IG-2500

OPERATIONS

GROUND CONTROL
Updated Wednesday, October 02, 2002

CONVENTIONS USED IN THIS GUIDE

These safety alert symbols are used to alert about hazards or hazardous situations that can result in personal injury. A single word, **DANGER, WARNING,** or **CAUTION** is used with the alert symbol to indicate the likelihood and potential severity of injury.

This safety alert symbol is used to alert about hazards or hazardous situations that can result in personal injury. A signal word, DANGER, WARNING, or CAUTION, is used with the alert symbol to indicate the likelihood and potential severity of injury.

DANGER

Indicates an imminent hazard or unsafe practice which, if not avoided, will result in death or severe personal injury.

WARNING

Indicates a hazard or unsafe practice which, if not avoided, could result in death or severe personal injury.

CAUTION

Indicates a hazard or unsafe practice which, if not avoided, might result in moderate or minor personal injury.

CAUTION

When used without the alert symbol, indicates a hazard or unsafe practice that might result in property damage.

CONGRATULATIONS

…on your purchase of the IG-2500 from Ground Control.

The Mobile Satellite Dish is a Fixed Transportable Broadband Internet System. We at Ground Control are certain that you will be enjoying many hours of "always-on" Broadband Internet connectivity no matter where you find yourself parked.

FEATURES

- Automatic Pointing to the DIRECWAY Satellite.
- Broadband Internet access that is "always on".
- Automatic Signal Peaking and Cross Pol with the DIRECWAY Satellite.
- Optional DirecTV Television Reception at the same time as Internet Surfing.
- Dual TV LNB allows the use of two TV receivers.
- Quick reacquiring of a satellite that was pointed at last.
- Stowing the dish without having to turn the computer on.
- Auto Stow if the vehicle is moved.
- Auto Stow if the vehicle rocks due to wind.
- Re-Peaking if the vehicle has settled.
- GPS location, heading and altitude.
- Optional manual control of the Dish.
- Locate any satellite.
- Self-Learning. The more you use the system, the better it gets.

TABLE OF CONTENTS

COMPUTER MINIMUM REQUIREMENTS

Please make sure your computer meets these requirements BEFORE you install the mobile satellite system.

- Pentium III with at least 500 MHz in speed.
- 128 Megs RAM
- 120 Megs hard drive space
- Floppy Disk Drive.
- CD-ROM Drive.
- Windows ME, 2000, XP.
- Available USB Port. *
- Available Serial Port.
- Dial-up Modem (for one time connection to activate dish)

* May use Belkin F5U103 USB to Serial Adapter

SATELLITE COMPONENTS

The mobile system shipps with these components:

a. The Mounted Dish
b. The Main Dish Controller Box
c. The DirecWay Transmit and Receive Modems
d. Software for DirecWay (Internet) and Positioning (moving the dish)
e. Cabling


THE MAIN CONTROLLER


DIRECWAY MODEMS

CAUTION

- **The transmitting device on the LNB arm emits radio frequency energy when in the transmit mode.**
- **To avoid injury, do not place head or other body parts between feed horn and the satellite dish when system is operational.**
- **Unplug indoor power connection before performing maintenance or adding upgrades to any satellite dish components**


OPTIONAL TV ATTACHEMENT


GROUND CONTROL CD-ROM
(floppy disk no longer ships)

INSTALLATION – HARDWARE

Please refer to the Hardware Installation instruction booklet for how to physically install the satellite dish to the vehicle inside the Ground Control CD-ROM in the MANUALS folder.

INSTALLATION – SOFTWARE

Please refer to the Software Installation Manual that is located in the GROUND CONTROL CD-ROM in the MANUALS folder. The Software Installation Manual is for installing the DIRECWAY Software, the mobile positioning software, and for calibrating the mobile satellite system.

THINGS TO KNOW

YOU NEED A BILLING ID. Make sure the installer has called Ground Control (800-773-7168) and received a Billing ID. This should happen before the installer begins work on the vehicle. Please do this as soon as possible to avoid problems.

ACTIVATION REQUIRES A HUGHES CERTIFIED DIRECWAY INSTALLER.
Once all software is loaded, it is mandatory that you activate your DIRECWAY modems with a Hughes Certified DIRECWAY installer that is also Ground Control trained on the mobile satellite platform.

DIFFERENCE OF SOFTWARE - The IG-2500 Positioning Software (Datastorm) is used to point the Satellite Dish, while the DIRECWAY software is used to connect your computer to the Internet via the 2-way satellite. Once both of these programs are loaded, you will only have to concern yourself with the IG-2500 DataStorm software to raise the dish and lower the dish any time you move.

OPTIONAL TV. You have the option of receiving Television with your IG-2500 at the same time you're surfing the Internet. You will need to call your local DirecTV provider to request a DirecTV receiver and a television package.. Please call Ground Control for more information. You will NOT need to purchase a dish. The IG-2500 is set up to allow you to have two receivers if you desire for watching two different channels at the same time. Make sure your installer knows you wish to watch TV and if you want run one or two receivers off your mobile satellite dish. (Optional Bird on Wire (BOW) is required. Consult Ground Control for proper model.)

⚠ CAUTION

- This device emits radio frequency energy when in the transmit mode.
- To avoid injury, do not place head or other body parts between feed horn and satellite antenna dish when system is operational.
- Unplug indoor power connection before performing maintenance or adding upgrades to any antenna components.

EXPLANATION OF HARDWARE

MAIN CONTROLLER

The IG-2500 Main Controller controls the pointing of the Satellite Dish.

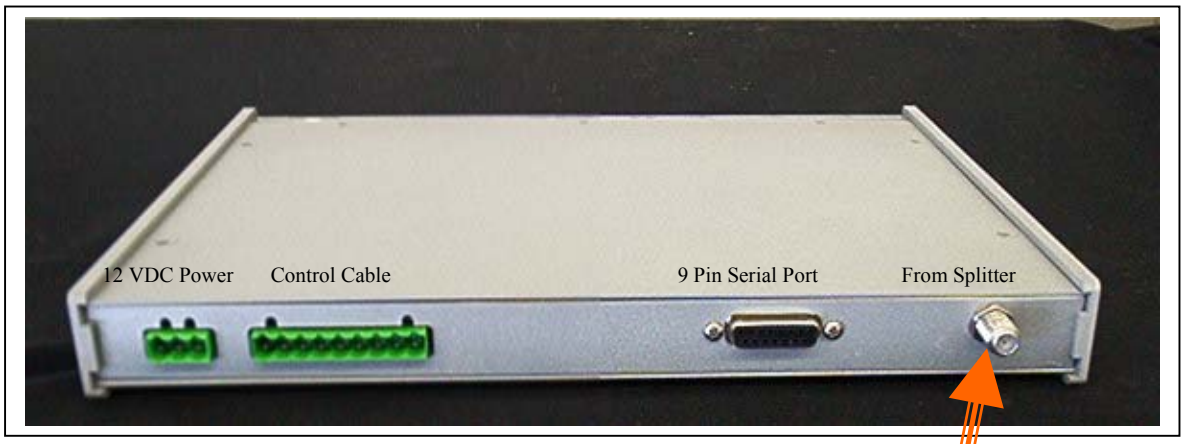
There is only one button the face of the Main Controller. When pressed, it turns on the controller by showing a blue light behind the button. When pressed again, it turns the controller off. Holding it down for 10 seconds will stow the dish.

The first green light on the left of the panel shows that the DIRECWAY modems are turned on. This light does NOT indicate that the main controller is turned on.

Next to the green light are two red lights that show when communications are happening between the dish and the main controller and when the motors are moving.

AUTOSTOW – If you press the "**ON**" button for more than 10 seconds, the dish will stow from a raised position, <u>even if the computer is turned off.</u>

BACK OF POSITIONER



Special Splitter (supplied)

To the Receive connector on the mobile satellite dish.

To IG-2500 Main Controller

To Receive Modem

DIRECWAY MODEMS

Receive Modem (IRU)

Transmit Modem (ITU)

Note: Air circulation is required to prevent premature or intermittent failure due to overheating.
Failure to provide proper ventilation may void warranty.

The DIRECWAY Modems are part of the mobile satellite system. The installer should have installed the software that runs the modems. If not, please refer to the software installation manual located in the Ground Control CD-ROM.

When you turn on your computer, you will notice a small "BE" icon on right side of the task bar.

If these icons do not appear (within one minute) after your run your computer, you may have to manually run the DIRECWAY software.

To manually run the DIRECWAY software, click on "Start" then choose "Programs" then choose "DIRECWAY" then choose "Navigator". This should put a "BE" icon on your task bar.

If this doesn't work, make sure your cables are connected and the modems are turned on. Please check your install manual for properly setting up the DIRECWAY cables and installing the DIRECWAY software.

USING THE MOBILE SATELLITE SYSTEM

BEFORE YOU RAISE THE DISH - You will need to park your vehicle in an area that will allow you to see the DIRECWAY satellite in the Southern sky. If you are in a RV and predict wind, it is recommended that you stabilize the rig with leveling jacks to reduce rocking.

Turn on your DIRECWAY modems, Computer and the Main Controller. You can be sure the Main Controller is turned on when the blue light behind the button lights up. (The green light on the Main Controller does NOT indicate the controller is turned on, only that the DIRECWAY modems are turned on).

Last thing to check…make sure the DIRECWAY software is running. This appears as a little "BE" icon on the task bar at the bottom right of the Windows Desktop. If this is not running, you may manually start the Navigation program by clicking on "Start", choosing "Programs" then choosing "DIRECWAY", and finally selecting "Navigator". If this doesn't start, please refer to the troubleshooting guide.

RAISING THE DISH - To raise the dish, run the IG-2500 DataStorm software and click on "Find Satellite".

The dish automatically raises and locks on satellite within 6 to 10 minutes …given no obstructions in its view of the satellite. The positioner screen will reduce itself to run in the background on your taskbar. To open up the screen again, double-click on the small blue icon on your Taskbar. You may also double click on the IG-2500 DataStorm application.

NOTE - Sometimes the GPS information is not found immediately when you press the "Find Satellite" button. In this case, simply click on the "Refresh" button until GPS is read.

That's it! Once you are locked on satellite, you may surf the Web at Broadband speeds!

AUTOMATIC CROSS POL (ISOLATION) ISSUES

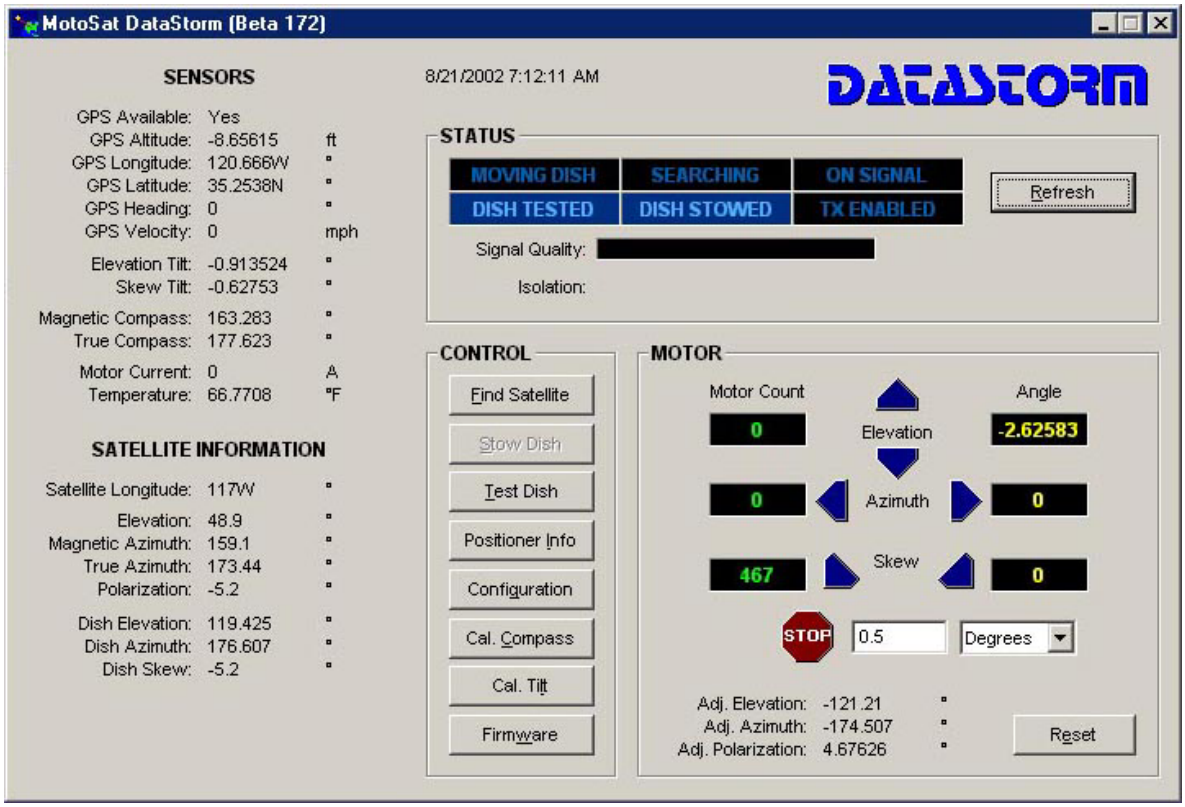
After you click on "Find Satellite", and the dish has locked on satellite, it will perform an Automatic Cross Pol. Cross Pol is the dish aligning itself horizontally and vertically to the satellite in orbit. You will either achieve a "Pass" or "Fail" on the isolation reading under the signal quality meter. Isolation is a reading of how well your dish is aligned. If you pass, you're online and able to surf the Internet.

If you do not pass isolation, click on the "Find Satellite" button again to see if you pass. If you still do not pass… please call Ground Control Technical Support to be trained in how to perform a manual cross pol. Ground Control can be reached at 800-869-2595.

OTHER DETAILS

The IG-2500 is an **always on** connection and you do not need to stow the dish when you are finished using the Web. However, we do recommend closing down your computer when you are not using it to save energy, but you should keep the IG-2500 Main Controller turned on for safety reasons. The dish will (soon) stow automatically when it senses movement by high wind rocking or by inadvertently driving off without stowing the dish. If the main controller is turned off, these safety features are not available. (This option will be available soon).

STOWING THE DISH – Click on “Stow Dish” in the IG-2500 DataStorm screen. If the computer is not turned on, you may simply press the “ON” Main Controller button for 10 seconds and the dish will stow automatically.



The IG-2500 (DataStorm) Main Screen

CONTROLS

REFRESH – Updates the screen with fresh “Current” information. This button is used often when you first open up the application and refresh till the GPS sensor has a valid reading.

FIND SATELLITE – Raises the dish from a stowed position to find the DIRECWAY Satellite. Also, if you have not moved your vehicle, it will go to the last known position of the satellite. Also… if you are already on satellite, it will re-peak on it…good for times when a air shocks have settled.

STOW DISH – Stows the dish.

TEST DISH – Used to calibrate motor movements, tilt sensors and find the limits of the IG-2500 mechanics. Process takes 10 minutes.

POSITIONER INFO – Contains advanced information on the IG-2500 system.

CONFIGURATION – Brings up the configuration screen (see image on next page).

RESET – Sometimes used by Hughes Certified DIRECWAY installer for performing a Cross Pol.

CAL. COMPASS – This is a utility to calibrate the Dish Compass. Please refer to the Software Installation Manual for more information.

CAL. TILT – This utility is used to calibrate the Dish when it is level. Please refer to the Software Installation Manual for more information.

FIRMWARE – Upgrades the IG-2500 Main Controller and dish electronics with the current version of software you are running.

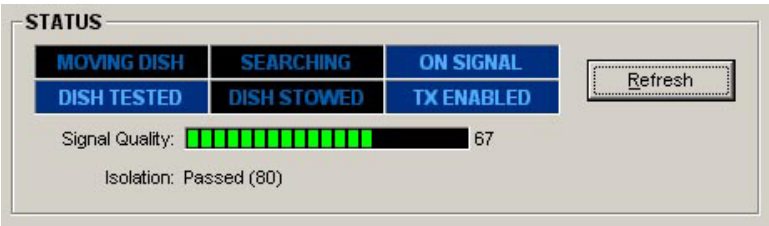
STATUS WINDOW

Inside of the status window are the current operations that are, or could be taking place. If an item is highlighted, it means that this function is currently taking place.

- **MOVING DISH** – The dish is moving.
- **SEARCHING** – The Dish has entered the search window for where it believes the DIRECWAY satellite is located.
- **PEAKING** – The Dish has found a signal and it is peaking for highest strength.
- **ON SIGNAL** – The Dish has located the correct satellite.
- **DISH TESTED** – A testing of dish perimeters has been performed on this dish.
- **DISH STOWED** – The dish is currently in a stowed or down travel posistion.
- **TX ENABLED** – The status of the transmitter.

SIGNAL QUALITY METER – When this bar appears green on the meter, it means that you are on the correct satellite. The higher the number, the greater the signal quality.

ISOLATION – Located under the Signal Strength meter, this is a reading of isolation. Isolation refers to how well your dish is aligned horizontally, vertically and skew aligned with the DIRECWAY satellite. This process is called "Cross Pol. A cross pol is performed every time you click on the "Find Satellite" button on the IG-2500 main screen. In order to surf the Internet, you must achieve a passing isolation level.



In this window, isolation has passed with a level of 80, which is the minimum amount of isolation that is passable. An isolation of 79 would not achieve a pass from the Hughes Network Operations Center.

If you fail, you may click on the "Find Satellite" button to reattempt for a passing reading.

Please contact Ground Control technical support if you are unable to achieve a passing isolation level.

THE CONFIGURATION WINDOW

HARDWARE (Serial Port)– You may choose which Comm Port you wish to use with your IG-2500. The Main Controller is connected to your computer via a serial cable that communicates over a communications port or Comm Port. This selection much match with Com Port availability on you computer.

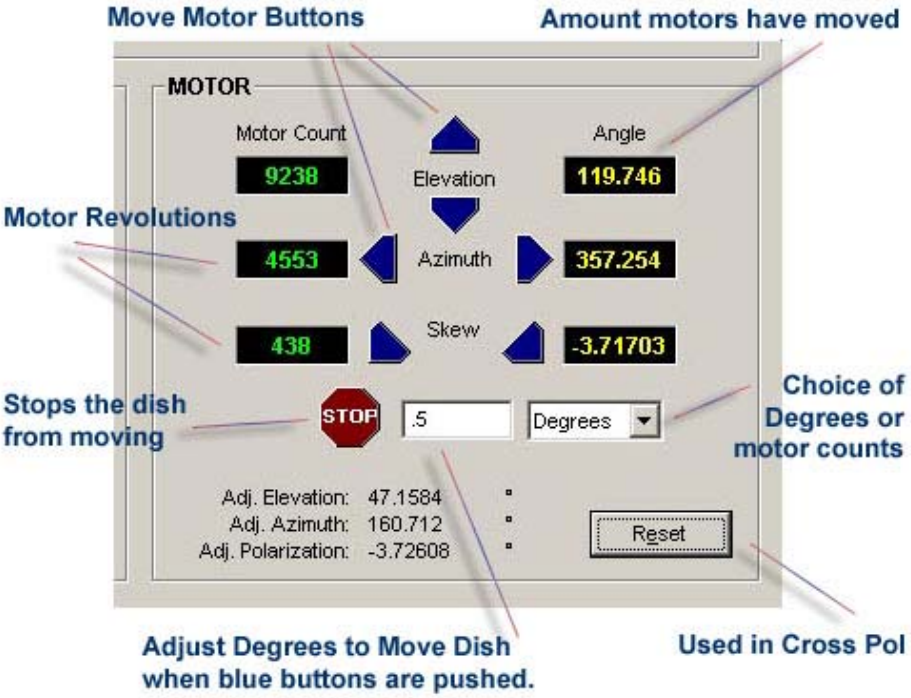
OVERRIDE GPS – If you click this box, you may override the current GPS settings. This is used if your dish is unable to receive GPS signal such as the vehicle is parked inside a building. Notice that the GPS information on the main screen will turn **RED** when manual override is used.

OVERRIDE COMPASS – If you find the IG-2500 compass is incorrect, such as parking next to a large metallic structure or **failure to Calibrate Compass**, you may need to override the compass reading with this function. Check the box, and enter the true heading of the vehicle. Zero is true North, 90 is true east, 180 is true South…and so on.

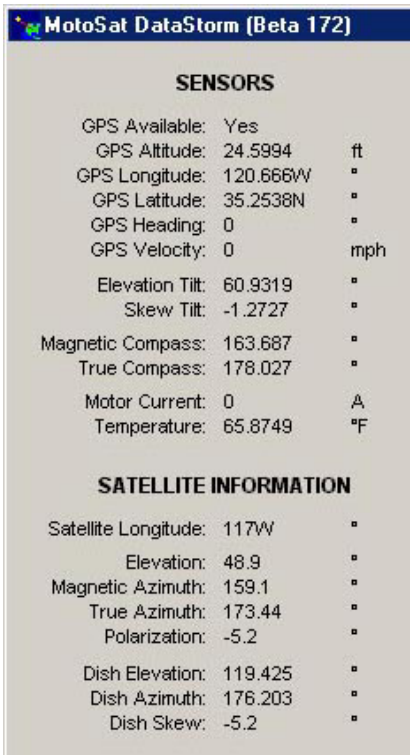
SATELLITE SEARCHING – You may change the search window that the IG-2500 uses to find the satellite in the sky. Default is 25 degrees Azimuth (Horizontal) and 5 degrees Elevation (Vertical). If you can't find satellite, simply open your search window or Calibrate your Compass. We recommend using **60** Azimuth and **15** Elevation if you cannot find the satellite due to incorrect compass heading or platform not being level.

ENABLE ACP – When this box is checked, **AUTO CROSS Pol is enabled and your system will cross pol each time you click on the "Find Satellite" button.**

MANUAL MOTOR CONTROL



To move the dish Manually, simply click on one of the blue move buttons to move that axis. The number entered in the text field shows how far the axis will move when pressed. The default number is half a degree, but you may change this to anything you like.



SENSORS

- **GPS AVAILABLE –** Shows if GPS (global positioning satellite) has been acquired or not.
- **GPS ALTITUDE** – The approximate elevation of the dish above/below sea level.
- **GPS LONGITUDE** – The actual longitude of your current parked location.

- **GPS LATITUDE** – The actual latitude of your current parked location.
- **GPS HEADING** – When moving, this will show the true direction the vehicle is headed.
- **GPS VELOCITY** – This shows the speed in MPH (miles per hour) of the vehicle.
- **ELEVATION TILT** – The number of degrees the dish is tilted when parked on any surface.
- **SKEW TILT** – The number of degrees the vehicle is tilted right.
- **MAGNETIC COMPASS** – The "magnetic" direction the vehicle is headed.
- **TRUE COMPASS** - The "true" direction the vehicle is headed.
- **MOTOR CURRENT** – The actual draw of electricity in amperes of the dish motors.
- **TEMPERATURE** – The temperature of the sensor box mounted on the Dish. This unit is self-heating and will warm all of the sensors in cold weather.

SATELLITE INFORMATION

- **SATELLITE LONGITUDE** – The satellite location in space that the IG-2500 will try to locate.
- **ELEVATION** – Best guess at where the satellite's elevation will be.
- **MAGNETIC AZIMUTH** – Best guess at where the satellite azimuth will be.
- **TRUE AZIMUTH** – Best azimuth guess corrected for declination.
- **POLARIZATION –** Best guess of what the skew of the dish will be.

TROUBLESHOOTING

TRY THIS FIRST…

The best way to quickly troubleshoot the system is by reading the Troubleshooting manual supplied to you with the IG-2500.

OUTDATED INFORMATION?…

You can get the latest information on troubleshooting the IG-2500 on the downloads page on the Ground Control web site …www.groundcontrol.com

CALLING TECHNICAL SUPPORT

Please… be kind to technical support by first troubleshooting your system with the troubleshooting manual. It can be found on the Ground Control CD-ROM in the Troubleshooting folder.

GROUND CONTROL TECHNICAL SUPPORT 800-869-2595

SOFTWARE UPGRADING

Occasionally, Ground Control will come out with software that will give added functionality to your mobile satellite system. To find the latest version of software, go to the downloads page at www.groundcontrol.com

Upgrading is as simply as running the new application and following the onscreen instructions.

IG-2500 SPECIFICATIONS

MOUNTING PLATE DIMENSIONS	48” inches long by 21 ¾” inches wide.
DISH STOWED DIMENSIONS	54” inches Long by 39 ½” inches wide by 10 ½” inches tall.
DISH FACE DIMENSIONS	39 ½” wide.
TOTAL WEIGHT OF DISH MOUNT	105 lbs.
MAIN CONTROLLER BOX (located inside vehicle)	1” inch tall, by 11” inches wide, by 9” inches long.
TRANSMIT AND RECEIVE MODEMS	12” long, by 7” wide by 3 ¾” tall.
OPERATING PARAMETERS	-20 degrees F to 120 degrees F
POWER	12-Volt DC 3 amp for Main Controller 120 Volt AC for Modems

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