

I-RIS Solid State AMTS Control

I-RIS System

The I-RIS solid state automated motorized total station (AMTS) control System is based on the CR1000 measurement and control platform. I-RIS is our software program running on the CR1000 providing fully automated remote control of robotic total stations. It also provides for reading common geotechnical instruments, wireless sensors (WiSe), and many other sensors applications.

I-RIS is compatible with common robotic total stations, including Leica and Trimble Robotic total Stations.

The CR1000 based I-RIS solution provides wireless, trouble free displacement data, 24 hours a day, rain or shine. I-RIS provides a simple monitoring solution to even the most difficult of sites with ease, at a minimum cost.

I-RIS reads each point in both telescope faces (if selected) to minimize measurement error.



Above: AMTS Theodolite

Operating Theory:

I-RIS controlled AMTS systems work by measuring distances, and angles in the horizontal and vertical planes referenced to a fixed point at the AMTS.

Modern AMTS systems use state of the art Electronic Distance Measurement (EDM) technology to accurately and repeatably measure Distances to the AMTS. Horizontal and vertical plane angles are controlled either with stepper motors, or magnetic drive systems, packaged in an environmental protected enclosure for weather protection. I-RIS works with the respective AMTS technologies to control and process data in three

orthogonal directions (X, Y & Z).

Most AMTS systems work in a "reflector" mode or "reflector less" mode. Most monitoring applications use the reflector mode, as accuracy and repeatability of the measurement is best. Reflector based measurements are accomplished with optic grade corner cube prisms packaged in a sealed shock proof aluminum canister.



Above: AMTS in tunnel application. Below: Geo-Instruments L-Bar 25.4mm prism can be attached to structure using either hardware or epoxy.



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*Helping you get the
data you need.*



ARGUS:

Once the field hardware is installed and prism locations "learned" by I-RIS, the system is free to collect data. The system configured to automatically deliver data to our ARGUS server, which then processes the points, applies alarm user input thresholds, and issues electronic alerts to cell phones or computers via email, SMS, voice, or text messages.

Argus creates a graphical representation of the site, making it easy for users to understand how movement is occurring on the site.

ARGUS accepts data formats from most commonly used datalogger outputs, and allows manual data input. Argus accepts multiple sensor types and plotting formats. Data is easily set up in a report format for simple information archiving and dissemination.

CR1000/CR800 Platform:

The CR1000 is a field rugged datalogger and communications device. Unlike solid state PC's the CR1000 does not crash, and has a very low quiescent power draw.

I-RIS/CR1000 stores current re-



Above: CR800 (top) and CR1000 bottom, Solid State controller running I-RIS Software.

ading in memory (typically up to 1 month of data storage) and provides for robust communications options, assuring that no readings are lost.

The CR1000/CR800 platform allows for additional sensor types to be measured and collected while also controlling the AMTS. This is a huge benefit on most geotechnical applications where multiple sensor types need to be collected and integrated in real time.

Communications:

- Wireless IP (GRPS or CDMA modems)
- 900 or 2.4 Mhz spread spectrum radio,
- Satellite

System features:

Benefits to this system include:

- Real time
- Unattended monitoring
- Low cost
- Easy to use
- Highly accurate
- Highly efficient
- Rental or Purchase
- Web or local based
- Flexible alarm delivery
- Data integration

Specifications:

VOLTAGE: 12VDC

TYPICAL CURRENT DRAIN: Sleep Mode: ~0.6 ma

EXTERNAL BATTERIES: 12 VDC nominal; reverse polarity protected.

One independent 12 V unregulated source is switched on and off under program control.

3 differential (DF) or 6 single-ended (SE) individually configured. Channel expansion provided by AM16/32 and AM25T multiplexers.

PROCESSOR: Renesas H8S 2322 (16-bit CPU with 32-bit internal core)

MEMORY: 2 Mbytes of Flash for operating system; 4 Mbytes of battery-backed SRAM for CPU usage, program storage and data storage

SERIAL INTERFACES: CS I/O port is used to interface with Campbell Scientific peripherals;

RS-232 port is for computer or non-CSI modem connection.

CLOCK ACCURACY: ± 3 min. per year

Housed in NEMA4X enclosure

Complete system component specs available on request

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