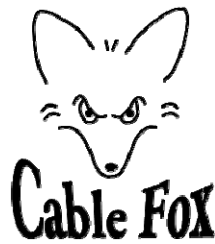


**INSTRUCTION MANUAL**

**CABLE FOX REMOTE CONTROL ADCP TOWING SYSTEM**  
**MODEL CFX**



QUALITY SYSTEM  
ISO:9001  
CERTIFIED



HYQUEST SOLUTIONS PTY LTD  
PO BOX 332, LIVERPOOL B.C NSW 1871, AUSTRALIA  
Phone:(Int.) 612 9601 2022 Fax: :(Int.) 612 9602 6971  
Phone:(Nat.) (02) 9601 2022 Fax: :(Nat.) (02) 9602 6971  
Email: [sales@hyquestsolutions.com.au](mailto:sales@hyquestsolutions.com.au)  
Web: [www.hyquestsolutions.com.au](http://www.hyquestsolutions.com.au)

**TABLE OF CONTENTS**

<b>1.</b>	<b>Product Overview .....</b>	<b>3</b>
<b>2.</b>	<b>Installation.....</b>	<b>3</b>
<b>3.</b>	<b>Operation.....</b>	<b>7</b>
<b>3.1</b>	<b>Brief Description of Controls .....</b>	<b>7</b>
<b>3.2</b>	<b>Menu Operation.....</b>	<b>10</b>
<b>3.2.1</b>	<b>Set Waters Edge.....</b>	<b>10</b>
<b>3.2.2</b>	<b>More.....</b>	<b>11</b>
<b>3.3</b>	<b>Cable Fox.....</b>	<b>11</b>
<b>3.3.1</b>	<b>Cable Fox Pulley Circumference.....</b>	<b>11</b>
<b>3.3.2</b>	<b>Cable Fox Direction.....</b>	<b>11</b>
<b>3.4</b>	<b>Remote... ..</b>	<b>11</b>
<b>3.4.1</b>	<b>Remote S/W Rev and Battery Voltage.....</b>	<b>11</b>
<b>3.4.2</b>	<b>Remote Sounder, Backlight and Units.....</b>	<b>11</b>
<b>3.4.3</b>	<b>Communication Frequency and Charger Status.....</b>	<b>12</b>
<b>3.4.4</b>	<b>Return to Remote... ..</b>	<b>12</b>
<b>4.</b>	<b>Specification .....</b>	<b>13</b>

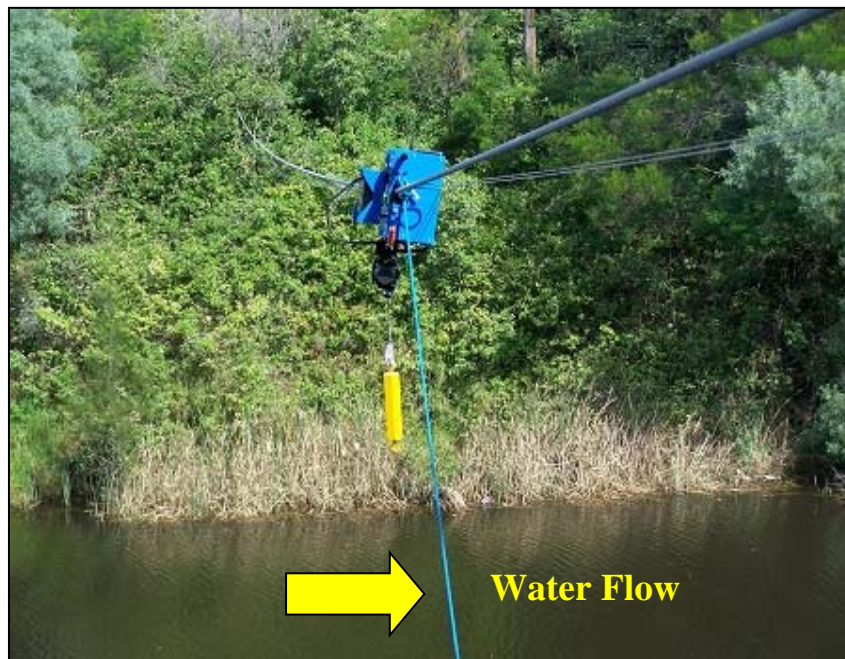
## 1. Product Overview

The Hyquest Solutions Cable Fox is a unique product that allows the towing of an ADCP across an existing gauging site's steel cable. The Cable Fox has the following features:

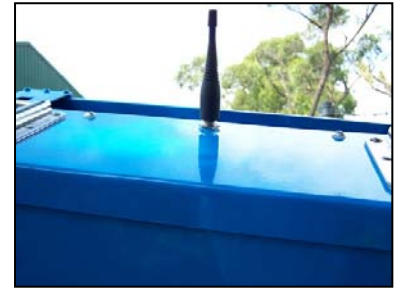
- Can operate on steel cables from 16mm to 31.75mm dia (  $\frac{5}{8}$ " to  $1\frac{1}{4}$ " )
- Locks onto cable to prevent accidental detachment.
- Traversing speed adjustable from 0.01m/s to 0.60m/s (0.03ft/s to 2.00ft/s)
- Traversing distance measured, with waters edge zeroing.
- Can raise and lower the ADCP from the water. (Optional)
- Automatically stops when raising, when at end of winch cable.
- Cable Fox traversing brakes activated when stationary.
- Brake is released when Remote Control is switched off – for manual retrieval.
- Automatically returns to the home position if comms is lost for 2 minutes. (Home position is defined as the position where the Cable Fox is turned on)
- Measures Cable Fox BattV + Current, Remote Control BattV and signal strength.
- All fuses are automatically resettable.
- Remote Control beeps when Cable Fox battery is less than 10.8V
- Cable Fox can **ONLY** be moved toward home position when battery is less than 10.5V
- 400m communication range.
- Operates on a single 12V 18Ah battery

## 2. Installation

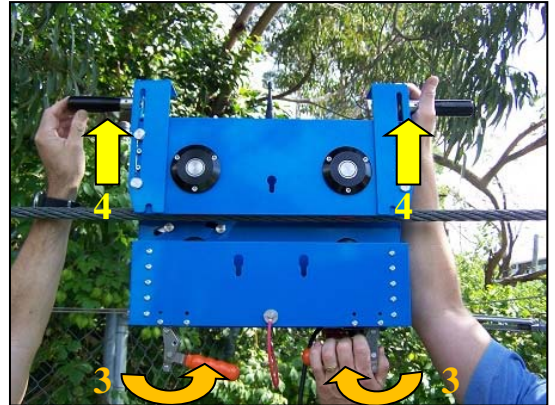
1. Determine the water flow direction and install the Cable Fox on the cable as shown, with the **battery box on the upstream side**.



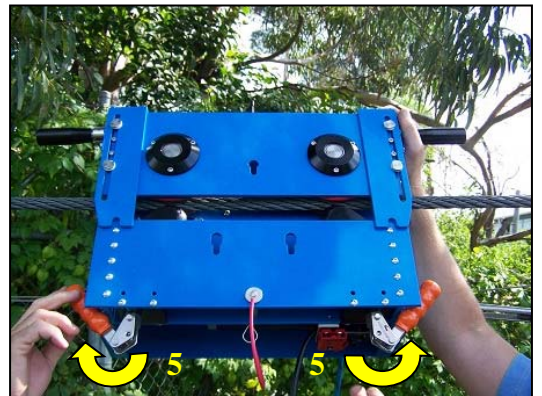
2. Before lifting the Cable Fox onto the cable, fit the antenna onto the BNC fitting on top of the cabinet. Squeeze the plastic at the bottom of the antenna and rotate clockwise.



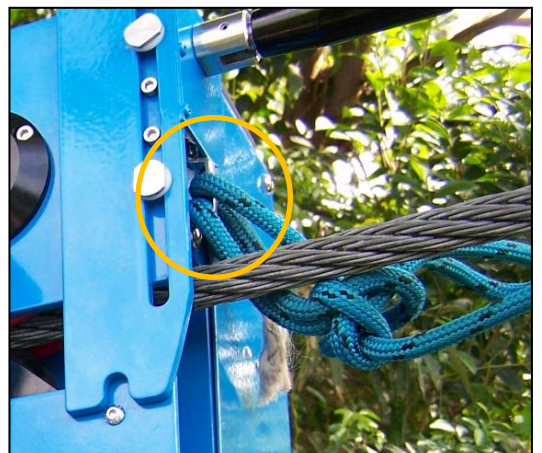
3. Make sure the orange tension handles are angled to the centre – this gives the maximum clearance between the rollers for the Cable Fox to fit onto the cable. (3)
4. Lift the Cable Fox onto the main cable using the lifting handles as shown (4)



5. Move the orange tension handles to the outside to provide maximum tension between the drive rollers (red) and the guide rollers (black).

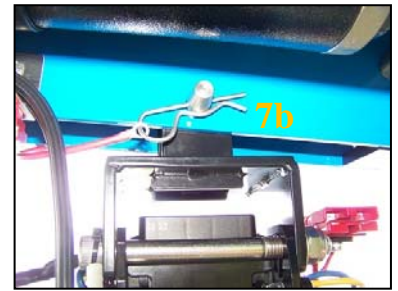
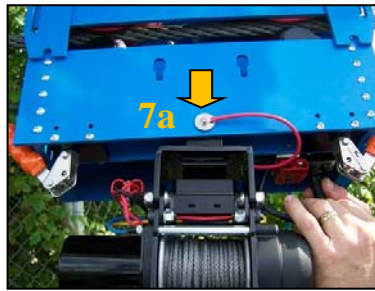


6. At the operators discretion, a safety rope can be attached onto the side of the Cable Fox cabinet, as a precaution, to assist in retrieval in case there is a problem encountered with the drive system.

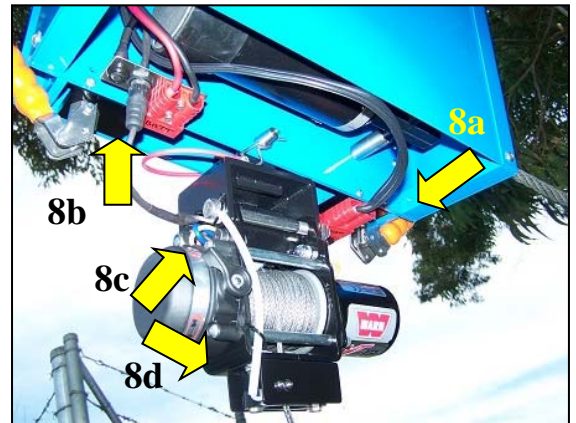




7. Insert the winch (optional) into the bottom of the Cable Fox and insert the retaining pin to hold it into position – use the “R” clip to lock the pin securely.



8. Plug the hoist power into the Hoist (8a). Plug the 3 pin hoist control cable into the Cable Fox and rotate the lock clip (8b). The winch gear lever should be set to the engaged position (8c) for **normal** operation, and freefall position (8d) for manual rope extension.



9. Connect a weight to the winch – approx. 10kg (25lb).



10. Fit the battery into the battery box and secure with the strap and spring pin lock.



11. Lift the battery box and battery and fit the 3 pins into the side of the Cable Fox – and lower into the slots until secure.



12. Insert the battery cable into the Cable Fox battery socket and then press the On/Off button.



13. The red and green LEDs on the side of the Cable Fox cabinet will flash alternately. Turn on the Remote Control and the green LED will flash quickly indicating the comms is working properly.



14. Connect the ADCP to the bottom of the hoist weight.

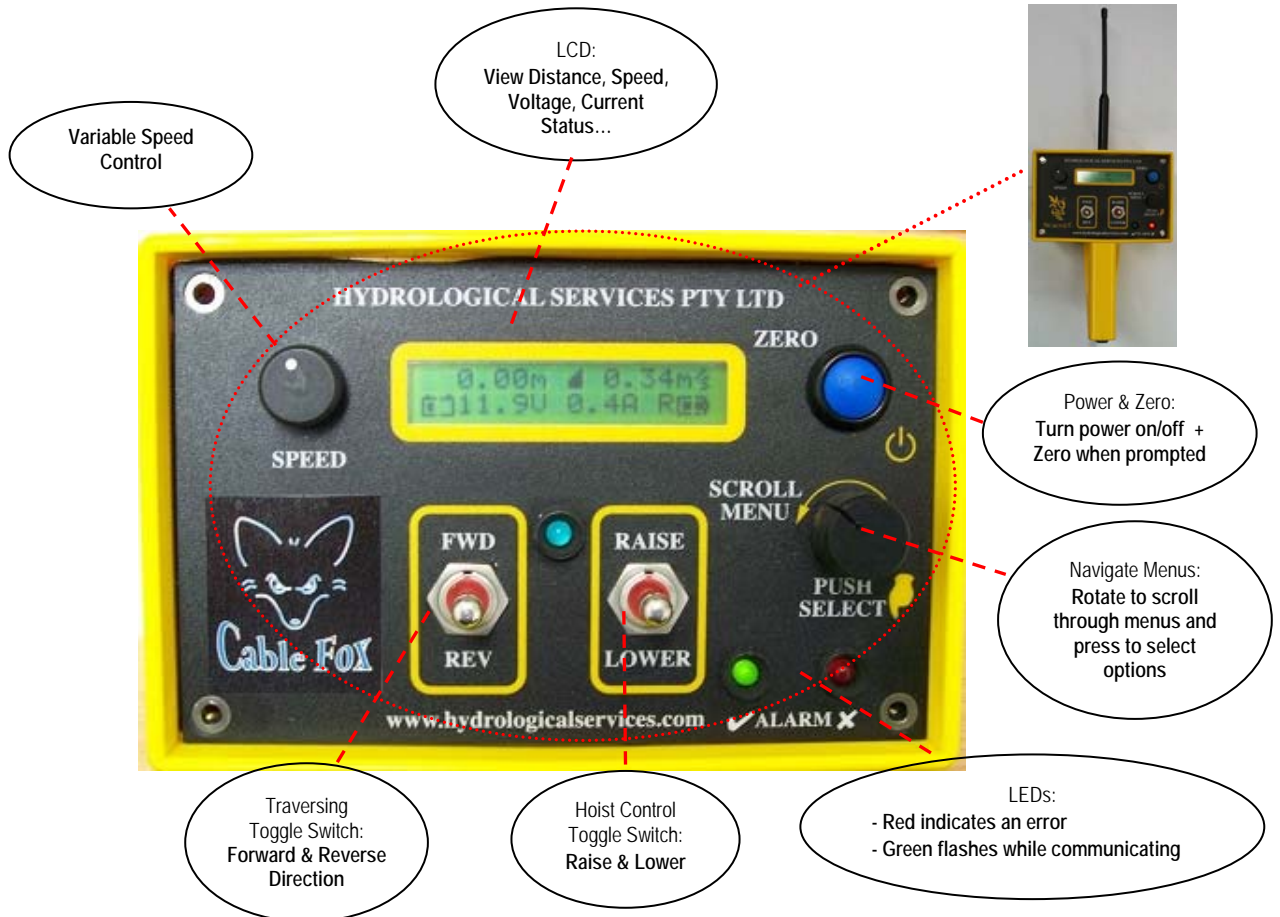
**NOTE 1** : If the FWD switch does not move the Cable Fox in the forward direction, operation can be reversed through a CFox... menu option.

**NOTE 2** : When the Remote Control comms is operating and the Cable Fox is stationary, a brake is applied to the traversing motor. If the Remote Control is turned off, the brake is released for easier rope retrieval.

**NOTE 3** : If the Cable Fox loses communications for a 2 minute interval, it will automatically return to its 'HOME' position – that is the position when the power was switched on. A beeper will sound for 10 secs before this commences, and also during the return motion.

### 3. Operation

Press and hold the Power button on the Remote Control and the LCD will come on. The red LED on the Remote Control should turn off when communications is established. The green LED will flash as the Remote Control communicates with the Cable Fox.



#### 3.1 Brief Description of Controls

##### Power + Zero

Press and hold the blue button to turn on the Remote Control (wait until the LCD comes on) When the Remote Control is “on”, press and hold the blue button to turn off the Remote Control. When a zero is required, the user will be prompted to press the “zero” button with a “Z” and a down arrow symbol on the lower RHS of the LCD.



##### Speed

The speed control knob sets the Cable Fox traversing speed. When using an ADCP it is important to traverse the water at a constant speed. (The speed is displayed on the main menu in either m/s or ft/s, depending on the units selected in the Remote... menu.)





**Fwd / Rev**

The Fwd / Rev toggle switch controls the traversing movement. If there is any problem, the cause will be displayed on the LCD while the switch is being operated.



**Raise / Lower**

The Raise / Lower toggle switch controls the hoist. If there is any problem, the cause will be displayed on the LCD while the switch is being operated.



**Red and Green LED**

When the red Status LED is on, it indicates there is a problem. This could be due to Communications, low Cable Fox battery, low Remote Control battery, or drive control problems.



The green LED flashes whenever comms is successful to the Cable Fox.

**Menu Navigation**

The menu navigation is performed by rotating the “Scroll Menu” knob clockwise and anticlockwise. Pressing the same knob allows the operator to select options etc. See the section on navigating the menus for a full description.



**LCD + Backlight**

The LCD has backlighting, which can be always OFF, always ON, or on for several seconds when anything is touched. The LCD backlighting option can be changed in the “Remote...” menu.



**Sounder**

The remote control has an inbuilt sounder, which beeps when the Cable Fox battery is less than 10.8V.

**Operating Frequency**

The Cable Fox components communicate to each other in the 915MHz band which is the ISM (Industrial, Scientific and Medical) license free band. There are 26 channels available, which can be user selected at any time. The frequencies used are 902.5MHz through to 914.5MHz in the USA (with a 1MHz channel spacing) and 915.5MHz to 927.5 MHz in Australia (with a 1MHz channel spacing). The transmitter power is +15dBm, which is equivalent to only 32mW. This provides a line of sight range of about 1km.





### NiMh Battery Charging

The handle of the Remote Control has provision for charging the internal NiMh batteries that power the Remote Control. A mains power plug-pack and a vehicle cigarette lighter adapter are supplied. The voltage required is 12VDC with a capacity of 1A. (A 9VDC to 18VDC plug-pack can be used.) The connector is a DC Power 2.1mm connector with center pin +ve. (The charging socket is polarity protected.) If the Remote Control is off when the charging plug is inserted, the Remote Control will automatically turn on, and indicate it is charging by scrolling the Remote battery indicator. The batteries will be initially fast charged at about 500mA, and when fully charged drop back to a trickle charge – so there is no problem with leaving it plugged in for extended periods.



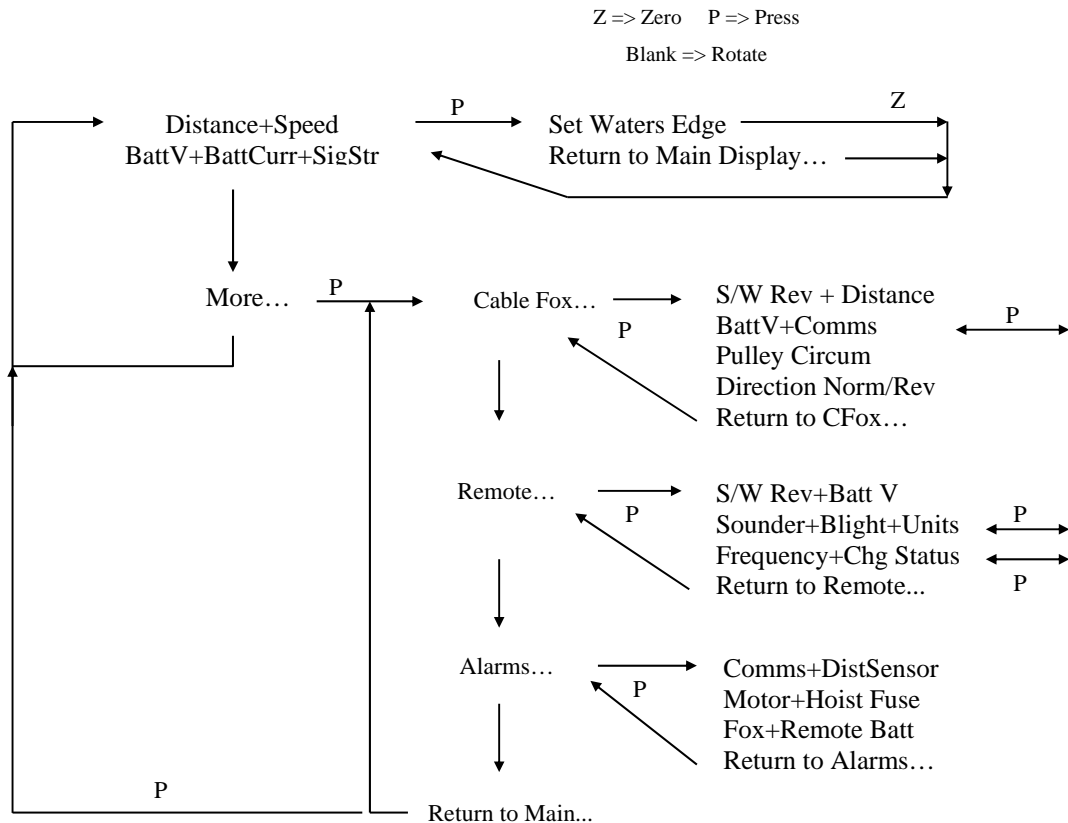
In an **emergency** you can use 3 x AA Alkaline batteries to power the Remote Control. Simply remove the 4 screws that secure the front panel of the Remote Control, then remove the lower screw on the strap over the 3 batteries and rotate the strap out of the way. Replace the 3 x NiMh batteries with 3 x alkaline batteries and re-assemble the Remote Control.

**NOTE: Do not attempt to charge while alkaline batteries are installed!!**

### 3.2 Menu Operation

As previously stated, the controller menu is navigated by rotating and pressing the “Scroll Menu” knob.

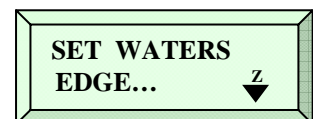
The main menu shows the most used information. Pressing the scroll menu knob while in this menu allows the Set Waters Edge function to be performed. Stepping into the More... menu allows data specific to the Cable Fox, Remote Control and Alarms to be displayed.



Note that if a measurement cannot be displayed due to a comms error, the data will be displayed as “-.- -”.

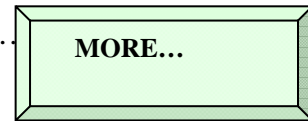
#### 3.2.1 Set Waters Edge

Position the weight so that it is just above the closest waters edge. Press the blue Zero button. This will zero the horizontal distance counter so the river width can be measured.



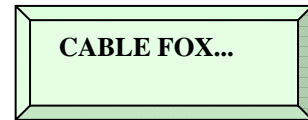
### 3.2.2 More...

This menu item is the door to CFox... Remote... and Alarms... menu. Press the menu scroll knob to enter the CFox... menu.



### 3.3 Cable Fox...

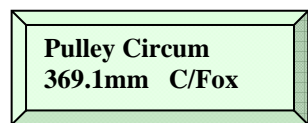
This menu is the entry point to view the Cable Fox information (Battery Voltage, S/W Rev) and change Cable Fox parameters (Backlighting, Sounder, Units, Operating Frequency). Rotate the menu scroll knob to step



to the Alarms... menu or press the menu scroll knob to view Cable Fox information.

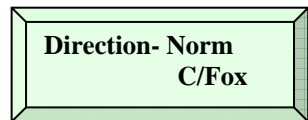
#### 3.3.1 Cable Fox Pulley Circumference

The distance measurement of the Cable Fox relies upon the circumference of the drive rollers. If the distance measurement is incorrect, adjust the Pulley Circum parameter and retry the distance measurement.



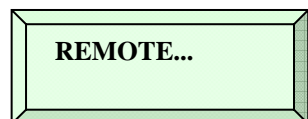
#### 3.3.2 Cable Fox Direction

When the Cable Fox is put onto the main cable, the drive direction and distance measurement may not be the correct sense – when the FWD toggle switch is pressed, the Cable Fox should move away from the bank you have setup on. Changing the 'Direction' setting from Norm to Rev will correct this.



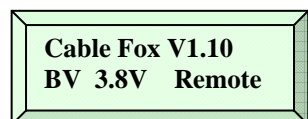
### 3.4 Remote...

This menu is the entry point to view the Remote Control information (Battery Voltage, Charging Status, S/W Rev) and change Remote Control parameters (Backlighting, Sounder, Units, Operating Frequency). Rotate the menu scroll knob to step to the Alarms... menu or press the menu scroll knob to view Remote Control information.



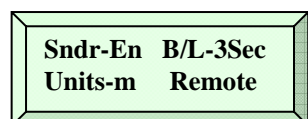
#### 3.4.1 Remote S/W Rev and Battery Voltage

The top line of the LCD displays the Remote Control Software Revision and the bottom line displays the voltage of the batteries inside the Remote Control.



#### 3.4.2 Remote Sounder, Backlight and Units

The top line of the LCD displays the present state of the Sounder (Enabled or Disabled) and the present state of the Backlight (Always Off, On for 1 Sec, 2 Sec,...9 Sec after a control is touched, or always On).



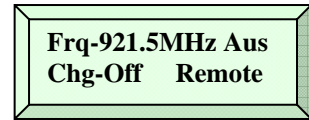
The bottom line of the LCD displays the state of the system Units (either meters or feet). These options can be changed as follows : Press the menu scroll knob and the sounder "En" will flash, rotate the knob to change the selection, and press the knob again to save the selection. When the menu scroll knob is pressed again, the backlight option will flash – rotate

Cable Fox

the menu scroll knob to change the selection and press the knob to save the selection. When the menu scroll knob is pressed for a third time, the units “m” will flash – rotate the knob to change the selection and press again to save the selection.

### 3.4.3 Communication Frequency and Charger Status

The top line of the LCD displays the present communication frequency selected (902.5MHz to 914.5MHz is license free in the US and 915.5MHz to 927.5MHz is license free in Australia) and the bottom line of the LCD displays the Charger status (either Off, On or trickle charge).



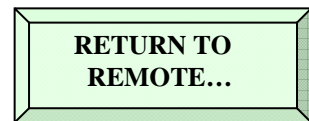
**\*\*\*NOTE\*\*\* Before changing the communication frequency, make sure that the Cable Fox is powered on and communicating properly. When the Frequency is changed on the Remote Control, it automatically updates it in the Cable Fox electronics !!!**

When the menu scroll knob is pressed, the frequency “921.5” and the “Aus” will flash, rotate the knob to change to one of 26 different frequencies, and press the knob again to save the selected frequency and issue a request to the Cable Fox electronics to change its frequency as well. The communications will continue seamlessly at the new frequency.

If for some reason there is no communications between the Remote Control and the Cable Fox, then simply return to the last frequency used ( or step through, select and save each of the 26 different frequencies one at a time, until it picks up communications again ) – and then step to the new required frequency.

### 3.4.4 Return to Remote...

Press the menu scroll button to return to the Remote... Menu.





## 4. Specification

### Cable Fox

Motor Body	Geared Motor 320W
Speed	Drives carriage up to 0.6 m/s (2.00 ft/s)
Distance Measurement	0.01m ( 0.01 ft) resolution
Power Requirement	12V DC 18Ah battery Internal 30A auto reset fuse

### Hoist (Optional)

Lifting Capacity	100 Kg (220 lbs)
Power Requirements	Uses the above Cable Fox power (12V 18Ah) Separate internal 30A auto reset fuse
Cable	Synthetic Rope 12.2m (40ft)

### Wireless Remote Control

Controls	Raise / Lower Control + Battery Voltage monitoring Forward / Reverse + Speed control
LCD	16 char x 2 line with backlighting Calculates horizontal distance
Radio Frequency	USA 902.5 to 914.5 MHz AUS 915.5 to 927.5 MHz (26 channels @ 1MHz spacing) Operating Range 400m (1300 ft) line of sight
Indicators	LEDs for comms and fault indication Sounder for low battery
Power Source	3 x NiMh 2.5Ah AA batteries with built-in charger (3 x AA Alkaline batteries in an emergency)