

#### Thank you for purchasing this product.

**BASE Engineering Inc.** strives to continuously improve its products and services. Customer feedback is an important part of this process. If you have suggestions for the improvement of this product, this document or the services we provide, we would like to hear from you. Please contact us at the numbers listed below:

Steve A. Belyea - President

1-800-924-1010

1-506-635-2280

1-506-635-2281 fax

sales@baseng.com

WARNING: The receiver/relay enclosure unit is NOT approved for use in hazardous locations. Installation must be carried out by a qualified electrician for all AC systems, in a non-hazardous zone well removed from any explosive or dangerous gas supply, piping, hoses or valve fittings.

#### FCC Rules and Compliance.

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

i. This device may not cause harmful interference, and

ii. This device must accept any interference received, including interference that may cause undesired operation.

FCC Part 15.231

#### UM-16-012

# **TECHNICAL SUPPORT**

Product technical support is available by contacting BASE Engineering Inc. at 1.800.924.1010 or 506-635-2280 between 7:00am and 5:00pm Eastern Standard Time (USA). After hours technical support can be reached at this same phone number.

BASE ENGINEERING INC. 600 ROTHESAY SAINT JOHN, NEW BRUNSWICK

CANADA E2H 2H1

WEBSITE	www.baseng.com
E-MAIL	sales@baseng.com
FAX	1.506.635.2281
	1.506.635.2280
PHONE	1.800.924.1010

# WARRANTY AND RETURN PROCEDURES

#### Limited Warranty Policy

This **BASE Engineering Inc**. radio remote control system is sold with a limited warranty to be free from defects in material and workmanship for a period of **four (4) years from the date of manufacture**. This warranty covers only repair or replacement parts/components. Labor to diagnose, remove, or replace failed components is not covered under this warranty. Lithium batteries and leather cases have a warranty of one (1) year.

Replacement parts will be shipped within 24 hours when possible. All defective components must be returned to the factory clearly marked with a RGA (Returned Goods Authorization) number for identification purposes. Returning an item without an authorized RGA number will result in substantial processing delays.

#### Warranty Claims

**BASE Engineering Inc.** will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within the warranty period. Before any warranty repairs are attempted or before returning any product to the factory **BASE Engineering** must be contacted. **BASE** Engineering staff will require the model number and the serial number of the system.

**BASE Engineering** is not liable for material, labor or contingent liabilities arising out of the improper use or function of any product. Warranty shall become void if the product is improperly installed, modified, damaged, abused, or used for applications other than intended use.

# **PRODUCT WARNINGS**

## PLEASE READ BEFORE OPERATING OR INSTALLING ANY BASE SYSTEM

Air solenoids used to control the tank internal valves should be connected to the same air supply for the DOT required MANUAL Emergency Stop switch(es). Following activation of the radio remote Emergency Stop feature, the operator MUST first close the manual internal valve switch prior to resetting the **BASE** system. Failure to do this may result in the internal valve(s) automatically and unintentionally reopening with system reset.

Systems wired 'hot' to power when the vehicle is in motion have ALL remote functions still operable. A driver (or passenger) may accidentally activate the remote control, unintentionally causing the Emergency Stop feature to activate and the truck's engine to stop instantly. Systems must be properly interlocked to prevent unintended use.

Systems must be properly interlocked to prevent unintended use. **AN UNINTENTIONAL ENGINE SHUT DOWN WHILE THE VEHICLE IS IN MOTION MAY RESULT IN SERIOUS INJURY OR DEATH.** 

Never attempt to perform PTO repairs from under chassis while engine is running or while wearing radio remote control device.

All open valves must be closed prior to system reset to prevent the valve from automatically and unintentionally reopening with Emergency Stop reset.

DO NOT CONNECT CHASSIS GROUND TO EITHER OF THE HOSE REEL MOTOR ELECTRICAL LEADS WHEN USING A REMOTE CONTROL POLARITY REVERSE CIRCUIT. BOTH LEADS MUST BE CONNECTED DIRECTLY TO THE CONTROLLER AS SHOWN IN THE SUPPLIED SYSTEM DRAWINGS.

NEVER GO UNDER A TRUCK WITH THE ENGINE RUNNING AND NEVER USE THE REMOTE CONTROL DEVICE TO ACTIVATE THE PTO WHEN WORKING ON OR SERVICING THE PTO FROM UNDER THE TRUCK. THE REMOTE CONTROL DEVICE IS INTENDED TO BE USED ONLY WHEN THE OPERATOR IS NOT AT RISK OF BEING INJURED BY THE MACHINE.

# **PRODUCT WARNINGS CONT'D**

### AN UNINTENTIONAL USE OF REMOTE WHILE WORKING ON THE TRUCK MAY RESULT IN SERIOUS INJURY OR DEATH.

Unauthorized modifications to any **BASE** system or any unintended uses of **BASE** systems may void the manufacturer's warranty for the product. This may include, but is not limited to, drilling holes in **BASE** product enclosures, adding auxiliary or bypass switches, changes to installation procedures, modifications to antennae configurations, or changes to the electronic or mechanical workings of the system.

Do not charge the unit in an ignitable, flammable or explosive atmosphere.

If unit is damaged or malfunction discontinue use, do not use damaged unit in an ignitable, flammable or explosive atmosphere.

SEPARATE handheld and charger base ONLY IN A NON-HAZARDOUS AREA.

DO NOT CHARGE IN A HAZARDOUS AREA.

REFER TO THE INSTRUCTION MANUAL FOR BATTERY CHARGING

# TROUBLESHOOTING

Symptom: The handheld will not turn on when MENU is pressed. Reason: The battery may be dead.

- Slide handheld into charging cradle
- Make sure that the charging cradle green light turns on
- Press and hold MENU button for 5 seconds
- If handheld does not turn on, call BASE Technical Support

#### Symptom: Handheld is not charging when docked.

Reason: The charging cradle is not powered up.

- Check to see if the red power light or the green active light on the charging cradle is lit
- If all lights are off, check all connections
- If red power light is on, remove handheld from the charging cradle and reinsert into it.

Symptom: When in delivery mode, the message "REG ERROR" is displayed

Reason: The receiver has lost communication with the register, pulse converter, or on-board computer.

- Verify connections are not broken and that the register is powered
- Use the Diagnostics tool (page 24) to confirm communication has been restored

#### Symptom: Handheld is not communicating with the receiver.

Reason: Handheld and receiver are not paired

• Pair handheld to receiver using the instructions outlined in the "System Pairing/Dedication" section of this document

Reason: Handheld is out of range with receiver

 Use the "Radio Diagnostics" from the "System Testing" section of this document to find the source of the obstruction and where the radio signal is weak

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# SYSTEM MAINTENANCE

Little maintenance is required. Regularly checking the condition of the handheld, verifying that the display activates correctly, and ensuring communication is functioning properly between the handheld and the truck is all the maintenance that is necessary.

If one of the system checks fails, contact the factory and we will troubleshoot your handheld unit.

Handheld repairs or modifications must be done at the factory to maintain your warranty or certification.

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6. The process will happen automatically and may take up to 1 minute. The handheld will indicate when the process has completed.



# SYSTEM PAIRING/DEDICATION

# **DEDICATION SCREEN**

The wireless control system is supplied from the factory fully programmed and ready for use, however, the following procedure can be used to re-program/dedicate a replacement handheld or receiver unit in the field.

- On the handheld, enter the 'Main Menu' by pressing the green menu 1. button.
- Using the navigation buttons, highlight 'Dedicate Handheld' and press 2. the navigation button under the 'Select' label.
- Follow the instructions on the screen. 3.
- 4. Press the 'Setup' button on the receiver 1 time. Wait for the blue LED on the receiver to stop flashing and ensure the red LED does not flash.
- 5. Once the LED has stopped flashing on the receiver, press the navigation button under the 'Done' label on the handheld.



# ProControl<sup>3</sup> HANDHELD COMPONENTS

Please check that your package includes the following:

- Custom ProControl<sup>3</sup> transmitter
- Charging cradle for in-cab or office use ٠
- Cable to supply power to charging cradle
- Output selector module (optional component) •
- Antenna relay module (optional component) •

It is strongly recommended that any radio control system be powered only when the equipment is parked and ready to work. A park-brake interlock switch for all air-brake truck applications is available from BASE Engineering at the time of order.

AN UNINTENTIONAL ENGINE SHUT DOWN WHILE THE VEHICLE IS IN MOTION MAY RESULT IN SERIOUS INJURY OR DEATH.



# **ProControl<sup>3</sup> HANDHELD OVERVIEW**

This manual is intended to guide the user through the many operations of the ProControl<sup>3</sup> handheld.

The handheld unit is designed to IP67 standards for a robust, custom designed ergonomic unit. Its 12 function buttons double as an alphanumeric keyboard and provide positive tactile feedback when operated. In addition to the 12 function buttons, 3 additional navigation buttons are used to guide you through the various software menus.

The function of the 3 navigation buttons will be mode/menu specific and displayed directly above the button.

Additional user feedback is provided through the use of an audible buzzer and vibrations.

The ProControl<sup>3</sup> handheld can be equipped with Direct Sequence Spread (DSS) radio technology at an operating frequency of 2.4Ghz, or a Frequency Hopping Spread Spectrum (FHS) radio technology at an operating frequency of 900MHz. These radio technologies deliver good range and good performance.

The handheld and receiver are pre-programmed to operate as a paired system unless otherwise requested. Replacement handhelds can be quickly field programmed by following the instructions in the section of this manual entitled System Pairing/Dedication (page 29).



- 4. Update Firmware
  - a. Select English by pressing *Button 1* on the main handheld keypad
  - b. Use the UP and DOWN buttons to select the firmware file. Press the SELECT button to proceed.
  - c. The bootloader progress value will increase from 0% to 100% before the main application starts up. The firmware updating process is now complete.



# **USB FIRMWARE UPDATING**

The firmware of the handheld can be updated in the field if it is necessary. To conduct the firmware updating, the following steps should be done.

- 1. Confirm USB Compatibility
  - a. Place the handheld into the charging cradle and confirm that the green cradle light is illuminated
  - b. Navigate to the *Handheld Properties* page in the *Main Menu* [MENU > SYSTEM DIAGNOSTICS > HANDHELD PROPERTIES]
  - c. Confirm the following properties match the following values

PROPERTY	VALUE
HANDHELD REMOTE > USB	Supported
CHARGING CRADLE > PRESENCE	Present
CHARGING CRADLE > USB	Supported

If these properties do not match those stated above then contact tech support.

- 2. Setup USB Stick
  - a. Put a firmware file (\*.HEX) on a USB stick. Contact technical support to obtain a firmware file.
  - b. Insert the supplied USB Type A to USB Type B converter into the USB input in the cradle
  - c. Insert the USB stick into the USB converter
- 3. Reset handheld into bootloader
  - a. Navigate to the *Update Firmware* page in the *Main Menu* [MENU > HANDHELD SETTINGS > UPDATE FIRMWARE]
  - b. Press the SELECT button to reset into bootloader mode
  - c. The handheld should now be in the bootloader mode.

The ProControl<sup>3</sup> is powered by a rechargeable lithium ion battery, lasting for up to 12 hours of continuous use, and has a low battery indicator to indicate when charging is necessary. Each system ordered includes a charging cradle to securely hold the handheld while the vehicle is in motion and provide necessary charging to the handheld.



# **BATTERIES & CHARGING**

The ProControl<sup>3</sup> handheld runs on a rechargeable lithium ion battery pack that can endure up to 12 hours of use. When the battery is exhausted, the handheld battery icon will change to a single red bar. At this point the unit should be recharged as soon as possible, but depending on the method and amount of use, the handheld will remain operational for approximately 1-2 hours. If the handheld is not charged at this time and reaches critical-low, the icon will change to a red exclamation point (!). You will have under 5 minutes before the handheld shuts down.

To charge the battery, place the handheld into the charging cradle. The green LED will illuminate on the charging cradle, indicating that the connection is secure. Ensure that 12/24VDC power is available to the charging cradle at all times. Be aware that in some vehicles the power to the receptacle is cut off when the ignition is off.

While the handheld is charging, the battery icon will show a charging symbol. The charging symbol icon will turn green once charging is complete. It will take **up to six hours** to charge the batteries from a fully depleted state.



## **EMERGENCY STOP TESTING**

The system should regularly be powered up and tested in accordance with DOT documentation requirements.

- Power up the receiver unit and ensure the *POWER/ACTIVITY* LED is illuminated.
- 2. Power up the handheld by pressing the green menu button until the display is active.
- Press any button on the handheld and verify that the screen displays the appropriate message.
- Check for proper operation of all radio remote command and machine functions from the maximum range/distance that will be encountered in day-to-day use.
- Press the transmitter 'Emergency Stop' button and you should observe the machine operation stop.
- Cycling the power to the receiver unit will re-arm the system making it ready for use.

**NOTE:** The transmitter **cannot** be used to reset the system following the activation of the emergency stop feature. This has been designed into the system software to prevent accidental re-opening in a panic situation. Pressing the transmitter repeatedly will send the same "stop" message.

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SELECT

#### Handheld properties

The handheld properties include information relating to the handheld, charging cradle, and the receiver.

The handheld column shows the firmware version, the system drawing number, the radio type, the battery voltage, the USB supported status, barcode software, and a list of hardware options. The hardware options are primarily listed for technical support reasons. The USB supported status is important because not all PC3s support USB updating and this Handheld Properties page is the best way to determine support.

@ I HANDHELD PROPERTIES HANDHELDREMOTE FIRMWARE: A.3.2.2 DRAWING: 93745.R0 RADIO: FHS BATTERY: 3515 mV USB: Supported OPTIONS: RB SM0-a-1.1 BARCODE SOFTWARE: BARCODE LAST SCAN TYPE: NONE HANDHELD CHARGING CRADLE PRESENCE: Not Present USB: Not Present WIRELESS RECEIVER 2018080800 FIRMWARE: DRAWING: 93745.R0 ∽ UP DOWN DONE

The charging cradle column shows

two items: if the handheld is present in the cradle or not and if the cradle supports USB updating. This is important because not all cradles support USB updating and this Handheld Properties page is the best way to determine USB support of the cradle.

The wireless receiver column shows information that the handheld polls from the receiver. This shows the firmware version of the receiver and the drawing number that it is based off of.

## WARNING

Do not charge the handheld unit with any device other than the supplied BASE charger or damage to the unit may occur.

Charging at low temperatures (below 0°C/32°F) will reduce life span of the battery and extend the time for full charging cycle. If overnight charging is required, it is recommended to charge indoor. A charging cradle with an AC adaptor should be ordered separately."

### DO NOT CHARGE IN A HAZARDOUS AREA.

# **BRAKE INTERLOCK ALARM**

There is an optional alarm in the charging cradle that will sound when the user drives away with the handheld undocked. To do this, the charging cradle must be interconnected with a brake-line pressure sensor and with the signal from the truck's "Ignition ON/RUN" power connection (please see the wiring diagram in the next page).

When correctly wired in to these two signals with the supplied harness, the cradle will issue an alarm *only* under the following conditions:

The handheld is undocked from the cradle AND

The Ignition is on AND

The brakes are released.

To stop the alarm sounding, either replace the handheld in the cradle, apply the brakes, or turn off the ignition.

# **CHARGING CRADLE SPECIFICATIONS**

Parameter	Value
Supply Voltage	10V to 28V
Supply Current	2A
Current into Ignition Sense	<10mA
Current into Brake Interlock	<10mA
Alarm Sound Pressure Level (minimum @10 cm)	90dB
Mounting screw type	#6-32 UNC

# SYSTEM TESTING

## **DIAGNOSTICS SCREEN**

The diagnostics screen is useful when issues arise and/or further communication information is required. You can use the 'Diagnostics' screen for radio diagnostics and handheld properties.



#### **Radio diagnostics**

Radio diagnostics are used to verify the quality of the communication between the handheld and truck receiver. Please record information to be relayed to technical support if issues continue.



the ProControl 3 receiver is powered up and that the wireless connection between the ProControl 3 handheld and receiver is active (indicated by the wireless signal icon in the upper right-hand corner of the screen.) Also, be sure that the register address specified is accurate for the register in use. The synchronization can be begun again by exiting this screen and reentering it.

Now that the register information is loaded into the ProControl 3, the user can return to the Delivery screen by pressing the Menu button repeatedly to backtrack through the screen sequence.

This register synchronization only needs to occur when the product details on the register/truck are changed or if the Delivery Screen shows the "Product Mismatch" error.

# COMPARTMENT SETUP SCREEN

Compartments can be renamed or made to not show up in the quick list (available from the dedicated Compartment button). In order to rename or enable/disable, select the "Compartment Setup" tile on the **Main Menu** screen . Note that this may be the seventh tile, requiring navigation past the end of the visible tiles.

In the **Compartment Setup** screen, select the compartment entry to edit in the first row. The name and enabled properties

have the same function as for Register Setup screen. The Product Name, Code and Type fields are opportunities to assign what is contained in the specified compartment. The Register field is for assigning which register must be used to access the product in the compartment. Note that the Register Setup must be completed before performing the Compartment Setup.

COMPARIMENT SETUP
Select Compartment: ID 1
Name: COMPARTMENT 1
Enabled: ON
Product Name: NONE
Product Code: NONE
Product Type: NONE
Register: REGISTER 2



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# HANDHELD OPERATION

The handheld unit is shipped from the factory configured and ready for operation. Ensure that the unit is fully charged before first use.

Each handheld's functionality is custom configured based on each company's individual needs. Please see your provided drawing for further descriptions.

This operational manual will outline **only** the standard functionality of the ProControl<sup>3</sup> handheld.

## **TURNING ON/OFF THE HANDHELD**



s 🛙
DEVICE SHUT DOWN
SHUT DOWN HANDHELD2
Shor Bown HANDHEED!
YES
PRESS MENU TO EXIT

The units are shipped with the handheld turned off. To turn the handheld on, press and hold the green 'Menu' button until the display activates.

To turn the handheld off, press and hold the green 'Menu' button until the menu screen displays. Navigate to the menu item "Shut Down Handheld", and follow the instructions.

## **REGISTER SETUP SCREEN**

In the main menu screen, navigate to the Register Settings tile and select it to open the register settings menu. In this menu, select the Register Setup tile in order to enter the register setup screen. Note that in some systems, the register setup tile is located in the main menu screen

The top entry shows which register in the handheld is being viewed and edited currently. Changing this value (by navigating to the first row, selecting it, and then selecting the desired entry from the new list) will cause the handheld to end communication with the previously selected register and initiate a connection with the newly selected register.



The third line is the address of the register. Each register has a unique address (1-255) which must be used in order to communicate with it.

The fourth line is a control switch for whether or not this register will appear

in the quick list of registers available via the dedicated Register button on the keypad of the handheld. A register must be enabled in order to communicate with it.

The last line provides a link to the **Register Synchronization** screen. In this screen, the ProControl 3 automatically retrieves all the product information from the register. If no information is displayed on the Register Synchronization screen after 5 seconds, check to make sure that



## HANDHELD SETTINGS SCREEN

Use the navigation buttons to highlight the setting you'd like to change. Once the desired setting is highlighted, push the navigation button under the 'Select' label. Depending on what setting you're adjusting, you may be required to use the alphanumeric keypad. Once the setting is adjusted to your requirements, save the setting by pressing the navigation button under the 'Select' button.



## GENERAL FUNCTIONS From most screens, you can control any necessary truck functions. You can navigate back to your last screen by pressing the 'Menu' button. When a truck function is pressed, the handheld will communicate with the truck unit to turn on, or off, the required channel output. The text label for that function will appear on the display while the button is being pressed and for a short period of time after button is 🕿 👔 released. At the top of each screen, there is a title bar where vou can see the communication link icon and the battery icon. If at any time the communication link is lost, the symbol will have a red X through it. The battery symbol shows the 4 stages of battery life: ٠ Green = fully charged Half green bar = approximately 50% remaining ٠ Red = battery is exhausted; charge as soon as possible Red exclamation point (!) = charge immediately; shutdown in less than 5 minutes You are also able to access various specialty screens, such as 'Delivery', 'Preset', 'Tote/Compartment', 'RFID' and 'Menu'. Please examine the chart below for descriptions: **Screen Description** Button To view the readings from the truck's meter Deliverv register for the present volume To enter a preset volume or price Preset Tote/Compartment To activate a selected tote or compartment To read RFID tag and validate a customer tank/ RFID asset To enter main menu for different settings and Menu

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diagnostics

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## DATA ENTRY

Some text fields in different screens of the handheld accept numbers only. In order to enter the number "55", simply press the "5" button twice in a row.

Some text fields accept all characters. In order to enter "Bottom Tote", knowledge of the multi-tap style is required. Multitap means that pressing the "2" button three times in a row, followed by a second of not touching, will result in the letter "B" being stored.



In order to enter a space in the text, press the "0" (zero) button two times and wait one second for the space to be stored. Pressing the zero repeatedly will cycle through "0", space, period, comma, hyphen, and slash.

## MAIN MENU SCREEN

This screen can be used to enter settings and diagnostics for the handheld and system. Use the navigation buttons to select the desired function. Press the navigation button under the 'Select' label, once the desired icon is highlighted.



ltem	Settings Description
Shut Down Handheld	To shut down the handheld.
Dedicate Handheld	To enter the dedication sequence to pair with a receiver.
Handheld Settings	To enter the settings menu screen to modify some handheld settings.
Register Settings	To enter the register settings screen.
Compartment Setup	To enter the compartment setup screen.
System Diagnostics	To enter and review diagnostic options.



# **COMMON SCREENS**

## STANDARD DELIVERY SCREEN

From this screen, you will be able to view the present volume from the truck's meter register. Additional control of the register can also occur from this screen.

To activate a delivery, press the navigation button below the 'Start' label. To end the delivery and print the ticket, press the navigation button below the 'Print' label. To pause the flow during a delivery, press the navigation button below the 'Pause' label.



## PRESET STATUS

If utilized, the preset value that is sent to the register is mirrored on the screen in the 'Preset Status' field. This label disappears when the preset is set to zero.

#### **REGISTER STATUS**

The 'Register Status' field shows the state of the register. The label descriptions are in the table below:

Label	Description
Register Idle	Register is ready to start a delivery
In Delivery	A delivery has been started
Ticket Pending	The delivery has been ended and the ticket has not completed printing yet
Register Busy	The register is unresponsive because it is starting a delivery or printing a ticket
Register Disconnected	The register communication cable is disconnected from the BASE receiver

#### **CHANNEL STATUS**

The status of 'ON' or 'OFF' for a particular channel can be reflected on the delivery screen

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# PRESET SCREEN

This screen allows you to enter a preset value. Use the alphanumeric keypad to enter the required volume or price. Once entered, press the navigation button under the 'Select' label. If at any time a correction is required, press the navigation button under the back arrow to delete the last entered number. Once the preset has been sent to the register/OBC, the delivery screen will show the preset value.

Pi numi	PRESET ease enter the ber of gallons for the preset.
85	

## **COMPARTMENT/TOTE SCREEN**

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Select Tote To Enable
TOTE OFF
TOTE 1
TOTE 2
TOTE 3
TOTE 4
TOTE 5
TOTE 6
TOTE 7
TOTE 8
PRESS MENU TO EXIT

This screen allows you to activate a single, available compartment. Use the navigation buttons to move up and down the list until the appropriate compartment is selected. Press the navigation button under the 'Select' label to activate the compartment output.

## ANTENNA SELECTOR (ANTENNA FUNCTION BUTTON)

If handheld is equipped with Antenna Selector, pressing the ANTENNA button will switch from the primary (1st) antenna to the secondary (2nd) antenna, and vice versa. The antenna selection will be reset upon each power cycle.

