

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 ± 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: $\pm 0.002\%$ of FSR (-40E to 85EC)

RANGE AND RESOLUTION

Software selected by channel

Input Range (mV)	Resolution (μ V)
± 2500	0.15
± 1250	0.075
± 625	0.037
± 313	0.019
± 156	0.009
± 78	0.005
± 39	0.002
± 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

± 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)

1st stage: tripolar plasma surge arrestors

2nd stage: SiDactor™ medium voltage surge arrestors

3rd 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 for most up-to-date information. Customized units can be built to order in many but not all cases.