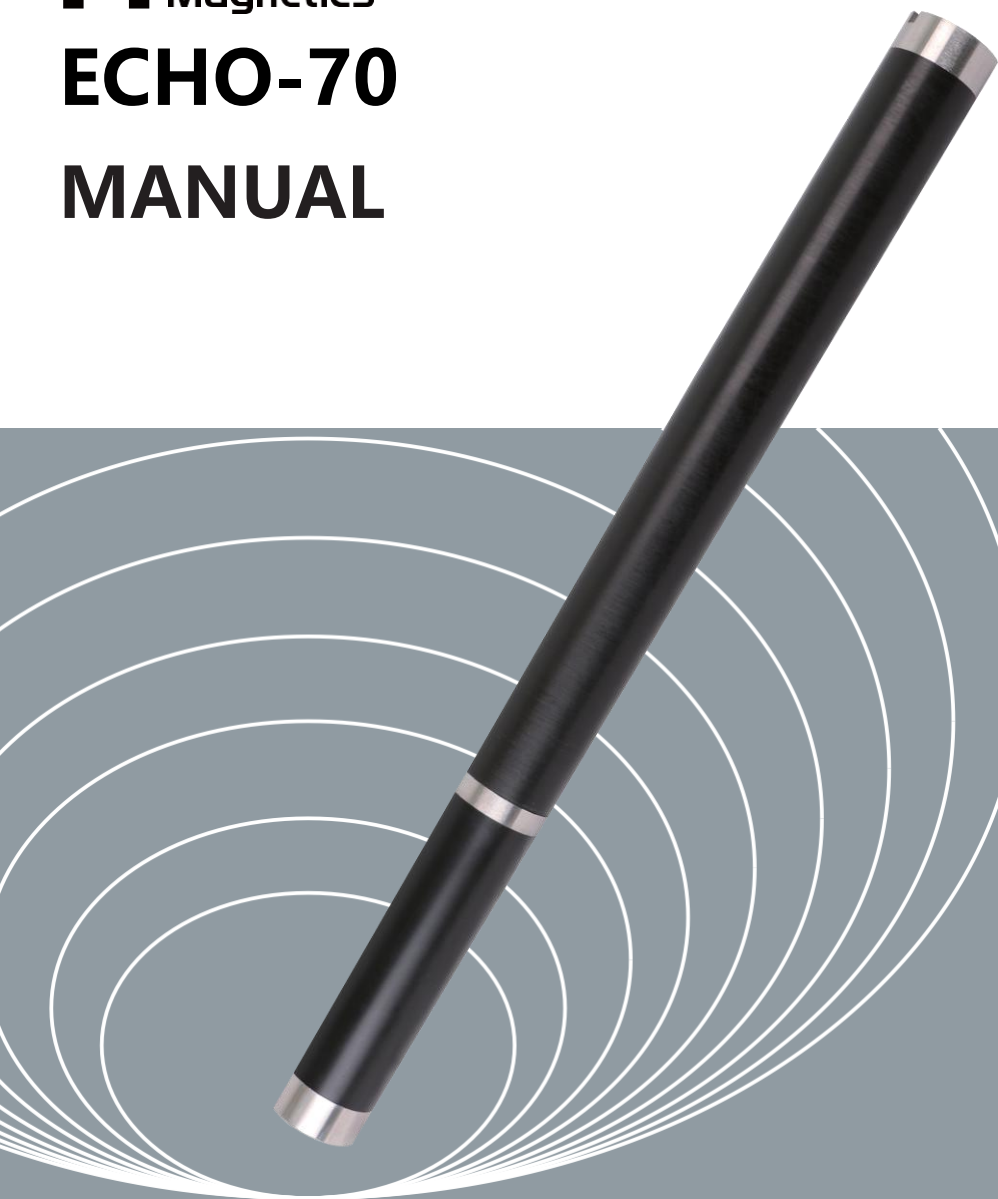




Underground
Magnetics

ECHO-70

MANUAL



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5 Transmitter

5.1 Introduction

The transmitter provides drill head temperature, clock position, pitch, battery status and locating signal. The transmitter transmits signals at 19 kHz-31 kHz. The transmitter will enter a “sleep” mode after 15 minutes without rotation. It takes about 10 seconds to “wake up” when the transmitter is rotated.

5.2 Specifications

Echo-70:

Frequency: 19 kHz-31 kHz Depth Range :

60 m/190 ft@regular power

70 m/230 ft@high power

Power: 3 18650 rechargeable lithium batteries

18650(3.7v)*3 battery life: 60h@regular power

15h@high power

Dimensions: $\phi 3.6 \times 39.3(\text{cm}) / \phi 1.4 \times 15.5(\text{in})$

Temperature: Under 85°C(185°F)

Water proof: IP67

V.BAT: 8.4v~12.6v



5.3 Digital Information

- Pitch: From -106% to +106% with 0.1% resolution
- Roll: 1-12 clock position with half hour resolution
- Battery: Battery full, 2/3 full, 1/3 full and flash warning
- Temperature: When the transmitter is overheating, temperature indication in the receivers display flashes. If temperature reaches over 85°C, transmitter may be permanently damaged. If this happens, the dot temperature indicator on the front of transmitter will turn black, ECHO70, ECHO90 and ECHO110 without the dot temperature indicator.

5.4 Transmitter Maintenance

- Do not place the transmitter near excessive temperature (over 85°C/185°F).
- Do not apply excessive pressure, shock or vibration on the transmitter.
- Take the battery out of the transmitter after use.
- Clean the spring and cap on the battery compartment when necessary.
- Regularly check the sealing ring on the battery cover. Replace it when necessary.

6 Battery and Charger

- Mag locators use rechargeable lithium batteries.
- This rechargeable lithium battery comes with a special charger. Any use of other lithium rechargeable battery or charger for the receiver may cause fire, explosion, leaking or other damages. Keep the battery at the normal temperature of 15-25 degrees Celsius (59-77°F). Extreme high or low temperatures will short the battery life. Do not soak the battery in water or any other liquids.
- Do not throw the battery into fire. Do not disassemble the battery. Avoid any kind of damage to the battery. Do not discard the battery as normal trash. Please dispose of it properly.
- When charging the battery, red light of the charger is on.
- When charging is complete, a green light will be on.
- Please place the battery properly as shown in the diagram.

7 Warranty

Underground Magnetics offers standard warranty on parts and labor of the Mag series locating system under normal usage. The warranty period is one year for the receiver and display and six months for the transmitter. Warranty time is from the date of transaction.

IC Warning

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference, and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement

The device is compliance with RF exposure guidelines, users can obtain Canadian information on RF exposure and compliance.

Après examen de ce matériel aux conformité ou aux limites d' intensité de champ RF, les utilisateurs peuvent sur l' exposition aux radiofréquences et la conformité and compliance d' acquérir les informations correspondantes.

FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Attention that changes or modification not expressly approved by the party responsible for compliance could void the user' s authority to operate the equipment.

Note: This product has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this product does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The device has been evaluated to meet general RF exposure requirement.



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