

Xpert Datalogger & Controller



Overview

The Xpert, a high performance datalogger & communications device for unattended, remote, real-time data acquisition & control, is a multi-tasking logger capable of making measurements & transmitting multiple communications simultaneously. Xpert's Graphical User Interface (GUI) & removable memory make Xpert a perfect option for those needing easy-to-use touchscreen navigation & programming plus the ability to transfer data via SD card or USB devices.

Features

- Extremely easy to use
- No programming background or experience necessary
- Simple Graphical User Interface (GUI) based setup
- Support for SD or USB memory
- 64MB internal flash memory
- 32-Bit Processor
- Multiple communications simultaneously
- Sensors connect to the system via analog and digital I/O modules that plug into the I²C port as well as via RS232, RS485 & SDI-12.
- 4 communications serial ports for satellite transmitters, modems, radios & other serial communication devices.
- Retrieve data using any communication interface, USB or SD memory cards.
- Wide operating temperature (-40 to +60°C)
- Built-In Ethernet
- View data, calibrate & adjust the Xpert using its large touch screen. Locally or remotely, all Xpert functionality is accessed through communications ports using easy-to-understand set-up, data display & system maintenance GUIs.
- Built-in 10 channel A/D, 8 channel DIO
- Advanced programming using Xpert BASIC set-up
- Independent *hardware* watchdog
- *Software* watchdog to monitor important system functions and guide intelligent recovery when required



Xpert
8080-0000-2B



Applications

Easily Customized using BASIC or C++ routines for virtually any hydrological / meteorological / control application.

- ▶ Meteorology & Climatology
- ▶ Agrometeorology
- ▶ Oceanography
- ▶ Aviation (AWOS)
- ▶ Flood Warning
- ▶ Water Level & Flow Monitoring
- ▶ Water Quality
- ▶ Hydrology
- ▶ Air Quality
- ▶ Visibility
- ▶ Geotechnical
- ▶ Dam Safety
- ▶ Structural Stability
- ▶ Energy
 - ✓ Solar Farm
 - ✓ Wind Farm

EXPANDABLE I/Os

Inputs and Outputs can easily be added using Sutron's I/O modules which use an industry-standard "I²C" bus, running a total of 10 ft between devices.

ANALOG MODULES

8080-0003-1

High Resolution Analog I/O

- ▶ 6 channels configurable as 6 single-ended or 3 differential inputs, or a combination of both. Channels feature self-excitation & built-in voltage, current & resistance sensing.
- ▶ Up to 6 (six) 4-20mA sensor interfaces & makes resistance measurements without any external resistors.
- ▶ 24 bit resolution
- ▶ Accepts inputs from -5V to +5V.
- ▶ Per measurement input gain settings allow selection of $\pm 5V$ or $\pm 300mV$ input range.
- ▶ Programmable excitation from -5V to +5V can be applied to any of the 6 channels.
- ▶ 1 (one) switched battery power output.
- ▶ 1 (one) protected battery power output.

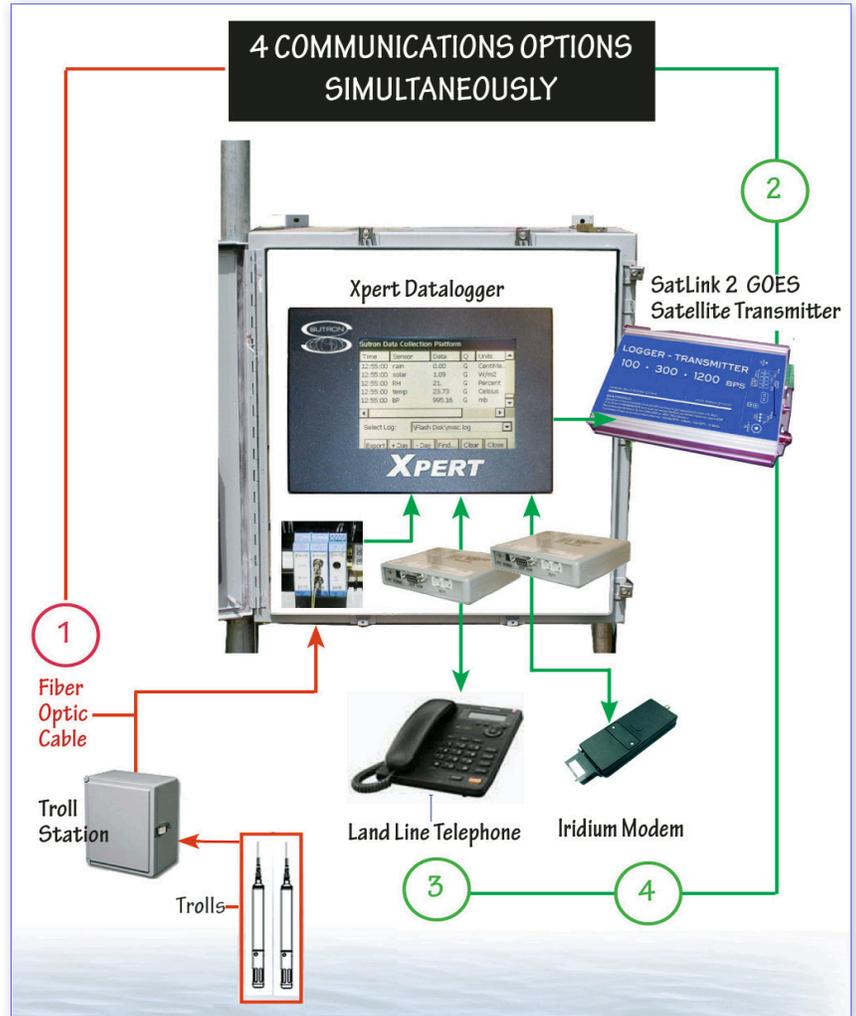
8080-0003-3

I/O WITH SURGE PROTECTION BOARD

- ▶ All features of the 8080-0003-1 above plus all connections are brought out via ribbon cable to a termination board.
- ▶ Multi-stage surge protection circuitry including spark gaps on termination board.
- ▶ Termination board grounds directly to metal mounting panel via standoffs.

8080-0007-1 10-CHANNEL ANALOG I/O

- ▶ 10 channels configurable as 10 single-ended or 5 differential inputs, or a combination of both
- ▶ 16 bit resolution
- ▶ Accepts inputs from -0.1V to +5V
- ▶ Measurement ranges: 0-5V, $\pm 2.5V$, $\pm 78mV$
- ▶ 1 (one) switched battery power output.
- ▶ 1 (one) reference output.
- ▶ Built-in multi-stage surge protection circuitry with spark gaps.



DIGITAL MODULES

8080-0002-1 DIGITAL I/O

- ▶ 1 (one) switched battery power output
- ▶ 8 digital I/O, (6 bi-directional, 2 input only). Configurable as follows:
 - ✓ ≤ 8 general sampled inputs, level sense with alarm, 32 bit event or frequency counters
 - ✓ ≤ 4 quadrature output sensors (quadrature requires 2 inputs per sensor)
 - ✓ Built-in 100K pull-up on 6 inputs for switch closure sensors
 - ✓ 2 switchable threshold RM Young wind-sensor-compatible inputs (low level AC signal)
 - ✓ 6 inputs for switch battery voltage signals & 5V logic signals
 - ✓ 6 open collector outputs that can work with devices tied to 12V

8080-0002-4 DIGITAL I/O WITH SURGE PROTECTION BOARD

- ▶ All the same features as the 8080-0002-1 plus all the connections are brought out via ribbon cable to a termination board.
- ▶ Multi-stage surge protection circuitry including spark gaps on a termination board.
- ▶ Termination board grounds directly to metal mounting panel via standoffs.

FIRE WEATHER I/O MODULE (RAWS) 8080-0008-1

In response to NIFC feedback, Sutron created an integrated Fire Weather package. Digital I/O modules, Analog I/O modules, voice modem and all connectors are integrated into one small package, the same size as a standard Xpert.



Integrated Fire Weather Module Package

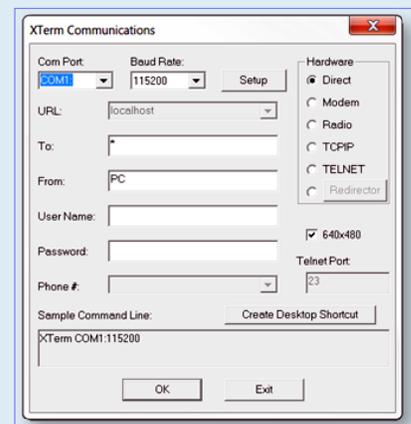
FEATURES

- ▶ Custom built Xpert-sized modules (same dimensions as the Xpert Data Logger)
- ▶ Rugged, high performance connectors
- ▶ Polarized to prevent improper connections
- ▶ Bayonet lock for quick connections
- ▶ Designed for NFDRS Update Compliant Remote Automatic Weather Stations
- ▶ Each Sutron RAWs contains many setup files pre-loaded into its non-volatile memory. Use a laptop, smart device or Xpert's back-lit LCD touch screen to choose the sensor-appropriate files.
- ▶ Supports all required and optional sensors identified in NFDRS Update plus virtually any foreseeable environmental sensor.
- ▶ Maximum flexibility! Setup shows wind direction vector average data written to 2 separate log files for GOES transmission plus an alarm condition transmitted by voice over the voice radio modem.
- ▶ Interface for Bendix/King portable LOS radio
- ▶ NFDRS Optional Sensors
 - ✓ Fuel Temperature
 - ✓ Barometric Pressure
 - ✓ Fuel Moisture
 - ✓ Other sensors as required processor @66 MHz, 32 bits
- ▶ Alerts!
 - ✓ Multiple threshold alerts. For example, a station can be programmed to send voice alert over radio when temperature reaches XX°C and RH drops to Y%
 - ✓ Nearly unlimited options for voice alerts with Sutron's library or create your own alerts (with Voice Option)
 - ✓ Alerts customized for your combination of conditions
 - ✓ Audio alerts delivered in your choice of English, Spanish or both (with Voice Option)
 - ✓ WAV file voice alerts (with Voice Option)

XTERM COMMUNICATIONS

Sutron's XTerm Communications Program allows any PC to remotely setup & operate an Xpert without using the front panel.

- ▶ Remote operation of Xpert
- ▶ Automatically displays the graphic display of the Xpert
- ▶ Sends mouse clicks to the Xpert as if you were pressing the touch screen
- ▶ Easy file transfer for up/downloading of setups, programs, data files
- ▶ Set the clock with a single button
- ▶ Export the log to your PC
- ▶ Communicate to an Xpert via RS232 com ports 1-9 at up to 115200 baud.
- ▶ Supports direct connect modems, & keyed half duplex radio systems
- ▶ Communicate to an Xpert or XLite via a TCP/IP network.
- ▶ Communicate over the internet by using XTerm as a proxy
- ▶ Automatically prompts for login account & password when needed.
- ▶ Displays system information on running processes, threads, & memory usage
- ▶ Available for Windows Mobile



XTERM SCREEN

No special installation is needed for XTerm. Simply copy it to any folder on your PC.

To setup, use the controls on the screen to select the com port, baud rate, type of hardware (direct, modem, radio, TCP/IP) and related values. Then select OK and Xterm will begin operation with the type of communications you have selected.

SPECIFICATIONS	
<i>Subject to change without notice.</i>	
MEASUREMENTS	
Measurement Interval	0.1 Seconds to 24 hours (Programmable)
# of Measurements	Unlimited
SDI-12	V1.3 compatible
Analog Inputs	Optional via I ² C modules
Digital Inputs & Outputs	Optional via I ² C modules
Excitation Channels	Optional via I ² C modules
TELEMETRY	
Available Types	SatLink 3, Sutron Data & Voice Modem, Radio, Direct Connect, GPRS, IRIDIUM, MODBUS, custom devices via BASIC
Communication Ports	4 RS232 for communications
# of Simultaneous Communications	4 or 8 com ports depending on model
Communication Protocols Supported	SSP (Sutron Standard Protocol), MODBUS, YMODEM, Telnet, HTTP, FTP, DHCP, DNS, SLIP, PPP, & custom protocols via Basic using RS-232, TCP, UDP
MEMORY	
Built-In	Non-volatile memory: 65MB (1 to 3 million readings), RAM: 32 MB
SD Card	For download data and read/write setups or additional log memory
Ethernet	Built-in 802.3 10BaseT
Programming	Menu driven setup, Expanded complexity via BASIC, Custom capability via C++
Operating Temperature	-40°C to +60°C
Display Operating Temperature	LCD operates to -20°C
Display Type	320x240 LCD display, monochrome, transfective
Keypad Type	Touchscreen
Clock Accuracy	5.4 sec/month (at 0°C - 40°C)
Power Requirements	10-16VDC (20VDC max)
Current Drain	Typically 3mA standby, 40mA active
DIMENSIONS	
Height	8.5 in. (21.6 cm)
Length	6.5 in. (16.6 cm)
Width	2.5 in. (6.4 cm)
Weight	2 lbs. (.9 Kg)
SHIPPING DIMENSIONS	
Shipping Height	14 in. (35.6 cm)
Shipping Length	10 in. (25.4 cm)
Shipping Width	6 in. (15.3 cm)
Shipping Weight	5 lbs. (2.3 Kg)

ORDERING	
8080-0000-1B	Xpert with Display 4 Com Ports
8080-0000-2B	Xpert with Display 8 Com Ports
8080-0000-3B	Xpert with Display 8 Com Ports including 1 RS-485 Com Port
8080-0001-1B	Xpert without Display 4 Comm Ports
8080-0001-2B	Xpert without Display 8 com Ports
8080-0001-3B	Xpert without Display 8 Com Ports including 1 RS-485 Com Port
XPERT I/O MODULES	
8080-0002-1	Xpert Digital I/O Module
8080-0002-4	Xpert Digital I/O Module w/ Surge Protection Board
8080-0003-1	Xpert Analog I/O Module 6 Channels
8080-0003-3	Xpert Analog I/O Module 6 Channels w/Surge Protection Board
8080-0007-1	Xpert Analog I/O Module 10 Channels
8080-0005-1B	Voice modem (V.34, V.42bis) with voice
8080-0005-2B	King Radio voice module
8080-0008-1	Fire Weather I/O Module (RAWS)
COMMUNICATIONS	
6661-1293	SD Card with 2 G of available memory
ISBD-1-O	Iridium Modem
GPRS-1-O	GPRS Modem
SL3-1	SatLink 3
SL3-XMTR-1	SatLink 3 Transmitter
Note: Please refer to the User Manual for full product specifications and variations	