



HDR GOES Transmitter - SatLink 2-V2 in Enclosure  
Model w/ Airtight Enclosure, SD Card Slot & Interactive Display

# SatLink2-V2 Transmitter/Logger

## Supports NESDIS GOES V2.0 Specifications

### SL2-G312-V2 with 3 Year Warranty

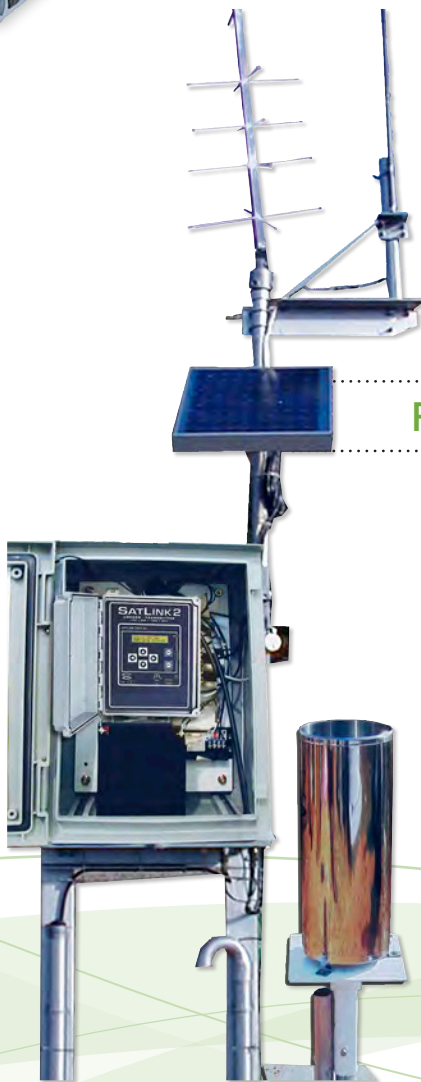
Innovative design provides everything needed to collect high quality data, without costly options. Our standard unit includes a Built-in Logger, SDI-12 Interface, Dedicated Tipping Bucket Input, 4 Analog Inputs, & a powerful Mathematical Equation Editor.

### NEW!

- ▶ *GOES transmissions Continue for 1 Month if GPS Lost.*
- ▶ *Antenna Pointing Calculator*
- ▶ *Power Auto-Set Based on Antenna & Satellite*
- ▶ *SL2-V2 Supports the NEW GOES V2.0 CHANNELS for Future NESDIS Assignments (double the number of channels).*

### FEATURES

- ▶ 16 Independent Measurements: 4 Analog Inputs, SDI-12, Tipping Bucket Input & more
- ▶ Built to operate for a decade, SL2-V2 has the lowest life-cycle cost & the highest ROI of any GOES Transmitter available.
- ▶ USA-manufactured to exacting ISO 9001 QUALITY STANDARDS, our satellite transmitters provide long-term, reliable operation in the harshest climates.
- ▶ Intuitive data view makes set up & data collection very straightforward.
- ▶ You'll collect & transmit data more accurately, using one of the lowest power consumption DCPs available!
- ▶ Built-In Logger
- ▶ USB port for PCs without RS-232 ports.  
**NOTE:** RS232 port is not operational when the USB port is active.
- ▶ Satellite Certification
  - GOES High Data Rate 300/1200 bps
  - GOES CGMS International 100
- ▶ Battery backup for the Real Time Clock for proper 'time tagged' logging at power-up before GPS resynchronization.
- ▶ Front Panel Programming
- ▶ Min/Max Processing
- ▶ Processes Non-Linear Sensors - simply copy & paste a formula without any programming!
- ▶ Two-Level Password Protection
- ▶ Multiple Models for multiple applications



SatLink2-V2 Stand Alone Rainfall Station

# SatLink2-V2 Transmitter/Logger

## Supports NESDIS GOES V2.0 Specifications

### CONFIGURATION OPTIONS

#### Front Panel Access with Separate Display & SD Card to Extend Data Handling & Programming

- ▶ SL2-V2 Display includes SD Card slot for Log Downloads
- ▶ With Display & SD Card Slot - Start & Stop SatLink
- ▶ View Current Status & Current Set-up
- ▶ Fully Set-up Transmissions & Sensor Measurements
- ▶ Initiate Transmissions
- ▶ Built-In Antenna Pointing Calculator
- ▶ Calibrate Sensors
- ▶ View Current & Previous Measurements
- ▶ Use Two Levels of Password Protection
- ▶ Multiple Choices for Downloading SatLink Log (or Any Part of It) : all data since the last download, the entire log, or a range of dates.
- ▶ Save SL2-V2 Setup on the SD Card to Setup another SL2-V2.
- ▶ Increased Logging Capacity & Data Redundancy (leave Card inserted & SL2-V2 backs up Log to Card)
- ▶ Power Auto-Set based on Antenna & Satellite

#### Voice for Messaging & Alarms in SL2-V2 in Enclosure with Modem

- ▶ The SL2-V2 Model that provides Voice is the SATLINK2-V2 in ENCLOSURE WITH MODEM (# SL2-V2-ENC-DISP-2)
- ▶ This SL2-V2 model has a special internal Sutron SL2-V2 Voice Modem (installed in the equipment) that allows the user to dial into a Satlink2-V2 station using a telephone.
- ▶ A properly equipped "speaking" SatLink2-V2 delivers measurements & diagnostics via voice. User dials the station, the station answers & provides current sensor data.



#### Built-In Logger

- ▶ In many applications, SatLink2-V2 can function as a stand-alone DCP, thus **saving about \$2000 per station** by eliminating the need for a separate datalogger.
- ▶ SL2-V2 Logger: 16 Independent Measurements, Easy Data Merge (logs its own measurements & receives data from other loggers), an SDI-12 Interface, dedicated Tipping Bucket Input, 4 Analog Inputs, & a powerful Mathematical Equation Editor.
- ▶ When integrated into a station with another datalogger, SL2-V2 provides critical data redundancy & expansion options.

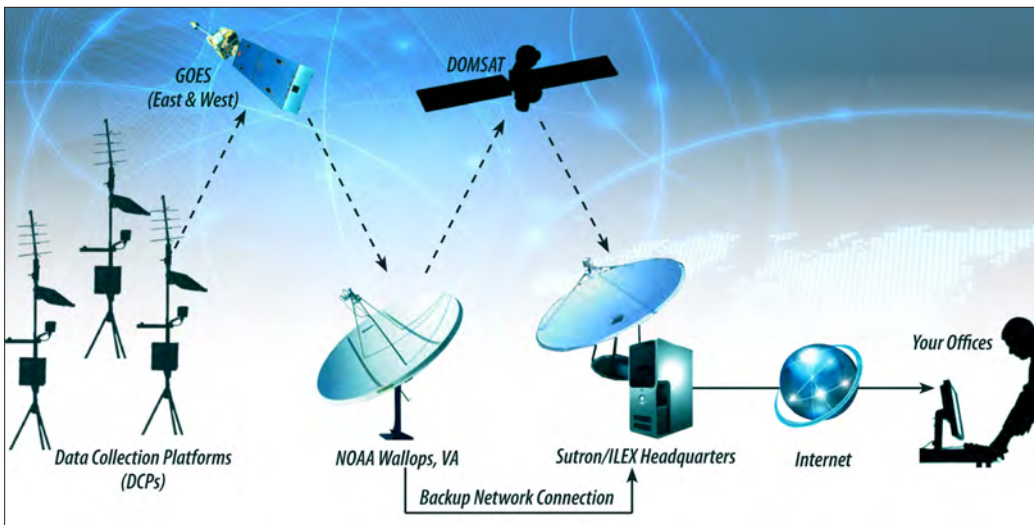


USB Mini Type B requires USB Type A Transition Cable. Sutron provides 6 ft USB Cable upon request.  
Cable Part # 6411-1613

# SatLink2-V2 Transmitter/Logger

## Supports NESDIS GOES V2.0 Specifications

### GOES RECEIVE SITES



- ▶ Sutron's Base Station Software automatically collects & processes data, makes it available on demand & on schedule, & generates alarms & messages .
- ▶ There are many ways to retrieve your GOES data. Our LRGS Receivers support DOMSAT, LRIT, Internet, GOES-DRGS & NOAAPORT. We will help you choose the right system for your needs.
- ▶ Any data collected via sensors in the field must be quality-controlled. Sutron has automated tools to view hydromet data & correct it if necessary.

### DATA HANDLING & DATA/ALARM DELIVERY

- ▶ GOES Web-based Networks
- ▶ 100%-reliable automated dial-out notification, call-out & alarm system with user-selected parameters
- ▶ Dynamic real-time web-reports (graphical & tabular) rainfall/ water levels, alarm status, trending tables, diagnostics, pager & voice reports, alarms, text messages, manual data entry
- ▶ Internal flash log (downloaded @ 115200 Baud.) & multiple log files to distribute data among many users
- ▶ Hardened & tested for dependable performance in the most remote sites & harshest climates in the world.
- ▶ Real-Time Data, quality-verified & delivered automatically at user-set intervals
- ▶ Data on-demand, random & user scheduled
- ▶ Powerful mathematical equation editor - analog data conversion with polynomial & trigonometric support port
- ▶ Easy Data Merge - Logs its own measurements & receives data from other loggers.

### EXPAND SYSTEM CAPABILITIES

- ▶ Use SL 2-V2 with other telemetry, **up to 4 options simultaneously:** Iridium, IP Modems, PSTN Dial-Up, GSM/ GPRS, Hard-Wire, Ethernet, LOS Radio, Fiber Optic, All Cell Phone Types
- ▶ Remote DCP SatLink2-V2 access & programming via any PC, Smart Phone & the Internet
- ▶ Complete System Remote Diagnostics & Configuration including Transmission Quality & GPS
- ▶ SD Card allows user to download entire SL2-V2 log (or any part)
- ▶ SD Card increases logging capacity & data redundancy (when card is left inserted, SL2-V2 backs up log to card)
- ▶ Sutron loggers & transmitters are frequently integrated into existing networks to upgrade & expand system capabilities.
- ▶ *Therefore, we design & manufacture our equipment & systems with commonality of components & uniform interfaces for modular, open, distributed system architecture providing excellent performance regardless of the number of sensors, field stations or base stations added.*



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2/23/2011

# SatLink2-V2 Transmitter/Logger

## Supports NESDIS GOES V2.0 Specifications

### SENSOR INTERFACES & APPLICATIONS

- ▶ SL2-V2 is compatible with & integrates with the majority of existing & new sensors & data loggers, regardless of manufacturer.
- ▶ Supports 16 Sensors or Measurements including...
- ▶ Non-Linear Sensors - simply copy & paste a formula without any programming!
- ▶ Gain setting options on analog inputs
- ▶ SDI-12 for vast array of sensors
- ▶ Quick & easy firmware & field upgrades
- ▶ Surface Water - Catch Basins, Reservoirs, Lakes, River Basins, etc.
- ▶ Groundwater
- ▶ Water Quality
- ▶ WMO-Compliant Meteorological Sensors
- ▶ COOP, GCOS Met Sensors
- ▶ Sediment
- ▶ Precipitation
- ▶ Snow, Snow Melt & Ice
- ▶ Real-Time Stream Flow, Stage, Depth, Discharge, Head
- ▶ Evapotranspiration
- ▶ Agricultural-Meteorology
- ▶ Dam Safety
- ▶ Flood & Floodway
- ▶ Coastal Ocean
- ▶ Currents, Tidal
- ▶ Storm Water
- ▶ Aviation Weather
- ▶ Water Rights, FERC Licensing
- ▶ Dam Performance



### GPS JAM-RESISTANT BULLET ANTENNA

Maximize the unattended life cycle of your station. The GPS Bullet Antenna is a viable option...

1. ...when magnet mount antenna cable length is not sufficient. New standard cable lengths for this antenna are 5 or 10 meters. (There is sufficient gain to go further although it's not supported.)
2. ...when an application requires a more robust cable (i.e., direct exposure to the elements), this antenna provides a UV-rated cable about 0.3 inches dia.
3. ...in urban environments or when nearby transmitters may overload a standard mag antenna, the Bullet inside filtering reduces interference.
4. ...where the antenna must be mechanically mounted. Application ex: buoys, towers, ocean exposure, anywhere with high winds or problems that might move a magnetic antenna.



#### Can I still use the standard magnetic antenna?

Yes, the standard antenna is ideal for many applications. Considerations:

1. Conduit for the tiny cable if there is direct outdoor exposure. The small size of the cable can allow for rodent damage or damage from branches rubbing, etc if installed directly.
2. Mount the antenna to protect it from weather events that may dislodge it.
3. Different installation conditions may require other adjustments or options. Questions? Contact Sales or Customer Service, (703)406-2800.

#### OPTION 1: JAM-RESISTANT GPS ANTENNA

The Bullet Antenna is recommended for applications where interference near the GPS frequency band might cause jamming or loss of GPS reception. The antenna is also suited for marine environments and any application where a more rugged antenna is required. This antenna has a TNC connector allowing the use of special length cables where required. (Mounting hardware not included.) **Part #5000-0170**

#### OPTION 2: MOUNTING KIT FOR JAM-RESISTANT GPS ANTENNA

This kit is designed to mount to existing Uni-Strut type mounting arms used at many stations. Included are a 4 inch stainless steel threaded pipe with a pair of Uni-Strut mounting brackets with hardware for mounting to a Uni-Strut tower arm. (This kit does not include the Uni-Strut arm on the tower, see below.) **Part #6211-1209-1**

#### OPTION 3: TOWER MOUNT ARM (UNI-STRUT SOLID WALL)

38 inches long. Hot Dipped Galvanized plating. Place the antenna in an open sky view location, i.e. away from the tower as much as possible. **Part #2271-1061-1**

#### OPTION 4: ANTENNA CABLE FOR GPS ANTENNA

Low-loss RG-59 cable is provided with a TNC-male connector on one end & an SMA-male on the other. 2 lengths available . 5 meter length is preferred.

**5 Meter Length**  
**10 Meter Length**

**Part #6411-1561-1**  
**Part #6411-1561-2**

# SatLink2-V2 Transmitter/Logger Specifications

## Supports NESDIS GOES V2.0 Specifications

TRANSMITTER			
<b>MECHANICAL</b>			
WEIGHT	2.2 lbs.		
SIZE	5.55 in. x 7.70 in. x 1.75 in. (not including mounting ears)		
ENVIRONMENTAL	-40°C to +65°C		
LED INDICATORS	Status, Fault & Transmit		
<b>CONNECTIONS</b>			
POWER	Built-in cable		
GPS	SMA (Bulkhead Mounted)		
RS232	DB9		
SDI-12	5 position removable terminal strip		
TIPPING BUCKET	5 position removable terminal strip		
ANALOG INPUT	7 position removable terminal strip		
TIMEKEEPING	Accurate within 10 ms.; Frequency discipline to within 10Hz typ		
<b>POWER REQUIREMENTS (@ 12.5 VDC)</b>			
QUIESCENT	8.2 mA (typ modem inactive)		
TRANSMITTING 100/300 BPS	3.1 Amps (typ with YAGI)		
TRANSMITTING 1200 BPS	3.9 Amps (typ with YAGI)		
OPERATING VOLTAGE	10.4 to 15 VDC, reverse voltage protected		
<b>TRANSMISSION MODES</b>			
300 BPS GOES random & self-timed, CSV2.0 compliant	1200 BPS GOES random & self-timed, CSV2.0		
100 BPS CGMS International random & self-timed	METEOSAT Alert & Self Timed		
ARGOS/SCD Format	4800 BPS INSAT		
<b>TRANSMISSION SUPPORT &amp; FORMATS</b>			
Random Reporting	Self-Timed	SHEF SHEFFIX	Pseudo Binary
CE Approved			
<b>SL2-V2 TRANSMITTER OUTPUT POWER</b>			
Software selectable power levels based on antenna	Between 1.25 Watts & 14 Watts		
<b>SATELLITE CHANNELS SUPPORTED</b>			
CGMS International (10/2009) 1-11	GOES DOMESTIC	1-266, 301-566 (V2.0 compliant)	
<b>PROTECTION AGAINST OPEN OR SHORT CIRCUIT LOADS ON TRANSMITTER OUTPUT</b>			
Supports Square Root Raised Cosine Filter (SRRC) for excellent sideband control & best performance.			
<b>MISCELLANEOUS</b>			
CONFIGURATION STORAGE	Non-Volatile		
DATA COLLECTION	Visual Indication		
SET UP UTILITY	Windows™ Based		
TIME	GPS Support for Accurate Time		
CLOCK ACCURACY	Typ ±50 ms w/GPS (0.25 sec max per month w/o GPS)		

LOGGER	
<i>Applies to all SatLink V2 versions unless otherwise noted.</i>	
<b>MEASUREMENTS</b>	
ANALOG INPUTS	4 single ended (0-5V, differential ratiometric selectable)
A/D RESOLUTION	24 bit A/D converter
A/D ACCURACY	± 0.02% FS @25C; ± 0.03% FS @ 25 during TX
TEMPERATURE COEFFICIENT	± 5 ppm/C typ.; ± 10 ppm/C max
LINEARITY	± 0.005% FS
REFERENCE OUTPUT	2.5 Volt, 10 ma. max (for temp. sensors)
SWITCHED +12V OUT	500 ma. Nom
TIPPING BUCKET / PULSE COUNTER	Dedicated switch closure counter input, 16 bit resolution
INTERNAL MEASUREMENT	Battery Voltage & Temperature
SOLAR PAN. CHARGING STATUS	Optional
HUMIDITY % ENCLOSURE	Optional
SDI-12	V1.0, V1.1, V1.2, V1.3 sensors
SENSOR SUPPORT	Supports 16 sensors or measurements
SCHEDULES	Independent for each sensor
SENSOR LABELS	User enterable
MATHEMATICAL EQUATIONS	Analog sensor data conversion allows user entry of any equation
READINGS	Manually Entered
<b>LOG</b>	
READINGS	120,000
TIME STAMP	Individually w/1 sec. resolution
NUMBER RANGE	Can log numbers as small as 1E-38 or as large as 3E+38
QUALITY FLAG	One for Each Data Sample
MEMORY LOG	Non-volatile Flash
DATA MERGE MODE	Supports merging of SL2-V2 Logger data & data from external logger
CIRCULAR BUFFER MODE	Enhanced transmission data mgt. Excess data stored & sent on next transmsn.
<b>ALARMS</b>	
TYPES	High, Low & Rate of Change Alarms
SENSOR DIFFERENTIATION	User configurable for each sensor
<b>MODEM (Optional Internal Modem with Display Only)</b>	
MAX DATA RATE	33.6 kbps
POWER OFF	Special power saver circuitry to power off while inactive
AUTO POWER	Auto power up on ring
ERROR CORRECTION	v.42, MNP2-4 & 10-EC
DATA COMPRESSION	V.42 bis & MNP-5 data compression









**SUTRON CORPORATION**

# SatLink2-V2 Transmitter/Logger Ordering

Supports NESDIS GOES V2.0 - Antennas, Peripherals, Power Supply, SL2-V2 Models

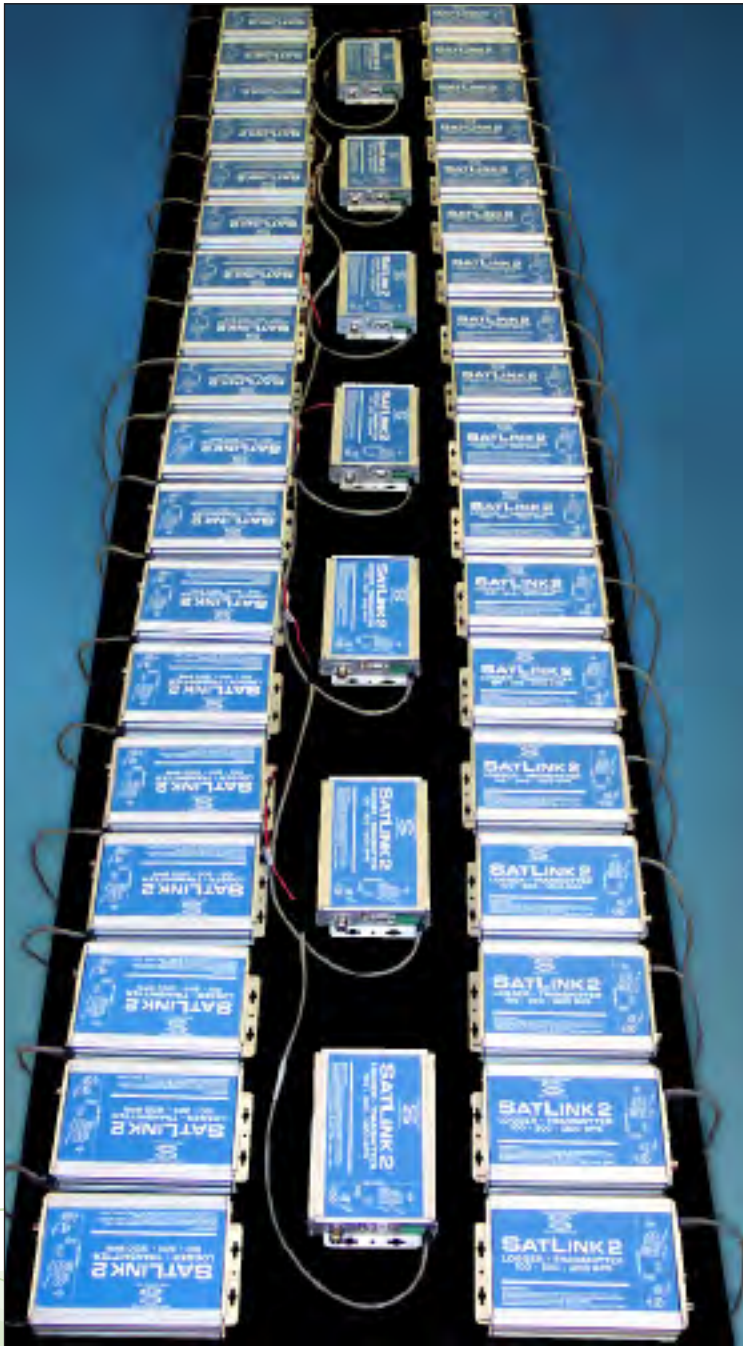
PART #	ANTENNA
5000-0020-1	OMNI-Directional Satellite Antenna, Half-Wave
5000-0021-1	OMNI Satellite Antenna, Full-Wave
5000-0080	YAGI Antenna, Crossed, 401.8 MHz, 11dB gain, 2" pipe mount, Type N Connector
5000-0081	YAGI Antenna, Stainless Steel Elements, Crossed, 401.8 MHz, 11dB gain, 2" pipe mount, Type N Connector
5000-0125-1	Sutron Dome Antenna
5000-0100	GPS Antenna, SMA with 15 ft. cable
5000-0151-1	YAGI Antenna, 402 MHz (formerly #5000-0010-1) Rev Pol (reversible polarity)
5000-0151-2	YAGI Antenna, Stainless Steel, 402 MHz (formerly #5000-0010-2) Rev Pol
5000-0155-1	YAGI GOES Satellite Antenna
5000-0156-1	YAGI GOES Satellite Antenna, Stainless Steel Mast & Elements
5000-0170	GPS Antenna, Bullet (High Gain)
n/a	Trimble GPS w/fast satellite acquisition included in every unit
POWER SUPPLY	
5100-0020-3	Battery Charger, Float
5100-0010, 5100-0030, 5100-0040	Battery, 12VDC: 7 AH, 24 AH, 105 AH
5100-0406	Solar Panel, 53 Watts (Mount 2271-1049 & Cable 6411-1017-3 ordered separately)
5100-0410-1	Solar Panel, 20 Watts unregulated, includes Mount (Cable 6411-1017-3 ordered separately)
5100-0400-1	Solar Panel, 10 Watts unregulated including 10 ft. Cable & Mount
5100-0407	Solar Panel Charger Control, (Regulator), 4 amp
5100-0408	Solar Panel Charger Control, (Regulator), 8 amp
5100-0411	Solar Regulator, 3 amp
ENCLOSURES	
SL2-V2-ENC SL2-V2-ENC-DISP-1 SL2-V2-ENC-DSP-2	Enclosure dimensions: 10" x 8" x 6.5" RF cable, sensors & battery are connected to enclosure bottom which requires more height than 10".

PART #	PERIPHERAL
6661-1248-1	SDI-12 Analog Plus Module
6661-1258-2	Bluetooth CSA, Standard
6661-1280	128M SD Card (SL2-V2 Display includes slot)
6461-1247-1	Tipping Bucket Rain Gauge Adapter for SL2-V2 Logger
INSTALLATION, MOUNTING, CABLES, CONNECTORS	
6211-1012-1	Mounting Hardware, Enclosure
6211-1024-1	Mounting, RG Tipping Bucket to 2" Pipe
6211-1207-1	Mounting 8210/SL2-V2/SP Modem
6211-1208-1	Mounting 8210/SL2-V2 no modem bracket
6211-1209-1	Mounting for use with 5000-0170 Bullet Antenna
6411-1022-1	Cable Assembly, Semi-Rigid, Low Loss, 15 ft, Antenna
6411-1162-1	Cable Assembly, Antenna, 15 ft**
6411-1561-1	Cable, 5M for use with 5000-0170 Bullet Antenna
6411-1561-2	Cable 10M for use with 5000-0170 Bullet Antenna
6411-1613	USB Type A Cable for USB Mini Type B (Sutron will provide 6 ft USB cable upon request.)
2271-1049	Solar Panel Mount (53 W Panel)
2271-1061-1	Tower Mount Arm for 5000-0170 Bullet Antenna(Uni-Strut Solid Wall)
2911-1066-1	Mounting Hardware, Antenna to Tower
2911-1196-1	Mounting, Tipping Bucket to Tower
3121-1357	Type N Connector
LIGHTNING PROTECTION	
8111-1113-1	RF COAX Cable Lightning Protection. Bulkhead mount, 36" RG-58 N to N cable (for mounting in NEMA enclosure)
8111-1099-1	Protector, Coax with Cable (wall/panel mount)
3121-1543	Connector, Helix, 7/8" to N-Male 50
6461-1240	Lightning Protection Module
<p><b>NOTE:</b> Sutron <b>RECOMMENDS</b> installing SatLink2-V2 in a NEMA 4 enclosure for humid or hostile environments. Sutron also recommends using an optional lightning protection module such as the Sutron 6461-1240 for remote systems.</p>	

	PART #	SATLINK2 CONFIGURATION	BASIC SATLINK	XLITE	DISPLAY	ENCLOSURE	VOICE MODEM	AMPLIFIER	8310
	SL2-G312-V2	Basic SatLink2- V2 GOES Systems	✓						
	SL2-G312-1B	Basic SatLink2 - INSAT, METSAT, METEOSAT (MSG), FEN YUNG, ARGOS/SCD, GMS/MTSAT	✓						
	SL2-Display-1	Display only (w/SD Card Slot)			✓				
	SL2-Display-2	Display+Internal Modem (w/SD Card Slot)			✓		✓		
	SL2-ENC	SatLink2 w/NEMA 4 Enclosure	✓			✓			
	SL2-ENC-DISP-1	SatLink2, Display, Enclosure	✓		✓	✓			
	SL2-ENC-DISP-2	SatLink2, Encl., Display & Modem	✓		✓	✓	✓		
	9210-SL2-2B 9210-SL2-ENC-B	SatLink2 & XLite Datalogger SatLink2 & XLite Datalogger in Enclosure	✓	✓		✓			
	8310-N-S 8310-N-S-P 8300-N-S-G 8310-N-S-I	8310 & SatLink2-V2 in NEMA enclosure 8310 & SatLink2-V2 enclosure & phone modem 8310 & SatLink2-V2, enclosure & GSM/GPRS 8310 & SatLink2-V2, enclosure, Iridium modem	✓						✓
	SL2-B40W-1	SatLink2 with 40 Watts for Buoy Applications	✓					✓	

# SatLink2-V2 Transmitter/Logger

Supports NESDIS GOES V2.0



Photographed at Sutron Headquarters, Sterling, Virginia, USA, December 2010  
Manufacturing Production of new SatLink2-V2 GOES Transmitters

## 30-DAY REPAIRS FOR ISO-CERTIFIED, SUTRON-MANUFACTURED SL2-V2

### ▶ 30 Days vs. 3 Months?

Many GOES Transmitters are manufactured by 3rd parties & sold through providers who do not & cannot repair the equipment. Thus, the average turn-around on repairs for *other* GOES Transmitters is 3 months.

### ▶ One-Stop Accountability

Our SatLink2-V2 Transmitter is *designed* by Sutron, *manufactured* by Sutron, *supported* by Sutron, & *frequently installed & integrated* into systems by Sutron. We have control over our own equipment & repair it in-house within 30 days.

## SATLINK2 IS CERTIFIED FOR ALL ENVIRONMENTAL GEOSTATIONARY SATELLITES WORLDWIDE.

SatLink2 Transmitter (very similar to our new SL2-V2 - the first certified for GOES V2.0.) is certified for the following global satellites:

- INSAT/METSAT, India
- METEOSAT 2nd Gen. (MSG), Europe & Africa
- GMS /MTSAT , Japan, Australia
- FY2C , China
- ARGOS/SCD New, Brazil

Please ask your Sutron Sales Manager or Sales Administrator for the SL2 datasheet that applies to your geographical area of interest.



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