

The i3000 Controller provides the backbone of the iSite™ remote monitoring system. It consists of a WINBOND W77LE58 CPU with 512 Kbytes of data storage saved in circular FIFO requiring zero power backup. The onboard operating system supports up to 8 devices connected with the advanced serial communication bus. The self-booting operating system is stored in 32 KB of nonvolatile RAM. Each controller has a programmable ID. Up to 256 controllers can be run in one network.

Combine i3000 Controller with i3100 device interfaces to collect data from up to 128 sensors with a single datalogger.



## Standard Packages

### i3000-XX-YY-ZZ

- XX – number of external ports  
3 external ports  
8 external ports (7 if modem or radio used,  
6 if both used)
- YY -- radio option  
NO no radio  
9M 900 MHz  
2G 2.4 GHz spread spectrum
- ZZ - modem option  
NO no modem  
LL landline  
CD CDMA (USA only)  
G1 GSM800/1900 (NA only)  
G2 GSM900/1800 (outside NA)

#### Example part numbers

- For data logging of two sensor interface units with periodic download of stored data by RS232 connection use i3000-2-NO-NO.
- For remote monitoring by cellular telephone network in USA of a controller with two sensor interface units use i3000-2-NO-G1
- For network operation from controller with two sensor interface units and on site data transfer by spread spectrum radio use i3000-2-2G-NO
- For remote monitoring by cellular telephone network in USA of six sensor interface units and remote wireless network with spread spectrum radio to other units on site, use i3000-6-2G-G1

## Power Supply

- ▶ Main Internal Battery: 3.6 vdc 7000 mAh NiMH rechargeable
- ▶ External: 7.5 to 20 vdc via Hirose miniature connector

## Power Consumption

- ▶ Average current in continuous operations: 50 ma
- ▶ Average current in standby mode: 10 ma

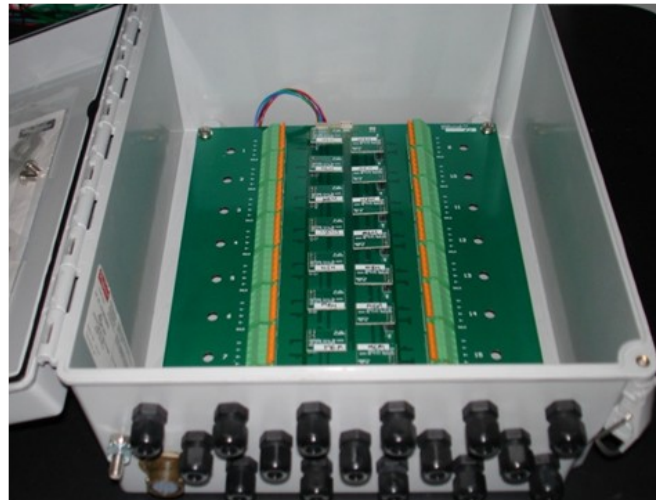
## Operating Environment

- ▶ Temperature: -25° to +80°C
- ▶ NEMA 4 moisture resistant enclosures

## Peripheral Interfaces

- ▶ RS232 using 38,000-baud ASCII protocol with one start bit, one stop bit, eight data bits, no parity via Hirose miniature connector
- ▶ 2, 3 or 8 Serial Interface Buses via MIL-C-26482 12-10 S circular bayonet lock connectors

The i3100 device interfaces connect sensors and supported devices to the iSite™ i3000 controller. Each interface consists of a WIN-BOND W77LE58 CPU programmed to exchange information between the controller and the supported device. Supported devices include bit analog to digital converters, frequency readers for vibrating wire sensors, strain gage bridges, seismographs, automated total stations and Leica GPS systems.



## Power Supply

- ▶ External: vdc via Serial Interface Bus

## Power Consumption

- ▶ Average current in continuous operations: 30 ma
- ▶ Average current in sleep mode: 10 ma

## Operating Environment

- ▶ Temperature: -25° to +80°C
- ▶ NEMA 4 moisture resistant enclosures

## Peripheral Interfaces

- ▶ Serial Interface Buses via MIL-C-26482 12-10 S circular bayonet lock connectors

- SG350 strain gage 350 ohm
- VBWIR vibrating wire
- CC lightning protection
- NO no lightning protection
- LP with three stage lightning protection
- DD enclosure
- 01 metal with external bayonet connectors
- 02 ABS plastic with external bayonet connectors
- 03 metal with external Hyroshie connectors
- 04 plastic with external Hyroshie connectors
- 05 metal with internal push pin connectors and moisture resistant cable glands
- 06 plastic with internal push pin connectors and moisture resistant cable glands

## Device Interfaces

- i3110 device interface to InstanTel Blastmate III seismograph
- i3120 device interface to Syscom MR2002-CE seismograph
- i3130 device interface to Leica 1201 automated total station
- i3140 device interface to Leica GPS.

## Example part numbers

To interface 8 channels of vibrating wire sensors without lightning protection using plastic case and internal push pin connectors use i3100-VBWIR-08-NO-06.

To interface 16 – 120 ohm strain gages with full bridge completion circuit and lightning protection in plastic case with external bayonet connectors, use i3100-SG120-16-LP-02.

## Standard Packages

### i3000-AA-BB-CC-DD

#### Sensor Interfaces

AA number of sensors

- 02 two channels
- 04 four channels
- 08 eight channels
- 16 sixteen channels

BB sensor type

- ANUNI analog unipolar
- ANBIP analog bipolar
- CUSTM customized
- DIGITL digital I/O
- SG120 strain gage 120 ohm
- SG240 strain gage 240 ohm

The i3200 series of iSite™ dataloggers combine an iSite™ 3000 controller with a i3100 sensor interface in the same enclosure together with network communications options. These dataloggers provide a robust self-contained unit in an easy to install package that survives harsh outdoor environments. Units under water for days have returned to full use after being dried out. Units power the sensors with individually control voltage. The i3200 can continually monitor each sensor to determine if an alarm value has been exceeded. Robust operating system supports push and pull of data from memory to external devices.



## Power Supply

- ▶ Main Internal Battery: 3.6 vdc 7000 mAh NiMH rechargeable
- ▶ External: 7.5 to 20 vdc via Hirose miniature connector

## Power Consumption

- ▶ Average current in standby mode: 10 ma
- ▶ Average current in continuous operations: 30 ma
- ▶ Average current in cell mode: 130 ma

## Operating Environment

- ▶ Temperature: -25° to +80°C
- ▶ NEMA 4 moisture resistant enclosures

## Peripheral Interfaces

- ▶ RS232 using 38,000-baud ASCII protocol with one start bit, one stop bit, eight data bits, no parity via Hirose miniature connector.

## Standard Packages i3000-AA-BB-CC-DD

### AA - sensor type

ANUNI	analog unipolar
ANBIP	analog bipolar
CUSTM	customized
DIGITL	digital I/O
SG120	strain gage 120 ohm
SG240	strain gage 240 ohm
SG350	strain gage 350 ohm
VBWIR	vibrating wire

### BB - number of sensors

- 02 two channels
- 04 four channels
- 08 eight channels
- 16 sixteen channels

### CC lightning protection

- NO no lightning protection
- LP with three stage lightning protection

### DD - enclosure

- 01 metal with external bayonet connectors
- 02 BS plastic with external bayonet connectors
- 03 metal with external Hirose connectors
- 04 plastic with external Hirose connectors
- 05 metal with internal push pin connectors and moisture resistant cable glands
- 06 plastic with internal push pin connectors and moisture resistant cable glands

### EE -- radio option

- NO no radio
- 9M 900 MHz
- 2G 2.4 GHz spread spectrum

### FF - modem option

- NO no modem
- LL landline
- CD CDMA (USA only)
- G1 GSM800/1900 (NA only)
- G2 GSM900/1800 (outside NA)

### Example part numbers

For 8 channel data logger for vibrating wire sensors without lightning protection using plastic case and external bayonet connectors with CDMA cell modem, use i3100-VBWIR-08-NO-02-NO-CD

To interface 16 – 120 ohm strain gages with full bridge completion circuit and lightning protection in plastic case with internal push pin connectors and radio, use i3100-SG120-16-LP-06-9M-NO

## Remote Instrumentation Monitoring System for Structural Health Monitoring

The *iSite™-HS* system is designed for high speed monitoring applications where the user needs access to data from remote instrumentation quickly and inexpensively. The system consists of standalone dataloggers which take and store readings at programmed intervals up to 1,000 readings per second per channel. Units are networked with Ethernet connections. By connecting the units through a switch to a G3 cell modem, data can be streamed to a remote location at up to maximum speed of the modem. Alternately units may be connected to an onsite computer with WiFi modules attached to each data logger. Software operating on a networked workstation can receive data in a streaming mode and save to files. The only limit to the number of dataloggers placed into the network is communications bandwidth of the network to download the data. Any channel on any datalogger can be remotely configured using the included software.

The *iSite™-HS* system can be programmed to run multiple data logging sessions simultaneously. A common use of this option is to run one session to log readings of each sensor every hour over a long time period; then run a second session to take readings at a high sampling rate when a trigger is set. High speed data logging can be controlled by (1) reading on any sensor exceeding a preset threshold value, an external trigger that sets one of the digital inputs high, or a preset start time.

The datalogger is housed in a NEMA-4 plastic enclosure that provides protection against moisture. One version provides push pin connectors with through-box gland cable connectors to allow direct connection of sensor cables. The other version provides Amphenol bayonet connectors on the exterior of the enclosure for plug type connection of sensors to the data logger.



The *iSite™* system is compatible with any sensor with dc voltage output of up to  $\pm 2.5$  volts, including strain gages. Each datalogger can excite and read up to eight sensors. The unit provides sensor excitation that is adjustable by software between 5 and 10 VDC for each channel. An option provides built-in, three-staged lightning and surge protection on each sensor. All components, including options, are preassembled inside the weather resistant NEMA 4 metal enclosure. Installation is simple and quick. Adjust the excitation level by software to that required by a particular sensor and connect the sensor. Install the unit. Set the reading interval and initiate data logging.

The *iSite™-HS* removes the need for wires connecting sensors to a central data logging unit. This greatly lowers the materials and installation costs for most field monitoring applications. The *iSite™-HS* is useful in many field monitoring applications that use DC based sensors and require high speed data logging. Some of these include monitoring structural loads and strains, effects of impact loads, effects of extreme weather events, vibrations and blast monitoring.

**Remote Data Acquisition  
System Specifications**

**INPUTS**

**NUMBER OF CHANNELS**

8 differential, individually configured

**ANALOG INPUTS**

ACCURACY:  $\nabla 0.002\%$  of FSR (-40E to 85EC)

**RANGE AND RESOLUTION**

Software selected by channel

Input Range (mV)	Resolution ( $\mu$ V)
$\nabla 2500$	0.15
$\nabla 1250$	0.075
$\nabla 625$	0.037
$\nabla 313$	0.019
$\nabla 156$	0.009
$\nabla 78$	0.005
$\nabla 39$	0.002
$\nabla 20$	0.001

**SAMPLE RATES FOR RESOLUTION**

16 bits at 1,000 Hz

18 bits at 150 Hz

**SAMPLING FREQUENCY**

Programmable from 25 to 1,000 Hz in high speed mode.

User programmable from 1 per day to 25 Hz in normal sampling mode.

**INPUT POLARITY**

User programmable unipolar or bipolar

**A/D OUTPUT NOISE**

3Mv at 2 gain and 150 Hz sampling

6Mv at 2 gain and 1,000 Hz sampling

0.2Mv at 128 gain and 150 Hz sampling

0.6Mv at 128 gain and 1,000 Hz sampling

**NOISE FREE RESOLUTION**

17 bits at 2 gain and 150 Hz sampling

16 bits at 2 gain and 1,000 Hz sampling

15 bits at 128 gain and 150 Hz sampling

14 bits at 128 gain and 1,000 Hz sampling

**COMMON MODE REJECTION**

1.2 to 4.05 volts

**DC COMMON MODE REJECTION**

120 dB

**INPUT CURRENT**

0.5 nA for gain > 1

**INPUT RESISTANCE**

2.5 Gohms typical

**SENSOR EXCITATION**

Programmable per channel 5-10 VDC,

100 mA maximum

**DIGITAL INPUT/OUTPUT**

4 lines programmable for input or output

**CPU AND INTERFACE**

PROCESSOR: ARM 9

**PROGRAM STORAGE**

512 Kbytes

**DATA STORAGE**

4 Mbytes FLASH with zero power backup with circular FIFO storage

**ALARMS**

User programmable high and low on each input channel

**PERIPHERAL INTERFACE**

Ethernet using 100 Mbit TCP/IP protocol

**CLOCK ACCURACY**

$\nabla 1$  minute per month

**OPERATING TEMPERATURE**

-25E to +60EC

**BATTERY BACKUP**

CR1225 lithium battery for clock 220 with mAhr for up to 2 months reserve

**TYPICAL CURRENT DRAIN**

70 mA

**EXTERNAL POWER SOURCE**

12 to 18 VDC or 9 to 12 VAC

**SENSOR CONNECTORS**

MIL-C-26482 12-10 size circular bayonet lock connector, or Molex push pin header

**ENCLOSURE**

NEMA 4 plastic with lock cover

SIZE: 13.1 x 11.3 x 7.3 inches

333 x 287 x 185 mm

5 lb (3.2 kgm)

**LIGHTNING AND SURGE PROTECTION**

(optional)

1<sup>st</sup> stage: tripolar plasma surge arrestors

2<sup>nd</sup> stage: SiDactor™ medium voltage surge arrestors

3<sup>rd</sup> stage: SiDactor™ low voltage surge arrestors

**REMOTE ACCESS**

TCP/IP via wired Ethernet

Optional WiFi using IP access point

Optional IP cell phone

**WARRANTY**

Three years against defects in materials and workmanship. Damage from abuse, misuse or direct lightning strike excluded. Specifications subject to change without prior written notice. Visit [www.geocomp.com](http://www.geocomp.com) for most up-to-date information. Customized units can be built to order in many but not all cases.