



Preliminary
D4



Mobile Satellite Antenna Controller

User and Service Manual

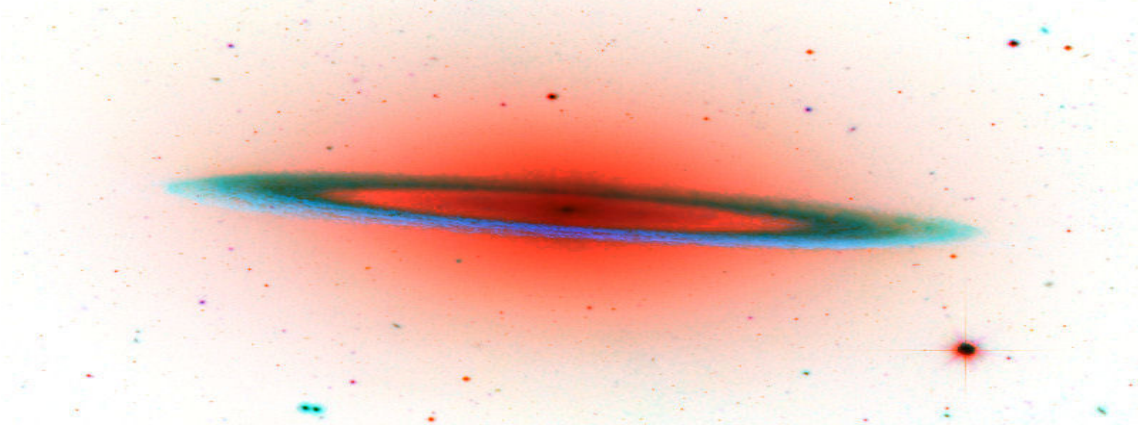
Firmware Version D4.401y

Preliminary Mar 31, 2009

Model D4-1RU Shown Above

Preliminary Manual

The DataStorm D4 Satellite Antenna Controller



Features

- Stand Alone Antenna Controller
- Front Panel Search, Stow, and Power Commands
- HTML User Interface
- HTML Setup and Configuration
- LED Status Indicators
- Multiple Satellite Selection Table
- Telnet Commands for Diagnostics
- Import and Export Configuration Files
- Import and Export Satellite Tables
- No Software Required on PC
- DVB-S2 Satellite Identification
- Field Firmware Upgradeable
- Simple Electrical Connections
- * External Switched AC Power Output

The DataStorm D4 Satellite Antenna Controller

is one of the most advanced Satellite Antenna Controllers available. Combining simple operation with many advanced configurable features will allow the user the flexibility needed for almost any application.

Operate from the Front Panel or through a PC using an Internet Browser such as Internet Explorer, Firefox, or even Linux Based Browsers. No additional software is required.

A true stand alone Satellite Antenna Controller.

* Available only in D4-1RU Model.

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D4 NORMAL OPERATION

IMPORTANT! Before the D4 is ready for normal use the system must be wired and configured correctly. Go to **Setup and Configuration** for setup.

The D4 Controller can be operated through either **Front Panel Controls** or via the **HTML Interface** built into the Controller.

FRONT PANEL OPERATION

Model D4-1RU



NOTE: Shown and described below is the Model D4-1RU. The Standard D4 is not a Rack Mount and does not include the Main AC Power Switch or the switch able External AC power output on the back of the unit. Pictures of the Standard Model D4 Controller are shown in the Back of the Manual in the Specifications section.

The Front Panel has four switches and Buttons.

The AC Power Switch located far right is an Illuminated Rocker Switch. Besides supplying the main power to the D4 Controller it also switches 115 VAC power to the AC Out connector on the Rear Panel.

The AC Power Switch is illuminated Orange when the main power is On. This switch must be on for Normal Operation.

When wired properly the AC Power switch can be used as a **KILL SWITCH** for the Modem or BUC. See Wiring for additional details on this feature.

The Power Button is used to turn the D4 Controller On and Off. When Powered on the Green LED to the Left of the Power Button will illuminate. AC Power Rocker Switch must be in On “Illuminated” position.

On Power up the controller will take about 15 seconds to initialize. The Power, LNB, and LAN LED’s should be illuminated when controller is ready for use.

Under normal conditions the Stow LED should also be illuminated when first powered on.

The Search Button will cause the Antenna to rise from the stowed position and search for the **Satellite 1 (Sat 1)**. See Building, Importing and Exporting a Config File.

The LNB and GPS lights should be illuminated before the Antenna will start a Search (move).

Wait for the LNB Light to illuminate before pressing the Select Button. Once selected the BUSY and READY lights will start to flash.

The dish will begin a search if the GPS Light is on. (GPS Locked)

If the GPS Light is blinking then the Antenna will not move until the GPS Light goes solid. A blinking GPS means that a valid GPS location has not been determined. Typically GPS should acquire lock in less than 120 seconds.

The Stow Button when pressed will move the Antenna to the Travel Position. When the Antenna is moving to the Stowed position the Busy and Stow Light will flash. When the Antenna is stowed the Stow Light will be on Solid.

The Front Panel has eight (8) lights.

MAIN AC Power Light illuminates Orange when the main power is On.

This switch must be on for Normal Operation.

Power Light (Green) is illuminated when ever the D4 is powered on. The Main AC power Light should also be illuminated.

LNB Light (Blue) will illuminate when a Modem is connected to the D4 and power is applied to the Modem. If the D4 is configured to Generic Mode then the D4 will supply LNB power.

LAN Light (Blue) is illuminated when a network connection is detected.

GPS Light (Blue) will illuminate when GPS has received a valid Latitude and Longitude location. When GPS is not locked LED will Blink.

If there is no GPS (Sensor Board) installed on the Antenna Mount then the GPS light will be off.

READY Light (Blue) will illuminate when the Target Satellite is locked and peaked.

The Ready Light will flash when the Antenna is searching for a Satellite.

BUSY Light (Red) illuminates under many conditions.

On Power Up the Busy light will flash for approximately 15 seconds while the D4 Controller is initializing the system configuration. During Search and Stow the Busy light will flash.

STOW Light (Red) is on Solid when the Antenna is Stowed (travel position). When the Antenna is moving to the stow position the Stow Light will flash.

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HTML (Web Browser) OPERATION

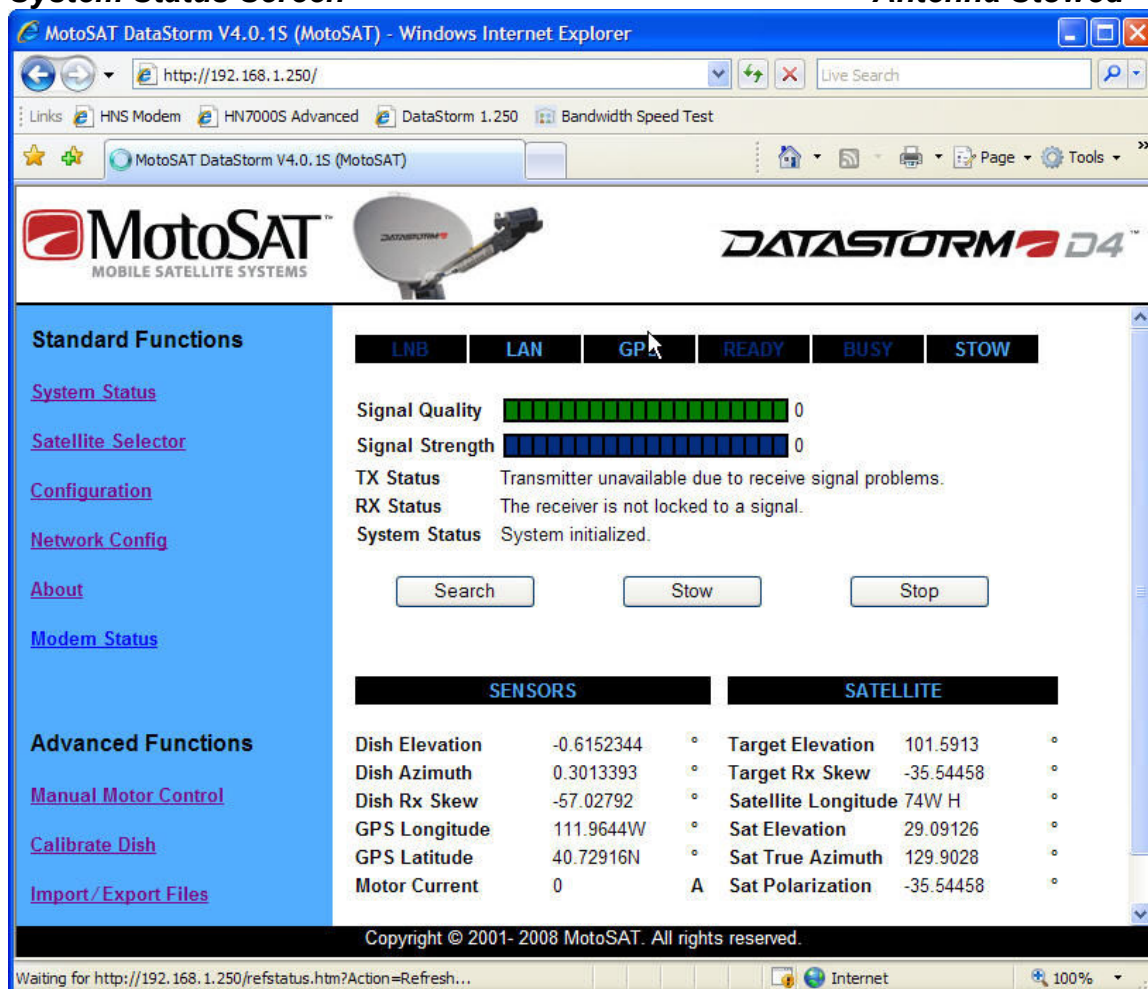
IMPORTANT! The LAN Light must be on before the web browser can open.

To use the **HTML Interface** you must access the D4 by using a standard Web Browser such as Internet Explorer, Netscape, or Mozilla. Open the Browser as you normally would then type into the address bar the IP Address of the D4 Controller. The default IP address of the D4 is set to **192.168.1.250**. This address can be changed in the Network Config Screen.

The System Status screen should open if the browser and D4 IP address are configured correctly. See Setup and Configuration if the page below does not open.

System Status Screen

Antenna Stowed



SENSORS		SATELLITE	
Dish Elevation	-0.6152344	Target Elevation	101.5913
Dish Azimuth	0.3013393	Target Rx Skew	-35.54458
Dish Rx Skew	-57.02792	Satellite Longitude	74W H
GPS Longitude	111.9644W	Sat Elevation	29.09126
GPS Latitude	40.72916N	Sat True Azimuth	129.9028
Motor Current	0	Sat Polarization	-35.54458

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Waiting for http://192.168.1.250/refstatus.htm?Action=Refresh...

FIND SATELLITE (Search)

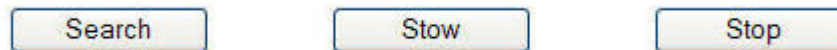
Before the System will begin a search the LNB and LAN status indicators must be illuminated.



The GPS indicator will illuminate when valid GPS is acquired.

Clicking on the Search button (below) will cause the Antenna to begin a search for Satellite 1 (Sat1). Now referred to as the Target Satellite.

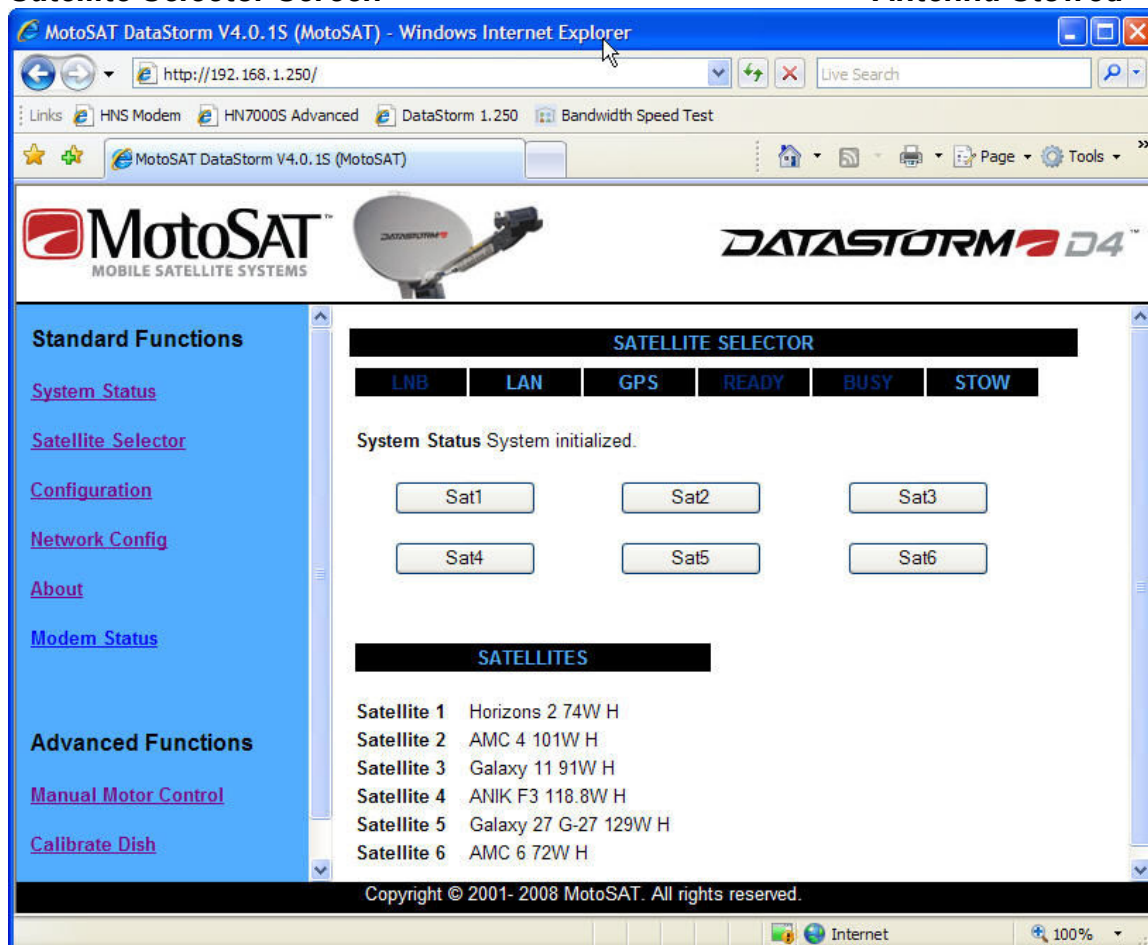
Satellite 1 was created in a Config File and imported during initial system setup. See Setup and Configuration.



By Clicking on the **Satellite Selector** located under **Standard Functions** allows the user to select up to six (6) different Satellite locations.

Satellite Selector Screen

Antenna Stowed



The Sat Buttons correspond to the Satellite Table located on the lower part of the Satellite Selector Screen.

Click a Sat button 1 thru 6 and the Antenna will begin a search for the selected Satellite.

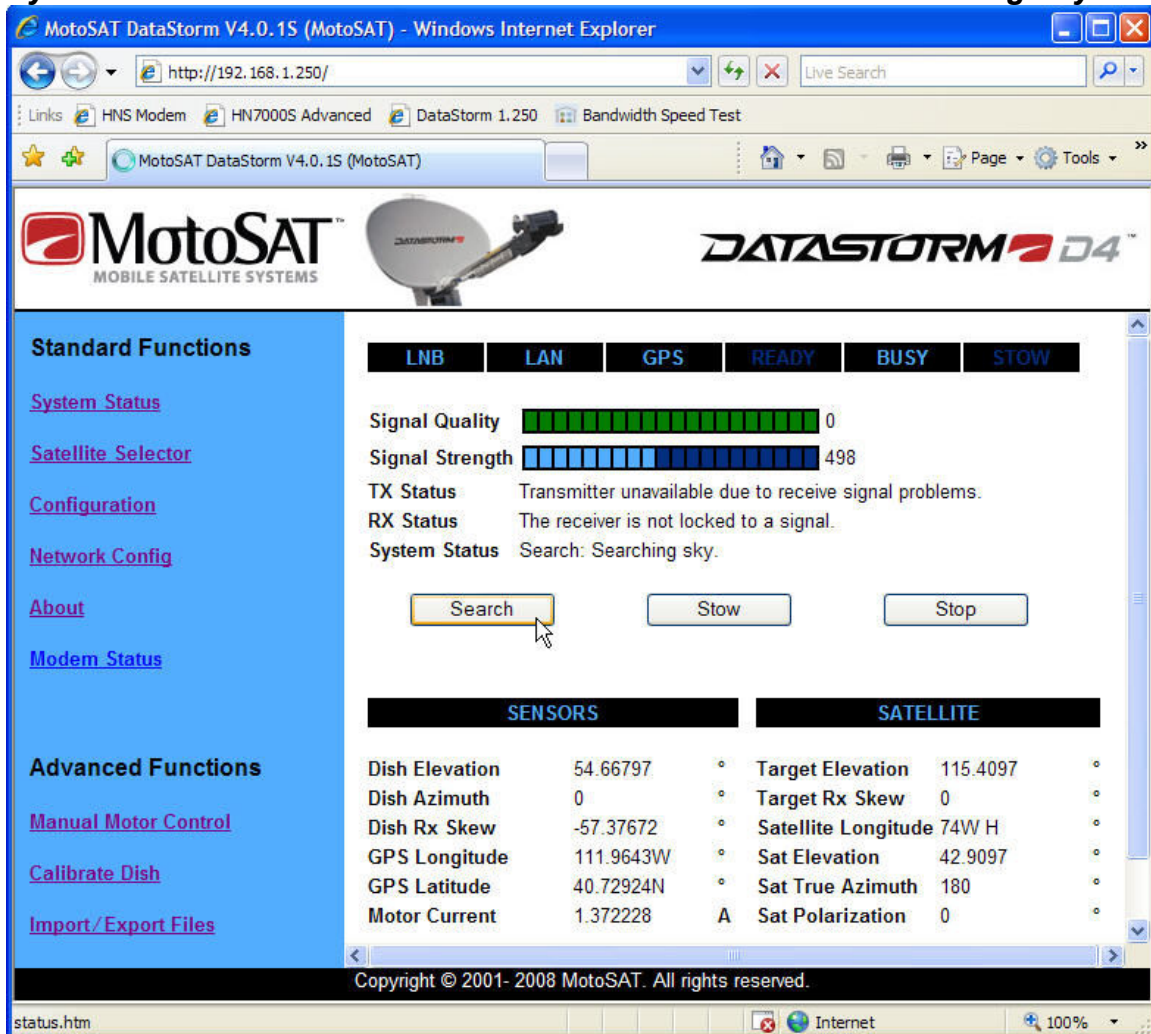
Once a Satellite has been selected the HTML returns to the System Status Screen and will display **Searching Sky** on the System **Status Line**.

The Sensor and Satellite Status located on the lower part of the screen will display the Antenna Mount position and the current Satellite information while the Search is in progress.

Under normal search conditions and based on the Satellite Table that was created in Setup and Configuration the D4 Controller will choose a Satellite that is near the true southern sky based upon your current Longitude.

System Status Screen

Searching Sky



The screenshot shows the MotoSAT DataStorm V4.0.1S web interface in a Windows Internet Explorer browser. The address bar shows 'http://192.168.1.250/'. The page features the MotoSAT logo and a satellite dish image. The main content area is titled 'Standard Functions' and includes a sidebar with links: System Status, Satellite Selector, Configuration, Network Config, About, and Modem Status. The main display shows the 'Searching Sky' status with a 'Signal Quality' bar at 0 and 'Signal Strength' bar at 498. The 'TX Status' is 'Transmitter unavailable due to receive signal problems.' and the 'RX Status' is 'The receiver is not locked to a signal.' The 'System Status' is 'Search: Searching sky.' Below this are buttons for 'Search', 'Stow', and 'Stop'. The 'SENSORS' table shows Dish Elevation (54.66797), Dish Azimuth (0), Dish Rx Skew (-57.37672), GPS Longitude (111.9643W), GPS Latitude (40.72924N), and Motor Current (1.372228). The 'SATELLITE' table shows Target Elevation (115.4097), Target Rx Skew (0), Satellite Longitude (74W H), Sat Elevation (42.9097), Sat True Azimuth (180), and Sat Polarization (0). The footer shows 'Copyright © 2001- 2008 MotoSAT. All rights reserved.'

The D4 Controller may find and peak several satellites before identifying a valid satellite in the Sat Table. Once a southern pointed reference Satellite is identified the D4 Controller will place the Selected Satellite Longitude into the **Satellite Longitude** field on the **System Status Screen** and recalculate to new Satellite position based upon the reference satellite.

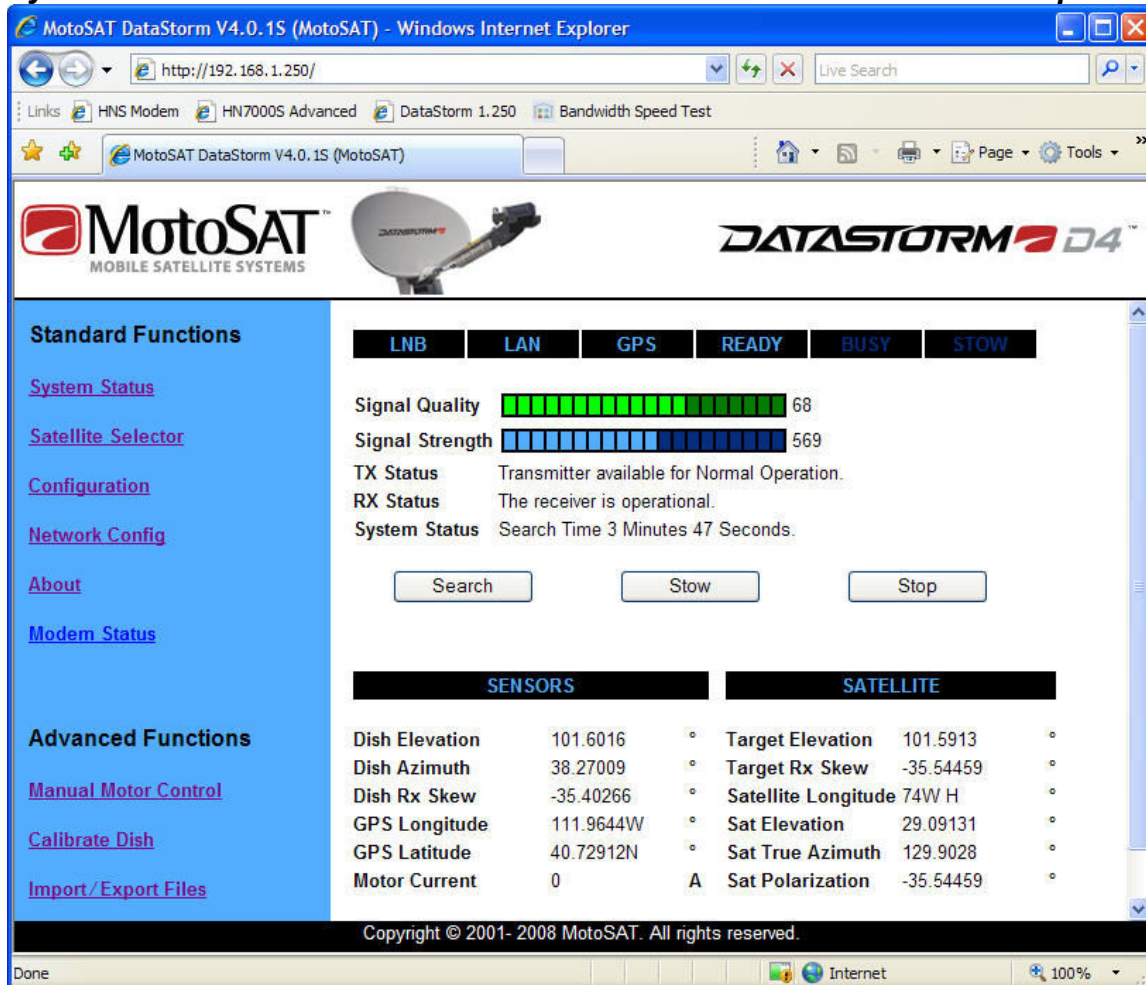
The Antenna will move to the new calculated position and peak the satellite at that location. Typically after the peak is completed the Target Satellite should be identified correctly at this location.

NOTE: There are conditions where the Antenna can move into an adjacent Satellite with a stronger signal level. If this happens the D4 Controller should ID that Satellite and then move to the Target Satellite as described above.

Search Operation completed the system is ready for use.

System Status Screen

Search Complete



MotoSAT DataStorm V4.0.1S (MotoSAT) - Windows Internet Explorer

Address: <http://192.168.1.250/>

Links: HNS Modem, HN7000S Advanced, DataStorm 1.250, Bandwidth Speed Test

MotoSAT DataStorm V4.0.1S (MotoSAT)

MotoSAT MOBILE SATELLITE SYSTEMS

DATASTORM D4

Standard Functions

- [System Status](#)
- [Satellite Selector](#)
- [Configuration](#)
- [Network Config](#)
- [About](#)
- [Modem Status](#)

Advanced Functions

- [Manual Motor Control](#)
- [Calibrate Dish](#)
- [Import/Export Files](#)

System Status

LNb LAN GPS READY BUSY STOW

Signal Quality: 68

Signal Strength: 569

TX Status: Transmitter available for Normal Operation.

RX Status: The receiver is operational.

System Status: Search Time 3 Minutes 47 Seconds.

Search Stow Stop

SENSORS		SATELLITE	
Dish Elevation	101.6016	Target Elevation	101.5913
Dish Azimuth	38.27009	Target Rx Skew	-35.54459
Dish Rx Skew	-35.40266	Satellite Longitude	74W H
GPS Longitude	111.9644W	Sat Elevation	29.09131
GPS Latitude	40.72912N	Sat True Azimuth	129.9028
Motor Current	0 A	Sat Polarization	-35.54459

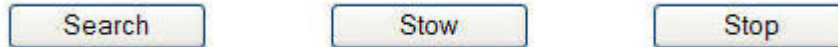
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Done Internet 100%

STOW DISH (STOW)

Stowing the Dish puts the antenna back into a travel position where the Antenna is in a Face Down position on the roof of the vehicle pointing toward the rear of the vehicle.

Clicking on the Stow button will cause the Antenna to begin the Stow routine.



The System will begin to stow and the D4 Front Panel will show Stow and Busy Lights flashing. The HTML Status Screen will show **Stowing Dish**.

The typical stow routine will cause the antenna to first move elevation to a full back position, then rotate Skew to a correct stow position, then rotate Azimuth fully counterclockwise, and finish stowing Elevation to a full down position.

When using the **Generic** mode type in **Configuration, Satellite System** the antenna elevation is moved up above the Satellite Belt first to prevent any undesired transmissions from hitting any other satellites during stow.

When using specific modems such as **iDirect and Hughes (HNS)** the D4 Controller has the ability to disable the Transmit function of the Modem.

When these modems are selected in **Configuration, Satellite System** the Antenna will not need to move elevation up before stowing the antenna.

The HTML Screen will show **Stow Dish Operation Complete**.

SETUP AND CONFIGURATION

Connection and Configuration! Nearly 95% of all technical support calls are due to either improper wiring, or incorrect configurations. Please be sure to review these two items before contacting technical support for assistance.

The D4 must be configured properly before it can be used in normal operation.

Before proceeding insure that all wiring to the D4 Controller is correct. This would include any connections to the DataStorm Mount. See D4 System Wiring.

QUICK START for Configuration

Once the System is installed and wired the next step is to set the D4 Controller up for the users specific requirements.

Below is a quick list to follow to insure proper operation.

- Step 1 Set up a Network Connection between the D4 and the PC
- Step 2 Upgrade Firmware
- Step 3 NVClear
- Step 4 Modify the Network Config Page
- Step 5 Modify the Configuration Page
- Step 6 Export the Current Config File
- Step 7 Export the Default Sat Table
- Step 8 Import the modified Config File
- Step 9 Import the modified Sat Table
- Step 10 Calibrate Dish
- Step 11 Ready for Normal Operation

SET UP A NETWORK CONNECTION between the D4 and the PC

The D4 Controller is shipped with a **Default** IP Address of 192.168.1.250

Insure the Controller is connected to the PC via either a Ethernet Switch or Router which must set up to see the Controller Address.

Open your browser and type <http://192.168.1.250> into the Address box.

The DataStorm D4 Series System Status Screen should open.

If not check your connections, and IP Settings on the PC and Router

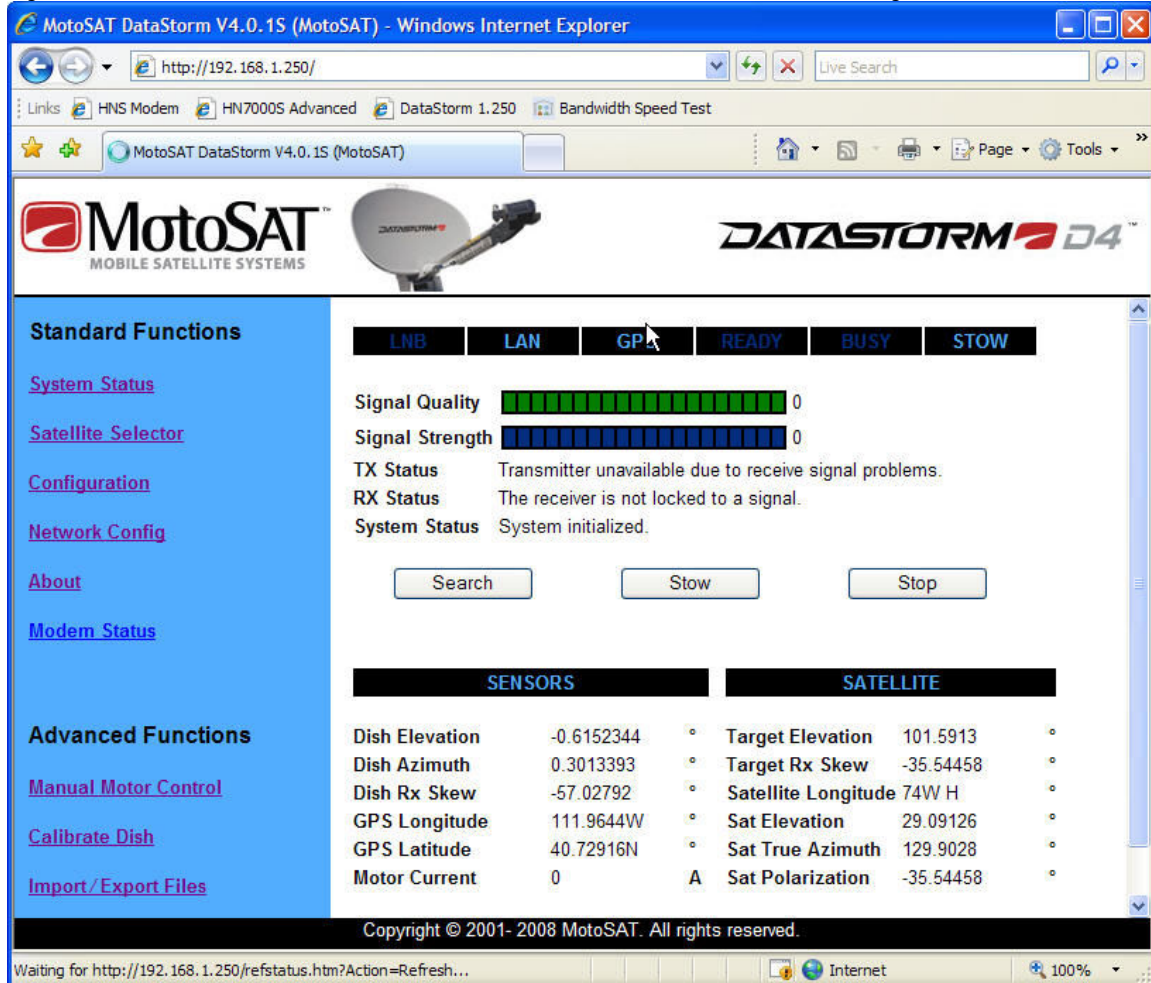
Subject to change without notice 11

Problem is resolved.

The screen below will appear when configured properly.

System Status Screen

System Initialized



Standard Functions

- [System Status](#)
- [Satellite Selector](#)
- [Configuration](#)
- [Network Config](#)
- [About](#)
- [Modem Status](#)

Advanced Functions

- [Manual Motor Control](#)
- [Calibrate Dish](#)
- [Import/Export Files](#)

System Status

Signal Quality: 0
Signal Strength: 0

TX Status: Transmitter unavailable due to receive signal problems.
RX Status: The receiver is not locked to a signal.
System Status: System initialized.

Search Stow Stop

SENSORS		SATELLITE	
Dish Elevation	-0.6152344	Target Elevation	101.5913
Dish Azimuth	0.3013393	Target Rx Skew	-35.54458
Dish Rx Skew	-57.02792	Satellite Longitude	74W H
GPS Longitude	111.9644W	Sat Elevation	29.09126
GPS Latitude	40.72916N	Sat True Azimuth	129.9028
Motor Current	0	Sat Polarization	-35.54458

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Waiting for http://192.168.1.250/refstatus.htm?Action=Refresh...

Under **Standard Functions** located in the blue Frame on the left, click the **About** to open the **About Screen**.

In the lower area of the About Screen below the Black System Bar you will find the Firmware Version.

Compare this version with the MotoSAT website latest Version for the D4 Controller.

Download the latest version of Firmware and save it on your PC.

If the Version is not the latest we recommend that the D4 Controller be upgraded before completing the configurations.

Preliminary Manual

UPGRADE FIRMWARE

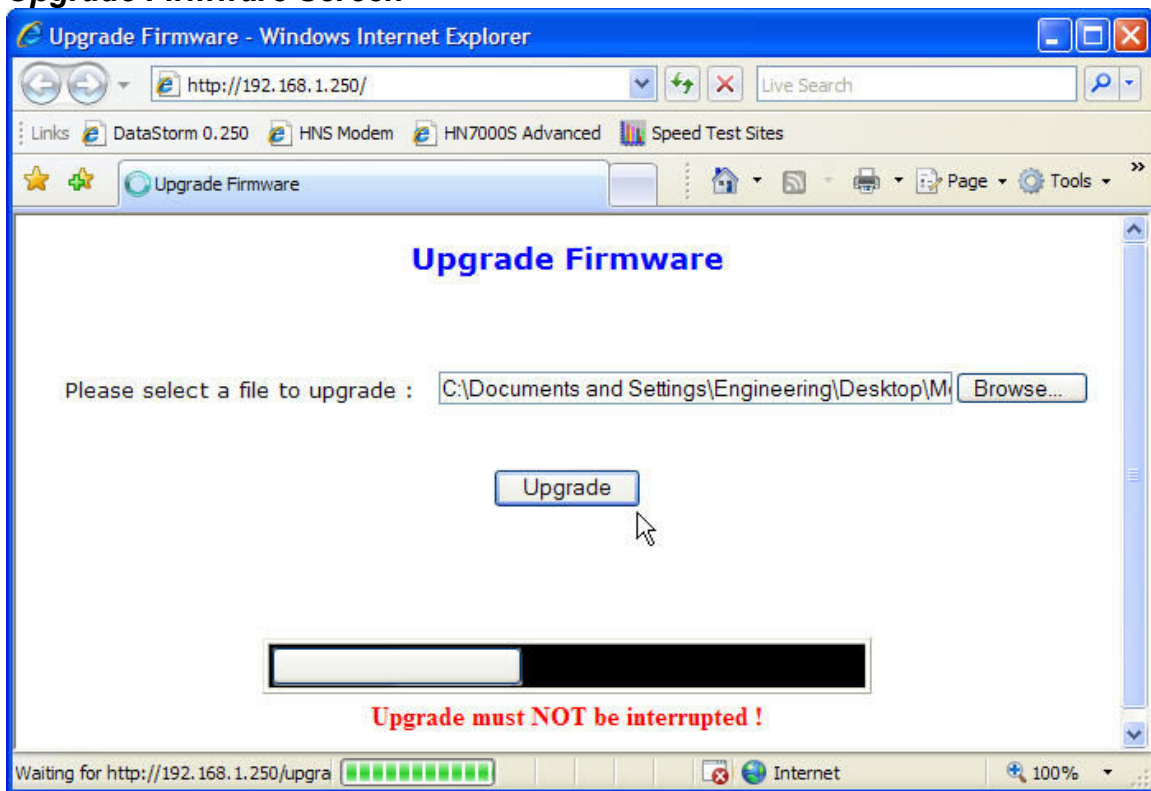
With the PC and Router still set to communicate to the D4 Controller at 192.168.1.250 shut off the D4 Power button on the left side of the controller.

While holding the Search and Stow buttons down press the Power button to power on the D4 Controller. Release buttons.

All Status Indicator Lights except the LNB will illuminate.

Open your browser and type <http://192.168.1.250> into the Address box.

Upgrade Firmware Screen



Click on the **Browse** button to the left side of the Link box and select the location and name of the latest firmware.

Click on the **Upgrade** button in the center of the screen.

The firmware will begin loading. You must not interrupt this process. The upgrade takes about 7 minutes. The timer bar at the bottom will show the approximate load completion time.

When complete the Screen will display **Upgrade Firmware Complete** and the D4 Controller will restart in about 15 seconds.

NVCLEAR

With the PC and Router still set to communicate to the D4 Controller at 192.168.1.250 shut off the D4 Power button on the left side of the controller.

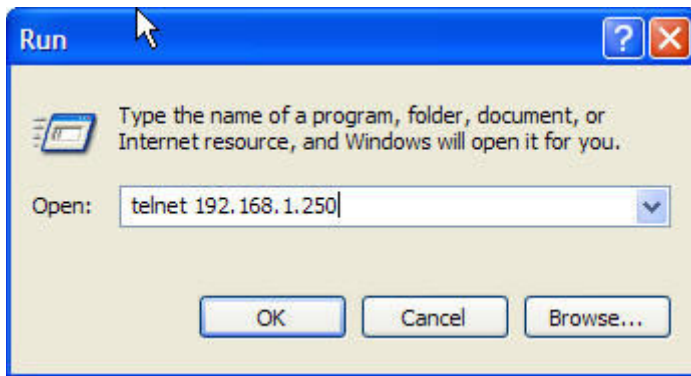
While holding the Search and Stow buttons down press the Power button to power on the D4 Controller. Release buttons.

All Status Indicator Lights except the LNB will illuminate.

On the Windows Desktop (XP version) click the Start button in the bottom left corner.

Click the Run... command in the lower right area of the Start window.

Type in **telnet 192.168.1.250** in the Open: text field as shown below.



Click OK. A Telnet Session will open. D4 Boot% _ should display.



Type in **nvclear** and hit **Enter**. (must be in lower case)



This function will clear all RAM memory and any old configuration data.

Turn the Power off and then back on to cycle the power.

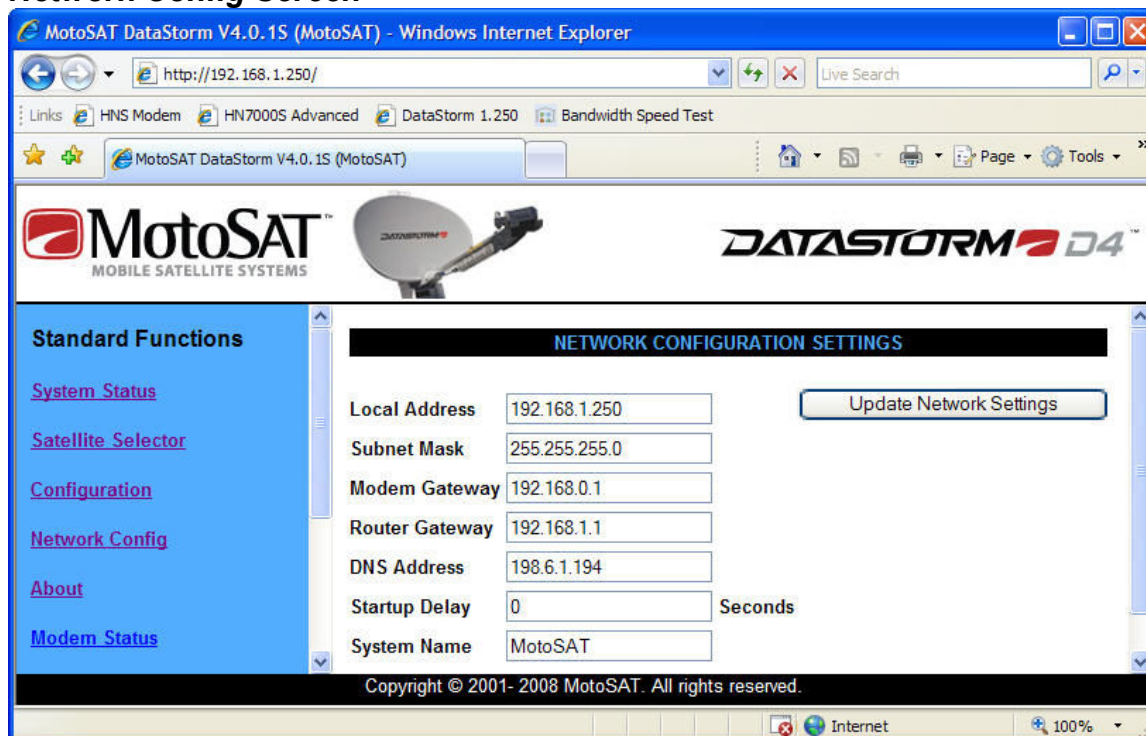
MODIFY NETWORK SETTINGS (Configuration Page)

Open a browser and type <http://192.168.1.250> into the Address box.

The DataStorm D4 Series System Status Screen should open.

Select **Network Config** in the Blue Frame on the left.

Network Config Screen



Consult with your IT Manager for the correct IP settings to allow the D4 Controller to operate on the Network.

After setting the Network Configurations click on the **Update Network Settings** button to the right of the Screen to save these values.

NOTE: If the Local Address is changed the D4 will restart, you will need to open the Browser using the new Local Address i.e. 192.168.0.250

IMPORTANT! If you change the **Local IP Address** but are not able to open the D4 Controller Status Page, check that the PC is configured with the new Network Settings. If the D4 Controller still does not respond go back to **nvclear** and this will reset the D4 Controller back to 192.168.1.250

Local Address (192.168.1.250)

The Local Address is the internal Ethernet Address of the D4 Controller. This address is set at 192.168.1.250 from the factory but can be changed based on the customer network requirements.

Subnet Mask (255.255.255.0)

Default to 255.255.255.0, see your IT manager if changes to this value are necessary.

Modem Gateway (192.168.1.1)

This value is set to the modem address. See Modem manual for more information.

Router Gateway (192.168.1.1)

This value is set to the Router address. If a LAN switch is used then setting this to the modem address is typical. See Router or Modem manuals for more information.

DNS Address (192.168.1.1)

This value is set to the modem address. See manuals or white papers for more information.

Startup Delay (0)

Startup Delay sets a time delay from D4 Power On to active LAN connection. This time period is displayed in seconds (0 to 999). This time delay is used to allow the Router and or Modem time to configure properly and communicate after AC power has been applied to these devices. The D4 will attempt to communicate with the modem after the delay time has expired.

Example; a LinkSys Router typically requires 20 seconds before it sets DHCP and accesses the WAN port. So setting the Startup Delay to 30 seconds should resolve this for the D4 to see the modem.

System Name (D4_Controller)

Allows users to name and manage several vehicles by identifying the D4 Controller through remote access.

MODIFY CONFIGURATIONS (Page)

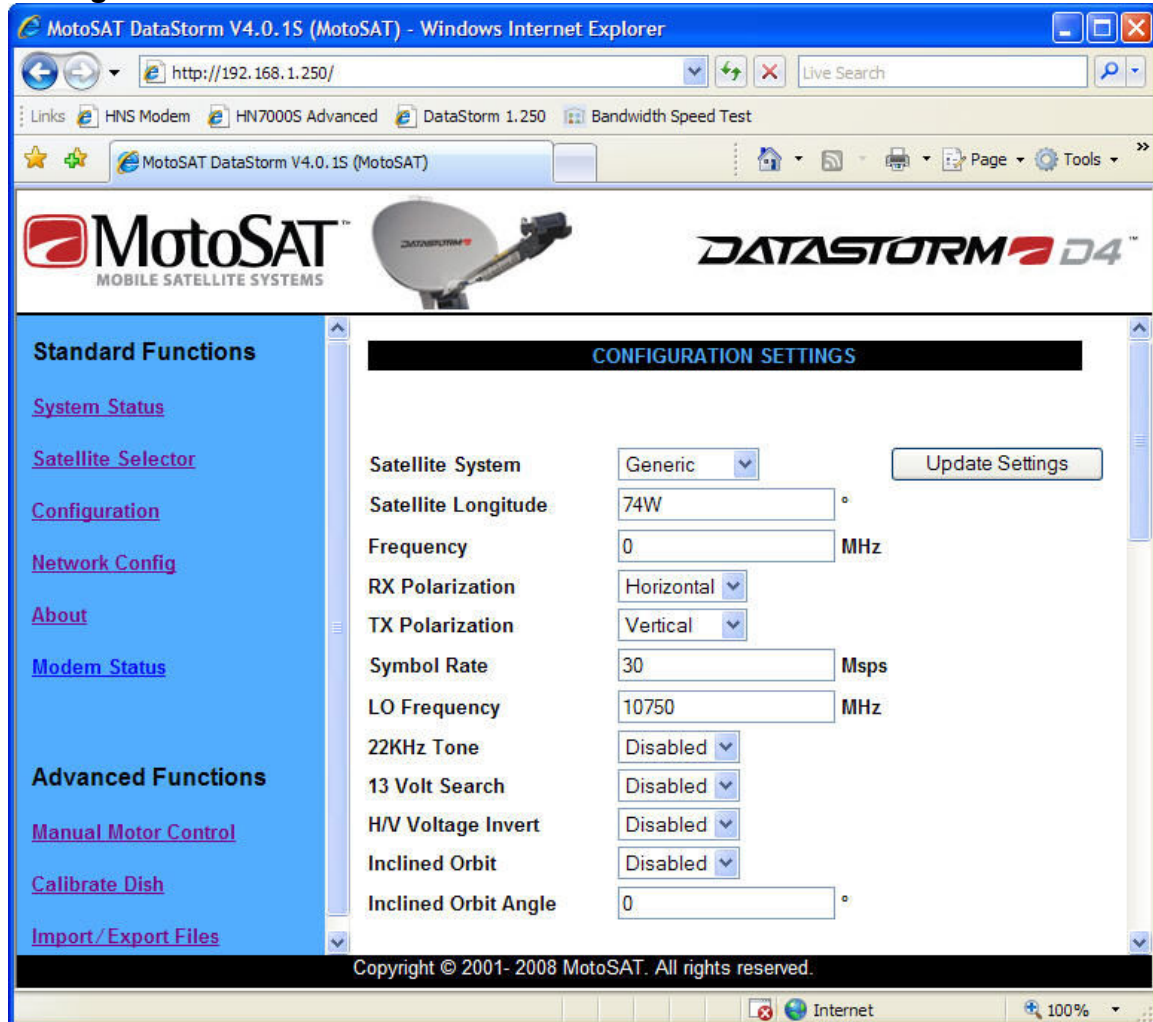
Open a browser and type <http://192.168.1.250> into the Address box.

The DataStorm D4 Series System Status Screen should open.

Select **Configuration** in the Blue Frame on the left.

Configuration Screen

Part 1



The D4 Controller is configurable for many applications; go to **D4 Configuration Details** for specific information on any configuration parameter shown on the Configuration Screens Part 1, 2, and 3.

In most cases setting the **Satellite System, Satellite Longitude, and RX Polarization** is all that is required to allow the D4 Controller to operate. Check with your Network Provider for these specific settings.

Before making any changes to the configurations consult with a certified installer or MotoSAT Technical Support.

IMPORTANT! Modifying Configuration Parameters can cause the system to operate erratically or even fail to operate.

D4 Configuration Definitions

Satellite System (Generic) **Setting required**

When no modem is connected or does not require any external input then Generic is recommended.

Satellite System sets Modem or ISP type. Setting this value for the proper modem type will allow the D4 to integrate at different levels with specific modems.

Currently the D4 shares data with the Hughes Net and iDirect Modems allowing the D4 to confirm correct Satellite Identification, Signal Quality level, set TX ranging values, etc.

Other Modems currently displayed in the Satellite System drop down box are LinkStar and Comtech. These currently function in Generic mode.

Important Note: It is extremely important that when using Hughes Net mode that many of the following configurations are set correctly. Just being close will not work.

Satellite Longitude (89W) **Setting required**

Satellite Longitude is a numerical value that sets the Target Satellite Location. I.E. 89W

If inputting a Satellite Longitude in the western hemisphere then you would place a W after the numerical longitude value. It is not necessary to add the W as the western hemisphere is set to default.

If inputting a Satellite Longitude in the eastern hemisphere then you would place an E after the numerical longitude value.

IF Frequency (0) **Setting optional**

Is used to select a specific Peak Frequency when the Target Satellite has only a few Transponders and the signals are difficult to see.

IF Frequency and Peak Frequency can be set in the Sat Tables so the default Value of 0 is recommended.

Hughes Net Required! This value is set from 950 to 1450 MHz. Check with the Hughes configurations to insure accuracy.

RX Polarization (Vertical) **Setting required**

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This is a critical setting. For the D4 to set the Satellite System properly for correct modem operation the Receive Polarization must be correct.

TX Polarization **(Horizontal)** **Hughes Only**

Hughes Net Required! Sets the TX Polarization value for Hughes. Not required for all other systems. Check with the Hughes configurations to insure accuracy.

Note: When using the DataStorm F1 Mount TX Polarization must be Horizontal Only! When using F2, F3, XF2, and XF3 mounts the TX Polarization must be set to the opposite field of the RX Polarization.

Symbol Rate **(30)** **Hughes Only**

Hughes Net Required! The symbol rate is enter in Msps (Mega Symbols per Second). Again this value is only needed in Hughes Net mode.

Example; 30,000,000 symbols per second is entered as 30 Msps.

LO Frequency **(10750)** **Setting optional in US**

LO Frequency is used in the LNB to mix with the incoming RF signal to produce a IF Frequency in the 950 to 2150 MHz range. Check with the Modem supplier to see what IF Frequency is needed for your specific application.

The Default LO Frequency is 10750 MHz. This value is usually set between 9750 to 11300 MHz. It is extremely important this value is set correctly for proper D4 operation.

22 KHz Tone **(Disabled)** **Setting optional**

The *22 KHz Tone* can be used to switch the LO Oscillator from one frequency to another. Some Modems may require 22 KHz tone for other reasons. Check with your Modem Hardware supplier or ISP to see if 22 KHz tone is necessary for your application.

13 Volt Search **(Disabled)** **Call MotoSAT**

The *13 Volt Search* locks to LNB Voltage to 13 Volts. Typically the D4 Controller will follow the Modem LNB voltage and output the same DC Voltage Level as the Modem. When 13 Volt Search is Enabled the D4 will continuously output 13Volts until the Search Operation is completed.

H/V Voltage Invert **(Disabled)** **Call MotoSAT**

The *H/V Voltage Invert* is used when the LNB on the system is attached to the Feed Assembly in such a way that when 13 Volts supplied to the LNB is actually looking at the Horizontal Receive Field. When this happens the D4 Controller will need this configuration Enabled to operate properly.

Inclined Orbit (Disabled) Setting optional

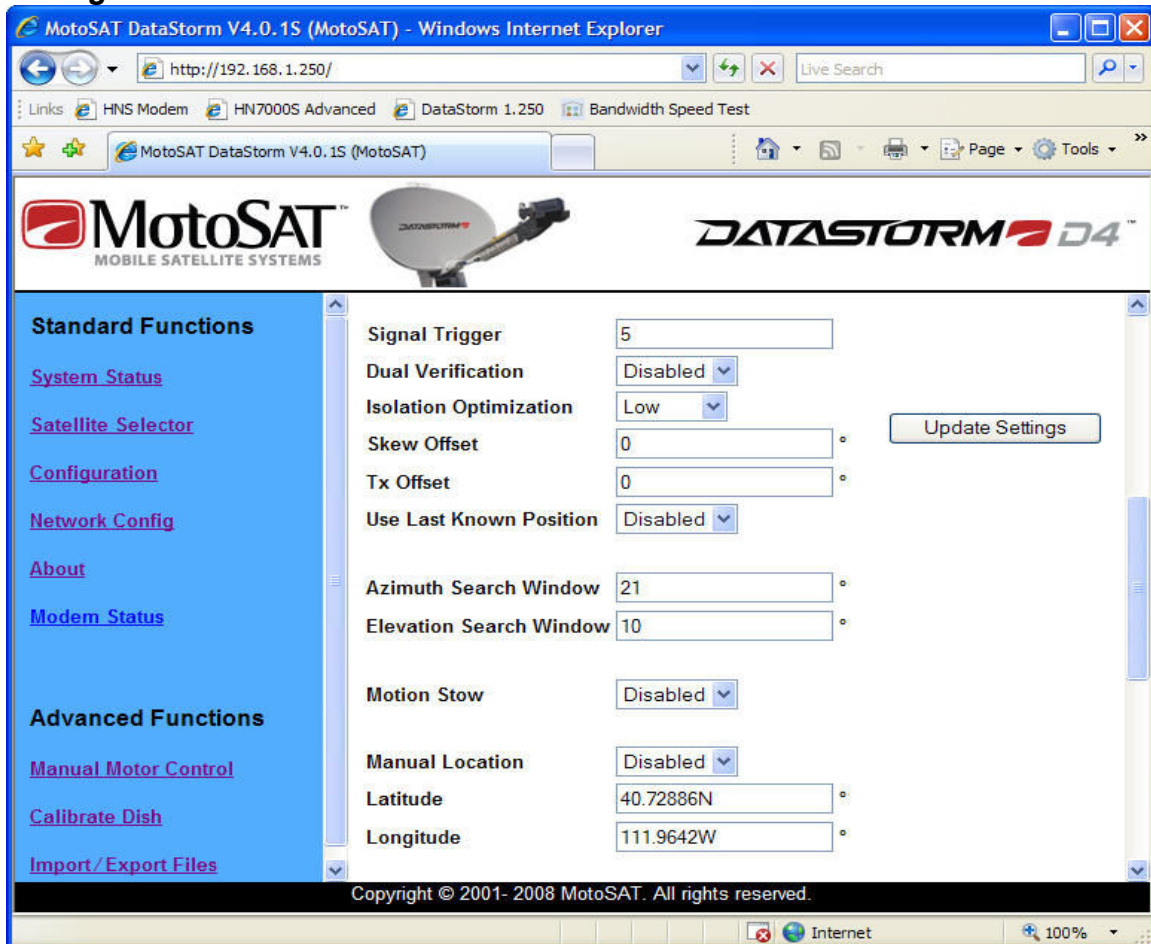
The *Inclined Orbit* is used when the Target Satellite is constantly moving in a Vertical Elevation pattern from the determined Clark Orbital slot. To track this kind of Satellite this configuration must be Enabled.

Inclined Orbit Angle (0) Setting optional

The *Inclined Orbit Angle* is set when the Vertical Change is known. Inclined Orbit Satellites usually change less than +/- 6 degrees in a vertical direction. There is a small Azimuth component and is also tracked when Enabled. Set this numerical value if known.

Configuration Screen

Part 2



MotoSAT DataStorm V4.0.1S (MotoSAT) - Windows Internet Explorer

http://192.168.1.250/

MotoSAT DataStorm V4.0.1S (MotoSAT)

MotoSAT MOBILE SATELLITE SYSTEMS

DATASTORM D4

Standard Functions

[System Status](#)

[Satellite Selector](#)

[Configuration](#)

[Network Config](#)

[About](#)

[Modem Status](#)

Advanced Functions

[Manual Motor Control](#)

[Calibrate Dish](#)

[Import/Export Files](#)

Signal Trigger: 5

Dual Verification: Disabled

Isolation Optimization: Low

Skew Offset: 0

Tx Offset: 0

Use Last Known Position: Disabled

Azimuth Search Window: 21

Elevation Search Window: 10

Motion Stow: Disabled

Manual Location: Disabled

Latitude: 40.72886N

Longitude: 111.9642W

Update Settings

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Signal Trigger is a numerical value that represents a change of Signal Strength Level during a small time period. When this value is triggered the D4 will initial a Signal Identification Peak.

The Signal Trigger Value is set to Default 5. It can be adjusted from 1 to 40. The lower this value can be set the wider view of the sky for a quicker search. If this value is set too low the D4 will begin to stop on false targets such as trees, lights, and buildings. The higher this value is set the narrower the sky view search angle.

Dual Verification (Disabled) Setting optional

Dual Verification is used in areas where high RF Reflectivity could cause the D4 to Lock to a mirror image. When Enabled the D4 must verify two satellites in the proper orbital locations before completing the Search Operation. A typical example of this would be when parked close to metal buildings.

Isolation Optimization (Medium) Setting optional

Isolation Optimization is used to set Cross Polarization (Cross Pol) of the antenna Transmitter to an acceptable Isolation level.

Low

When set to *Low* the skew Cross Pol value is determined by calculating the proper skew rotation of the RF Assembly using GPS. If Skew has ever been set to Medium or High mode for initial Cross Pol to Optimize the Isolation then setting Isolation Optimization to low should offer a minimal acceptable isolation for TX use.

Medium

When set to *Medium*, Cross Pol is initially set similar to the *Low* setting. The D4 will then test DVB and Dish Sensors to adjust the DataStorm Mount for optimized Cross Pol. Some initial settings in Skew Offset and TX Offset will need to be adjusted for Medium to function properly.

High

When set to *High*, initializes like *Medium*. When in Hughes Net mode the ACP routine will maximize Hughes Isolation to maximum value.

Skew Offset (0) Setting optional

The D4 Controller use GPS Location to calculate the correct Horizontal and Vertical Skew Angles of a specific satellite base upon the Dish location on earth. However, some Satellites in the Clarke Orbit are Skewed off several degrees from what should be a true H/V based upon their Longitudal position.

Your ISP or NOC should provide you with a Skew Offset in this case which you can add as a positive or negative value in **Skew Offset**. This will correct the initial search skew angle.

Tx Offset (0) **Setting optional**

Tx (Transmitter) Offset allows the installer /user the ability to correct the mechanical error or the RF Assembly so when the DataStorm Mount is peaked on Satellite the Transmitter pointing at the Satellite will be properly Cross polled for maximum Isolation.

This one time setup requires the system to first be peaked on satellite in Medium Mode. Go to Manual Motor Screen and write down the Skew Count and Degree Values. Call NOC/NMC and perform a Isolation Peaking Test where the NOC steps you through the Skew field and noting when you have hit the maximum Isolation value. Not just a minimum pass value. Read the new Skew Count and Angle values. Add or subtract the difference and place this Angle value in **Tx Offset**.

Note when you repeat the system the Skew Angle Value will display what your original Skew Angle Reading was, but your Skew Count Value will display the new Count Value.

See Setting Tx Offset in D4 Technical Manual

Use Last Known Position (Disabled) **Setting optional**

Disabled (Default)

When *Use Last Known Position* is disabled the D4 reads the current location values (Latitude and Longitude) from the GPS and begins a new search from this location when “Search” has been initiated.

Enabled

When Enabled the D4 Controller will return the Dish to the last known location a “Search” has been initiated.

If the Target Satellite is not found then the Dish will begin a normal search routine.

Azimuth Search Window (21) **Setting optional**

The *Azimuth Search Window* sets the Satellite Table size with respect to the calculated Satellite Longitude.

On initial Search the D4 will choose a Satellite Longitude equal to the GPS Longitude. This causes the D4 to search for Satellites near the apogee of the Satellite Arc.

Setting the Search window narrower will reduce the total number of Satellites that the Sat Table will ID. This reduces the ID time because the D4 Controller will not have to test as many Satellite DVB Carriers. If the Satellite Table is built efficiently this can greatly reduce the Search Times.

But if the Search Window is wider this will allow more Satellites to be identified during the search but will require more ID Time on every unknown Satellite the system stops on.

Elevation Search Window (10) **Setting optional**

The *Elevation Search Window* is the vertical search area of the Mount after a Reference Satellite has been located. The D4 will determine the calculated relative location of the Target Satellite from the Reference Satellite Location. The D4 Controller will begin a search for the Target Satellite in the middle of the *Elevation Search Window* and continue to move the Dish Elevation higher and lower from this location at the end of every Azimuth pass until the total Value set in this window has been searched. I.E. a value of 10 in this window will allow the elevation to search 5 degrees above and below the calculated Target location.

The Default value for *Elevation Search Window* is 10. This value can be narrowed if the vehicle is always very level, but not recommended. If the Mount/Dish is placed on a Skid or Pallet and the ground is not level increasing this value may be necessary.

Motion Stow (Disabled) **Call MotoSAT**

Motion Stow is initiated when the Tilt (accelerometer) Sensors detect motion other than mild rocking caused by wind. The D4 Controller **must** be on for Motion Stow to work.

NOTE: It is important to know that some vehicles may disable the AC power when the ignition has been turned on. If the DC Power Supply that runs the D4 is on this AC Power circuit then Motion Stow can not work.

Manual Location (Disabled) **Setting optional**

Disabled

When **Manual Location** is disabled the D4 reads the Location values (Latitude and Longitude) from the GPS module installed on the Mount/UCB.

NOTE: If a *Search* has been initiated and it has been 3 minutes with GPS not acquiring valid latitude and longitude, the D4 will use the current values displayed

in *Latitude* and *Longitude* and begin a search for the target satellite. These values may be from a previous location and not valid for Skew and Ranging information in some modems.

Enabled

When Enabled the D4 Controller will use the current Latitude and Longitude values located in the Latitude and Longitude fields.

Latitude **Setting optional**

Latitude values can be entered manually if GPS is not able to deliver valid data to this field. But even if *Manual Location* has been *Enabled* once GPS can deliver valid Latitude it will overwrite the current value in this field.

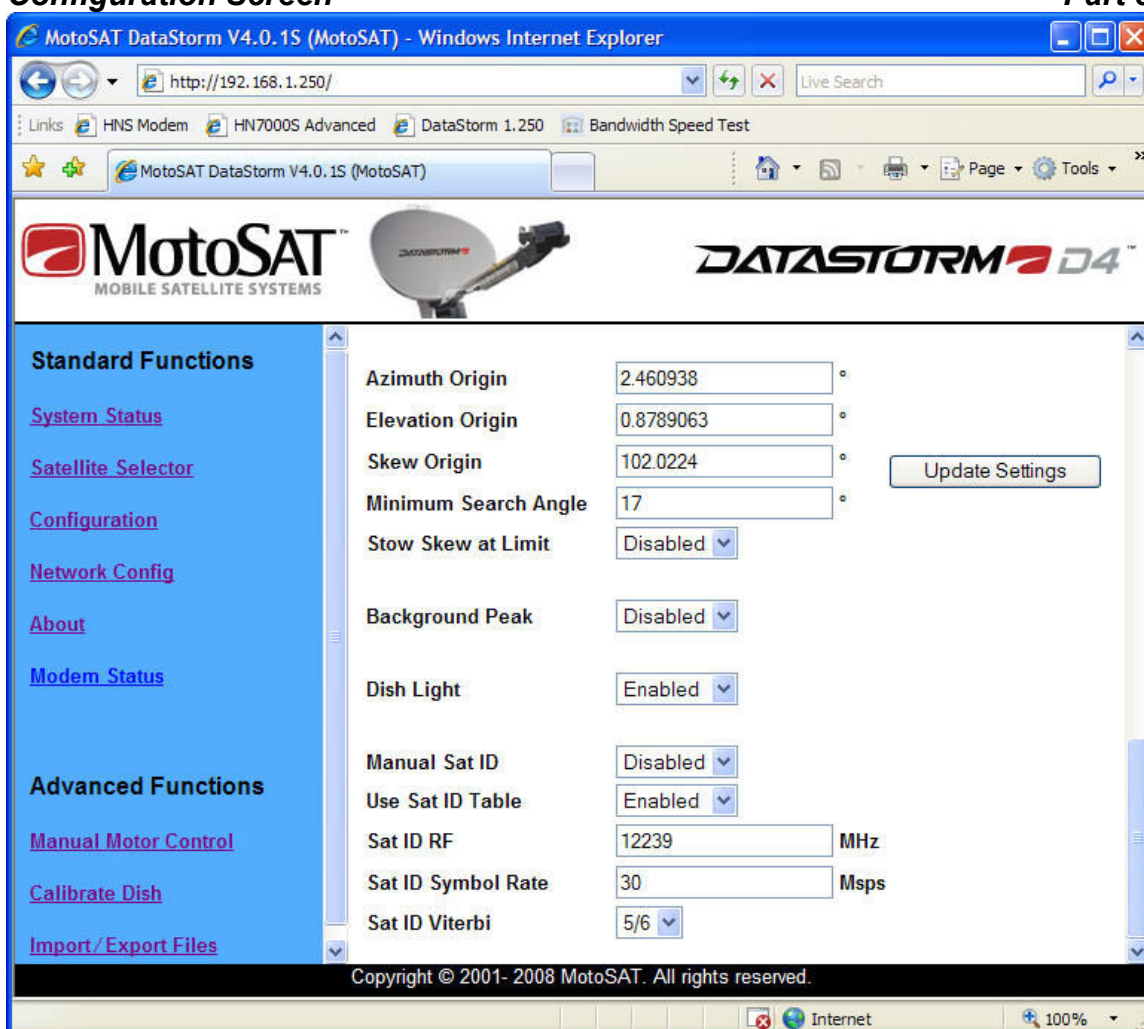
Longitude **Setting optional**

Longitude values can be entered manually if GPS is not able to deliver valid data to this field. But even if *Manual Location* has been *Enabled* once GPS can deliver a valid Longitude it will overwrite the current value in this field.

Azimuth Origin (0) **Call MotoSAT**

Can be set to center the Azimuth Stow position with respect to the Mounting Plate.

We recommend that the Entire Azimuth Mount be rotated slightly on the Azimuth Plate to compensate for any Azimuth Stow Offset.



Elevation Origin (3) **Recommended**

After a Dish Calibrate the D4 will set Elevation Origin to approximately 3 degrees.

What this means is when the motor counts reach zero the F1, F2, or F3 have seen a mechanical stall in the Stowed position. From this stalled position the mount is about 3 degrees higher than a level (horizontal) stow.

After a Search and Peak on the Target Satellite this value may change +/- several degrees. This automatic adjustment will now set the true horizontal stow value of the mount. This now means that when a search elevation value is determined by the D4, the D4 will move very close to the correct value to find the Target Satellite on the first search pass.

It is recommended that this value not be adjusted after a successful Target Satellite Search and Peak.

Skew Origin (0) **Call MotoSAT**

It is recommended that this value not be adjusted if ACP Isolation was performed in Medium or High mode.

Minimum Search Angle (17) Setting optional

This is the lowest Satellite Look Angle allowed by the D4 Controller when in search mode. From the factory the D4 is set with an angle of 17 degrees. Seventeen degrees on the F1 and F3 mounts allows the Dish to rotate 360+ degrees in azimuth without the LNB Arm Assembly hitting objects on the roof of the vehicle.

Once the Dish has been mounted on the roof or platform this value can be lowered as necessary as long as full Azimuth Rotation will not cause the LNB to hit objects in this rotation. Typically 17 degrees will work for most of US and Southern Canada.

Background Peak (Disabled) Call MotoSAT

Disabled

When disabled the dish remains pointed in a fixed position. Any movement caused by wind or vehicle repositioning is ignored.

Enabled

When Enabled the D4 Controller will monitor DVB Signals and/or Modem Signal Data to try to maintain a peak at the Target Satellite. This will usually mean fine adjustments of Azimuth and Elevation to the Dish.

Note: This is NOT an “Inmotion” routine and may not keep up positioning in a real time situation. There may be some signal degradation if movement of the Dish is too rapid.

Dish Light (Enabled) Setting optional

Enabled

Under normal use when the *Dish Light* is *Enabled* the DataStorm Dish will have a glowing Blue reflection off of the Dish surface when the dish is deployed. When the Dish is stowed this light will be off.

Disabled

If the user chooses to have this light off all the time simply disable this feature.

Manual Sat ID (Disabled) Setting optional

Disabled

If the D4 Satellite ID Table is current (valid) and the Target Satellite (Satellite Longitude) is valid in this table then *Manual Sat ID* should be **Disabled**.

Enabled

If there is not a Valid Target Satellite in the current D4 Sat ID Table this feature can be enabled. When *Enabled* the user must input valid data in the Sat ID RF, Sat ID Symbol Rate, and the Sat ID Viterbi.

Another condition where *Manual Sat ID* would be *Enabled* could happen if a Reference Satellite recently had changes where it would ID the same as the Target Satellite. Under this condition the user would need to change the Target Satellite *Manual Sat ID* values.

Use Sat ID Table (Enabled) Setting optional

The D4 has an internal Satellite ID Table which covers most of the Ku Band Satellites around the world. This table is updated by firmware periodically. The D4 uses this table to ID any reference satellite in the sky that is within approximately +/- 45 degrees of the "Satellite Longitude", Target Satellite or Target Longitude. Once a reference Satellite within this range has been identified the D4 will calculate the correct azimuth distance to the Target Satellite.

Terms; Reference Satellite is any satellite that can be used to determine the correct location of the Target Satellite.

Target Satellite is the Satellite that the D4 has been configured to search and Peak. This is selected by inputting a valid Satellite Longitude in Configuration.

Target Satellite, Target Longitude, and Satellite Longitude are synonymous in this document.

Enabled

If the D4 Satellite ID Table is current (valid) the "Use Sat ID Table" should be **Enabled**. A current Satellite ID Table allows the D4 to perform faster searches.

Disabled

If it has been a year or more since the last use of the D4 it is possible that there will be several or many errors in the Satellite Table. The more errors in this table the more likely the search time for the Target Satellite will increase. It is also possible that a Reference Satellite may now have the

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same ID information as the Target Satellite. Under these conditions a user may want to Disable the “*Use Sat ID Table*” and Enable the “*Manual Sat ID*” to be able to find the Target Satellite to download a current Firmware Upgrade with a current Satellite ID Table.

Sat ID RF **Setting optional**

This value is displayed in Megahertz (MHz) (million cycles per second). This value must be input correctly when Manual Sat ID is “**Enabled**”.

The Ku Band RF Receive Frequency range is from 10650 to 12950 MHz.

Example; 12,140,000,000 Hertz (cycles per second) would be entered

As 12140 MHz

Sat ID Symbol Rate **Setting optional**

This value is displayed in Mega symbols per second. This value must be input correctly when Manual Sat ID is “**Enabled**”. The D4 controller can read values from 2 to 45 Msps. Examples; *26, 015,000 symbols per second must be entered as 26.015 Msps, or 10,000,000 symbols per second can be entered as 10.*

Sat ID Viterbi **Setting optional**

Viterbi or FEC are used to describe the Error Correction Ratio. This ratio must be input correctly when Manual Sat ID is “**Enabled**”. This value can be from 1/2, 2/3, 3/4, 5/6, or 7/8

CONFIGURATION FILE

Building, Importing, and Exporting a Config File

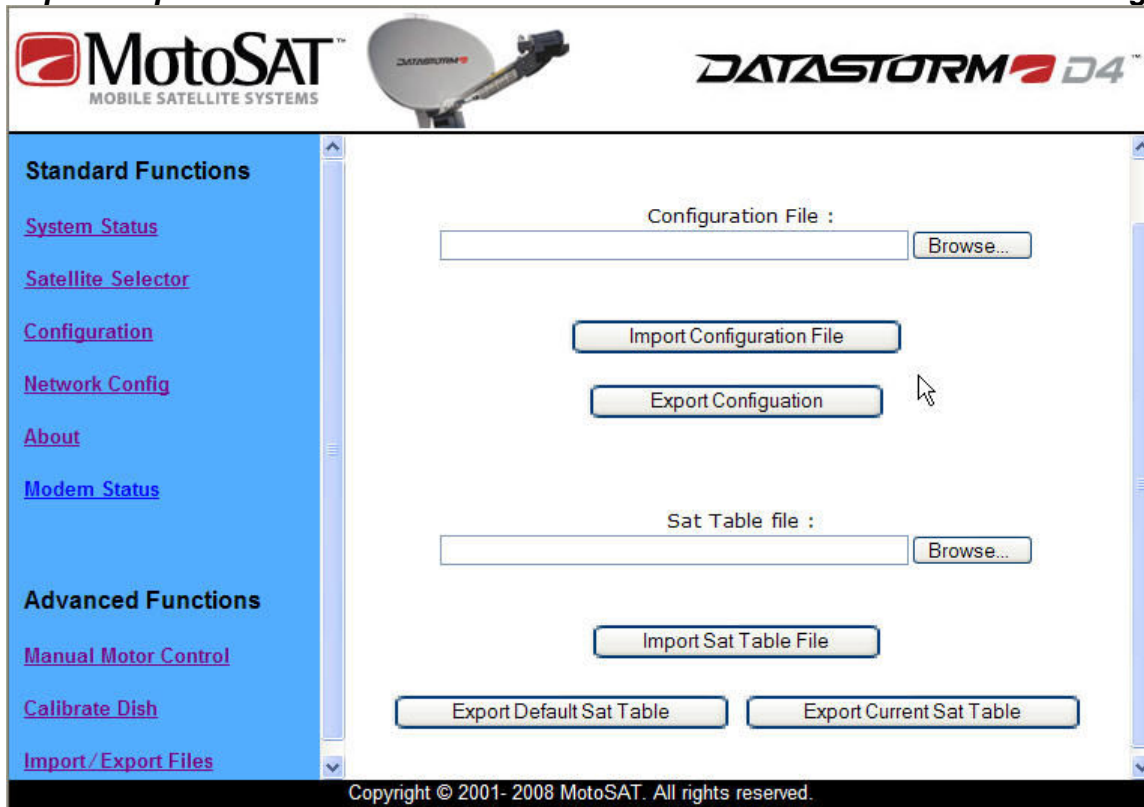
What is A Config File?

A Config File for the MotoSAT D4 Controller contains the current status of every setting to make the Antenna Mount perform to the users' preferences.

Inside the Config file is stored the IP Addresses of the D4 Controller, the Data Modem, and the Router. Also the Satellite Select Table. Settings specific to the LNB type, and sensitivity to signals while the Antenna is searching. Including many other settings that can be set to meet the needs of the user.

Import/Export Files Screen

Config



When should I Export the Config File?

If you ever modify the Configuration Page you should Export the Config File with these new settings.

You should update your Config files any time you upgrade the D4 Controller to a newer version of Software. Sometimes Software upgrades are to add additional features to the Configuration.

If you need to change the D4 Controller out because of Operational issues it is recommended that you export your latest Config File to your Desktop to later Import into

Subject to change without notice 29

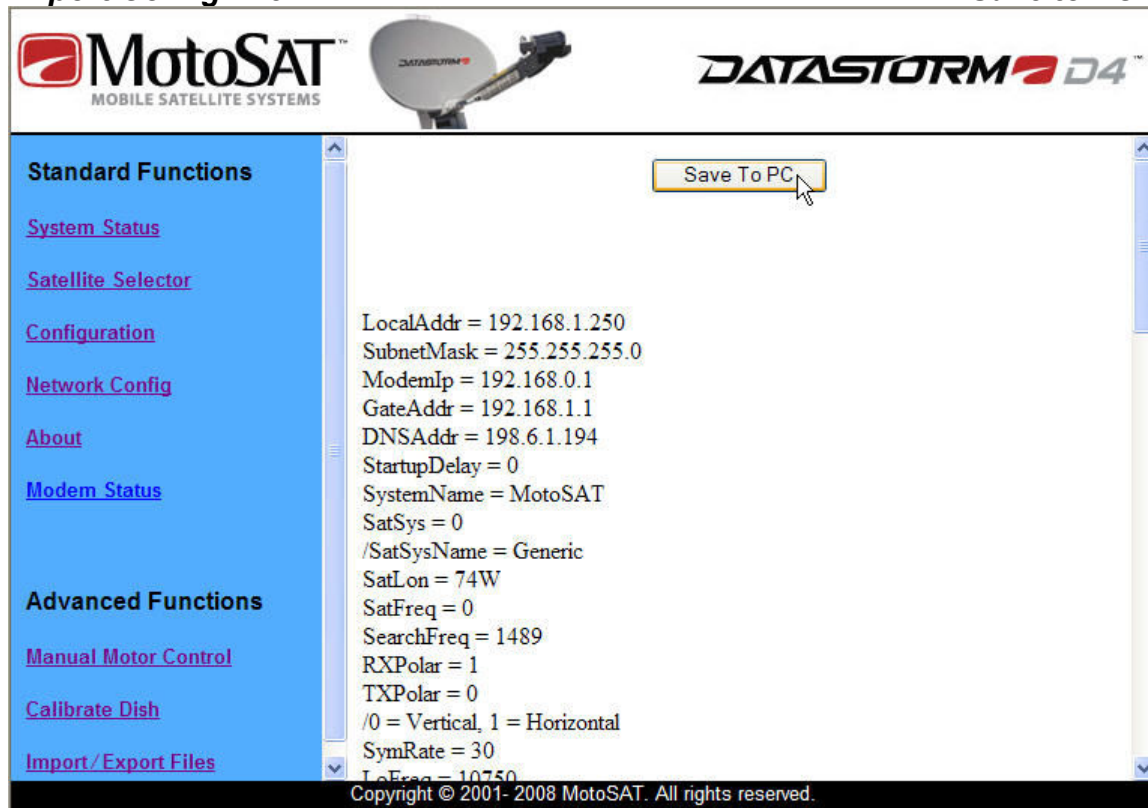
If you ever need to NVClear (memory reset) the controller which may occur during a technical support session you should export the latest Config File before performing an NVClear.

After setting up the desired operating parameters on the Configuration Page you can save a copy of these settings by exporting them to a File on your Desktop or other location to retrieve at a later date.

We recommend saving this file on the Desktop in a Folder named MotoSAT. Naming the File "Config (Sat Long) (Pol)" is common. This usually will assist Technical Support. Example: **Config 74 V.txt**

Export Config File

Save to PC

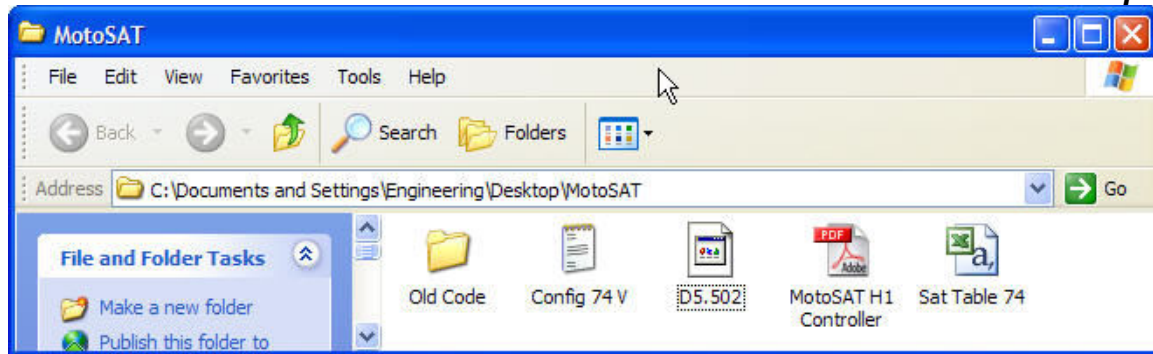


Click the Save to PC button as shown above and point to the MotoSAT folder on the Desktop.

Name the File according to the Satellite Identified as Sat1Long = -74 located in the lower section of the Config File.

MotoSAT Folder

on Desktop



When should I Import a Config File?

Only Import a Config File after opening it with Notepad or a Text Editor to see that it matches critical settings such as the Controller IP Address and other important Network Settings.

If you have edited the Config File to modify the Satellite Select Table you should Import this file into the D4 Controller.

After an NVClear if it was directed by technical support.

If you are replacing the existing D4 Controller with a new D4 Controller you should import the latest Config file saved from the existing controller.

What information is stored in the Config File?

Insure all the Configuration parameters on the HTML Configuration Page are how you want the Controller to operate.

Network Settings, Sat 6 Settings, Signal Trigger, TX Offset, Isolation, all have a lot to do with how your system performs. Become familiar with the entire configuration page and modify those that may improve your specific application.

Can I modify my Config File using a Text Editor?

Yes, we have intentionally set the "Sat Select Table" inside the Config File only. This allows the IT or Administrator to be the only ones to modify the Sat Select Table.

Once you have exported the Config File you can open the Config File.txt with Notepad or other txt editor and change the 6 Sat Table Locations. After saving this file go back to the D4 HTML Screen and Import the modified Config File to update the Sat Select Table.

Anything in the Config File can be modified using a Text Editor but we recommend you make a backup copy of this file before experimenting on your own. Please read Setting

Configurations in the user manual before making changes to this file.

A typical Config File looks like the text below;

```
LocalAddr = 192.168.1.250
SubnetMask = 255.255.255.0
ModemIp = 192.168.9.9
GateAddr = 192.168.1.1
DNSAddr = 198.6.1.194
StartupDelay = 0
SystemName = D4_Controller
SatSys = 0
/SatSysName = Generic
SatLon = 83W
SatFreq = 0
SearchFreq = 1489
RXPolar = 1
TXPolar = 0
/0 = Vertical, 1 = Horizontal
SymRate = 30
LoFreq = 10750
Tone22K = 0
SearcD43V = 0
HVInvert = 0
SignalThreshold = 5
DualVerify = 0
IsolationOpt = 0
SkewOffset = 0
TxOffset = 0
LastKnownPos = 0
AzWindow = 15
ElWindow = 7
MotionStow = 0
ManualLocation = 0
ManualLatitude = 40.729N
ManualLongitude = 111.9643W
AzOrigin = 0
ElOrigin = -1.999331
SkOrigin = 101.4998
MotorSpeedAZ = 101
MotorSpeedEL = 40
MotorCurrentAZ = 4
MotorCurrentEL = 2.5
MotorCurrentSK = 1.2
PeakStepPK = 0.5
PeakStepID = 0.33
MinSearchAngle = 17
StowSKAtLimit = 0
BkgndPeak = 0
```



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DishLight = 1
ManualSatId = 0
SatIdTable = 1
SatIdRF = 12239
SatIdSymRate = 30
SatIdViterbi = 3
ModemUsername = admin
ModemPassword = P@55w0rd!
Sat1Long = -74
Sat1Polar = 1
Sat1Freq = 0
Sat2Long = -72
Sat2Polar = 1
Sat2Freq = 0
Sat3Long = -91
Sat3Polar = 1
Sat3Freq = 0
Sat4Long = -101
Sat4Polar = 1
Sat4Freq = 0
Sat5Long = -119
Sat5Polar = 1
Sat5Freq = 0
Sat6Long = -105
Sat6Polar = 1
Sat6Freq = 0

HOW TO BUILD A CONFIGURATION FILE

Building, Importing, and Exporting a Sat Table File.

What is A Sat Table?

A Sat Table for the MotoSAT D4 Controller is a database of specific details about most of the Geosynchronous Satellites that are visible from the current position the Antenna Mount. This table allows the D4 Controller to locate the desired satellite of the user.

The details in a Sat Table usually include the Satellite Name, the equatorial longitude (position) of the satellite, active DVB transponders (frequencies) and specific information related to the transponder including the polarity of the of the transmitted signal.

Not all of the details of every satellite is used in a Sat Table. Based on the user a Sat Table can be condensed to a few as 10 satellite entries and maybe only 6 satellites and be more effective than using 100's of entries and 20 plus satellites.

When should I Import a Sat Table?

Only Import a Sat Table after opening it with Notepad or a Text Editor to see that it includes the current satellites you intend to use and that it also includes several reference satellites which include 72, 91, 101, 119, and 129 degrees longitude.

If you have exported your current Sat Table and edited the data to improve the search and find times you will need to Import this file back into the D4 Controller for it to be effective.

You should Import your Sat Table any time you upgrade the D4 Controller to a newer version of Software.

After an NVClear if it was directed by technical support.

If you are replacing the existing D4 Controller with a new D4 Controller you should import the latest Sat Table saved from the existing controller.

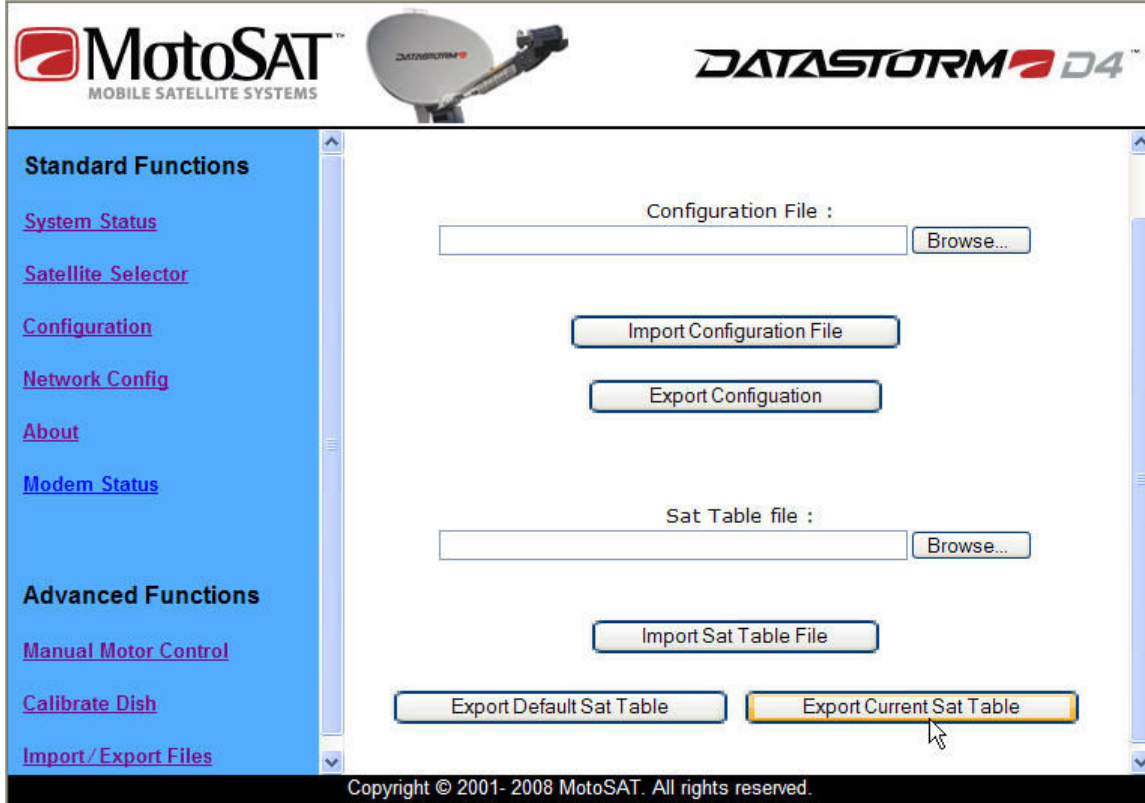
When should I Export the Current Sat Table?

Satellites transponders are own or leased privately by many data providers and the settings used by these providers can change. Usually these changes are small and will not affect the specific satellite you are using. How often does this happen? Some satellites may not change data significant enough over several years to warrant a Sat Table update.

The Satellites that lease space on daily or hourly schedules seem to require the Sat Table to be updated even as often as every 4 to 6 months. If you are using one of these satellites then we would recommend editing your Sat Table frequently.

Import/Export Files

Export Sat Table



If you notice that the search times have increased dramatically you should update your Sat Table.

Under the conditions discussed above you should Export the Current Sat Table and make minor changes as needed.

If you have changed Service Providers or have been moved to a new Satellite you can Export and modify the Current Sat Table.

Before an NVClear if it was directed by technical support you should Export the Current Sat Table.

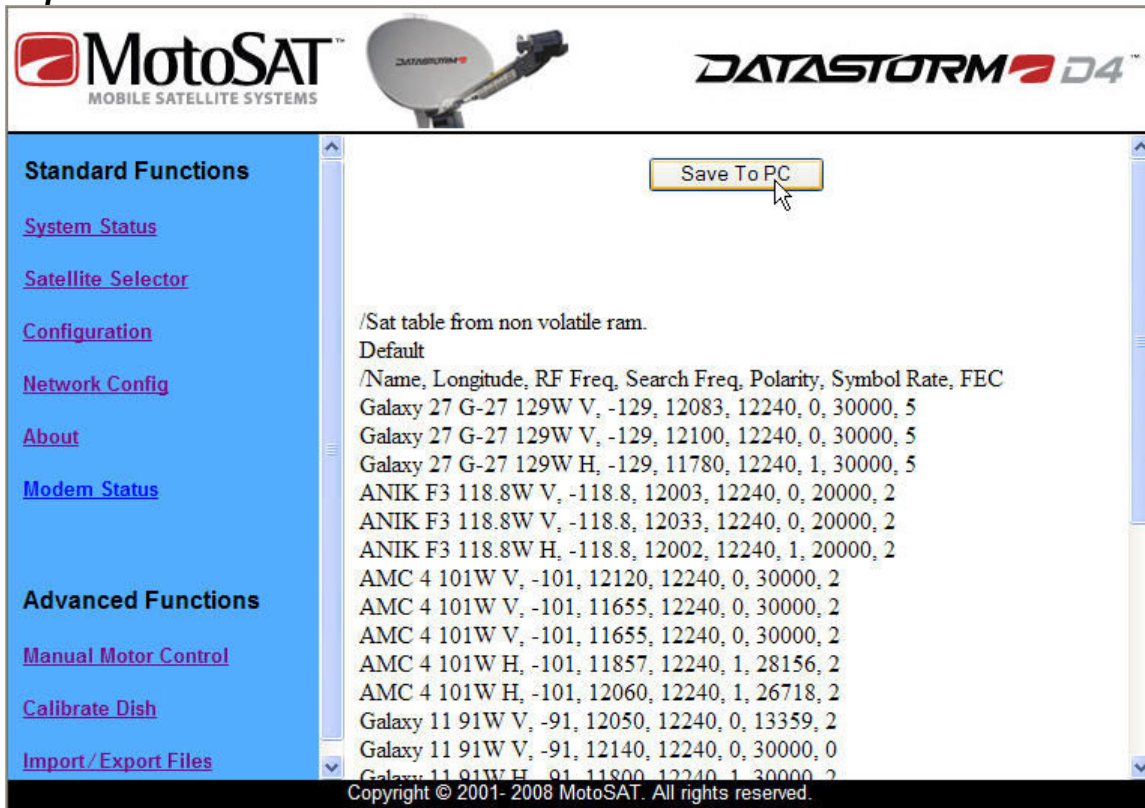
You should Export your Sat Table any time you upgrade the D4 Controller to a newer version of Software.

If you need to change the D4 Controller out because of Operational issues it is recommended that you export your latest Current Sat Table to the Desktop to later Import into the new D4 Controller.

We recommend saving this file on the Desktop in a Folder named MotoSAT. Naming the File "Sat Table 74.txt" is common. This usually will assist Technical Support.

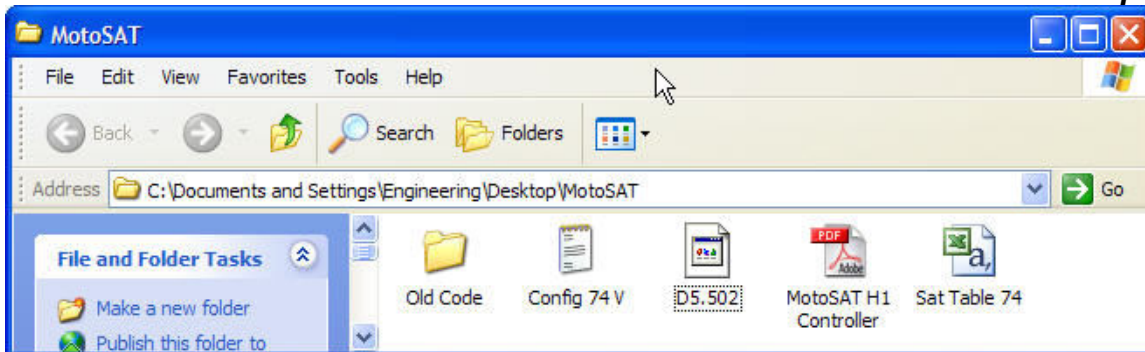
Export Current Sat Table

Save to PC



MotoSAT Folder

on Desktop



After naming the File "Sat Table 74.txt" you will need to open this file with **NOTEPAD** then **Save AS** select **All file Types** and end with extension **.csv**

You can only import Sat Tables that are .CSV files (comma separated value)

Change **Sat Table 74.txt** to **Sat Table 74.csv**

When should I Export the Default Sat Table?

Only Export the Default Sat Table if after Exporting and Editing the Current Sat Table the File has become corrupted.

The Default Sat Table over time will become inaccurate.

It is important to keep the Current Sat Table as updated as possible to insure fast Search and Lock times.

Updated Sat Tables are available on the www.motosat.com website.

WHAT IS A SAT TABLE

What information is stored in the Sat Table?

The details in a Sat Table usually include the Satellite Name, the equatorial longitude (position) of the satellite, active DVB transponders (frequencies) and specific information related to the transponder including the polarity of the of the transmitted signal.

A typical Default Sat Table looks like the text below;

/Default sat table from flash.

Default

/Name, Longitude, RF Freq, Search Freq, Polarity, Symbol Rate, FEC

Galaxy 27 G-27 129W V, -129, 12083, 0, 0, 30000, 5

Galaxy 27 G-27 129W H, -129, 11780, 0, 1, 30000, 5

Horizons 1 127W V, -127, 12140, 0, 0, 30000, 3

Horizons 1 127W H, -127, 11877, 0, 1, 21930, 1

Galaxy 10R 123W V, -123, 11803, 0, 0, 26670, 2

Galaxy 10R 123W H, -123, 11730, 0, 1, 13250, 2

Galaxy 23 G-23 121W V, -121, 11898, 0, 0, 20000, 2

Galaxy 23 G-23 121W H, -121, 11971, 0, 1, 20000, 2

ANIK F3 118.8W V, -118.8, 12033, 0, 0, 20000, 2

ANIK F3 118.8W H, -118.8, 12002, 0, 1, 20000, 2

SatMex 5 116.8W V, -116.8, 11980, 0, 0, 30000, 5

SatMex 5 116.8W H, -116.8, 12044, 0, 1, 4340, 0

Anik F2 111.1W V, -111.1, 11861, 0, 0, 10000, 3

Anik F2 111.1W V, -111.1, 11873, 0, 0, 10000, 0

Anik F2 111.1W V, -111.1, 11831, 0, 0, 7300, 1

Anik F2 111.1W H, -111.1, 11794, 0, 1, 4500, 5

Anik F1 107.3W H, -107.3, 11903, 11790, 1, 5856, 2

Anik F1 107.3W H, -107.3, 11903, 11790, 1, 5863, 2

AMC 15 105W V, -105, 12000, 0, 0, 30000, 2

AMC 15 105W H, -105, 12175, 0, 1, 17796, 1

AMC 1 103W V, -103, 11940, 0, 0, 20000, 2

AMC 1 103W H, -103, 11880, 11760, 1, 26680, 5

AMC 4 101W V, -101, 12120, 0, 0, 30000, 2

AMC 4 101W V, -101, 11655, 0, 0, 30000, 2

AMC 4 101W H, -101, 11857, 0, 1, 28156, 2

AMC 4 101W H, -101, 12060, 0, 1, 26718, 2
 Galaxy 16 G-16 99W V, -99, 11863, 12099, 0, 30000, 2
 Galaxy 16 G-16 99W H, -99, 11963, 0, 1, 30000, 5
 Galaxy 25 G-25 97W V, -97, 12054, 0, 0, 22000, 2
 Galaxy 25 G-25 97W H, -97, 12150, 0, 1, 20000, 2
 Galaxy 25 G-25 97W H, -97, 11873, 0, 1, 22000, 1
 Galaxy 3C 95W V, -95, 12063, 0, 0, 21500, 2
 Galaxy 3C 95W H, -95, 12082, 0, 1, 21100, 2
 Galaxy 26 G-26 93W V, -93, 12115, 0, 0, 20610, 2
 Galaxy 26 G-26 93W H, -93, 11902, 0, 1, 6906, 2
 Galaxy 11 91W V, -91, 12050, 12240, 0, 13359, 2
 Galaxy 11 91W V, -91, 12140, 12240, 0, 30000, 0
 Galaxy 11 91W H, -91, 11800, 11800, 1, 30000, 2
 Galaxy 11 91W H, -91, 11964, 12240, 1, 6117, 2
 Galaxy 11 91W H, -91, 12120, 12084, 1, 6117, 2
 Galaxy 28 G-28 89W V, -89, 11920, 12160, 0, 30000, 5
 Galaxy 28 G-28 89W V, -89, 11955, 12160, 0, 19546, 2
 Galaxy 28 G-28 89W V, -89, 12160, 12160, 0, 30000, 5
 Galaxy 28 G-28 89W V, -89, 11760, 12160, 0, 26000, 0
 Galaxy 28 G-28 89W H, -89, 12140, 11900, 1, 30000, 5
 Galaxy 28 G-28 89W H, -89, 12112, 11900, 1, 15000, 5
 Galaxy 28 G-28 89W H, -89, 11780, 11900, 1, 29000, 2
 AMC 3 87W V, -87, 11736, 11900, 0, 8333, 1
 AMC 3 87W V, -87, 11820, 11900, 0, 10000, 3
 AMC 3 87W V, -87, 11900, 11900, 0, 30000, 1
 AMC 3 87W H, -87, 12000, 11840, 1, 30000, 5
 85W V, -85, 12174, 0, 0, 3984, 2
 85W V, -85, 12115, 0, 0, 4343, 2
 85W V, -85, 12150, 0, 0, 6117, 2
 85W H, -85, 12178, 11820, 1, 3980, 2
 85W H, -85, 12182, 11820, 1, 3980, 2
 85W H, -85, 12173, 11820, 1, 3978, 2
 85W H, -85, 12188, 11820, 1, 3980, 2
 AMC 9 83W V, -83, 12140, 0, 0, 30000, 5
 AMC 9 83W V, -83, 12060, 0, 0, 30000, 5
 AMC 9 83W H, -83, 11845, 0, 1, 17800, 2
 AMC 9 83W H, -83, 11970, 0, 1, 8420, 1
 Horizons 2 74W V, -74, 12172, 0, 0, 13340, 2
 Horizons 2 74W V, -74, 12190, 0, 0, 13340, 2
 Horizons 2 74W H, -74, 11733, 0, 1, 6616, 1
 Horizons 2 74W H, -74, 11734, 0, 1, 6616, 1
 Horizons 2 74W H, -74, 11800, 11880, 1, 27715, 1
 AMC 6 72W V, -72, 11840, 0, 0, 29680, 2
 AMC 6 72W H, -72, 11726, 0, 1, 6405, 2
 ...
 ...
 ...

/Total Entries: 191

HOW TO BUILD A SAT TABLE

How do I edit a Sat Table?

Step 1

For the US we recommend keeping Satellites at longitudes 72, 91, 101, 119, and 129 degrees in the Sat Table.

Step 2

For ease of editing separate each Satellite Longitude by spacing as shown below.

Step 3

Reduce the total number of Satellite Entries by placing a / in front of that particular line you wish to eliminate from the Sat Table.

Example;

/AMC 15 105W V, -105, 12000, 0, 0, 30000, 2

This will keep that information inside your table for future use just in case you need to add this satellite back into the Sat Table but it will remove it from the actual Sat table to be imported.

Step 4

Review the file carefully to see that you have not added any improper lines or other data.

Step 5

Convert this file from a .txt file to a .csv

Open the file with **NOTEPAD** then **Save AS** select **All file Types** and end the file name with the extension **.csv**

You can only import Sat Tables that are .CSV files (comma separated value)

Change **Sat Table 74.txt** to **Sat Table 74.csv**

Example of modified Sat Table

This particular Sat Table was modified to find Sat 74 Longitude.

Default

/Name, Longitude, RF Freq, Search Freq, Polarity, Symbol Rate, FEC

Galaxy 27 G-27 129W V, -129, 12083, 12240, 0, 30000, 5
Galaxy 27 G-27 129W H, -129, 11780, 12240, 1, 30000, 5

DVB119 119.0W V, -119, 12003, 12240, 0, 20000, 2
DVB119 119.0W V, -119, 12033, 12240, 0, 20000, 2
DVB119 119.0W H, -119, 12002, 12240, 1, 20000, 2

/AMC 15 105W V, -105, 12000, 0, 0, 30000, 2
/AMC 15 105W H, -105, 12175, 0, 1, 17796, 1

/AMC 1 103W V, -103, 11940, 0, 0, 20015, 2
/AMC 1 103W H, -103, 11880, 0, 1, 26687, 5

AMC 4 101W V, -101, 12120, 12240, 0, 30000, 2
AMC 4 101W V, -101, 11655, 12240, 0, 30000, 2
AMC 4 101W H, -101, 11857, 12240, 1, 28156, 2
AMC 4 101W H, -101, 12060, 12240, 1, 26718, 2

/Galaxy 16 G-16 99W V, -99, 11864, 12097, 0, 30031, 2
/Galaxy 16 G-16 99W H, -99, 11964, 0, 1, 30031, 5

Galaxy 11 91W V, -91, 12140, 12240, 0, 30000, 0
Galaxy 11 91W V, -91, 11740, 12240, 0, 30031, 5
Galaxy 11 91W H, -91, 12120, 12240, 1, 30000, 3

/Galaxy 28 G-28 89W V, -89, 11924, 12160, 0, 30031, 5
/Galaxy 28 G-28 89W H, -89, 12140, 11900, 1, 30031, 5

/AMC 9 83W V, -83, 12060, 0, 0, 30031, 5
/AMC 9 83W V, -83, 12140, 0, 0, 30031, 5
/AMC 9 83W H, -83, 11845, 0, 1, 17800, 2
/AMC 9 83W H, -83, 11970, 0, 1, 8420, 1

Horizons 2 74W V, -74, 12172, 0, 0, 13340, 2
Horizons 2 74W V, -74, 12190, 0, 0, 13340, 2

Horizons 2 74W H, -74, 11733, 0, 1, 6616, 1
Horizons 2 74W H, -74, 11734, 0, 1, 6616, 1
Horizons 2 74W H, -74, 11733, 0, 1, 6616, 1
Horizons 2 74W H, -74, 11734, 0, 1, 6616, 1
Horizons 2 74W H, -74, 12040, 0, 1, 29281, 2
Horizons 2 74W H, -74, 12080, 0, 1, 29281, 2
Horizons 2 74W H, -74, 12160, 0, 1, 30031, 2

AMC 6 72W V, -72, 11840, 12240, 0, 29680, 2
AMC 6 72W H, -72, 11726, 12240, 1, 6405, 2

Satellites 72, 74, 91, 101, 119, and 129 will be the only satellites to show in the actual Sat Table when imported into the D4 Controller via the HTML Import/Export Files Screen.

Satellites 105, 103, 99, 89 and 83 will not import because of the / in front of there names.

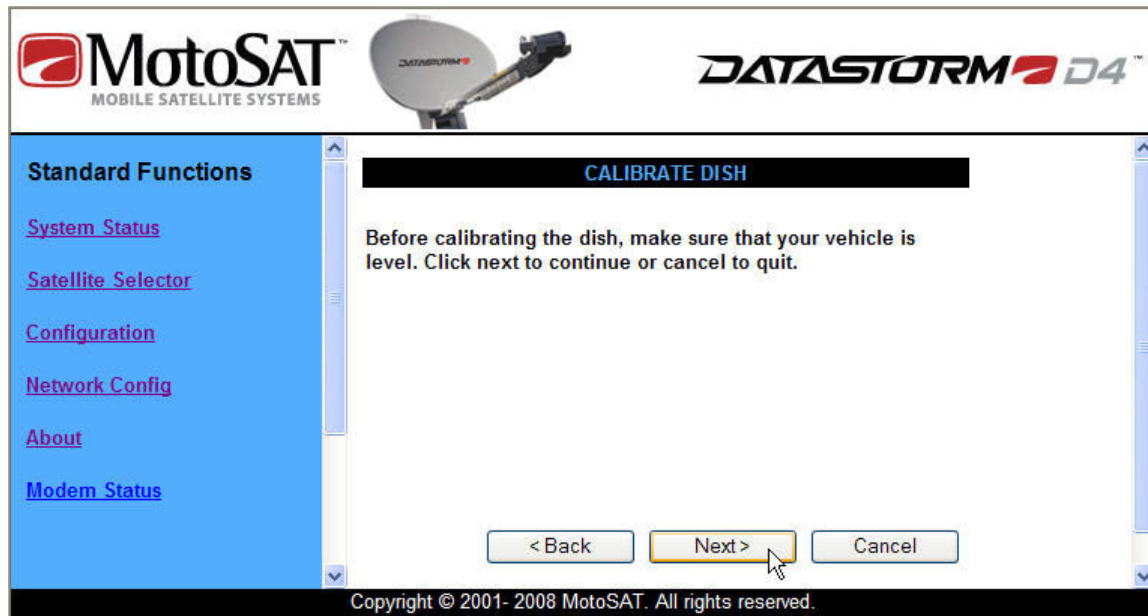
CALIBRATE DISH

A Calibrate is the last test function to be performed before the system is ready for use.

Calibrate Dish will test the motor currents, motor counters, and mechanical limits of the antenna mount.

Calibrate Dish Screen

Start



A proper Calibrate Dish will;

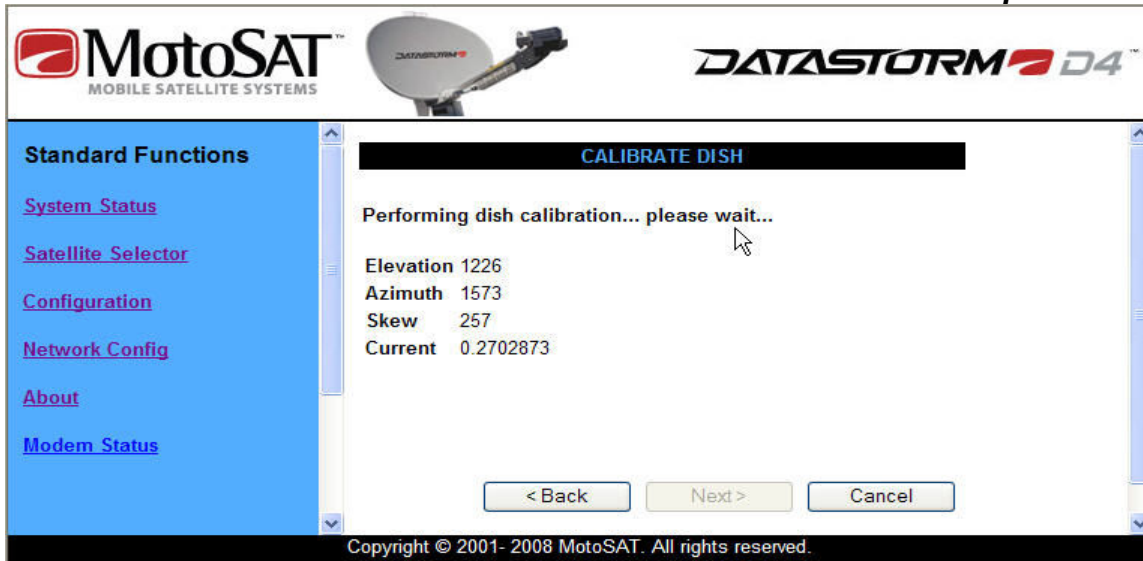
- Raise Elevation approximately 145 degrees to Max Stall
- Test Max Elevation twice
- Lower Elevation to 85 degrees dish angle
- Test Elevation Peak Speed and Currents
- Rotate Skew CCW to MAX Skew Limit (facing Dish)
- Rotate Skew Clockwise to MIN Skew Limit (facing Dish)
- Move Skew (LNB) to Configured Stow Position
- Rotate Azimuth Clockwise 375 degrees (360 +15)
- Rotate Azimuth CCW 180 Degrees, test Peak Speed and Currents
- Rotate Azimuth CCW to Stow Position

- Lower Elevation to Stowed Position
- End of test

We recommend that one person be outside the vehicle while the test is in process to assure that the antenna moves properly to all maximum and minimum limits as described above.

Calibrate Dish Screen

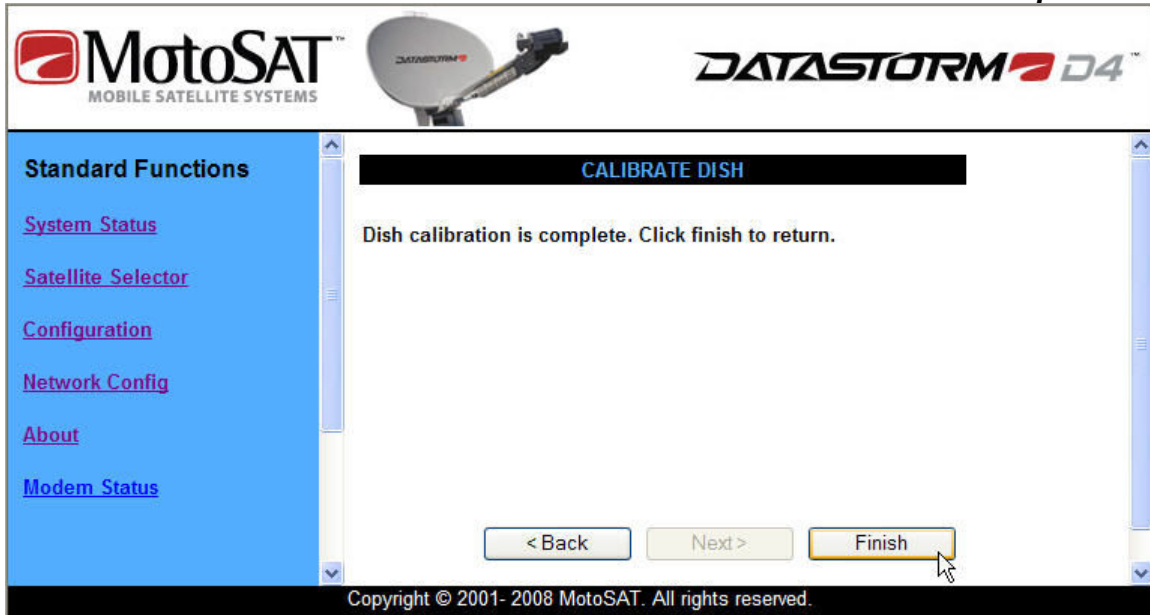
In process



If at any time the Dish stops the Calibrate Dish has failed.

The System Status Screen will display Error message.

Contact Technical Support for assistance.



If Calibrate Dish completed properly the system is ready for Normal Operation.

Diagnostics

Controller Startup test

D4 Controller Status Indicators

Power up Test. This test will determine that the main power up sequence is operating properly.

Antenna in stowed position.

Begin test with the D4 Controller Power off and the Main AC Power Off.

Use windows Desktop Clock as the timer.

Start Test

Turn on AC Power Switch on right side of controller.

- Switch will illuminate a Burnt Orange Color.

Wait for Windows clock to start at the 0 Second (12 O'clock position)

Start!

Seconds	Action
0	Press Power button on Left side of D4 Controller.
0	ON light illuminates.
0	LAN, GPS, Ready, Busy, and Stow lights illuminate
1	LAN, GPS, Ready, Busy, and Stow lights Off
12	Busy Light starts blinking at one second intervals
13	LNB light illuminates
14	LAN light illuminates
24	Stow light illuminates
30	GPS light blinks at one second intervals
55	GPS light On solid (Lock minimum time)
180	GPS light On solid (Lock maximum time)

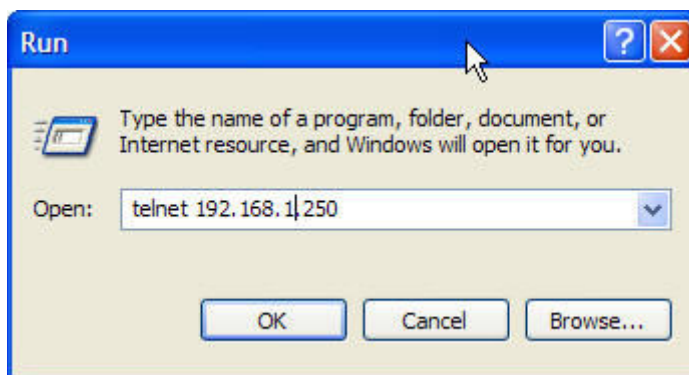
Times from 12 to 180 seconds have a +/- 3 second tolerance.

End Test.

Telnet Communications

How to access Telnet Communications.

Click **Start, Run, and Local IP Address** of the D4 Controller.



DiSEqC Communications

Digital Satellite Equipment Control (DiSEqC)

DGPS Commands

```
Telnet 192.168.1.250
DATASTORM % dgps
usage: dgps [status] [version] [gps] [buffer] [tilt] [tw]
```

```
Telnet 192.168.1.250
DATASTORM % dgps status
Buffer 25, Variable 25
Status = 19
DATASTORM %
```

```
Telnet 192.168.1.250
DATASTORM % dgps version
Version 3, Variable 3
Version = 3
DATASTORM %
```

```
Telnet 192.168.1.250
DATASTORM % dgps gps
Lat and Long = 40.7292, -111.9643
DATASTORM %
```

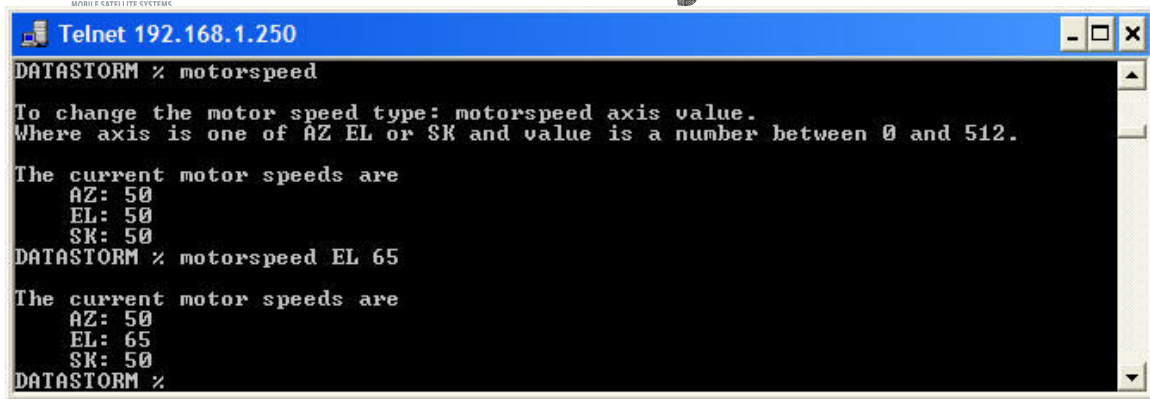
```
Telnet 192.168.1.250
DATASTORM % dgps gps
Lat and Long = 40.7292, -111.9643
DATASTORM %
```

```
Telnet 192.168.1.250
DATASTORM % motorcurrent

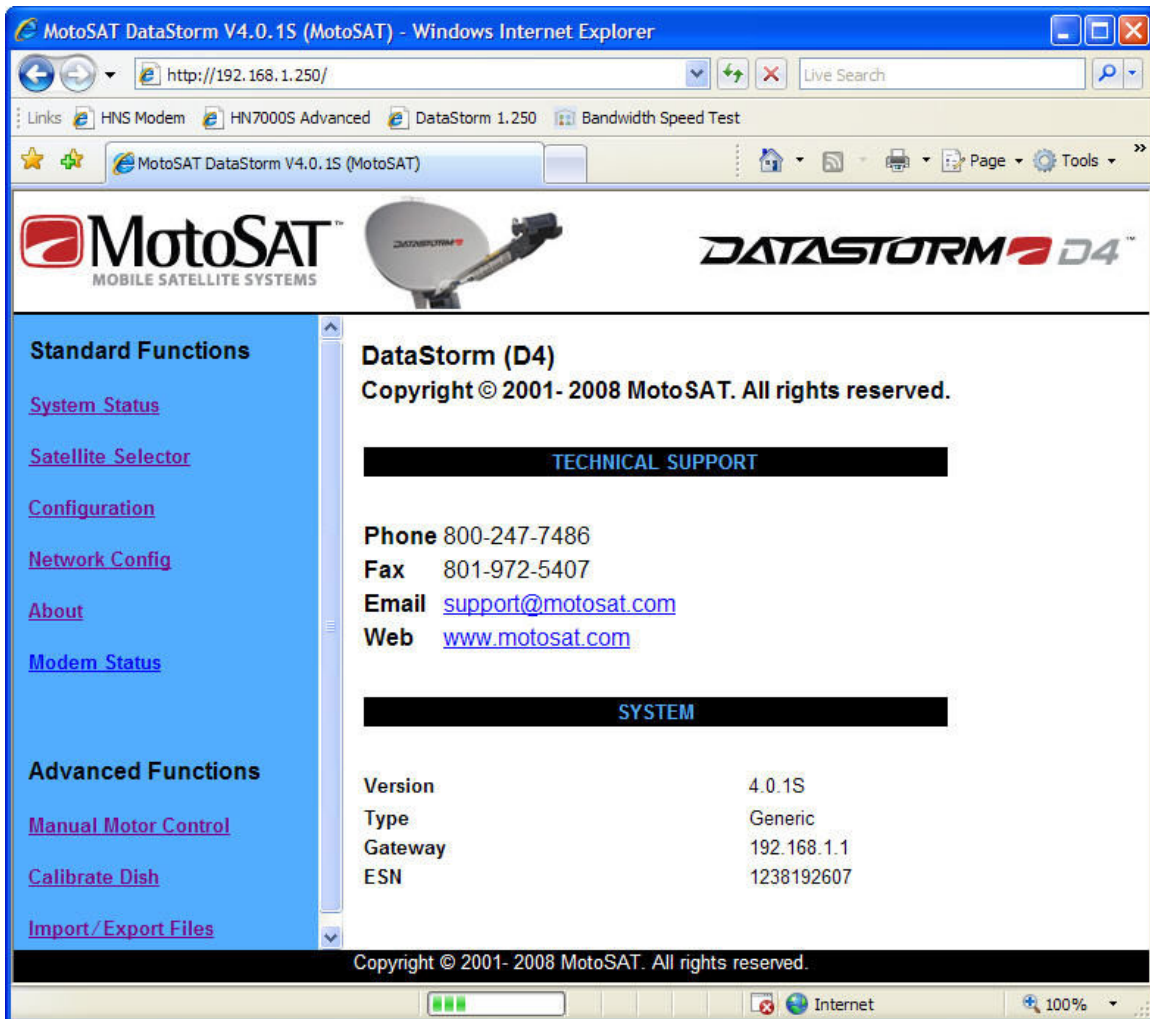
To change the motor current limits: motorcurrent axis value.
Where axis is one of AZ EL or SK and value is a number between 0.1 and 6.0.

The current motor current limits are
  AZ: 2.75
  EL: 2.5
  SK: 0.6
DATASTORM % motorcurrent AZ 2.5

The current motor current limits are
  AZ: 2.5
  EL: 2.5
  SK: 0.6
DATASTORM %
```

```
Telnet 192.168.1.250
DATASTORM % motorspeed
To change the motor speed type: motorspeed axis value.
Where axis is one of AZ EL or SK and value is a number between 0 and 512.
The current motor speeds are
  AZ: 50
  EL: 50
  SK: 50
DATASTORM % motorspeed EL 65
The current motor speeds are
  AZ: 50
  EL: 65
  SK: 50
DATASTORM %
```



MotoSAT DataStorm V4.0.1S (MotoSAT) - Windows Internet Explorer

http://192.168.1.250/

Links: HNS Modem, HN7000S Advanced, DataStorm 1.250, Bandwidth Speed Test

MotoSAT DataStorm V4.0.1S (MotoSAT)

MotoSAT MOBILE SATELLITE SYSTEMS **DATASTORM D4**

Standard Functions

- [System Status](#)
- [Satellite Selector](#)
- [Configuration](#)
- [Network Config](#)
- [About](#)
- [Modem Status](#)

Advanced Functions

- [Manual Motor Control](#)
- [Calibrate Dish](#)
- [Import/Export Files](#)

MANUAL MOTOR CONTROL

Signal Quality: 58 (Green bar chart)

Signal Strength: 559 (Blue bar chart)

System Status: Search Time 3 Minutes 54 Seconds

Count: 1169, 808, 384

Angle: 101.6016, 38.11942, -35.40266

Elevation, Azimuth, Skew

STOP 0.5 Degrees

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Waiting for http://192.168.1.250/refmotor.htm?Action=Refresh...

D4 (System) WIRING

The D4 has Seven (7) Connections on the back of the Controller.

D4 Rear Panel



AC In > Main power supplies 115 VAC up to 10 Amps.

AC Out > 115 VAC Switched output. Can be used to supply up to 10 Amps for a Modem or BUC requiring AC power. In this condition the AC Power Switch located on the Front Panel can be used as a **Transmitter Kill Switch**.

Antenna > 9 Pin Terminal Block > connects the D4 Controller to the DataStorm Satellite Antenna usually mounted on the vehicle roof. This connector supplies Motor Power and Position Information.

Use supplied MotoSAT Antenna Control Cable and wire as shown to the DataStorm Satellite Antenna Circular Connector (9 or 14 Pin). It is important to use the cable supplied.

Pin 1	Black	AZ Motor - Output
Pin 2	Brown	AZ Motor + Output
Pin 3	Red	EI Motor + Output
Pin 4	Orange	EI Motor - Output
Pin 5	Yellow	Position Count Halt Input
Pin 6	Green	Ground
Pin 7	Blue	CAN + Communications
Pin 8	White	CAN - Communications
Pin 9	Purple	UCB Power (+12 to +15 Volts DC)

I/O RS232 > 3 Pin Terminal > when enabled can supply a GPS NMEA data stream to modems or other devices.

LAN > RJ45 > is the Network Interface to communicate to a Local Computer, Router, and Satellite Modem. This Port has configuration tools that make it extremely flexible for almost any user requirement. See D4 Configuration for additional information.

LNB RX Out > F Type > connects to the Satellite Modem/Router. When connected the D4 Controller can monitor the DC Voltage supplied to the LNB and also allows the LNB located on the Satellite Antenna Mount to be shared by both the D4 Controller and the Satellite Modem at the same time with no external splitters or switches required.

LNB RX In > F Type > connects to the LNB located on the Satellite Antenna. This input receives L Band Signals 950-2050 MHz and supplies LNB DC Volts.

9 Pin Terminal Plug



IEC Male Plug



IEC Male AC Cable



DataStorm D4 Message codes:

-1 "Unknown error",

Issue: The system has received a message it can not decipher from the processor.

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible replacement.

-2 "Invalid CAN command",

Issue: Can bus error. (UCB to D4 communication error)

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Using the mounts wiring diagram perform an OHMS test and ensure the system is within tolerances.
5. Contact MotoSAT support for possible parts replacement.

-3 "Bad parameter",

Issue: Can bus error. (UCB to D4 communication error)

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Using the mounts wiring diagram perform an OHMS test and ensure the system is within tolerances.
5. Contact MotoSAT support for possible parts replacement.

-4 "Not ready",

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-5 "Bad return value",

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-6 "Access denied",

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-7 "System error",

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-8 "Handshake error",

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-9 "Operation timeout",

Issue: Can bus error. (UCB to D4 communication error)

Resolution:

12volt PS on 15 Volt System

1. Ensure the D4 power supply is supplying the correct voltage and amperage for the specific mount it is controlling.
2. Power cycle the controller and check connections at the mount and on the controller.
3. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
4. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
5. Using the mounts wiring diagram perform an OHMS test and ensure the system is within tolerances.
6. Contact MotoSAT support for possible parts replacement.

-10 "PC Serial timeout",

Not used obsolete.

-11 "Mount A/D failure",

Issue: UCU is not functioning properly

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
3. Contact MotoSAT support for possible replacement.

-12 "Invalid pointer",

Issue: N/A = This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.

3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-13 "Compass failure",

Future use only

-14 "Mount SPI failure",

Obsolete not used

-15 "Mount not present",

Issue: Control cable shorted or disconnected Upper control board shorted or disconnect. Internal wire harness shorted or disconnected.

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Check and reseat connections at the UCU..
3. Using the mounts wiring diagram perform an OHMS test and ensure the system is within tolerances.
4. Contact MotoSAT support for possible parts replacement.

-16 "Tilt sensor failure",

Issue:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-17 "GPS failure",

Issue: GPS chip is not sending data.

Temporary solution: Enable Manual location settings in configuration.

Resolutions:

1. Contact MotoSAT support for possible replacement.

-18 "Shorted GPS Antenna",

F1 mount Trimble Antenna

Issue: GPS antenna is not sending data to the GPS chipset.

Temporary solution: Enable Manual location settings in configuration.

Resolutions:

1. Contact MotoSAT support for possible replacement.

-19 "Open GPS Antenna",

F1 mount only BRICK UCB

Issue: GPS antenna is not sending data to the GPS chipset

Temporary solution: Enable Manual location settings in configuration.

Resolutions:

1. Contact MotoSAT support for possible replacement.

-20 "No GPS battery",

F1 Only BRICK UCB

Temporary solution: Enable Manual location settings in configuration.

Resolutions:

1. Contact MotoSAT support for possible replacement.

-21 "Isolation test error",

Hughes Only

Issue: there was a communications error with the Direcway modem during the isolation test.

Resolutions:

1. Power cycle the controller modems and router and check network connections.
2. Contact the Direcway bandwidth provider for possible modem or radio assembly replacement.

3. Contact 3rd party networking hardware provider for possible networking hardware replacement.
4. Contact MotoSAT support for possible parts replacement.

-22 "No serial connection", Obsolete

-23 "Dish not tested",

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

Perform test dish

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-24 "Bad version",

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-25 "Modem not responding",

Issue: Usually only seen in iDirect mode when username or password are incorrect or the iDirect modem is not responding or not commissioned.

If in iDirect modem with iDirect modem attached:

Resolution:

Or no LNB power from Modem to controller

Telnet sensors command to read modem voltage

1. Check network Cabling and network configurations on the D4 to ensure they match with the iDirect option files information.
2. using the DATASTORM% telnet prompt use the setvalue commands to re set the modem username and password.

Or import name using Config file

4. Contact 3rd party networking and or modem hardware provider for possible networking hardware replacement.

If not in iDirect mode:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-26 "Serial Tx locked", Obsolete not used

-27 "CAN Tx locked",

Obsolete not used

-28 "Positioner Serial timeout",

Obsolete not used

-29 "Positioner CAN timeout",

Issue: Can bus error. (UCB to D4 communication error)

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Using the mounts wiring diagram perform an OHMS test and ensure the system is within tolerances.
5. Contact MotoSAT support for possible parts replacement.

-30 "Mount CAN timeout",

Issue: Can bus error. (UCB to D4 communication error)

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Using the mounts wiring diagram perform an OHMS test and ensure the system is within tolerances.
5. Contact MotoSAT support for possible parts replacement.

-31 "Isolation test not available",**Hughes Modems only**

Issue: there was a communications error with the Direcway modem during the isolation test.

Resolutions:

1. Check all coaxial connections and F connectors.
2. Power cycle the controller modems and router and check network connections.
3. Contact the Direcway bandwidth provider for possible modem or radio assembly replacement.
4. Contact 3rd party networking hardware provider for possible networking hardware replacement.
5. Contact MotoSAT support for possible parts replacement.

-32 "Can't load ACPAPI",

Hughes only communications issue with Hughes modem or HNS cross pol server.

Retest later.

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-33 "Bad license key",

Obsolete not used

-34 Motor overcurrent Azimuth

Issue: The Azimuth motor is drawing too much current. This can also happen if a counter is not working properly and the mount hits a limit when the software thinks it should not.

Motor has seen excessive currents. Man move motor 90 degrees both ways. Test counts. See that motor moves. Nothing blocking dish.... Hit limit when no counts.

Resolutions:

1. Check the controller's power supply and ensure it is supplying the correct voltage and amperage for the mount it is controlling
2. On a D4 Isolate the Motor that is causing the error by running a Test Dish and making note of the direction the dish is moving when the error occurs.
3. On a D4 ensure the controller has firmware version 3.9.0 or higher, perform a test dish from the DATASTORM% prompt to determine the motor that is causing the error.
4. Attempt to move that Motor using manual software motor controls.
5. If the Unit still will not move attempt to move that motor by directly applying power (9-18v) to the proper wires on the control cable.
6. Continue to troubleshoot below depending on the motor with the issue.

Azimuth and Skew Motors: It is possible to determine if the issue is on the UCU by swapping the location the motor is plugged into the UCU as the connectors are the same size and has the same wiring configuration. If the motor causing the error will work while plugged into its counter parts connection on the UCU then the issue is with the UCU (replace UCU). If it will not, the issue is with the Motor itself or its count sensor (replace motor).

Elevation Motor: 90% of these will be elevation motor failure 10% could be the UCU. Replace and test in that order.

7. Contact MotoSAT support for possible parts replacement.

-35 Motor count azimuth,

Issue: The azimuth counter is not counting.

Test man motor movement. Bad sensor, bad UCB, bad scotch lock, broken or shorted wire

Resolutions:

1. On a D4 ensure the controller has firmware version 3.9.0 or higher, perform a test dish from the DATASTORM% prompt to determine the motor that is causing the error.
2. Attempt to move that Motor using manual software motor controls.
3. If the Unit still will not move attempt to move that motor by directly applying power (9-18v) to the proper wires on the control cable.
4. Contact MotoSAT support for possible parts replacement.

-36 "Bad motor count",

Displays in Test Dish Only. Manually man move dish to confirm bad sensor.

Issue: After a dish calibration a count is out of tolerance.

Resolutions:

1. Check the controller's power supply and ensure it is supplying the correct voltage and amperage for the mount it is controlling.
2. On a D4 Isolate the Motor that is causing the error by running a Test Dish and making note of the direction the dish is moving when the error occurs.
3. On a D4 ensure the controller has firmware version 3.9.0 or higher, perform a test dish from the DATASTORM% prompt to determine the motor that is causing the error.
4. Attempt to move that Motor using manual software motor controls.
5. If the Unit still will not move attempt to move that motor by directly applying power (9-18v) to the proper wires on the control cable.
6. Continue to troubleshoot below depending on the motor with the issue.

Azimuth and Skew Motors: It is possible to determine if the issue is on the UCU by swapping the location the motor is plugged into the UCU as the connectors are the same size and has the same wiring configuration. If the motor causing the error will work while plugged into its counter parts connection on the UCU then the issue is with the UCU (replace UCU). If it will not, the issue is with the Motor itself or its count sensor (replace motor).

Elevation Motor: 90% of these will be elevation motor failure 10% could be the UCU. Replace and test in that order.

7. Contact MotoSAT support for possible parts replacement.

-37 "Satellite not found",

**Check sat table, scansat , find other satellite, tree, building, skew motor not wired right
G75 tri assembly is in other polarity**

Issue: Satellite acquisition failed.

Resolutions:

1. Check all coaxial connections and F connectors.
2. Power cycle the controller modems and router and check network connections.
3. Perform a dish calibration.
4. Send the unit to search again.
5. Contact MotoSAT support for possible parts replacement.

-38 "Gateway not found",

Issue: The gateway specified in the network configuration is not able to be pinged from the controller.

Resolutions:

1. Power cycle the router, switches, and or modems.
2. Check network cabling and network configurations on the D4 to ensure they match the current routers or switches configuration.
3. Power cycle the Controller.
4. Contact 3rd party networking hardware provider for possible networking hardware replacement.
5. Contact MotoSAT support for possible parts replacement.

-39 "Can't start isolation test",

Hughes only, test later.. no Hughes server. Wait and retest

Issue: there was a communications error with the Direcway modem during the isolation test.

Resolutions:

1. Check all coaxial connections and F connectors.
2. Power cycle the controller modems and router and check network connections.
3. Contact the Direcway bandwidth provider for possible modem or radio assembly replacement.
4. Contact 3rd party networking hardware provider for possible networking hardware replacement.
5. Contact MotoSAT support for possible parts replacement.

-40 "Isolation test failed",

Hughes only, test later... Wait and retest try other satellite.

Issue: The Direcway modem failed the isolation test.

Resolutions:

1. Check all coaxial connections and F connectors.
2. Power cycle the controller modems and router and check network connections.
3. Change isolation optimization in the controllers' configuration to High or Medium as necessary.
4. Contact the Direcway bandwidth provider for possible modem or radio assembly replacement.
5. Contact 3rd party networking hardware provider for possible networking hardware replacement.
6. Contact MotoSAT support for possible parts replacement.

-41 "Operation cancelled",

Issue: This is a normal system condition when you push stop on the system status screen.

-42 "Out of memory",

Replace D4

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Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-43 "Not supported",

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

Replace D4, contact MotoSAT,

-44 "Dish not stowed",

Obsolete not used. Call MotoSAT if detected.

-45 "Modem LNB Volts not detected",

Issue: The D4 controller does not detect any voltage from the Modem LNB In port.

Resolutions:

1. Check all coaxial connections and F connectors.
- 2.
3. Contact MotoSAT support for possible parts replacement.

-46 "Controller RF Cables reversed",

Issue: If the transmit and receive cables are reversed you get this message

Resolutions:

1. Check all coaxial connections and F connectors.

-47 "DVB not detected",

Issue: Only on D4 controllers.

Replace Controller

1. Contact MotoSAT support for possible parts replacement.

-48 "DiRECTWAY modems not found",

Or no LNB power from Modem to controller

Telnet sensors command to read modem voltage

Issue: In Hughes Net or Direcway mode but cant talk to the modem.

Resolutions:

1. Power cycle the controller.
2. Check network Cabling and network configurations on the D4 to ensure they match with the modems commissioning information.

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3. Contact the DiRECWAY bandwidth provider for possible modem replacement.
4. Contact 3rd party networking hardware provider for possible networking hardware replacement. If not in iDirect mode:
5. Power cycle the controller and check connections at the mount and on the controller.
6. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
7. Contact MotoSAT support for possible parts replacement.

-49 "Satellite not supported",

Sat Table or Config issue

Issue: Wrong satellite longitude entered or the Satellite entered does not exist in the DVB table.

Resolutions:

1. Ensure the controllers configurations match that of the connected modem.
2. Contact MotoSAT support to ensure the satellite requested is in the DVB table.

-50 "Motor limit",

Issue: This is a standard system message when a motor reaches its limit while using manual motor controls. No error.

-51 "Tuner AGC did not lock",

Issue: DVB Tuner failure

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Contact MotoSAT support for possible parts replacement.

Replace controller

-52 "AZ Motor Limit",

Test dish, check man counts. Stow replaces controller.

Issue: The azimuth motor reached its limit prematurely.

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform stow dish operation.
3. Ensure the controller has firmware version 3.9.0 or higher and perform a test dish from the DATASTORM% prompt.
4. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller higher and perform a test dish from the DATASTORM% prompt.
5. Contact MotoSAT support for possible parts replacement.

-53 "El Motor Limit",

Test dish, check man counts. Stow replaces controller.

Issue: The elevation motor reached its limit prematurely.

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform stow dish operation.
3. Ensure the controller has firmware version 3.9.0 or higher and perform a test dish from the DATASTORM% prompt.

4. Perform nvclear command from the D4boot% prompt in a telnet session, power cycle the unit and reconfigure the controller higher and perform a test dish from the DATASTORM% prompt..
5. Contact MotoSAT support for possible parts replacement.

-54 "SK Motor Limit",

Test dish, check man counts. Stow replaces controller.

Issue: The skew motor reached its limit prematurely.

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform stow dish operation.
3. Ensure the controller has firmware version 3.9.0 or higher and perform a test dish from the DATASTORM% prompt.
4. Perform nvclear command from the D4boot% prompt in a telnet session, power cycle the unit and reconfigure the controller higher and perform a test dish from the DATASTORM% prompt..
5. Contact MotoSAT support for possible parts replacement.

-55 "Azimuth is not at the limit",

XF Mount.. read sensors, test mount, replace controller

Issue: Azimuth limits sensor failure.

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform stow dish operation.
3. Ensure the controller has firmware version 3.9.0 or higher and perform a test dish from the DATASTORM% prompt.
4. Perform nvclear command from the D4boot% prompt in a telnet session, power cycle the unit and reconfigure the controller higher and perform a test dish from the DATASTORM% prompt..
5. Contact MotoSAT support for possible parts replacement.

-56 "Elevation is not at the limit",

XF Mount.. read sensors, test mount, replace controller

Issue: Elevation limits sensor failure.

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform stow dish operation.
3. Ensure the controller has firmware version 3.9.0 or higher and perform a test dish from the DATASTORM% prompt.
4. Perform nvclear command from the D4boot% prompt in a telnet session, power cycle the unit and reconfigure the controller higher and perform a test dish from the DATASTORM% prompt.
5. Contact MotoSAT support for possible parts replacement.

-57 "SNR Not Available",

Check sat table, Config, try other satellite, LNB cables, or controller

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.

3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-58 "Bad motor parameter",

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-59 "Can communication problem",

Issue: Can bus error. (UCB to D4 communication error)

Resolution:

1. Ensure the D4 power supply is supplying the correct voltage and amperage for the specific mount it is controlling.
2. Power cycle the controller and check connections at the mount and on the controller.
3. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
4. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
5. Using the mounts wiring diagram perform an OHMS test and ensure the system is within tolerances.
6. Contact MotoSAT support for possible parts replacement.

-60 "Bad parameter LED",

Replace Controller

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-61 "Communications problems with Hughes",

Obsolete... call MotoSAT if displayed.

Issue: In Hughes Net or Direcway mode but cant talk to the modem.

Resolutions:

1. Power cycle the controller.
2. Check network Cabling and network configurations on the D4 to ensure they match with the modems commissioning information.
3. Contact the DiRECWAY bandwidth provider for possible modem replacement.
4. Contact 3rd party networking hardware provider for possible networking hardware replacement.

If not in iDirect mode:

5. Power cycle the controller and check connections at the mount and on the controller
6. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
7. Contact MotoSAT support for possible parts replacement.

-62 "Bad parameter Exchange 1",

Replace Controller

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-63 "Bad parameter Exchange 2",

Replace Controller

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-64 "Bad parameter Bad Key",

Replace Controller

Issue: This message should only be displayed in debug mode for use when compiling newer versions of software if this message appears during normal use:

Resolutions:

1. Power cycle the controller and check connections at the mount and on the controller.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Perform ucupdate command from the DATASTORM% prompt in a telnet session.
4. Contact MotoSAT support for possible parts replacement.

-65 "Motor stalled elevation",

Motor Count issue

Issue: elevation counter is not working properly

Resolutions:

1. Ensure the controller has firmware version 3.9.0 or higher and perform a test dish from the DATASTORM% prompt.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Contact MotoSAT support for possible parts replacement.

-66 "Motor stalled skew"

Motor count issue

Issue: skew counter is not working properly

1. Ensure the controller has firmware version 3.9.0 or higher and perform a test dish from the DATASTORM% prompt.
2. Perform nvclear command from the D4boot% prompt in a telnet session power cycle the unit and reconfigure the controller.
3. Contact MotoSAT support for possible parts replacement.

-67 Azimuth Motor Speed Failed

**Motor Speed testing in test dish, set mot speed and mot current retest
Mount, motors, controller**

--68 Elevation Motor Speed Failed

**Motor Speed testing in test dish, set mot speed and mot current retest
Mount, motors, controller**

-69 Halt Line Failure

-70 Motor Overcurrent Elevation

**Set motor currents in telnet or Config
Replace bad motor or mount, or controller**

-71 Motor Overcurrent Skew

**Set motor currents in telnet or Config
Replace bad motor or mount, or controller**

-72 Rotary Sensor Wait

XF mount only

The XF2 and XF3 Mounts use Quadrature Count Sensors for both Azimuth and Elevation positioning. These sensors operate properly when the outside temperature is above 32 degrees F. In extreme cold environments these sensors must warm up before the mount will begin to move.

These sensors have built in heating circuits that are monitored by the UCB (Upper Control Board) which will communicate to the

Extreme cold weather wait.

-73 Semaphore Locked

Replace Controller

-74 Locked Semaphore Released.

-75 Low Battery or No Motor Voltage

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MESA Only

The MESA 120A and 120P mount can be operated from either an External Battery located on the MESA Mount behind the Motor Control Board or from a 15 Volt DC 4 Amp power Source.

The Battery is trickle charged through the RX Coax Cable which comes from the D4 Controller through a 2 Port Power Passive Splitter located on the Back of the Antenna Mounting Plate then into the Motor Control Board. Depending on how long the Mount has been in storage before installation, this Battery may need to be charged. A Trickle Charge may take up to 5 hours depending on the Battery.

The Battery can be removed from the MESA Mount and charged quicker using a standard Car Charger at 3 Amps or less.

If External 15 Volts DC is supplied then it will be directly connected to the Motor Control Board. See Wiring Diagrams to show proper wiring of the 15 Volt DC Source.

Issue:

The D4 Controller is receiving this message from the Motor Control Board located on the MESA Mount.

Resolutions:

1. If the MESA mount has been just been installed or has been disconnected from use for several weeks the Battery voltage may require charging.
 - a. Check that the LNB light on the D4 Controller is ON.
 - b. Check the Telnet Sensors command to see MESA Battery voltage. C or D would be a full charge.
 - c. Verify that Charging = Yes
 - d. Check that LNB Volts = 18 volts (approx)

If a, b, and c above are correct let the MESA mount charge for approximately 3 hours before use. The Charging voltage is supplied through the Coax Cable from the D4 Controller. Leave power on D4 during this time.

If Battery does not come up to charge replace Battery.

2. If the MESA mount does not have a Battery, check the DC voltage running to the mount. Voltage should be 12 to 15 Volts DC.
 - a. If no voltage replace DC Power Supply
 - b. If voltage is good replace MESA Motor Control Board.
3. If the above steps do not resolve this issue contact MotoSAT Technical support at 800-247-7486 for additional assistance.

Telnet 192.168.1.250 or as configured
DATASTORM % sensors

Mount Sensors:

[HARDWARE]

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Preliminary Manual

Tuner ID: 82

hardware version = 7

MESA mount. Andrews dish.

LNB VReg 1C. 18 Volts. Boosted

Status F2D

Battery Charge	D	> B is Low
Charging	NO	> Yes if Charging
Limit Flag	YES	
Motor Moving	NO	
Timeout	NO	
Stowed	YES	
Dish Tested	YES	
Stow Limits Tested	YES	
Count valid	YES	
Low Battery	NO	> Yes if Needs charge

[Lower Control Board Info]

ADC0	30	
ADC + Gain	0	
Volts In	11.83105	> External Power Supply
Tuner Volts	0.225586	
Tuner Amps	1.070547	
Rec Volts	0	> LNB Volts from Modem
LNB Volts	18.2209	> Volts supplied to Charge MESA
LNB chip	1C	> you would not understand

End of Preliminary Document

Jan 31, 2009

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CONTACT INFORMATION

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