TELEDYNE FLIR

TEST & MEASUREMENT

MOISTURE METER GUIDE

FIND THE RIGHT SOLUTION

FLIR MR277

MOISTURE METERS WITH IGM™

Teledyne FLIR is proud to offer a line of high-quality building inspection systems and moisture meters to meet your needs

What if you could track moisture to its source, identify areas in need of remediation, and improve building performance? Our selection of building inspection systems and moisture meters includes models with built-in thermal imaging – we call it IGM™ (Infrared Guided Measurement) – that make inspection, restoration, and remediation easy. IGM is designed to save you time by guiding you to the precise spot that may require further testing and investigation. With IGM, you can identify problems before they become major issues, saving you the expense of unnecessary repairs.

Work faster, smarter, and move on to the next job.

Field-replaceable temperature/relative humidity sensor
Laser pointer
Worklight
Large 2.8-in LCD color display
2 MP visual camera
Record up to 15,000 images
Bluetooth connectivity for wireless data transfer
View stored images
Easy navigation controls
2 m drop-tested durability
IP54 splashproof rating
FLIR MR277
76.3 %
21.0
14.6
REMOVE
IGM
INFRARED GUIDED MEASUREMENT
METER LINK
3.7V
MOISTURE METER XXXXXX
Model number: MR277
Contains FCC ID: XXXXXXXX
Contains IC: XXXX-XXXXX
CMIIT ID: XXXXXXXXXX

MR277

Moisture Meter, MSX® IR Camera & Hygrometer

160 × 120 thermal imaging sensor

Pinless moisture sensor

Charging and accessory ports

Combining the advantages of a high-resolution thermal imaging sensor, FLIR MSX, a hygrometer, and a laser pointer, the all-in-one MR277 building inspection system helps you quickly locate, clearly identify, and easily document critical moisture and building envelope issues.

KEY FEATURES

- Scan large areas for moisture, air leaks, and more with the 160 × 120 thermal camera
- Easily identify both the context and the issue; MSX embosses physical details on thermal images for clear interpretation
- Pinpoint the exact location of problems with the integrated laser
- Scan for moisture with the integrated non-invasive pinless sensor
- Field-replaceable temperature/relative humidity sensor
- Capture exact measurements with an external pin probe (included) and wide range of optional moisture probes
- Simplify documenting issues with the integrated digital camera
- Create a single file documenting thermal, visual, MSX, hygrometer readings, and laser location
- Download images and data via USB cable or upload via Bluetooth® to the FLIR Tools® App

Large 2.8-in color display

Save up to 15,000 images

View stored images

IP54 splashproof rating

2 m drop-tested durability

160 × 120 thermal imaging sensor

Worklight

2 MP visual camera

Laser

MR265

Moisture Meter and Thermal Imager with MSX®

aser pointer

The FLIR MR265 is a combination pin and pinless moisture meter with thermal imaging designed to show building and facilities maintenance professionals exactly where to investigate issues related to moisture, air leaks, and insulation voids.

Pinless moisture sensor

Charging and accessory ports

KEY FEATURES

- Pinpoint problems at the source using the 160 × 120 (19,200 pixels) built-in thermal camera and laser
- Clearly identify the inspection area using the onboard 2 MP visible camera
- Eliminate guesswork with MSX, which enhances image quality by embossing visible light details onto thermal images in real time for greater edge and outline detail
- Take qualitative, non-destructive measurements using the built-in electromagnetic/capacitive pinless moisture sensor
- Use the included pin probe resistive sensor for quantifiable moisture measurements
- Inspect in dimly lit areas using the bright, built-in worklight
- Save up to 15,000 visual and radiometric thermal images
- Upload images into FLIR Thermal Studio for professional thermography analysis and reporting capabilities, or use the jpeg in a software platform of choice

Field-replaceable temperature/relative humidity sensor*

2.3-in color LCD display

Snap and save up to 9999 images

IP54 splashproof rating†

3 m drop-tested durability

Laser pointer

80 × 60 thermal imaging sensor

*MR176 only
†MR160 only

MR176/MR160

Moisture meters with IGM™

Featuring IGM technology powered by a built-in thermal imaging sensor, the MR176 and MR160 can visually guide you to the precise spot that moisture may be hiding.

Pinless moisture sensor

Charging and accessory ports

MR176/MR160 Shared Features

- Pinpoint moisture using the 80 × 60 FLIR Lepton® thermal imaging sensor
- Take either non intrusive or intrusive measurements using the integral or external pinless probe or external pin probe
- Target easily with the laser pointer and display crosshairs
- Review images and generate reports with FLIR Thermal Studio software

MR176 UNIQUE FEATURES

- Measure temperature and relative humidity (the field-replaceable sensor automatically calculates and displays environmental readings)
- Prevent extreme temperatures from interfering with images using the “lock image” setting
- Take accurate readings in locations with diverse environmental conditions (the Progressive Environmental Stability Indicator lets you know when relative humidity readings have stabilized)

Field-replaceable temperature/relative humidity sensor

Dual digital 2.2-in LCD display with trending bargraph

IR thermometer for non-contact temperature measurements

Bluetooth connectivity for wireless data transfer

Store readings and recall up to 99 measurement points

2 m drop-tested durability

Pinless moisture sensor

MR77

5-in-1 MOISTURE METER WITH METERLiNK®

Provides the basic essential features for moisture remediation or HVAC: Bluetooth® METERLiNK capability, a pinless moisture sensor and pin probe, a temperature and relative humidity sensor, and an IR thermometer.

Charging and accessory ports

KEY FEATURES

- View and share readings from a mobile device
- Wirelessly integrate moisture readings onto thermal images from compatible FLIR infrared cameras
- Measure temperature and relative humidity (the field-replaceable sensor automatically calculates and displays environmental readings)
- Manually store readings and recall up to 20 measurement points
- Calculates metrics based on multi-sensor input: Grains Per Pound or Grains Per Kilogram, Dew Point, Condensation Point, Differential Temperature (IR and Dew Point)
- Quickly take non-contact measurements with the integrated IR thermometer
- Capture exact measurements with an external pin probe (included) and wide range of optional moisture probes

MR60

MOISTURE METER PRO

A full-featured construction troubleshooting tool that allows the collection and storage of moisture data over time from multiple sites.

KEY FEATURES

- Take either non-intrusive or intrusive measurements using the integral or external pinless probe or external pin probe
- Save up to 10,000 screenshots and readings that you can transfer and view via PC/USB
- Tune the meter to the appropriate test material using a built-in library of 11 material groups, including timbers, drywall, and concrete
- Create reports easily using FLIR Thermal Studio software
- Expand your meter as needed; the MR60 is compatible with FLIR's full line of external moisture probes

MR55

PIN MOISTURE METER WITH BLUETOOTH

Optimize your workflow with wireless connectivity and a built-in library of 11 material-group settings for more accurate readings.

KEY FEATURES

- Wirelessly connect the meter to FLIR Tools Mobile to remotely view readings from your mobile device
- Tune the meter to the appropriate test material using a built-in library of 11 material groups, including timbers, drywall, and concrete
- Access the correct group number for test materials by scanning the QR code on the back of the meter with your mobile device

MR59

BALL PROBE MOISTURE METER WITH BLUETOOTH

An affordable Bluetooth pinless meter with a ball-tip sensor that can help you cover a large area in a short time without leaving a mark.

KEY FEATURES

- Measure into corners and around baseboards with the ball-tip sensor
- Wirelessly connect the meter to FLIR Tools Mobile to view live readings from your mobile device
- Locate hidden sources and migration paths of moisture by creating heat maps of affected areas
- Identify potential moisture problems up to 100 mm (4 in) below the surface

MR40

MOISTURE PEN + FLASHLIGHT

A pocket-portable and rugged moisture meter/flashlight combo designed to find and quantify moisture content in wood and common building materials.

KEY FEATURES

- Take accurate measurements with the two-pin, single-scale moisture meter
- Easy to use when measurement is needed in tight spaces
- Eliminate the need to carry a separate flashlight
- Use in combination with a thermal camera to confirm moisture

UPGRADE YOUR MOISTURE METER WITH FLIR ACCESSORIES

MR01 Temperature/ RH Sensor

Replacement temperature and relative humidity sensor designed for use with the MR77, MR176, and MR277.

MR13 Temperature/ RH Sensor

Designed for use with the FLIR MR277 to take accurate temperature and humidity measurements. The MR13 is factory calibrated and features a protective cap. A metallic screw secures the probe in place.

MR02 Standard External Pin Probe

Designed for use with the MR77, MR176, or MR277, the MR02 is an easily replaceable, calibrated pin probe.

MR11 Handheld Temperature & Humidity sensor accessory

Pre-deploy in dehumidifier exhaust vents for instantaneous readings, or use in locations where access is restricted, such as small holes inside wall cavities.

MR04 Extension Pole

Easily probe large and out-of-reach areas with this telescoping pole that extends up to 132 cm (52 in).

MR05* Impact Probe

Easily test for moisture in challenging spots – on rough or uneven surfaces, in corners, in hard woods or high-density materials, and in areas without a dry reference.

MR06* Wall Cavity Probe

Penetrate into wall cavities and the inside face of exterior walls to measure insulation moisture levels.

MR07 Hammer Probe

Take measurements in the subfloor through carpet, hardwood flooring, and hard materials that are difficult to penetrate with a standard pin probe.

MR08 Hammer/ Wall Probe

Comfortably hammer probe into vertical, angled, or inverted surfaces, and get down below carpet pads and the subfloor.

MR09 Baseboard Probe

Probe behind baseboards, wall trim, crown molding, and other inaccessible areas without requiring removal.

MR10-2 Protective Case

Safeguard your valuable FLIR T&M instruments with this durable EVA protective case to shield against dirt, dings, and harsh environmental conditions.

MR12 Ball probe moisture sensor accessory

Take non-invasive readings up to 100 mm (4 in) below a surface.

*FLIR recommends using the MR05 or MR06 to test moisture in concrete/building materials.
Please review your instruction manual for complete details.

MOISTURE METER
ACCESSORY COMPATIBILITY

FLIR MOISTURE KITS PROVIDE THE COMPLETE SOLUTION FOR FAST AND ACCURATE TROUBLESHOOTING

FLIR MR160-KIT5
PROFESSIONAL IMAGING MOISTURE KIT

Kit includes the FLIR MR160 Imaging Moisture Meter and the FLIR MR08 Hammer/ Wall Cavity Probe.

FLIR MR176-KIT5
PROFESSIONAL IMAGING MOISTURE KIT

Kit includes the FLIR MR176 Imaging Moisture Meter, the FLIR MR08 Hammer/ Wall Cavity Combo Probe accessory, plus an extra FLIR MR01 Replaceable Temperature / Relative Humidity Sensor.

MR160-KIT2
BUILDING INSPECTION KIT

Kit includes the FLIR MR160 Imaging Moisture Meter, the FLIR C3-X Compact Thermal Camera, and the FLIR MR06 Wall Cavity Probe accessory.

MR176-KIT6
PROFESSIONAL REMEDIATION KIT

Kit includes the FLIR MR176 Imaging Moisture Meter, the FLIR E6-XT Thermal Imager, and the FLIR MR08 Hammer/ Wall Cavity Combo Probe.

Accessory/ Moisture Meter	MR40	MR55	MR59	MR60	MR77	MR160	MR176	MR265	MR277
MR01 Temperature/ Relative Humidity Sensor	-	-	-	-	x	-	x	-	x
MR13 Temperature/ Relative Humidity Sensor	-	-	-	-	-	-	-	-	x
MR11 Handheld Temperature/ Humidity Sensor	-	-	-	-	x	-	x	-	x
MR02 Standard Pin Probe	-	-	-	x	x	x	x	x	x
MR04 Extension Pole*	-	-	x	-	-	-	-	-	-
MR05 Impact Pin Probe	-	-	-	x	x	x	x	x	x
MR06 Wall Cavity Probe	-	-	-	x	x	x	x	x	x
MR07 Hammer Probe (with bag)	-	-	-	x	x	x	x	x	x
MR08 Hammer and Wall Cavity Probe Combo (with bag)	-	-	-	x	x	x	x	x	x
MR09 Baseboard Probe	-	-	-	x	x	x	x	x	x
MR12 Ball-Type Moisture Sensor	-	-	-	x	-	x	x	x	x
MR10-2 EVA Protective Case	-	-	-	x	x	x	x	x	x

* The MR04 is compatible with the following accessories: MR05, MR06, MR11, MR12

TECHNICAL SPECIFICATIONS

	MR40	MR55	MR59	MR60
Thermal Imaging				
IR Resolution (IGM)	—	—	—	—
Field of View	—	—	—	—
Thermal Image Palettes	—	—	—	—
Display				
LCD with LED Backlight	LCD (no backlight)	Yes	Yes	—
Color QVGA Display	—	—	—	2.3" 64K TFT graphic
Moisture Detection				
Moisture Measurement	Pin	Pin	Pinless	Pin and pinless
Pin Moisture Range	5% - 30% MC (±2% MC) 30% - 60% (reference only)	Wood groups (1-9): 7% - 30% MC (±2% MC) 30% - 99% (reference only) Construction material groups (10-11): 1 - 99% Group 10 (reference only) 1 - 35% Group 11 (reference only)	—	Wood groups (1-9): 7% - 30% MC (±1.5% MC) 30% - 100% (reference only) Construction material groups (10-11): 0 - 20% (reference only)
Pinless Moisture Range	—	—	0 to 100% relative	0 to 100% relative
Relative Humidity	—	0% - 20% (±5%) 20% - 80% (±3.5%) 80% - 100% (±5%)	—	—
Pinless Moisture Depth	—	—	Up to 100 mm (4 in)*	Up to 19 mm (0.75 in)*
Pin Moisture Material Types	Group 9 / building materials: plywood, drywall, and oriented strand board (OSB) **	9 wood groups, 2 construction material groups	—	9 wood groups, 2 construction material groups
General				
Laser Pointer	—	—	—	—
Saved Image File Format	—	—	—	.BMP with values overlaid
.CSV Stored Data Format	—	—	—	Yes
Stored Image Capacity	—	—	—	9,999 images
IR Temperature	—	—	—	—
Connectivity	—	Bluetooth (BLE)	Bluetooth (BLE)	—
Temperature/RH Sensor Calculations	—	—	—	—
Battery	2× AAA	2x 1.5 V AA	1x 9 V	Internal rechargeable Li ion
Drop Test	3 m (9.8 ft)	2 m (6.6 ft)	2 m (6.6 ft)	3 m (9.8 ft)

*Depending on material under test
** For materials other than Group 9 download the MR40 Material Conversion Table (publication MR40-AN01): http://flir.custhelp.com/app/account/fl_download_manuals

	MR77	MR160	MR176	MR265	MR277
Thermal Imaging					
IR Resolution (IGM)	—	80 × 60	80 × 60	160 × 120	160 × 120
Field of View	—	51° × 38°	51° × 38°	57° × 44°	55° × 43°
Thermal Image Palettes	—	Iron, Rainbow, Ice, Gray	Iron, Rainbow, Ice, Gray	Iron, Rainbow, Arctic, White-hot, Black-hot	Iron, Rainbow, Arctic, White-Hot, Black-Hot
Display					
LCD with LED Backlight	Yes	—	—	—	—
Color QVGA Display	—	2.3 in 64K TFT graphic	2.3 in 64K TFT graphic	QVGA (320 × 240 pixels) 2.8 in color TFT graphical display	QVGA (320 × 240 pixels) 2.8 in. color TFT graphical display
Moisture Detection					
Moisture Measurement	Pin and pinless	Pin and pinless	Pin and pinless	Pin and pinless	Pin and pinless
Pin Moisture Range Accuracy	Wood groups (1-9): 7% - 30% MC (±1.5% MC) 30% - 100% (Reference Only)	Wood groups (1-9): 7% - 30% MC (±1.5% MC) 30% - 100% (reference only)	Wood groups (1-9): 7% - 30% MC (±1.5% MC) 30% - 100% (reference only)	Material groups (1-11): 7% - 30% MC (±1.5% MC) 30% - 100% (reference only)	Material groups (1-11): 7% - 30% MC (±1.5% MC) 30% to 100% (reference only)
Pinless Moisture Range	0 to 99.9% relative	0 to 100% relative	0 to 100% relative	0 to 100% relative	0 to 100% relative
Relative Humidity Accuracy	0% - 10% (±3%) 10% - 90% (±2.5%) 90% - 99% (±3%)”	—	10%- 90%(±2.5%)	—	0% to 100% (±2.5%)
Pinless Moisture Depth	Up to 19 mm (0.75 in)*	Up to 19 mm (0.75 in)*	Up to 19 mm (0.75 in)*	Max of 19 mm (0.75 in)	Up to 19 mm (0.75 in)
Pin Moisture Material Types	9 wood groups	9 wood groups	9 wood groups	11 material groups	11 material groups
General					
Laser Pointer	Yes, with IR temperature	Yes	Yes	Yes	Yes
Saved Image File Format	—	.BMP with values overlaid	.BMP with values overlaid	Radiometric JPG	Radiometric JPG
.CSV Stored Data Format	—	Yes	Yes	Yes	Yes
Stored Image Capacity	20 points internal storage	9,999 images	9,999 images	15,000 images	15,000 images
IR Temperature	-20 to 200°C (-4 to 392°F)	—	—	0°C to 100°C (32°F to 212°F)	0°C to 100°C (32°F to 212°F)
Connectivity	Bluetooth	—	—	—	Bluetooth & METERLiNK
Temperature/RH Sensor Calculations	Vapor Pressure, Relative Humidity, Temperature, GPP, Dew Point	—	Vapor Pressure, Relative Humidity, Temperature, GPP, Dew Point	—	Vapor Pressure, Relative Humidity, Temperature, GPP, Dew Point
Battery	1x 9 V	Internal rechargeable Li ion	Internal rechargeable Li ion	Rechargeable 3.7 V nominal, 5400 mAh LiPo	Rechargeable 4.2 V, 5400 mAh LiPo
Drop Test	2 m (6.6 ft)	3 m (9.8 ft)	3 m (9.8 ft)	2 m (6.6 ft)	2 m (6.6 ft)

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