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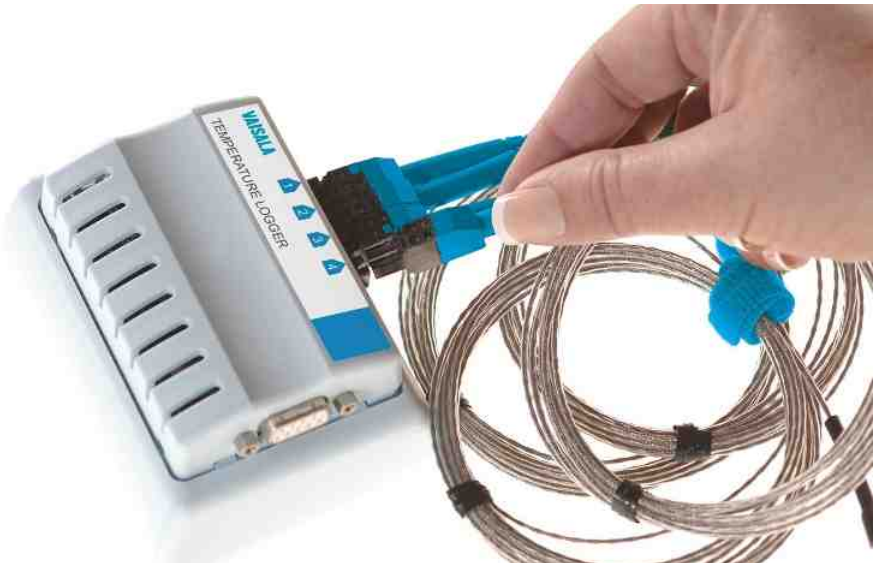
Vaisala Mid-Range Data Loggers for Temperature, Humidity & Contact Channel Measurement



Designed for Controlled Environments such as:

- Drug Discovery, R&D
- Early Phase Clinical Trials
- Blood & Tissue Banks
- Hospitals & Pharmacies
- Nutraceutical Manufacturing
- Food & Dietary Supplement Applications
- Aerospace
- Semiconductors
- Museums & Archives

Vaisala's 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 °C to +50 °C.

The MR loggers include NIST-traceable calibration in one of Vaisala's accredited calibration laboratories to ensure cGMP, ISO 9000 and HACCP quality standards. Optional services are available, including extended warranties and onsite calibration.

Easy Configuration

Connectivity options include USB, wireless, and Power over Ethernet with a vNet PoE network interface. When MR loggers are used with 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. See Express IQOQ and Rapid IQOQ under "Accessories" on page 3.

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

Technical Data

General

Size	85 x 59 x 26 mm (3.4 x 2.3 x 1") 76 g (2.7 oz.)
Interfaces	RS-232 serial Ethernet USB WiFi vNet PoE network interface
Mounting	Magnetic strips 3M Dual Lock™ Fasteners Snap-in connector for secure probe connections
Software	• vLog Validation/Mapping • viewLinc Continuous Monitoring & Alarming • OPC Server to add Vaisala loggers to any OPC compatible monitoring system
Internal clock accuracy	±1 min. /month 0 °C to +50 °C (32 °F to +122 °F)
Electromagnetic compatibility	FCC Part 15 and CE
Power source	Internal 10-year lithium battery[1]

[1]Battery life specified with sample interval of 1 min. or longer

Memory

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
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 (Battery life specified with sample interval of 1 min. or longer)

Temperature Sensors

Internal Sensor type	Precision-tolerance epoxy encapsulated NTC thermistor
EXTERNAL TEMPERATURE PROBES	
Sensor Tip	Stainless Steel
Diameter	3.2 mm (1/8")
Length	38 mm (1.5")
PROBE CABLE LENGTHS	
DL1016MR/MRB	3 m (10')
DL1416MR/MRB	7.6 m (25')
CABLE CONSTRUCTION	
2 mm (0.07") Diameter, Teflon coated cable	

DL1000MR Internal Temperature Sensor

RANGE AND ACCURACY

Logger Operating Range	-35 °C to +85 °C (-31 °F to +185 °F)
Calibrated Measurement Range	-25 °C to +70 °C (-13 °F to +158 °F)
Accuracy over temperature range[2]	
at -25 °C ... +70 °C (-13 °F .... +122 °F)	±0.5 °C (±0.9 °F)
Resolution	0.02 °C at +25 °C (0.04 °F at +77 °F)

DL1016/1416MR External Temperature Sensors

RANGE AND ACCURACY

Logger Operating Range	0 °C to +50 °C (32 °F to +122 °F)
Probe Operating Range	-95 °C to +70 °C (-139 °F to +158 °F)
Calibrated Measurement Range	-55 °C to +50 °C (-130 °F to +122 °F)
Accuracy over temperature range[3]	
at -55 °C ... +50 °C (-67 °F .... +122 °F)	±0.5 °C (±0.9 °F)
Resolution	0.01 °C at +25 °C (0.02 °F at +77 °F)

[2]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.

[3]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)

DL2000MR Internal Temperature/ RH Sensor

TEMPERATURE RANGE AND ACCURACY

Operating Range	-35 °C to +85 °C (-31 °F to +185 °F)
Calibrated Measurement Range	-25 °C to +70 °C (-13 °F to +158 °F)
Accuracy over temperature range[2]	at -25 °C ... +70 °C ±0.5 °C (-13 °F .... +122 °F) (±0.9 °F)
Resolution	0.02 °C at +25 °C (0.04 °F at +77 °F)

RELATIVE HUMIDITY RANGE AND ACCURACY

Calibrated Measurement Points	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 %RH to 100 %RH (non-condensing)
Temperature range +20 °C ... +30 °C (68 °F ... 86 °F)	10 ... 90 %RH ±2.0 %RH
Temperature range -20 ... +20 °C, +30 ... +70 °C (-4 °F ... 68 °F, 86 °F ... 158 °F)	10 ... 90 %RH ±3.0 %RH
Resolution	0.05 %RH
Humidity sensor	Vaisala HUMICAP® 180R
Stability	±2 %RH over 2 years

Accessories

TEMPERATURE PROBE

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

BOOLEAN CONTACT CABLES

EPT-DS-25 Available cable with magnetic contact switch – 7.6 m (25') for use with MRB loggers.

VALIDATION DOCUMENTS

VL-VPE-VLNC-43 Express Validation	IQ is eight tests, OQ is eleven tests. Testing includes security testing for users.
VL-VPR-VLNC-43 Rapid Validation	IQ is eight tests, OQ is six tests. Only tests that challenge the basic operation of GxP processes (i.e.: alarming and data collection).

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