Installation Instructions

CyberTrak

Interactive Vehicle Systems

www.cybertraklocate.com

rev.03.04.heu-s

WARNING

When connecting the HEU-S to a Heavy Equipment Tractor with a cut-off switch, read the voltage at the cut-off switch to determine that the voltage does not reverse. If so, wire the 12 volt (RED) and ground (BLACK) directly to one battery to avoid possible shorts. Also add an additional fuse to the Ground wire to avoid any other short.

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Introduction

Satellites are in a 12-hour orbit at 12,000 miles above the earth. There are 24 satellites in the system and generally there are at least 5 satellites orbiting overhead at any one time. This antenna must be positioned to receive signals from these satellites. The antenna location must be selected carefully so that the antenna can receive the satellite signals. The standard GPS antenna is designed to be located inside the heavy equipment. The ideal location is in a place that allows line of sight reception from the GPS satellites in orbit above. The satellite signals will pass through glass if it is not coated with a metallic film. Both the radio transceiver antenna and GPS antenna is designed to be mounted inside the heavy equipment, **(not exposed to the outside weather)**.

Through formal agreements with cellular carriers throughout north America enabling the wireless transmission of data. This network covers virtually the entire population of the U.S, Canada, and Mexico that is within reach of cellular network.

1.1 Safety Statement

This installation manual covers the installation of the Heavy Equipment Unit - Small (HEU-S). This manual is for the professional and novice installer and should be used to ensure a safe and functional install of the HEU-S.

***Always a suggested practice to disconnect the heavy equipment battery while installing this or any other automotive electronic product.

This product is connected directly to the heavy equipment's 12-volt system. There is no on-off switch on the unit. The installed unit operates 24 hours a day and must be energized to log heavy equipment events or send data as required by anyone using the service.

The HEU-S is shipped with one in-line 5-amp fuse attached to the power cable. This fuse must be installed as close as possible to the primary 12-volt source connection. The fuse protects the power cable should there be a short in the cable between the fuse and the HEU-S. This fuse must be installed properly. If the fuse is replaced, it should be of the same type as originally supplied from the factory. The original fuse supplied is a 5 amp 125-volt type 5AG. Also included is a glass fuse for the back-up battery. Replace this fuse after testing is completed. Located at the front of the HEU-S base is a port in which the glass fuse is installed. Use a flat blade screwdriver, place in port and turn clockwise until object snaps in place.

Failure to use the proper fuse or to install the fuse in the recommended location could cause a heavy equipment fire hazard. The fuse provides overload protection for the power cable and HEU-S. The wiring installed between the fuse and primary heavy equipment power is not protected from overheating if a short should occur. Use care when routing the power cable and fuse. Route the cables where they will be protected and use commonly accepted install practices for after market heavy equipment electronic devices.

There are two acceptable methods of making a wire connection:

- Soldering your connections (recommended)

- Crimp connectors (with the use of the proper crimping tool)

Regardless of the method you choose, ensure that connection is mechanically sound and properly insulated. Use high quality electrical tape or shrink tubing, cheap tape will unravel in hot weather making it a poor insulator.

Never use "t-tap" connectors (poor quality mechanical type connection)
Never "twist and tape" without soldering your connection

***Always** tape up fuseholder and any exposed wires to prevent moisture build-up
*** Before attempting to add anything electrical to your heavy equipment check the Owner's Manual**

1.2 Additional Support

* Over the phone training is available (recommended). See activation worksheet for detail (Page 9).

2. Tool List

- Power drill AC/DC (Cordless recommended)
- Magnetic bit holder that houses Phillips and flat-head bits
- Wire stripper and cutters
- Crimpers for insulated connectors
- Electronic voltage meter (Digital display recommended)
- Tools to disconnect and reconnect heavy equipment battery (Crescent wrench, open end wrenches, etc.)
- Tools to remove internal heavy equipment trim (Panel poppers, sockets, ratchet, screwdrivers, torx bits, hex bits, etc.)
- Butt connectors (Various sizes)
- Ring terminal connectors (For grounding wire)
- Self tapping screws (Various sizes)
- Star washers for grounding (Strongly recommended)
- Electrical tape (Black)
- Wire 18 gauge
- Velcro and/or double sided tape (For mounting antenna)
- Wire ties (Various sizes)
- Soldering iron & solder

Using Your Digital Multi Meter

We at Aircept Technical Support hear more and more often about damaged computers and air-bag systems as a result of probing with a test light Not all air bag wires are in yellow tubing, and not all transistorized outputs can light a test light bulb without shorting out! The best solution, as it has always been, is a good digital multi meter.

How to Find (+) 12V Ignition with Your Multi Meter

1. Set your meter to DCV or DC voltage (12V or 20 V is fine)
2. Attach the (-) probe of the meter to chassis ground.
3. Probe the wire you suspect of being the ignition wire. The steering column is an excellent place to find this wire. Your meter should read (+) 0V.
4. Turn the ignition key to the "ON" position. If your meter reads (+)12V go to the next step. If it doesn't probe another wire.
5. Now turn the key to the start position. The meter display should stay steady(+) 12V, not dropping by more than a few tenths of a volt. If it drops close to or all the way to zero, go back to step 3. If it stays

steady at (+) 12V you have the ignition wire.

How to Find the (+) 12V Starter Wire with Your Multi Meter

1. Set your meter to DCV or DC voltage (12V or 20 V is fine)
2. Attach the (-) probe of the meter to chassis ground.
3. Probe the wire you suspect of being the starter wire. The steering column is an excellent place to find this wire. Your meter should read (+) 0V. Note: Remember you do not have to interrupt the starter at the same point you test it. Hiding the starter kill is always recommended.
4. Turn the key to the "ON" position, your meter should still read (+) 0V. Not: Make sure the car is not in gear. Now turn the key to the "START/RUN" position if the meter reads (+) 12V when the engine is cranking. Go to the next step. If it doesn't probe another wire.
5. Cut the wire you tested and attempt to start the car. If the starter will not turn over you have the right wire. If it still starts reconnect it and go back to step 3.

3. Selecting the Mounting Unit/Antenna Location for the HEU-S

Selecting the Mounting Unit Locations: The Heavy Equipment Unit - Small (HEU-S) is supplied with a 6 ft. power cable. The unit should be mounted so it will not be exposed to damage from people or objects. The cables that connect to the unit should also be routed to protect them from possible damage. The HEU-S has a mounting base or flange with six mounting holes. Normal installation is with these four holes and #6 or #8 sheet metal screws. The unit must be mounted where it will not be exposed to direct sunlight or excessive heat generated by the heavy equipment operation.

Selecting the Mounting Antenna Locations: The HEU-S requires two antenna elements. One antenna is for receiving GPS signals from the Navistar GPS Satellites. The second antenna is a radio transceiver antenna that communicates with the Cellular Network. The antenna does not require a ground plane to function properly. There are 2 antenna cables in addition to the main power harness that must be connected to the HEU-S, so be sure there is room to access the connectors for installation and service.

The GPS/RF Combo Antenna must be mounted on the rooftop of the heavy equipment or any flat plane with direct view of the sky. Also if there is no metal on the Steering Cluster, it could go underneath that dash piece as long as there is no metallic barrier to the GPS satellite signals. The Combo Antenna works best mounted horizontal with a clear view to the sky. Any metallic objects between the antenna and the satellites will degrade the signal and reduce the overall performance.

4. Hardware Connections for HEU-S

1. HEU-S power is connected to pin 8 (red w/ the fuse holder) this source will always have voltage.
2. Ground pin 5 (black in the same jacket as the main power) to chassis of Heavy Equipment.
3. Connect a true ignition source to pin 8 (brown add a 3amp fuse inline)
4. Connect the black lead (p85) from the Starter Disable (SD) relay to pin 1 (green)---(Diagram Provided)

- Connect SD relay p86 (white) to a true ignition source (add a 3amp fuse inline)
- Connect SD relay p30 (blue) & 87a (red) to the starter wire from the Heavy Equipment

- P87 (yellow) is not used

5. Connect the (-) over heat input to pin 6 (white)
6. If the over heat input is (+) add a relay (Diagram Provided)
    - Connect relay p86 to positive side of over heat lamp
    - Connect relay p85 & p30 to chassis ground
    - Connect relay p87 to pin 6 (white)
    - P87a is not used
7. Place Back up Battery fuse with a flatblade screwdriver (See Diagram)

Initial Power Up of HEU:

1. Make sure you document the ESN (serial number) of the HEU-S.
2. Make sure the Heavy Equipment is outdoors with nothing overhead.
3. Make sure the antenna leads are connected to the HEU-S.
4. Make sure the HEU-S is properly grounded.
5. Connect main power to the HEU-S.
6. Ground the test wire (BLUE). This will reset the hours of use in the HEU-S.
7. Keep an eye on the status LED located in between the two antenna inputs. It will start blinking green in intervals of 5 to 10 seconds.
8. If the LED is blinking orange that is an indication of weak cellular signal.
9. If the LED is blinking red that is an indication of no cellular signal.
10. If the LED is blinking green that is an indication of good cellular coverage.
11. The LED should start blinking green on and off in intervals of a second. This usually takes about five minutes. This status is an indication of a GPS lock.
12. If you do not get these results within the first fifteen minutes of power up, relocate the antenna and power cycle the HEU-S by removing the main power source and removing the Back Up Battery's Fuse by half turn with flatblade screwdriver.
13. After obtaining these results it is time to log on the website www.cybertraklocate.com and review history. A start-up test should appear on the screen with your location visible.

After confirming that the HEU-S is communicating it is then time to close up the install.

5. Initial Power Up of HEU-S

1. Make sure you document the ESN (serial number) of the HEU-S.
2. Make sure the Heavy Equipment is outdoors with nothing overhead.
3. Make sure the antenna leads are connected to the HEU-S.
4. Make sure the HEU-S is properly grounded.
5. Connect main power to the HEU-S.
6. Flip the test dipswitch from "run" to the "on" position and back to "run". This will reset the hours of use in the HEU-S.
7. Keep an eye on the status LED located in between the two antenna inputs. It will start blinking green in intervals of 5 to 10 seconds.
8. If the LED is blinking orange that is an indication of weak cellular signal.
9. If the LED is blinking red that is an indication of no cellular signal.
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11. The LED should start blinking green on and off in intervals of a second. This usually takes about

five minutes. This status is an indication of a GPS lock.
12. If you do not get these results within the first fifteen minutes of power up, relocate the antenna and power cycle the HEU-S by removing the main power source and unplugging the Back Up Battery.
13. After obtaining these results it is time to go on the website www.cybertraklocate.com and get a history review and make sure you get a start-up test with a proper location.

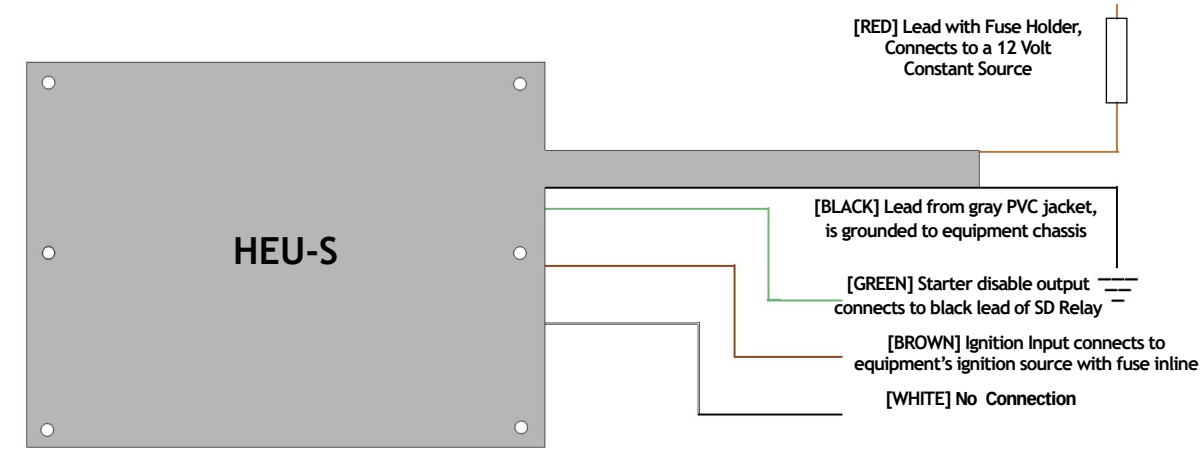
After confirming that the HEU-S is communicating it is then time to close up the install.

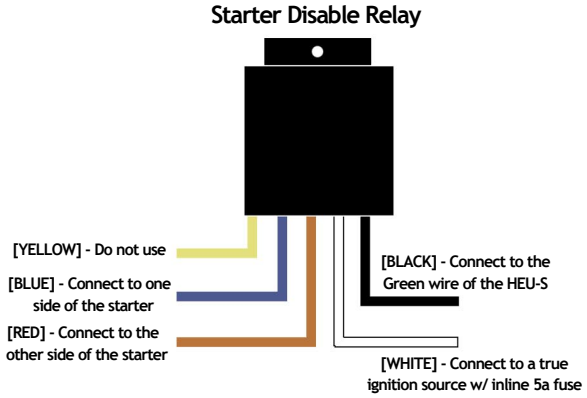
6. Confirming Proper Operation

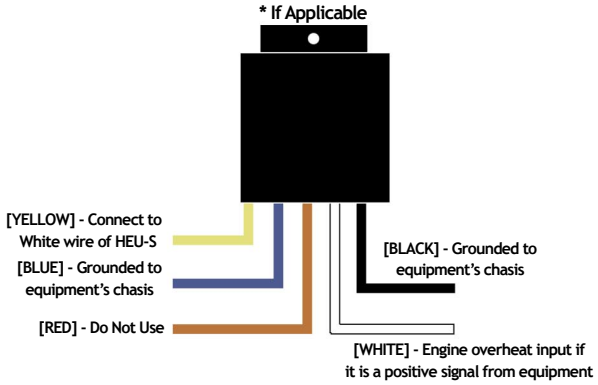
The Test wire (see wiring diagram) on the HEU-S is for testing the internal functionality of the hardware. Running tests with this wire grounded will not send data to the call center. The user account does not need to be activated to run the tests. Grounding the wire will start test mode function. If the wire is not removed from ground the unit will remain in the test mode for 5 minutes and then return to normal operation. To start the tests again you must ground the test wire again. If you want the HEU-S to function normally after testing, remove the test wire from ground and tape the end to prevent the device from going into test mode during normal operation.

Remember that the HEU-S will remain in the test mode for only 5 minutes at a time and you will need to cycle the test wire to re-enter the test mode. The HEU-S interface circuits are all pre-wired in the cable harness. Table 1 also shows the wire colors associated with the input and output circuits. The digital outputs are provided to switch optional external devices. Each can sink 1 amp at 35 volts. The outputs are voltage protected so they can sink current from inductive loads. If the individual sink current is allowed to exceed 1 amp, the outputs could be damaged. The digital inputs are triggered by a contact closure or short of less than 100 ohms from the contact to ground on their inputs.

8. Wiring Schematic

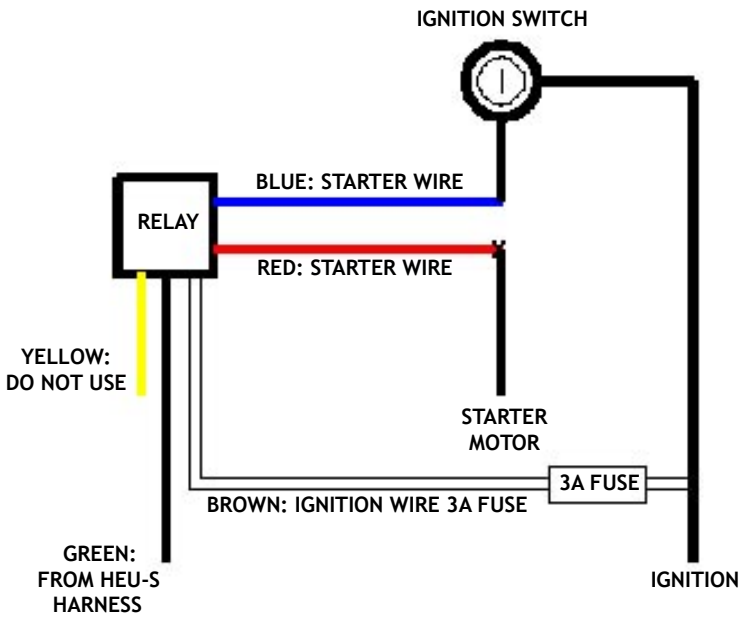






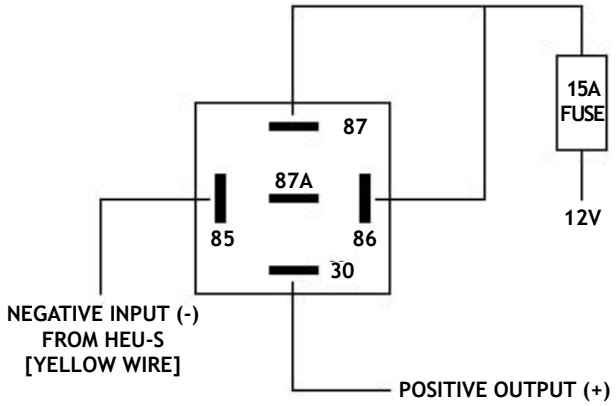
Note: RED +12 VOLT[1] = Failure to properly identify or connect to a constant power source may result in excessive "Start-Up" messages.

9. Starter Disable Diagram



9.2 Invert Polarity Diagram

Change polarity from Negative to Positive, used mainly for Engine Overheat. Diodes and resistors may be required for some applications.



10. Wire Harness Pin Connection

HEU-S External Wire Harness-12 Pin Plug				
Pin #	**Wire Color**	**Pin Name**	**Primary Use**	**Electrical Characteristics**
1	Green	Output 2	Starter Disable	1 Amp Relay Driver
4	Red	Primary Battery	Primary Battery Source	9-20 VDC
5	Black	Primary Ground	Primary Ground	Ground
6	White	Input 3	Engine Overheat	Ground For 2 Minutes
8	Brown	Analog Input	Alternate Ignition Sense	Connect To True Ignition Source
10	BLUE	TEST WIRE	Test/Reset Hours Count	Ground To Reset Z (5 To 30 Seconds)

Note: Please refer to your Configuration Sheet to determine if any of the above listed output messages apply to your account.

11. Trouble Shooting

PROBLEM	CAUSE	SOLUTION
I CANNOT POLL MY Heavy equipment?	1. NO POWER TO UNIT	1. CHECK FOR GOOD GROUND AND GOOD POWER SOURCE
	2. BLOWN/LOOSE FUSE	2. REPLACE/TIGHTEN FUSE
	3. LOW CAR BATTERY	3. REPLACE OR RECHARGE BATTERY
	4. CAR IN GARAGE OR OVERHEAD ROOF RACK	4. MOVE THE CAR TO AN OPEN AREA
	5. BAD CELL COVERAGE	5. MOVE CAR A BLOCK OR TWO AWAY FROM THE AREA
	6. BAD ANTENNA LOCATION	6. MOVE TO ANOTHER LOCATION IN Heavy equipment INSURING NO METAL ABOVE
	7. WRONG ESN NUMBER	7. VERIFY ESN# ON UNIT WITH NUMBER ON WEBSITE
	8. TEST WIRE IS GROUNDED (GREEN/ YELLOW)	8. REMOVE TEST FROM GROUND
UNIT RESPONDS BUT I GET NO MAP OR THE LOCATION IS NOT BEING UPDATED?	1. BAD ANTENNA LOCATION	1. MOVE TO ANOTHER LOCATION IN Heavy equipment INSURING NO METAL ABOVE OR ANTENNA IS FLAT WITH THE GPS RECIEVER FACING UPWARD
	2. NOT ENOUGH VOLTAGE TO UNIT WHEN CAR IS OFF	2. IF BROWN WIRE IS CONNECTED TO IGNITION TURN THE CAR ON AND IT SHOULD SUPPLY THE CORRECT AMOUNT OF VOLTAGE FOR A CLEAR LOCATE
	3. BUILDING COVERING GPS RECEPTION	3. MOVE CAR ABOUT 10 TO 20FT FROM THE BUILDING
	4. CAR IN GARAGE OR OVERHEAD ROOF RACK	4. MOVE THE CAR TO AN OPEN AREA
STARTER DISABLE WONT WORK?	1. WRONG WIRES ARE CONNECTED	1. MAKE SURE THE CORRECT WIRES ARE CONNECTED (i.e. GREEN WIRE NOT GREEN/YELLOW)
	2. I NCORRECT POWER SOURCE	2. ESTABLISH GOOD POWER SOURCE BEFORE CRANK AND DURING CRANK
WEB ISSUES		
WHEN I TRACK A Heavy equipment NO MAP COMES UP, IT TAKES ME TO THE CONTROL PANEL.	POP-UP BLOCKER	DISABLE POP-UP BLOCKER OR BROWSERS LIKE AOL MAY CAUSE THIS, THEREFORE IF YOUR ISP IS AOL - USE THE LATEST VERSION OF INTERNET EXPLORER OR NETSCAPE WHEN YOU ARE LOGGED ON TO THE NET.
I LOG IN, BUT WHEN I TRY TO USE ANY FEATURES IT TAKES ME BACK TO THE LOGIN PAGE.	ALL COOKIES ACCEPTED IS DISABLED.	DISABLE ANY COOKIE BLOCKER OR WHILE USING IE BROWSERS - UNDER THE PRIVACY TAB IN YOUR INTERNET OPTIONS, BY CLICKING THE TOOLS MENU, ACCEPT ALL COOKIES BEFORE ACCESSING WEB APPLICATION ON COMPUTER/S BEING USED.

12. Access Information

Congratulations, you have just installed the Internet based vehicle telematics system. Now that it's installed, here's how to use your system.

Turn on your computer and log on to the Internet using your standard Internet browser.

- Go to the CyberTrak home page at www.cybertraklocate.com
- Choose the applicable site from the drop down menu.
- Enter customer login and password. Then click login.

You will now be on the Control Panel page.

Select the vehicle which will be tested.

Click on the Vehicle Location Request button to obtain a location, speed and direction. This step is to ensure proper functionality of the MLU.

A map will generally appear on average of about 2 min. Make sure the information on the map is correct.

Zoom in/out on the map by using the circular buttons located on the bottom right hand corner.