



Ypsilon HuB

Battery & Asset Monitor

P/N 700.YHUB001 24/36/48/60V

P/N 700.YHUB002 60/72/80/96V

P/N 700.YHUB103 24/36/48/60V

INSTALLATION MANUAL

Do not install this device unless you have read and understood the details of this installation manual.



IMPORTANT SAFETY INSTRUCTIONS


SAVE THESE INSTRUCTIONS – This manual contains important safety and operating instructions

Before installing the device, read all instructions and cautionary markings on the battery pack, and product powered by the battery.

GENERAL INFORMATION

- This device is an electronic unit which is IP66 rated for installation within the battery compartment of DC powered vehicles using flooded lead acid (FLA) or VRLA (GEL or AGM) batteries.
- Reverse polarity protected with inline fuses.
- This device may be equipped with:
 - Red positive voltage sense wire, 1m (39") with M10 (3/8") terminal and 2A inline fuse
 - Black negative voltage sense wire, 1m (39") with M10 / 3/8" terminal
 - Temperature sensor either integrated into the black negative sense wire OR a separate thermal probe on a 1m (39") cable
 - Red half-voltage sense wire, 1m (39") with M10 (3/8") terminal and 2A inline fuse
 - Hall effect sensor, 1m (39") with 20mm (13/16") or 35mm (1 3/8") hinged opening
 - External antenna, 1m (39") with magnetic back for 4G and GPS
 - Electrolyte level sensor with 2A fuse
 - CAN communication cable


REQUIRED FOR INSTALLATION

- Your Company Ypsilon HuB **Account Number** and **Password**
- Bluetooth enabled smart phone/tablet with Android or iOS to load Y-Hub APP
 - phone settings must allow full access
- Multimeter to check battery voltage.
- Hand tools to fix M10 (3/8") terminals to battery posts / terminals.
- The supplied 12mm drill bit & stop collar to drill a mounting hole for the (optional) electrolyte level sensor
- An accurate measuring tool or tape. (for electrolyte level sensor installation)
- Screwdriver to install the Hall effect sensor. #1 Philips  A 3/32" blade screwdriver could also work.
- Sidecutters to trim the supplied tie wraps.
- Knife to trim black covering of the (optional) electrolyte level sensor .
- Tool to cut the lead electrolyte level sensor tube to length.

Ph: 905.636.9865 Fax: 905.636.9879

E-mail: info@bti-chargers.com Website: www.bti-chargers.com

WARNINGS

- **This device should not be used by persons with a lack of experience and knowledge on DC electrical systems and batteries unless they have been trained by and/or supervised by a suitably knowledgeable and experienced person.** 
- Failure to heed these warnings could lead to damage to persons or property.
- If the electrical connections become damaged or loose, do not operate the device.
- A damaged unit must not be installed.
- **Observe the voltage rating of the device before connection to a battery.**
- Connection to a system of higher or lower voltage may result in incorrectly measured values.
- If connected to a system with a voltage higher than the maximum permissible, the device may be damaged.
- If connected to a system with a voltage lower than the minimum permissible level, the unit will not operate as intended and data may not be captured and/or it may be lost.
- The housing of the device is designed to operate in an acidic environment, however it should be cleaned of any acid residues whenever the batteries are maintained. Observe normal safety measures when cleaning acid residues.

HEALTH HAZARD

- Use protective glasses and gloves during installation. A damaged or leaking battery can cause chemical burns on contact.
- In case of contact with battery acid, wash the affected parts with fresh water and seek medical attention.
- Electrolyte level sensor contains **lead**.



WARNING: Lead
Cancer and Reproductive Harm
www.P65Warnings.ca.gov



INSTALLATION STEPS

STEP 1 – DC Connections

- Connect the main input (+) red cable with inline fuse to the most positive terminal.
- Connect the main input (-) black cable to the most negative terminal.
- If desired, connect the AUX-Input (+) red cable with inline fuse to positive terminal with ½ system voltage.
- If not installing the AUX-Input (+) red cable, secure the wire when you reach STEP 6 on the following pages.

NOTE: In cases where there is an uneven number of batteries in the pack – the AUX-Input (+) red cable should not be connected. It is necessary to disable the half-voltage measurement during set-up using the Y-HuB APP.

STEP 2 – Electrolyte Level Sensor



CAUTION: The electrolyte level sensor tube contains LEAD.
Thoroughly wash your hands if you came into contact with the lead in the tube.
Dispose of any cut length according to local regulations.

If not installing the Y-Hub on wet (flooded) batteries or if you are installing the device on sealed batteries - skip to STEP 3. Secure the sensor and wires when you reach STEP 7 on the following pages.

NOTE: If not installing the device, it is necessary to disable the electrolyte level sensor during set-up using the Y-HuB APP.

A. Select the cell for the location of electrolyte level sensor.

- For packs of 2V cells:
 - Choose the the battery cell closest to the middle of the pack.
- For packs of 6, 8 or 12V blocks
 - Choose the nth cell from the negative post where $n = \# \text{ cells in pack} / 2$.
 - e.g. in 36V pack (18 cells) install in the $(18/2)$ 9th cell.

B. Locate a suitable position for the sensor in the cell.

- Position should be near the centreline of the cells with sufficient clearance to the caps themselves.
- Do not drill in areas where there are stiffening ribs under the housing as this will interfere with the mounting hole.

C. Drill a hole.

- Fit the supplied stop collar to the supplied 12mm diameter drill bit, setting a depth to penetrate the top cover. A depth of 13mm / 1/2" is usually sufficient. The stop collar need to be tightly installed and secured perpendicular to the drill bit shaft to ensure a clean round hole.
- Make a hole through the housing using a slow drilling speed.
- **NOTE:** The hole can ONLY be this diameter otherwise the sensor will be loose when inserted. Do not use 7/16" or 1/2" drill bits.

D. Determine the required length for the sensor tube.

- Note: 3mm (1/8") is the **MINIMUM** clearance.
- Insert the level sensor tube into the battery until it touches the plates.
- Carefully note the distance from the top of the battery housing to the main upper body of the sensor. This measured length (**L**) will be the distance from main upper body of the sensor to the plates.



NOTE: If the sensor tube is too long it can touch the plates. Ensure that it does not otherwise it will not function as intended.

NOTE: It is desirable to have the electrolyte level sensor more than 3mm (1/8") above the plates. Consider that as the sensor is shortened the alarm signals will be generated at a higher electrolyte levels.

E. Trim the sensor tube.

- At a 45 degree angle (as seen in above diagram) cut this length determined above **plus** AT LEAST 3mm (1/8") off the bottom of the sensor tube

F. Strip the sensor tube.

- Trim ~ 5mm (3/16") of the black covering away from the tip of the level sensor exposing the lead tube.

G. Insert the level sensor into the battery.

- Press down firmly until it fits snugly.
- Avoid removing and re-inserting the level sensor as rough edges in the hole can wear the material and cause it to become loose.

Note: It may be possible to visually check the position of the end of the level sensor by removing the adjacent vent cap and looking into the cell.

- If the level sensor is later removed, the hole can be covered using the supplied black 12mm polypropylene hole plugs.



STEP 3 – Temperature Sensor

Your device may have one of 2 types of temperature sensor.

1 - Integral

- The temperature sensor wire is mated to the the negative cable and will thus be terminated near the negative terminal. No installation is required.
NOTE: This sensor is intended to capture the temperature surrounding the battery pack due to heat in the pack, not the hottest area of the pack.



2 - Remote

- The temperature sensor is on a separate 1m (39") cable. It is to be mounted in the middle of the battery pack, between the cells or blocks.




NOTE: Neither sensor will identify faults within individual cells or blocks.

STEP 4 – Hall Effect Sensor



NOTE: The Hall effect sensor must be installed ONLY on the main battery cable of the most negative or positive battery terminal. Installation on intercell cables can produce inaccurate measurements. See 300A (20mm opening) and 800A (35mm opening) sensor shown.

- Open the Hall effect sensor by removing the one screw allowing the hinge to open.
- Making sure the **ARROW**  is pointing toward the **POSITIVE** terminal run the DC cable through the sensor.
- Close the sensor and secure it with the screw.



IMPORTANT: Secure the hall effect sensor with cable ties (provided) so that it cannot move with respect to the cable running through it.

STEP 5 – CAN Communication Cable

- This is an optional use cable for CAN enabled systems.

STEP 6 – External Antenna

- Install the external antenna in the best possible manner outside the body of the machine so it can receive and transmit data over the cellular network.
- This unit has a magnetic back to assist in installation on metal housings.



STEP 7 – Cable Management

- Carefully route all cables so they cannot be pinched or damaged in any way.
- Ensure that cables do not cross.
- Ensure that cables are not in contact with any heat generating parts such as battery terminals or case (the thermal sensor is of course an exception).
- Secure with cable ties if necessary. Cables should not move during machine use.
- If the half-voltage sense wire, electrolyte level sensor or CAN communication cables were not installed, secure them in a convenient location.

STEP 8 – Device Set-Up using the Y-HuB APP

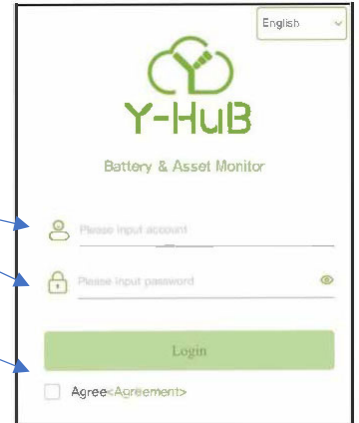
- **NOTE:** Only install one Y-HuB device at a time
- Scan the QR code to locate the Y-Hub APP for iOS or Android
- This QR code is also located on the rating label of the device



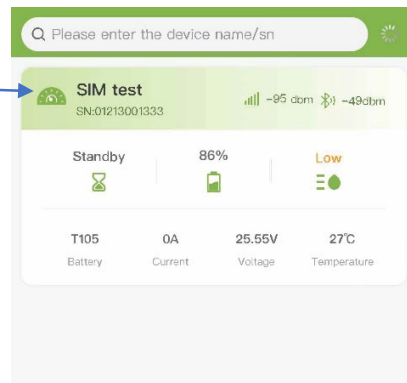
- Turn on Location Services and Bluetooth on your mobile device.
- Open Y-HuB APP.
- Enter your company **account name** and **password** and **agree to the terms** to login.

NOTE: EULA is available on request.

- Allow Y-HuB full access to your device.
- Use the **Search** function to find the Bluetooth signal of your device in range.



- Click on the header of the *found device*.

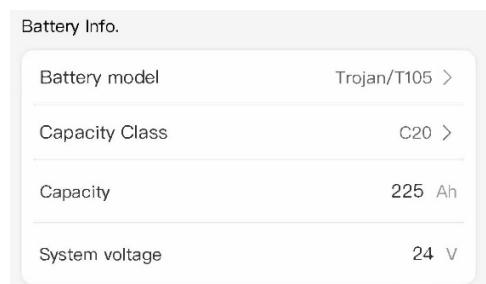


The MINIMUM REQUIREMENTS for installation are below:

- Find and select the settings icon on the APP.



- Select the Advanced icon.
- Select your Battery model from the drop-down menu
- Select the Capacity Class and adjust if necessary
- Check the Capacity and adjust if needed
- Check the System voltage and adjust if necessary
- Scroll to the bottom and select **Submit**



Select the Warning icon.



- Toggle the Level warning ON or OFF as desired
- Toggle the Half voltage warning ON or OFF as required
- Scroll to the bottom and select **Submit**

Level warning	<input checked="" type="checkbox"/>
Duration	5 min.
Half voltage warning	<input checked="" type="checkbox"/>
Warning value	150 mV
Duration	90 S

Select the Control icon.



- Calibrate voltage by measuring actual battery voltage and entering that value in the field. Press **Calibrate**, enter value, press **Confirm**.
- With no loads applied and no charging current; set the current value to zero. Press **Set zero**.
- Calibrate the 1/2 voltage (Second voltage) if applicable. Press **Calibrate**, enter value, press **Confirm**.

Voltage	25.18V	Calibrate
Current	0A	Set zero
Second voltage	0.08V	Calibrate



Failure to enter the above MINIMUM REQUIREMENTS for settings will lead to inaccurate or incorrect results and/or false warnings!

A number of optional alerts and warnings can be set-up using the APP or they can be set-up later using BTI DRM Web Portal. Explore using the Info icon.



Info.

WARNING: Do not make changes to values if the meaning is not clear and the effect obvious. Consult with BTI or your Service Manager if necessary.

- Once all settings changes have been made, close the APP to disconnect Bluetooth connection to the Y-Hub.

STEP 9 – CHARGE THE BATTERY PACK

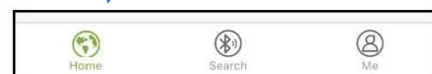
Connect your charger and charge the battery pack.

It is VERY IMPORTANT to connect your battery charger and charge the battery pack once the Y-Hub is installed. If this is not done, you will get incorrect information regarding the battery condition and state of charge. While the charger is working, go to the next step.



STEP 10 – CHECK THE ONLINE STATUS

- Go to the settings area of your mobile device and TURN OFF your Bluetooth.
- Open the Y-HuB APP
- The new device (and other devices already installed on your company or user account) can now be selected and details viewed with the APP over the network. Click on the *Home* icon to see the devices available.



- Select the Monitor icon.



Check the status of the device you just installed to check that it is connected to the network and properly reporting data. While the pack is recharging you should see values changing on the APP.

Note: It may take ~ 8 minutes for data to be reported and change. While charging the current value should be positive – if not, go back to Step 4 and check the polarity of the hall effect sensor installation.

If there is no network connection you will not see values updated in the APP. Data will not be reported to the BTI DRM Web Portal for processing and so remote monitoring of your machine will not be possible. You might need to reposition the external antenna or locate the machine physically where a network connection is possible.

BTI is not responsible for limited or absent network connections that affect the reporting of Y-HuB data.

STEP 11 – Check the Status LEDs

Check that no errors or abnormal conditions are shown. If the system is connected to the network and operating when the green “OK” led flashes once at intervals.

See the chart below for meanings of the led flashing codes.

	OK	green led	FLASHES ONCE at intervals	network connection OK
		green led	FLASHES 5 TIMES at intervals	Bluetooth is connected
		green led	OFF	Bluetooth chip fault
		green led	ON	Bluetooth is normal - Network is offline
		red led	FLASHING	network is abnormal
		yellow led	FLASHES ONCE at intervals	level 1 high temperature warning
		yellow led	FLASHES TWICE at intervals	level 2 high temperature warning
		yellow led	FLASHES 5 TIMES at intervals	level 3 high temperature warning
		yellow led	ON	abnormal temperature sensor (fault)
		red led	quickly FLASHES ONCE at intervals	voltage warning (high or low)
		red led	quickly FLASHES TWICE at intervals	electrolyte level warning
		red led	quickly FLASHES 5 TIMES at intervals	half voltage warning (battery imbalance)

DEVICE INSTALLATION COMPLETE

BTI DRM WEB PORTAL

- Use the web address below to access the BTI DRM Web Portal using your company account number and password.:

<https://bti-drm.gpdcloud.net/#/login>

Y-HUB REPORTS AND ALERTS

- Weekly reports and alerts generated by your warning settings will be sent to the e-mail address related to your account from notifications@bti-chargers.com.

SERVICE

- Service should only be performed by qualified persons.

RATING LABEL

- The rating label of the Y-HuB contains the following details:
 - SN: serial number of the device
 - PC: pass code
 - MD: manufacturing date
 - NM: network modem
 - IMEI: international mobile equipment identity
 - Nominal Voltage: acceptable nominal voltages
 - QR Code: links to Y-Hub APP in APP Store or Google Play

TECHNICAL DATA

- System voltages: YHUBx01 → 24-36-48-60V
YHUBx02 → 60-72-80-96V
- Voltage resolution: +/- 0.1V
- Current range: YHUBx01 → up to 300A
YHUBx02 → up to 800A
- Current resolution: 300A sensor → +/- 0.5A
800A sensor → +/- 3.2A
- Temperature resolution: +/- 1 deg. C
- Power Consumption: Max. 3W., Avg. 0.5 – 2W depending on functions
<0.3W in power save mode, 0W in hardware protection mode
- Operating Range (deg. C.): -20 to +70
- Device enclosure IP rating: IP66
- Network: 4G + GPS
- Bluetooth: BLE 5.0
- APP OS: Android or iOS

REGULATORY AND COMPLIANCE

