

3M

Dynatel™

Cable/Pipe and Fault Locators 2273M

Cable/Pipe, Fault and Marker Locators 2273M-iD



GPS Interface Allows Real-Time Mapping

INNOVATIVE TECHNOLOGY FOR LOCATING UNDERGROUND UTILITIES WITHOUT ANY DOUBT

The 3M™ Dynatel™ Cable/Pipe and Fault Locators 2273M and 3M™ Dynatel™ Cable/Pipe and Fault and Marker Locators 2273M-iD are microprocessor-based systems that incorporate advanced digital signal processing techniques to quickly and efficiently locate conductor or sheath (earth return) faults and trace the path of underground cables and pipes (with metallic tracer wire).

They provide accurate cable or Sonde depth measurements, giving a digital readout in inches, feet and inches, or centimeters (user-selectable). Lightweight, compact and well balanced, these cable/pipe and fault locators allow you to accurately and easily:

- Locate cable and pipe path
- Measure cable or Sonde depth with the push of a button
- Measure signal current in the cable
- Pin-point conductor or sheath (earth return) faults and cable breaks
- Discriminate between light and heavy faults
- Identify cable and cable pairs
- Tone shorts and grounds in aerial cable
- Identify cable pairs through wet sections
- Locate energized power cable



3M™ Dynatel™ Cable/Pipe and Fault Locator 2273M

ADVANCED FEATURES DETECT MORE INFORMATION ABOUT UNDERGROUND UTILITIES

A feature exclusive to the 3M™Dynatel™ Cable/Pipe, Fault and Marker Locators 2273M-iD is the ability to write, read and lock programmed information into the 3M™ Electronic Marker System iD Ball Markers 1400 Series.

Information such as a pre-programmed unique identification number, facility data, owner information, application type, placement date and other details from up to 100 markers can all be read, stored with date/time stamp and transmitted back to your PC through a standard RS232 serial port for enhanced resource management.

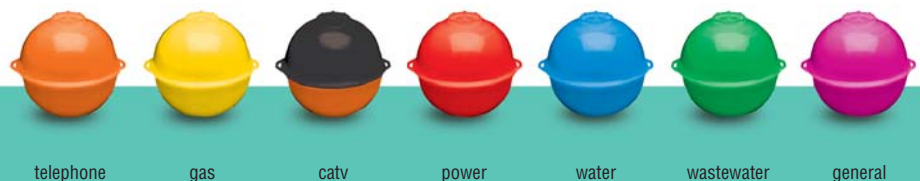
Designed to be more accurate, faster and more integrated, the new locators can perform these additional functions:

- Pin-point the location and estimate the depth of all existing models of properly installed underground passive EMS markers
- Direct depth reading of markers
- Locate two different marker frequencies simultaneously
- Trace a cable path while simultaneously finding buried markers along the way

SEVERAL UNIQUE MODES OF OPERATION FOR ACCURATE LOCATES IN EVERY SITUATION

For cable path locating, 2273M/2273M-iD locators have a highly accurate multi-antenna design for various user-selected locating modes—Directional Peak, Multi-Directional Null, plus an ultra-sensitive Special Peak mode for extreme depths.

A unique “expander” function makes peaks and nulls more pronounced. Directional Peak mode combines the response from four peak antennas to indicate direction to the cable/pipe while a bar graph and numeric display indicate the sharp and accurate dual-peak response. Automatic gain set with manual override provides maximum flexibility and control. Multi-directional null mode shows null signal response with automatic gain and shows cable/pipe location and direction on a unique compass-like graphic.



PRECISE LOCATION OF SHEATH (EARTH RETURN) FAULTS

The 3M™ Dynatel™ Cable/Pipe and Fault Locators 2273M/2273M-iD can precisely locate conductor or sheath (earth return) faults on both short and long cable sections faster than ever. The transmitter unit sends a trace signal simultaneously with a fault-locate signal, allowing the operator to use the cable-locate function when locating faults in long cable sections. Fault strength is measured allowing minor faults to be ignored. Three fault readings may be stored at a time for quick reference.

A SIMPLE, EASY-TO-USE SYSTEM

The new locators require very little operator training. An RS232 communications port allows interfacing to an external computer for uploading/downloading of data, unit configuration and remote software upgrades. Estimated operating time is more than 30 hours on eight AA alkaline batteries.

The system consists of three basic components:

- Transmitter with built-in ohmmeter, which also measures the presence of foreign voltage and tests the continuity of the circuit.
- Rugged, one-piece hand-held receiver with large high-resolution LCD display. Bar graph signal strength and direction indicates received signal and proximity to the cable. iD versions locate and read/write to all EMS-iD markers.
- Lightweight earth contact frame that is color-coded to correspond with indications from the receiver directing the operator toward the fault.

The 2273M/2273M-iD locators use four active trace frequencies (individually or simultaneously) to compensate for varying field conditions. The receiver incorporates passive power and auxiliary frequencies that do not require the use of the transmitter. The receiver also accommodates four user-definable auxiliary frequencies and allows the user to perform a self-calibration operation at any frequency at any time. With the easy-to-use configuration tool, users can enable or disable any of 23 frequencies. Both the receiver and the transmitter feature a self-test routine that is executed each time the unit is turned on.

EXCLUSIVE GPS SYSTEM ADDS ACCURACY WITH EASE

The 3M™ Dynatel™ Cable/Pipe and Fault Locators 2273M/2273M-iD are now compatible with select GPS/GIS field mapping instruments for real-time mapping of marker placement. The customized Dynatel interface commands the GPS/GIS device in a mode transparent to the user allowing even a generalist field technician to perform real-time mapping. Saving information directly into CAD and GIS systems creates an automated paperless system for records updating.

Visit our website at <http://www.3m.com/dynatel> for more details.



3M™ Dynatel™ Cable/Pipe and Fault Locator 2273M

STANDARD 3M™ DYNATEL™ ACCESSORIES

PRODUCT NUMBER	DESCRIPTION
8006	Ground Rod, stainless steel
3019	Dyna-Coupler Kit, consists of 3 in. Dyna-Coupler, Coupler cable and pouch
2876	Direct-Connect Transmitter Cable, 10 ft. (3 m) in length; for Utility (U) models
9012	Direct-Connect Transmitter Cable, 5 ft. (1.5 m) in length; for Communications (C) models
3014	Earth Contact Frame, Fault locating probe
9026	Earth Contact Frame Cable, 4 ft. (1.2 m) in length

OPTIONAL 3M™ DYNATEL™ ACCESSORIES

PRODUCT NUMBER	DESCRIPTION
2892	Small Clip Direct-Connect Transmitter Cable, 10 ft. (3 m) in length
9043	Ground Extension Cable
3001	Dyna-Coupler 3 in., for use on cables up to 3 in. (7.6 cm) in diameter
1196	Dyna-Coupler 6 in., for use on cables up to 6.9 in. (17.5 cm) in diameter; with pouch
9011	Coupler Cable 12 ft.
3011	Inductive Probe 3/8 in., for pair identification
3013	Direct Probe
9023	Probe Cable
2200M	Carrying Case/Bag

ENVIRONMENTAL SPECIFICATIONS

Operating temperature	-4° F to 122° F (-20° C to 50° C)
Storage temperature	-4° F to 158° F (-20° C to 70° C)

PHYSICAL SPECIFICATIONS

	SIZE (H X W X D) IN. (CM)	WEIGHT (INCLUDING BATTERIES)
Transmitter	6.75 x 11.25 x 7.75 (17.2 x 28.6 x 19.7)	5.2 lb. (2.4 kg)
Receiver	10.25 x 10.5 x 30 (26.7 x 26.1 x 76.2)	2273M – 4.05 lb. (1.9 kg), 2273M-iD – 4.85 lb. (2.3 kg)
Shipping	N/A	2273M – 27 lb. (12.5 kg), 2273M-iD – 28 lb. (12.9 kg)

ELECTRICAL SPECIFICATIONS

RECEIVER

Frequencies

Trace and tone modes	Active: 577Hz, 8kHz, 33kHz, and 200kHz Passive power: 50L, 50H, 100, 60L, 60H, 120 Passive (other): CATV 31.5kHz Auxiliary: 560, 512, 460, 400, 393, 340, 333, 273Hz User defined: up to four frequencies (50-999Hz)
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Depth

Display resolution	0.1 dB
Depth display range	0 to 30 ft. (9 m)
Depth units	cm, inch, ft.-in.
Depth accuracy*	+/- 2% +/- 2 in. (5 cm) 0 to 60 in. (1.5 m) +/- 6% +/- 2 in. (5 cm) 60 to 120 in. (1.5 to 3 m) +/- 10% +/- 2 in. (5 cm) 120 to 180 in. (3 to 4.5 m)

Cable current display	0.1 dB resolution or 0.01 mA resolution Units: dB or mA
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Power	Battery type: Eight AA size, alkaline
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Typical battery life	30 hours
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TRANSMITTER

Output frequencies

Trace mode	577Hz, 8kHz, 33kHz, 200kHz
Sheath (earth return) fault mode	10/20 Hz for sheath (earth return) fault; 577Hz and 33kHz for tracing
Tone mode	577Hz and 200kHz pulsed at 8Hz
Induction mode	33kHz, 200kHz

Output voltage (maximum)

Sheath (earth return) fault	70 Vrms
Trace	70 Vrms
Tone	Normal setting: 10 Vrms, High setting: 60 Vrms

Output power	Normal setting: Limited to 0.5W High setting: Limited to 3W, or 5W with External DC power (option 'A' only)
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Output protection	240 Vrms
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Power	Battery type: Six C size, alkaline (LR14) cells; External DC: 9-18V DC (1A) (option 'A' only)
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Typical battery life	Normal output level: 50 hours High output level: 10 hours
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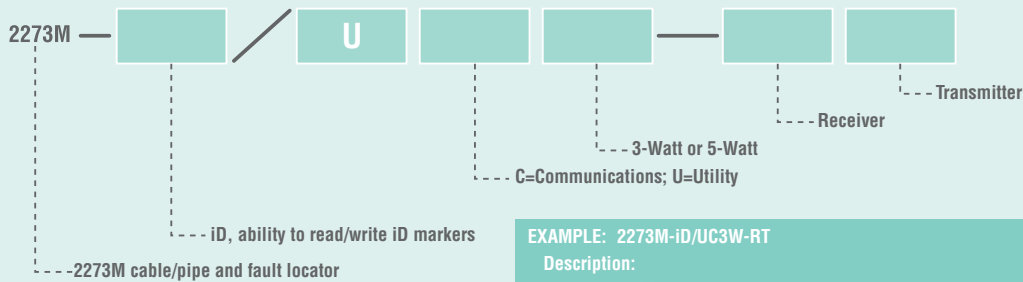
*Note: Locators are tested in model field conditions with no adjacent signals. Actual operating conditions may result in decreased depth accuracy due to outside signal disruptions.

FEATURES

RECEIVER	2273M	2273M-ID
Directional peak, directional null, single peak locate modes	X	X
Large backlit, high-resolution graphic display	X	X
Push-button cable/pipe depth readout with continuous depth measurement mode	X	X
Active duct probe (Sonde) depth measurement	X	X
Signal current measurement	X	X
Toning amplifier function	X	X
Cable/pair identification	X	X
Marker alert mode while path tracing		X
Wet section tagging	X	X
Digital fault strength indicator	X	X
Expander amplifier	X	X
Pre-set auxiliary frequencies for power, CATV, radio and long haul fiber applications	X	X
Four user-definable auxiliary frequencies	X	X
Self-calibration mode, on demand	X	X
PC interface via standard RS232 serial port	X	X
User-configurable features and interface	X	X
Detects all seven EMS marker frequencies		X
Locator PC tools software	X	X
iD marker read/write capability		X
Dual marker frequency search-simultaneous		X
Marker depth estimation		X
Conductor or sheath (earth return) fault locating	X	X
GPS communications capability with select GPS receivers		X
TRANSMITTER	2273M	2273M-ID
Simultaneous signals	X	X
Built-in ohmmeter and continuity tester and voltmeter	X	X
Indicates presence of crossed or hazardous voltage	X	X
Three tone application methods (direct connect, coupler, inductive)	X	X
Auto load matching	X	X
High and normal output level	X	X
3-watt and 5-watt models available	X	X
Conductor or sheath (earth return) fault signal	X	X
Fault locate and cable locate tones applied simultaneously	X	X

ORDERING INFORMATION

To order, specify the appropriate product using the schematic below.



EXAMPLE: 2273M-ID/UC3W-RT

Description:

- 2273M cable/pipe and fault locator with ID capability
- US Version
- Communications Application
- 3-Watt Transmitter-Receiver and Transmitter Included

PRODUCT NUMBER	DESCRIPTION
2273M-ID/UR	Cable/pipe and fault locator US Receiver only, with EMS-ID capabilities
2273M-ID/UC5W-RT	Cable/pipe and fault locator US Communications 5-watt with EMS-ID capabilities
2273M-ID/UU5W-RT	Cable/pipe and fault locator US Utility 5-watt with EMS-ID capabilities
2273M-ID/UC3W-RT	Cable/pipe and fault locator US Communications 3-watt with EMS-ID capabilities
2273M-ID/UU3W-RT	Cable/pipe and fault locator US Utility 3-watt with EMS-ID capabilities
2273M-UR	Cable/pipe and fault locator US Receiver only
2273M-UC5W/RT	Cable/pipe and fault locator US Communications 5-watt
2273M-UU5W/RT	Cable/pipe and fault locator US Utility 5-watt
2273M-UC3W/RT	Cable/pipe and fault locator US Communications 3-watt
2273M-UU3W/RT	Cable/pipe and fault locator US Utility 3-watt

To order, call 800/426 8688. For more information, please contact your local 3M representative.

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