QD Quick Deploy Technical Specifications

Standard Components

Tripod base:	• Aluminum, adjustable-length legs, adjustable “lilypad” feet with optional ground spike. • Includes hand tightening locking bolt to secure cabinet on top. • Includes solid steel bolt ring and heavy-duty nylon tie- down strap for securing to ground anchor.
Ground anchor:	• Includes both spiral (screw-in) ground anchor and duck-bill anchor. • Includes pounding rod for driving duck-bill anchor with sledgehammer (not included).
Enclosure:	• Heavy gauge (.08”) marine-grade aluminum, powder coated finish. • Lockable heavy-duty stainless steel clasps. • Rain drip rail over lid to keep rain out of enclosure when door is open. • 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.
Datalogger:	• Axiom F6 datalogger integrates a powerful computer and the NIFC fire RAWS (or specified CDN) program, accessed through a built-in, waterproof touchscreen. • Integrated GOES transmitter.
Connectors:	• 100% waterproof military-style bayonet connectors. • Each connector is keyed differently and color-coded.
Antennae:	• Eon CS2 GOES antenna requires no aiming. • GPS antenna provides accurate time to datalogger once per day to ensure GOES transmission is within allotted window.
Sensors:	• Dual wind speed/wind direction sensor (includes mast extension to raise height to 10’). • Temperature/humidity sensor. • Tipping bucket rain gauge. • Typical lifecycle is 10+ years, depending on maintenance frequency, parts obsolescence and physical installation.
Cables:	• Combination of braided stainless steel and UV-stable PVC cable housing. • Cables are lightweight, flexible and permanently attached to sensors.
Power system:	• (3) 7.5 Amp-hour batteries. • 20W solar panel • Microprocessor-controlled, intelligent power manager monitors solar panel output and optimizes charging voltage according to ambient temperature, greatly extending battery life. • All data, programming and telemetry configuration data is saved in the event of a power failure. • System will automatically start up and resume full operation when power is detected following a power failure.
Carrying/shipping case:	• Two cases total, both soft yet rugged Cordura weatherproof, UV-stable and abrasion-resistant outer shell with crushproof inner molded closed cell foam (molded cavity for each component). • Carrying handles are made from nylon webbing which exceeds burst capacity of case weight when full. • Straps run full length of load bearing surface. • Case 1: 15” x 20” x 38”. • Case 2: 12” x 24” x 38”. • No sharp buckles on outside of case. • Includes easy (graphical) 12-step setup and packing instructions inside, in top of lid.

Optional Components

Sensors:	• Solar radiation sensor

	• Fuel moisture/fuel temperature (fuel stick)
	• Barometric pressure sensor
	• Ultrasonic wind speed and direction sensor
	• Soil moisture/soil temperature
	• Hydromet:
	  ◦ Turbidity
	  ◦ Water temperature
	  ◦ Stage (pressure transducer)
	• Compatible with other vendor's sensors in most cases.

Telemetry:	• GOES satellite data • Digitized voice radio UHF/VHF • Cellular (GPRS) • Digital radio modem • Setup, configuration and testing of each telemetry type is accomplished easily through the integrated touchscreen in Axiom datalogger.

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 outputs (0-5V)
	  ◦ 2 switched 12V outputs.

Axiom F6 Datalogger - Hardware

Display/touchscreen:	• Graphical color touch screen display, 3.65" (diagonal), QVGA (320x240 pixels) • Display is transflective (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 total, both low-power RISC • Main CPU is 200MHz 32-bit ARM
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 NFDRS logging criteria, 7,575 days (about 20 years) of data can be stored
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: N-type jack • GPS RF input: SMA jack

Sensor ports:	• Waterproof, color-coded, military-style connectors
	• Dedicated ports for:
	  ◦ wind speed (frequency input)
	  ◦ wind direction (potentiometer input)
	  ◦ rain gauge (counter)
	  ◦ temperature (thermistor, 0-20mA) & humidity (thermistor, 0-1.0V)
	  ◦ fuel stick (thermistor, 0-1.0V)
	• 2 independent SDI-12 V1.3 ports, expandable using external expansion modules to support up to 61 digital sensors
	• Optional, configurable analog-to-SDI expansion module (SDI-AM) to connect legacy analog sensors (terminal strips)

Serial ports:	• F6-G6-QD and F6-G6-RVT2-QD: one port factory configured as internal GOES transmitter • No external serial ports available
Environmental sealing, size, weight:	• Waterproof to IP67, O-ring sealed, cast aluminum & stainless steel hardware • Dimensions: 10" W x 8" H x 6" D • Weight: approx. 8 lbs.

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

Axiom F6 Datalogger - Software

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

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
	• The trip report can be sent to WFMI/CMMS electronically (plain text)
	• This report could be customized to be directly imported into WFMI

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
Rain count:	• Custom NFDRS 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)
One-touch current conditions:	• 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 • The electronic service report automatically captures the current conditions at the start (pre-swap) and after (post-swap)
Data transfer via USB memory stick:	• Data, Programs and Firmware updates can be transferred to and from datalogger via a conventional USB memory stick • Historical data download is fast: approximately 5 seconds for 1 year of data including logger and telemetry records • Data downloaded in universal .CSV (comma-separated values) format; importable into Excel and many other software

GOES Transmitter (integrated into Axiom F6-G6-QD and Axiom F6-G6-RVT2-QD)

Manufacturer:	• FTS
Supported baud rates:	• 100 bps • 300 bps • 1,200 bps
Operating supply voltage:	• 10.8 VDC to 16 VDC
Supply current (at 12VDC):	• Idle: <3 mA • Transmitting: <2.6 A • GPS ON: <50 mA

Output power:	**GOES** • 300 bps: 14W max • 1,200 bps: 14W max **METEOSAT** • 100 bps: 14 W max
EIRP:	• 40-45 dBm
Data validity:	• Integrated GPS time synchronization on start-up and once every 24 hours • Maximum 28-day transmit timing accuracy without a GPS fix
Frequency range:	**GOES** • 401.701 MHz – 402.09850 MHz **METEOSAT** • 402.0355 – 402.4345 MHz
Frequency stability:	• Initial accuracy +/- 20Hz synchronized to GPS • GPS Schedule: 1 fix at power up, 1 fix per day thereafter
Channel bandwidth	• 100 bps: 3KHz • 300 bps: 750 Hz • 1,200 bps: 1.5 KHz
Time-keeping:	• < 100 µsec initial accuracy, automatically synchronized to GPS • < 10 ms per day drift without GPS • 28 day operation without GPS signal (after initial GPS synchronization)

Interface Serial Ports

Command port:	• N/A
SDI-12 port:	• N/A

User Interaction

User interface:	• Always-present status indicator of GPS time, data received by transmitter, success of transmission. • Number of satellites in view, average signal strength and other GPS status information available.
Forced transmissions:	• User can select any channel and time to force a test GOES transmission.

Environmental Protection

Operational moisture range:	• 0-100% RH, condensing
Operational temperature range:	• Display operation: -20°C to +60°C • Datalogger operation: -40°C to +60°C • Storage: -55°C to +70°C

Lightning protection:	• Three-stage protection circuit offers superior protection:
	  ◦ Stage 1: transient earth clamp.
	  ◦ Stage 2: series impedance.
	  ◦ Stage 3: high speed shunt diode.

UV resistance:	• Excellent, as minimal plastics are used. Cable housing and omnidirectional GOES antenna are UV-stable.
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:	• IP67

Power Consumption

Datalogger current:	• 2-3mA at idle. • 7.5mA average while collecting data. • 60mA with touchscreen backlight on. • 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
5 V	± 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

Bits of resolution:	• 24 bits
Logging rates:	• Logging rates are user-defined and can be as frequent as 1 second. • Logging can be done on a timed basis or conditionally. • Logging 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.

Miscellaneous

Assembly:	• Completely tool-less design. 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. • Allows complete assembly with no tools and full operation within 15 minutes by one person.
Warranty:	• One year from date of receipt against all defects or failures on all components. • Most replacement parts shipped within 24 hours. • Service contract with RSFWSU or FTS extends warranty for one year for every year of service contract.
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.