HawkEye 5300

Dual-Mode Iridium/GPRS Data Terminal

Installation Guide

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NOTICE

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INTRODUCTION

The information contained in this manual describes the features, functions, technical characteristics, components, installation considerations and setup procedures for Blue Sky Network's HawkEye 5300 Iridium/GPRS/GPS data terminal, as well as the harness and antenna.

NOTE: Information, drawings and wiring diagrams contained in this manual are intended as a reference for engineering planning only. Drawings and wiring diagrams contained herein do not represent any specific vehicle installation.

This guide is applicable to the following components:

Component Name	Component Description
HawkEye 5300	Iridium/GPRS/GPS tracking unit with connectors and internal battery
HawkEye 5300 Iridium/GPS antenna	HawkEye 5300 external Iridium and GPS antenna
HawkEye 5300 harness	Harness for HawkEye 5300
HawkEye Touch (optional)	HawkEye Touch video display panel/communication interface

SYSTEM DESCRIPTION & OPERATION

HAWKEYE 5300 NETWORK

The Blue Sky Network HawkEye 5300 is an Iridium/GPRS/GPS data terminal. With its compact size, it can be easily installed in a vehicle for tracking, event and alert notifications, and over-the-air commands.

With the integration of the optional display HawkEye Touch, it also supports two-way messaging and in-car navigation.

All services are managed by the customer through Blue Sky Network's web-based SkyRouter portal. (Access to SkyRouter is highly secure and password protected.)

SkyRouter delivers global asset tracking, and a multitude of account management features, such as user authorization, asset settings, messaging and billing information.

GSM NETWORK

GSM (Global System for Mobile communications) is an open, digital cellular technology used for transmitting mobile voice and data services.

GSM supports data transfer speeds of up to 9.6 kbit/s, together with the transmission of SMS (Short Message Service).

GSM operates in the 900MHz and 1.8GHz bands in Europe and the 1.9GHz and 850MHz bands in the US. The 850MHz band is also used for GSM and 3G in Australia, Canada and many South American countries.

By having harmonized spectrum across most of the globe, GSM's international roaming capability allows users to access the same services when travelling abroad as at home. This gives consumers seamless and same number connectivity in more than 218 countries.

Terrestrial GSM networks now cover more than 80% of the world's population. GSM satellite roaming has also extended service access to areas where terrestrial coverage is not available.

IRIDIUM SATELLITE NETWORK

Iridium delivers essential communication series to and from remote areas where no other form of communications is available. It is the most reliable global communications network available.

With its unparalleled reach and unrivaled service, Iridium's call quality is as much as three times greater than its competition. Iridium provides low latency from anywhere in the world.

Iridium's Constellation of 66 interconnected low earth orbit (LEO) satellites provides inherent advantages in terms of performance and reliability.

Iridium's ground network includes two gateways, a satellite network operations center, a technical support center and four tracking telemetry and control stations interconnected by advanced fiber optic and broadband satellite links.

Blue Sky Network is a Tier One Service Partner, a Value Added Manufacturer, and Value Added Reseller for Iridium.

GPS SATELLITE NAVIGATION SYSTEM

The Global Positioning System (GPS) is a worldwide radio-navigation system formed from a constellation of satellites and their ground stations. GPS uses these "man-made stars" as reference points to calculate positions accurate to a matter of meters.

GPS satellite signals are processed in a GPS receiver, enabling the receiver to compute position, velocity and time. GPS receivers have been miniaturized to just a few integrated circuits, and are becoming ever more economical, making the technology accessible to virtually everyone.

While there are thousands of public users of the GPS system world-wide, the system was originally designed for the US military. GPS is funded and operated by the US Department of Defense.

HAWKEYE 5300 OVERVIEW

SPECIFICATIONS

GPS: SIRFstarIII	**Real-time clock:** 1
GSM/GPRS modem: Quad Band GSM (5300)	**Input Voltage Range:** 8-30V
Iridium Satellite modem: 9602	**Max Peaking Current:** 2.0A
RS232 (RX/TX only): 1	**Internal battery (2):** Lithium Polymer; 1300mA
1-Wire: 1	**Diagnosis LED:** 7
Accelerometer: 3-D	**Operating temperature:** -20 to +60°C
Included antennas: External Iridium and GPS dual channel	**Dimensions (mm):** 203.14 x 128.29 x 40.00
Digital inputs 5 to 30 V (3 inputs can be used to wake up the device [alarm mode]): 4 (+1 ignition)	**Weight (grams):** < 454
Digital outputs (open drain [max 350 mA]): 2	**Iridium/GPS antenna:** SMA (f) 2
Main controller: Intel PXA 270 (312 MHz)	**IO serial ports:** 18-pin Molex
RAM: 32 MB	**Power supply:** Same as IO
Flash memory: 32 MB	

ACCESSORIES AND OPTIONS

- HawkEye Touch, driver-friendly, portable navigation/messaging terminal (optional)
- 12V cigarette lighter adapter
- Panic button
- Door sensor
- Temperature/pressure sensor

BENEFITS

- Global coverage via Iridium based transceiver
- Simple, discreet installation
- Flexibility to match your business requirements
- Notification when vehicles operate in unauthorized zones or time frames
- Monitor idling, driver behavior and vehicle status remotely
- Change configuration and settings in the field
- Movement reporting while vehicle ignition is off
- Sense and report erratic driving behavior
- Flexible sensor monitoring for complex applications
- Connect with peripherals through standard interface
- Turn-by-turn directions and two-way messaging (optional)

PREPARING THE HAWKEYE 5300

INSTALLING YOUR SIM CARD

The first thing you will need to do is install your SIM card. Simply remove the cover by unscrewing the four bottom screws, as shown in Figure 1.

Figure 1: *The HawkEye 5300 with cover attached.*

Then place the SIM card with the contacts facing down and the notch facing out, as shown in Figure 2. Push the SIM forward. It must be firmly seated.

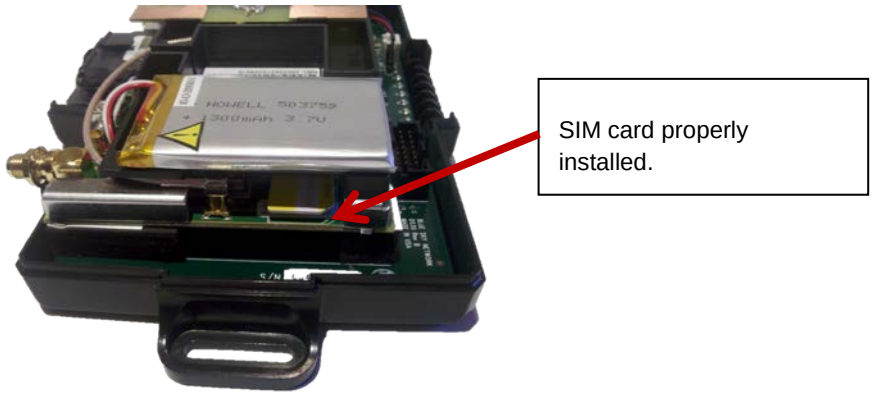


Figure 2: *The SIM card properly installed and seated.*

ACTIVATING INTERNAL BATTERY SWITCHES

Next step is to ensure your batteries are turned on. The device has two internal battery switches, one to back up the GPS receiver (Figure 3) and the other to back up Iridium transceiver (Figure 4).

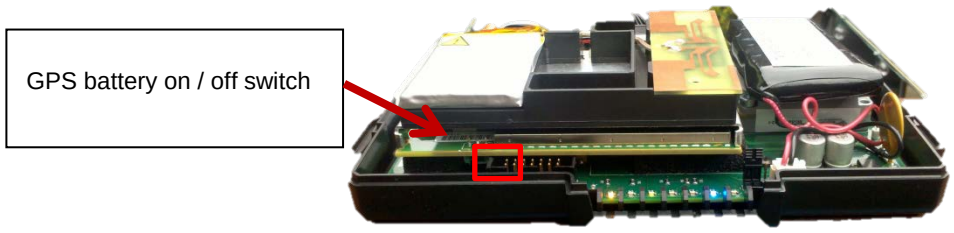


Figure 3: *To activate the internal GPS battery, move the switch highlighted in red to the left.*

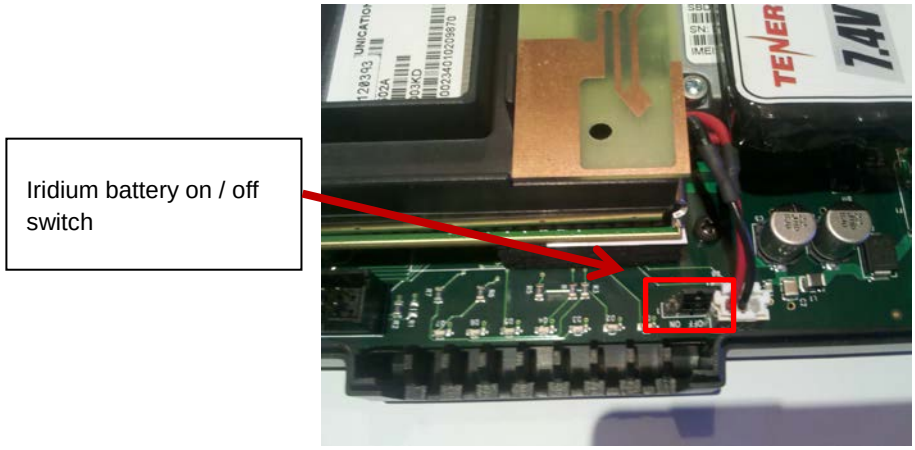


Figure 4: *To activate the internal Iridium battery move the jumper highlighted in red to the left.*

INSTALLING THE HAWKEYE 5300

MOUNTING

To minimize tampering and protect the HawkEye 5300, location is critical. Blue Sky Network recommends that the HawkEye 5300 be hidden from plain view of any occupant of the vehicle.

The ideal location for the unit would be face-up under the dashboard, or under either the driver side or passenger seat, depending on external electrical connections available.

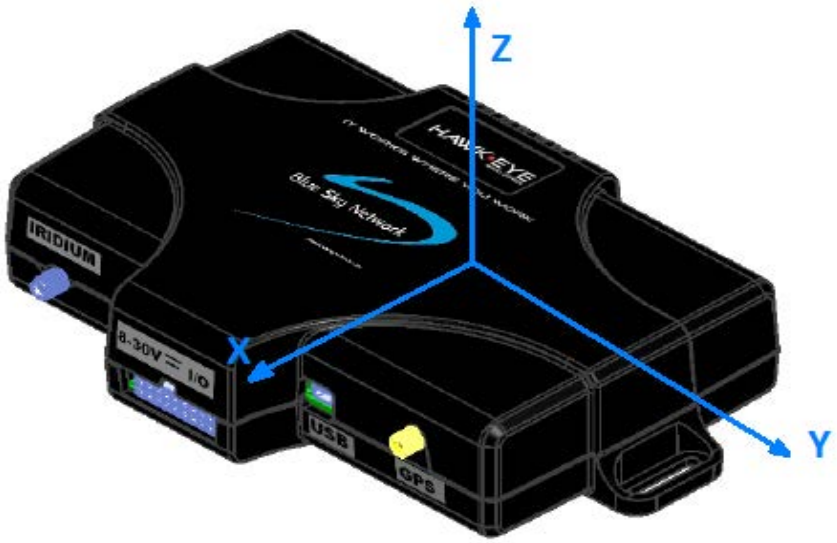
The device should be securely fastened down and all external wires out of the way of the driver and all mechanical objects used for operation of the vehicle. To install the device, you can use Velcro, double-face tape, expansive foam, or clutching cable.

As each vehicle is different, there is no codified method to install. If you're having trouble installing the device, you can contact a professional as well. Services are available in most markets; simply do a Google search on "GPS installation."

ACCELEROMETER

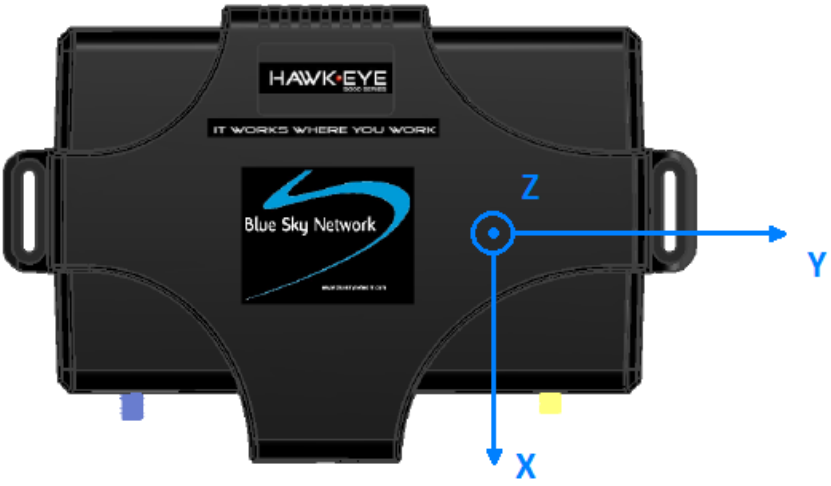
In order for the accelerometer to operate as intended the Hawkeye needs to be installed in a fixed orientation in order for the accelerometer-driven features to work properly. The X-axis needs to be aligned with the forward direction of the car; Y-axis needs to be aligned with the driver direction (left) and orthogonal to X-axis; Z-axis needs to be aligned with upward direction (normal to ground) direction and orthogonal to both X-axes and Y-axis.

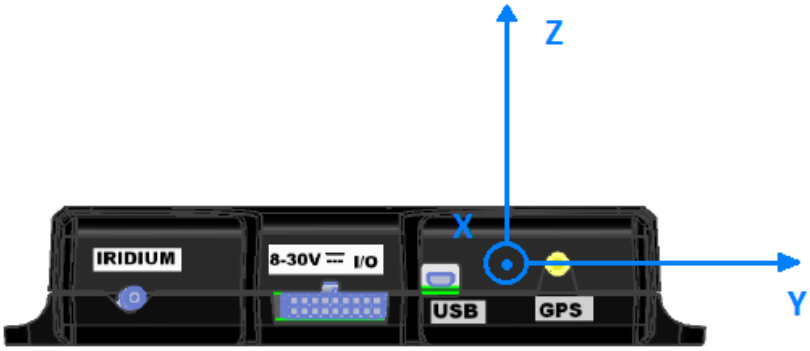
The following illustration shows the 3-dimentional view of X, Y, and Z axis of the accelerometer equipped in the Hawkeye device:



View from top and front side:

NOTE: ⊙ indicates vector “coming out of the plane”.





WIRING

OVERVIEW

Figure 5 shows an overview of the wiring included with the HawkEye 5300.

●	**RED WRAPPER (A):** **Serial port (1)** Maroon wire : Ground RS232 Yellow wire: TXD1 -RS232 Orange wire: RXD1 - RS232 Red wire: CTS1 RS232 White wire: RTS1 RS232 **Serial port (2)** Maroon wire: Ground RS232 Green wire: RXD2 -RS232 Blue wire: TXD2 -RS232 Grey wire: 1-wire Black wire: 1-wire
●	**BLUE WRAPPER (B) :** Grey wire: Output 1 TOR GND White wire: Output 2 TOR GND Purple wire: Input 3 TOR +Vbat Blue wire: Input 2 TOR GND Green wire: Input 1 TOR GND Orange wire: Input 4/Alarm (TOR GND)
●	**BLACK WRAPPER(C) :** Red wire: Battery (permanent power) (8-30 V) Black wire: Ground battery White wire: After contact (Ignition) (830 V)

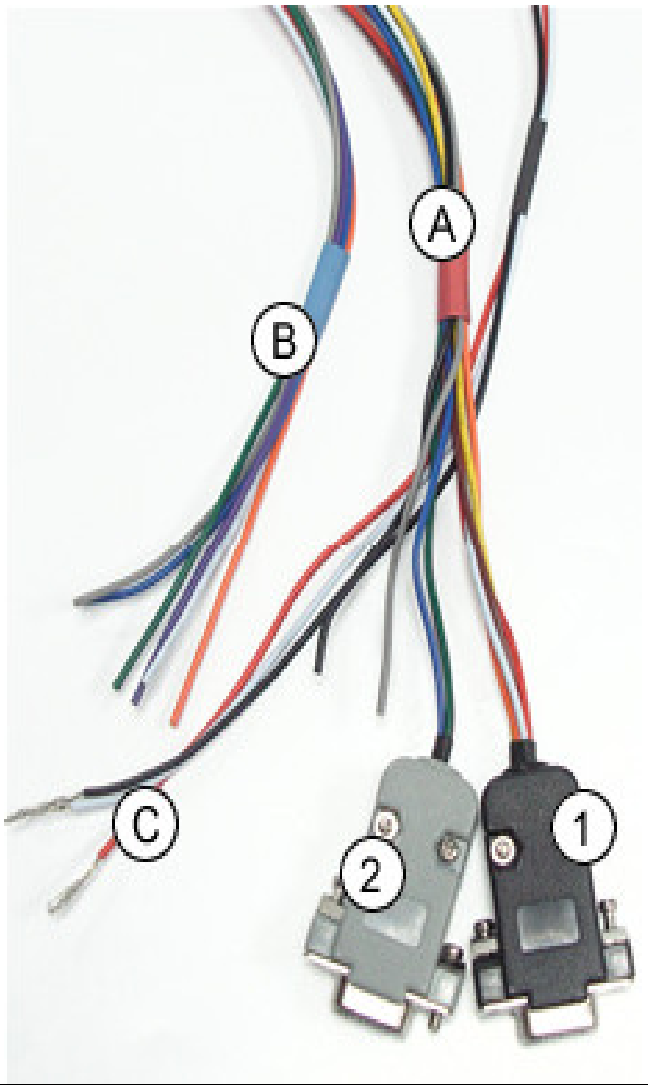


Figure 5: *Wiring overview.*

Power supply may be derived directly from the vehicle's accumulator or from the board installation. In the first case, it is an absolute must that a fuse on the main cable is present

WARNING: The ground wire must be connected first.

CONNECTING TO THE VEHICLE BATTERY

The device must have a direct connection with the vehicle battery. Blue Sky Network advises against the use of an intermediate system.

Figure 6 shows the wires that must be connected to your vehicle's battery: Ground wire (2), main power wire (1), and ignition wire (3).

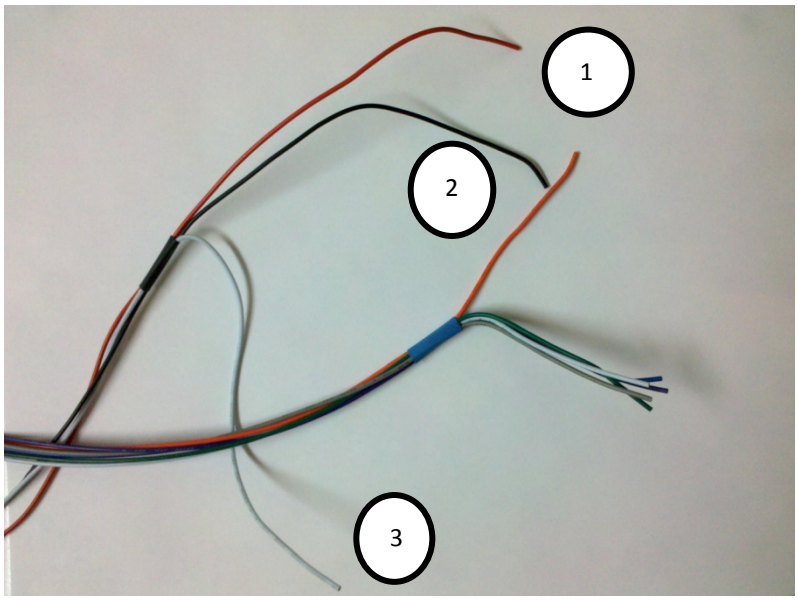


Figure 6: These wires must be connected to the vehicle battery.

Take the following steps to connect your HawkEye 5300 to your vehicle battery:

1. Locate the group of three wires (red, white and black) in the black wrap
2. Connect the black wire in the black wrapper to the ground of the external power source (group C in Overview diagram/chart).
3. Connect the red wire in the black wrapper to the constant external power source (8-30VDC) (group C in Overview diagram/chart).
4. Connect the white wire in the black wrapper to the true ignition line (i.e. line goes high when ignition is engaged and stays high while engine is running. Line goes low when the ignition is disengaged and the engine is stopped) (group C in Overview diagram/chart).

It is advised to install a 2A fuse on both the Main power (1) and ignition (3) lines to protect against current fluctuations.

WARNING: The device should be always plugged to the ground of the external battery, i.e., a ground point defined by the vehicle manufacturer.

NOTE: A circuit breaker should never be enabled as long as 1) the vehicle ignition is active or the vehicle ignition goes OFF for less than 2 minutes. The latter is the time for the device to do a proper shutdown.

ANTENNA INSTALLATION

The device comes with a dual input aero antenna that handles both GPS and Iridium satellite transmissions (Figure 7). The antenna should always be installed with the inputs facing down.

Figure 7: *The back of the HawkEye 5300 antenna with dual inputs (capped) for GPS and Iridium.*

The face of your antenna (Figure 8) must have an unobstructed view of the sky. Blue Sky Network recommends the antenna be installed externally as some types of coated windshields, as well as windshields with an in-screen heating system, can block GPS signals.

Additionally, the external antenna should never be covered by any kind of object or material, especially metal. Maintain a minimum space of 20 cm between the antenna and any audio speakers.

There are four screw holes in the antenna (Figure 8) to facilitate a permanent installation on your vehicle:

Figure 8: *The front of the HawkEye 5300 antenna has four screw holes.*

The Hawkeye has exterior antenna connectors for both the GPS cable and the Iridium cable (Figure 9).

Figure 9: The HawkEye 5300 device has connectors for both Iridium and GPS cables.

Use the provided SMA to SMA coaxial cable to connect the HawkEye device to the antenna, matching GPS on the device to GPS on the antenna, and Iridium to Iridium.

(Should you choose to use antenna cables other than the ones provided by Blue Sky Network, strict attenuation requirements must be met to avoid unnecessary signal degradation, contact Blue Sky Network Support for more details.)

If you're having trouble installing the antenna, you can contact a professional as well. Services are available in most markets; simply do a Google search on "GPS installation."

THE HAWKEYE TOUCH

If you require two-way communication, the HawkEye Touch (Figure 10) will be a critical part of your system.

Figure 10: The HawkEye Touch.

This optional component is a sophisticated touch screen that comes pre-loaded with Blue Sky Network's custom messaging application, which enables the creation and sending of short messages.

It also includes varied functionality, such as being able to give your central office a quick position report (QPOS, as seen in Figure 11), which is ideal in case of breakdowns or accidents: one touch on QPOS and they know exactly where to find you. There are additional functions available as well, such as navigation, and custom functionalities may be developed as well.

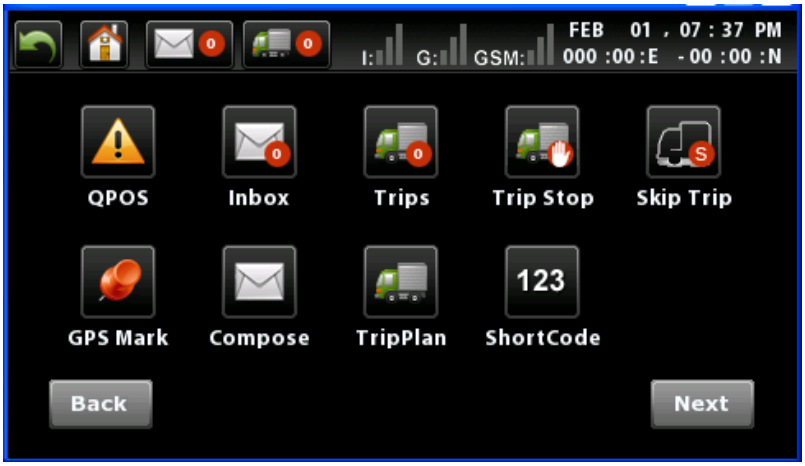


Figure 11: A screenshot from the HawkEye Touch, showing only some of the embedded functionality.

INSTALLING THE HAWKEYE TOUCH

Figure 12 shows all that comes with the HawkEye Touch video display and communicator.

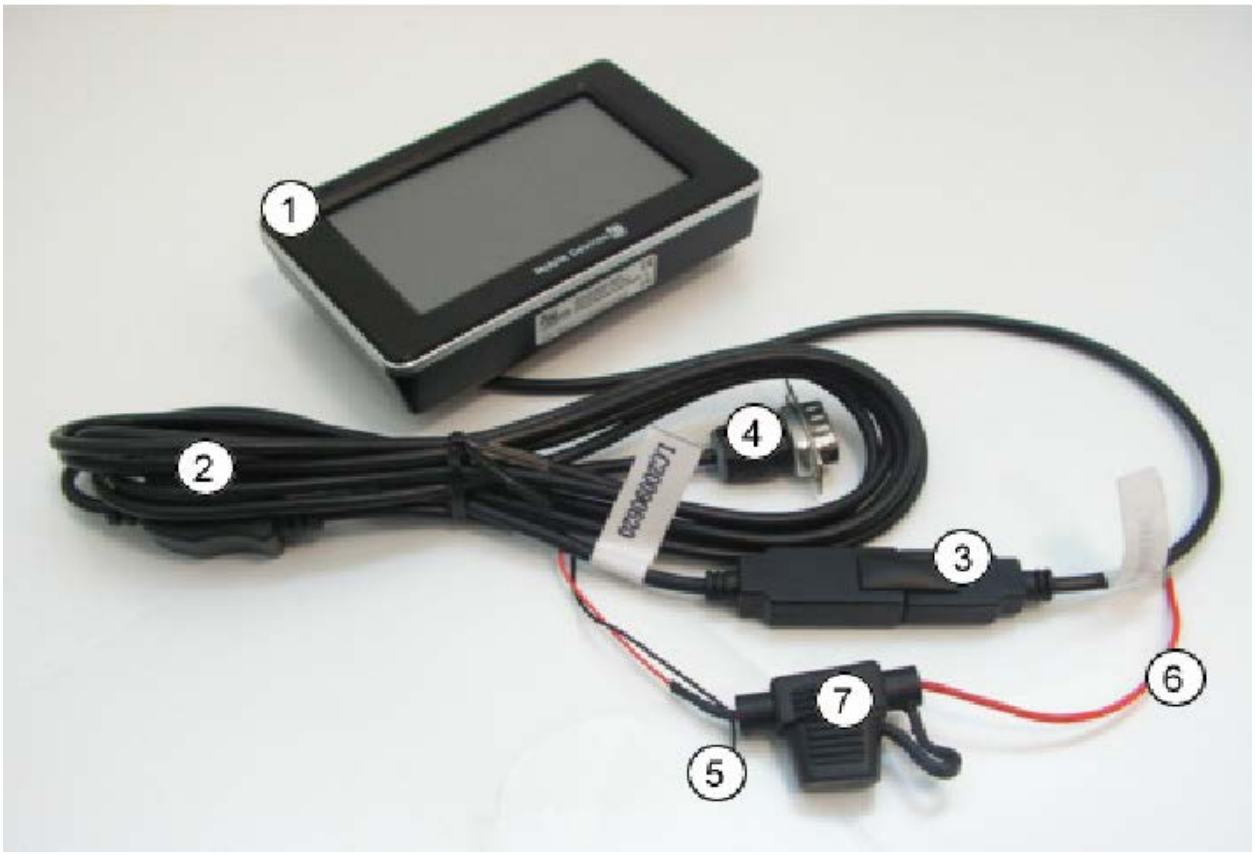


Figure 12: The HawkEye Touch (uninstalled).

1. The HawkEye Touch
2. Wire harness
3. USB connector
4. RS232 connector (must be connected the Hawkeye Black Serial Port)
5. Ground wire (black)
6. Vcc/Permanent positive wire (red)
7. Fuse (2A)

Attach the black wire (5) to the vehicle ground and the red wire (6) to the vehicle battery line.

As each vehicle is different, there is no codified method to install. If you're having trouble installing the HawkEye Touch, you can contact a professional as well. Services are available in most markets; simply do a Google search on "GPS installation."

VERIFYING INSTALLATION

Verifying that your HawkEye 5300 device and antenna are properly installed is easy thanks to the HawkEye 5300's built-in LED display (Figure 13) that tells you what you need to know in a glance.

Figure 13: *The HawkEye 5300's LED display.*

	P: (Main Power)	Solid red LED indicates vehicle power is connected to the device; no red LED indicates no vehicle power connection, or that your unit is turned off.
	I: (Iridium Signals)	Solid blue LED indicates good Iridium signal strength, blinking blue LED indicates weak Iridium signal strength, and no blue LED indicates Iridium modem is asleep or no Iridium signal.
	GSM: (GSM signals)	Solid green LED indicates good GSM signal strength, blinking green LED indicates weak GSM signal strength, and no green LED indicates no GSM signals.
	GPS: (GPS signals)	Solid yellow LED indicates good GPS signal strength, blinking yellow LED indicates weak GPS signal strength, and no yellow LED indicates no GPS signal.
	BI: (Iridium Battery)	Solid Green LED indicates device is operating off internal Iridium backup battery, no green LED indicates you are using external power, or that your unit is turned off.
	BG: (GPS Battery)	Solid green LED indicates device is operating off internal GPS backup battery, no green LED indicates you are using external power, or that your unit is turned off

NOTE: When you power up from a cold start (no internal batteries activated) all of the LEDs should flash until the unit has reached a steady power and signal state.

SERVICE ACTIVATIONS

Blue Sky Network handles all activation requests. An activation request can be submitted through our website, the link is shown below. You should receive an immediate email confirmation that your request has been submitted and another email once the requested services have been activated. Please make sure your contact details are accurate, this is how we contact you if there are any problems processing your request.

We will only process activation requests submitted by the account Administrator; we do not activate for installers.

http://www.blueskynetwork.com/Support/ActivationForm.php

SUPPORT

Please do not hesitate to contact us either via email, phone or, for self-help, see http://www.blueskynetwork.com/Support/Support.php (case sensitive)

Thank you for choosing Blue Sky Network!

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REVISION HISTORY

Date	Revision	By	Description
2011	1.0	MP	Original publication
09/18/12	1.01	MP	Formatting changes
07/26/13	1.02	MP	Included accelerometer installation guidelines
03/21/17	1.03	AN	Updated the address

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