Contents

Overview:

The MK2 *Chain Counter* has been updated from its original version with numerous enhancements while still providing the same robust, primary functions and anchor rode measurement. The following enhancements set it apart from its competitors;

- GPS location and user settable anchor drag alarms.
- Mobile (Android) and PC Bluetooth application connectivity for status and setting control
- Simplified installation – a single 10 mm (3/8”) hole
- Anchor approach warning
- Improved water resistance IP67
- Remote Windlass control capability

The Chain Counter MK2 (CC) is easy to install and provides a display of the anchor rode length. This ensures the desired length to depth ratio is attained for secure anchoring.

The CC is compatible with both electric and hydraulic windlasses.

Previous chain counters usually rely on a windlass mounted sensor to provide “rotation” counts to the counter display. This sensor, which is difficult to install, is located in an extremely harsh environment, often resulting in an unreliable, inaccurate and troublesome operation.

The CC utilizes the consistent rotation of the windlass drive to calculate the length of chain deployed. Calibration to the specific windlass is performed in both directions to minimize any load variations.

Features:

In addition to the CC enhancements above, the following original features have been maintained…

- Simple design and installation which eliminates the troublesome windlass mounted sensor
- Functions as additional remote windlass control
- No boat-length wiring; wire only to windlass control buttons or solenoids.
- Bright LCD display, visible in full sunlight
- Simple 5 wire installation
- Multi length unit display (feet / meters) with LCD indicator.
- Auto on / off
- Internal alarm speaker and Alarm signal output
- Low current draw 50 mA in sleep-mode, 100 mA with backlight on.
- Recovery countdown that indicates when anchor approaches deck level.
- Multiple units can be added anywhere in the vessel
- LCD icons indicate; GPS / Alarm / Bluetooth / Unit status

Installation:

Installation is simple;

a) Locate a surface that has access from both sides and is not greater than 5/8” (16 mm) thick.
b) Drill a 10-12 mm (3/8”-1/2”) hole.
c) Remove protective seal from double sided tape and position the seal to the back of the CC.
d) Remove the 2nd protective film from the seal. Locate the unit through the hole carefully aligning the unit to the desired viewing position; then press the unit onto the mounting surface to achieve a seal.
e) Thread the retaining nut onto the wire spindle and tighten (10 foot lbs).

Electrical Connections:

Connect the 5 wires in the pigtail as follows;

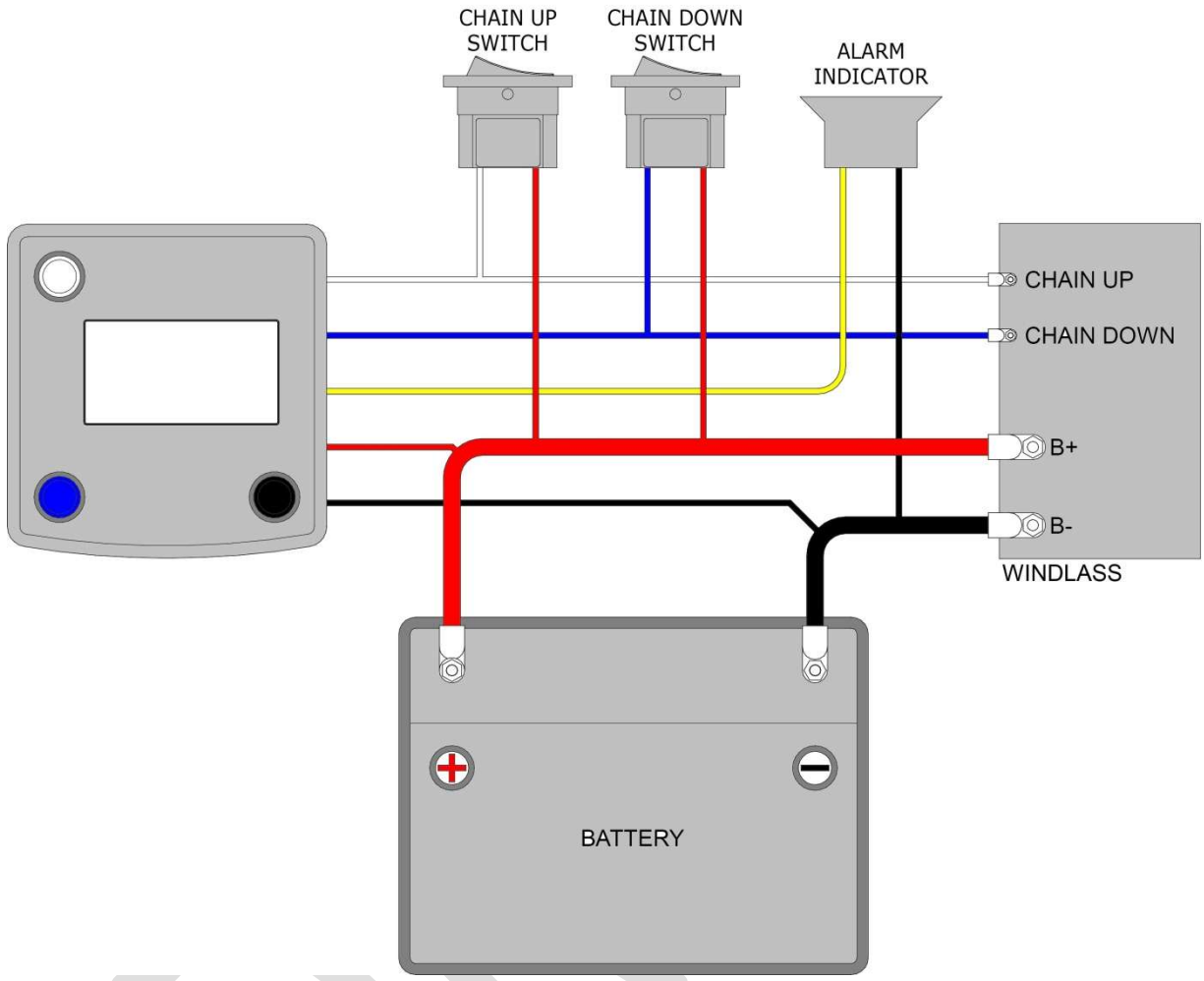
Note: all connections will accept a voltage range of 9 to 30 VDC.

Color	Function	Connects to
Black	Negative Power Supply	Battery Negative
Red	Positive Power Supply	Battery Positive
White	Monitors the "Chain up" command to the Windlass. *	To "Chain Up" windlass control
Blue	Monitors the "Chain down" command to the Windlass. *	To "Chain Down" windlass control
Yellow	Signal lead "alarm". Signal lead provides output same as input with maximum 1 A draw.	To remote alarm indicator

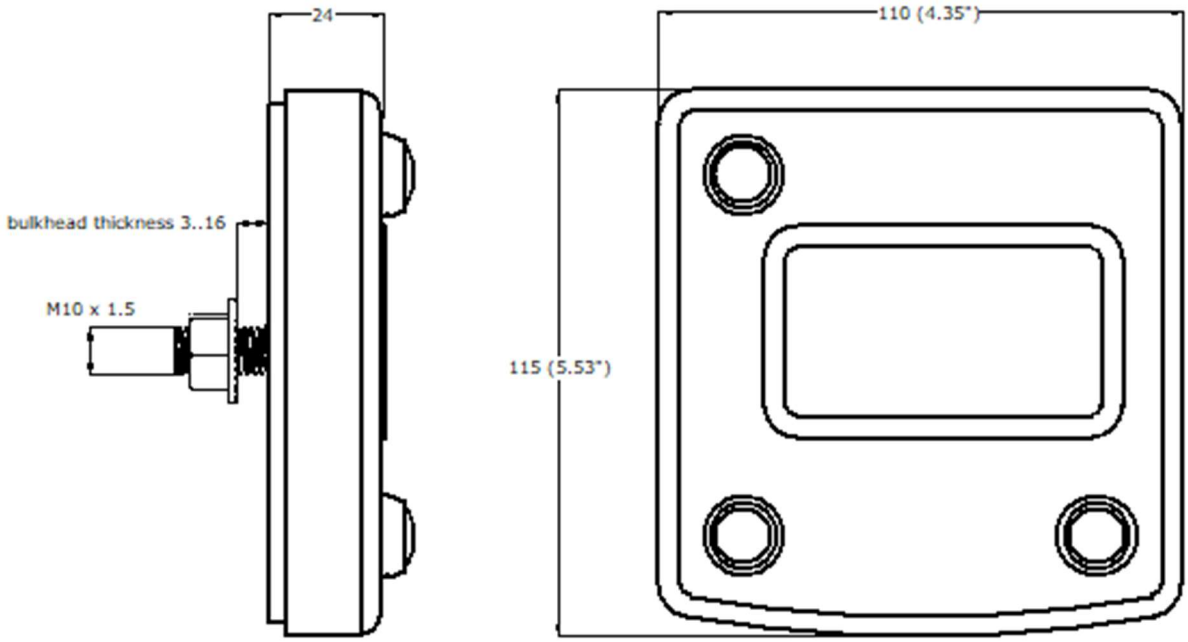
***NOTE:** The signal inputs (Blue & White wires) must be connected at the "output" side of any windlass control switches.

The UP / DOWN buttons on the CC can function as windlass control if so configured in the Settings field of the PC APP.

The CC can be mounted anywhere by extending the wires.



Above schematic shows connections to windlass control buttons. The UP / DOWN buttons on the CC can also be used the control the windlass; this function needs to be enabled in the SETTINGS app.



All units are millimeters (inches)

Introduction:

The primary settings are established using the Bluetooth mobile App or PC based App (Figure 1). Once the settings are defined the Chain Counter is fully functional.

PC Application:

The PC App requires a Bluetooth paired connection; this pairing process is required only once.

Make sure on MK2 Chain counter is switched on, this automatically enables the Bluetooth function.

Navigate to your PC's Bluetooth devices , right-click and select "Add Bluetooth device, "Chain Counter" should appear, and then connect to the device. The CC will connect for a few seconds then show "Not Connected" as it waits for the PC APP connection.

Once the Bluetooth is paired to the "Chain Counter" device, launch the App (Chain Counter.exe) and right-click over the App window (Figure 1) to bring up the menu (Figure 2); click on "Connect"

The *Bluetooth Connection Status* field (bottom left corner) will change from "*Not Connected*" to "*Connected*" , the Bluetooth icon on the LCD screen on the device will change from flashing (active) to solid (connected); also the bottom field will change from ; Chain Counter not connected to System State received in 229 bytes indicating the CC is connected and communicating.

Figure 1

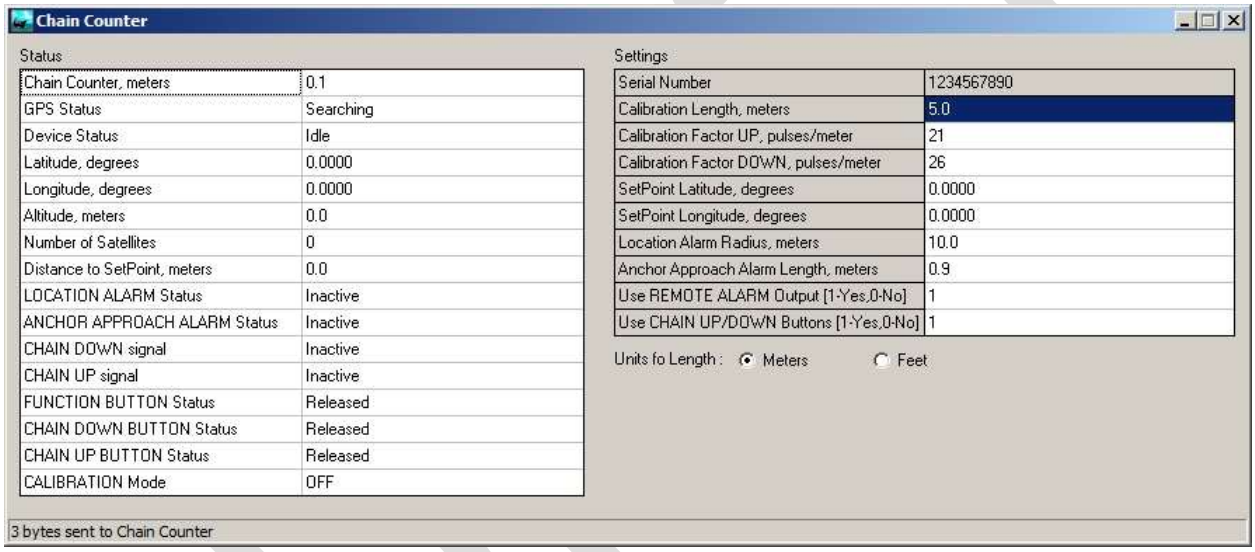
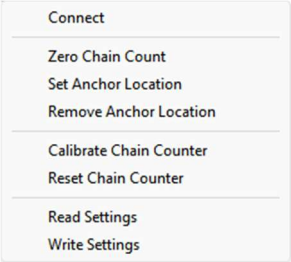


Figure 2 – Right Click pop-up menu



The App window has 2 tables; ***Status*** *and* ***Settings.***

The ***Status*** fields indicate the various states and measurement values whereas the "***Settings***" table allows the user to modify the device. The "Status" fields will update every 0.5 second whereas the "Settings" fields will only update when a right-click and "***Read Settings***" is selected.

Status Table:

GPS Status – Searching or Connected
Device Status –
Latitude, degrees – Current location
Longitude, degrees – Current location
Altitude, meters (feet) – Current altitude
Number of Satellites – Number of GPS satellites – minimum for quality location 5
Distance to SetPoint – Distance from current location to SetPoint
LOCATION ALARM Status –
ANCHOR APPROACH ALARM Status –
CHAIN DOWN signal – indicates if device is receiving signal "Active or Inactive"
CHAIN UP signal – indicates if device is receiving signal "Active or Inactive"
FUNCTION BUTTON status – Indicates whether FUNCTION button is Pressed or Released.
NOTE: Button presses of less than 0.5 seconds are not detected.
CHAIN DOWN BUTTON Status – Whether button on CC is being pressed
CHAIN UP BUTTON Status – Whether button on CC is being pressed
CALIBRATION Mode – Indicates whether device is in Calibration mode "ON or OFF"

Settings Table:

Serial Number – unique serial number of device-
Calibration Length – User choice to calibrate 10 M (30 ft) is typical
Calibration Factor UP, pulses / meter (feet) - Value determined for device during calibration process
Calibration Factor DOWN, pulses / meter (feet) - Value determined for device during calibration process
SetPoint Latitude, degrees – GPS Value determined by device when SetPoint is established.
SetPoint Longitude, degrees – GPS Value determined by device when SetPoint is established.
Location Alarm Radius – The distance from Current position to SetPoint that triggers the Alarm – sound and flashing center icon 
Anchor Approach Alarm – The distance from the Start point (Windlass) that the approach alarm sounds and the icon flashes….this provides a warning that the anchor is approaching the boat.
Use REMOTE ALARM Output – Enables remote alarm signal (1 Amp)
Use CHAIN UP / DOWN Buttons – Enables CC buttons to control windlass
Units -

Calibration:

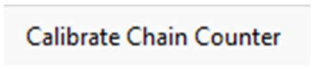
The Chain Counter must be calibrated to the specific Windlass….this is a one-time procedure can be initiated from either the PC App or Mobile App.

PC APP:

Calibration is accomplished by deploying and retracting a "known" length of chain approximately 10 feet (3 meters).

1. Mark a start and stop point on the chain enter the "known" length in the "Calibration Length" field of the PC app.

Right click over the App to bring up the pop-up menu, select "Write Settings" to enter this know value. Right click again and select "Calibrate Chain Counter"



, the CC display will show "CALIBRATION" is the lower left corner, the APP field will change to;

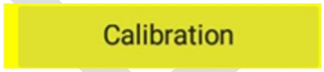
CALIBRATION Mode	ON

2. Using the windlass "DOWN" button deploy the chain such that the marked start and stop points travel past a fixed point.
3. Once the stop point has reached the fixed point, retract the chain using the windlass "UP" button and stop when the "start" mark reaches the fixed point again.
4. Press FUNCTION button to complete the calibration. Right-click and select "Read setting" to update the APP fields.

- The Counter may be re-calibrated at any time.

Mobile APP:

The mobile app has the same functionality and interface with the following look to



Operation:

The basic operation once calibrated is straightforward; whenever the windlass controls buttons are activated (the respective icon will appear in the top-left corner)  the CC display will light and indicate the value of the deployed chain. The windlass can be directly driven from the CC, pressing the UP / DOWN buttons  . The icons will appear within a circle.

The display backlight will turn off (Sleep mode) after 10 seconds of inactivity….the display can be turned on by pressing the main button or activating a Windlass control button.

Pressing the FUNCTION button for 3 seconds displays distance to anchor GPS set-point.

Pressing and holding the FUNCTION button for 10 seconds will zero the chain length.

Alarm Features:

- The left icon indicates Alarm status 
- Icon off – alarm not enabled
- Icon steady alarm active but not in alarm state
- Icon flashing the alarm is in an Alarm state based on user setting of the

Location Alarm Radius, meters 10.0 ; distance from current position to set-point position exceeds the set value (10.0).

- If the REMOTE ALARM Output has been enabled a signal will be provided to via the Yellow connection wire.

GPS Features:

- The center icon  indicates GPS status;…if flashing, the GPS is searching for a fix. Once a fix is achieved, the icon will remain steady
- Normal accuracy +/- 3 meters (10 ft.) with 5 satellite connections
- Lat / long displayed in app in decimal degrees i.e.-49.1235 ◦
- Location Alarm Radius -

Bluetooth Features:

- The right icon  indicates the Bluetooth status
- icon off – no Bluetooth connection
- Icon flashing in pairing mode
- Icon steady On….Bluetooth connection is made.

Sleep Mode:

The CC enters sleep mode to reduce electrical consumption and turn off the backlight. Sleep mode is entered when there is no signal or button activity for 5 seconds. Pressing the windlass controls or any CC button will bring the CC out of sleep mode.

Mobile App (Android):

The mobile app provides both status and control functions. The app is connected as follows;

1. Enable Bluetooth on the mobile device
2. View "Discoverable Devices" and select "Chain Counter"
3. Confirm connection on both mobile device and Bluetooth icon  on the CC screen.

Once connected there are 2 screens; **STATUS** and **SETTINGS**.

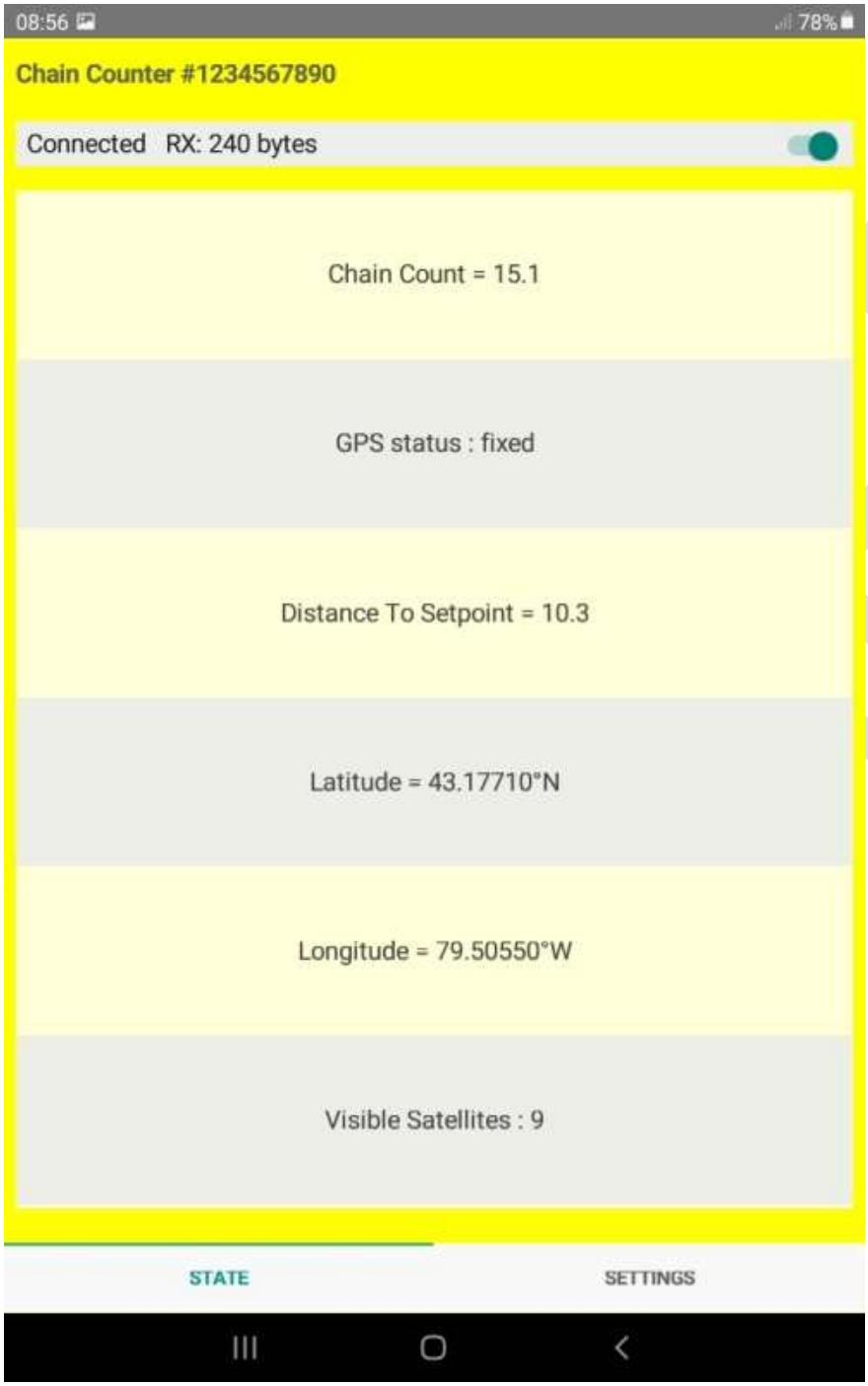
STATUS:

The Status screen (SCREEN #1) has initially 8 fields, which indicate current values;

If the Anchor Alarm function is enabled a 9th field will appear when the Anchor Location Drift Alarm is "triggered" or the Anchor Approach Alarm is active (SCREEN #2)

1. Chain Counter serial #
2. Connection status
3. Chain Count – in designated units (meters / feet)
4. GPS Status
5. Distance to Setpoint -
6. Latitude – if GPS fix is established
7. Longitude - if GPS fix is established
8. Visible Satellites – minimum 4 required for 5 meter accuracy
9. Alarm- indicates various alarm states

SCREEN #1


08:56
78%
Chain Counter #1234567890
Connected RX: 240 bytes
Chain Count = 15.1
GPS status : fixed
Distance To Setpoint = 10.3
Latitude = 43.17710°N
Longitude = 79.50550°W
Visible Satellites : 9
STATE
SETTINGS

If the Anchor Alarm function is enabled a 9th field will appear when the Anchor Location Drift Alarm is "triggered". (SCREEN #2)

SCREEN #2

9th Field

SETTINGS:

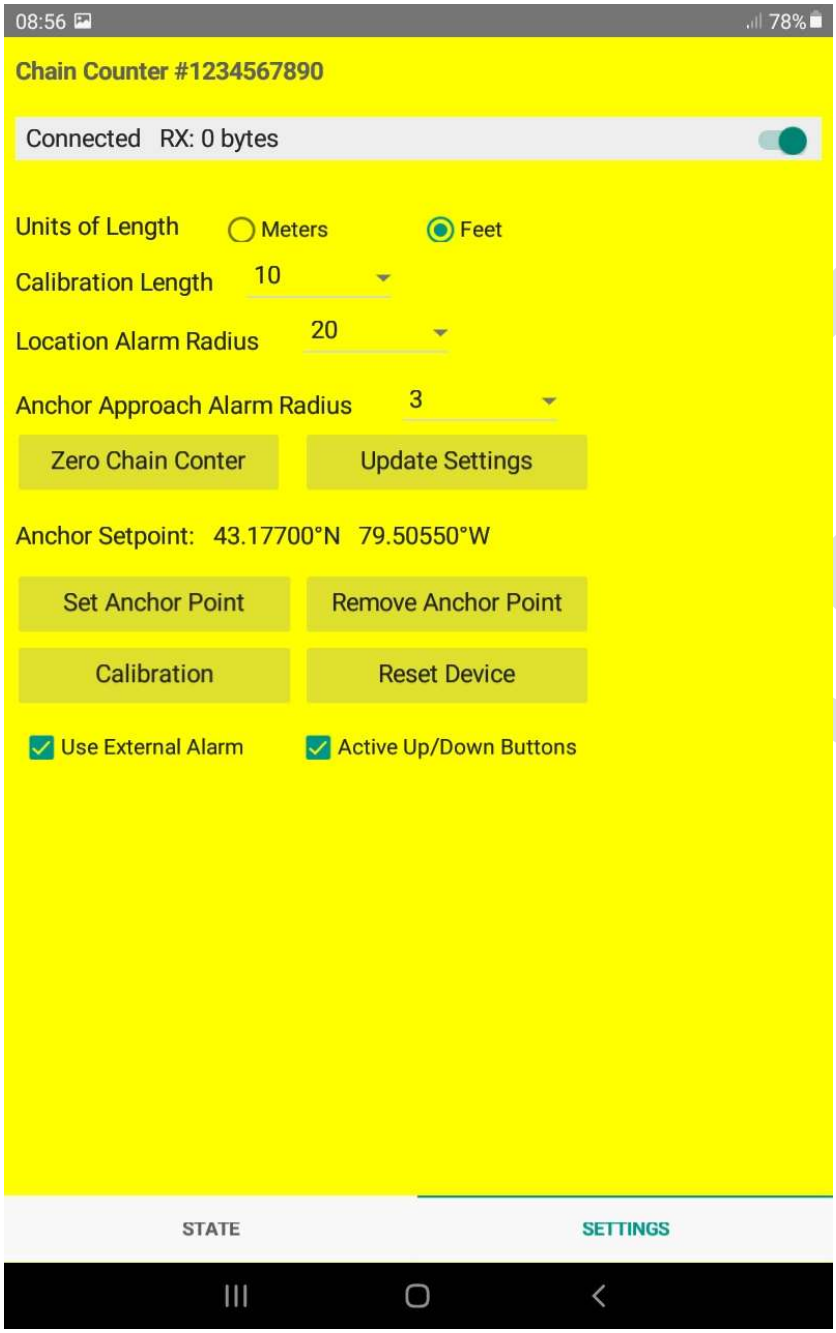
The SETTINGS screen (SCREEN #3) provides the interface to allow USER settings.

1. Units of Length
2. Calibration Length – distance to use for the calibration procedure…10 ft (3m) recommended.
3. Location Alarm Radius – distance to setpoint that causes Alarm to activate

   NOTE: The Alarm radius should be greater than the deployed rode length.

4. Anchor Approach – Distance the warning alarm activates as Anchor is lifted to the vessel
5. UPDATE Settings – Writes settings to the CC with any value changes that have been made.
6. Anchor Setpoint – Position when "Set Anchor Point" was selected.
7. Set Anchor Point – button to set or reset "Anchor Setpoint"
8. Remove Anchor Point – Clears Setpoint; effectively disables Anchor drift alarm
9. Calibration –initiates calibration process
10. Reset Device – Reset function is case of function issues – resets unit to factory settings.
11. Use External Alarm – Check box – Enables signal to optional external alarm if equipped.
12. Active Up / Down buttons –Check box – Enables the CC to send signals to the Windlass controls to operate the Windlass.

SCREEN 1


08:56
78%
Chain Counter #1234567890
Connected RX: 0 bytes
Units of Length
Meters
Feet
Calibration Length
10
Location Alarm Radius
20
Anchor Approach Alarm Radius
3
Zero Chain Conter
Update Settings
Anchor Setpoint: 43.17700°N 79.50550°W
Set Anchor Point
Remove Anchor Point
Calibration
Reset Device
Use External Alarm
Active Up/Down Buttons
STATE
SETTINGS

Summary:

The simplicity of installation and operation make the Chain Counter both a convenience and a valuable safety device, taking the frustration and uncertainty out of the anchoring process.

A solo-sailor can now confidently set the vessel's rode length from the cockpit windlass controls. Anchor recovery can be safely achieved using the "approach' alarm and count-down display.

The GPS function alerts when any condition results in the vessel's position varying from the user specified distance.

NOTE: *The GPS alarm is intended as a convenience feature, not as a single source of protection. A single GPS based alarm should NOT be relied on.*

Good seafaring practices require regular visual position observations.

Convenience and safety in a simple to install package…..

Simplicity afloat in the surest guarantee of Happiness! (*L. Francis Herreshoff)*