

Titanium Satellite



ASC1

Satellite Positioner and Polarity Controller

Owners Manual v.7

June 26th, 2015

Titanium Satellite

Congratulations! You now own the most advanced satellite dish controller based on the latest technologies, the ASC1 dish actuator and polarity controller by Titanium Satellite. The ASC1 has been assembled using the highest quality components to provide exceptional performance and years of reliable operation.



The ASC1 may be used as a stand-alone or as a fully automatic positioner when connected to your DiSEqC capable satellite receiver. Replaces old legacy analog or 4DTV satellite receivers to completely control a motorized satellite dish. No more conversion charts taped to the wall or juggling multiple remotes to position the dish and select the correct polarity!

Any DiSEqC 1.2 capable satellite receiver connected to the ASC1 using a single coax cable, automatically controls satellite dish positioning, polarity and skew offset. Simply change channels on your STB and the ASC1 will take care of the rest. Unattended blind scanning of the entire arc with both polarities on a mechanical polarity servo type system is once again possible.

PC loader/editor software, RS-232 serial port and USB convertor allows back-up and restoration of satellite positions, custom satellite names and even share your custom satellite list. No more hours of reprogramming after factory reset. No need to send the ASC1 in for reprogramming or put up with outdated satellite names. Visit the support section of www.TitaniumSatellite.com for software, satellite lists and firmware upgrades that will add even more exciting functions and features to your ASC1.



The heavy duty 36Vdc @ 5 amp power supply exceeds every other consumer controller available. Effortlessly lifts large, heavy dishes and overcomes wind loads and large snowfalls.

IEC power connector and switchable AC input 115/230Vac @ 50/60hz allows the ASC1 to be operated anywhere in the world. Separate power source for polarity servo control and another for LNB, LNBFs and switches. Switchable LNB power settings of 13/18Vdc, reversed 18/13Vdc, fixed 18Vdc or 13Vdc @ 450mA provides many power options for your system. Native support Reed type sensors and with the optional OHR adapter, compatibility with Optical and Hall Effect type sensors plus Reed isolation filtering.

Visit www.TitaniumSatellite.com for expanded owners manuals, operational videos and a FAQ section. These support materials are being continuously updated as new features are introduced.

Please contact us with any questions or suggestions for product improvement. Thank you for your purchase!

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Important Notice: Save all original boxes, manuals, accessories and packaging materials in case it is necessary to return the merchandise. Before unpacking or assembly of any item, inventory the accessories and check for damage. Review the warranty, exchange and refund policies provided by your reseller. Immediately contact your reseller to report any issues.

Package Contents:

- ASC1 Controller
- Remote Control Unit
- 2 AAA Batteries
- RS-232 F/F DB-9 Cable
- USB/Serial Converter w/CD
- UL approved 3 pin AC cord.

Materials contained in this installation manual are the property of:
Titanium Satellite
PO Box 1201 / 16981 Placer Hills Road, Suite B7
Meadow Vista, CA 95722
530-652-4405

Important Safety Instructions

- ① Read these instructions.
- ② Keep these instructions.
- ③ Heed all warnings.
- ④ Follow all instructions.
- ⑤ Do not use this apparatus near water.
- ⑥ Clean only with dry cloth.
- ⑦ Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- ⑧ Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus(including amplifiers)that produce heat.
- ⑨ Do not defeat the safety purpose of the polarized or grounding-type plug.
A polarized plug has two blades with one wider than the other.
A grounding type plug has two blades and a third grounding prong.
The wide blade or third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- ⑩ Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- ⑪ Only use attachments/accessories specified by the manufacturer.
- ⑫ Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- ⑬ Unplug this apparatus during lightning storms or when unused for long periods of time.
- ⑭ Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



Caution - These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualifie to do so.

WARNING : TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE AND OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHOULD NOT BE PLACED ON THIS APPARATUS

Precautions



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE THE COVER (OR BACK). NO USER-SERVICEABLE PARTS ARE INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol indicates “dangerous voltage” inside the product that presents a risk of electric shock or personal injury.



This symbol indicates important instructions accompanying the product.

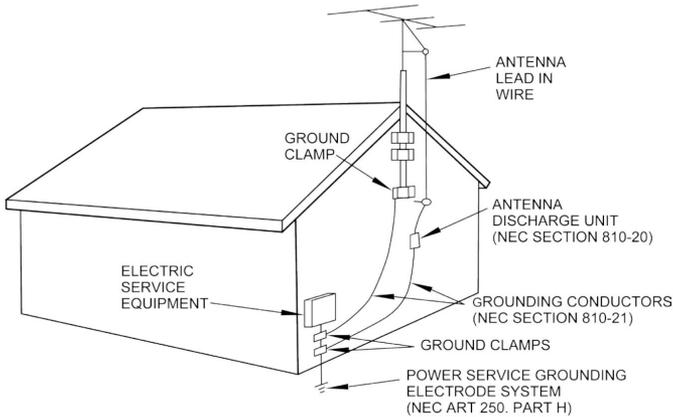
Do not install this equipment in a confined space such as a bookcase or similar unit.

WARNING : To prevent damage which may result in fire or electric shock hazard, do not expose this appliance to rain or moisture.

Notice

- ① The apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.
- ② The mains plug is used as the disconnect device. The disconnect device shall remain readily operable.

NEC, ANSI/NFPA 70



Example of Antenna Grounding

Replacement Parts When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards. Modification to the hardware or software without authorization by the manufacturer will result in voiding any warranty. Service assistance may be arranged by contacting your reseller.

Safety Check Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

ASC1 Specifications

AC Voltage In	115/230Vac, 50/60hz - User Setting
Current in Operation	600 ~ 1200mA @ 115Vac 340 ~ 640mA @ 230Vac
Current in Standby	270mA @ 115Vac / 120mA @ 220Vac
Input Protection	2A @ 250Vac User Replaceable Fuse
Output Voltage M1 / M2	32Vdc (typ), 38Vdc (max)
Output Current M1 / M2	5A (max)
Dual Motor Relays	10Amp @ 40Vdc (max)
IF In / Out Connectors	F-type IEC169-24 Female Loop-Through
Output Voltage to LNB/Switches	13Vdc/18Vdc Automatic or Fixed
Output Current to LNB/Switches	450mA (max), Warning Message @ 600mA
Over Current – LNB/Switches	Thermal Protection w/Auto Reset
Motor Connections	M+ / M- Screw Terminal 14 gauge
Sensor	Reed: S+ / S- Screw Terminal 14 gauge Optical / Hall Effect: See Optional OHR Adapter
Servo	Gnd/Pulse/+5Vdc 550m Screw Terminal 14 gauge
RF Insertion Loss	1.5dB
DiSEqC Control Amplitude	0.8 ±0.2V (required input level)
DiSEqC 1.2 Positions	99
Positioner Count	10,000 (+5,000 to -5,000)
Sensor Resolution	50hz (max)
Skew Offset	+/- 90° Rotation from H and V Polarity Setting
RS-232	Transfer Rate 56Kbps, 9 pin Male D-Sub
USB	Included USB to Serial RS-232 w/ CD PC Drivers
LCD Operation/Programming	4 Line Scrolling, Green Color Backlight
Front Panel Keys	7 Keys: Power, OK, Lock (Keyboard/Remote) (Dual Menu Nav) - East, West, Skew+, Skew-
Remote Control Keys	19 Active Keys: Power, OK, East, West, Skew+, Skew-, +, -, Previous, Home, Numeric (0-9)
Dimensions	11 L x 9.5 D x 4.5 H in 280 L x 240 D x 115 H mm
Weight	11.7 lbs / 5.3 KG



DiSEqC is a trademark of EUTELSAT
Assembled in China

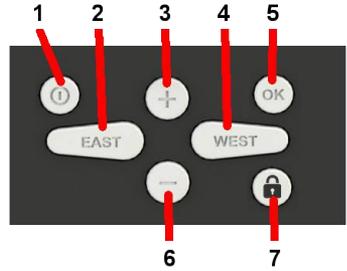


Warranty

This product is warranted against manufacturing and design defect for one year from the date of purchase. All warranty claims must be processed through your reseller and include a copy of the purchase receipt. This warranty is available only to the Customer whose name appears on the sales invoice. If a Vendor warranty is stated on the invoice, Vendor will repair or replace, at Vendor's option, the product containing manufacturing defects as long as the product is returned in its original shipping materials to Vendor within the original Vendor warranty period. Firmware upgrades with unapproved files or hardware modifications by a non-Vendor approved technician voids any and all warranties, expressed or implied. No merchandise will be accepted for repair or replacement without prior RMA number.

ASC1 Front Panel Keys:

1. Standby/Operate Mode
2. Drive Motor - East
Menu Function - Left
3. Polarity - Skew Offset Increase
Menu Function - Up
4. Drive Motor - West
Menu Function - Right
5. Menu Function – Enter or Accept
6. Polarity - Skew Offset Decrease
Menu Function - Down
7. RCU Lock – Disable/Enable Remote Control



Remote Control Keys:

-  Standby/Operate Mode
-  Numerical Keys- Satellite Selection
-  Menu Navigation - Up/Down
-  Enter or Accept
-  Drive Motor – West or East
-  Polarity Skew Offset Setting +/- 90°
-  Return to Previous / Main Menu
-  Go To Operation Screen



Rear Panel



Critical Setting: To prevent damage and voiding the ASC1 warranty, before connecting the power cord to the ASC1 or powering on the input voltage selector switch must be set for the local AC power voltage. For regions with electrical voltage of 90-130Vac, select the 115 position. For regions with voltages between 200-240Vac, select 230. The factory default setting is 230Vac.

1. AC Input Voltage Select 115Vac / 230Vac
2. AC Input Power Cord Connection IEC C14 type
3. AC Fuse 250Vac, 2A, 5 x 20mm, (slow-blow type approved)
4. Master Power Switch
5. Motor Connection – M1 /M2 (swap wires if reverse motor movement)
6. Positioner Count Sensor – S1 (positive)/S2 (ground) Sensor must be connected to prevent move error display.
7. Ground (typical color code black)
8. Polarity Servo – Pulse or Skew (typical color code white)
9. Polarity Servo - 5Vdc (typical color code red)
10. Receiver Connection F-type (Automatic Control w/ DiSeqC 1.2)
11. LNB/LNBF Connection F-type (13/18,18/13, 18, 13Vdc or Off)
12. Serial Com RS-232 (Upgrade, Edit, Back-up and Computer Control)

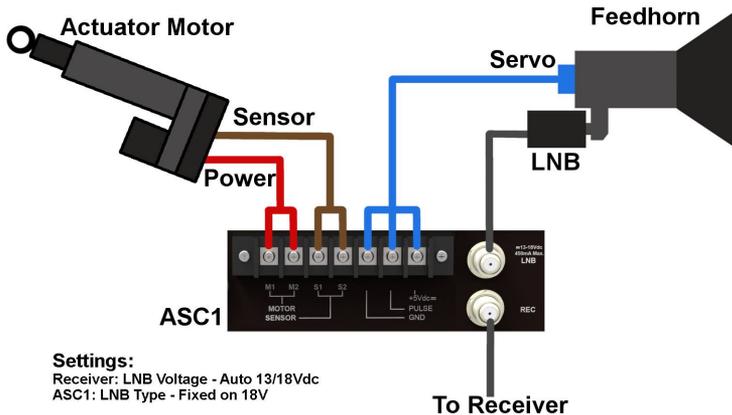
Installation

It is recommended that you only use high quality coax cable that is RG6 Quad Shield type or better with compression fittings and water proofed connections. Motor power wires M1/M2 should be at least 12-14AWG. Sensor and servo wires bundles should be 18-22AWG, each with a shielded bundle connected to ground at the ASC1 end of the run to minimize position count, motor setting and polarization control errors.

To avoid a dangerous and damaging voltage potential, the satellite dish ground must be bonded to the structure ground according to local electrical code. Failure to bond multiple grounds may cause switch, sensor and LNB control/performance issues. Please consult with a local electrician if you are unsure of proper grounding requirements. Carefully verify all connections prior to turning on the ASC1 Master Power Switch. Incorrect connections will damage the equipment and void warranties.

This manual assumes that the satellite dish has been prepared for the ASC1 installation with the motor's East and West mechanical limiters set and the dish parked in a position that is a few degrees to the East of the motor's West mechanical limit. If installing on a servo type feedhorn, be sure that the feed is rotated to the proper orientation using the manufacturer's "polar axis template". If you do not have a template, site down the long side of the servo motor; pointing it at about the 11 o'clock angle.

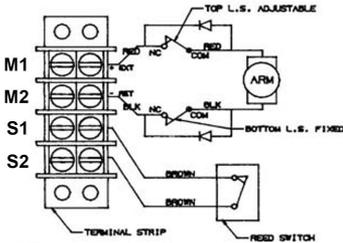
Connection Type: Servo Feedhorn / Single LNB



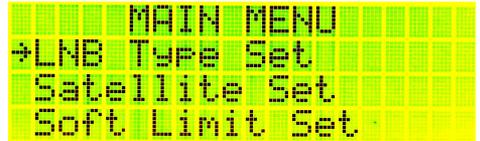
* See FAQ section at the back of this guide for additional install types and wiring diagrams.

Basic Install: Servo Feedhorn with Single LNB

1. Verify that the ASC1 Master Power Switch is OFF.
2. Select the Correct AC Line voltage for your install location. Use the 115 setting for AC voltages 90-130Vac and 230 setting for AC voltages 200- 240Vac.
3. Connect the ASC1 S1/S2 terminals to the actuator motor's Reed switch sensor leads using 18-22AWG wires. It does not matter which wire is connected to either S1 or S2. These sensor wire leads are typically brown color. Connect the shield for the sensor wire bundle only on one end of the run (ASC1's GND terminal, structure ground or the actuator housing. If the motor has an Optical or Hall Effect type sensor, purchase the optional OHR Adapter to interface.



4. Connect the ASC1 M1/M2 terminals to the actuator motor power connections using 12-14AWG wires. These wires are typically red and black color.
5. Verify that the M1/M2/S1/S2/GND wires are correctly connected. Failure to correctly connect these wires may short and possibly damage equipment and void the warranty.
6. Connect the AC cord from the ASC1 to the wall outlet. Do not remove or defeat the ground blade on the IEC AC cord. This ground connection protects you and your equipment!
7. Turn Master Power Switch ON
8. The Main Menu will appear for 20 seconds. If no menu option is selected, the Main Menu the Default Operation Display Screen will appear. Scroll to the next page of the operation menu or press the Return button on the remote to display the Main Menu.



Important Notice: Be sure that the motor moves the correct direction when the East or West keys are pressed. If the dish moves in the wrong direction, the M1 and M2 wires must be swapped. (be sure to turn off the Master Power Switch if this wire swap is required). If the dish has been repositioned, perform a “Position Reset” to resync the counter display to sensor count 0000 (see page 10). Some users prefer to have the 0000 count displayed on the East end of the arc, centered, or on the West end of the arc. This is a personal choice and will not affect the positioning control or programming procedures.

Note: If the remote control does not control the ASC1 after inserting or replacing the batteries, check that the Front Panel RCU Lock function is not enabled. This is a toggle ON/OFF button that will disable the ASC1's remote control from controlling the unit.

Setting Software East / West Limits (optional)

The mechanical travel limiters located inside of the motor should have already have been set. The motor mechanical limiters prevent extreme dish movements that could drive the reflector into the ground or other object, damaging the reflector or motor. If the mechanical limiters have not been already been set, this should be done before installing the ASC1. Software limits stored in the ASC1 are optional and should only be used as an additional safety precaution. It is **NOT** necessary to program the East and West Limits in the ASC1. Follow these step if you wish to set software limits.

1. Select **Soft Limit Set** and press OK.

2. The Position counter should display 0000. The dish should already be parked near the West Mechanical limit setting. Select Set as WEST Limit and press OK. **WEST Limit Saved!** prompt will be displayed.

```
Soft Limit Set
+Position:    0000
Set as WEST limit
Set as EAST limit
```

3. Select Position and press the East Key to drive the motor to the Eastern limit. Carefully watch the dish during the movement to the Eastern limit to be sure that the dish does not contact any object and the motor does not bind or the dish flops.

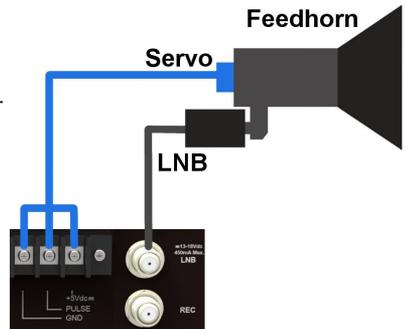
```
Soft Limit Set
Position:    0775
Set as WEST limit
+Set as EAST limit
```

4. Back the dish up a few clicks from the mechanical hardware limiter stop. Select Set as EAST Limit and press OK. **EAST Limit Saved!** prompt will display.
5. Arrow down to Select Quit then Press OK to exit Soft Limit Set Menu and return to the Main Menu.

```
Soft Limit Set
+Quit
```

Polarity - Servo Connection

1. Power OFF the ASC1 Master Power Switch.
2. Connect the ASC1 three Servo terminals to the mechanical polarity servo connections using 18-22AWG shielded wire. Typically, the +5Vdc color code is red color, Pulse (Skew) is white and the Ground is black. This wire bundle must have a shielded and the shield must be connected to ground to prevent servo error, polarity drift and switching chatter. See the FAQ section at the end of this booklet for additional steps if the Servo continues to chatter or pulse after polarity changes.



Important Notice: The feedhorn polarity alignment on the dish is very important. Most feedhorn manufacturers provide a template for installing the feedhorn. If your feedhorn was not provided with an installation template, the long edge of the servo body is typically aligned with the vertical axis of the reflector when the dish is aimed at true South (the highest point of the arc). See Page 14, step 6 for additional information.

LNB Connection

1. Power OFF the ASC1 Master Power Switch before connecting to a LNB or Switch. Connecting with the Power ON may damage the switch or LNB.
2. Connect the ASC1 LNB port to the LNB using a quality RG6 coax cable. If your system has multiple LNBs or LNBFs, see the FAQ in the back of this install guide. Consult with the switch supplier regarding wiring configurations and establishing a signal path using the receiver 22KHz/DiSEqC 1.0/1.1 commands.
3. Power ON the ASC1 Master Power Switch.

LNB Power Setting

1. Select LNB Type Set. Press OK.
 - a) Select **Fixed on 18V** if powering a single or multiple LNBs or to lock a horizontal polarity on a LNBF.
 

```
LNB Type Set
→H:18V, U:13V
H:13V, U:18V
Fixed on 18V
```
 - b) Select **H:18V, V:13V** if the connected STB will control the voltage polarity of a voltage polarity controlled LNBF or if using a voltage controlled multi-switch.
 - c) Select **H:13V, V:18V** if you wish to reverse the typical polarity switching protocol as outlined above.
 - d) Select **Fixed on 13V** if you wish to control a specific switch port or lock a vertical polarity on a LNBF.
2. Select Save when the desired LNB output voltage has been selected. **LNB Type Saved** will be displayed.
 

```
LNB Type Set
Fixed on 13V
→Save
Quit
```
3. Select Quit. Press OK to exit and return to the main menu.

System Reset

We recommend that you use the PC software and RS-232 serial cable and/or USB Convertor to back-up your custom satellite list and polarity settings before performing a System Reset. This simple save/reload procedure may save hours of reprogramming.

The ASC1 has four different types of resets.

1. Complete Reset of the Satellite List including the positioning, names & polarity settings.
2. Reset Software East/West Limits.
3. Reset Positioner Count to 0000.
4. Global Reset All Data To Default.



When a reset function is completed, select Quit. Press OK to return to the main menu.

Satellite List Reset

1. Select Reset SAT Data. Press OK.
2. Press OK a second time within 3 seconds to confirm deletion of all satellites / positioning data.
3. SAT Data Reset! Prompt will display.

```
Press OK to confirm
+Reset SAT data
SAT data reset!
```

Software East West Limit Reset

1. Select Reset Soft Limit. Press OK.
2. Press OK a second time within 3 seconds to confirm that you wish to delete the East and West software limits.
3. Soft Limit Reset! Prompt will display.

```
Press OK to confirm
Reset SAT data
+Reset soft limit
Soft limit reset!
```

Positioner Count Reset – Resynchronize Global Shift

1. Drive to the position that is to be the new 0000 position.
2. Select Reset Position and press OK.
3. Press OK a second time within 3 seconds to confirm that you wish to reset the Positioner Count to 0000.
4. SAT Position Reset! Prompt will display.

```
Press OK to confirm
Reset SAT data
Reset soft limit
+Reset position
```

```
SAT position reset!
```

Hint: If all satellite positions need to be shifted the same number of counts, determine how many counts to offset from the current position. Drive the positioner to 0000 then drive East or West the additional number of counts required to shift and resync using the Reset Position function. Simply perform steps 1 – 4 to resynchronize a global shift of all satellite positions.

Global Reset

1. Select Global Reset and press OK.
2. Press OK a second time within 3 seconds to confirm that you wish to reset all data and return to the default settings.

```
System Reset
+Global reset
Quit
All data cleared!
+Global reset
Quit
```

Notice: This will delete all satellite positions, satellite names, polarity and skew settings. Upon completion, the All Data Cleared! Prompt will display.

Back Light Timeout

The default time for the LCD backlight is 30 seconds. This may be set to 10, 20, 30, 40, 50 or to stay lit at all times. The LCD will automatically light when a command is sent from a connected STB or selection is made from the ASC1 front panel or remote control.

1. Select Back Light Set. Press OK.
2. Select the length of time the backlight will be lighted and press OK. An arrow will appear to the right of the selected time setting.
3. Select Save. Press OK. Backlight Set OK will be displayed.
4. Select Quit and press OK to return to the main menu.

```

Backlight Set
+10 Seconds
 20 Seconds
 30 Seconds
                                     +
  
```

```

Backlight set OK!
+Save
Quit
  
```

Programming - Quick Overview

When both the satellite receiver and ASC1 have been programmed, the ASC1 will become an automatic interface between your STB and the satellite dish. Whenever you change channels on your receiver or scan for channels, the ASC1 will automatically move the dish and set the correct polarity. You may use either the receiver's install menu to fine-tune the dish position or you may use the ASC1 remote or front panel to fine-tune both dish position and polarity offsets. These fine tuned settings may be saved by either the receiver or the ASC1.

The receiver and ASC1 communicate using a protocol called DiSEqC 1.2. DiSEqC 1.2 assigns a motor reference number for each satellite. This assigned number is typically called the DiSEqC 1.2 Number or Motor Position in the satellite receiver's installation menu. A DiSEqC 1.2 number is either preassigned by the firmware or is a user setting. The important thing to remember is that in order to communicate, the DiSEqC 1.2 number assigned for each satellite in the receiver must match the satellite DiSEqC 1.2 number assigned in the ASC1.

DiSEqC 1.2 motor assignment numbering coordination is critical! Example: If the satellite receiver is programmed for DiSEqC 1.2 position number 1 to be satellite A, but the ASC1 has been programmed for DiSEqC 1.2 number 1 to be satellite B, The ASC1 will move the motor to satellite B when the receiver issues a command to go to DiSEqC motor assignment 1. This is not a fault of either the receiver or the ASC1, but simply that the system was incorrectly programmed.

Note: Many receivers will automatically issue control signals if a programmed satellite signal is lost in an attempt and re-establish the signal path. If the user manually moves the motor East/West using the ASC1 front panel or remote control and loses signal for the tuned channel, a programmed receiver might be capable of sending the commands to return to the programmed setting. This is not a fault of either the receiver or the ASC1, but simply the way the receiver manufacturer coded the firmware.

ASC1 Programming with a Connected Receiver

If you are a beginner to using DiSEqC 1.2 motor control, we suggest that you initially simultaneously program the receiver and ASC1 using the receiver's installation menu. Use the receiver's install menu to move the motor East/West, assign a DiSEqC 1.2 motor number then Save. This will automatically match the satellite motor number assignments in both the receiver and the ASC1.

Polarity skew offset adjustment is not a native install menu function for DVBS or S2 satellite receivers and is positioned using either the ASC1 front panel buttons or with the ASC1 remote. Please refer to the owners manual for the receiver specific menu screens to program the DiSEqC 1.2 motor control.

Notice: The ASC1 supports these receiver DiSEqC 1.2 commands: East/West Continuous Move, East/West Step Move, Save and GoTo X. The ASC1 may not support these receiver DiSEqC 1.2 commands: Global Reset, East/ West Limit Set, East/ West Limit Reset. We have found that many receivers do not use correct DiSEqC 1.2 protocol and these commands are often incorrectly implemented.

To program the ASC1 with a DiSEqC 1.2 (GoTo X) enabled receiver, connect the receiver to the REC port. Use the receiver's Satellite Installation menu and DiSEqC 1.2 motor control menu screens to assign the satellite motor number and move the motor East or West to acquire and optimize the Signal Quality on an active transponder. If installing on a dish with a feedhorn polarity servo, follow page 14, steps 6-8 for adjusting the polarity servo / feedhorn polarity probe to the optimized angle. Please note that your receiver may have preassigned DiSEqC 1.2 motor assignment numbers or limit the number of programmable DiSEqC 1.2 assignments. Contact your receiver reseller for any questions on the operation and programming of these DiSEqC 1.2 motor settings.

Programming ASC1 – Manual via Front Panel or Remote

1. Select Satellite Set and press OK.
2. Select DiSEqC 1.2 motor assignment number and press OK. A black color block will flash over this two digit number. Use either the numeric remote control keys to enter a two digit number 01-99 (for example:01) or use the front panel Up/Down keys to select the motor position number. Press OK to exit the DiSEqC setting line.


```
SAT should be 01-99
→00:
Position: 0000
Horizontal: -45°
```
3. Select Position: Use the East/West keys to drive the motor to the first satellite. The motor count increases or decreases as the motor positions the dish. W< or >E symbols indicate West or East direction of travel. Note: Position 0000 cannot be saved as a satellite position. You may offset by one count and save the satellite or perform a Position Reset so the satellite is not saved on 0000.


```
Satellite Set
01:
→Position: 0060
Horizontal: -45°
```

4. Bump the Dish East and West one count at a time to be sure that the signal is optimized on your signal quality meter or attached STB meter.
5. Place a signal meter or STB on both horizontal and vertical transponders to be sure that the feedhorn is properly positioned.
6. The alignment will be much simpler if the feedhorn is installed with the correct probe angle matching the default ASC1 Horizontal and Vertical polarity value. With the dish pointed true South (at the apex of the arc) and the ASC1 polarity of Horizontal and default value of -45° , the polarity probe should be pointed at the 3 or 9 o'clock angle. When the ASC1 default polarity setting is changed to Vertical with a value of $+45^\circ$, the probe should be pointed at the 12 or 6 o'clock angle .
7. Once the feedhorn placement is correct, optimize the Servo Polarity Skew setting for a horizontal transponder by selecting Horizontal: on the ASC1 Satellite Set menu. Press the + or – Polarity Skew keys to rotate the Skew one degree at a time and optimize the signal quality. This Skew fine-tuning will vary between transponders on the same satellite. Skew fine-tuning is a wonderful function that will help optimize signal quality on any transponder and may be the difference between crystal clear reception and no signal with the digital cliff!

→Horizontal: -42°
8. Chose a Vertical transponder on the satellite meter or STB. Select Vertical: then press the + or – Polarity Skew keys to rotate the Skew and optimize the signal quality.

→Vertical : 48°
9. Select Save. Press OK again within 3 seconds to confirm that you wish to save the satellite position and polarity settings.

Press OK to confirm
Vertical : 48°
→Save
Quit
10. To add additional satellites repeat steps 2 - 8.
11. Once you are completed with manually adding satellites, positions and skew offsets, select Quit, press OK and exit back to the Main Menu.

Adding / Swapping Receiver with Programmed ASC1

It is easy to enable any DiSEqC 1.2 capable receiver to control the ASC1. Receivers may be swapped or replaced without any reprogramming to the ASC1. The motor assignment number and dish position is saved in the ASC1 and is requested by the receiver using the common motor control protocol called DiSEqC 1.2.

To enable a receiver to control a previously programmed ASC1, first make a list of all of the satellite assignment numbers programmed and saved in the ASC1. Power OFF the ASC1 to prevent the receiver from overwriting the programmed settings. In the receiver's install menu, select the target satellite, assign a DiSEqC 1.2 motor number and save. Repeat for each each matching satellite. When the receiver programming is complete, power ON the ASC1. The receiver will now be synchronized and instruct the ASC1 when to move to the target satellite and select the correct polarity and skew offset.

ASC1 Operation - Operation Mode Screen

The Operation Mode Screen is the default display. This single screen shows the Position number (optional Satellite Name), Position Counter, Polarity and Skew Offset. This screen may also be used for manual satellite list selection, fine tuning and saving the dish position, manual selection of the polarity and fine tuning and saving the skew offsets.



```

01:139W AMC 8
→Position: 0100
Horizontal: -45°
Vertical : 45° ←
  
```

The Arrow on the left indicates what function is selected. The Arrow on the right indicates what Polarity is selected. The polarity may either be automatically selected by a connected satellite receiver or manually selected (or override) by the ASC1 front panel / ASC1 remote control.

Important Notice: When using a Satellite receiver with DiSEqC 1.2 to control the ASC1, selecting a polarity on the ASC1 operation screen or Satellite Set Menu will manually over-ride the receiver's polarity commands. Example: If the receiver is on a horizontal polarity transponder and the ASC1 cursor is selecting the Vertical polarity, the receiver **WILL NOT** receive a horizontal signal.

Stand Alone Operation - ASC1 Manual Control

The ASC1 may be used as a stand alone dish actuator motor and polarity controller. Once the satellites are programmed, the controller may be operated from the operation screen or the Satellite Setting Screen.

1. To move to a different satellite select the DiSEqC 1.2 position (example: 01: 139W AMC8. Press OK.
2. If using the remote control use the numeric key to enter the two digit motor assignment number. Using the front panel or remote control an alternate method is to press the +/- (up/down) keys to select the desired satellite.
3. Press OK and the ASC1 will move the dish to the selected satellite and set to the the preprogrammed skew offset.
4. To fine tune the dish position press East or West on the remote control or front panel. Note: If connected to a receiver that is activated with DiSEqC 1.2 settings, some receivers will over-ride manual positioning and reissue the switch and motor commands causing the ASC1 one to return the positioner to the preprogrammed setting. This is a function of the receiver and the manufacturer may offer a firmware upgrade to disable this function.
5. To manually set the polarity selection of a servo motor, select the polarity.
6. To fine tune the individual polarity skew offset with a servo motor, select the desired polarity and press the + or – on the remote control or front panel.
7. To save the modified settings, select Save and press OK. Press OK again within 3 seconds to confirm that you wish to save the new settings.

ASC1 PC Loader Editor Software

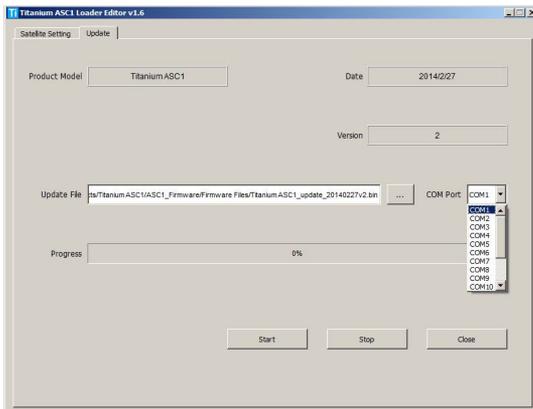
A PC based software loader and editor allows the user to update the ASC1 firmware via RS-232 serial connection to add new functions. It is not necessary to use this function, but loading new firmware will add new features and allow you to display a customized satellite name with each satellite position. The Satellite List may be downloaded to the PC, saved, edited, uploaded to the ASC1 and shared with other ASC1 units. The loader software and firmware updates are available at www.TitaniumSatellite.com/updates

The ASC1 is shipped with Serial RS-232 cable and a USB/Serial Converter which is compatible with the ASC1 and most Win XP/7/8 PCs. We currently do not have support Linux or Mac OS. If your computer does not have a RS-232 serial port or you experience difficulties using the USB converter, it is advised to install a PCI(e) serial communication board in your PC. The included USB converter has been extensively tested, but often can be problematic with 3rd party drivers. We do not recommend using generic USB to Serial RS-232 converters as they may corrupt and disable the ASC1.

It is advised to use an uninterruptable power supply during all update procedures. If the power is interrupted during a firmware update, the ASC1 may be disabled and require service to restore operation. During the firmware update, never power off the ASC1 or terminate the loader software operation. Interrupting the update process will corrupt the ASC1 software. The recovery service and fees are not covered by warranty.

Open and Close ASC1 Loader / Editor

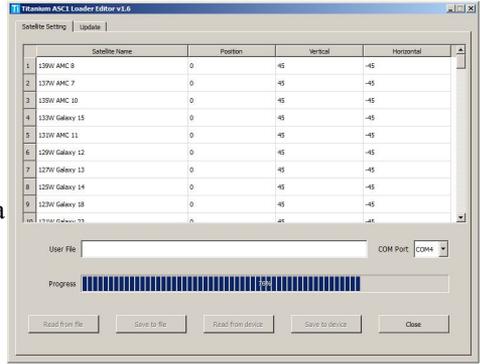
1. Download, unzip and install the ASC1 Loader / Editor on any Win XP/7 PC.
2. Connect the included RS-232 cable from the PC serial port (or USB Converter) to the ASC1 port.
3. Launch the ASC1 Loader/Editor .exe. Your PC may warn that the .exe file is not signed and could be potentially dangerous. Accept and the program will launch.



4. Select the active RS-232 serial device COM Port from the drop down list.
5. Click Close when finished with the ASC1 Loader/Editor.

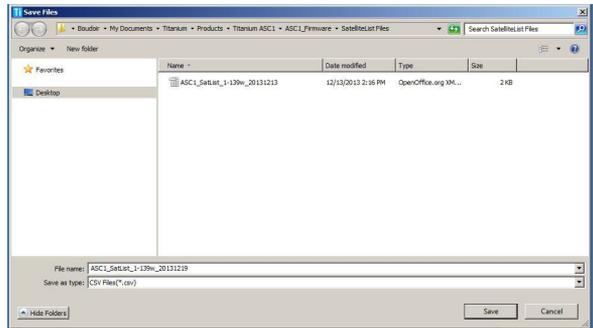
Read the Current Satellite List from the ASC1

1. Select the Satellite Setting Tab.
2. Make sure that the ASC1 is powered ON.
3. Click Read From Device.
4. When the Satellite list is downloaded from the ASC1 the data will propagate the data cells.
5. The ASC1 rear Master Power Switch must be power cycled to unlock the menus and restore operation.



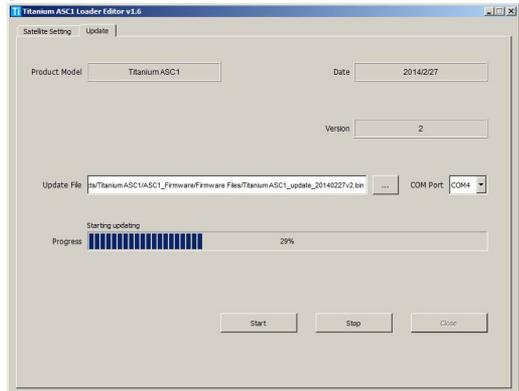
Save a Satellite List

1. Click Save To File.
2. Name the Satellite List .csv file and set the path to save your custom Satellite List.
3. Click Save.



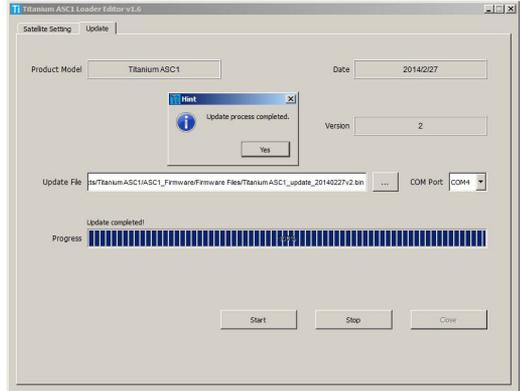
Firmware Upgrade

1. Download and unzip the latest ASC1 firmware file.
2. We recommend that the current Satellite list be downloaded, saved before upgrading the firmware. If the firmware overwrites the Satellite List or you perform a Factory Reset, the saved Satellite List may be quickly loaded back to the ASC1 and your custom settings re-installed.
3. Select the Update Tab.
4. Click Start and set the ASC1 firmware file path. The file information will propagate the Product Model, Date and Version information fields.
5. Click Start. A status bar will display the transfer progress.



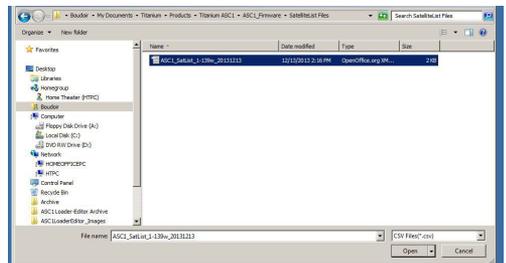
Caution: It is not recommended to interrupt the update while in progress. This could corrupt and disable the ASC1. It is best practice to allow an incomplete upgrade attempt to time-out after 2 minutes. Always close the ASC1 Loader/Editor Software and power cycle the ASC1 using the rear master power switch before initiating another upgrade attempt.

6. When the Upgrade is complete 100% a window will indicate “Update Process Completed”. Click Yes to exit the Upgrade and close the software.
7. Perform a Global Reset in the ASC1 Reset menu.
8. Power cycle the ASC1 using the master power switch on the rear of the unit.

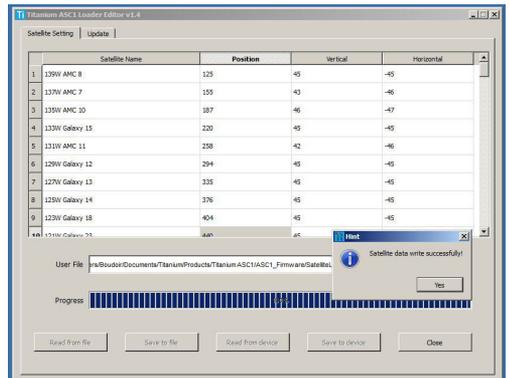


Upload Satellite List to the ASC1

1. Select the Satellite Setting Tab.
2. Click Read From File.
3. Set the file path to the saved Satellite List file. Click Open.
4. The Satellite List data will propagate the data cells.
5. Click Save To Device.

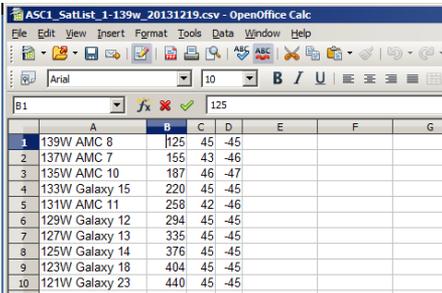


6. When the Satellite List transfer is complete at 100%, a window will indicate “Satellite Write Data Successfully!”. Click Yes to exit the transfer process.
7. Power cycle the ASC1 using the master power switch on the rear of the unit to unlock the menu and restore operation.



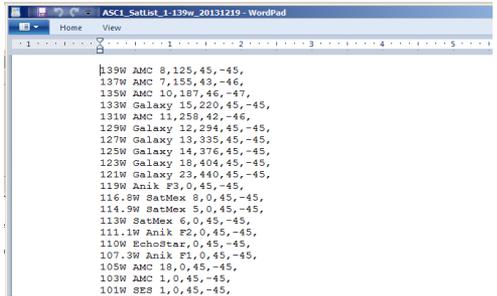
Edit Satellite List

The Satellite List is a simple 4 column and 99 row .csv type file. The file may be created and edited with the ASCII Editor, Excel, Notepad or any text editor.



The screenshot shows the OpenOffice Calc interface with a CSV file open. The data is displayed in a grid with columns A through G. The first four columns contain the satellite name, counter position, vertical polarity offset, and horizontal polarity offset, respectively. The remaining columns (E, F, G) are empty.

	A	B	C	D	E	F	G
1	139W AMC 8	125	45	-45			
2	137W AMC 7	155	43	-46			
3	135W AMC 10	187	46	-47			
4	133W Galaxy 15	220	45	-45			
5	131W AMC 11	258	42	-46			
6	129W Galaxy 12	294	45	-45			
7	127W Galaxy 13	335	45	-45			
8	125W Galaxy 14	376	45	-45			
9	123W Galaxy 18	404	45	-45			
10	121W Galaxy 23	440	45	-45			



The screenshot shows the WordPad interface displaying the raw CSV data from the same file. Each line of data is separated by a carriage return and tab characters, corresponding to the columns in the spreadsheet view.

```

139W AMC 8,125,45,-45,
137W AMC 7,155,43,-46,
135W AMC 10,187,46,-47,
133W Galaxy 15,220,45,-45,
131W AMC 11,258,42,-46,
129W Galaxy 12,294,45,-45,
127W Galaxy 13,335,45,-45,
125W Galaxy 14,376,45,-45,
123W Galaxy 18,404,45,-45,
121W Galaxy 23,440,45,-45,
119W Anik F3,0,45,-45,
116.8W SatMex 8,0,45,-45,
114.9W SatMex 5,0,45,-45,
113W SatMex 6,0,45,-45,
111.1W Anik F2,0,45,-45,
110W EchoStar,0,45,-45,
107.9W Anik F1,0,45,-45,
105W AMC 18,0,45,-45,
103W AMC 1,0,45,-45,
101W SES 1,0,45,-45,

```

- Each row is a line return and each column is separated by a comma.
- Column 1 is the Satellite Name of up to 14 alpha numeric characters.
- Column 2 is positive or negative 4 digit number indicating the counter position of up to 10,000 counts (-5000 / 0000 / +5000). This count is specific to your system and location.
- Column 3 is positive 2 digit number for vertical polarity degree offset range 0 to 90 with default vertical setting of +45 degrees.
- Column 4 is negative 2 digit number for horizontal polarity degree offset with default horizontal setting of -45 degrees.
- Unused rows may be left blank. The Loader will recognize a (0) zero as blank.

Troubleshooting FAQ

If you are experiencing counting errors, these often are caused by the type of wiring, grounding / shielding and excessive motor noise. If when moving from point A to point B, the motor stops short of the programmed position, the sensor circuit is receiving too many counts. This indicates that noise is entering the sensor circuit. Here are a few suggestions to correct common noise issues.

- Connect a .01 μF , 50 volt (minimum rated / approximate value) capacitor between the M1 and M2 wires at the actuator motor. The capacitor minimizes the motor RF noise from interfering with the sensor and servo control circuits.
- Always use proper gauge and isolated shielded wires bundles for the sensor and the servo control. Connect the shield drain wire to ground only at one end of the cable run. Typically the shield drain wire is connected to the ASC1's GND terminal or to the actuator or dish structure.
- Do not use unshielded wire groups typically sold for sprinkler or thermostat control. Unshielded control and sensor wires will result in positioning and control errors. RF noise enters the circuit and adds or masks the sensor counts.

If a sensor moving error message appears while attempting move the dish, the sensor may have a defect or there may be interference in the circuit:

- Verify with a multi-meter that the S1/S2 wires not compromised.
- Verify that the sensor switch is opening and closing as the motor attempts to move the dish. The motor should step move a single open/close cycle before an error screen appears. This cycle should show on a multi-meter as a close /open.
- If intermittent, the switch may be failing.
- Install a 200pF, 50v (minimum rated / approximate value) capacitor across the ASC1 S1/S2 terminals. Some users have installed higher values with good success. Some wiring and system hardware variances may require a different value of capacitor.

If when moving from point A to point B, the motor must always be moved to the East or to the West a few counts to optimize the satellite signal, this is often due to a failing sensor. Sensors are not expensive and they are usually the first motor component to fail.

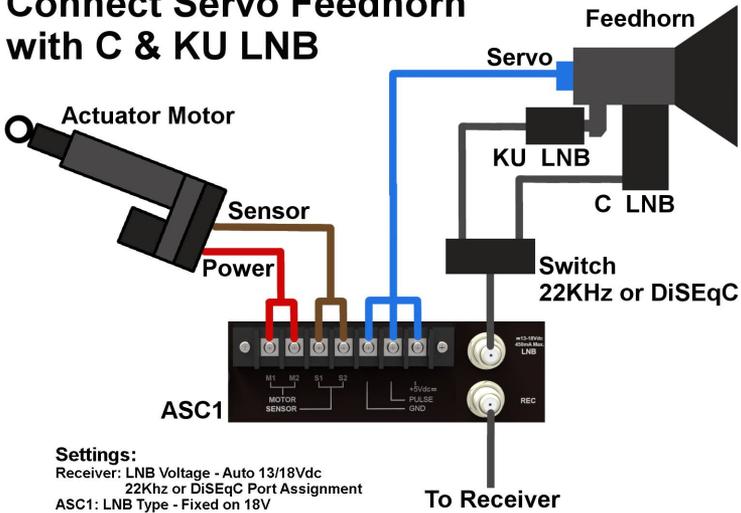
Improper grounding is the most frequent cause of improper switching, excessive RF noise and positioning errors. Always bond multiple grounds (such as a ground rod driven at the dish or the coax ground block) to a structure ground following local electrical code.

If the servo motor chatters after a channel/polarity change or the polarity probe drifts:

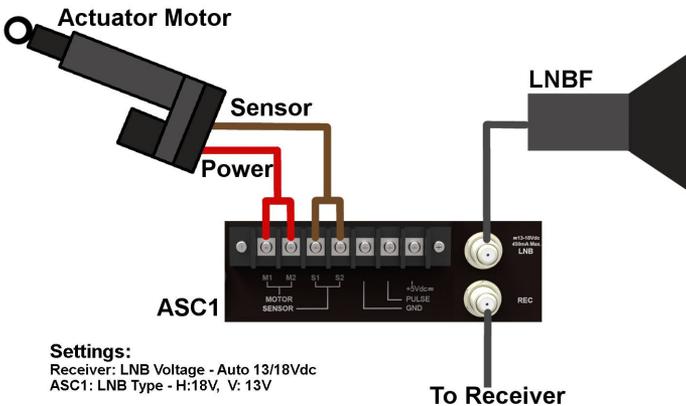
- Could be caused by an unshielded servo wire bundle, corroded connections, poor or not grounded.
- To reduce excessive RF line noise, connect a 1000 μF , 5 volt (minimum rated) capacitor between the +5 V and ground wires at the servo motor. The capacitor prevents the voltage drop between the controller and the servo, eliminating the servo motor "flutter" after channel or polarity changes.

Alternative Wiring Diagrams

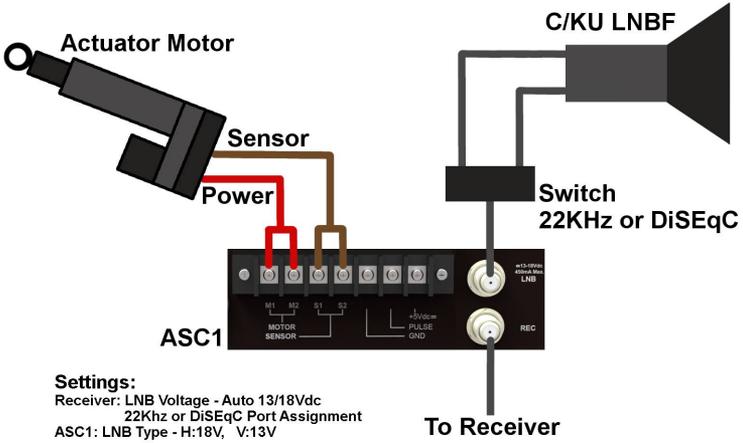
Connect Servo Feedhorn with C & KU LNB



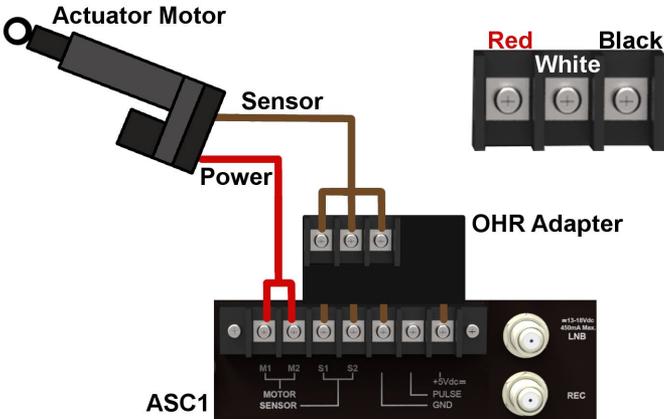
Connect with C or KU LNBF



Connect C & KU LNBF



Connect OHR (optional accessory) Optical / Hall Effect Reed Sensor & Isolation Adapter



The **OHR** adapter interfaces the ASC1 Satellite Positioner with pulse based position sensors and switches on dishes with linear actuators or positioning motors. The OHR adapter converts and reshapes the switch closures, providing precisely timed cycling ON/OFF pulses. The adapter minimizes switch bounce errors often produced by aging or dirty sensors and isolates the unwanted motor or terrestrial RF noise that may be carried on the distribution wiring connecting the sensor circuit to the satellite dish actuator motor.

Install OHR Isolation Adapter

1. Loosen ASC1 terminal strip screws S1/S2/GND/+5Vdc
2. Align and insert the 4 OHR connectors into the ASC1 terminal strip positions S1/S2/GND/+5Vdc
3. Tighten ASC1 terminal strip screws S1/S2/GND/+5Vdc

Connect Optical or Hall Effect Type Sensor

1. Connect sensor +5Vdc lead to OHR red terminal screw
2. Connect sensor Signal lead to OHR white terminal screw
3. Connect sensor Ground lead to OHR black terminal screw

Connect Reed Type Sensor

1. No connection to OHR red terminal screw
2. Connect sensor S1 or S2 lead to OHR white terminal screw
3. Connect sensor S1 or S2 lead to OHR black terminal screw

No additional configuration or set-up is necessary. Install and use the ASC1 using the normal procedure.

NOTE: This is an evolving document. Please check back regularly for new firmware versions and supporting manual updates describing the new features and functions.

Please email your product requests and suggestions to: support@titaniumsatellite.com