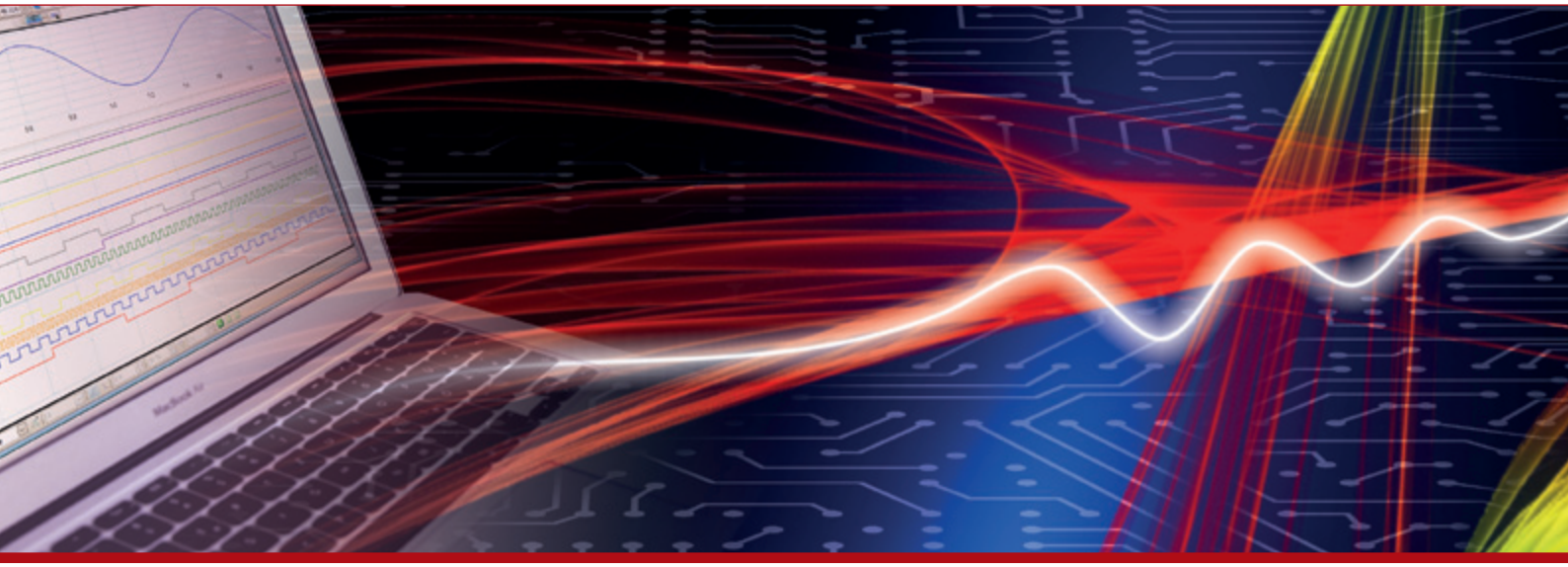
Product Datasheet - Technical Specifications



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FLIR MR176

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Website

http://www.flir.com

Customer support

http://support.flir.com

Disclaimer

Specifications subject to change without further notice. Camera models and accessories subject to regional market considerations. License procedures may apply. Products described herein may be subject to US Export Regulations. Please refer to exportquestions@flir.com with any questions.

Imaging Moisture Meter Plus with IGM	
Part number	MR176
Part name	Imaging Moisture Meter Plus with IGM

The FLIR MR176 Imaging Moisture Meter Plus with IGM is an all-in-one tool equipped with a built-in thermal camera that can show you exactly where to measure moisture. Featuring Infrared Guided Measurement (IGM) technology, the FLIR MR176 helps you quickly scan and target moisture issues, visually guiding you to the spot where you can confidently take measurements and analyze readings. An integrated pinless sensor and an external pin probe provide the flexibility to take either non-intrusive or intrusive measurements. Coupled with a field-replaceable temperature and relative humidity sensor, and automatically calculated environmental readings, the FLIR MR176 delivers added convenience and ease of use, producing the right measurements—faster.

- Visually identify hidden moisture with IGM. Easily investigate moisture issues and troubleshoot quickly.
- An 80 × 60, 4800-pixel Lepton thermal imager powers IGM technology, visually indicating potential moisture areas via the color display.
- Customize thermal images: select which measurements are integrated (moisture, temperature, relative humidity, dew point, vapor pressure, mixing ratio), and choose from one of four color palettes (Iron, Rainbow, Ice, Greyscale); a lock-image setting prevents extreme hot and cold temperatures from interfering with images while scanning for issues.
- Equipped with a laser and cross-hair to easily reference the exact location of the potential moisture issue seen in the thermal image Get precise readings. Confidently take measurements and analyze readings.
- The field-replaceable temperature/relative humidity sensor can simply be removed from the meter and exchanged when needed, so you can continue to work and reduce downtime.
- The Progressive Environmental Stability Indicator removes response time error when you move through a site to different measurement locations, informing you when the relative humidity readings have reached a steady state.
- Integrated pinless moisture measurements for fast detection, and an external pin probe included with expandable probe options. Convenient and easy to operate. Get more work done in less time.
- Rugged, portable design with an intuitive menu system.
- Document readings and images to share via the included USB cable.
- Free FLIR Tools PC software quickly generates reports.

Thermal imaging	
Imaging detector	FLIR Lepton, microbolometer
Image calibration	Automatic with manual lock scale option
Thermal image resolution (W × H)	4800 pixels (80 × 60)
Spectral response	8–14 µm
Field of view (W × H)	51° × 38°
Sensitivity	<150 mK

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Thermal imaging	
Detection limit (wet area detection @ 10 m / 32 in.)	49 cm^2 (19.7 in^2)
Image update speed frequency	9 Hz
Thermal image palettes	Iron, Rainbow, Ice, Greyscale
Thermal image minimum focus distance	10 cm (4 in.)

Moisture measurement	
Pin moisture range	7–100%
Pin moisture accuracy	±1.5%, 7–30%
	Reference only: 30–100%
Pin moisture groups	9 material groups
Pinless moisture range	0–100
Pinless moisture accuracy	Relative
Pinless measurement depth	19 mm (0.75 in.) maximum
Measurement resolution	0.1
Response time pinless mode	100 ms
Response time pin mode	750 ms

Environmental measurement	
Relative humidity range	0–100%
Relative humidity basic accuracy	±2.5%
Relative humidity detailed accuracy	±4.7%, 0–10 ± 2.5%, 10–90 ± 4.7%, 90–100%
Air temperature range	0– 50°C (32–122°F)
Air temperature accuracy	±0.6°C (±1.1°F)
Dew point	–30 to +50°C (–22 to +122°F)
Dew point basic accuracy	±1.0°C (±1.8°F)
Vapor pressure	0.0–12.0 kPa
Vapor pressure basic accuracy	±0.05 kPa
Mixing ratio range	0.0–80.0 g/kg (0–560 GPP)
Mixing ratio basic accuracy	0.25 g/kg (±2 GPP)

General information	
Display type	QVGA (320 × 240 pixels) 2.3 in. color TFT graphical display
Warranty	https://www.flir.com/testwarranty
Language options	Meter display text can be shown in any of 14 languages
Saved image file format	Bitmap (.bmp) with measurement values overlaid
Stored image capacity	9999 images
Internal memory	4 GB

Laser	
Type	Visible class 2
Orientation	Single laser pointer to center of thermal image
Power output	Maximum 1.0 mW
Wavelength	650 ±20 nm

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Power system	
Continuous run time	18 hours maximum
Typical usage	4 work weeks
Auto power off	Programmable: off, 1, 5, or 20 minutes
Battery	3.7 V, 3000 mA h Li ion rechargeable via Micro USB

Certifications	
Certification standards	EN 61326 (EMC), EN 60825-1 Class 2 (Laser)
Agency approvals	CE, FCC Class B, RCM

Environmental specifications	
Operating temperature	0–50°C (32–122°F)
Storage temperature	–10 to +60°C (14–140°F)
Operating temperature	0– 50°C (32–122°F)
Storage temperature	–10 to +60°C (14–140°F)
Operating humidity	≤ 90%, 0–30°C (32–86°F) ≤ 75%, 30–40°C (86–104°F) ≤ 45%, 40–50°C (104–122°F)
Storage humidity	90% relative humidity
Drop test	3 m (9.8 ft.)

Meter physical data	
Weight:	323 g (11.4 oz.)
Dimensions (H × W × L)	17.5 cm × 7.2 cm × 4.2 cm (6.8 in. × 2.9 in. × 1.7 in.)
Material	PC-ABS
Color	Gray, black

Shipping information	
Packaging type	Retail color box
Packaging contents	FLIR MR176, FLIR MR01 Replaceable Temperature and Relative Humidity Sensor, FLIR MR02 Standard Pin Probe, quick start guide, international USB charger, USB cable
Packaging weight	0.8 kg (1.8 lb.)
Packaging dimensions (H × W × L)	33 cm × 14 cm × 12 cm (13 in. × 5.5 in. × 4.75 in.)
Inner carton quantity	4
Master carton quantity	12
UPC	793950371763
EAN	0793950371763
Country of origin	China
Tariff Code	9025805000

Technical support	
Website	http://support.flir.com

Replacement parts	
MR02 Standard Pin Probe	Replacement Standard External Pin Probe
MO220-PINS	Replacement Pins for MR02 Standard Pin Probe, includes 25 pairs of pins

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Replacement parts	
MR05-PINS1	Replacement Pins for MR05 (standard), includes 25 pairs of pins
MR05-PINS2	Replacement Pins for MR05 (wide), includes 25 pairs of pins
MR-PINS2	2 in. pins for MR06, MR07, MR08, includes 1 pair of pins
MR-PINS2-10	2 in. pins for MR06, MR07, MR08, includes 10 pairs of pins
MR-PINS4	4 in. pins for MR06, MR07, MR08, includes 1 pair of pins
MR-PINS6	6 in. pins for MR06, MR07, MR08, includes 1 pair of pins

Supplies & accessories:

- MR11; FLIR MR11: Handheld Temperature & Humidity sensor accessory
- MR12; FLIR MR12: Ball probe moisture sensor accessory
- MR01; Replaceable T/RH Probe for MR77
- MR02; Replaceable External Moisture Pin Probe for MR77
- MR05; Impact Pin Moisture Probe
- MR06; Wall Cavity Probe
- MR07; Hammer Probe
- MR08; Hammer and Wall Cavity Probe Combo
- MR09; Baseboard probe
- MR10; EVA Protective case
- MR10-2; Protective case for FLIR Moisture Meters