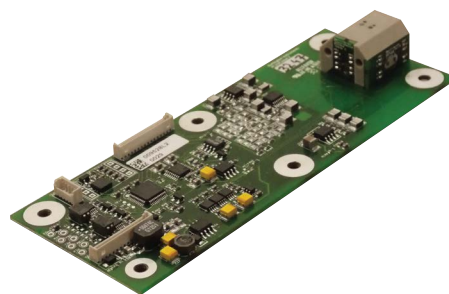


Mag658

Unpackaged Digital
Three-Axis Fluxgate Magnetometer





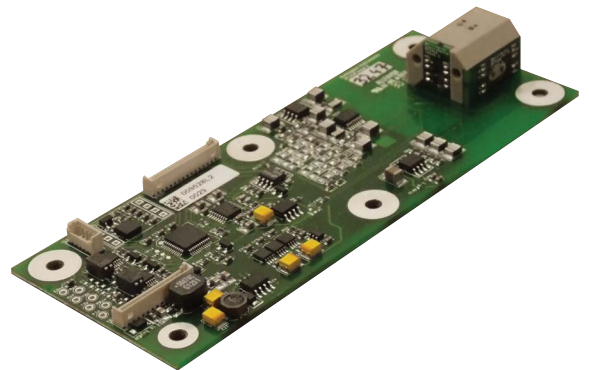
Mag658 Unpackaged Digital Three-Axis Fluxgate Magnetometer

The Mag658 enables the precise measurement of vector fields up to $524\mu\text{T}$ magnitude, in conjunction with orientation data from integrated accelerometers.

The unpackaged format and RS-422 interface makes the sensor easy to integrate directly into customers' data acquisition systems.

A Mean Time to Failure (MTTF) of over 1 million hours makes the Mag658 extremely reliable and ideal for long term installations.

Custom package design is available for this product. Contact Bartington Instruments for further information.



Features

- Integral accelerometers
- RS-422 interface
- High reliability, ideal for permanent installations
- Custom package design is available

Typical Applications

- Integration in surveillance systems
- Geomagnetic field measurements
- UAV-based measurements



Mag658 Specifications

| Performance | |
|--|--|
| Number of axes | Three |
| Polarity | +ve non-inverting output when pointing North |
| Measuring range | $\pm 524 \mu\text{T}$ |
| Bandwidth (-3 dB) | $\geq 15\text{Hz} \pm 10\%$ |
| Measurement noise floor | $< 10\text{nTrms}$ (digitiser noise) |
| Scaling temperature coefficient | $\pm 1\text{nT}/^\circ\text{C}$ ($\pm 200\text{ppm}/^\circ\text{C}$) |
| Resolution | 62.5pT/bit |
| Start up time to data ready | At least 5s from application of power |
| Warm up time | 15 mins |
| Offset | $\pm 100\text{nT}$ |
| Temperature coefficient of offset | $\pm 3.0\text{nT}/^\circ\text{C}$ |
| Scaling error | $\pm 0.5\%$ |
| Orthogonality error between axes and datum | $\pm 0.5^\circ$ |
| Linearity error (% of full scale) | 0.01% (Least Squares Fit) |
| Frequency response ($\pm 5\%$) | DC – 5Hz ($\pm 5\%$ at DC) |
| Hysteresis | $< 2\text{nT}$ at 1 x full scale $< 30\text{nT}$ after 3.0 mT field exposure |
| Data rate | Up to 100 samples/second on all 3 axes (magnetometer data only in Auto Result mode) Up to 50 samples/second on all 3 axes (magnetometer and accelerometer data in Auto Result mode) |

| Accelerometers | |
|---------------------------------------|--|
| Range | $\pm 1\text{g}^*$ |
| Resolution | 1mg^* |
| Offset | 10mg^* at 25°C |
| Offset change with temperature | $< \pm 1\text{mg}^*/^\circ\text{C}$ |
| Scaling error | 1% at 25°C (10mg^*) |
| Scaling error change with temperature | 0.1% FS/ $^\circ\text{C}$ (1mg^*) |

* $1\text{g} = 980.665\text{Gal}$ (ISO/IEC80000)

| Environmental | |
|-----------------------|---|
| Operating temperature | -30°C to $+40^\circ\text{C}$ |
| Storage temperature | -40°C to $+70^\circ\text{C}$ |
| MTTF estimation | $> 1,000,000$ hours based on manufacturer's reliability data FIT @ 55°C . |

| Mechanical | |
|------------------------|--------------------------------|
| Dimensions (W x H x L) | 50mm x 20mm x 128mm |
| Weight | ~35g |
| Connector | Molex Picoblade 14W 53047-1410 |
| Mounting arrangements | 6x M3 clearance holes |

| Electrical | |
|-----------------------------------|-----------------------------------|
| Supply voltage | +10V to +20V DC |
| Current Consumption (typical/max) | 60/100mA at 10V 40/60mA at 20V |
| Power on surge | 250mA max |
| Power requirement | <1W |
| Digital output | RS-422 |

| Digital | |
|------------------------|---|
| Communication protocol | RS-422: 4-wire full duplex, 115.2k / 460.8k / 921.6k baud. Protocol defined by DP2778 |
| Total cable length | 300m max. when terminated |
| Sensors per single bus | 32 max. |
| Data bits per axis | 24 |

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The specifications of the products described in this brochure are subject to change without prior notice.