Mini-MBT Transmitter

Engineered

Radio Remote Control

MAGNETEK
RADIO CONTROLS

Part Number: 198-80203-0002 R1
June 2015
© 2015 Magnetek Material Handling

Your New Radio Receiver

Thank you for your purchase of Magnetek's Enrange® brand Mini-MBT Transmitter Radio Remote Equipment Control. Magnetek has set a whole new standard in radio-remote performance, dependability, and value with this line of modular receivers.

If your product ever needs modification or service, please contact one of our representatives at the following locations:

U.S. Service Information

For questions regarding service or technical information contact:
1.866.MAG.SERV
1.866.624.7378

International Service:
+1.262.783.3500

Magnetek, Inc.
N49 W13650 Campbell Drive
Menomonee Falls, WI 53051

Telephone: +1.800.288.8178
Website: www.magnetek.com
E-mail: mhcustomerservice@magnetek.com

Fax Numbers:
Main: +1.800.298.3503
Sales: +1.262.783.3510
Service: +1.262.783.3508

Canada Service Information:
4090B Sladeview Crescent
Mississauga, Ontario
L5L 5Y5 Canada
Phone: +1.800.792.7253
Fax: +1.905.828.5707
+1.416.424.7617 (24/7 Service pager)

EU Market Contact:
Brian Preston
Magnetek (UK) Ltd.
Unit 3 Bedford Business Centre, Mile Road
Bedford, MK42 9TW UK
Phone: +44.1234.349191
Fax: +44.1234.268955

©2015 MAGNETEK

All rights reserved. This notice applies to all copyrighted materials included with this product, including, but not limited to, this manual and software embodied within the product. This manual is intended for the sole use of the person(s) to whom it was provided, and any unauthorized distribution of the manual or dispersal of its contents is strictly forbidden. This manual may not be reproduced in whole or in part by any means whatsoever without the expressed written permission of MAGNETEK.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
5050 S. Towne Drive, New Berlin, WI 53151
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

TABLE OF CONTENTS

1. PRODUCT MANUAL SAFETY INFORMATION 5
1.1 PRODUCT WARRANTY INFORMATION 5
2. CRITICAL INSTALLATION CONSIDERATIONS 7
2.1 GENERAL 7
2.2 PERSONS AUTHORIZED TO OPERATE RADIO CONTROLLED EQUIPMENT 7
2.3 SAFEY INFORMATION AND RECOMMENDED TRAINING FOR RADIO CONTROLLED EQUIPMENT OPERATORS 7
2.4 TRANSMITTER UNIT 9
2.5 PRE-OPERATION TEST 9
2.6 HANDLING BATTERIES 9
2.7 OPTIONAL RECHARGEABLE BATTERY CHARGING 9
2.8 BATTERY DISPOSAL 10
2.9 CRANE/LIFTING DEVICE SPECIFIC WARNINGS 10
3. MINI-MBT STANDARD CONFIGURATION AND OPERATION 12
3.1 INSTALLING THE BATTERY PACK 13
3.1.1 Alkaline Battery Pack (BT151-0) 13
3.1.2 Optional NiMH Rechargeable Battery Pack (BT150-0) 14
3.2 TURNING THE TRANSMITTER ON AND OFF 14
3.2.1 Machine Stop and START Push Button 15
3.2.2 Machine Stop and ON-OFF-START Toggle 15
3.2.3 Machine Stop, ON-OFF Toggle, START Push Button 15
3.2.4 Transmitter Initialization (with Standard Status LED Indicator) 15
3.2.5 Transmitter Initialization (with Optional Graphic User Interface Screen) 16
3.2.6 Turning Off the Transmitter 16
3.3 MACHINE STOP SWITCH (For Emergency Stopping Only) 16
3.4 STATUS AND BATTERY LEDS 16
3.5 OPTIONAL GRAPHIC USER INTERFACE 16
3.6 NORMAL OPERATING MODE WITH STANDARD LEDS 17
3.6.1 Watch Dog Indicator (Steady Blinking Status LED) 17
3.6.2 Switch Change Indicator (Rapidly Blinking Status LED) 17
3.6.3 Low Battery Level Indicator (Blinking Red Battery LED) 17
3.7 NORMAL OPERATING MODE WITH OPTIONAL GRAPHIC USER INTERFACE 17
3.7.1 Watch Dog Indicator (Sweeping Dot) 17
3.7.2 Command Confirmation 18
3.7.3 Battery Life Indicator 18
3.7.4 Signal Strength Indicator 18
3.7.5 Two-Way Feedback System 18
3.8 JOYSTICKS AND PADDLES/LEVERS 18
3.9 ROTARY SELECTOR SWITCH 18
3.10 AUXILIARY SWITCHES 18
4. TRANSMITTER SETUP 19
4.1 TRANSMITTER SETUP SETTINGS WITH STANDARD STATUS LED 19
4.1.1 IR Configuration Receiver 19
4.2 USING THE TRANSMITTER IN SETUP MODE (WITH OPTIONAL GRAPHIC USER INTERFACE) 20
4.2.1 Entering Setup Mode 20
4.2.2 Adjusting Settings in Setup Mode 20

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

5. OPTIONAL PROGRAMMING WITH RCP 24
5.1 ACCESS CODES 24
5.2 CHANGING RECIEVER ACCESS CODES 25
5.3 CONNECTING THE MINI-MBT TO A COMPUTER 25
5.4 CONFIGURATION WITH RCP 26
6. TRANSMITTER CHANNEL CONFIGURATION SETTINGS 27
6.1 FCC STATEMENTS 27
6.2 433MHz CHANNEL SET 28
6.3 433 MHz TELEMOTIVE LEGACY CHANNEL SET: TMS AND TDMA 29
6.4 419MHz CHANNEL SET 30
6.5 900 MHz CHANNEL SET 31
6.6 2.4 GHz: FHSS 31
7. OPTIONAL CAN BUS TETHER FEATURE 32
7.1 INSTALLATION OF TETHER CABLE 32
7.2 OPERATION OF TRANSMITTER IN TETHER MODE 32
7.3 RETURNING TRANSMITTER TO WIRELESS MODE 32
7.4 CAN CONNECTOR RECEPTACLE PIN-OUT DETAILS 33
8. GENERAL TROUBLESHOOTING 34
8.1 TROUBLESHOOTING OPTIONAL TETHER OPERATION 35
8.2 ASSEMBLY AND REPLACEMENT PARTS 35
9. NOTES 36
10. EU DECLARATION OF CONFORMITY 37

GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

1. PRODUCT MANUAL SAFETY INFORMATION

Magnetek, Inc. (Magnetek) offers a broad range of radio remote control products, control products and adjustable frequency drives, and industrial braking systems for overhead material handling applications. This manual has been prepared by Magnetek to provide information and recommendations for the installation, use, operation and service of Magnetek's material handling products and systems (Magnetek Products). Anyone who uses, operates, maintains, services, installs or owns Magnetek Products should know, understand and follow our instructions and safety recommendations in this manual for Magnetek Products.

The recommendations in this manual do not take precedence over any of the following requirements relating to cranes, hoists and lifting devices:

- Instructions, manuals, and safety warnings of the manufacturers of the equipment where the radio system is used,
- Plant safety rules and procedures of the employers and the owners of facilities where the Magnetek Products are being used,
- Regulations issued by the Occupational Health and Safety Administration (OSHA),
- Applicable local, state or federal codes, ordinances, standards and requirements, or
- Safety standards and practices for the overhead material handling industry.

This manual does not include or address the specific instructions and safety warnings of these manufacturers or any of the other requirements listed above. It is the responsibility of the owners, users and operators of the Magnetek Products to know, understand and follow all of these requirements. It is the responsibility of the owner of the Magnetek Products to make its employees aware of all of the above listed requirements and to make certain that all operators are properly trained. **No one should use Magnetek Products prior to becoming familiar with and being trained in these requirements.**

1.1 PRODUCT WARRANTY INFORMATION

Magnetek, hereafter referred to as Company, assumes no responsibility for improper programming of a device (such as a drive or radio) by untrained personnel. A device should only be programmed by a trained technician who has read and understands the contents of the relevant manual(s). Improper programming of a device can lead to unexpected, undesirable, or unsafe operation or performance of the device. This may result in damage to equipment or personal injury. Company shall not be liable for economic loss, property damage, or other consequential damages or physical injury sustained by the purchaser or by any third party as a result of such programming. Company neither assumes nor authorizes any other person to assume for Company any other liability in connection with the sale or use of this product.

For information on Magnetek's product warranties by product type, please visit www.magnetek.com.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

WARNINGS and CAUTIONS

Throughout this document WARNING and CAUTION statements have been deliberately placed to highlight items critical to the protection of personnel and equipment.

WARNING – A warning highlights an essential operating or maintenance procedure, practice, etc. which if not strictly observed, could result in injury or death of personnel, or long term physical hazards. Warnings are highlighted as shown below:

CAUTION – A caution highlights an essential operating or maintenance procedure, practice, etc. which if not strictly observed, could result in damage to, or destruction of equipment, or loss of functional effectiveness. Cautions are highlighted as shown below:

WARNINGS and CAUTIONS SHOULD NEVER BE DISREGARDED

The safety rules in this section are not intended to replace any rules or regulations of any applicable local, state, or federal governing organizations. Always follow your local lockout and tagout procedure when maintaining any radio equipment. The following information is intended to be used in conjunction with other rules or regulations already in existence. It is important to read all of the safety information contained in this section before installing or operating the Radio Control System.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

2. CRITICAL INSTALLATION CONSIDERATIONS

WARNING

PRIOR TO INSTALLATION AND OPERATION OF THIS EQUIPMENT, READ AND DEVELOP AN UNDERSTANDING OF THE CONTENTS OF THIS MANUAL AND THE OPERATION MANUAL OF THE EQUIPMENT OR DEVICE TO WHICH THIS EQUIPMENT WILL BE INTERFACED. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

FOLLOW YOUR LOCAL LOCKOUT TAGOUT PROCEDURE BEFORE MAINTAINING ANY REMOTE CONTROLLED EQUIPMENT. ALWAYS REMOVE ALL ELECTRICAL POWER FROM THE EQUIPMENT BEFORE ATTEMPTING ANY INSTALLATION PROCEDURES. DE-ENERGIZE AND TAGOUT ALL SOURCES OF ELECTRICAL POWER BEFORE TOUCH-TESTING ANY EQUIPMENT. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

AFTER INSTALLATION BE SURE TO VERIFY THAT THE TRANSMITTER IS NOT INTERFERING WITH OTHER EQUIPMENT IN THE AREA. ALSO VERIFY THAT OTHER EQUIPMENT IS NOT INTERFERING WITH THE TRANSMITTER AND ITS ASSOCIATED EQUIPMENT. FAILURE TO FOLLOW THESE WARNINGS COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

2.1 GENERAL

Radio controlled equipment operates in several directions. Quite frequently, the equipment is operated in areas where people are working in close proximity to the equipment. **The operator must exercise extreme caution at all times.** Workers must constantly be alert to avoid accidents. The following recommendations have been included to indicate how careful and thoughtful actions may prevent injuries, damage to equipment, or even save a life.

2.2 PERSONS AUTHORIZED TO OPERATE RADIO CONTROLLED EQUIPMENT

Only properly trained persons designated by management should be permitted to operate radio controlled equipment.

Radio controlled equipment should not be operated by any person who cannot read or understand signs, notices and operating instructions that pertain to the equipment.

Radio controlled equipment should not be operated by any person with insufficient eyesight or hearing or by any person who may be suffering from a disorder or illness, is taking any medication that may cause loss of equipment control, or is under the influence of alcohol or drugs..

2.3 SAFEY INFORMATION AND RECOMMENDED TRAINING FOR RADIO CONTROLLED EQUIPMENT OPERATORS

Anyone being trained to operate radio controlled equipment should possess as a minimum the following knowledge and skills before using the radio controlled equipment.

<u>The operator should:</u>

- have knowledge of hazards pertaining to equipment operation
- have knowledge of safety rules for radio controlled equipment

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

- have the ability to judge distance of moving objects
- know how to properly test prior to operation
- be trained in the safe operation of the radio transmitter as it pertains to the equipment being operated
- have knowledge of the use of equipment warning lights and alarms
- have knowledge of the proper storage space for a radio control transmitter when not in use
- be trained in transferring a radio control transmitter to another person
- be trained how and when to report unsafe or unusual operating conditions
- test the transmitter emergency stop and all warning devices prior to operation; testing should be done on each shift, without a load
- be thoroughly trained and knowledgeable in proper and safe operation of the equipment that utilizes the radio control
- know how to keep the operator and other people clear of hazardous areas
- know and follow the local lockout and tagout procedures when servicing radio controlled equipment
- know and follow all applicable operating and maintenance manuals, safety procedures, regulatory requirements, and industry standards and codes

The operator shall not:

- operate the equipment if the direction of travel or function engaged does not agree with what is indicated on the controller
- operate any damaged or malfunctioning equipment
- change any settings or controls without authorization and proper training
- remove or obscure any warning or safety labels or tags
- leave power on the radio controlled equipment when the equipment is not in operation
- operate any equipment using a damaged controller because the unit may be unsafe
- operate manual motions with other than manual power
- operate radio controlled equipment when low battery indicator is on

WARNING

THE OPERATOR SHOULD NOT ATTEMPT TO REPAIR ANY RADIO CONTROLLER. IF ANY PRODUCT PERFORMANCE OR SAFETY CONCERNS ARE OBSERVED, THE EQUIPMENT SHOULD IMMEDIATELY BE TAKEN OUT OF SERVICE AND BE REPORTED TO THE SUPERVISOR. DAMAGED AND INOPERABLE RADIO CONTROLLER EQUIPMENT SHOULD BE RETURNED TO MAGNETEK FOR EVALUATION AND REPAIR. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

2.4 TRANSMITTER UNIT

Transmitter switches should never be mechanically blocked ON or OFF. When not in use, the operator should turn the transmitter OFF. A secure storage space should be provided for the transmitter unit, and the transmitter unit should always be placed there when not in use. This precaution will help prevent unauthorized people from operating the material handling equipment.

Spare transmitters should be stored in a secure storage space and only removed from the storage space after the current transmitter in use has been turned OFF, taken out of the service area and secured.

2.5 PRE-OPERATION TEST

At the start of each work shift, or when a new operator takes control of the equipment, operators should do, as a minimum, the following steps before making lifts with any equipment:

Test all warning devices.

Test all functions.

Test the transmitter machine stop.

2.6 HANDLING BATTERIES

WARNING

KNOW AND FOLLOW PROPER BATTERY HANDLING, CHARGING AND DISPOSAL PROCEDURES. IMPROPER BATTERY PROCEDURES CAN CAUSE BATTERIES TO EXPLODE OR DO OTHER SERIOUS DAMAGE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

Use only batteries approved by Magnetek for the specific product.

Do not dispose of a battery pack in fire; it may explode.

Do not attempt to open the battery pack.

Do not short circuit the battery.

Keep the battery pack environment cool during storage (i.e., not in direct sunlight or close to a heating source).

2.7 OPTIONAL RECHARGEABLE BATTERY CHARGING

For those transmitters equipped with rechargeable batteries and battery chargers, all users shall be familiar with the instructions of the charger before attempting to use.

Do not attempt to charge non-rechargeable battery packs in the charger.

Avoid charging partially discharged rechargeable batteries to help prolong battery cycle life.

GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

Do not charge batteries in a hazardous environment.

Keep the battery pack environment cool during charging (i.e., not in direct sunlight or close to a heating source).

Do not short the charger.

Do not attempt to charge a damaged battery.

Use only Magnetek approved chargers for the appropriate battery pack.

Do not attempt to use a battery that is leaking, swollen or corroded.

Charger units are not intended for outdoor use. Only use charger units indoors.

2.8 BATTERY DISPOSAL

Before disposing of batteries consult local and governmental regulatory requirements for proper disposal procedure.

2.9 CRANE/LIFTING DEVICE SPECIFIC WARNINGS

WARNING

ALL EQUIPMENT MUST HAVE A MAINLINE CONTACTOR INSTALLED AND ALL TRACKED CRANES, HOISTS, LIFTING DEVICES AND SIMILAR EQUIPMENT MUST HAVE A BRAKE INSTALLED. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

AN AUDIBLE AND/OR VISUAL WARNING MEANS MUST BE PROVIDED ON ALL REMOTE CONTROLLED EQUIPMENT AS REQUIRED BY CODE, REGULATION, OR INDUSTRY STANDARD. THESE AUDIBLE AND/OR VISUAL WARNING DEVICES MUST MEET ALL GOVERNMENTAL REQUIREMENTS. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

THE DIRECT OUTPUTS OF THIS PRODUCT ARE NOT DESIGNED TO INTERFACE DIRECTLY TO TWO STATE SAFETY CRITICAL MAINTAINED FUNCTIONS, I.E., MAGNETS, VACUUM LIFTS, PUMPS, EMERGENCY EQUIPMENT, ETC. A MECHANICALLY LOCKING INTERMEDIATE RELAY SYSTEM WITH SEPARATE POWER CONSIDERATIONS MUST BE PROVIDED. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH OR DAMAGE TO EQUIPMENT.

Cranes, hoists, lifting devices and other material handling equipment can be large, and operate at high speeds.

<u>The operator should:</u>

- continuously watch and monitor status of lifted loads
- know and follow cable and hook inspection procedures

<u>The operator shall not:</u>

- lift or move more than the rated load

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

- use the crane, hoist or lifting device to lift, support or transport people
- lift or carry any loads over people
- operate the crane, hoist or lifting device unless all persons, including the operator, are and remain clear of the supported load and any potential pinch points
- operate a crane, hoist or lifting device when the device is not centered over the load
- operate a crane, hoist or lifting device if the chain or wire rope is not seated properly in the sprockets, drum or sheave
- leave any load unattended while lifted

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

3. MINI-MBT STANDARD CONFIGURATION AND OPERATION

WARNING

BEFORE OPERATING THE TRANSMITTER, FAMILIARIZE YOURSELF WITH ALL SAFETY INFORMATION IN THIS MANUAL, THE CORRESPONDING RECEIVER SYSTEM MANUAL, APPROPRIATE MANUAL SUPPLEMENTS AND ANY OTHER LOCAL, STATE, OR FEDERAL RULES OR REGULATIONS ALREADY IN EXISTENCE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

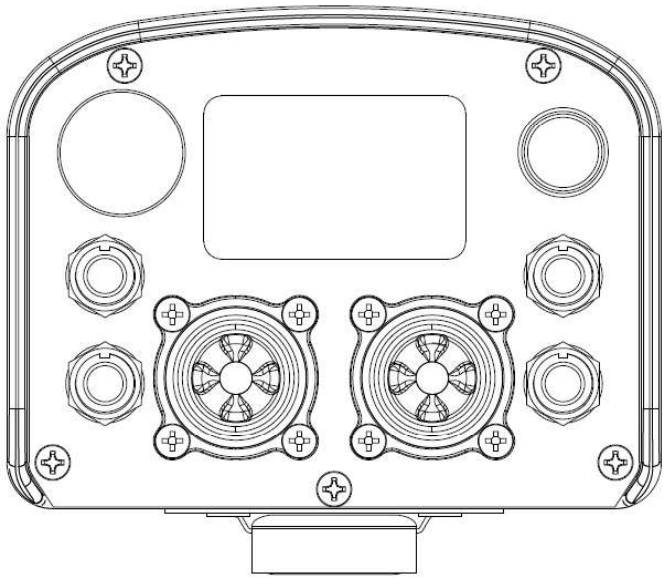


Figure 1: Typical Mini-MBT Configuration

GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

3.1 INSTALLING THE BATTERY PACK

Prior to utilizing the Mini-MBT transmitter, the battery pack must be installed.

3.1.1 Alkaline Battery Pack (BT151-0)

The Mini-MBT comes standard with a battery pack (BT151-0) that holds four disposable AA alkaline batteries.

Figure 2: BT151-0 Battery Pack

To change the alkaline batteries in the battery pack, unscrew the four screws holding the battery pack in the transmitter. Then remove the battery pack from the transmitter. The batteries can then be replaced with new ones.

When reinserting the battery pack into the transmitter, be sure that the screws align with the screw holes. Then screw the battery pack back into the transmitter.

Figure 3: Installation of Battery Pack into Mini-MBT transmitter

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

3.1.2 Optional NiMH Rechargeable Battery Pack (BT150-0)

The rechargeable battery pack BT150-0 is a sealed pack that has no user-serviceable components within it.

Figure 4: BT150-0 Battery Pack

The rechargeable battery pack BT150-0 is shipped from the factory with a minimal charge and will need to be charged prior to use for the first time with the specified charger.

To charge the battery, remove the battery pack from the transmitter. Connect the battery pack to the provided wall power adapter through the micro-USB port. Plug the wall power adapter into a power socket on the wall and charging will begin. Not using the provided wall power adapter, or one that cannot provide 1.8-2.0A at 5V, may cause the charging process to not complete correctly or in a timely manner; furthermore, **this may damage the batteries.** Do not attempt to charge this battery pack through a USB port on a computer.

One bi-colored status LED provides the current state of the charging process:

- Solid red and green indicate that charging is in progress
- Solid green indicates that charging is complete
- Solid red indicates an error

NOTE: When utilizing the optional tether mode on the Mini-MBT transmitter, the battery packs will not be recharged from the tether power feed. The rechargeable battery pack only can be recharged using the specified charger.

When reinserting the battery pack into the transmitter, be sure that the screws align with the screw holes. Then screw the battery pack back into the transmitter.

3.2 TURNING THE TRANSMITTER ON AND OFF

The Mini-MBT can have different methods of turning the unit on depending upon how the unit was ordered. Sections 3.2.1, 3.2.2 and 3.2.3 explain how to turn on the unit for each configuration. Initialization of the transmitter will be different depending upon whether or not a display is present. Sections 3.2.4 and 3.2.5 explain the initialization process with and without a display present.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

3.2.1 Machine Stop and START Push Button

1. Ensure the Machine Stop is in the raised (pulled out) position.
2. After the unit has initialized (refer to Sections 3.2.4 and 3.2.5 for initialization), press the START push button to enable communication with the receiver.

3.2.2 Machine Stop and ON-OFF-START Toggle

1. Ensure the Machine Stop is in the raised (pulled out) position.
2. Move the ON-OFF-START toggle to the ON position.
3. After the unit has initialized (refer to Sections 3.2.4 and 3.2.5 for initialization), press the ON-OFF-START toggle to the START position to enable communication with the receiver.

3.2.3 Machine Stop, ON-OFF Toggle, START Push Button

1. Ensure the Machine Stop is in the raised (pulled out) position.
2. Move the ON-OFF toggle to the ON position.
3. After the unit has initialized (refer to Sections 3.2.4 and 3.2.5 for initialization), press the START push button to enable communication with the receiver.

Figure 5: Machine Stop Switch and START push button

3.2.4 Transmitter Initialization (with Standard Status LED Indicator)

Upon turning the transmitter on, the Status LED lights up as a solid green color. Following the Status LED turning on and illuminating green, the unit will perform a routine initialization.

During initialization, the Mini-MBT scans for any switches or motions that may be on during power up. If any switches or motions are on, the failure will be displayed as a solid red Status LED, and the Mini-MBT will power itself down.

After a successful initialization, the Mini-MBT will enter normal operation mode and display the normal operating status LED indications. See Section 3.6 for more information on the normal operation mode with standard status LED.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

3.2.5 Transmitter Initialization (with Optional Graphic User Interface Screen)

Upon turning the transmitter on, the LCD screen turns on and the unit will perform a routine initialization.

During initialization, the Mini-MBT scans for any switches or motions that may be on during power up. If any switches or motions are on, the failure will be shown on the display, and the Mini-MBT will power itself down.

After a successful initialization, the Mini-MBT will enter the Normal Operation Mode and display the normal operating screen. See Section 3.7 for more information on the Normal Operation Mode with Optional Graphic User Interface.

NOTE: Holding the START toggle or button in the START position for more than 5 seconds will put the device into Setup Mode. For normal use release the START toggle once the display turns on. See Section 4.2 for more information on the Setup Mode.

3.2.6 Turning Off the Transmitter

The transmitter can be turned off by pressing the OFF-ON-START toggle switch down to the OFF position. Once turned off, the MLC relay in the receiver is immediately opened.

NOTE: If the unit has a standard status LED, it will illuminate a solid red color during the transmitter's power down process. Once the power down process is complete, the transmitter will turn off and the status LED will not be on.

NOTE: Depressing the Machine Stop switch will also turn the transmitter off and open the Machine Stop relay in the receiver. See Section 3.3 for more information on the Machine Stop switch.

3.3 MACHINE STOP SWITCH (FOR EMERGENCY STOPPING ONLY)

When depressed, the Machine Stop relay in the receiver is immediately opened.

Under normal operating conditions, the Machine Stop switch must be in the raised position or the transmitter and system will not operate.

NOTE: The Machine Stop Switch is to be used for emergency stopping only, not for normal system shut down, unless it is specifically configured in that manner.

3.4 STATUS AND BATTERY LEDS

The standard Mini-MBT transmitter includes a status LED to let the operator know that the unit is functioning and a battery LED to indicate when the battery level is low.

3.5 OPTIONAL GRAPHIC USER INTERFACE

The optional LCD screen provides visual information during the operation of the Mini-MBT transmitter. It is used to change configuration settings, confirm commands being operated, provide two-way feedback, and display transmitter diagnostic information such as battery life and signal strength.

The optional graphic user interface replaces the standard status and battery LEDs when ordered.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

3.6 NORMAL OPERATING MODE WITH STANDARD LEDS

3.6.1 Watch Dog Indicator (Steady Blinking Status LED)

The blinking LED represents the watch dog timer within the CPU of the unit.

NOTE: The LED should be continuously blinking at all times. If the LED is not blinking the transmitter will need to be rebooted to operate properly.

3.6.2 Switch Change Indicator (Rapidly Blinking Status LED)

When a switch is actuated or a switch status changes, the status LED will blink rapidly during the change.

NOTE: If a joystick, rotary switch or auxiliary switch is held in position or latched, the status LED will return to the steady watch dog indicator blinking state.

3.6.3 Low Battery Level Indicator (Blinking Red Battery LED)

When the battery level drops below 10% the battery LED will turn red.

3.7 NORMAL OPERATING MODE WITH OPTIONAL GRAPHIC USER INTERFACE

In normal operating mode, the Mini-MBT displays real time information relating to the operation of the transmitter on the graphic user interface. Information may include Command Confirmation, Battery Life, Signal Strength, Two-Way Feedback, etc.

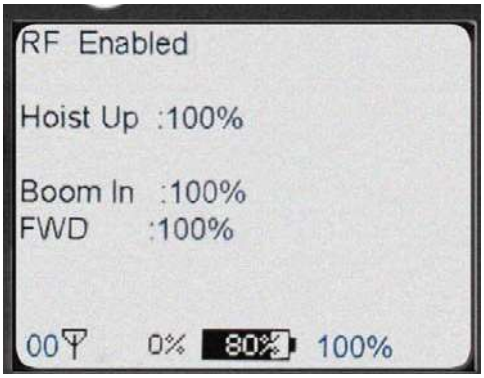


Figure 6: Normal operating screen on graphic user interface

3.7.1 Watch Dog Indicator (Sweeping Dot)

The Watch Dog Indicator is located on the far right of the bottom status line of the Mini-MBT graphic user interface screen. The 4 pixel sweeping dot will start in the right corner of the screen, moving toward the upper left corner of the screen, stopping while still on the bottom line, and then return to the right corner of the screen. The watch dog indicator should always be moving, but will move at different rates.

NOTE: The dot should be continuously sweeping at all times. If the dot is stationary (not sweeping), the transmitter needs to be power-cycled to operate properly.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

3.7.2 Command Confirmation

Each time the user operates a control on the transmitter, a message will be displayed on the graphic user interface screen confirming what is being operated.

3.7.3 Battery Life Indicator

Remaining battery life is displayed on the bottom of the graphic user interface screen.

Battery life is displayed in 10% increments.

3.7.4 Signal Strength Indicator

The Signal Strength Indicator shows the radio signal strength at the receiver.

The Signal Strength Indicator is only available in systems equipped for Two-Way feedback (systems utilizing the 433 MHz frequency band do not have Two-Way feedback available). For such systems, Signal Strength is displayed at the bottom right hand corner of the graphic user interface screen.

3.7.5 Two-Way Feedback System

This option allows the user to view various parameters that may be important to the operation of the equipment on the graphic user interface display screen.

Parameters such as engine RPM, the torque or speed of a drive, temperature, current, or any other useful values can be sent from the receiver and displayed on the transmitter.

NOTE: Systems utilizing the 433 MHz frequency band do NOT have Two-Way feedback available.

3.8 JOYSTICKS AND PADDLES/LEVERS

To activate the desired motor functions, operate the Joystick or Paddle/Lever that corresponds to the desired motion.

To activate higher speed functions for those transmitter models so equipped, operate the Joystick or Paddle/Lever further to activate the desired speed.

3.9 ROTARY SELECTOR SWITCH

The rotary selector switch can be used to select various modes of operation.

A rotary switch can have 2 to 12 positions to select from.

3.10 AUXILIARY SWITCHES

These switches activate special function relays that control items such as grab attachments, magnets, lights, and etc.

The auxiliary switches can be momentary or latched.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

4. TRANSMITTER SETUP

The transmitter may have settings changed one of three ways.

The RF channel and access code can be programmed using the IR configuration link with a compatible receiver. All other settings can only be changed at the factory or with the optional RCP software.

For units with the optional graphic user interface, the Setup Mode can be used to edit configuration settings such as: Access Code, Channel Select, User Code, Transmitter Time Out, Backlight Time Out, Password Enable, Change Password, and more. The settings can also be changed with the optional RCP software.

4.1 TRANSMITTER SETUP SETTINGS WITH STANDARD STATUS LED

The access code and channel can be changed using the IR configuration receiver link with a compatible receiver (contact the factory to determine if your receiver is compatible).

4.1.1 IR Configuration Receiver

IR Cfg Recv function allows the transmitter to link to a compatible receiver by using IR (contact the factory to determine if your receiver is compatible) and automatically set up the channel and access code to match the linked compatible receiver.

4.1.1.1 IR Configuration Receiver on Transmitters Equipped with Separate Power/Status and Battery LED Indicators

To utilize the IR configuration receiver function and link to a compatible receiver, push the OFF-ON-START toggle to the START position and hold for more than 5 seconds. When the transmitter successfully enters the IR configuration mode, the Power/Status and Battery LED(s) will blink alternately continuously. After the LEDs are blinking alternately, point the IR window of the transmitter at the desired receiver to control and momentarily press the OFF-ON-START toggle to the START position and release.

If the link is successful, the LEDs will stop blinking and the transmitter will shut down. The new settings obtained from the IR configuration function will take effect upon the next power cycle of the transmitter.

If the link is unsuccessful with a compatible receiver, the Power/Status and Battery LED(s) will continue to blink alternately.

To cancel the IR configuration receiver without a successful link, move the OFF-ON-START toggle to the OFF position.

4.1.1.2 IR Configuration Receiver on Transmitters Equipped with Single Status/Battery LED Indicator

To utilize the IR configuration receiver function and link to a compatible receiver, push the OFF-ON-START toggle to the START position and hold for more than 5 seconds. When the transmitter successfully enters the IR configuration mode, the Status/Battery LED will blink continuously. After the LED is blinking, point the IR window of the transmitter at the desired receiver to control and momentarily press the OFF-ON-START toggle to the START position and release.

If the link is successful, the LED will stop blinking and the transmitter will shut down. The new settings obtained from the IR configuration function will take effect upon the next power cycle of the transmitter.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

If the link is unsuccessful with a compatible receiver, the Status/Battery LED will continue to blink.

To cancel the IR configuration receiver without a successful link, move the OFF-ON-START toggle to the OFF position.

4.2 USING THE TRANSMITTER IN SETUP MODE (WITH OPTIONAL GRAPHIC USER INTERFACE)

NOTE: The Setup Mode is only accessed on transmitters equipped with the optional graphic user interface. The units equipped with the standard status LED can only have the settings of the transmitter changed at the factory or by using the optional RCP software.

The Setup Mode can be used to edit configuration settings such as: Access Code, Channel Select, User Code, Transmitter Time Out, Backlight Time Out, Password Enable, Change Password, and more.

NOTE: Parameter changes will not take effect until the user has selected 'Save and Exit' from the Setup Mode.

4.2.1 Entering Setup Mode

To enter the Setup Mode, first make sure the unit is OFF and the Machine Stop switch is raised. Next, push the OFF-ON-START toggle switch to the START position and hold it in the START position for more than 5 seconds until the setup screen appears.

The user will see a prompt for a four digit password if the password feature is enabled. If no password is enabled, then the adjustments in Section 4.2.2 will be available with no further input required from the user.

NOTE: The password feature is enabled by default from the factory.

Use the Joystick/Paddle to increment/decrement the value and toggle to the START position when finished. If the password is entered correctly, the device will enter Setup Mode. If it is entered incorrectly, the device will power down.

*NOTE: The factory default password to get into the setup menu is **0000**.*

4.2.2 Adjusting Settings in Setup Mode

To navigate through Setup Mode, the Joystick/Paddle designated (MTN 1) and OFF-ON-START switch are used. The Joystick/Paddle cycles through the menus and is also used to change parameters within the menus. Pushing the OFF-ON-START switch to the START position will toggle between the menu and its parameter(s). When adjusting larger values, the speed is dependent on how far the Joystick/Paddle is depressed.

NOTE: No parameter changes will take effect until the user has selected 'Save and Exit' from the Setup Mode.

4.2.2.1 Access Code

The Access Code determines which receiver will be controlled by the transmitter.

The Access Code in the Mini-MBT transmitter must match the receiver Access Code or dip switches.

If the Access Codes settings on the receiver and transmitter do not match, no communication will occur.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

The Access Code is a 20-bit binary value with a decimal equivalent of 0 - 1048575. It will be displayed as binary or decimal depending on the application.

4.2.2.2 Channel Select

The Channel Select setting determines the frequency that the Mini-MBT is operating on.

The user can select channels which correspond to the frequencies in Section 6.

4.2.2.3 RF Power

The RF Power setting determines the RF output of the transmitter.

The user can select values of “Min Power”, “1/4 Power”, “1/2 Power”, and “Max Power”.

If Setup Mode is entered using the sequence in Section 4.2.1, then the value entered into this parameter will be used after selecting ‘*Save And Exit*’ from the Setup Mode menu without having to restart the Mini-MBT.

4.2.2.4 Transmitter Timeout

This setting controls the amount of time that the transmitter can be inactive before it automatically shuts off.

The Timeout time can be set from 1 to 60 minutes.

When the unit times out, the transmitter will turn off.

Setting Timeout to 0 disables transmitter timeout.

WARNING

DO NOT ASSUME THE POWER IS OFF IN THE RECEIVER BECAUSE THE TRANSMITTER IS TURNED OFF. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

4.2.2.5 Backlight Power %

The Backlight Power percentage setting controls the brightness of the backlight on the Mini-MBT transmitter.

The Backlight Power can be set from ‘*Backlight Off*’ (0%) to 100%, in 5% increments.

If ‘*Save and Exit’* is selected from the setup menu after changing this parameter, it will immediately take effect.

4.2.2.6 Backlight Timeout

The Backlight timeout setting controls the amount of time that the backlight will stay on after a command is pressed before it automatically shuts off.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

Backlight Timeout can be set from 1 to 30 seconds.

Setting Timeout to disable will disable the backlight.

Setting Timeout to “always on” sets the backlight to be on continuously while the transmitter is on and active.

NOTE: Leaving the backlight on longer will decrease the battery run time and will require more frequent battery replacement (or recharges for optional rechargeable battery packs).

4.2.2.7 Set Clock

This sets the system clock for the Mini-MBT unit. The clock is set in the following format:

10/01/12 13:12:11

MM/DD/YY hh:mm:ss

If ‘*Save and Exit’* is selected from the setup menu after changing this parameter, it will immediately take effect.

4.2.2.8 Password Enable

This setting enables or disables the requirement of entering a password into the transmitter to enter Setup Mode.

When the disabled setting is selected the user will go directly into Setup Mode without being prompted to enter a password.

Magnetek strongly recommends enabling the Setup Mode password setting to prevent unauthorized or accidental changes to parameters.

NOTE: The unit is shipped with the password requirement enabled and utilizing the factory default password.

4.2.2.9 Change Password

This allows the user to change the password needed to enter the Setup Mode.

The password must consist of 4 digits.

4.2.2.10 IR Configuration Receiver

IR Cfg Recv function in the setup allows the transmitter to link to a compatible receiver by using IR (contact the factory to determine if your receiver is compatible) and automatically set up the channel and access code to match the linked compatible receiver.

Figure 7: Mini-MBT IR Window

After selecting this option, point the IR window located on the bottom of the transmitter (as seen in Figure 7) at the desired receiver to control and momentarily press the OFF-ON-START toggle to the START

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

position and release. The graphic user interface will display “Attempting” with a countdown of the time while scanning for the receiver’s IR signal. If the receiver is in range and IR link is made, the message will change to “Success”. The transmitter and receiver should be within one foot of each other to ensure successful exchange of information via IR.

NOTE: The changes to the transmitter’s channel configuration and access code will not be saved until the operator selects the Save and Exit option to exit the Setup Mode.

If the receiver is not in range, the scan will time out and the graphic user interface will display “Failed”. The operator can reposition the transmitter and reattempt to establish the IR link with the receiver by toggling the START position on the OFF-ON-START toggle multiple times.

NOTE: The access code and channel will not be updated to match the desired receiver until “Success” is displayed. Once “Success” is displayed, subsequent “Failed” messages will not overwrite the access code and channel obtained in the successful IR link until a new successful IR link is made.

The IR configuration function will only update channel and access code information if the receiver and transmitter are programed at the factory with the same project identification number. If the receiver/transmitter pairing is not programmed with the same project identification number, the graphic user interface will display “Err Project ID” when an IR link is attempted. The IR link will not be successful and the access code and channel information in the transmitter will not be changed.

If the receiver and transmitter IR pair are not operating in the same frequency band when an IR link is attempted, the graphic user interface will display “Err RF Freq”. The IR link will not be successful and the access code and channel information in the transmitter will not be changed.

4.2.2.11 Exit Without Save

If the user does not wish to save any of the configuration changes made, the Exit Without Save option can be selected.

NOTE: None of the changes will be saved upon selection of this option. The transmitter will start up with the last saved configuration settings.

4.2.2.12 Save and Exit

Selection of this option saves all changes and exits the Setup Mode.

Upon exit, the device will start up with the new configuration settings.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

5. OPTIONAL PROGRAMMING WITH RCP

Using the optional RCP software makes programming of the Mini-MBT easier and allows for settings to be saved for future reference.

WARNING

THE USE OF RCP (RADIO CONTROL PROGRAMMER) IS INTENDED FOR USE BY AUTHORIZED PERSONS ONLY. CHANGES TO ANY RADIO DATA VALUE MAY LEAD TO UNEXPECTED, UNDESIRABLE, OR UNSAFE OPERATION OF EQUIPMENT AND FURTHERMORE MAY LEAD TO EQUIPMENT DAMAGE, PERSONAL INJURY, OR EVEN DEATH. ALL EQUIPMENT OPERATORS AND/OR PERSONNEL SHOULD BE NOTIFIED OF ANY RADIO DATA VALUE CHANGES THAT MAY AFFECT OPERATION.

5.1 ACCESS CODES

The receiver and transmitter must be programmed with the same access code to properly communicate with each other.

WARNING

TWO OPERATIONAL TRANSMITTERS WITH THE SAME ACCESS CODES OPERATING AT THE SAME TIME IS A DEFINITE SAFETY HAZARD. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

5.2 CHANGING RECIEVER ACCESS CODES

Receiver Access Code Programming. For detailed instructions on setting parameters including access codes, see the “Programming” section of the applicable receiver manual.

WARNING

AFTER CHANGING THE ACCESS CODES ON THE TRANSMITTER, TEST THE UNIT BY TURNING IT ON AND OFF NEAR THE APPROPRIATE RECEIVER. IF THE RECEIVER DOES NOT RESPOND, DO NOT ACTIVATE A FUNCTION BUTTON! THE TRANSMITTER MAY HAVE THE WRONG ACCESS CODE, WHICH COULD MOVE OTHER EQUIPMENT. RE-CHECK THE ACCESS CODE IN THE TRANSMITTER AND RETEST. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH, AND DAMAGE TO EQUIPMENT.

WARNING

THE ACCESS CODES IN THE RECEIVER ARE UNIQUE AND FACTORY PRESET. DO NOT CHANGE THESE ACCESS CODES UNLESS YOU ARE REPLACING AN EXISTING RECEIVER AND ITS ACCESS CODE. CHANGING THIS CODE COULD MAKE IT COMMON WITH ANOTHER RECEIVER ACCESS CODE, WHICH COULD MOVE OTHER EQUIPMENT. NO TWO SYSTEMS IN ANY LOCATION SHOULD EVER HAVE THE SAME ACCESS CODES INDEPENDENT OF THE FREQUENCY. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH, AND DAMAGE TO EQUIPMENT.

5.3 CONNECTING THE MINI-MBT TO A COMPUTER

The Mini-MBT transmitter contains circuits that permit communication with a computer system via USB. The USB mini-B plug is located through the IR/USB port window as detailed in Section 3.1.3.

Figure 8: USB mini-B receptacle as viewed through USB/IR port

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

When plugging in the transmitter to a computer system, the transmitter batteries must be installed. The USB circuit does not provide power to the transmitter. Magnetek highly recommends using a fully charged battery pack when using USB and RCP with the transmitter.

5.4 CONFIGURATION WITH RCP

Refer to the RCP Users Guide for information on configuring the Mini-MBT with RCP.

GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

6. TRANSMITTER CHANNEL CONFIGURATION SETTINGS

The RF channel can be set via the setup mode or the optional RCP software on systems equipped with the optional graphic user interface. Sections 6.2 through 6.6 show the channels and protocols available for each transmitter radio frequency option.

6.1 FCC STATEMENTS

Compliance Statement (Part 15.19)

This device complies with Part 15 of 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.

Warning (Part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance should void the user's authority to operate the equipment.

This portable transmitter with its antenna complies with FCC's RF exposure limits for general population/uncontrolled exposure.

GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

6.2 433MHZ CHANNEL SET

Channel	Frequency
01	433.000 MHz
02	433.050 MHz
03	433.100 MHz
04	433.150 MHz
05	433.200 MHz
06	433.250 MHz
07	433.300 MHz
08	433.350 MHz
09	433.400 MHz
10	433.450 MHz
11	433.500 MHz
12	433.550 MHz
13	433.600 MHz
14	433.650 MHz
15	433.700 MHz
16	433.750 MHz
17	433.800 MHz
18	433.850 MHz
19	433.900 MHz
20	433.950 MHz
21	434.000 MHz
22	434.050 MHz
23	434.100 MHz
24	434.150 MHz
25	434.200 MHz
26	434.250 MHz
27	434.300 MHz
28	434.350 MHz
29	434.400 MHz
30	434.450 MHz
31	434.500 MHz
32	434.550 MHz

GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

6.3 433 MHZ TELEMOTIVE LEGACY CHANNEL SET: TMS AND TDMA

Channel Count	Channel Designator	Frequency
01)	AK01	439.8 MHz
02)	AK02	439.6 MHz
03)	AK03	439.4 MHz
04)	AK04	439.2 MHz
05)	AK05	439.0 MHz
06)	AK06	438.8 MHz
07)	AK07	438.6 MHz
08)	AK08	438.4 MHz
09)	AK09	438.2 MHz
10)	AK10	438.0 MHz
11)	AK11	437.8 MHz
12)	AK12	437.6 MHz
13)	AK13	437.4 MHz
14)	AK14	437.2 MHz
15)	AK15	437.0 MHz
16)	AK16	436.8 MHz
17)	AK17	436.6 MHz
18)	AK18	436.4 MHz
19)	AK19	436.2 MHz
20)	AK20	436.0 MHz
21)	AKA00	433.125 MHz
22)	AKA01	433.325 MHz
23)	AKA02	433.525 MHz
24)	AKA03	433.725 MHz
25)	AKA04	433.925 MHz
26)	AKA05	434.125 MHz
27)	AKA06	434.325 MHz
28)	AKA07	434.525 MHz
29)	AKA08	434.725 MHz
30)	AK38	432.4 MHz
31)	AK50	430.0 MHz

GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

6.4 419MHZ CHANNEL SET

Channel	Frequency	Channel	Frequency
1*	418.950	**44**	417.500
2*	418.975	**45**	417.550
3*	419.000	**46**	417.600
4*	419.025	**47**	417.650
5*	419.050	**48**	417.700
6*	419.075	**49**	417.750
7*	419.100	**50**	417.800
8*	419.125	**51**	417.850
9*	419.150	**52**	417.900
10*	419.175	**53**	417.950
11*	419.200	**54**	418.000
12*	419.250	**55**	418.050
13*	419.275	**56**	418.100
14	416.000	**57**	418.150
15	416.050	**58**	418.200
16	416.100	**59**	418.250
17	416.150	**60**	418.300
18	416.200	**61**	418.350
19	416.250	**62**	418.400
20	416.300	**63**	418.450
21	416.350	**64**	418.500
22	416.400	**65**	418.550
23	416.450	**66**	418.600
24	416.500	**67**	418.650
25	416.550	**68**	418.700
26	416.600	**69**	418.750
27	416.650	**70**	418.800
28	416.700	**71**	418.850
29	416.750	**72**	418.900
30	416.800	**73**	419.350
31	416.850	**74**	419.400
32	416.900	**75**	419.450
33	416.950	**76**	419.500
34	417.000	**77**	419.550
35	417.050	**78**	419.600
36	417.100	**79**	419.650
37	417.150	**80**	419.700
38	417.200	**81**	419.750
39	417.250	**82**	419.800
40	417.300	**83**	419.850
41	417.350	**84**	419.900
42	417.400	**85**	419.950
43	417.450		

*NOTE: Channels marked with * are approved for use in China*

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

6.5 900 MHZ CHANNEL SET

Channel	Frequency
1	903.30 MHz
2	906.30 MHz
3	907.80 MHz
4	909.30 MHz
5	912.30 MHz
6	915.30 MHz
7	919.80 MHz
8	921.30 MHz
9	902.30 MHz
10	904.10 MHz
11	904.30 MHz
12	905.10 MHz
13	905.50 MHz
14	905.70 MHz
15	906.60 MHz
16	908.70 MHz
17	908.90 MHz
18	909.10 MHz
19	910.10 MHz
20	910.70 MHz
21	911.00 MHz
22	911.20 MHz
23	912.00 MHz
24	914.20 MHz
25	914.40 MHz
26	914.60 MHz
27	914.80 MHz
28	915.80 MHz
29	917.40 MHz
30	923.20 MHz
31	927.00 MHz
32	927.30 MHz

6.6 2.4 GHZ: FHSS

Channel sets are designated between 1 and 32. The frequency range is between 2402-2478 MHz. The frequency hopping protocol does not use one particular frequency to transmit a message; messages are transmitted over multiple frequencies in a predefined sequence or channel set. In doing so, this protocol is able to compensate for interference that may be present on a single frequency by sending the message across multiple frequencies.

This transmitter is available with optional licensed frequencies per customer request. If utilizing a licensed frequency, please refer to the factory application documentation that was shipped with the receiver or contact the factory for licensed frequency details.

GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

7. OPTIONAL CAN BUS TETHER FEATURE

The Mini-MBT transmitter can be ordered with an optional CAN bus tether feature. This feature allows for the operation of the transmitter as a wired transmitter with no wireless radio transmission. If the Mini-MBT transmitter was ordered with the CAN bus tether feature, this section applies to features and operation of the transmitter in tether mode.

7.1 INSTALLATION OF TETHER CABLE

The tether cable is attached to the CAN connector on the transmitter by lining up the alignment groove and inserting the plug into the CAN connector receptacle. Twist the locking ring on the CAN plug clockwise to tighten it down and prevent accidental disengagement.

7.2 OPERATION OF TRANSMITTER IN TETHER MODE

With the tether cable attached, turn on the transmitter following the startup sequence as outlined in Section 3.2.

During the startup sequence the transmitter will automatically recognize that the tether cable is attached and communicating and switch into tether mode. Tether mode turns off the wireless transmitter and sends all command signals through the tether cable.

If the transmitter has the optional graphic user interface screen installed, visual verification of the transmitter being in tether mode can be observed on the screen.

NOTE: The transmitter must go through the startup initialization sequence with the tether cable attached to activate tether mode.

All controls on the transmitter will function the same regardless of whether the transmitter is in tether mode or wireless mode.

NOTE: While the tether cable provides power to the transmitter when connected, it will not recharge batteries in the transmitter. To recharge batteries, you must only use the Magnetek approved chargers for the appropriate battery pack.

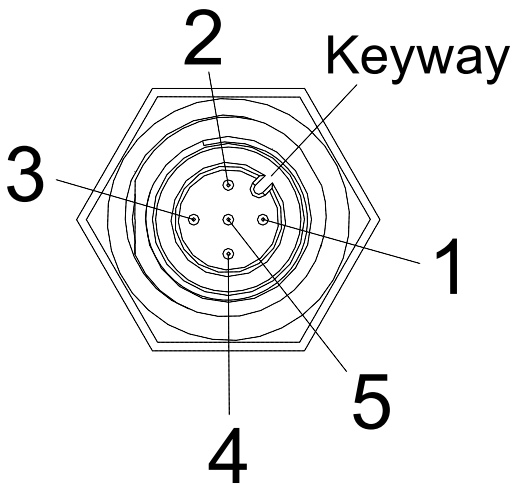
7.3 RETURNING TRANSMITTER TO WIRELESS MODE

To return the transmitter to wireless mode, power down the unit and disconnect the tether cable. Following the startup sequence from Section 3.2, restart the transmitter. The transmitter will automatically sense that it is no longer connected to the tether cable and start the unit in its normal wireless mode.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

7.4 CAN CONNECTOR RECEPTACLE PIN-OUT DETAILS

The CAN connector receptacle located on the transmitter has specific pin assignments. It is very critical that these pin assignments are matched in the CAN cable assembly.



CONNECTOR PINOUT (MALE PIN CONNECTOR)	
5-PIN CONNECTOR	FUNCTION
PIN 1	SHIELD
PIN 2	+12/24VDC
PIN 3	-12/-24VDC (common)
PIN 4	CAN-H
PIN 5	CAN-L

Figure 9: CAN Connector Pin Out details

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

8. GENERAL TROUBLESHOOTING

Problems	Possible Reasons	Suggestions
Transmitter will not turn on	Batteries are dead or installed backwards; battery holder is damaged.	Replace the batteries and confirm they are installed according to the polarity marking in the battery pack. Inspect all battery pack contacts for damage. When installing the battery pack into the MBT, confirm it is installed with the label facing out.
	Transmitter is failing switch scan.	Be sure all switches and motions are in the "off" position on startup. See Section 3.2 for more info.
	Transmitter Machine Stop Switch is down or pressed.	Be sure the Machine Stop switch is pulled up.
Transmitter will not respond with the receiver	Incorrect system RF channel.	Make sure the transmitter and receiver unit are both set to the same RF channel. See Section 4.
	Incorrect system access code.	Make sure the transmitter and receiver both have the same access code. See Section 4.
	System out of range.	Make sure that the startup procedure is initiated within 300 feet from the receiver location. If equipped with the Signal Strength Indicator, make sure the level is greater than 0%.
	The antenna on the receiver is missing, damaged, or improperly installed.	Inspect the antenna on the receiver for damage and try to locate the antenna in a location that is visible when operating the equipment at all times.

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

8.1 TROUBLESHOOTING OPTIONAL TETHER OPERATION

Problems	Possible Reasons	Suggestions
Transmitter will not turn on	The connecting tether cable is not installed, installed improperly, or is damaged.	Inspect the tether cable and confirm that it is installed and secured correctly. Inspect the connector, connector contacts and cable jacket for damage.
	Transmitter is failing switch scan.	Be sure all switches and motions are in the off position on startup. See Section 3.2 for more info.
	Transmitter Machine Stop switch is down or pressed.	Be sure the Machine Stop switch is pulled up.
Transmitter will not respond with the receiver in tether mode	System not in tether mode.	Make sure that the startup procedure is initiated with the tether cable attached. Ensure that all tether cable connections are secure prior to startup.
	The tether cable or connectors are damaged.	Inspect the tether cable and connectors for damage.
	CAN settings are incorrect.	Verify CAN settings match project specific CAN bus document.
Transmitter will not respond with the receiver in wireless mode	System not in wireless mode.	Make sure that the startup procedure is initiated with the tether cable detached. Ensure that the startup procedure is initiated within 300 feet from the receiver location.

8.2 ASSEMBLY AND REPLACEMENT PARTS

If your transmitter ever needs repair, we always recommend that you have Magnetek perform the repair. If you need to refer to a parts list, refer to your transmitter's drawing that was included in the shipment of your transmitter. Please contact Magnetek's service department at 1.866.MAG.SERV for information regarding parts and service.

GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

9. NOTES

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

10. EU DECLARATION OF CONFORMITY

MAGNETEK

EU Declaration of Conformity Certificate

For the following equipment:

Product	:	Mini-PGT/Mini-MBT Radio Remote Control
Product Receiver Models	:	CAN-2, MHR, WIC-2402, inteleSmart2, Flex M
Manufacturer's Name	:	Magnetek, Inc.
Manufacturer's Address	:	N49 W13650 Campbell Drive
		Menomonee Falls, WI 53051 USA

The undersigned hereby declares on behalf of Magnetek, that the above-referenced products, to which this declaration relates, is in conformity with the provisions of CE Mark Directive (93/68/EEC), Machinery Safety Directive (MD) 2006/42/EC, and Radio and Telecommunications Equipment Directive (R&TTE) 1999/5/EC.

The standards relevant for the evaluation of the product referenced above conformity to the directive requirements are as follows:

EN 301 489-1	EN ISO 12100
EN 301 489-3	EN ISO 13849-1 (e-stop conforms to PLd)
EN 300 220-3	EN ISO 13849-2
EN 60204-1	EN 13557
EN 60204-32	EN 60529

The European contact for Magnetek is:

Brian Preston
Magnetek
Unit 3, Bedford Business Centre
Mile Road
Bedford
MK42 9TW
United Kingdom

Per Annex II.B of the Machinery Directive (2006/42/EC):

The machinery, product, assembly or sub-assembly covered by this Declaration of Conformity must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the applicable Directive(s). This statement is only necessary where the product is to be incorporated into a machine or system (e.g. a safety component).

Signature of Authorized Person:

Ben Stoller / Director - Radio Controls
For Magnetek, Inc.
Menomonee Falls, WI USA

April 30, 2015
_____
Date of Issuance

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149
© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

Mini-MBT Transmitter

Technical Specifications

Transmitter Specification

Temperature Range:

- -40°F to 185°F (-40°C to 85°C)

Environmental Protection:

- IP66 and NEMA 4 Transmitter

Operation Range:

- Non-Licensed Part 15 — Up to 300 feet (91.44 m)
- Non-Licensed FHSS — Up to 2000 feet (609.6 m)

Frequency Range:

- Non-Licensed Part 15 — 430-439.8 MHz / 902-928 MHz
- Non-Licensed FHSS — 2.4-2.5 GHz
- Government Band — 411-430 MHz

Output Power:

- Non-Licensed Part 15 — Less than 1mW
- Non-Licensed FHSS — 10 mW, 125 mW
- Government Band — 1mW

RF Channels

- Non-Licensed Part 15 — 32 channels
- Non-Licensed FHSS — 32 channels
- Government Band — Up to 1000 channels

Antenna:

- Internal

RF Type:

- TMS (Time Multiplexed Signaling)
- FHSS (Frequency Hopping Spread Spectrum)
- Microprocessor Controlled PLL Synthesizer
- Transceiver (900MHz/2.4GHz)

Response Time:

- Approximately 50 ms

Test & Certifications:

- FCC Approved Part 15
- IEC 68-2-34 Random Vibration
- IEC 68-2-27 Shock Testing
- IEC 68-2-31 Drop & Topple
- SAE 1211 Dust Testing

Graphic Display:

- Optional
- Backlit display
- 3.77" x 2.83" (96 x 72 mm)
- Multilingual with standard ACSII characters

Weight:

- Approximately 1.5 lbs. (1.13 kg) – dependent upon configuration

Dimensions:

- Approximately 5.00" x 3.38" x 4.33" (127 x 86 x 110 mm)

Transmitter Component Specifications

A total of 9 inputs are available for analog components.

Joystick:

- Dual axis stepless/proportional, up to 2 per transmitter
- Single axis stepless/proportional, up to 4 per transmitter
- Optional pushbutton, 2 per transmitter
- Square Gate standard, Plus Gate optional

Potentiometers:

- Single turn

A total of 1 output (PWM) is available for an analog component.

Haptic Feedback:

- Optional

A total of 10 toggle switches or 20 inputs are available for digital components.

Toggle Switch:

- 2 position momentary
- 2 position maintained
- 3 position momentary
- 3 position maintained
- 3 position maintained/momentary

Pushbutton:

- Momentary
- Red, Green, Blue, Black, Yellow

E-Stop:

- Military Grade Push/Pull

Rotary Switch:

- Up to 12 positions per switch

Key Switch:

- 3 position maintained/momentary
- 2 position maintained

A total of 4 outputs are available for digital components. An optional board is available to increase the number of digital outputs to 16.

LED:

- Red, Yellow, Green
- Up to 2 bi-color or 4 single color per transmitter

USB:

- Programming Port

Infrared Port:

- Programming Port

CAN Port:

- Optional
- J1939
- CANOpen
- Other protocol available upon request
- Power input: 6-36VDC

P.O. Box 13615
Milwaukee, WI 53213
Toll-Free Phone 800.288.8178
Toll-Free Fax 800.298.3503

N49 W13650 Campbell Drive
Menomonee Falls, WI 53051
Phone 262.783.3500
Fax 262.783.3510

Canada Facility
4090B Sladeview Crescent
Mississauga, Ontario
L5L 5Y5 Canada
Toll Free Phone: 800.792.7253
Fax: 905.8281526

Magnetek (UK) Ltd.
Unit, 3 Bedford Business Centre
Mile Road
Bedford, MK42 9TW UK
Phone: +44 (0) 1234 349191
Fax: +44 (0) 1234 268955

www.magnetek.com

Brochure No. Mini-MBT Tech Specs

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life

GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149

© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

Labeling:

- Custom labels per application
- Multilingual
- Multi-Color

Note: Other components (joysticks, switches, potentiometers, etc.) may be available upon request. Consult the factory for compatibility.

Battery and Charger

Battery Type:

- *Rechargeable:* 4.8V NiMH, 4 Cell Pack, 1600 mAh
- *Disposable:* Four AA Alkaline Pack, 1600 mAh

Estimated Battery Life:

- With (4) AA Alkaline batteries
  - With display: TBD hours
  - Without display: TBD hours
- With rechargeable battery pack
  - With display: TBD hours
  - Without display: TBD hours

Note: Battery life will vary depending upon configuration of the transmitter.

Service Life:

- *Rechargeable:* 500 cycles

Battery Charging:

- Charging done via micro-USB port

Battery Charge Time:

- Fast Charge: Approx. 6 hours

Charger Power:

- 120 Vac 60 Hz
- 240 Vac 50Hz
- 12/24 Vdc

P.O. Box 13615
Milwaukee, WI 53213
Toll-Free Phone 800.288.8178
Toll-Free Fax 800.298.3503

N49 W13650 Campbell Drive
Menomonee Falls, WI 53051
Phone 262.783.3500
Fax 262.783.3510

Canada Facility
4090B Sladeview Crescent
Mississauga, Ontario
L5L 5Y5 Canada
Toll Free Phone: 800.792.7253

Magnetek (UK) Ltd.
Unit, 3 Bedford Business Centre
Mile Road
Bedford, MK42 9TW UK
Phone: +44 (0) 1234 349191

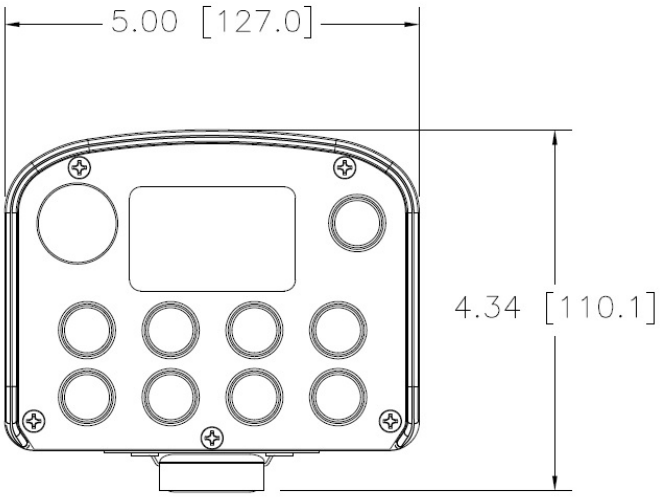
www.magnetek.com

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life

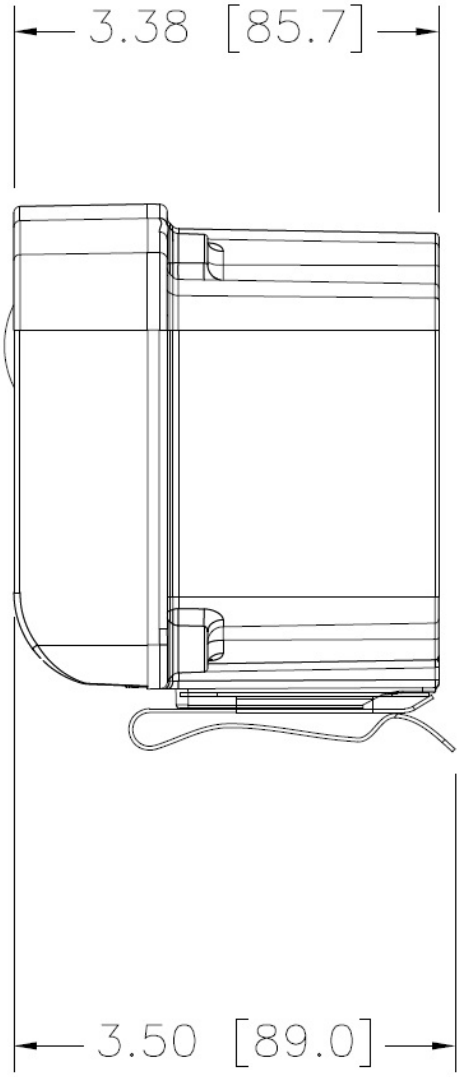
GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149

© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.

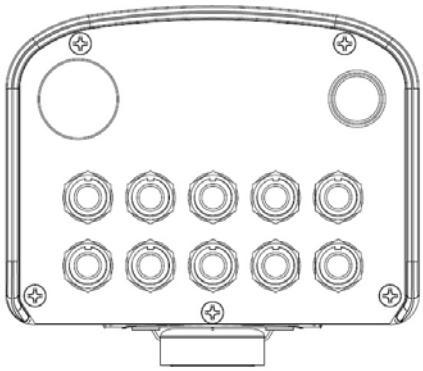
TYPICAL APPLICATION LAYOUTS



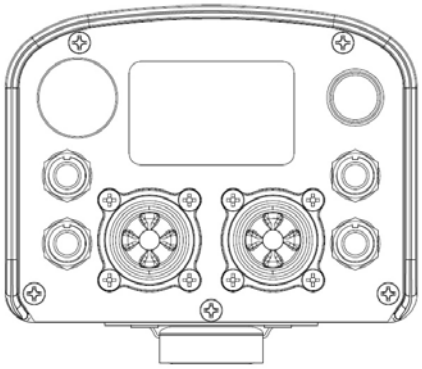
Mini-MBT Configuration with Pushbuttons



Mini-MBT Side View



Mini-MBT with 10 Toggles, No Display, Tethered Connection



Mini-MBT with 2 Joysticks, 4 Toggles, Display, and Tethered Connection

P.O. Box 13615
Milwaukee, WI 53213
Toll-Free Phone 800.288.8178
Toll-Free Fax 800.298.3503

N49 W13650 Campbell Drive
Menomonee Falls, WI 53051
Phone 262.783.3500
Fax 262.783.3510

Canada Facility
4090B Sladeview Crescent
Mississauga, Ontario
L5L 5Y5 Canada
Toll Free Phone: 800.792.7253
Fax: 905.8281526

Magnetek (UK) Ltd.
Unit, 3 Bedford Business Centre
Mile Road
Bedford, MK42 9TW UK
Phone: +44 (0) 1234 349191
Fax: +44 (0) 1234 268955

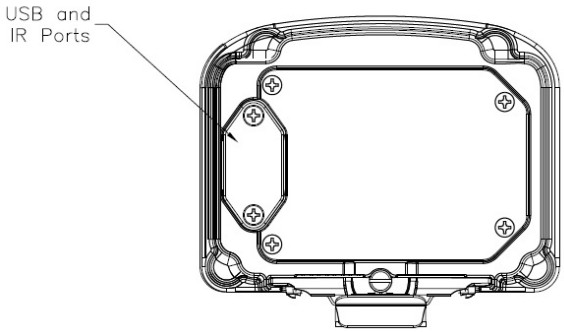
www.magnetek.com

Brochure No. Mini-MBT
Tech Specs

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life

GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149

© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.



Mini-MBT IR and USB Port Location

P.O. Box 13615
Milwaukee, WI 53213
Toll-Free Phone 800.288.8178
Toll-Free Fax 800.298.3503

N49 W13650 Campbell Drive
Menomonee Falls, WI 53051
Phone 262.783.3500
Fax 262.783.3510

Canada Facility
4090B Sladeview Crescent
Mississauga, Ontario
L5L 5Y5 Canada
Toll Free Phone: 800.792.7253
Fax: 905.8281526

Magnetek (UK) Ltd.
Unit, 3 Bedford Business Centre
Mile Road
Bedford, MK42 9TW UK
Phone: +44 (0) 1234 349191
Fax: +44 (0) 1234 268955

www.magnetek.com

Brochure No. Mini-MBT
Tech Specs

GS GLOBAL RESOURCES
Foremost in Machine Performance for Life

GS Global Resources • 1-800-261-8735 • gsglobalresources.com
926 Perkins Drive, Mukwonago, WI 53149

© GS GLOBAL REOURCES, INC. ALL RIGHTS RESERVED.