



Mid-range Data Loggers

For temperature, humidity, and contact channel measurement



Designed for controlled environments

- Drug discovery, R&D
- Early phase clinical trials
- Blood and tissue banks
- Hospitals and pharmacies
- Nutraceutical manufacturing
- Food and dietary supplement applications
- Aerospace
- Semiconductors
- Museums and archives

Vaisala Mid-range Data Loggers are designed for early phase drug and device development applications where speed and economy are critical. The MR loggers can be used with Vaisala software to monitor and analyze environmental data and provide presentation-quality records that are easily exported to PDF and spreadsheets.

Simplified calibration

Easy to install and configure, the MR loggers are calibrated with an abbreviated process that provides reliable accuracy in operating environments between -55 to $+50$ °C (-67 to 122 °F).

The MR loggers include calibrations traceable to SI units through national metrology institutes to ensure cGMP, ISO 9000, and HACCP quality standards.¹⁾ Optional services are available, including extended warranties and onsite calibration.

Easy configuration

Additional connectivity devices enable data transfer with several options, including USB, wireless, and Power over Ethernet with the vNet PoE network interface. When MR loggers are used with the vNet PoE device, installation takes minutes. With the vNet device, loggers are automatically identified on your network by the software.

Lean validation

For applications that require validation, we offer efficient and practical protocols that allow for quick verification of data logger functions. For information on IQOQ documents, see www.vaisala.com/gamp-gxp-validation.

Software options

Whether you need multistage alarming sent via text, email, PC display, or dial-out, or to perform a comprehensive mapping study, Vaisala has user-friendly software designed for use in regulated environments, including:

- viewLinc Continuous Monitoring and Alarming
- vLogSP for Validation/Mapping applications

Data logger options

Six versions of the MR loggers are available with up to four channels of temperature-only, temperature + humidity, or Boolean contact channel for door switches/alarm contact recording:

- DL1000MR - 1 internal temperature channel
- DL1016MR - 2 channel temperature with probes
- DL1016MRB - 2 channel with 1 temperature probe, and 1 contact input
- DL1416MR - 4 channel temperature with probes
- DL1416MRB - 2 channel temperature with probes, and 2 contact inputs
- DL2000MR - 2 internal channels temperature and RH

¹⁾ Measurement results are traceable to the International System of units (SI) through national metrology institutes (NIST USA, MIKES Finland, or an equivalent) or ISO/IEC 17025 accredited calibration laboratories.

Technical data

General

Interfaces	RS-232 serial, Ethernet, USB, Wi-Fi, vNet PoE network interface
Software	<ul style="list-style-type: none">vLog Validation/MappingviewLinc Continuous Monitoring & AlarmingOPC DA Server to add Vaisala loggers to any OPC compatible monitoring system
Internal clock accuracy	±1 min/month 0 to +50 °C (+32 to +122 °F)
Power source	Lithium battery with typical lifetime of 10 years ¹⁾

1) Typical battery life specified with sample interval of 1 min or longer.

Memory

Memory type	Non-volatile EEPROM
Memory mode	User-selectable wrap (FIFO) or stop when memory is full
Sampling rates	User-selectable rates from once every 10 seconds to once per day (Typical battery life specified with sample interval of 1 min or longer)

Data sample capacity

DL1000MR	48 100 12-bit samples
DL1016MR/MRB	68 600 16-bit samples
DL1416MR/MRB	101 375 16-bit samples
DL2000MR	122 197 12-bit samples

Mechanical specifications

Dimensions	85 × 59 × 26 mm (3.4 × 2.3 × 1 in)
Weight	76 g (2.7 oz)
Mounting	3M Dual Lock™ Fasteners Snap-in connector for secure probe connections

Temperature sensors

Internal sensor type	Precision-tolerance epoxy encapsulated NTC thermistor
Cable construction	2 mm (0.07 in) diameter, Teflon coated cable

External temperature probes

Sensor tip	Stainless steel
Diameter	3.2 mm (1/8 in)
Length	38 mm (1.5 in)

Probe cable lengths

DL1016MR/MRB	3 m (10 ft)
DL1416MR/MRB	7.6 m (25 ft)

Compliance

EU directives	EMC Directive (2014/30/EU) RoHS Directive (2011/65/EU)
EMC compatibility	EN 61326-1, industrial environment
EMC emissions	EN 55032:2012/AC:2013 Class B
Compliance marks	CE, FCC Part 15

Technical data

DL1000MR internal temperature sensor

Range and accuracy

Logger operating range	-35 ... +85 °C (-31 ... +185 °F)
Calibrated measurement range	-25 ... +70 °C (-13 ... +158 °F)
Resolution	0.02 at +25 °C (0.04 at +77 °F)
Accuracy over temperature range at -25 ... +70 °C (-13 ... +122 °F) ¹⁾	±0.5 °C (±0.9 °F)

¹⁾ Initial accuracy includes all known influence quantities present at the time of calibration including calibration uncertainty, mathematical fit, data logger resolution, hysteresis and reproducibility. Not included is any drift related to atypical contamination or misuse.

DL2000MR internal temperature/RH sensor

Temperature range and accuracy

Operating range	-35 ... +85 °C (-31 ... +185 °F)
Calibrated measurement range	-25 ... +70 °C (-13 ... +158 °F)
Accuracy over temperature range at -25 ... +70 °C (-13 ... +122 °F) ¹⁾	±0.5 °C (±0.9 °F)
Resolution	0.02 °C at +25 °C (0.04 °F at +77 °F)

Relative humidity range and accuracy

Calibrated measurement points	<ul style="list-style-type: none">45 %RH at +10 °C (+50 °F)10 %RH and 80 %RH at +25 °C (+77 °F)45 %RH at +25 °C (+77 °F)45 %RH at +45 °C (+113 °F)
Operating range	0 ... 100 %RH (non-condensing)
Temperature range +20 ... +30 °C (68 ... 86 °F)	10 ... 90 %RH ±2.0 %RH
Temperature range -20 ... +20 °C, +30 ... +70 °C (-4 ... 68 °F, 86 ... 158 °F)	10 ... 90 %RH ±3.0 %RH
Resolution	0.05 %RH
Humidity sensor	HUMICAP [®] 180R
Stability	±2 %RH over 2 years

¹⁾ Initial accuracy includes all known influence quantities present at the time of calibration including calibration uncertainty, mathematical fit, data logger resolution, hysteresis and reproducibility. Not included is any drift related to atypical contamination or misuse.

DL1016/1416MR external temperature sensors

Range and accuracy

Logger operating range	0 ... +50 °C (32 ... +122 °F)
Probe operating range	-95 ... +70 °C (-139 ... +158 °F)
Calibrated measurement range	-55 ... +50 °C (-130 ... +122 °F)
Resolution	0.01 °C at +25 °C (0.02 °F at +77 °F)
Accuracy over temperature range at -55 ... +50 °C (-67 ... +122 °F) ¹⁾	±0.5 °C (±0.9 °F)

¹⁾ Specification for external channels is for a probe calibrated to the specified channel of the data logger, with the logger at 0 °C to +50 °C (32 °F to +122 °F).

Accessories

Thermal dampening block, for use in refrigerators and freezers. The block simulates a glycol bottle to reduce alarms generated by opening and closing doors. EPT-TDB

Cable with magnetic contact switch (7.6 m (25 in)) for use with MRB loggers EPT-DS-25