iBTVM User Guide

(Item #12400)

M.C. Miller Co., Inc.
11640 US Highway 1
Sebastian, FL 32958
772.794.9448
sales@mcmiller.com
www.mcmiller.com

Revised June 16, 2023

Contents

Charging the Battery: 3
Charging Status: 3
Push Button Operation: 4
Turning the unit ON: 4
Turning the unit off: 4
Resetting the unit: 4
LED1: Status Indicator: (Blue push button lamp) 5
With the Power ON… 5
ON Mode … LED1: On all the time 5
Link Mode… LED1: On 1 sec, Off 3 sec 5
Active Mode… LED1: ON 0.9 second, Off 0.1 second. 5
Battery Too Low or Error detected… LED1: On 0.2 sec, Off 0.2 sec 5
Power OFF indications: 5
The BLUE LED is Off 5
Connecting an Android device to the iBTVM: 6
Turning on WPAN: 6
Opening and closing the “Basic” application: 6
To send data by email: 10
To use Dropbox: 11
Voltmeter setup: 12
Using the Data logger Function: 18
Using the data recorder: 20
Setting the recording interval 20
To close the application: 24
External connections: 25
Included Accessories: 25
Voltmeter Characteristics: 26
Specifications: 27

Charging the Battery:

Please charge the battery fully prior to using the iBTVM!

With the unit turned off, open the case and locate the charge port and charge lamp on the right side.

Connect the charging cable to the included AC adaptor and plug the adaptor into a standard 120VAC 60Hz outlet. The other end of the cable plugs into the charge port on the iBTVM. **DO NOT attempt to close the cover with the charger connected or charge port damage will result!**

Charging Status:

The LED on the AC adaptor should illuminate when plugged into the wall outlet and the red charge lamp on the iBTVM battery pack should illuminate indicating the unit is charging.

When the red charge lamp on the iBTVM turns off, the unit is fully charged and ready for use.

When the iBTVM is powered on and connected to a compatible device, the voltmeter application on the tablet indicates the battery status by the green square in the top right corner of the screen. When nearly discharged, the battery level line will change from green to red.

When using the supplied charger and cable the iBTVM should fully recharge in 3-4 hours.

Push Button Operation:

Turning the unit ON:

Press the Push Button for **2 to 4 seconds** to turn the **Power ON**.
The system is now in Active Mode.

Turning the unit off:

If the power is already ON
Press the Push button for **2 to 4 seconds** to turn the **Power OFF.**

Resetting the unit:

Press the Push button for **6 to 10 seconds**
This resets the power, turns OFF WPAN, voltmeter and GPS then turns everything back on again. The Blue pushbutton lamp will turn off and then back on.

NOTE 1:

Pressing more than the above specified times will not turn the system ON, OFF or Reset until the button is released and pressed again within the time allowed.

NOTE 2:

On later models with the ORANGE push button switch, it is no longer necessary to hold the button in for a specified length of time to power on or off. Simply push to turn on and push again to turn off. The button remains in when the unit is on. Turning the unit off also performs the reset function.

LED1: Status Indicator: (Blue push button lamp)

With the Power ON…

ON Mode … LED1: On all the time

Normally when the system wakes up from power off or reset power, the system is on but no WPAN link to a tablet or smart phone, and there are no detected system errors.

Link Mode… LED1: On 1 sec, Off 3 sec

No activity on WPAN but there is an active link to tablet or phone. The system is ready for use.

Active Mode… LED1: ON 0.9 second, Off 0.1 second.

The system is linked and was receiving/sending commands to/from WPAN within the last 1 minute.

Battery Too Low or Error detected… LED1: On 0.2 sec, Off 0.2 sec

The detected system indication could be:

- Battery voltage too low:

  The battery voltage is in a close to critical level. When battery voltage falls to 3.0 volts, this BAT / Error Mode starts blinking. When Battery reaches 2.7 volts, the system shuts itself off

Power OFF indications:

The BLUE LED is Off

Normally it will be Off because the unit was turned Off or the battery voltage level is extremely low.

Connecting an Android device to the iBTVM:

Turning on the WPAN technology:

If WPAN is not already enabled on the tablet or smart phone do so by opening "Settings", selecting the WPAN button and selecting "On".

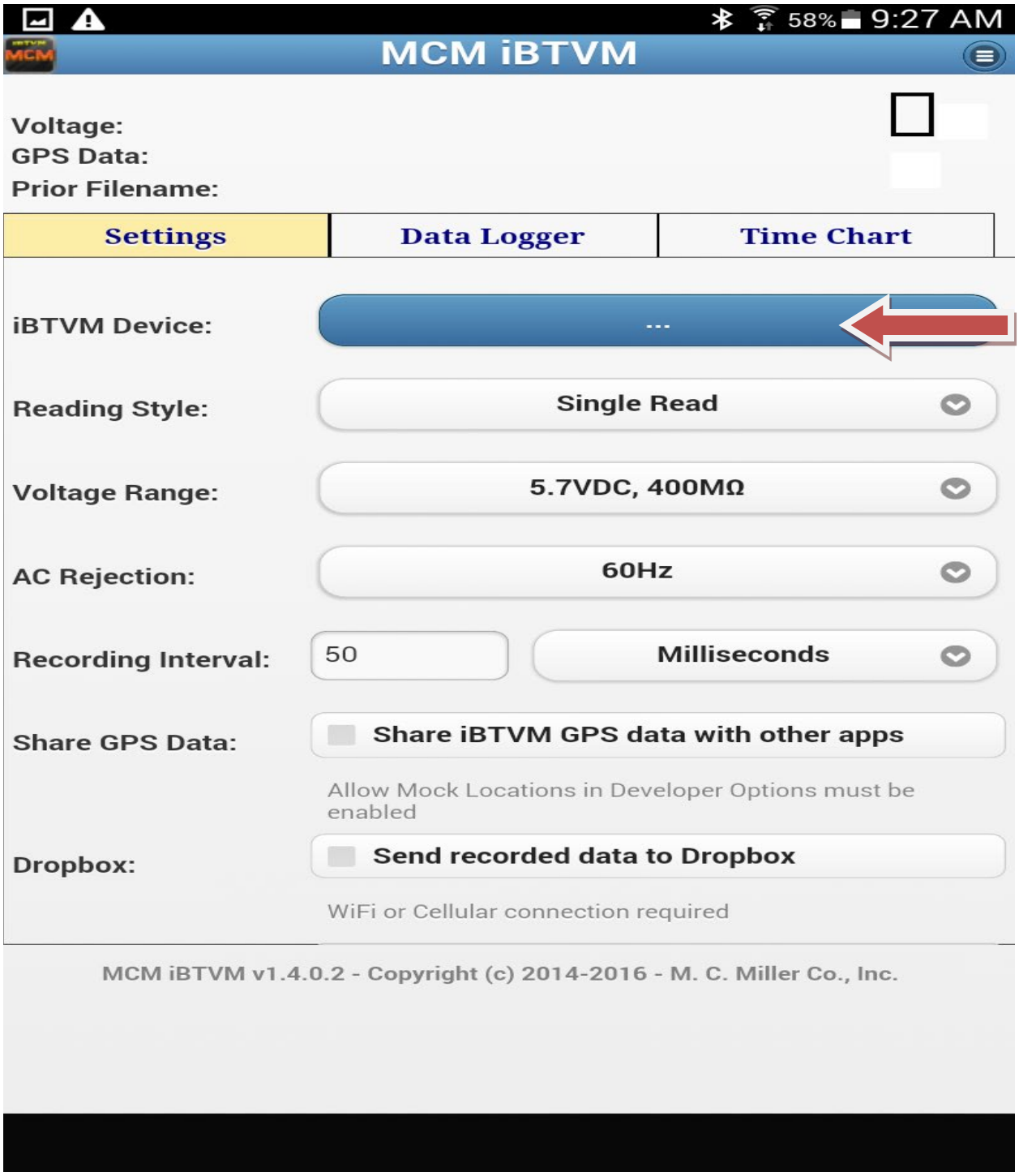
Having done this, close the "Settings" page.

Opening and closing the "Basic" application:

Turn the iBTVM on as instructed above.

Find and tap the icon for the "MCM iBTVM" application and the app should open as shown below.

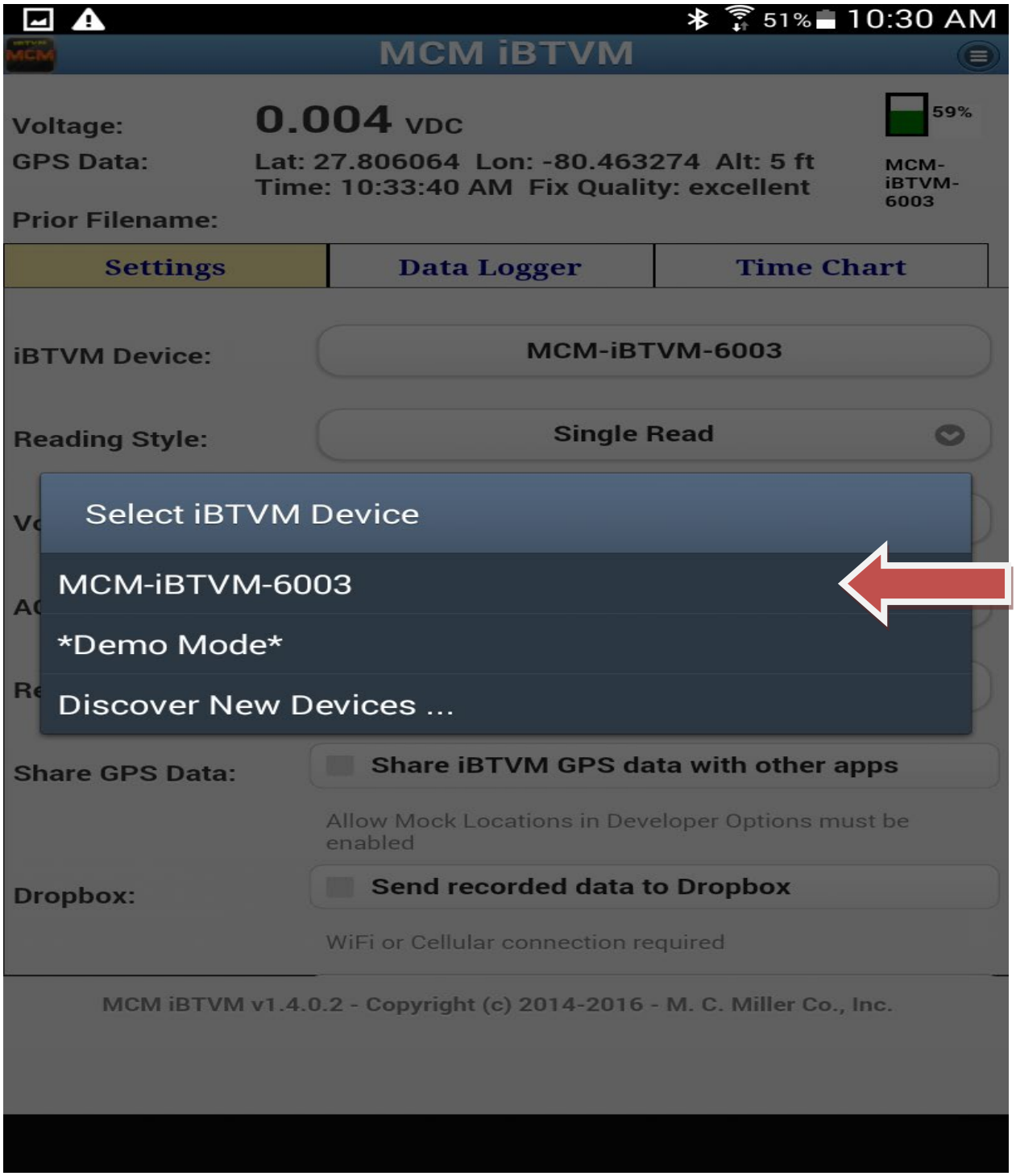
To close the application, tap the "Menu Bar" at the top right corner of the display, select "Exit" and tap "YES" to exit.



On the screen displayed above there is no currently connected device.

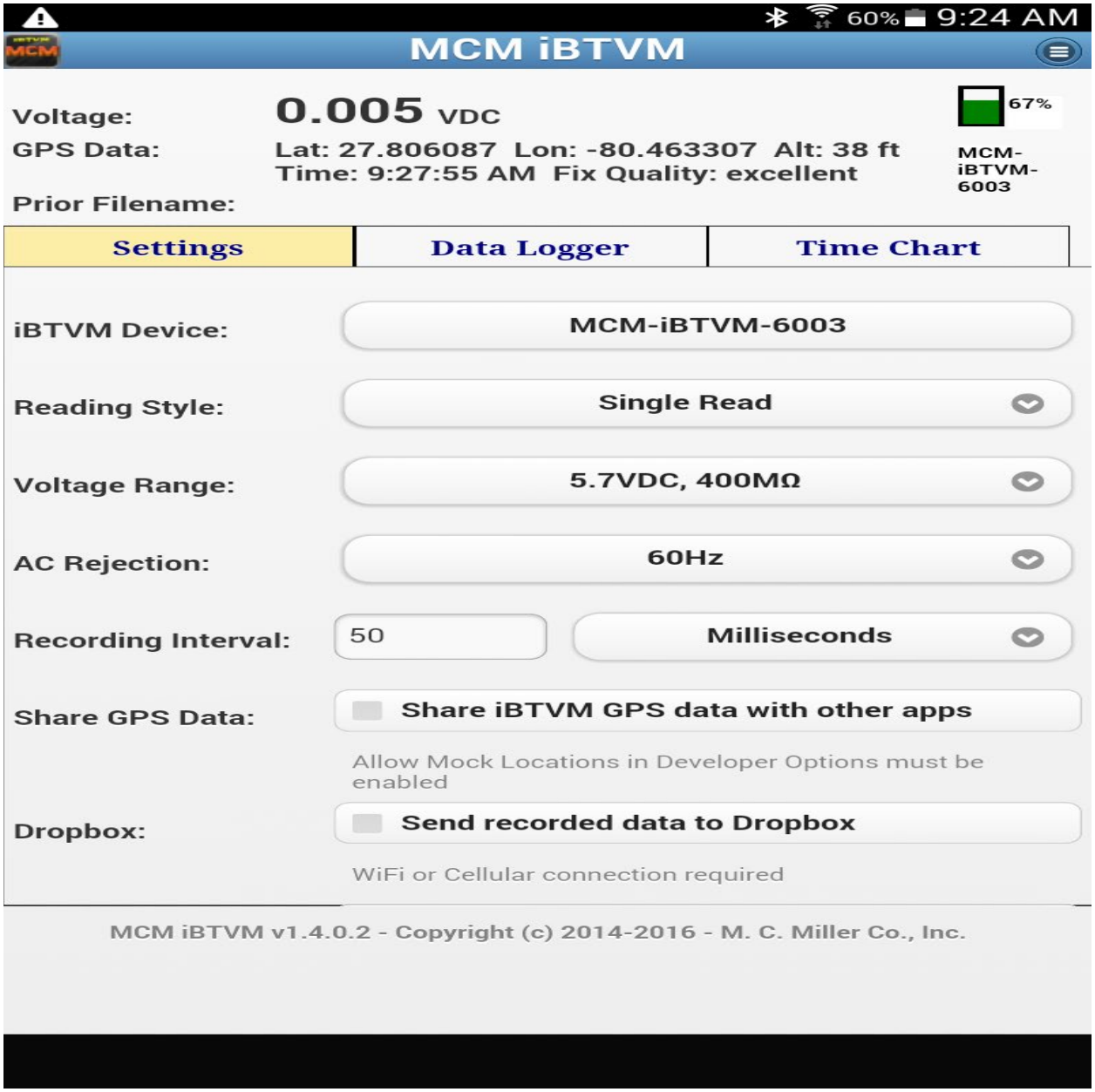
To connect to the iBTVM, turn the meter on and when the blue push button lamp is continuously on, tap the blue bar on the tablet display.

The next screen will show the available iBTVM(s). If none are shown, tap “Discover New Devices” to refresh the view. Then tap the device name matching that of the iBTVM you are using. For example: MCM-iBTVM-06005.



Available iBTVM devices

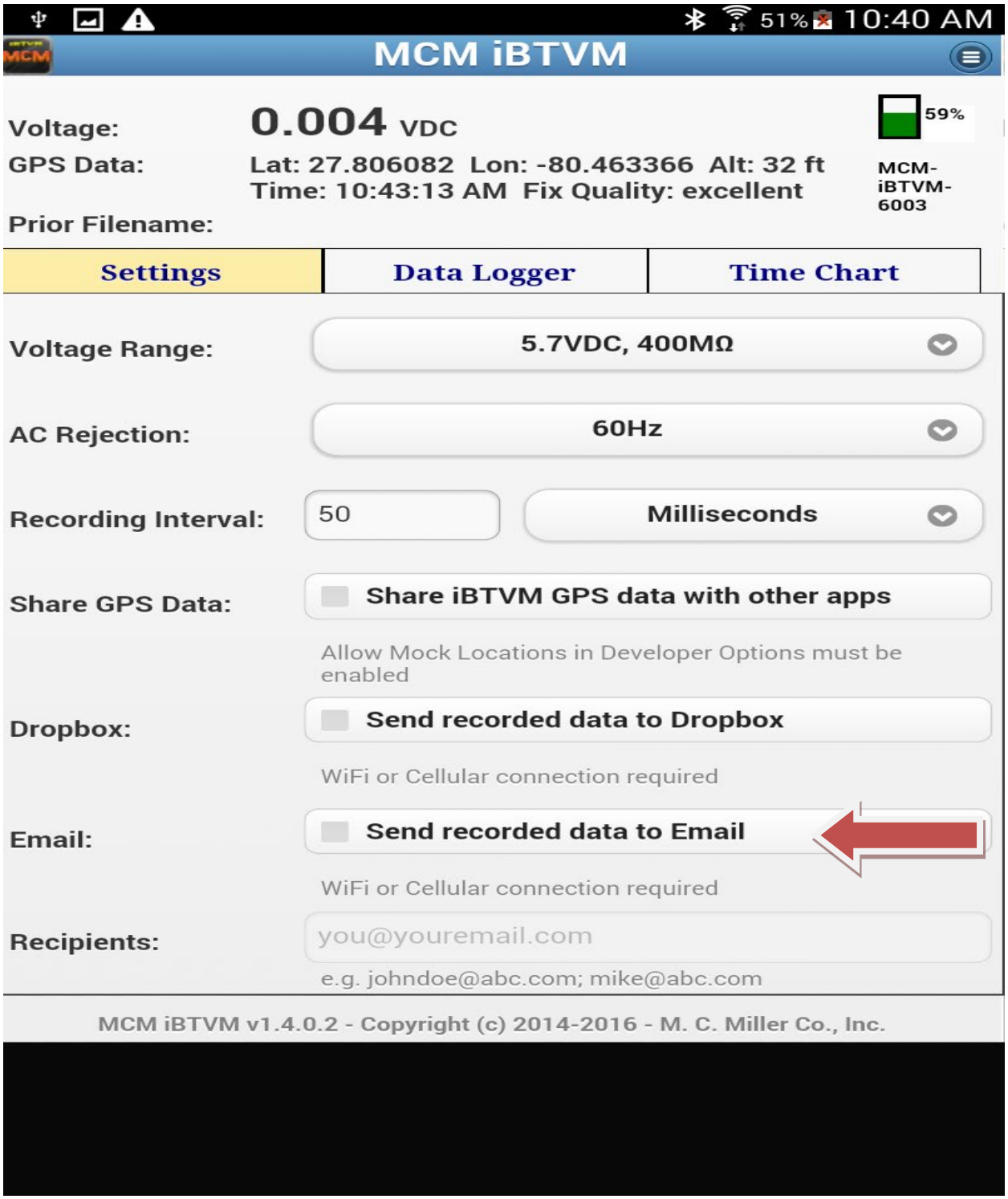
Once connected, the iBTVM will display the screen shown below (actual values may be different).



Before recording any data, it is desirable to set up the email and/or Dropbox accounts in the tablet's corresponding apps. These apps are then used by the iBTVM app to deliver recorded readings to your specified recipient.

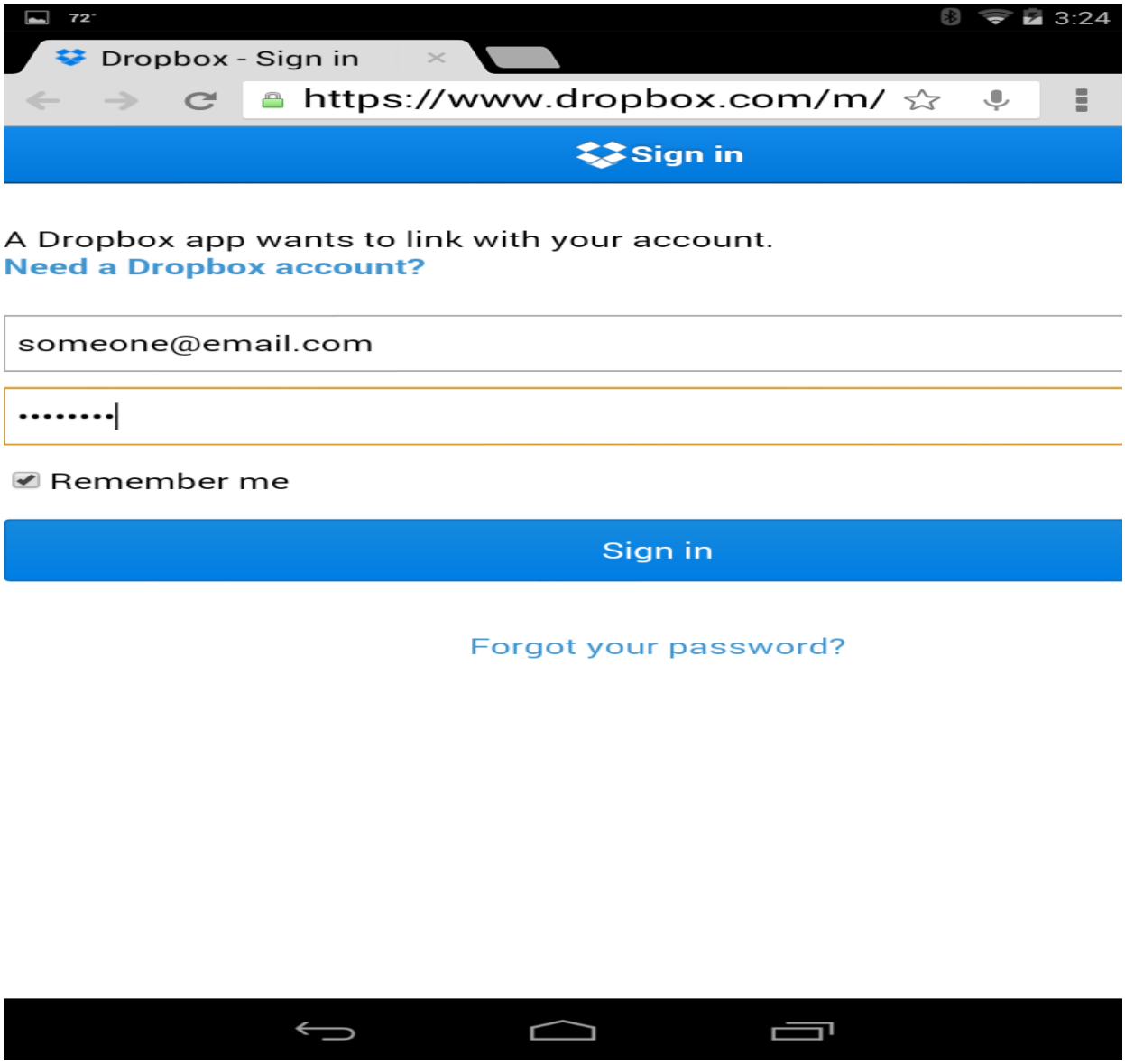
To send data by email:

Tap the “Send recorded data to Email” box and enter the email address you wish to send the file to (see below).



To use Dropbox:

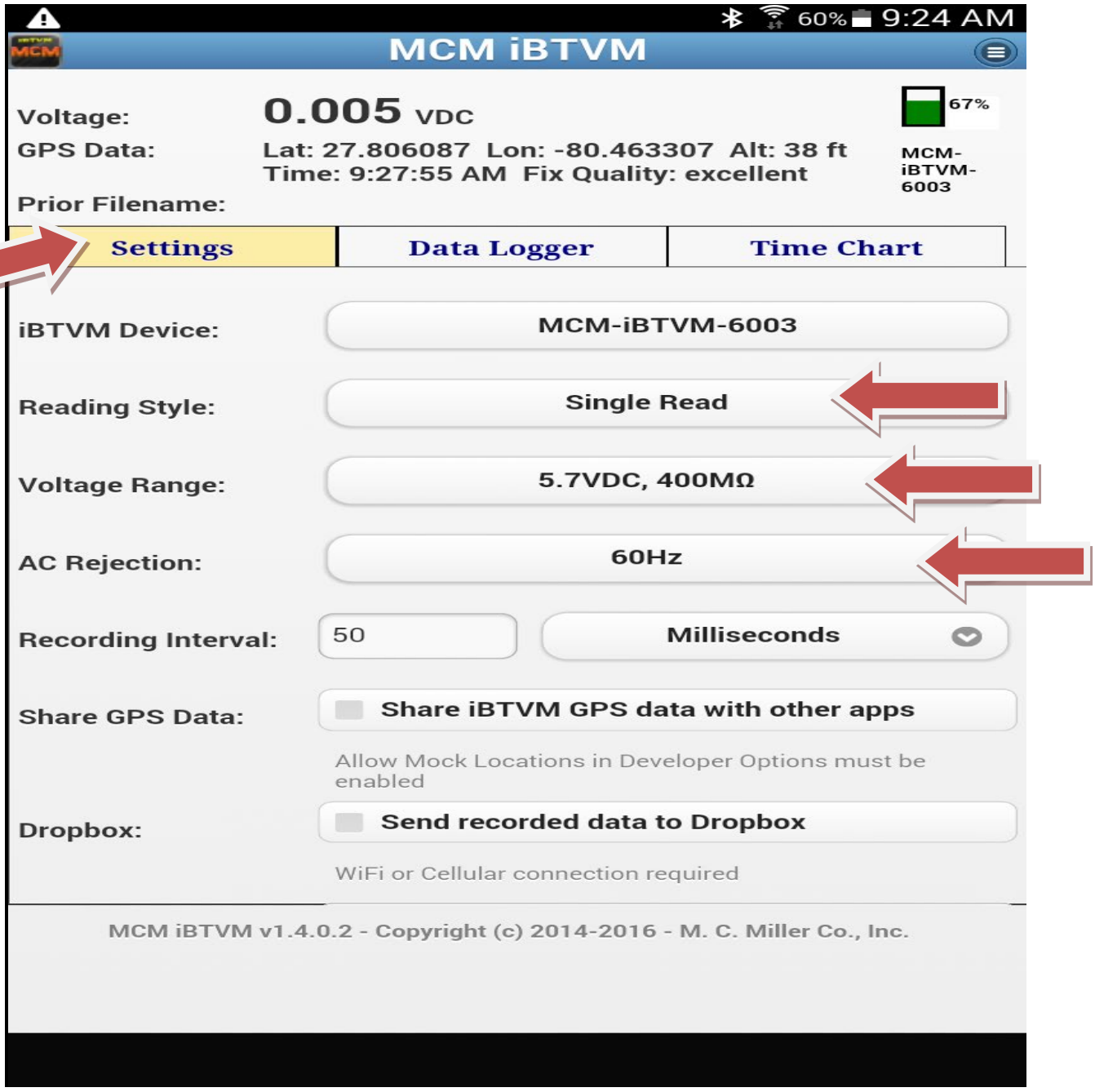
Tap the “Send the recorded data to Dropbox” and enter the requested Dropbox account information as shown below.

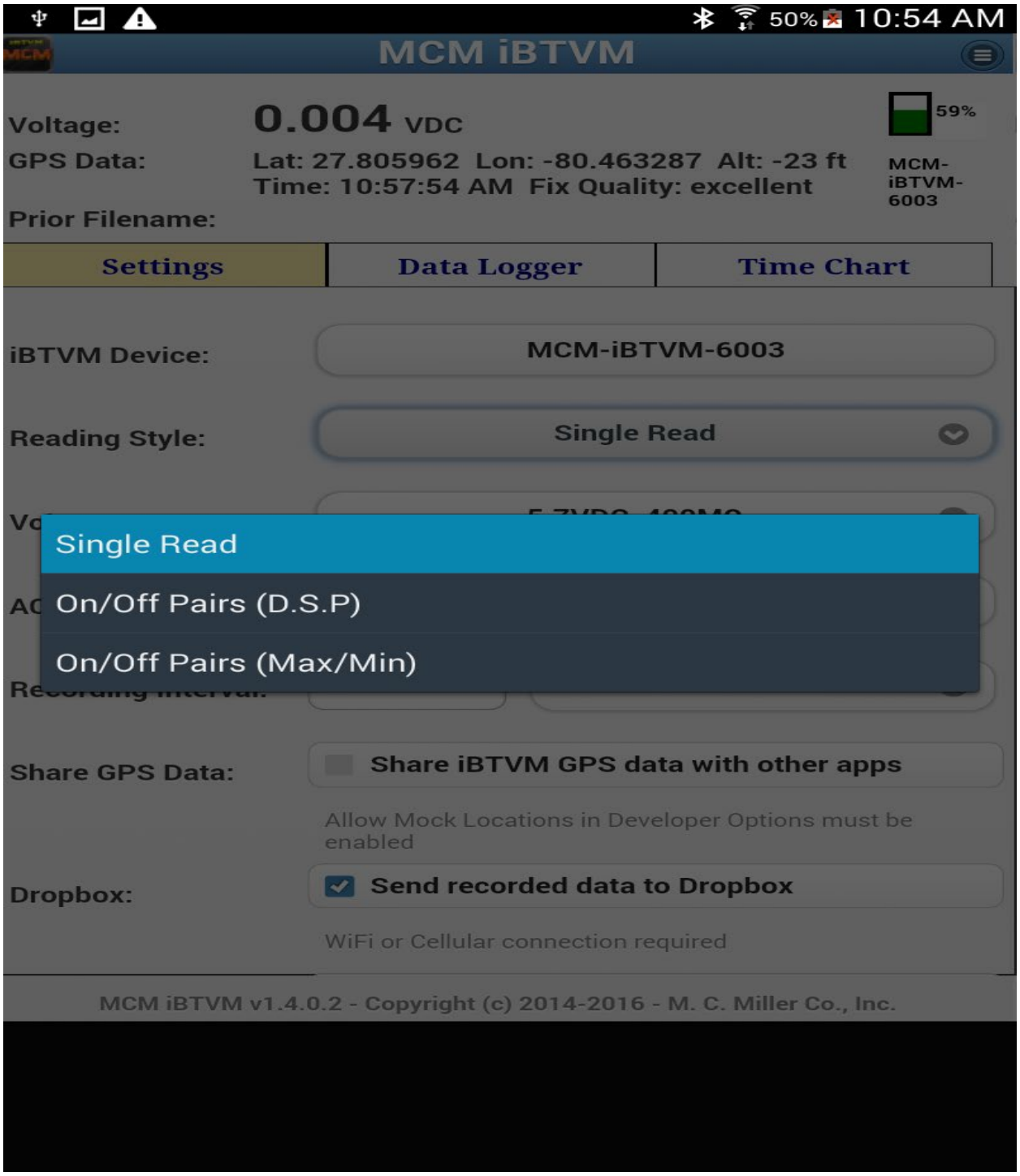


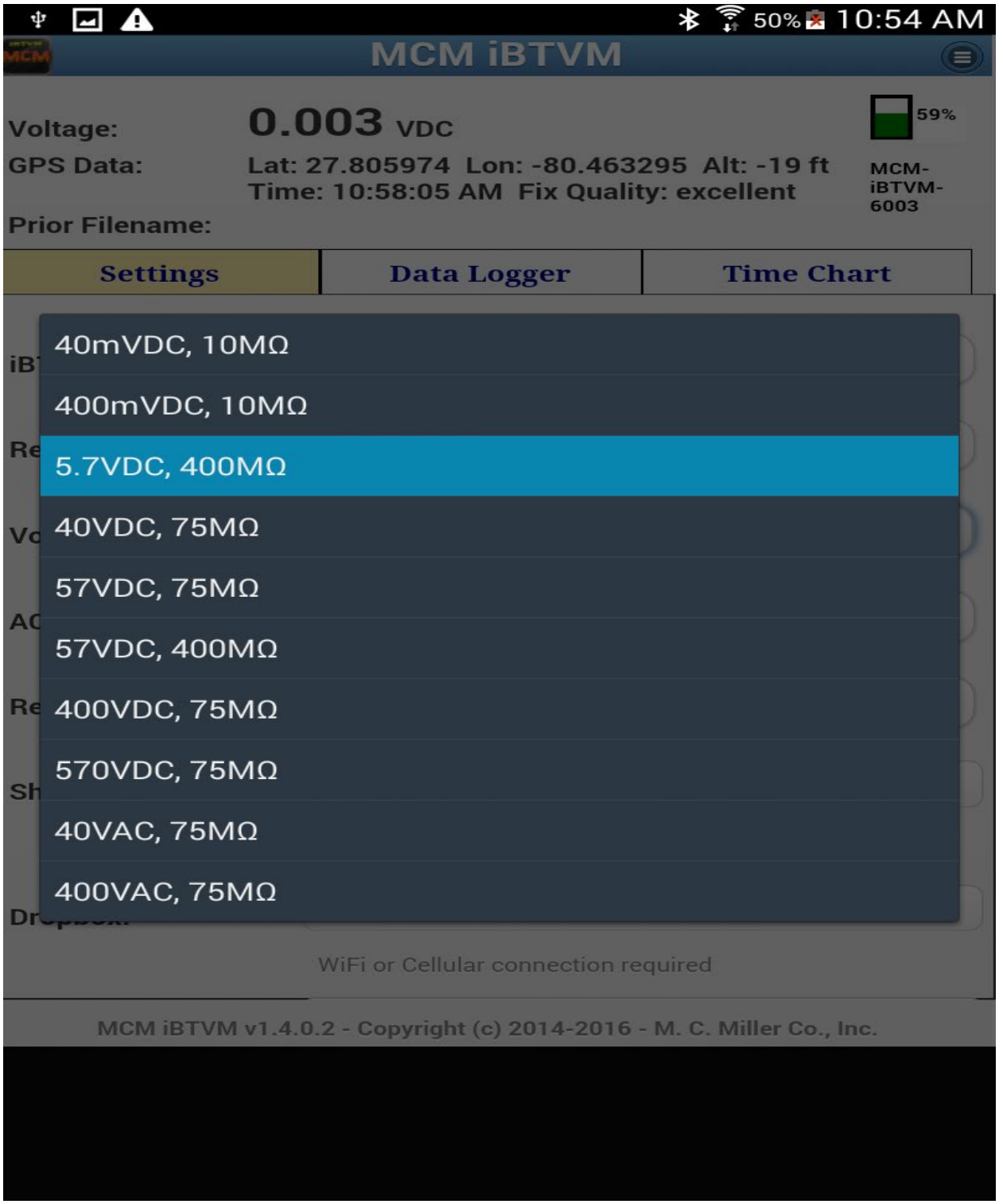
NOTE: In order to use either the Dropbox or email functions the mobile device must have an active cellular or Wi-Fi connection.

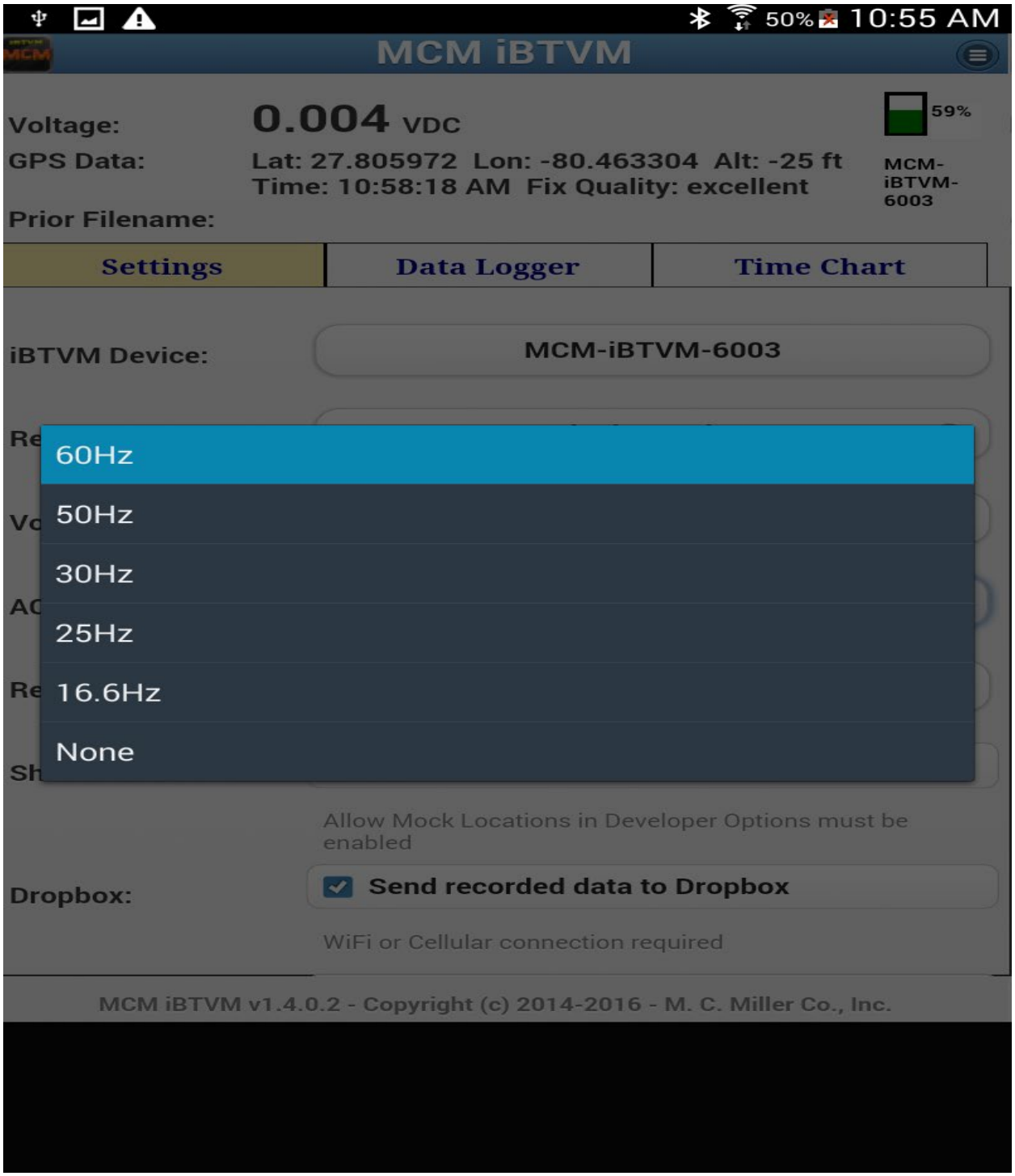
Voltmeter setup:

Tap the “Voltmeter Settings” tab and choose the appropriate “Reading Style”, “Voltage Range” and “AC Rejection” as shown in the next four slides.

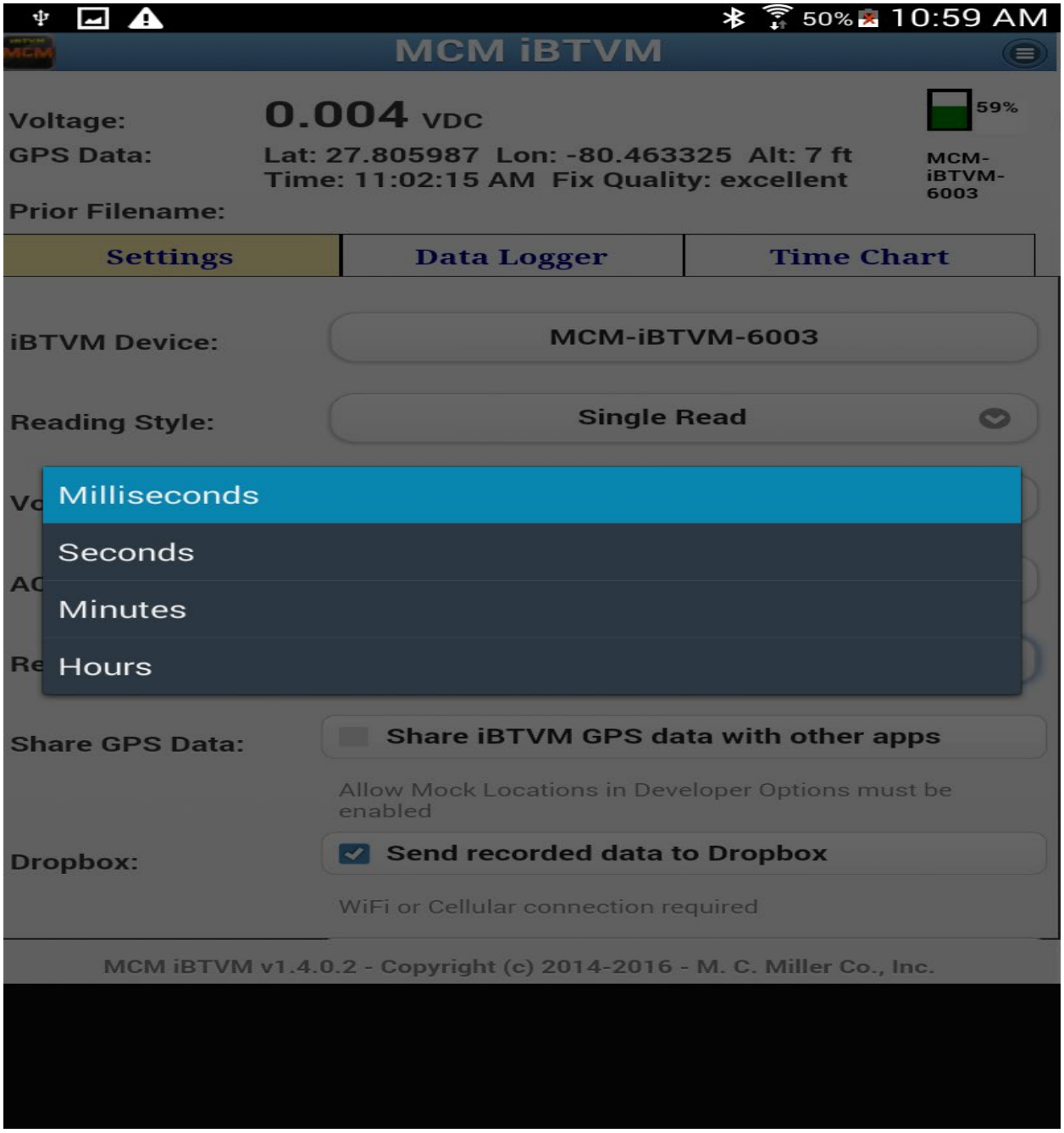


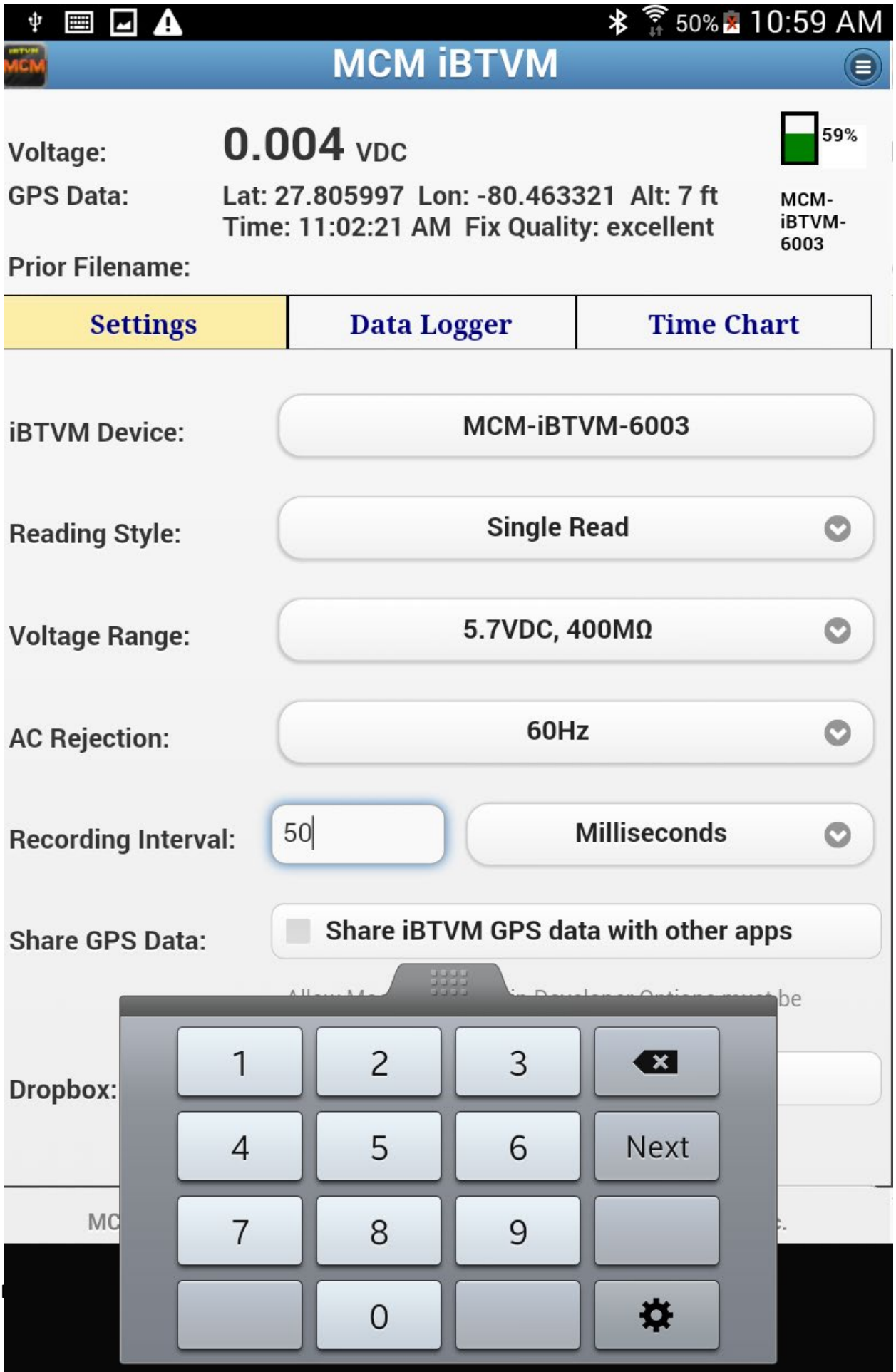

50% 10:54 AM
MCM iBTVM
Voltage:
0.004 VDC
59%
GPS Data:
Lat: 27.805962 Lon: -80.463287 Alt: -23 ft
Time: 10:57:54 AM Fix Quality: excellent
MCM-iBTVM-6003
Prior Filename:
Settings
Data Logger
Time Chart
iBTVM Device:
MCM-iBTVM-6003
Reading Style:
Single Read
Single Read
On/Off Pairs (D.S.P)
On/Off Pairs (Max/Min)
Share GPS Data:
Share iBTVM GPS data with other apps
Allow Mock Locations in Developer Options must be enabled
Dropbox:
Send recorded data to Dropbox
WiFi or Cellular connection required
MCM iBTVM v1.4.0.2 - Copyright (c) 2014-2016 - M. C. Miller Co., Inc.


50% 10:54 AM
MCM iBTVM
Voltage:
0.003 VDC
59%
GPS Data:
Lat: 27.805974 Lon: -80.463295 Alt: -19 ft
Time: 10:58:05 AM Fix Quality: excellent
MCM-iBTVM-6003
Prior Filename:
Settings
Data Logger
Time Chart
40mVDC, 10MΩ
400mVDC, 10MΩ
5.7VDC, 400MΩ
40VDC, 75MΩ
57VDC, 75MΩ
57VDC, 400MΩ
400VDC, 75MΩ
570VDC, 75MΩ
40VAC, 75MΩ
400VAC, 75MΩ
WiFi or Cellular connection required
MCM iBTVM v1.4.0.2 - Copyright (c) 2014-2016 - M. C. Miller Co., Inc.


50% 10:55 AM
MCM iBTVM
Voltage:
0.004 VDC
59%
GPS Data:
Lat: 27.805972 Lon: -80.463304 Alt: -25 ft
Time: 10:58:18 AM Fix Quality: excellent
MCM-iBTVM-6003
Prior Filename:
Settings
Data Logger
Time Chart
iBTVM Device:
MCM-iBTVM-6003
60Hz
50Hz
30Hz
25Hz
16.6Hz
None
Allow Mock Locations in Developer Options must be enabled
Dropbox:
Send recorded data to Dropbox
WiFi or Cellular connection required
MCM iBTVM v1.4.0.2 - Copyright (c) 2014-2016 - M. C. Miller Co., Inc.

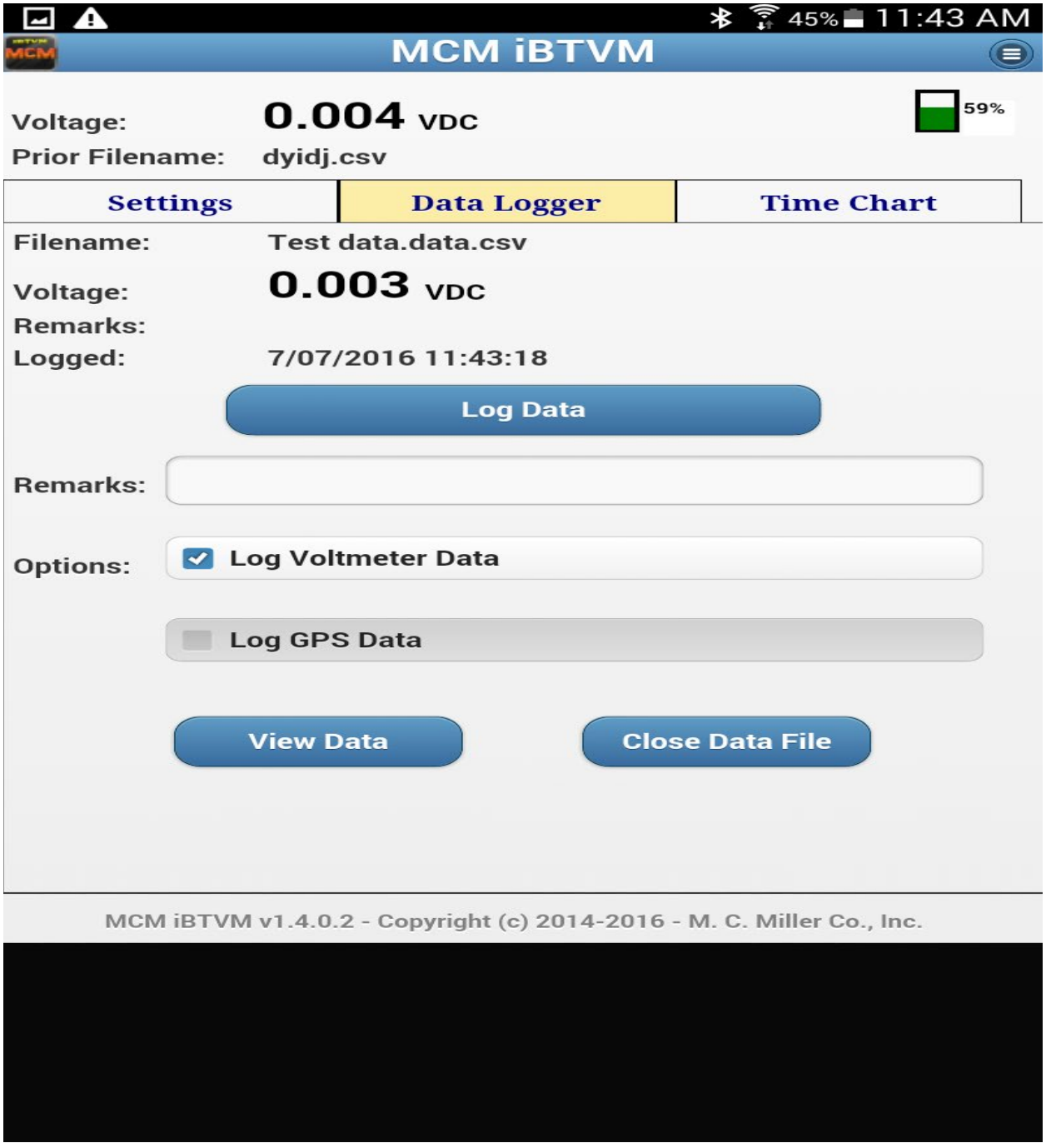
In ‘Single Read’ mode, you can select the desired recording interval duration as shown in the following three slides (minimum recording interval is 50ms).




50% 10:59 AM
MCM iBTVM
Voltage:
0.004 VDC
59%
GPS Data:
Lat: 27.805997 Lon: -80.463321 Alt: 7 ft
Time: 11:02:21 AM Fix Quality: excellent
MCM-iBTVM-6003
Prior Filename:
Settings
Data Logger
Time Chart
iBTVM Device:
MCM-iBTVM-6003
Reading Style:
Single Read
Voltage Range:
5.7VDC, 400MΩ
AC Rejection:
60Hz
Recording Interval:
50
Milliseconds
Share GPS Data:
Share iBTVM GPS data with other apps
Dropbox:
1 2 3
4 5 6 Next
7 8 9
0

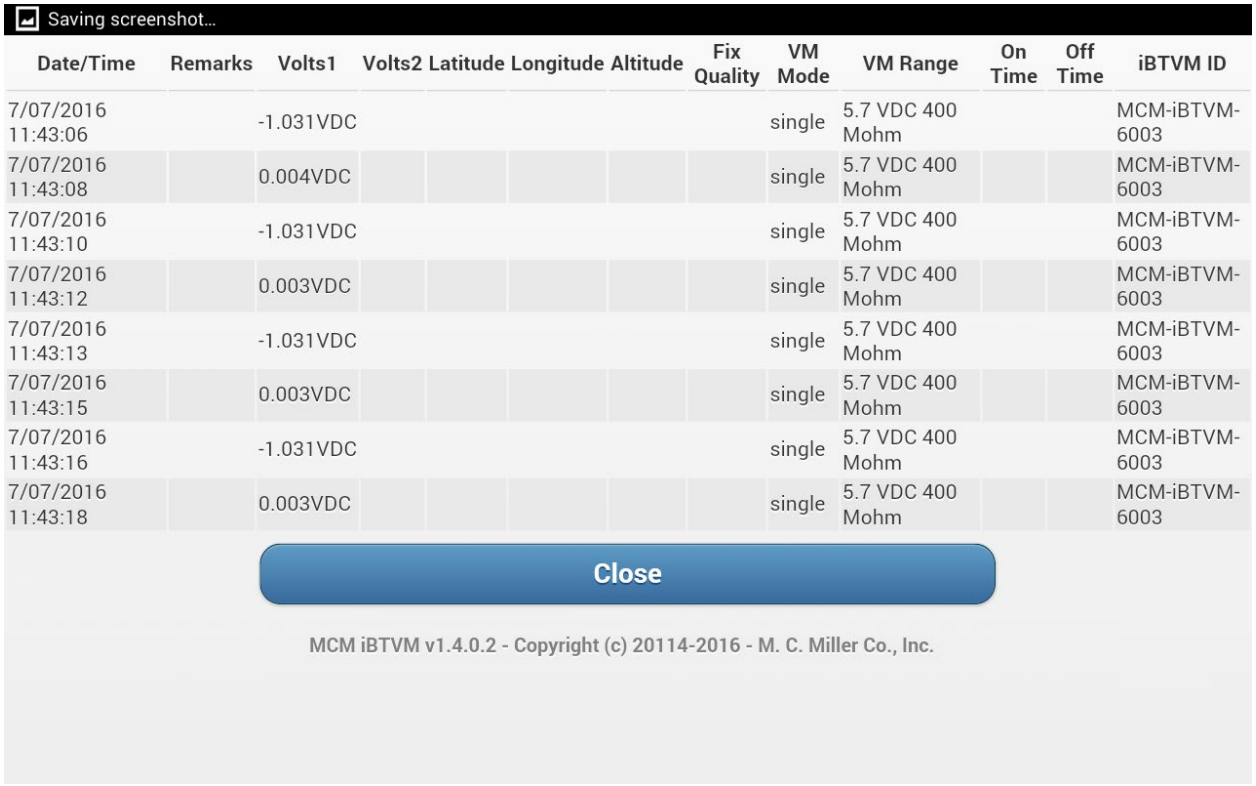
Using the Data logger Function:

On the DATALOGGER screen, select “LOG VOLTMETER DATA”, create and name a new data file**.**



Each time you tap the “LOG DATA” button, a datum will be recorded.

Select “VIEW DATA” and the chart of logged readings is displayed.



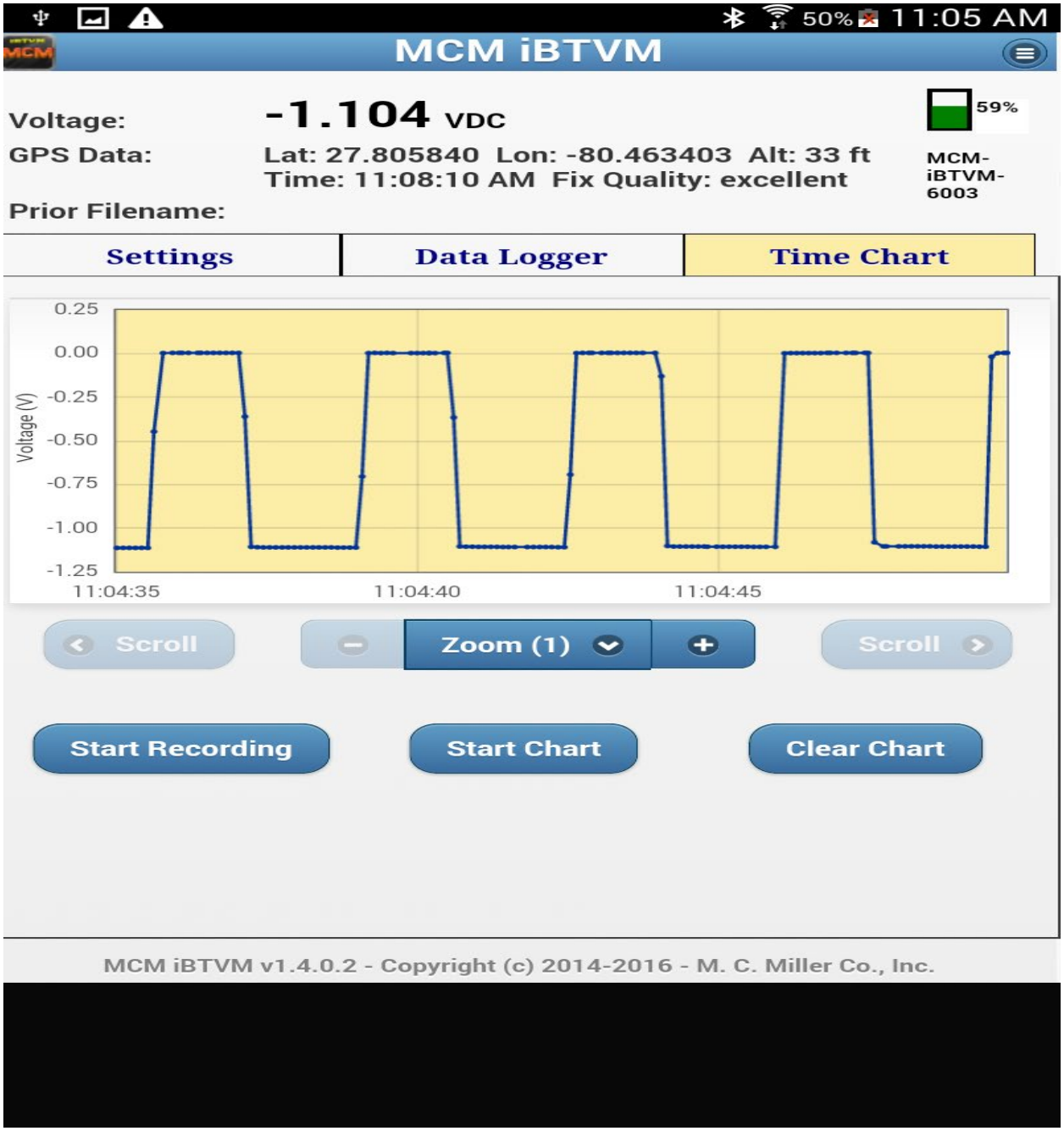
Date/Time	Remarks	Volts1	Volts2	Latitude	Longitude	Altitude	Fix Quality	VM Mode	VM Range	On Time	Off Time	iBTVM ID
7/07/2016 11:43:06		-1.031VDC						single	5.7 VDC 400 Mohm			MCM-iBTVM-6003
7/07/2016 11:43:08		0.004VDC						single	5.7 VDC 400 Mohm			MCM-iBTVM-6003
7/07/2016 11:43:10		-1.031VDC						single	5.7 VDC 400 Mohm			MCM-iBTVM-6003
7/07/2016 11:43:12		0.003VDC						single	5.7 VDC 400 Mohm			MCM-iBTVM-6003
7/07/2016 11:43:13		-1.031VDC						single	5.7 VDC 400 Mohm			MCM-iBTVM-6003
7/07/2016 11:43:15		0.003VDC						single	5.7 VDC 400 Mohm			MCM-iBTVM-6003
7/07/2016 11:43:16		-1.031VDC						single	5.7 VDC 400 Mohm			MCM-iBTVM-6003
7/07/2016 11:43:18		0.003VDC						single	5.7 VDC 400 Mohm			MCM-iBTVM-6003

To stop logging, simply select CLOSE DATA FILE. The logging process will end and the data file is saved in the folder “MCMiBTVM” in .CSV format.

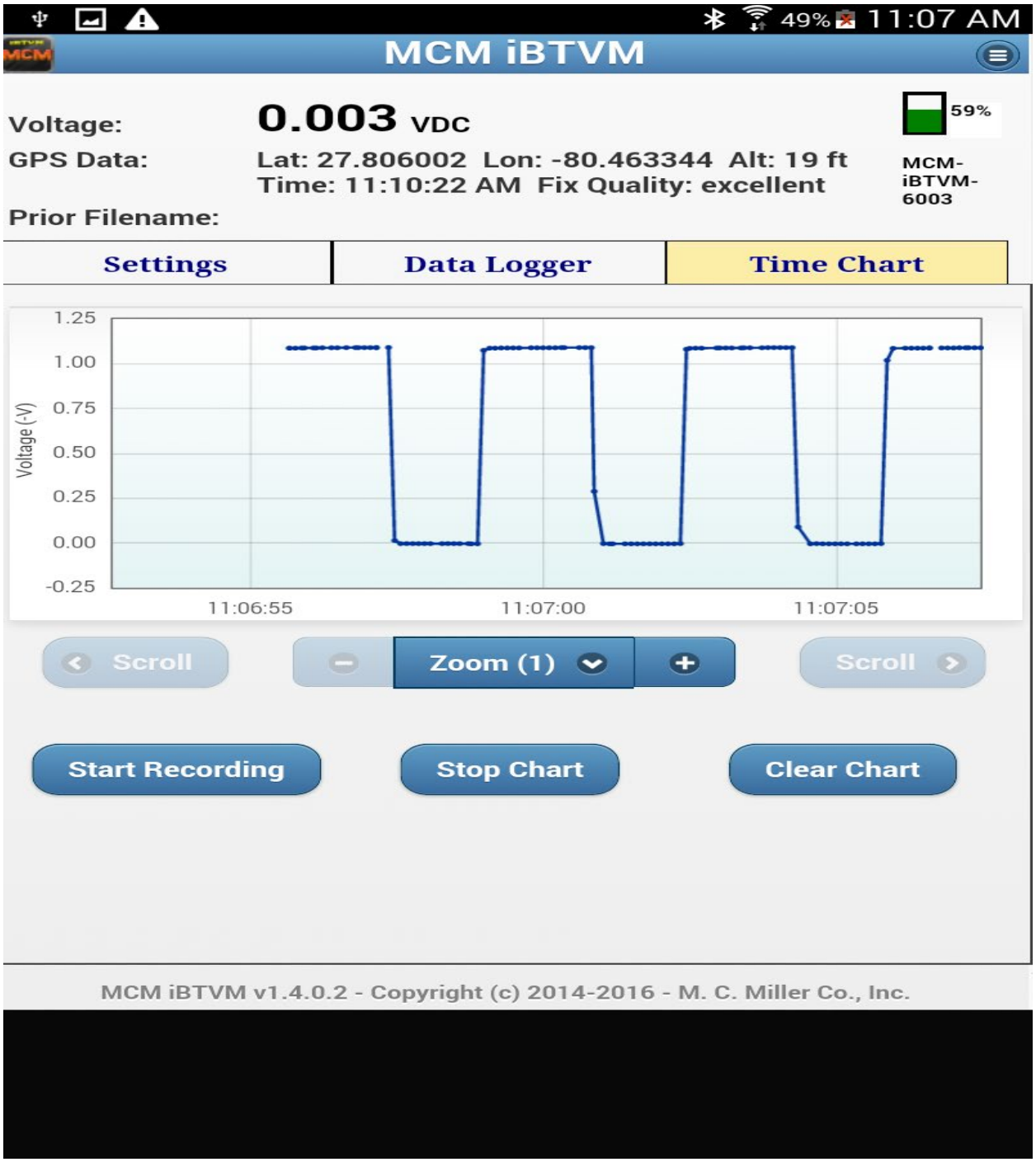
Using the data recorder:

Setting the recording interval

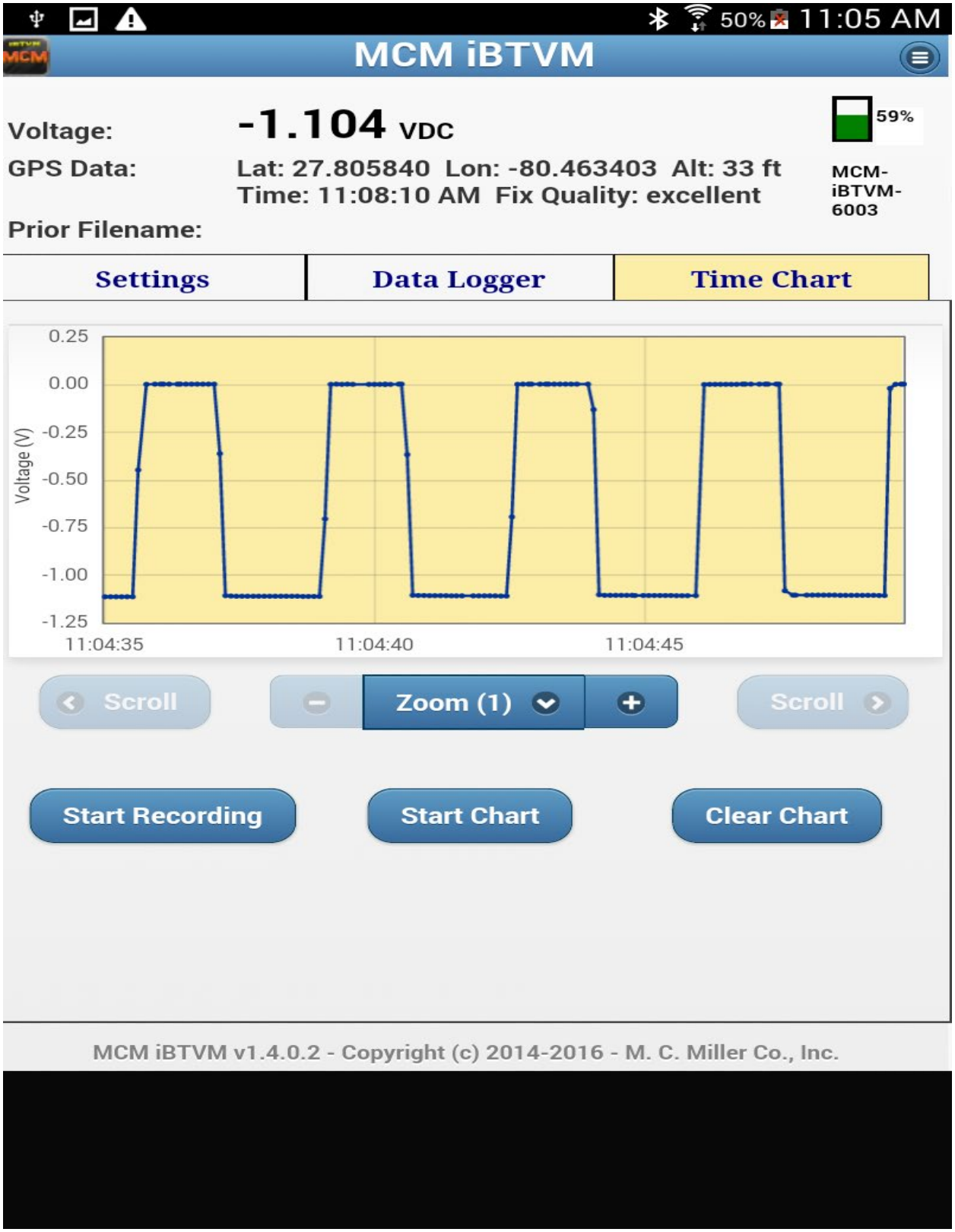
A sample from the chart recording display is shown in the next two slides. The first slide displays the voltage readings on the graph. After tapping the “Start Recording” tab, the recorded portion will be highlighted in yellow on the screen.



Sample time chart display

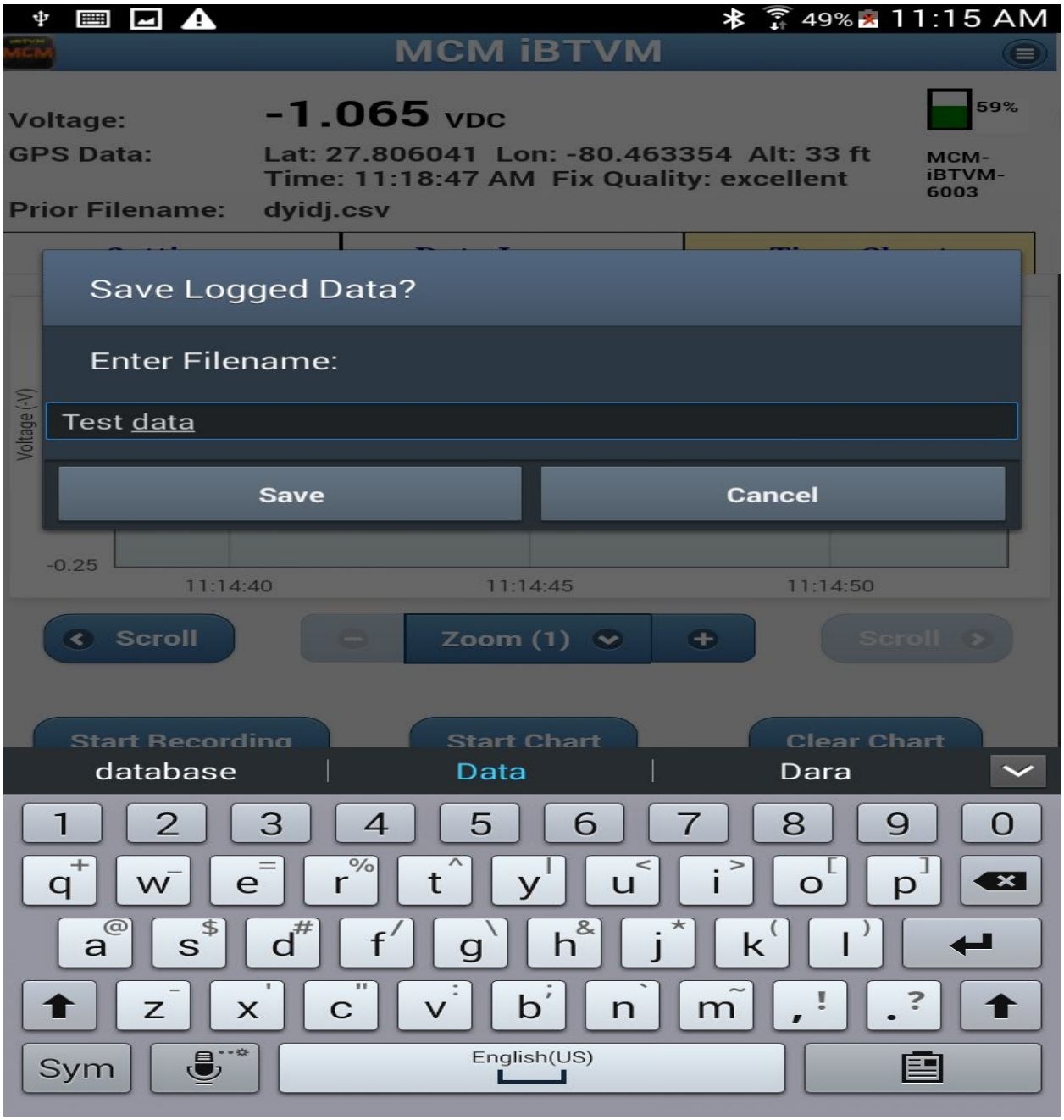

49% 11:07 AM
MCM iBTVM
Voltage:
0.003 VDC
GPS Data:
Lat: 27.806002 Lon: -80.463344 Alt: 19 ft
Time: 11:10:22 AM Fix Quality: excellent
Prior Filename:
59%
MCM-iBTVM-6003
Settings
Data Logger
Time Chart
1.25
1.00
0.75
0.50
0.25
0.00
-0.25
Voltage (-V)
11:06:55
11:07:00
11:07:05
Scroll
Zoom (1)
Scroll
Start Recording
Stop Chart
Clear Chart
MCM iBTVM v1.4.0.2 - Copyright (c) 2014-2016 - M. C. Miller Co., Inc.

Sample recording in progress:



When finished recording, select “Stop Recording, name and save the file for later use”.

When you tap the “Stop Recording” button, you will be asked to name the file and confirm that you want to save it.

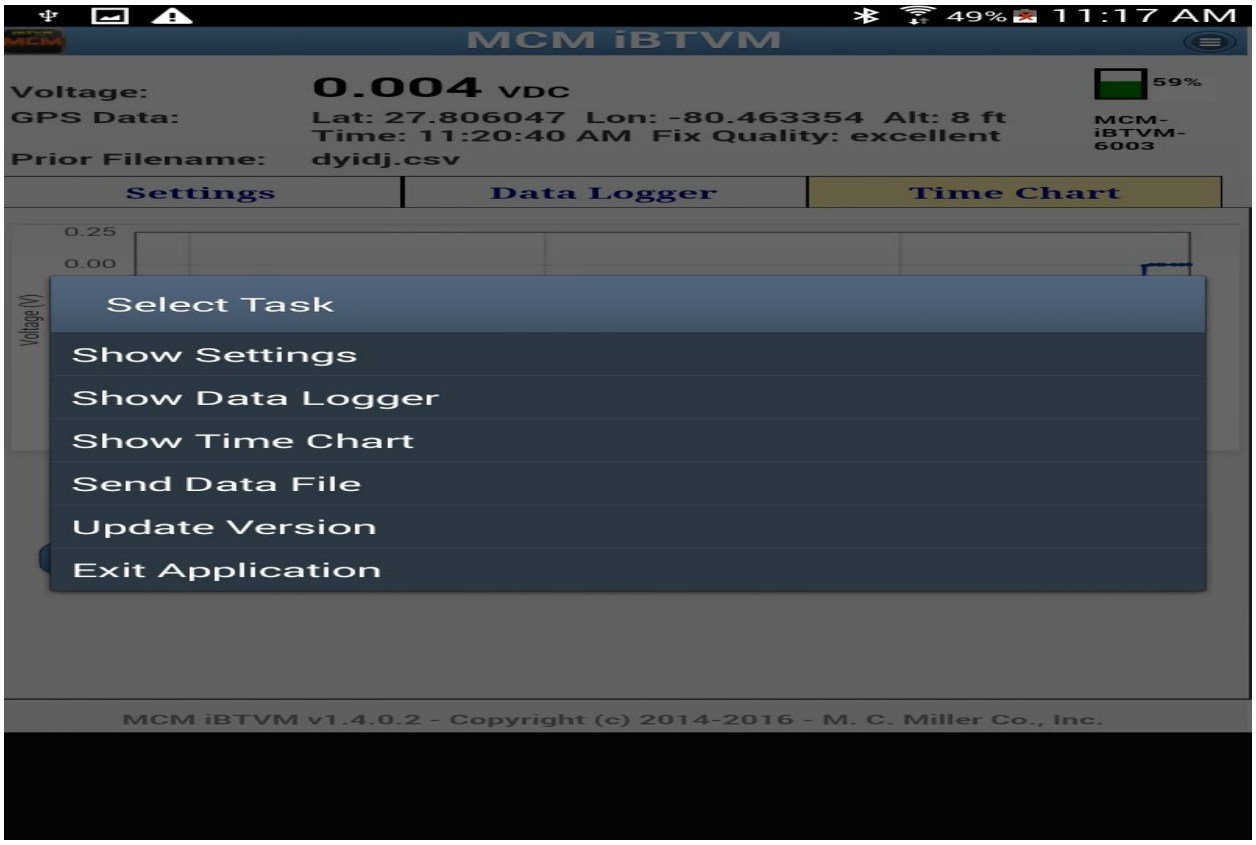


If you choose yes, the file is saved and the final screen allows you to email the file to the address you entered above during setup.

(If you want to email the file you must have an accessible WiFi or Cellular connection.)
If you choose to send the file later, it can be found in the folder labeled “MCMiBTVM”.

To close the application:

To close the application, tap the menu bar at the top right of the screen, Select Exit and tap “Yes” to confirm.



Note:

Going forward into external connections, it is important to note, there is a potential safety issue if a data probe and banana jack leads are connected at the same time. If measuring a large AC or DC voltage with test leads attached via the banana jacks, the same voltage will be applied to the data probe, the probes banana jack, and the half cell.

Additionally, when using the banana jack inputs of the meter for precise measurements on the 40 mV range, one should not have a data probe attached to the 5 pin connector. Any voltage from the data probe input can affect the displayed potential. This can result in a different potential display if the test leads are reversed.

External connections:

Use either the Red and Black sheathed banana jack or the 5 pin connector compatible with other equipment from MCM.

Included Accessories:

120VAC Charger adaptor

USB Charge Cable

6 Foot Red and Black Test Leads with Clips (1 each)

Handy Belt Clip

Sturdy Carrying Case

Voltmeter Characteristics:

• High Voltage Isolation for Operator Safety : Tested to 1kV steady-state/15kV transient voltage levels (designed for higher voltage level isolation) – operator isolated from power supply

• Non-Saturating : Voltmeter will not saturate on 5.7VDC and higher ranges with superimposed AC signals up to 120VAC (for readings up to approximately 50% of full scale at 60Hz) and/or inductive spikes up to 2kV appearing at the input terminals

• Extensive Ranges : Various DC Ranges (40mV full scale to 570V full scale) plus 40V and 400V AC Ranges. All DC Ranges have <80ms response times for accurate On/Off pair readings during fast current interruption cycling (for example, 700ms ON / 300ms OFF).

Power Source:

- Lithium-Polymer rechargeable battery
- Interior battery charging port
- Re-chargeable battery lasts 18 hours with continuous usage
- Battery module easily replaced in the field

Communication with Tablets/Phones via WPAN technology:

- Android compatible
- Connection status indicator, LED, on case exterior

Connectors:

- 5-pin connector for optional push-button data-probe triggering of readings
- Two shrouded banana jacks (one red/one black) – 1,000V; CAT III (IEC 61010 rating)

Integrated Sub-meter GPS System:

- Internal GPS antenna

Environmental:

- IP65 Rated

Temperature Ranges:

- Operating Range: 32°F to 104°F (0°C to 40°C) • Battery Charging Range: 32°F to 104°F (0°C to 40°C)

Case Dimensions (approximate): • 5-7/8" long x 3.5” wide x 1.75” high
Weight • 0.82lb

Specifications:

Voltmeter range, display resolution and accuracy specifications for the iBTVM, Input Impedance and Response Time (to 99% of final value).

Range	**Display Resolution**	**Accuracy (% reading value)**
VDC		
40mVDC, 10MΩ, 80ms	0.01mV	±0.2% ±0.08mV
400mVDC, 10MΩ, 80ms	0.1mV	±0.2% ±0.6mV
5.7VDC, 400MΩ, 80ms	0.001mV	±0.2% ±0.004V
40VDC, 75MΩ, 80ms	0.01mV	±0.2% ±0.04V
57VDC, 75MΩ, 20ms	0.01mV	±0.2% ±0.04V
57VDC, 400MΩ, 50ms	0.01mV	±0.2% ±0.04V
400VDC, 75MΩ, 80ms	0.1mV	±0.2% ±0.04V
570VDC, 75MΩ, 20ms	0.1mV	±0.2% ±0.04V
VAC		
40VAC, 75MΩ, 1.35s	0.01mV	±0.2% ±0.06V
400VAC, 75MΩ, 1.35s	0.01mV	±0.2% ±0.6V

AC range specifications valid over 10-1000Hz frequency range and 5-100% of full scale range.

*Android is a Trademark of Google, Inc.