

## FTS QUICK DEPLOY (QD) H-SERIES QD WITH H1RS OR H2 DATALOGGER



### Standard Components

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|-----------------------|---|
| <b>Tripod base:</b>   | <ul style="list-style-type: none"> <li>• Aluminum, adjustable-length legs, adjustable “lily pad” feet with optional ground spike.</li> <li>• Includes hand tightening locking bolt to secure cabinet on top.</li> <li>• Includes solid steel bolt ring and heavy-duty nylon tie- down strap for securing to ground anchor.</li> </ul> |
| <b>Ground anchor:</b> | <ul style="list-style-type: none"> <li>• Includes both spiral (screw-in) ground anchor and duck-bill anchor.</li> <li>• Includes pounding rod for driving duck-bill anchor with sledgehammer (not included).</li> </ul>   |

<b>Enclosure:</b>	<ul style="list-style-type: none"> <li>• Heavy gauge (.08") marine-grade aluminum, powder coated finish.</li> <li>• Lockable heavy-duty stainless steel clasps.</li> <li>• Rain drip rail over lid to keep rain out of enclosure when door is open.</li> <li>• Foam gasket at bottom of door perimeter seals out insects and dust yet allows door to close over cables. FTS toll-free service number printed inside door.</li> <li>• Withstand wind speeds of up to 160km/hr (100mph).</li> <li>• UV resistant as minimal plastics used.</li> <li>• IP55</li> </ul>		
<b>Antennae (Datalogger dependent):</b>	<ul style="list-style-type: none"> <li>• EON GOES antenna with cabinet mount.</li> <li>• GPS antenna with top of cabinet mount.</li> </ul>		
<b>Cables:</b>	<ul style="list-style-type: none"> <li>• AC adapter to solar panel port</li> </ul>		
<b>Power system:</b>	<ul style="list-style-type: none"> <li>• Three (3) 7.5 Amp-hour batteries.</li> <li>• 20W solar panel</li> <li>• The logger provides intelligent power management that monitors solar panel output and optimizes charging voltage according to ambient temperature, greatly extending battery life.</li> <li>• All data, programming and telemetry configuration data is saved in the event of a power failure.</li> <li>• System will automatically start up and resume full operation when power is detected following a power failure.</li> </ul>		
<b>Carrying/ shipping case:</b>	<ul style="list-style-type: none"> <li>• Two cases total, both with weatherproof, and abrasion-resistant outer shell and inner molded foam. <table border="0" style="width: 100%; margin-top: 10px;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Case 1</b></p> <p>Width: 74cm (29in) x</p> <p>Depth: 20.5cm (8in) x</p> <p>Height: 53.5cm (21in)</p> <p>Weight: 9.5kg (21lbs)</p> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Case 2</b></p> <p>Width: 96.5cm (38in) x</p> <p>Depth: 30.5cm (12in) x</p> <p>Height: 61cm (24in)</p> <p>Weight: 38.5kg (85lbs)</p> </td> </tr> </table> </li> <li>• No sharp buckles on outside of case.</li> <li>• Includes easy (graphical) setup and packing instructions inside, in top of lid.</li> <li>• <b>Case 2:</b> Carrying handles are made from nylon webbing which exceeds burst capacity of case weight when full. Straps on large case run full length of load bearing surface.</li> </ul>	<p><b>Case 1</b></p> <p>Width: 74cm (29in) x</p> <p>Depth: 20.5cm (8in) x</p> <p>Height: 53.5cm (21in)</p> <p>Weight: 9.5kg (21lbs)</p>	<p><b>Case 2</b></p> <p>Width: 96.5cm (38in) x</p> <p>Depth: 30.5cm (12in) x</p> <p>Height: 61cm (24in)</p> <p>Weight: 38.5kg (85lbs)</p>
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## Optional Components

- Sensors:**
- Turbidity
  - Water Temperature
  - Stage
  - Dual Analog Wind Speed/Direction
  - Air Temperature/Humidity
  - Rain Gauge
  - Solar Radiation
  - Fuel Temperature and Moisture
  - DigiBP SDI-12 Barometric Pressure
  - Water Quality
  - SDI Soil Moisture/Temperature
  - Compatible with Lufft WS sensors

- Other:**
- Analog-to-SDI expansion module (SDI-AM) provides terminal strip connections for integrating legacy analog sensors.
    - 4 analog inputs
    - 1 counter input
    - 2 sensor excitation output (0-5V)
    - 2 switched 12V outputs

## Axiom H1RS/H2 Datalogger - Hardware

- Display/ touchscreen:**
- Graphical color touch screen display, 3.65" (diagonal), QVGA (320x240 pixels).
  - Display is transfective (readable in low light and outdoors in bright daylight).
  - Displays system status, configuration, stored data (graphical and tabular) and provides system configuration and troubleshooting diagnostics.
  - Displays voltage and current separately for battery and solar panel and battery temperature
  - Supports troubleshooting, configuration and programming.

- CPU:**
- 2 CPUs, both low-power RISC
  - Main CPU is 200MHz 32-bit ARM

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- Memory/storage:**
- 64MB RAM
  - 256MB fixed physical, non-volatile flash memory for data and program storage
  - Data is stored in a circular 10MB buffer (oldest data overwritten by newest when buffer full)
  - Based on NFD RS logging criteria, 7,575 days (about 20 years) of data can be stored

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- Device ports:**
- 2 waterproof USB 2.0 host ports, 1.5Mbps and 12 Mbps, support for flash memory and other USB-compliant devices
  - 1 waterproof USB 2.0 12 Mbps device port with automatic PC detect
  - Supports USB keyboard and mouse
  - GOES RF output (for models with an integrated GOES transmitter): N-type jack
  - GPS RF input (for models with an integrated GOES transmitter): SMA jack

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- Sensor ports:**
- Waterproof, color-coded military-style connectors
  - Dedicated port for rain gauge (counter)
  - 2 (H1RS) or 4 (H2) independent SDI-12 V1.3 ports, expandable using external expansion modules to support up to 61 digital sensors

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- Serial ports:**
- Either:
  - Two ports factory configured as internal GOES transmitter and one external, waterproof, military style bayonet connector
  - Two external, waterproof, military-style bayonet connectors
  - One external, waterproof, military style bayonet connector
  - Signal levels: RS232C
  - Signals: TXD, RXD, RTS, CTS, DCD, DTR, RI

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- Environmental sealing, size, weight:**
- Waterproof to IP55, O ring sealed, cast aluminum & stainless steel hardware
  - Dimensions:
    - W:25.5cm (10in)
    - D: 15.5cm (6in)
    - H: 20.5cm (8in)
  - Weight: approx. 4.5kg (10 lbs).
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- Power supply:**
- Internal, temperature compensated charge regulator
  - Waterproof, military style bayonet connectors for solar panel and battery
  - Sensing of battery voltage, battery current, battery temp, solar voltage and solar current
  - 9.6VDC to 20VDC operating voltage

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## Axiom H1RS/H2 Datalogger - Software

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- Station identification:**
- The station's name, NESID and GOES data can be easily identified on the touchscreen display. This is critical when contacting FTS or your customer support provider for site troubleshooting or reporting.

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- Programming:**
- All programming done through intuitive graphical user interface (GUI) without writing code.
  - No laptop required; GUI accessed through integrated touchscreen.
  - Unlimited setup configurations are stored directly on the datalogger; different configurations can be selected or a new one created with the GUI.

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- Electronic service reports:**
- All of the data recorded by field techs during a service call can be captured electronically in the Axiom and saved to a USB memory stick.
  - Data includes:
    - A list of sensor serial numbers before and after the service trip
    - Audit log
    - Datalogger program version
    - Latitude, longitude, elevation

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- Datalogger performance verification:**
- Graph sensor data and diagnostic parameters.
  - Battery load tests; view voltage before and after (requires dummy load on battery) View current sensor readings.
  - View historical data.
  - View GPS performance stats.
  - View forward and reflected power stats to check GOES antenna performance.

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- Rain count:**
- Customized rain GUI allows users to quickly test tipping buckets each year by viewing manual tip measurement in real-time and quickly removing the test tips from memory.
  - User can select a rain reset date if desired and set the action on power failure (rain total can be set to return to previous values or reset to zero).
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<b>One-touch current conditions:</b>	<ul style="list-style-type: none"> <li>• Users can customize the Current Conditions screen so that all of sensors' real-time data are viewable with one button press, extremely handy when validating wind quadrants or simply validating each sensor as it is replaced.</li> <li>• The electronic service report automatically captures the current conditions at the start (pre-swap) and after (post-swap).</li> </ul>
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<b>Data transfer via USB memory stick:</b>	<ul style="list-style-type: none"> <li>• Data, Programs and Firmware updates can be transferred to and from datalogger via a conventional USB memory stick.</li> <li>• Historical data download is fast: approximately 5 seconds for 1 year of data including logger and telemetry records.</li> <li>• Data downloaded in universal .CSV (comma-separated values) format; importable into Excel and many other software.</li> </ul>
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## GOES Transmitter (integrated into Axiom H1RS-G6-QD and Axiom H2-G6-QD)

<b>Manufacturer:</b>	<ul style="list-style-type: none"> <li>• FTS</li> </ul>
<b>Supported baud rates:</b>	<ul style="list-style-type: none"> <li>• 100 bps</li> <li>• 300 bps</li> <li>• 1,200 bps</li> </ul>
<b>Operating supply voltage:</b>	<ul style="list-style-type: none"> <li>• 10.8 VDC to 16 VDC</li> </ul>
<b>Supply current (at 12VDC):</b>	<ul style="list-style-type: none"> <li>• Idle: &lt;3 mA</li> <li>• Transmitting: &lt;2.6 A</li> <li>• GPS ON: &lt;50 mA</li> </ul>
<b>Output power:</b>	<p><b>GOES</b></p> <ul style="list-style-type: none"> <li>• 300 bps: 14W max</li> <li>• 1,200 bps: 14W max</li> </ul> <p><b>METEOSAT</b></p> <ul style="list-style-type: none"> <li>• 100 bps: 14W max</li> </ul>
<b>EIRP:</b>	<ul style="list-style-type: none"> <li>• 40-45 dBm</li> </ul>
<b>Compatible antennas:</b>	<ul style="list-style-type: none"> <li>• Power: 14W Max</li> <li>• Polarization: Right hand circular</li> <li>• Connector: N-Type Female</li> </ul>

<b>Frequency range:</b>	<p><b>GOES</b></p> <ul style="list-style-type: none"> <li>• 401.701 MHz – 402.09850 MHz</li> </ul> <p><b>METEOSAT</b></p> <ul style="list-style-type: none"> <li>• 402.0355 – 402.4345 MHz</li> </ul>
<b>Frequency stability:</b>	<ul style="list-style-type: none"> <li>• Initial accuracy +/- 20Hz synchronized to GPS</li> <li>• GPS Schedule: 1 fix at power up, 1 fix per day thereafter</li> </ul>
<b>Channel bandwidth:</b>	<ul style="list-style-type: none"> <li>• 100 bps: 3KHz</li> <li>• 300 bps: 750 Hz</li> <li>• 1,200 bps: 1.5 KHz</li> </ul>
<b>Time-keeping:</b>	<ul style="list-style-type: none"> <li>• &lt; 100 µsec initial accuracy, automatically synchronized to GPS</li> <li>• &lt; 10 ms per day drift without GPS</li> <li>• 28 day operation without GPS signal (after initial GPS synchronization)</li> </ul>

## User Interaction

<b>User interface:</b>	<ul style="list-style-type: none"> <li>• Always-present status indicator of GPS time, data received by transmitter, success of transmission.</li> <li>• Number of satellites in view, average signal strength and other GPS status information available.</li> </ul>
<b>Forced transmissions:</b>	<ul style="list-style-type: none"> <li>• User can select any channel and time to force a test GOES transmission.</li> </ul>

## Axiom H1RS/H2 Datalogger - Environmental Protection

<b>Operational moisture range:</b>	<ul style="list-style-type: none"> <li>• 0-80% RH, condensing</li> </ul>
<b>Operational temperature range:</b>	<ul style="list-style-type: none"> <li>• Display operation: -20°C to +60°C</li> <li>• Datalogger operation: -40°C to +60°C</li> <li>• Storage: -55°C to +70°C</li> </ul>
<b>Lightning protection:</b>	<ul style="list-style-type: none"> <li>• Three-stage protection circuit offers superior protection:</li> <li>• Stage 1: transient earth clamp</li> <li>• Stage 2: series impedance</li> <li>• Stage 3: high speed shunt diode</li> </ul>
<b>UV resistance:</b>	<ul style="list-style-type: none"> <li>• Excellent, as minimal plastics are used. Cable housing and omnidirectional GOES antenna are UV-stable.</li> </ul>

- Electronics protection:**
- Core electronics sealed from moisture and dust in waterproof housings, completely isolated from environment and user.
  - All non-telemetry data exchange (firmware upgrades, report downloads) performed through waterproof USB port.
  - Battery overcharge protection.

**IP code rating:** • IP65

## Power Consumption

- Datalogger current:**
- 2-3mA at idle (no integrated GOES transmitter), 7-8mA (with integrated GOES transmitter)
  - Active (collecting data): 7.5mA (no integrated GOES transmitter), 12mA (with integrated GOES transmitter)
  - Touchscreen backlight on: 60mA
  - GOES transmit: 2.6A
  - GPS on: <50mA

- Power status:**
- Datalogger measures and logs solar panel voltage, solar panel current, battery voltage, battery current and battery temperature.
  - Status indicators (always visible) allow techs to identify if the system is charging correctly or not.
  - This data is also part of the Current Conditions screen call and are captured in the electronic service report.

## Resolution, Accuracy and Stability

I/O accuracy (with optional SDI- AM digital to analog module):	Input Ranges	Accuracy
	5V	± 1.5 mV
	2.5 V	± 0.75 mV
	1 V	± 0.3 mV
	100 mV	± 0.1 mV
	55 mV	± 0.055 mV
	25 mV	± 0.0375 mV

**Analog-to-Digital resolution:** 24 bits

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- Sampling rates:**
- Sampling rates are user-defined and can be as frequent as 1 second.
  - Sampling can be done on a timed basis or conditionally.
  - Sampling can be increased whenever a specific condition is met, for example if relative humidity drops below a certain percent, logging frequency can increase to every 15 minutes.
  - Multiple logging routines can be set and stored.
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- GPS (Models with GOES transmitter only):**
- Internal 12-channel GPS receiver.
  - SMA connector for 3V active patch GPS antenna.
  - Periodic time synchronization to UTC.
  - Latitude, longitude, elevation to full GPS accuracy.
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## Miscellaneous

- Assembly:**
- Completely tool-less design and full operation within 15 minutes by one person. All components secured to enclosure (which is supported by tripod base) with custom- designed, stainless steel “fast fit” mounting brackets and grenade pins.
  - All mounting hardware is designed to eliminate any sharp or hazardous edges. All mounting hardware is securely tethered to station frame.
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- Service and support:**
- Lifetime, unlimited, toll-free telephone and email support.
  - Telephone support hours are 7am to 4pm Pacific time, Monday through Friday, excluding Canadian statutory holidays.
  - Extended support hours available.
  - Free datalogger firmware updates provided for life of the product. Firmware updates can be done easily in the field by end user (via USB memory stick).
  - Several service contracts offered, including premium Annual On-Site Maintenance.