SAVITRI
TELECOM SERVICES

CablePipe and Marker Locator 2273M-iD(12W)

GPS Interface Allows Real-Time Mapping

Innovative technology for locating underground utilities without any doubt

The 3M Dynatel Cable/Pipe and Fault Locator 2273M and Cable/Pipe, Fault and Marker Locator 2273M-iD incorporate advanced electronics 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/pipe, or Sonde depth measurements, giving a digital readout in inches, feet and inches, or centimeters (user-selectable). Lightweight, compact and well balanced, these cable and pipe locators allow you to accurately and easily:

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

Advanced features detect more information about underground utilities

A feature exclusive to the 3M™ Dynatel™ Cable/Pipe, Fault and Marker Locator 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 stored with date/time stamp, and GPS coordinates*, 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
- Conduct direct depth reading of RFiD markers
- Locate two different marker frequencies simultaneously
- Trace a cable or pipe path while simultaneously finding buried markers along the way

Exclusive GPS system adds accuracy with ease

The 2273M/2273M-iD locators are now compatible with select GPS/GIS field mapping instruments for real-time mapping of marker placement. The customized Dynatel interface remotely commands the GPS/GIS device allowing even a generalist field technician to perform real-time mapping. Exporting information directly into leading CAD and GIS systems creates an automated paperless system for records updating.

Several unique modes of operation for accurate locates in every situation

For cable or pipe 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.

Semi-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 display.

* When connected to standard NMEA compliant GPS devices

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. Two fault readings may be stored at a time for quick reference.

A simple, easy-to-use syste

The new locators require very little operator training. An RS232 communications port allows interface 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. M-iD versions locate and read/write to all EMS-RFiD 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 CATV and auxiliary frequencies that do not require the use of the transmitter.

3m™ Dynatel™ Cable/pipe and Fault Locator 2273m and Cable/pipe, Fault and Marker Locator 2273M-iD

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 22 frequencies.

STANDARD 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, 3 m (10 ft.) in length; for Utility (U) models
9012	Direct-Connect Transmitter Cable, 1,5 m (5 ft.) in length; for Communications (C) models
3014	Earth Contact Frame, Fault locating probe
9026	Earth Contact Frame Cable, 1,2 m (4 ft.) in length

OPTIONAL ACCESSORIES

Product number	Description
2892	Small Clip Direct-Connect Transmitter Cable, 3 m (10 ft.) in length
9043	Ground Extension Cable
3001	Dyna-Coupler 3 in., for use on cables up to 7,6 cm (3 in.) in diameter
1196	Dyna-Coupler 6 in., for use on cables up to 17,5 cm (6.9 in.) in diameter with pouch
9011	Coupler Cable 12 ft.
2200M	Carrying Case/Bag
2200RB	Rechargeable Auxiliary Battery for 5-watt Units

ENVIRONMENTAL SPECIFICATIONS

Operating temperature	-20° C to 50° C (-4° F to 122° F)
Storage temperature	-20° C to 70° C (-4° F to 158° F)
Standard	1P54
Regulatory	CE (Export Models Only)

PHYSICAL SPECIFICATIONS

	Size (H x W x D) CM (IN.)	Weight (including batteries)
Transmitter	17,2 x 28,6 x 19,7 (6.75 x 11.25 x 7.75)	2,4 kg (5.2 lb.)
Receiver	26,7 x 26,1 x 76,2 (10.25 x 10.5 x 30)	2273M – 1,9 kg (4.05 lb.), 2273M-iD – 2,3 kg (4.85 lb.)
Shipping	N/A	2273M – 12,5 kg (27 lb.), 2273M-iD – 12,9 kg (28 lb.)

ELECTRICAL SPECIFICATIONS

Receiver	
Frequencies	
Trace and tone modes	Active: 577Hz, 8kHz, 33kHz, and 200kHz (577Hz, 8kHz, 33kHz, and 133kHz CE Approved Models) Passive power: 50L, 50H, 100, 60L, 60H, 120 Passive (other): CATV 31.5kHz (LF 9-30 kHz) Auxiliary: 560, 512, 460, 400, 393, 340, 333, 273Hz User defined: up to four frequencies (50~999Hz)
Depth	
Display resolution	0.1 dB
Depth display range	0 to 9 m (30 ft.)
Depth units	cm, inch, ft.-in.
Depth accuracy*	+/- 2% +/- 5 cm (3 in.) 1,5 m (0 to 60 in.) +/- 6% +/- 5 cm (3 in.) 1,5 to 3 m (61 to 120 in.) +/- 10% +/- 5 cm (3 in.) 3 to 4,5 m (121 to 180 in.)
Cable current display	0.1 dB resolution or 0.01 mA resolution Units: dB and mA
Power	Battery type: Eight AA size, alkaline
Typical battery life	40 hours - M units 30 hours - M-iD units
Transmitter	
Output frequencies	
Trace mode	577Hz, 8kHz, 33kHz, 200kHz (577Hz, 8kHz, 33kHz, 133kHz CE Approved Models)
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)	
Output protection	
240 Vrms	
Power	
Battery type: Six C size, alkaline (LR14) cells; External DC: 9-18V DC (1A) (5-watt units only)	
Typical battery life	
Normal output level: 50 hours High output level: 10 hours	

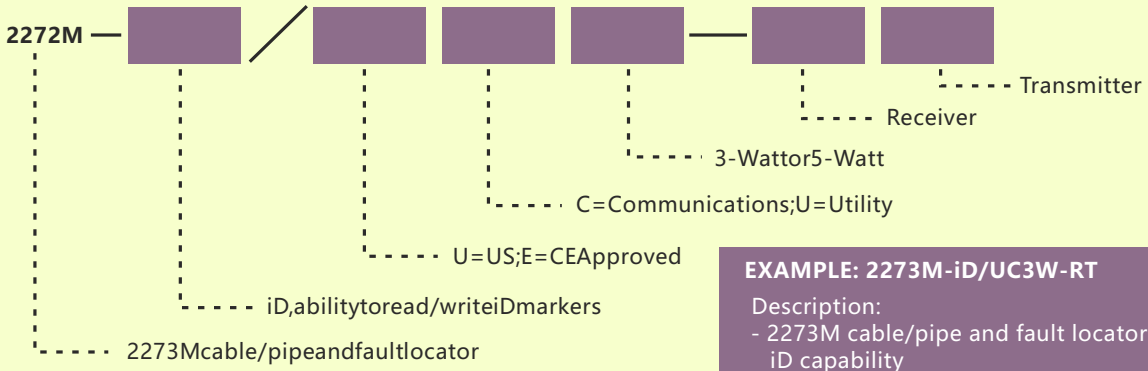
3m™ Dynatel™ Cable/pipe and Fault Locator 2273M and Cable/pipe, Fault and Marker Locator 2273M-iD

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 identification	X	X
Marker alert mode while path tracing		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 (50-999Hz)	X	X
PC interface via standard RS232 serial port	X	X
User-configurable frequencies	X	X
Detects all seven EMS marker frequencies		X
Locator PC tools software	X	X
RFiD 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 selected GPS receivers		X
Transmitter	**2273m**	**2273m-id**
Simultaneous signals	X	X
Built-in ohmmeter and continuity tester and voltmeter	X	X
Indicates presence of hazardous voltage	X	X
Three tone application methods (direct connect, coupler, inductive)	X	X
Auto load (impedance) 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
2273M-EC5W/RT	Cable/pipe and fault locator OUS Communications 5-watt (CE Approved Model)
2273M-EU5W/RT	Cable/pipe and fault locator OUS Utility 5-watt (CE Approved Model)
2273M-iD/EC5W-RT	Cable/pipe and fault locator OUS Communications 5-watt w/EMS-iD capability (CE Approved Model)
2273M-iD/EU5W-RT	Cable/pipe and fault locator OUS Utility 5-watt w/EMS-iD capability (CE Approved Model)

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