3M

Dynatel™

Advanced Cable/Fault Locator 2273

GPS Interface Allows Real-Time Mapping

BPC

Boddingtons Power Controls

Unit 1 Zone D, Chelmsford Road Industrial Estate, Great Dunmow, Essex, CM6 1XG, UK
Tel: +44 (0) 1371 876543 Fax:+44 (0) 1371 875460
www.boddingtonspowercontrols.com

The 3M™ Dynatel™ Advanced Cable/Fault Locator 2273 is a microprocessor-based system that incorporates advanced digital signal processing techniques to quickly and efficiently locate sheath (earth return) faults and trace the path of underground cables, both copper and fiber optic (with metallic trace wire). Lightweight, compact and well-balanced, the 2273 accurately:

- Locates cable path
- Measures cable or sonde depth with the push of a button
- Measures signal current in the cable
- Pinpoints sheath faults and cable breaks
- Discriminates between light and heavy faults
- Identifies cable using toning function
- Tones shorts and grounds in aerial cable
- Locates energized power cable

The 3M™ Dynatel™ Advanced Cable/Fault Locator 2273 can be used with the 3M™ Dynatel Marker Locating Accessory 2205/2206 EMS.

The 2273 provides accurate cable or sonde depth measurements, giving a digital readout in inches, feet and inches, or centimeters (user-selectable).

Additionally, when used in conjunction with the 3M™ Dynatel™ Marker Locating Accessory, 2205/2206 EMS the system can:

- Pinpoint the exact location of buried EMS markers
- Trace a cable path while simultaneously finding buried markers along the way

Four modes of operation for accurate locates, even in congested areas

For cable path locating, the 2273 advanced cable/fault locator receiver uses one of four user-selected locating modes – dual peak, dual null, differential or special peak (which increases the sensitivity of the receiver for tracing over longer distances). The mode is selected depending on which is most effective under the locating conditions.

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The 3M™ Dynatel™ receiver includes four volume settings, including a special "expander" function that makes peaks and nulls more pronounced. The expander feature enhances the amplitude difference between two conductors carrying the same signal, making the unit extremely accurate, even in congested areas. A headphone jack is also included.

Precisely locates faults

The 2273 cable/fault locator can precisely locate sheath (earth return) faults on both short and long cable sections. The unit sends a trace signal simultaneously with a fault-locate signal, allowing the operator to use the cable-locate function when locating sheath faults in long cable sections. Sheath (earth return) fault strength is indicated on the receiver LCD display, allowing minor faults to be ignored, if desired.

A simple, easy-to-use system

The Dynatel 2273 advanced cable/fault locator is easy to operate and requires very little training. Digital liquid crystal display (LCD) readout and push-button operation make the unit easy to understand, for more precise locates. A "memory" feature remembers operator set-up from previous use. 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.
- One-piece hand-held receiver with bar graph that indicates received signal and proximity to the cable.
- Earth contact frame that is color-coded to correspond with indications from the receiver directing the operator toward the fault.

The 2273 cable/fault locator uses four active trace frequencies – 577 Hz, 8 kHz, 33 kHz and 200 kHz – 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.

Both the receiver and the transmitter feature a self-test routine which 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.

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Features	Benefits
Transmitter	
Four operator-selectable frequencies	Optimizes unit performance in varying conditions
Simultaneous signals	Enables receiver to verify cable location
Fault-locate/cable-locate signals applied simultaneously	Enables receiver to verify cable location while fault locating
Built-in ohmmeter with voltage sensing/measuring capability	Displays earth fault resistance; confirms far-end grounds and shield continuity
Three signal application methods (direct connect, coupler, induction)	Flexibility under varying plant conditions
Auto load (impedance) matching	Automatic adjustment of output voltage to maximize signal
High and normal output level	High output level for extreme distance locates and other varying cable
conditions Displays output signal current in trace mode	Assists in proper frequency selection and setup
Audible indication of hazardous voltage in ohms mode	Warns operator of potentially dangerous situation
Can connect to energized power cables up to 240 Vac	Prevents inadvertent damage to unit; operates while attached to live circuits
External DC operation (Option 'A' only)	5-watt output capability and saves batteries
Receiver	
Peak and null modes	Verify cable location
Differential mode	Indicates direction to cable
Push-button digital depth readout (of cable or sonde) in inches, feet and inches, or centimeters	Easy, quick and accurate depth measurements; no conversion table required for sonde depth measure- ments
Measures signal current in cable	Helps identify target cable regardless of depth
Visual and audible cable locates	Ensure accuracy under varying field conditions
Digital fault strength indicator	Operator can differentiate between light and severe faults
Coupler jack	Pair/cable identification
Graphic display	Operator can distinguish between target cable and other cables in congested areas
Expander function	Improves sensitivity of audible and visual response
Three passive 50/60 Hz power frequency settings	Optimized for primary, secondary, or rectified power
31.5 kHz Auxiliary frequency	For locating CATV cables[1]
512 Hz, 560 Hz Auxiliary frequencies (some models)	Detects frequencies from central office installed transmitters
Compatible with 2205/2206 marker locating accessory	Allows unit to pinpoint location of buried EMS markers

Note 1. American NTSC, television set on

3m™ dynatel™ standard accessories

model	descripTion
9012	Direct-Connect Transmitter Cable; for direct connection to cable and ground; 5' (1.5 m) long
8006	Ground Rod; stainless steel
3014	Earth Contact Frame
9026	Earth Contact Frame Cable; 4 ft. (1.2 m) long
	40 ft. (12 m) long Cigarette Lighter Adapter Cable (Option'A' Only)

3m™ dynatel™ optional accessories

model	descripTion
3019	Dyna-Coupler Kit; consists of 3" Dyna-Coupler for use on cables up to 3" (7.6 cm), Coupler Extension Cable, and
Pouch 1196	6" Dyna-Coupler; for use on cables up to 6.9" (17.5 cm) in diameter
9043	Ground Extension Cable
9011	Coupler Extension Cable
3229	Active Duct Probe, 33 kHz
2205/2206	EMS Marker Locating Accessory
2200	Series Carrying Bag
2892	Small Clip Direct-Connect Transmitter Cable, for direct connection to cable and ground; 10' (3 m) long
2876	Direct-Connect Transmitter Cable, 10' (3 m) in length, for utility (U) models
2200RB	Rechargeable Auxiliary Battery for 5-watt units

Physical specification

Size	
Transmitter	6.75" H x 11.25" W x 7.75" D (17.2 cm x 28.6 cm x 19.7 cm)
Receiver	25.5" H x 3.75" W x 10.75" D (64.8 cm x 9.5 cm x 27.3 cm)
Weight (including batteries)	
Transmitter	5.3 lbs. (2.4 kg)
Receiver	4.1 lbs. (1.9 kg)
Shipping	21.5 lbs. (9.8 kg)

Environmental specifications

Operating temperature	-4° to 122°F (-20° to 50°C)
Storage temperature	-40° to 158°F (-40° to 70°C)

Ordering information

To order, specify The Appropriate 3M™ Dynatel™ 2273 Advanced Cable locator using the table below.

Generic product number: 2273-XYZ		
Market		**Code X**
USA/Canada		U3(3-watttransmitter)
USA/Canada (Option 'A')		U5 (5-watt transmitter)
Typical Use	**Direct connect cable configuration**	**Code Y**
Telephone/CATV	5-foot cable with telco-style direct connection clips	T
Power	10-foot cable with large alligator direct connection clips	P
Coupler Kit		**Code Z**
No coupler kit		N
3" coupler kit		3

Example 2273- X Y Z

Example: 2273-U5PN translates to a 2273 Cable Locator with 5-watt transmitter for the USA/Canada market, used by a power

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Electrical specifications

receiver	
Frequencies	
Trace and tone modes	Active: 577 Hz, 8 kHz, 33 kHz, 200 kHz Passive Power: 50/60 Hz user selectable: L50/L60 – 5th harmonic, H50/H60 – 9th harmonic, 100/120 – rectified power Auxiliary: 'T' model: 31.5 kHz, 512 Hz, 560 Hz 'P' model: 31.5 kHz
Depth	Range: 0 to 30' (0 to 9 m) Accuracy: ±10% ±1 digit for 0 to 60" (0 to 1.5 m) ±15% for 60" to 180" (1.5 to 4.5 m) ±20% for 180" to 360" (4.5 to 9 m)
Power	Six alkaline "AA" (LR6) cells
Typical battery life	50 hours
Transmitter	
Output frequencies Trace mode Sheath fault mode Tone mode Induction mode	 577 Hz, 8 kHz, 33 kHz, 200 kHz 10/20 Hz for sheath fault; 577 Hz and 33 kHz for tracing 577 Hz and 200 kHz pulsed at 8 Hz 33 kHz, 200 kHz
Output voltage (maximum) Sheath fault Trace	 70 Vrms 70 Vrms Normal setting: 10 Vrms, High setting: 60 Vrms
Output power	Normal setting: Limited to 0.5 W High setting: Limited to 3 W, or 5 W with External DC power (option 'A' only)
Output protection	240 Vrms
Power	Batteries: Six alkaline "C" (LR14) cells; External DC: 9-18V DC (1A) (option 'A' only)

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