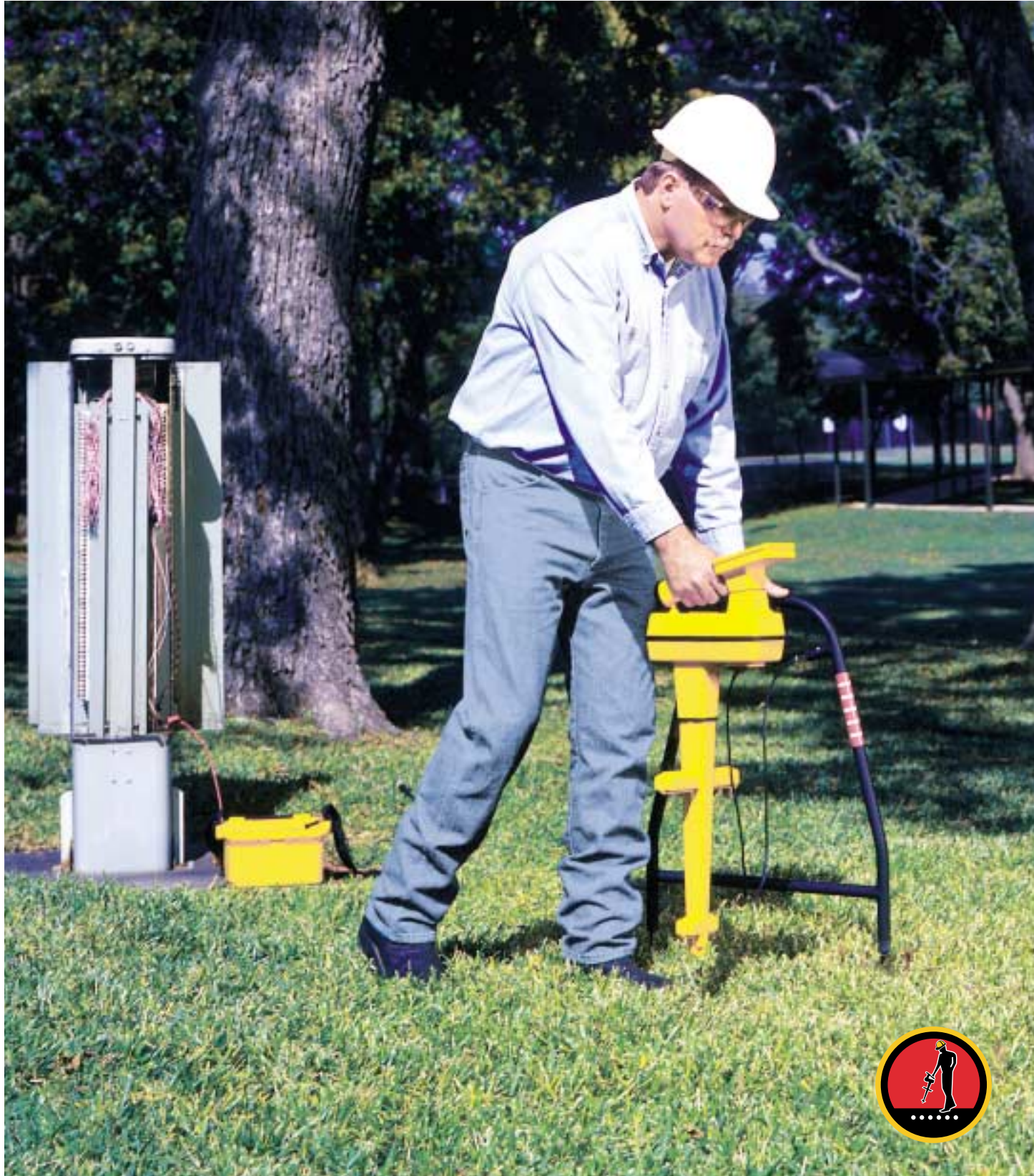


3M

Dynatel™

2273M Cable/Pipe and Fault Locators

2273M-iD Cable/Pipe/Fault and Marker Locators with iD Read/Write





New-to-the-world technology for locating underground utilities without any doubt.

The 3M™ Dynatel™ 2273M and 2273M-iD Cable/Pipe and Fault Locators 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, both copper and fiber optic (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

Advanced features detect more information about underground utilities.

A new feature exclusive to the 3M Dynatel 2273M-iD Cable/Pipe/Fault and Marker Locator is the ability to write, read and lock programmed information into the new 3M 1400 Series EMS iD Ball Markers. Information such as a pre-programmed unique identification number, facility data, owner information, application type, placement date and other details from up to 100 ID 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 than any other locator on the market, the 3M Dynatel 2273M-iD Cable/Pipe/Fault and Marker 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 ID 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, the 3M Dynatel Cable/Pipe and Fault 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.

The receiver includes a unique "expander" function that makes peaks and nulls more pronounced. The expander feature enhances the response for fast tracking and pin-pointing of position. The unique Directional Peak mode combines the response from four peak antennas to indicate left/center/right direction to the cable/pipe while the bar graph and numeric display indicate the sharp and accurate dual-peak response. Automatic gain set with manual override provides maximum flexibility and control. The multi-directional null mode shows null signal response with automatic gain and utilizes the multiple antenna design to show cable/pipe location and direction on a unique "compass" like graphic user interface on the high-resolution display.



Precise location of sheath (earth return) faults. The 3M™ Dynatel™ 2273M and 2273M-iD Cable/Pipe and Fault Locators can precisely locate conductor or sheath (earth return) faults on both short and long cable sections faster than ever before. 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 indicated on the receiver liquid crystal display (LCD) screen, allowing minor faults to be ignored, if desired. Up to three fault readings may be stored for quick reference.

A simple, easy-to-use system. Lightweight and easy to operate, the 3M Dynatel Cable/Pipe and Fault Locators are rugged, ergonomic and require very little operator training. A large backlit digital LCD screen and soft-key operation make them easy to understand for more precise locates. A “memory” feature remembers operator set-up from previous use. An RS232 communications port allows interfacing to an external computer for uploading/downloading of data, unit configuration and remote software upgrades. The system can run over 30 hours on eight AA alkaline batteries.

The system consists of three basic components:

- Transmitter with built-in ohmmeter, which also senses and measures the presence of foreign voltage and tests the continuity of the circuit
- Rugged, one-piece hand-held receiver with bar graph signal strength and direction, that indicates received signal and proximity to the cable; ID versions locate all 3M EMS Markers and read/write to all 3M 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 3M Dynatel Cable/Pipe and Fault Locators use four active trace frequencies — 577Hz, 8kHz, 33kHz and 200kHz — which can be used 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 has the unique capability to accommodate four user-definable auxiliary frequencies and allows the user to perform a self-calibration operation at any frequency at any time. In total, the receiver accommodates 23 frequencies. With the easy-to-use configuration tool, users can enable or disable any frequency to select only the frequencies that they need to use.



Both the receiver and the transmitter feature a self-test routine that is executed each time the unit is turned on. A power-up battery test indicates the battery level. Both components are constructed of heavy-duty materials designed to withstand typical field use.

Standard Dynatel accessories:

- 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
- 9026 Earth Contact Frame Cable; 4 ft. (1.2 m) in length

Optional Dynatel accessories:

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

Features of 3M™ Dynatel™ 2200M/M-iD Series Locators

RECEIVER	2250M	2250M-iD	2273M	2273M-iD
Directional peak, directional null, single peak locate modes	X	X	X	X
Large backlit, high resolution graphic display	X	X	X	X
Push button cable/pipe depth readout with continuous depth measurement mode	X	X	X	X
Active duct probe (Sonde) depth measurement	X	X	X	X
Signal current measurement	X	X	X	X
Toning amplifier function	X	X	X	X
Cable/pair identification	X	X	X	X
Marker alert mode while path tracing		X		X
Wet section tagging	X	X	X	X
Digital fault strength indicator			X	X
Expander amplifier	X	X	X	X
Pre-set auxiliary frequencies for power, CATV, radio and long haul fiber applications	X	X	X	X
Four user-definable auxiliary frequencies	X	X	X	X
Self-calibration mode, on demand	X	X	X	X
PC interface via standard RS232 serial port	X	X	X	X
User-configurable features and interface	X	X	X	X
Detects all seven EMS marker frequencies		X		X
Marker-Link and Locator PC tools software		X		X
ID marker read/write capability		X		X
Dual marker frequency search-simultaneous		X		X
Marker depth estimation		X		X
Conductor or sheath (earth return) fault locating			X	X

TRANSMITTER	2250M	2250M-iD	2273M	2273M-iD
Simultaneous signals	X	X	X	X
Built-in ohmmeter and continuity tester	X	X	X	X
Indicates presence of crossed or hazardous voltage	X	X	X	X
Three tone application methods (direct connect, coupler, inductive)	X	X	X	X
Auto load matching	X	X	X	X
High and normal output level	X	X	X	X
3 watt and 5 watt models available	X	X	X	X
Conductor or sheath (earth return) fault signal			X	X
Fault locate and cable locate tones applied simultaneously			X	X

Specifications for 3M™ Dynatel™ 2273M/M-iD Cable/Pipe and Fault Locators

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)

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)

ELECTRICAL SPECIFICATIONS	
Receiver	
Frequencies	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)
Trace and tone modes	
Performance	Sensitivity @ 1 m/3.3 ft. from cable, Single Peak mode under low noise conditions
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
Power	Battery type: Eight AA size, alkaline
Typical battery life	30 hours
Transmitter	
Output frequencies	577Hz, 8kHz, 33kHz, 200kHz
Trace mode	10/20 Hz for sheath (earth return) fault; 577Hz and 33kHz for tracing
Sheath (earth return) fault mode	577Hz and 200kHz pulsed at 8Hz
Tone mode	33kHz, 200kHz
Induction mode	
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 extension DC power (option 'A' only)
Output protection	240 Vrms
Power	Battery type: Six C size, alkaline (LR14) cells; External DC: 9-18V DC (1A) (option 'A' only)
Typical battery life	Normal output level: 50 hours High output level: 10 hours

*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.

ORDERING INFORMATION

To order, specify the appropriate 3M™ Dynatel™ 2273M/M-iD Cable/Pipe and Fault Locator using the schematic below.

2273M — [] / [U] [] [] — [] []

----- 2273M Cable/Pipe Fault Locator

----- iD, ability to read/write iD markers

----- C=Communications; U=Utility

----- 3 Watt or 5 Watt

----- Receiver

----- Transmitter

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/Fault Locator US Receiver only, with EMS-iD Capabilities
2273M-iD/UC5W-RT	Cable/Pipe/Fault Locator US Communications 5 watt with EMS-iD Capabilities
2273M-iD/UU5W-RT	Cable/Pipe/Fault Locator US Utility 5 watt with EMS-iD Capabilities
2273M-iD/UC3W-RT	Cable/Pipe/Fault Locator US Communications 3 watt with EMS-iD Capabilities
2273M-iD/UU3W-RT	Cable/Pipe/Fault Locator US Utility 3 watt with EMS-iD Capabilities
2273M-UR	Cable/Pipe Fault Locator US Receiver only
2273M-UC5W/RT	Cable/Pipe/Fault Locator US Communications 5 watt
2273M-UU5W/RT	Cable/Pipe/Fault Locator US Utility 5 watt
2273M-UC3W/RT	Cable/Pipe/Fault Locator US Communications 3 watt
2273M-UU3W/RT	Cable/Pipe/Fault Locator US Utility 3 watt



A CENTURY
of INNOVATION

All statements, technical information, and recommendations related to 3M's products are based on information believed to be reliable, but the accuracy or completeness is not guaranteed. Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use. Any statements related to the product which are not contained in 3M's current publications, or any contrary statements contained on your purchase order shall have no force or effect unless expressly agreed upon, in writing, by an authorized officer of 3M.



Warranty; Limited Remedy; Limited Liability. This product will be free from defects in material and manufacture for a period of 12 months from the date of purchase. **3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** If this product is defective within the warranty period stated above, your exclusive remedy shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product. **Except where prohibited by law, 3M will not be liable for any loss or damage arising from this 3M product, whether direct, indirect, special, incidental or consequential regardless of the legal theory asserted.**



6801 River Place Blvd
Austin, TX 78726-9000
800/426 8688
Fax 800/626 0329
www.3M.com/telecom

© 3M 2002 80-6111-3137-8 (5025.0) K/CSI-1