M5600/U5600 Software Manual

Wireless Pressure Transducers

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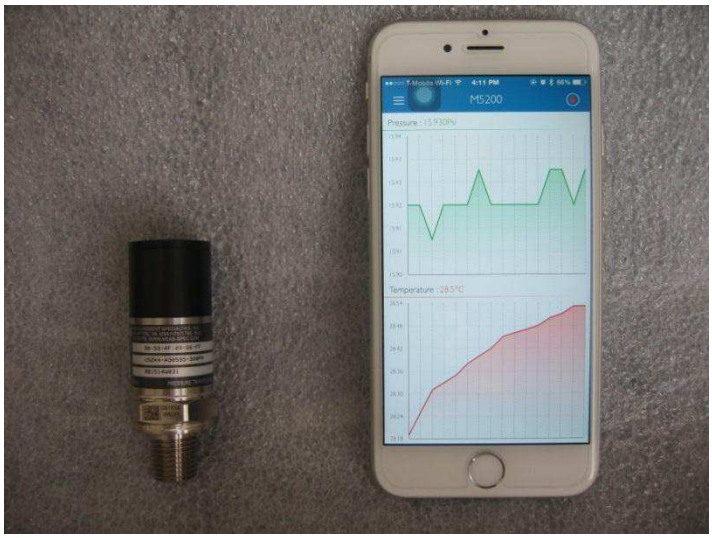
1 Introduction

The M5600 and U5600 pressure transducers use standard 2.4GHz wireless communication tag. The long battery life and integration design make these transducers a perfect fit for many industrial and commercial applications including marine, residential, campers, water, hydraulic, irrigation, pool, medical and sprinkler systems, or anywhere you would need to monitor pressure without the need for wires.

By installing the Windows® version software on your PC or embedding the wireless signal in your integrated system, you can monitor pressure and temperature in real time.

2 Smartphone/Tablet Software Installation

1. Download and install the "TE Sensor Tag" app for iOS or Android™ from the Apple App Store or Google Play Store.
2. Install the battery into the transducer.
3. Turn on standard 2.4GHz wireless communication tag for smartphone/tablet.
4. Run "TE Sensor Tag" app on smartphone/tablet and it will start searching for the transducer.
5. Select the transducer (M5600 or U5600) found by the app to pair it to your smartphone/tablet.
6. Once paired, the pressure and temperature charting will begin automatically. Data is collected every 5 seconds (programmed for best battery life).



3 Windows Version Software Installation and Operation Manual

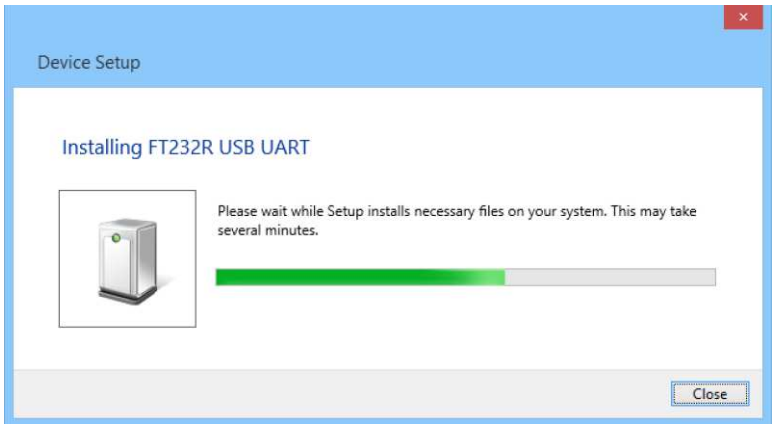
Hardware & System Requirement

- PC with USB serial port support
- USB Dongle: BT900-US
- Operation system: Windows XP, Windows 7 or above
- Microsoft .NET Framework4.0 or above

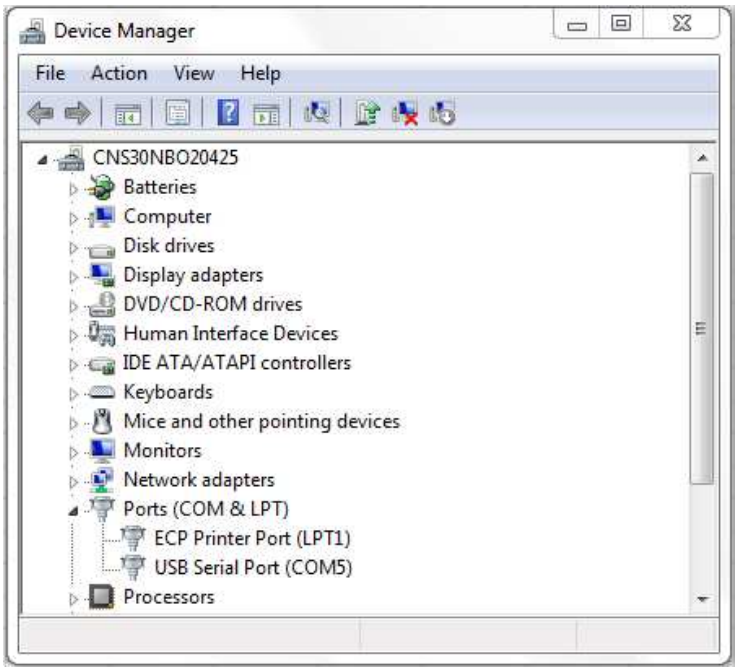
Dongle Installation and Programming

1. Insert the USB Dongle (BT900-US) into the USB socket of the PC.

The PC will install the related USB drivers automatically.



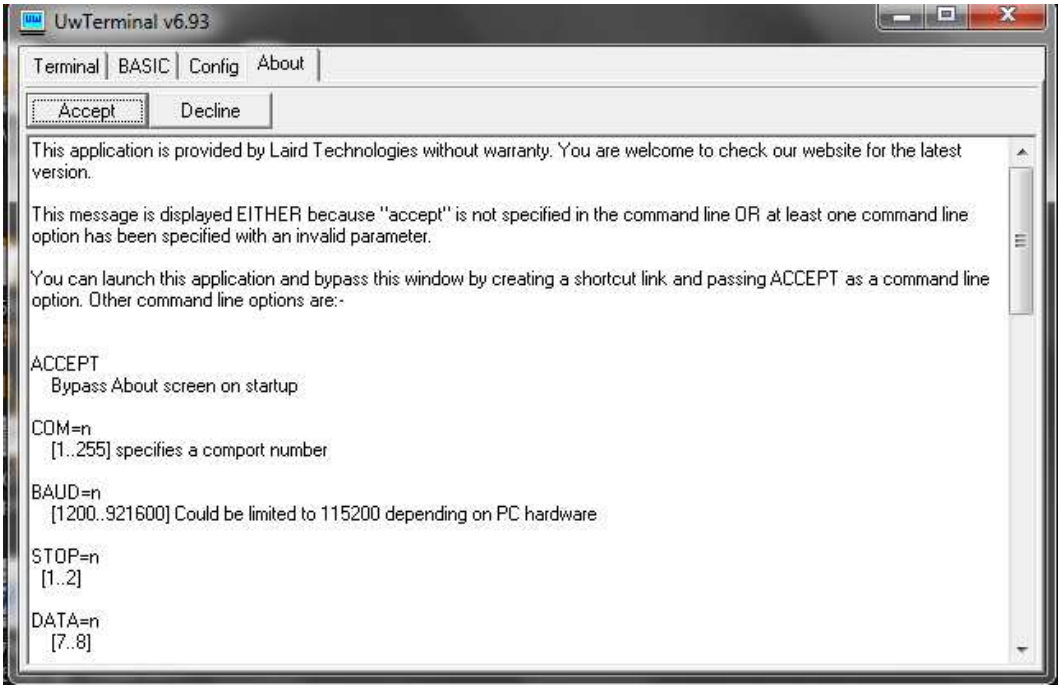
2. After installing FT232R USB UART, open the PC's Device Manager and check if the USB Dongle has the port number assigned as below (COM5 in this example):



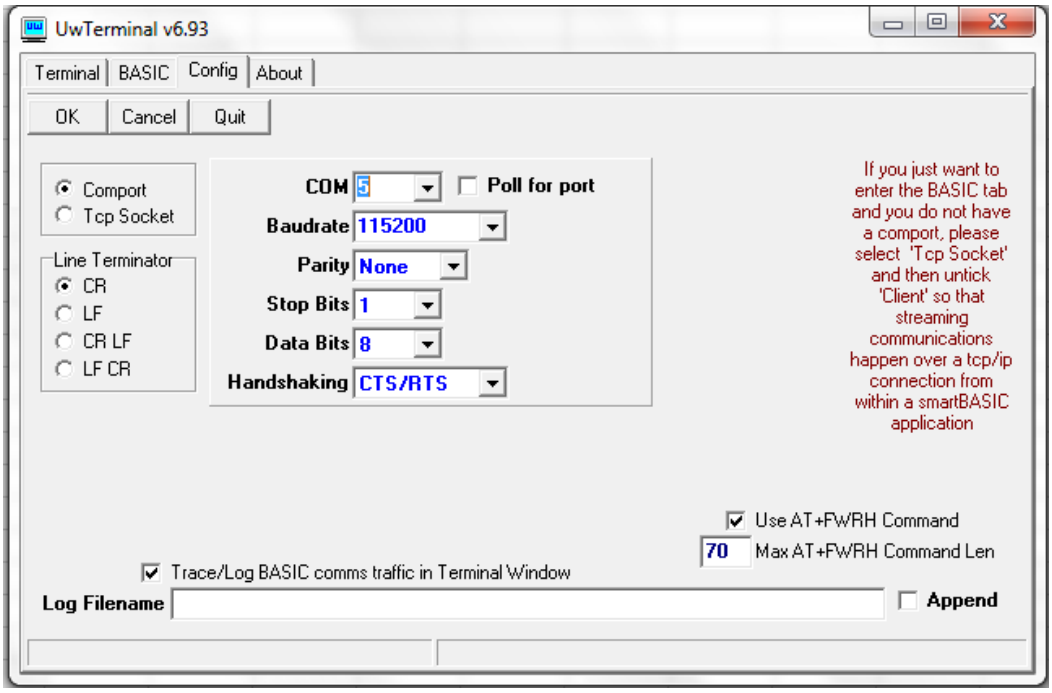
If not assigned, then it is necessary to install the FTDI FT232 USB Serial Converter Driver following instructions from the below link:
https://learn.sparkfun.com/tutorials/how-to-install-ftdi-drivers/windows---in-depth

Verify COM port is assigned to the Dongle in the Device Manager before proceeding to the next step.

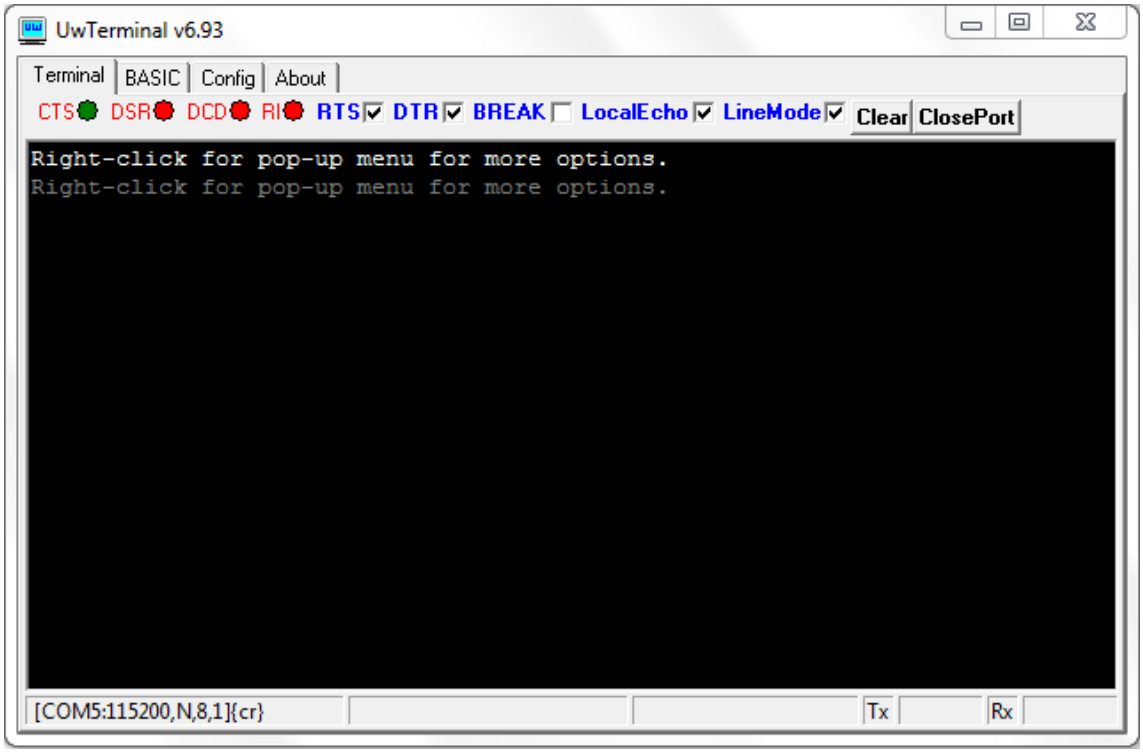
3. Copy Window's client software "TESS-M5600_U5600_Software.zip" to the PC and unzip it. Double-click to run UwTerminal in folder: TESS 5600\UwTerminal\. User interface should display as below:



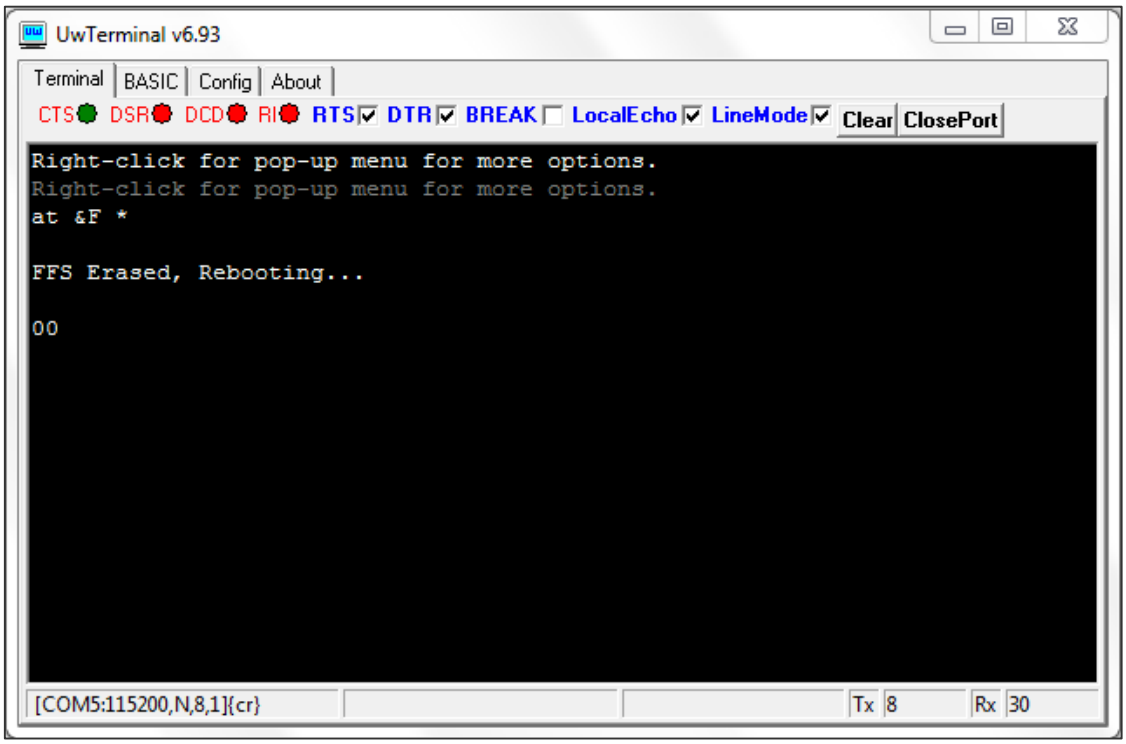
4. Click “Accept” to enter the configuration interface. Select the proper COM port where the Dongle is installed and leave the others at default settings.



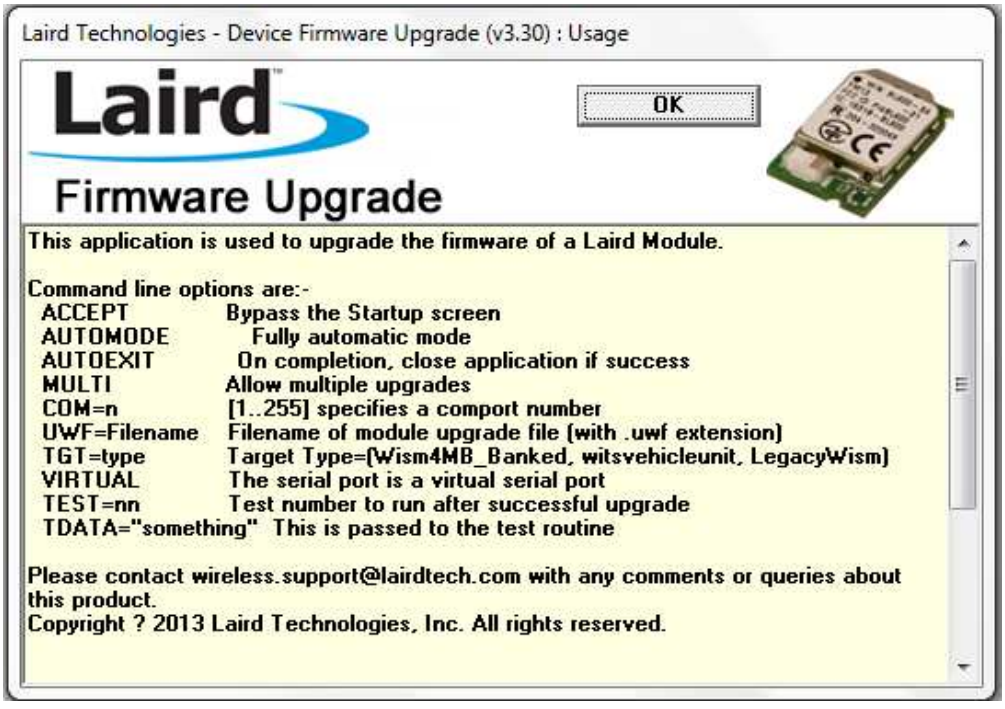
Then click “OK” to enter the command-line interface:

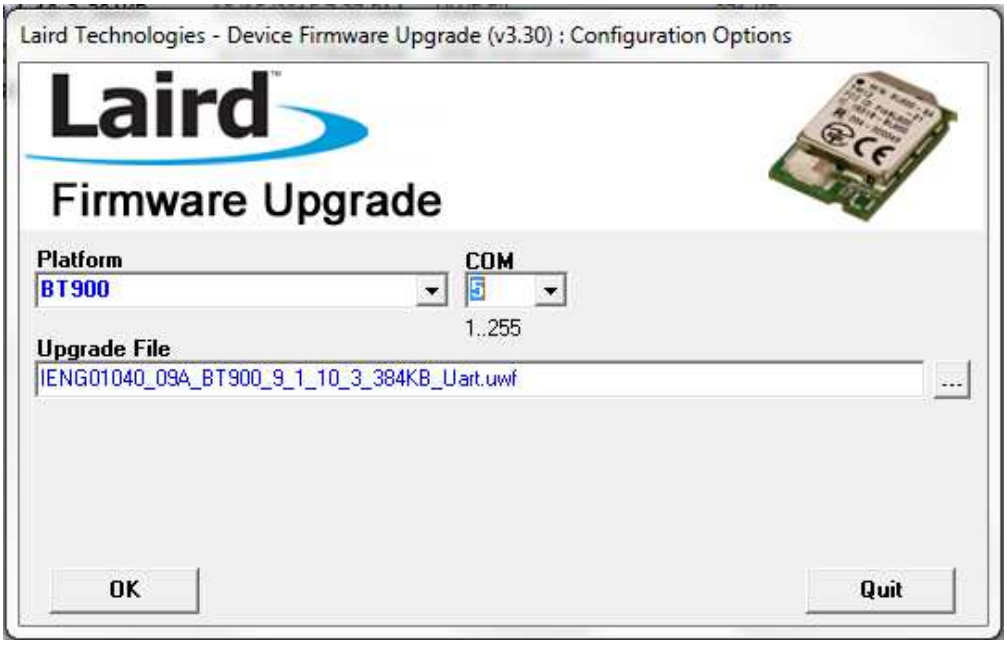


5. Input “at &F *” (at space &F space *) and press “Enter”. The screen will display “ FFS Erased, Rebooting…”
Close the window by clicking the “X” at the upper right corner.



6. Run “BT900UartFwUpgrade.exe” in folder: TESS 5600\BT900_9.1.10.3 to update the firmware. Follow these steps: Press “OK” → specify the correct COM port → press “OK” → press “Start Upgrade” → let it run until finish → pressing “Quit.”



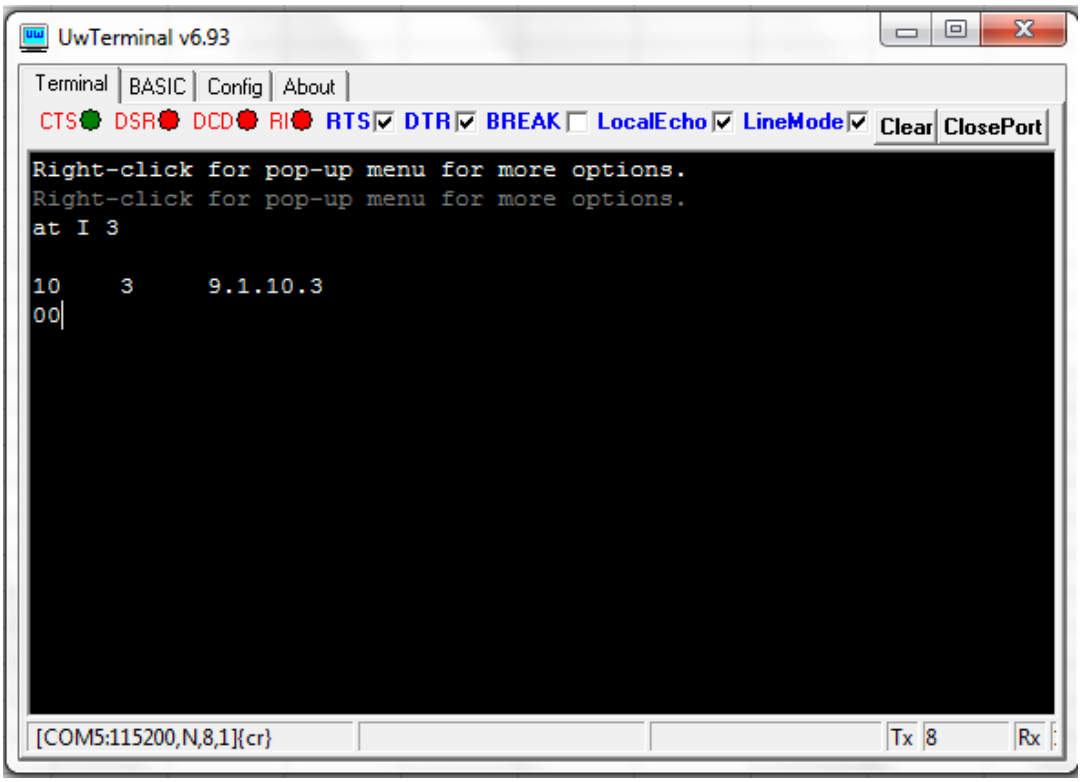

Laird Technologies - Device Firmware Upgrade (v3.30) : Configuration Options
Laird
Firmware Upgrade
Platform
BT900
COM
5
1..255
Upgrade File
IENG01040_09A_BT900_9_1_10_3_384KB_Uart.uwf
...
OK
Quit

Laird Technologies - Device Firmware Upgrade (v3.30)
Laird
Quit
Start Upgrade
Firmware Upgrade
Running on OS: Windows Vista or newer
This application upgrades firmware in the device from Laird Technologies.
After the upgrade, it's configuration may be reset to default values
and compiled scripts may have to be recompiled to be compatible with the new firmware.
After the upgrade please reset/power cycle the device and then set the Baudrate to an
appropriate value to enable your app to work.
Please click on the appropriate button to continue.
Upgrade file is: IENG01040_09A_BT900_9_1_10_3_384KB_Uart.uwf
Attached to comport 5

Laird Technologies - Device Firmware Upgrade (v3.30)
Laird
Firmware Upgrade
and compiled scripts may have to be recompiled to be compatible with the new firmware.
After the upgrade please reset/power cycle the device and then set the Baudrate to an
appropriate value to enable your app to work.
Please click on the appropriate button to continue.
Upgrade file is: IENG01040_09A_BT900_9_1_10_3_384KB_Uart.uwf
Attached to comport 5
Attempting to convert module to flash upload mode
Synchonised with device (Bootloader Version 3.2 or newer)
Erasing...
Writing...

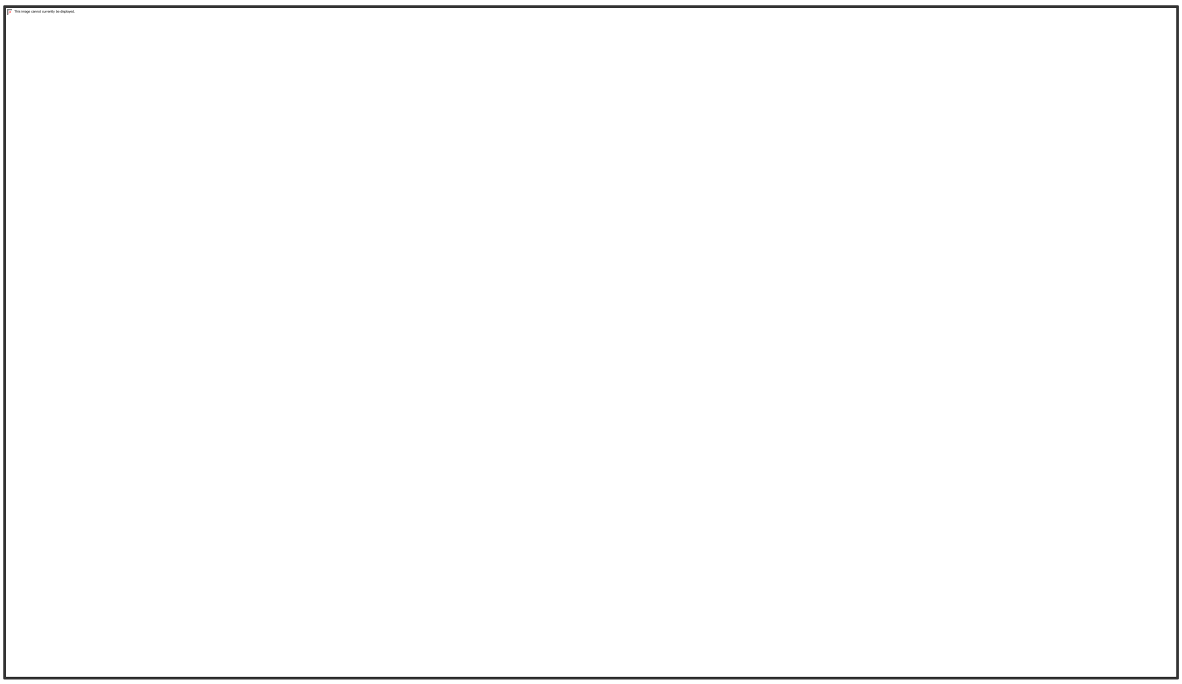
Laird Technologies - Device Firmware Upgrade (v3.30)
Laird
Quit
Firmware Upgrade
Please click on the appropriate button to continue.
Upgrade file is: IENG01040_09A_BT900_9_1_10_3_384KB_Uart.uwf
Attached to comport 5
Attempting to convert module to flash upload mode
Synchonised with device (Bootloader Version 3.2 or newer)
Erasing...
Writing...
Writing...
UPGRADE SUCCESS. Please power cycle the module once for normal use.
Download time:= 0:51 (min:sec)

7. Remove the USB Dongle and re-insert, repeat above steps 3 & 4.
   Input “at I 3” and press “Enter,” displaying “9.1.10.3” which is the latest version of the firmware.

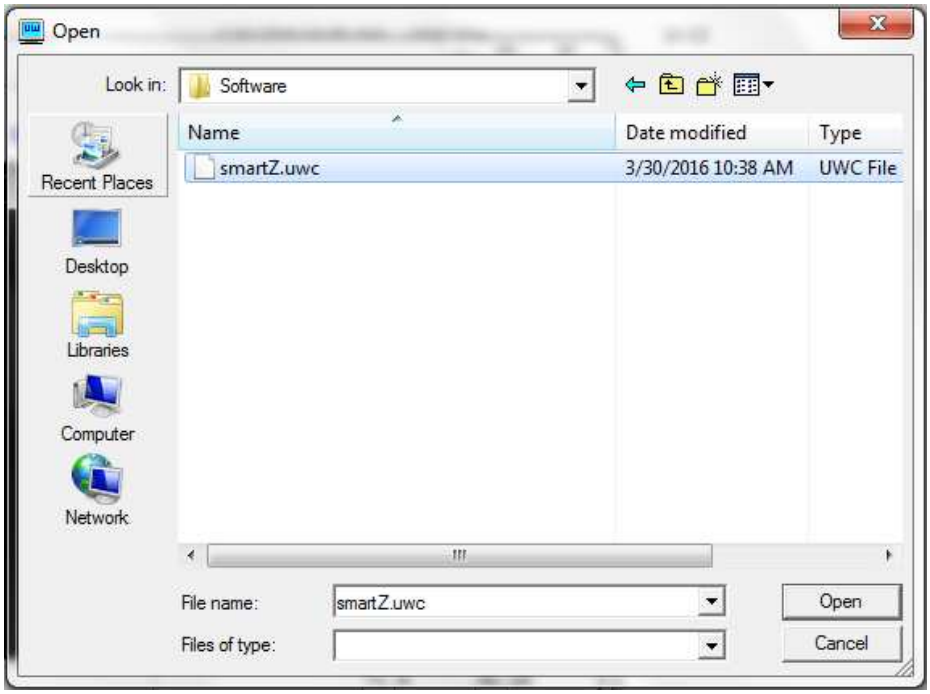


   Input “at &F *” and press “Enter.” Screen will display “FFS Erased, Rebooting…”
   Input “at+dir” and press “Enter.”

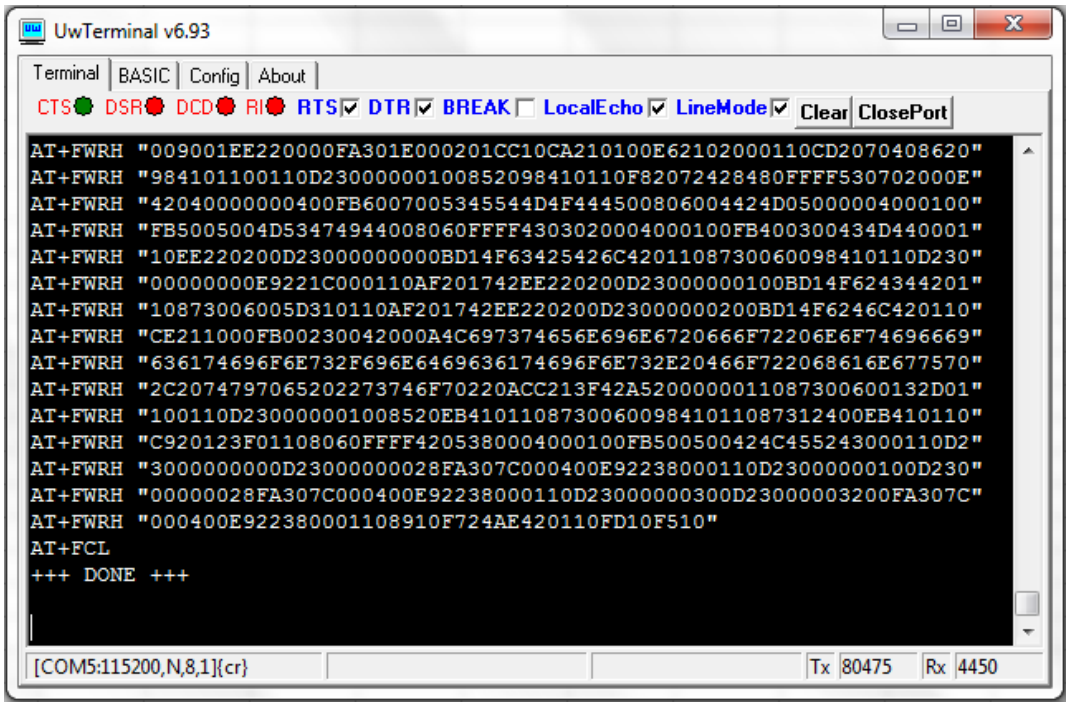
8. Right-click inside the window and click “load precompiled BASIC”



After the “Open” window pops up, select “smartZ.umc” in folder “TESS 5600\” and press “Open”



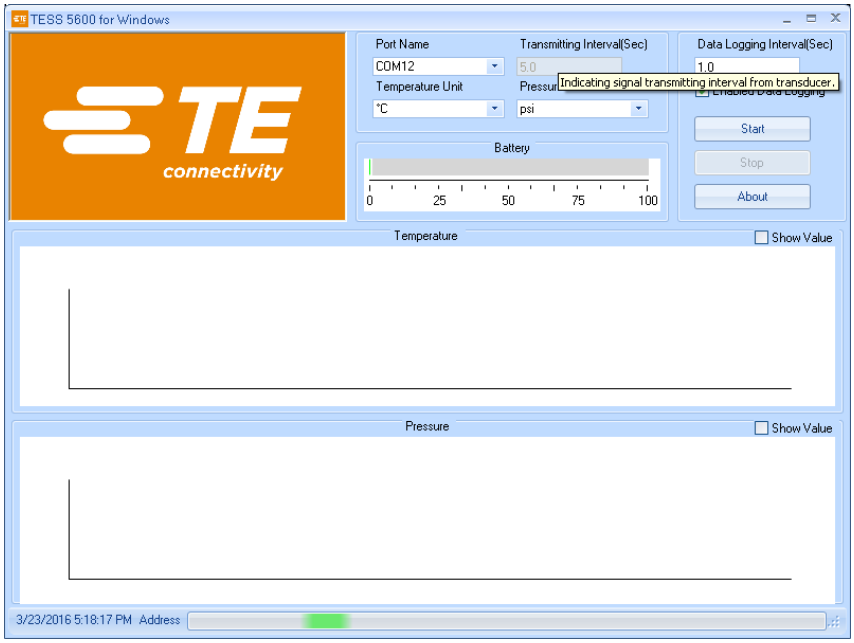
Text will scroll and after 1-2 minutes, it will display “DONE.”



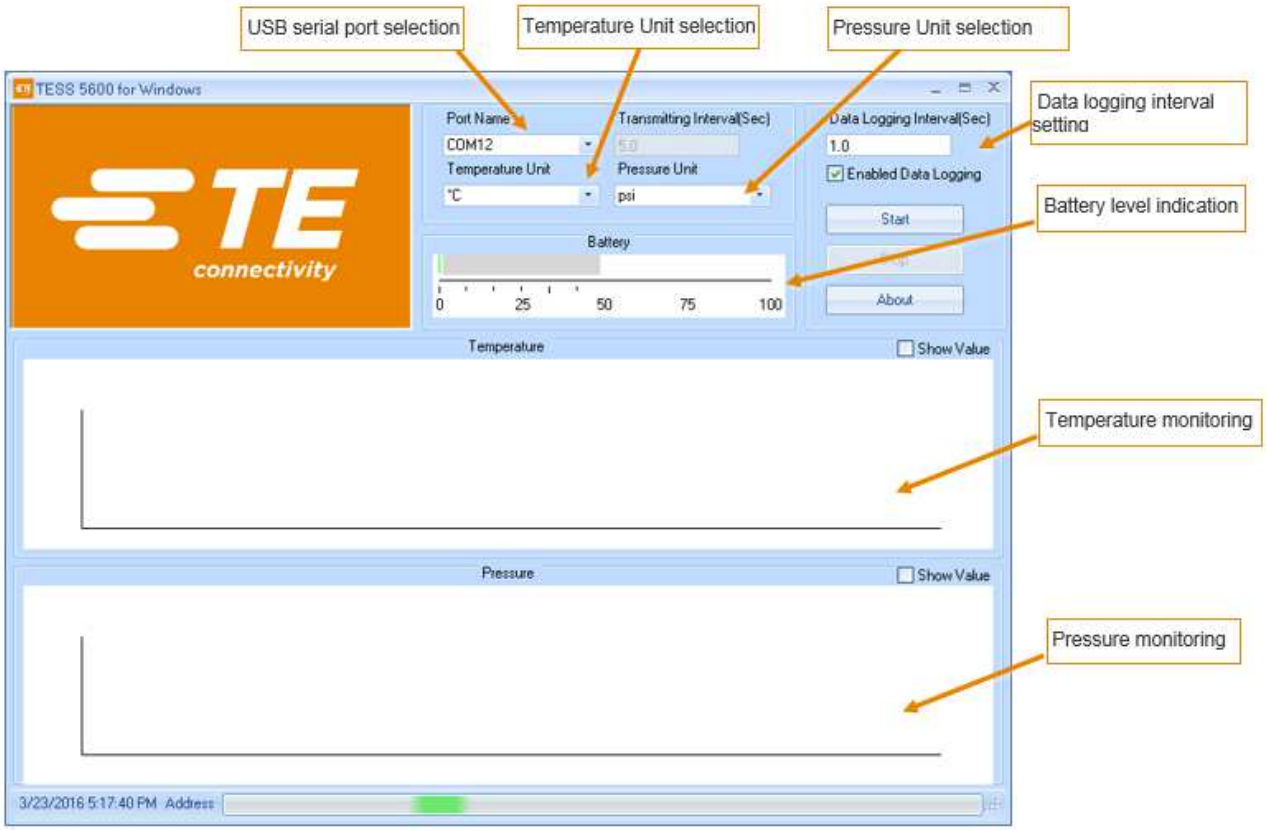
Close the “UwTerminal” window. Remove the USB Dongle and re-insert.

Monitoring Software Operation Manual

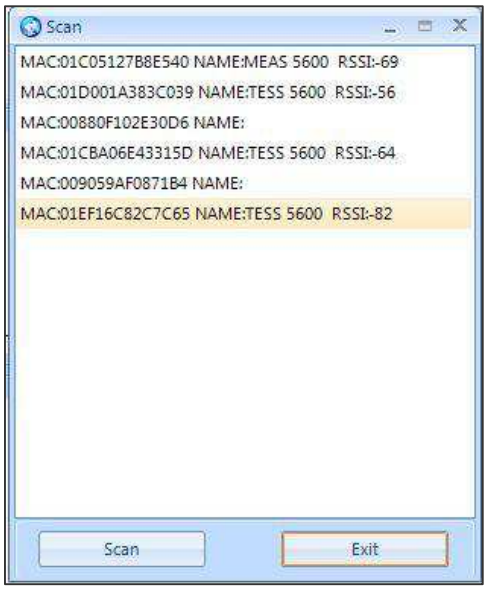
1. Double-click to run TESS 5600 for Windows in folder: TESS 5600\source\bin\Release\. The client software user interface should display as below. Certain explanations can be found when moving the cursor onto the words.



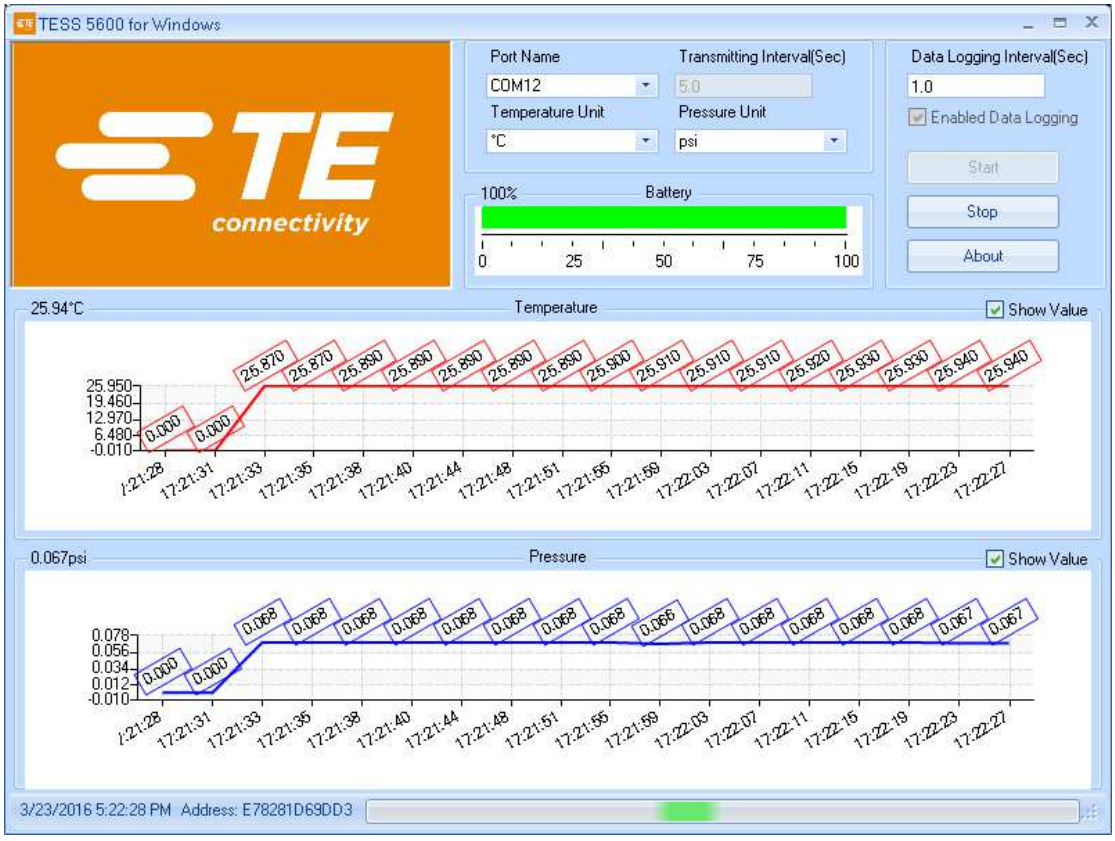
More explanations are provided as below:



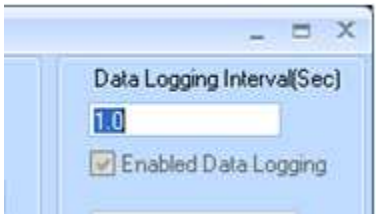
2. Ensure the Port Name matches the COM number in the Device Manager. Click the “Start” button, and then a “Scan” window will pop up to search for available wireless devices. Double-click the MAC number matching the target device to select it.

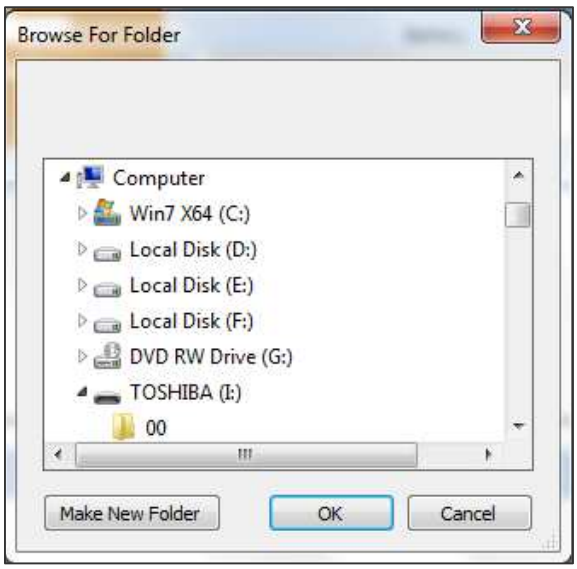


3. The software will start receiving and recording data on battery level and real-time pressure and temperature. Clicking the “Stop” button will stop the data taking process.



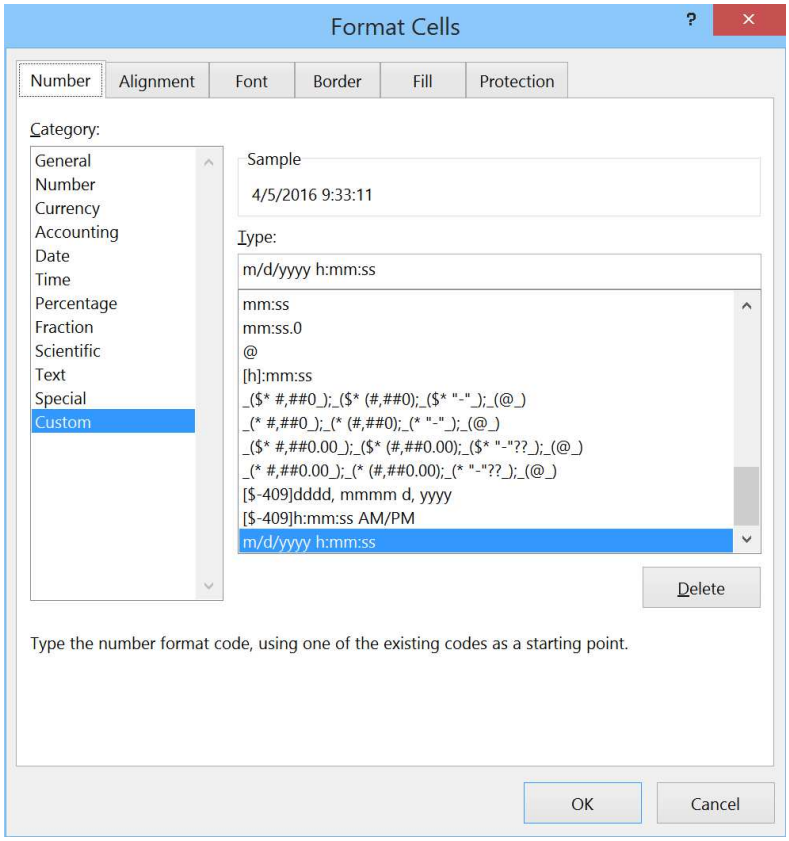
4. When “Data Logging” is enabled and the interval set, a “Save“ window will pop up. When clicking the “Start” button, all data will be saved in the folder appointed by the user (default: \\TESS\\data\\) as a *.dat file which can be opened with MS Excel.





	A	B	C	D	E	F
1	Pressure Range Min(psi): -14.7					
2	Pressure Range Max(psi): 2					
3	Date Time	Mac Address	Product Nam	Battery Level(%)	Temperature Value(°C)	Pressure Value(psi)
4	9:42:27 AM	E42F33EB9336	TESS 5600	100	19.39	14.5292326
5	9:42:29 AM	E42F33EB9336	TESS 5600	100	19.39	14.5292326
6	9:42:31 AM	E42F33EB9336	TESS 5600	100	19.47	14.52869595
7	9:42:33 AM	E42F33EB9336	TESS 5600	100	19.47	14.52869595
8	9:42:35 AM	E42F33EB9336	TESS 5600	100	19.47	14.52869595
9	9:42:37 AM	E42F33EB9336	TESS 5600	100	19.48	14.52895702
10	9:42:39 AM	E42F33EB9336	TESS 5600	100	19.48	14.52895702
11	9:42:41 AM	E42F33EB9336	TESS 5600	100	19.48	14.52895702
12	9:42:43 AM	E42F33EB9336	TESS 5600	100	19.48	14.52895702

The “Date Time“ column can be formatted to display seconds as shown below:



4 Software Protocol Specification

UUID for the M5600/U5600 is available, which allows the user to compile their own program to recognize the sensor's wireless signal and detect pressure, temperature and battery capacity.

Pressure and Temperature:

UUID		F000AB30-0451-4000-B000-000000000000

AVAILABLE CHARACTERISTICS

Name	UUID	Bytes	Read / Write	Notified
Data	F000AB31-0451-4000-B000-000000000000	14	Read	YES
Status	F000AB3F-0451-4000-B000-000000000000	1	Read	NO

DATA CHARACTERISTIC BYTES FIELDS

0	1	2	3	4	5	6	7	8	9	10	11	12	13
T LSB	T MSB	P LSB	P	P	P MSB	Pmin LSB	Pmin	Pmin	Pmin MSB	Pmax LSB	Pmax	Pmax	Pmax MSB

T is a 16 bits signed word, equals 0x7FFF if erroneous.
P, Pmin and Pmax are 32 bits signed words, equal 0x7FFFFFFF if erroneous.

T is a temperature value with 0.01°C resolution.
P, Pmin and Pmax are pressure values with 0.1Pa resolution

CONVERSION

Temperature (°C) = T / 100

Pressure (Pa) = P / 10

Pressure (Psi) = P / 10 / 6894.7

STATUS

0x00	OK
0x01	Sensor error

Battery Service:

UUID	F000180F-0451-4000-B000-000000000000

AVAILABLE CHARACTERISTICS

Name	UUID	Bytes	Read / Write	Notified
Data	F0002A19-0451-4000-B000-000000000000	2	Read	YES

DATA CHARACTERISTIC BYTES FIELDS

Byte 0	Byte 1
Battery Level (%)	Status

0% to 100% represents a supply voltage from 2.0V to 3.0V with 1%/bit resolution.

STATUS

0x00	Discharging
0x01	Charging

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