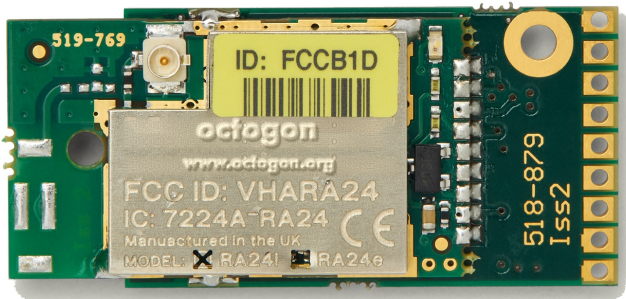


WIRELESS STRAIN BRIDGE MODULE



Type: **EFMF**

- 4-WIRE BRIDGE, 5 V
- UP TO 200 READINGS/S
- RANGE UP TO 800 M
- PCB 37.5 × 16.8 MM



VERSIONS

On-chip antenna	antenna on the board, range up to 500 m
External antenna	UFL socket, range up to 800 m
Sensitivity	± 3.1 mV/V · ± 4.5 mV/V · 20 mV/V

Both antenna versions with all three sensitivities.



OVERVIEW

The measuring electronics move into the sensor: a 37.5 mm board that reads a four-wire strain bridge, provides its 5 V excitation and sends the result by radio – load cells, torque sensors, strain gauges and pressure modules become wireless without a cable leaving the housing. Sleep mode between transmissions carries a pair of cells through years of service. Enclosures are available where embedding is not an option.

MEASUREMENT	RADIO AND POWER
• 4-wire bridge from 85 Ω, 5 V excitation • linearisation up to 9 points • 18.75 bit noise free at 1 reading/s	• 2.4 GHz DSSS, 10 mW, licence exempt • up to 500 m on-chip, 800 m external • 2.1 ... 3.6 V DC, up to 5 years on D cells



TECHNICAL DATA

INPUT AND MEASUREMENT

Excitation system	4 wire
Bridge excitation	5 V DC (4.5 ... 5.25 V)
Bridge resistance	85 ... 5000 Ω · up to four 350 Ω bridges in parallel
Sensitivity, maximum	± 3.1 mV/V · options ± 4.5 mV/V and 20 mV/V
Calibration	factory 2.5 mV/V · user calibration up to 9 points

PRECISION

Internal resolution	16 000 000 · 24 bit
Noise free at 1 reading/s	400 000 · 18.75 bit
Noise free at 10 ms sample time	15.5 bit
Offset drift	max. 4 ppm/°C
Gain drift	max. 5 ppm/°C
Non-linearity before linearisation	25 ppm of range

ENVIRONMENT AND MECHANICS

Operating temperature	-20 ... +55 °C
Storage temperature (no batteries)	-40 ... +85 °C
Humidity	max. 95 % RH, non-condensing
Protection	OEM board without enclosure · IP50 to IP67 in enclosures
Dimensions	37.5 × 16.8 × 6.6 mm (L × W × H)
Connections	9 solder pads: plated holes $\varnothing$ 1.0 mm, 1.9 mm pitch
Mounting	2 holes $\varnothing$ 2.1 mm · M2 or #0-80 near the pads, do not use #2

FUNCTIONS

Applications	building into load cells, torque sensors, strain gauge transducers and pressure modules – no cable leaves the housing
Sleep mode	the module sleeps between transmissions; battery life depends on interval and sessions

OUTPUTS AND INTERFACES

Radio	licence exempt transceiver, 2.4 GHz, DSSS
Transmit power	10 mW
Range	up to 500 m with on-chip antenna · up to 800 m with external antenna
Antenna	on-chip or UFL socket for an external antenna (depending on version)
Coexistence	Wi-Fi, Bluetooth, Zigbee
Encryption	128 bit AES
Transmission interval	5 ms ... 1 day · up to 200 readings per second

DISPLAY AND OPERATION

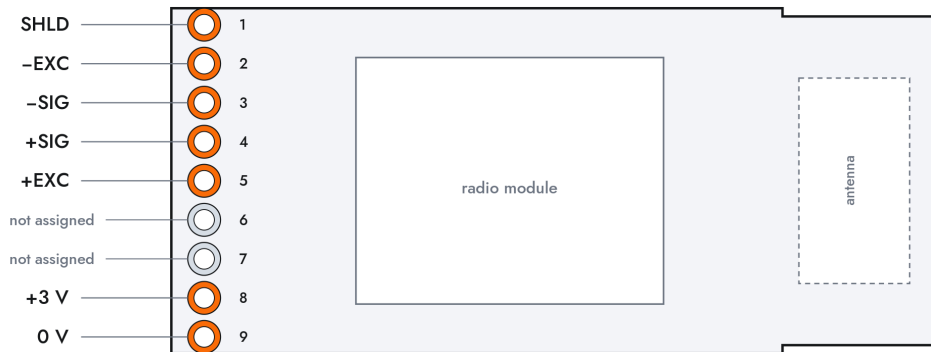
Receivers	handhelds, base stations, analogue outputs and relay modules, also several at a time
Configuration	PC software via the base station · linearisation up to 9 points

POWER SUPPLY

Supply voltage	2.1 ... 3.6 V DC · typical 3.0 V · no reverse polarity protection
Current, sleep mode	5 ... 20 μ A
Current, normal mode	60 ... 65 mA at 1 k Ω bridge
Battery life 2 × AA	continuous 3 weeks · 12 sessions of 5 min per day: 2 years
Battery life 2 × D	continuous 3.5 months · 12 sessions of 5 min per day: 5 years



ELECTRICAL CONNECTION



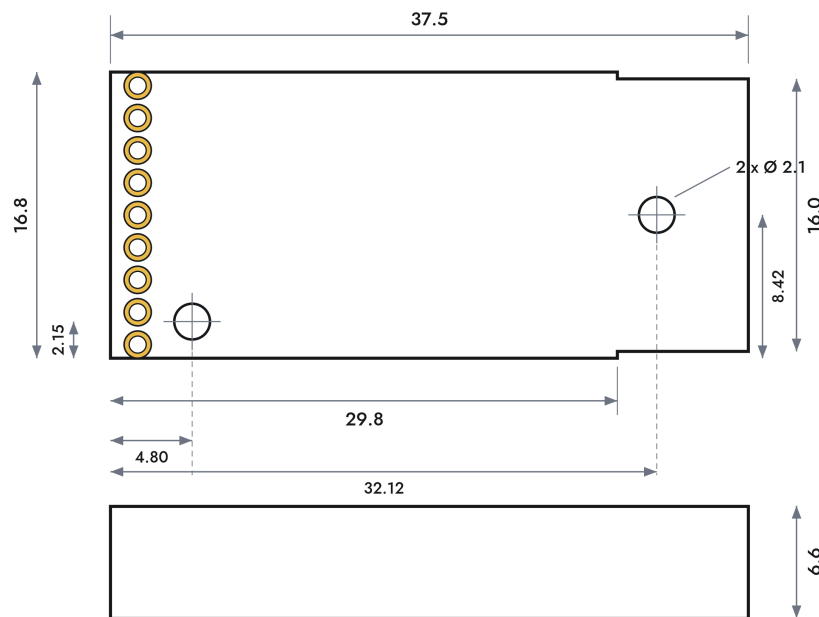
9 SOLDER PADS: PLATED HOLES Ø 1.0 mm, 1.9 mm PITCH

Sensor: 4-wire bridge 85 ... 5000 Ω · up to four 350 Ω bridges · cable below 3 m

Power: 3 V, maximum 3.6 V · no reverse polarity protection

Solder pads seen from the component side.

DIMENSIONS (mm)



9 plated through-holes Ø 1.0 on 1.9 pitch · all dimensions in mm

All dimensions in mm.



COMPLIANCE AND CERTIFICATION

 CE marked on the radio module

 2,4 GHz	Radio approvals	FCC (contains FCC ID VHARA24) · ETSI · IC 7224A-RA24 (Canada)
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ACCESSORIES AND OPTIONS

Antennas	for the external antenna version: PCB, whip, flexible whip and puck antenna
Enclosures	EFMC (IP67, 2 × AA) · further enclosures IP50 to IP67 on request
Receivers	handheld EFMD · USB base station EFME · large display EFMG

Manufacturer types: T24-SAi (on-chip antenna), T24-SAe (external antenna).

