



# SUTRON CORPORATION

Since 1975 real-time hydrological & meteorological monitoring & control systems, telemetry, dataloggers, sensors & open database software to collect, store, and transmit *from anywhere to everywhere* by satellite, secure internet, radio and/or telephone.

Sutron is an ISO 9001:2000 Certified Company.



## ABOUT SUTRON

- Sutron was founded in 1975.
- Sutron has manufactured and installed about 40,000 stations worldwide.
- Sutron is an ISO 9001:2000 Certified Company
- Sutron's multi-disciplined staff of civil, electrical, control, telecommunications, and software engineers have developed successful products and systems to solve problems all over the world as well as in every state in the union.



Sutron Installations - Albany, NY & the Cayman Islands Airport



## CORE CAPABILITIES



- **METEOROLOGIC MONITORING SYSTEMS**
- **AIRPORT WEATHER SYSTEMS**
- **HYDROLOGIC MONITORING & CONTROL SYSTEMS**
- **OCEANIC MONITORING & WARNING SYSTEMS**
- **HYDROLOGIC & METEOROLOGIC SERVICES**



## SUTRON'S UNIQUE ADVANTAGES



Our Products, Systems, Software & Services are

- Designed by Sutron
- Built by Sutron
- Installed by Sutron
- Supported by Sutron
- Maintained by Sutron



Our Responsive & Timely Customer Service - directly from the Manufacturer & System Designer - is unparalleled.

Unlike our competitors, a Sutron System does not require third party installers or equipment resellers.



# METEOROLOGICAL MONITORING



## APPLICATIONS/STATIONS

- Automatic Weather Stations (WMO Standard)
- Synoptic
- Climate - COOP, GCOS
- Rainfall - ARS
- Portable Weather Stations
- Agri-Met Stations
- Hazmat Stations
- Air Quality Monitoring Stations



# TYPICAL REMOTE STATION



NEMA-4X Weather Proof Enclosures & Military-Style Connectors





# HYDROLOGIC MONITORING & CONTROL SYSTEMS



## APPLICATIONS

- Water Resources Monitoring & Control
  1. Surface Water
  2. Ground Water
- Hydropower Monitoring & Control
- Canal Automation & Control
- Irrigation
  1. ALERT
  2. 2-Way



# HYDROLOGIC MONITORING & CONTROL SYSTEMS



- Geotechnical (Dam Safety Monitoring)
- SCADA Systems for Lift Stations
  1. Well House
  2. Pump Station Control
- Water Quality Monitoring
- Real-Time Flow Monitoring
- Stream Gauging





# OCEANIC MONITORING & WARNING SYSTEMS



- National Ocean Service Approved
- Tsunami & Storm Surge Monitoring
- Coastal Monitoring Systems (NWLON)
- Physical Real-Time System (PORTS)
- Great Oceanographic Lakes Water Level Monitoring Network
- Tidal & Sea Level Monitoring Stations



# OCEANIC MONITORING & WARNING SYSTEMS



## FEATURES

- Multiple Simultaneous Communications
- Support for Current & Wave Height Instruments
- Built-In Support for NOS PORTS & Dial-In Reports
- Custom Packaging & Surge Protection for Harsh Coastal Environments



## LOCAL WARNING CAPABILITIES

- Local Displays of Ocean Conditions
- Automated Voice Warnings & Sirens

**BUOY SYSTEMS - Sutron-Manufactured GOES & INSAT Certified 40W Transmitter**



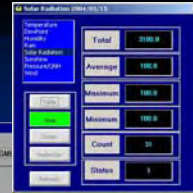
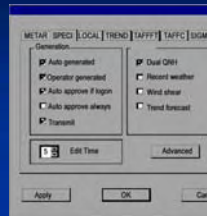


# SUTRON AIRPORT WEATHER SYSTEMS (SAWS)



## SYSTEM PRODUCTS

- Wind
- Visibility
- RVR
- Present Weather
- Cloud Height
- Sky Cover
- Temperature
- Dew Point
- Temperature
- QNH/QFE
- Barometric Pressure
- Meteorological Observations
- MET Report, METAR, SPECI, SYNOP, CLIMAT

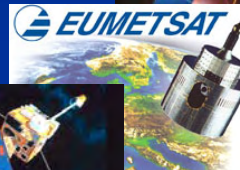
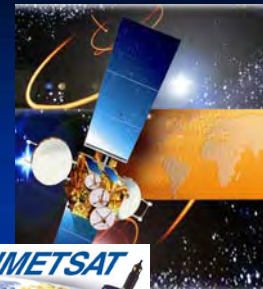


# COMMUNICATIONS



## SATELLITES

- GOES
- INSAT/KALPANA
- GMS/MTSAT
- METEOSAT
- INMARSAT
- ARGOS/SCD
- FY2C





# COMMUNICATIONS



## LOS RADIOS

- UHF/VHF
- Spread Spectrum
- ERICSSON Trunking
- Ethernet/IP Radios

## CELLULAR MODEMS

- CDPD, GPRS, GSM, CDMA

## SPEECH MODEMS

- Data & Voice - Land Lines

## DIRECT CONNECT

- RS-232/Ethernet (Converter)
- TCP/IP, UDP Protocols

## MODBUS PROTOCOL



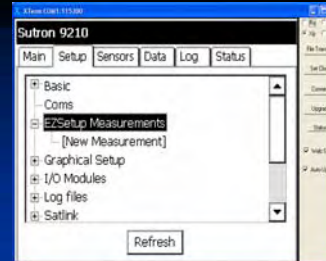
# SUTRON'S DATALOGGERS



- **THE XPERT** - *Powerful enough for the rigorous demands of our NOS-Approved Tide Stations*
- **SATLINK2 SATELLITE TRANSMITTER & DATALOGGER** - *with built-in Tipping Bucket Rain Gage interface*
- **RADAR LEVEL RECORDER** - *measures levels without direct contact with the water surface*
- **STAGE DISCHARGE RECORDER** - *the shaft encoder that never forgets*
- **8210 DATALOGGER** - *the Workhorse*
- .....and.....



# SUTRON 9210 XLITE



- Highly Modular
- Handles Multiple Applications - simple to very complex, portable & permanent
- Vast Sensor Library
- Intuitive, EZ Setup & Graphical Block-Oriented Setup
- 4 MB Standard Log Expandable to over 1 Gigabyte
- Flash Memory for recording data & events
- UNLIMITED EXPANSION with I/O Modules!
- High-Speed Data Transfers –downloads at 115k baud.
- Time Accuracy of 2 SECONDS/DAY over full temperature range

# 9210 XLITE FEATURES



- **LOW POWER CONSUMPTION** - Sleep modes with low quiescent power, low operating power
- Battery Operated – Each module operates off of 10 to 15 VDC
- Wide Temperature Operation -40 ° to +60° C
- High Reliability & Robust - No fuses, fault tolerant, built-in lightning protection
- Built-In High Performance, 10 Channel, 16 Bit A/D Module
- Built-In 8 Channel Digital Module
- Built-In 2 Line Backlit LCD Display with 3 Navigation Buttons



- 2 x 20 Backlit LCD Display - view data, make simple calibrations & adjustments
- Menu & Data Entry
- B Terminal Strip: 8 Channel Digital I/O, RS485, SDI-12
- A Terminal Strip: 10 Channel Analog Input, DC Power Connection
- Earth Connection
- 3 RS232 Ports, I2C Bus to I/O Modules, Optional PCMCIA



# 9210 XLITE FEATURES



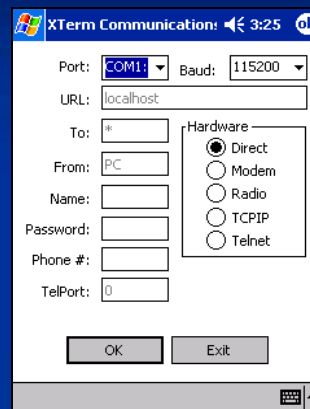
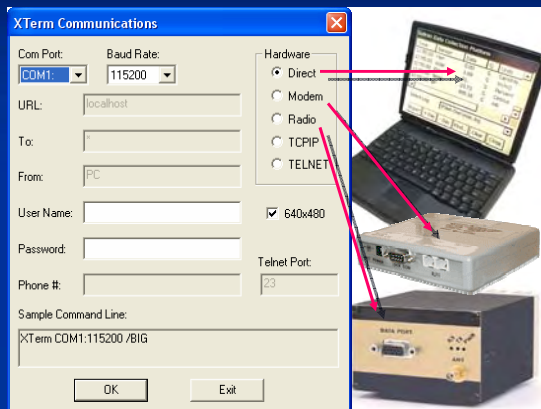
- Software Expandability with DLL Libraries
- Access All Functions through a PC or Pocket PC! Any XLite Operation can be done via a PC graphical interface.
- Multiple telemetry –GOES, METEOSAT, Telephone, LOS Radio, & MORE!
- System automatically detects any new module installed & allows it to be configured
- Flexible Measuring & Recording – Separate data schedules & individual recording intervals
- Very Open Design – Operates with sensors & modules manufactured by others




# XTERM






XTerm is a built-in PC program used to setup and test a 9210. There is no special installation needed for XTerm on a desktop PC. Simply copy it to any folder on the PC. You can always download the latest version from [www.sutron.com](http://www.sutron.com) downloads.









# SENSORS







- Wind Direction
- Wind Speed
- Air Temperature
- Relative Humidity
- Barometric Pressure
- Pyranometer
- Solar Radiation
- Soil Moisture
- Soil Temperature
- Leaf Wetness
- Evaporation
- Transepiration
- Shaft Encoder
- Radar Sensor
- Bubbler
- Submersible Pressure Sensor
- Water Temperature
- Water Quality Multi-Sonde Probes
- Vibrating Wire
- Tipping Bucket
- *Any Hydrological or Meteorological Sensor Requested*


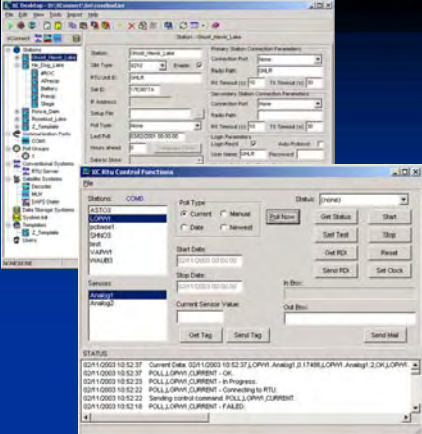






# DATA COLLECTION & SOFTWARE



**XCONNECT Real-Time Data Acquisition, Storage & Processing Software**

- Open Database - ODBC, Standard SQL
- OPC Compliant
- Data View, Trending, Editing
- Real-Time Error Detection Flags
- Quality Flags

- Communications Diagnostics
- Automated Calculations
- Statistical Processing
- Rating Table Computations
- Report Generation Capabilities



# TURN-KEY SERVICES



- Installation of Remote-Site Stations
- Annual Maintenance Contracts for Large Data Collection Networks
- Hydrological Modeling
- Data Hosting Services on the Web
- Data Collection & Analysis
- Stream Gauging, Rating Curves, etc.



# HYDROLOGICAL SERVICES



## HYDRAULIC & HYDROLOGIC ENGINEERING

- Flow Equation Development
- Agricultural Engineering
- Design
- Flood & Stormwater Management
- Water Quality & Wetlands
- River & Stream Analysis
- Watershed Management

## SCADA SERVICES

- Telemetry
- Networking
- RF Studies



Leon County SCADA Project



# HYDROLOGICAL SERVICES



## DATA SERVICES

1. Stream Gaging Networks
2. Ground Water Monitoring
3. Water Quality Monitoring
4. Design, Build, Operate
5. Web Hosting of Data



Sutron has major projects in the Everglades & on the Chesapeake Bay.

## MODELING

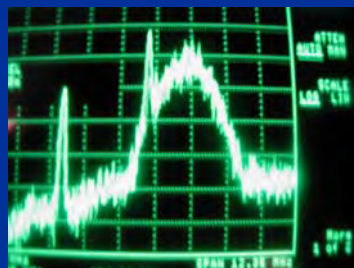
1. Hydrodynamic
2. Water Quality
3. Ground Water
4. Surface Water & Ground Water Interaction



# ENGINEERING SERVICES



- Site Selection & Survey
- Communication Analysis
- Economic Analysis
- Data Collection & Analysis
- System Design & Specifications
- Radio Path Study
- Field Strength Study
- Web Hosting





## FACTORY ACCEPTANCE & TRAINING



## KEY PROJECTS *THREE GORGES DAM*



- 80 Remote Stations with Xpert Dataloggers & Sutron Bubbler Water Level Sensors
- Portable Weather Stations
- In 2004 Sutron received orders to implement 120 stations.
- In 2007 Sutron received contracts totaling \$1,020,742 for equipment including dataloggers, sensors & ancillary equipment for 345 remote monitoring stations.





## Sutron Customers in China



- NARI Group
- Beijing IWHR Tech
- Hubei Yifang Science Tech Development Co., Ltd.
- China Academy of Meteorological Sciences
- China International Water & Electric
- Nanjing Automation Institute of Water Conservancy & Hydrology



## KEY PROJECTS

### AUTOMATED HYDRO-MET MEASUREMENT NETWORK

*The Polish Institute of Meteorology & Water Management*



Met Station in Poland



- 1000 Hydro-Met Stations Reporting to 6 IMGW Offices
  - 600 for Water Level/Stream Gauging
  - 350 for Rainfall
  - 350 for Meteorological Measurements
- 5 EUMETSAT Real-Time Flood Warning Stations
- Real-Time Earth Receive Station (ERS)
- **Designed:** RTUs/Enclosure, Civil-Mechanical-Electrical Works & Low Level Communication Software
- **Supervised:** Integration, Testing, Quality Control & RTU Assembly as well as Manufacturing & Assembly of the Civil Infrastructure
- Real-Time Data Collection Software: Data Collection, Data Dissemination, Data Storage, Generate Real-Time Reports & Alarms/Notifications



# KEY PROJECTS

## WMO – CARRIBEAN SIDS PROJECT



- 38 AWS Stations
- 13 Caribbean Countries
- 17 Base Stations
  - LOS
  - RADIO
  - SATELLITE
- GENERATE SYNOP/METAR
- SPECI
- INSTALLATION IN 9 MONTHS



# SUTRON'S GLOBAL CUSTOMERS



Please see back of Sales Brochure for more complete list.

- Latin America
- Canada
- Africa
- Europe
- Taiwan
- People's Republic of China
- India & South Asia
- U.S. Geological Survey
- U.S. Army Corps of Engineers
- U.S. Bureau of Reclamation
- National Weather Service
- National Ocean Service
- USDA Forest Service
- All 50 States & Many Municipalities