note:

The order code must be completed by the network address of the device (1÷30), for example:

FE02-4A-02
(FE02 device with 4 channels and network address = 2)

Technical specifications

NUMBER OF CHANNELS

1...6

DATA RESOLUTION

16 bit

SAMPLING TIME

1...65535 s

POWER SUPPLY

3.3...5.1 Vdc

0.003...5 mA (depending on the sampling time)

TEMPERATURE RANGE

-20°...60°C working (RH max 85% at 25°C)

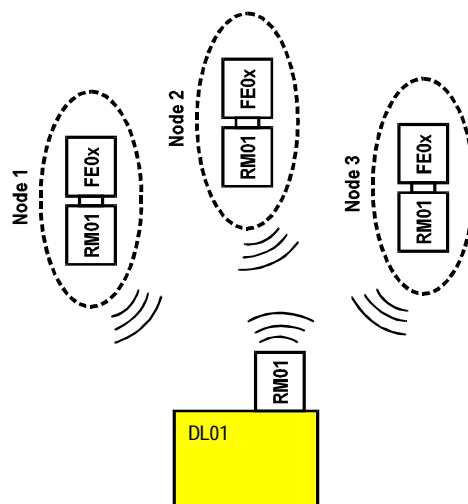
-30°...70°C storage

DIMENSIONS

40 mm x 40 mm x 20 mm (excluding connector and external probes)

WEIGHT

~45 g (excluding external probes)



Example of a wireless network composed by 3 measurement nodes

Models: -3A, -4A, -6A



TEMPERATURE

RESPONSE TIME

5...30 s

OPERATING RANGE

-20...60°C

RESOLUTION

0.01 °C

ACCURACY

± 0.3°C (@25°C)

REPEATIBILITY

±0.1°C

RELATIVE HUMIDITY

RESPONSE TIME

8 s (typ)

OPERATING RANGE

0...100%

RESOLUTION

0.03%

ACCURACY

±2% (@ 10...90%)

REPEATIBILITY

±0.1%

DEW POINT

ACCURACY

±0.5°C (@RH=60...90%, T=25°C)

Models: -1A, -4A, -6A



BAROMETRIC PRESSURE

OPERATING RANGE

600...1200 hPa

RESOLUTION

0.015 hPa

ACCURACY

±0.5 hPa (@10...40°C) relative
±1.5 hPa (@10...40°C) absolute

TEMPERATURE RANGE

-20...60°C 600...1200 hPa

Models: -3B →

TEMPERATURE (CELL/AIR)

TYPE OF SENSOR

RTD Pt1000, Class 1/3 B (DIN/IEC751)

RESPONSE TIME

8 s

OPERATING RANGE

-50...125°C (CELL)

-20...50°C (AIR)

RESOLUTION

0.01 °C

ACCURACY

± (0.15+0.017|t|) °C

PROBE CABLE

High temperature twisted cable. L = 1.4 m (CELL)

Models: -3B, -1B →

IRRADIANCE

TYPE OF SENSOR

Polycrystalline silicon, temperature compensated cell

RESPONSE TIME

<1 s

OPERATING RANGE

0÷1500 W/m²

-20÷50 °C

RESOLUTION

0.1 W/m²

ACCURACY

± (2.5% rdg + 20 dgt)

Models: -3C, -3E, -2A, -6A →

TEMPERATURE (SURFACE)

TYPE OF SENSOR

RTD Pt1000, Class 1/3 B (DIN/IEC751)

RESPONSE TIME

8 s

OPERATING RANGE

-50...125°C

RESOLUTION

0.01 °C

ACCURACY

± (0.10+0.017|t|) °C

MATCHING

± 0.05 °C (between two channels @T=20°C)

PROBE CABLE

High temperature twisted cable. L = 1.4 m

DIMENSIONS

Ø20 x 3 mm

WEIGHT

~1.5 g

Models: -3C, -3E, -6A →

HEAT FLUX

RESPONSE TIME

4 min

OPERATING RANGE

-300÷300 W/m²

RESOLUTION

0.01 W/m²

ACCURACY

± 5% (@T=20°C)

TEMPERATURE RANGE

-20÷60°C with temperature dependence of 0.1%/°C (typ)

THERMAL RESISTANCE

< 0.006 m²K/W

DIMENSIONS

Ø80 x 5.5 mm

WEIGHT

~70 g