



# Electronic Marker System

## 1401-XR 4" Ball Marker

for Telco Applications



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The 3M™ 1401-XR 4" Extended Range (XR) Ball Marker makes the job of precisely locating underground facilities easier. Less time and skill is required from the field crew, since placement is as simple as tossing the ball in the trench.

The unique self-leveling feature of the 4" Extended Range Ball Marker eliminates inaccurate locates. Other buried markers can be disturbed by backfill dirt, or installed improperly, so that they don't stay positioned correctly. This can cause locating problems due to erroneous readings.



The 4" Ball Marker's self-leveling design insures that the marker is always in an accurate, horizontal position regardless of how it is placed in the ground.

The 4" Ball Marker is buried directly over key underground locations. When the job requires access to that facility again, it can be located using a 3M™ 1264 EMS II

Marker Locator, or a 3M™ Dynatel™ 2200 Series Locator equipped with a 3M™ Dynatel™ 2205/2206 EMS Marker Locating Accessory.

The 1264 locator transmits an RF signal to the buried marker. The marker returns the signal to the locator, indicating the marker's exact position. The compact electronic locator provides both a visual reading and a tone. Use of the locator and markers requires only a few minutes of training.

The 4" Ball Marker's width enables the marker to be placed in a standard 4" trench without additional digging.

Eyelets on the ball marker allow the installer to attach the marker to a pipe, conduit, or splice case with a tie-down strap (optional), if desired.

Unlike stakes, flags or paint, a 4" Ball Marker cannot be inadvertently removed, or worn away by weather, and it is not affected by vegetation. It is the most dependable way to mark:

- Buried splices
- Buried service drops
- Conduit stubs
- Fiber optic facilities
- Cable paths
- Load coils
- Installations under pavement or snow

### Built for durability

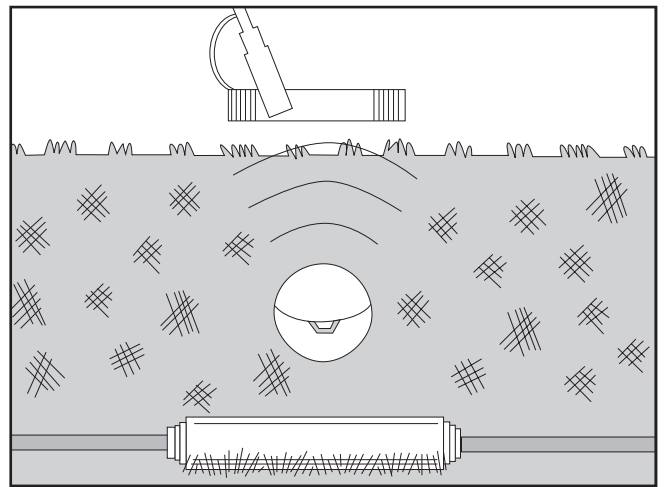
The 4" Ball Marker contains a passive-tuned antenna, molded inside a plastic disk, which is free-floating inside a waterproof, polyethylene shell. The shell is impervious to minerals, chemicals and temperature extremes normally found in underground plant environments.

### The EMS family of products

Other markers are available for a variety of applications.

- **Full-Range Marker** – accurate to depths of eight feet (2.44 m); also acts as a digging shield.
- **Mini-Marker** – accurate to depths of six feet (1.8 m). Can be buried in a narrow trench without additional digging.
- **Near-Surface Marker** – designed for applications of up to two feet (0.61 m) from marker to locator probe. Its size and shape make it easy to install in street surfaces for marking flush-mount facilities prior to repaving.

All telco markers are color-coded orange to APWA standards, and tuned to a specific frequency for each utility, reducing the risk of accidentally locating other buried facilities.



The vertical range of the 4" Ball Marker is five feet from the locator probe.

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## Physical Specifications

Size	4" diameter sphere	(10.4 cm diameter)
Weight	Net: 0.7587 lb. (0.35 kg)	Shipping: 24 lb. (10.4 kg)
Packaging	30 to a carton	
Range	5 feet (1.5 m) from locator probe	
Shell	High-density polyethylene	
Contents	25% Propylene Glycol* in water	

Color-coded orange for telco applications

## Environmental Specifications

Operating temperature	-22° to 150°F	(-30° to 66°C)
Storage temperature	-40° to 167°F	(-40° to 75°C)

## Construction

\*This material should not be confused with the Ethylene Glycol that is used as automotive anti-freeze. Propylene Glycol is approved for use in Pharmaceuticals, cosmetics and as a food additive. Being completely sealed in the marker, the Propylene Glycol would not normally come in contact with the environment. Should breakage occur, it is readily biodegradable and will not harm humans, wildlife or the environment.

## Ordering Information

To order, specify the 3M 1401-XR 4" Ball Marker. For further information, contact your sales representative.

## Important Notice

WARRANTY AND REMEDY. This product will conform to 3M published specifications and be free from defects in materials and workmanship for a period of one year from the date of purchase. In addition, 3M provides the following Conditional Lifetime Warranty for its Electronic Marker Products: When installed in accordance with 3M's installation instructions, 3M warrants 3M™ Electronic markers for the lifetime of the product, to be free from defects in material and manufacture, provided the Electronic Markers are located with 3M™ Dynatel™ Test and Measurement Instruments or other brand locators as may be designated by 3M in writing.

This warranty does not extend to Electronic Markers that have been subjected to misuse or improper applications or that have been repaired or altered by others. 3M MAKES NO OTHER WARRANTY INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. If the Marker is found to be defective within the stated warranty period, your exclusive remedy shall be, at 3M's option, to repair or replace the Marker or refund the purchase price. 3M will not be liable for any special, incidental, or consequential damages arising from use of this 3M product, regardless of the legal theory asserted.



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