PRODUCT CATALOG

ENCARDIO RITE

RELIABLE INSTRUMENTATION & DATA MONITORING SOLUTIONS

GEOTECHNICAL | GEODETIC | STRUCTURAL | ENVIRONMENTAL

CONTENTS

INCLINOMETER/IN-PLACE INCLINOMETER

READ-OUT UNITS/DATALOGGERS

ACCESSORIES

GEODETIC TARGETS & SURVEY MARKERS

AUTOMATIC WEATHER STATION

AGENCY

EXPERIENCE

Encardio-rite Group of Companies have acquired varied and extensive expertise in monitoring of large construction projects. We have worked with some of the best consultants and construction companies in the world and have developed safety monitoring expertise for turn-key solutions to detect, measure and model structural, geotechnical and geodetic behavior for project owners, designers, consultants and contractors.

220 km
METRO TUNNELS

300 km
RAIL & ROAD TUNNELS

160 km
SEWER TUNNELS

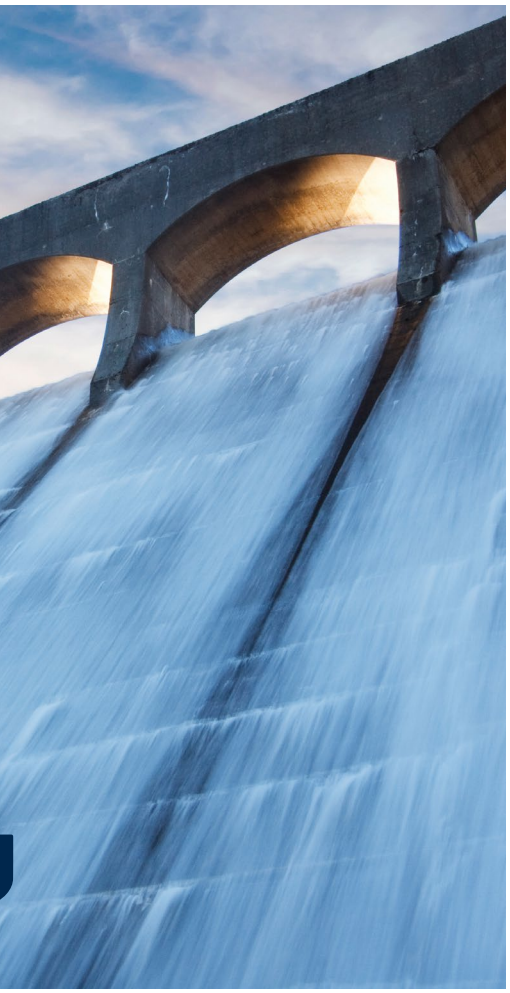
Over 200
DAMS ALL OVER THE WORLD

Over 100
HIGH RISE BUILDINGS, MONUMENTS, ASSETS & FOUNDATIONS

Over 2000
ONLINE GROUNDWATER WELLS


HYDROELECTRIC PROJECTS


STRUCTURAL MONITORING




METROS & TUNNELS


adani
STS-03
SETTLEMENT MONITORING


SLOPE MONITORING

HYDROELECTRIC PROJECTS

Dams | Power House | Tunnels | Surge Shafts | Penstock | Spillway

TEESTA HEP (III, IV, V)
India

INDIRA SAGAR DAM
India

GHATGAR UPPER & LOWER DAM
India

KOYNA DAM
India

KOL DAM
India

PURULIA PSP
India

PINALTO DAM
Dominican Republic

SALMA DAM
Afghanistan

EL PLATANAL DAM
Peru

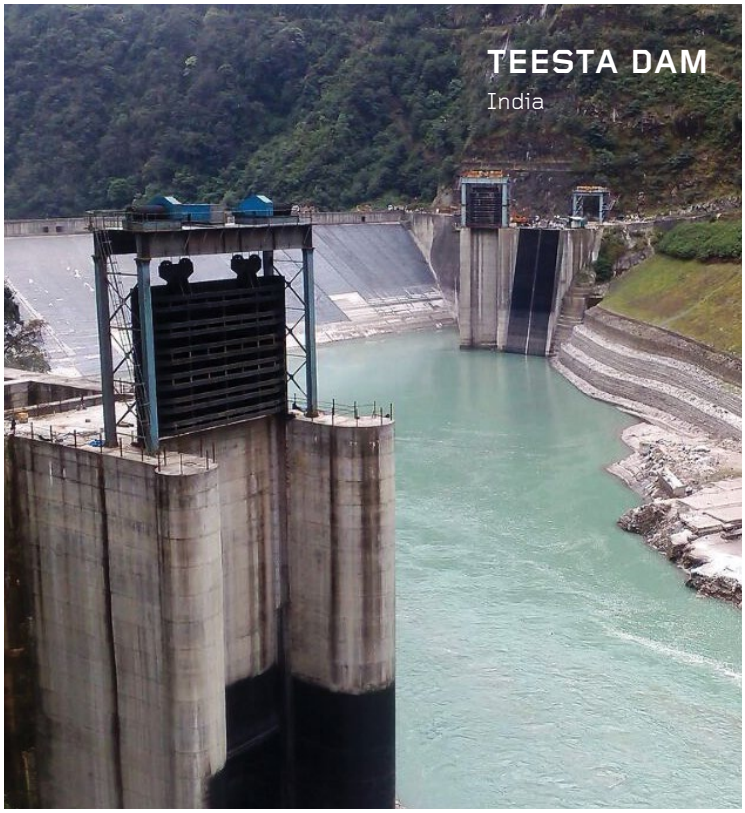
MIDDLE MARSYANGDI
Nepal

CHHUKHA HEP
Bhutan

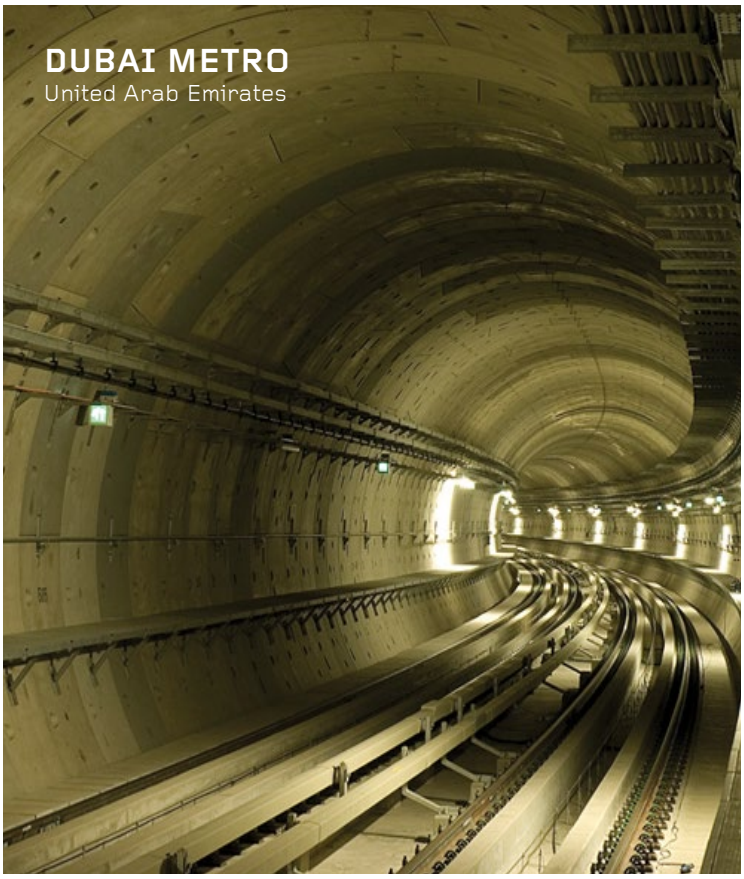
DAGACHHU DAM
Bhutan

KOPRUBASI POWER HOUSE
Turkey

UPPER KOTMALE DAM
Sri Lanka



METROS, RAIL, ROAD & SEWER TUNNELS



DELHI, MUMBAI, CHENNAI, BENGALURU, KOLKATA METRO
India

CHENANI NASHRI ROAD
India

NORTH FRONTIER RAIL
India

AL RAYAN ROAD PROJECT
Qatar

EXPOLINK ROUTE 2020
United Arab Emirates

ATHENS METRO
Greece

PIR PANJAL RAIL TUNNEL
India

BRENNER BASE TUNNEL
Italy

EGNATIA MOTOR WAY
Greece

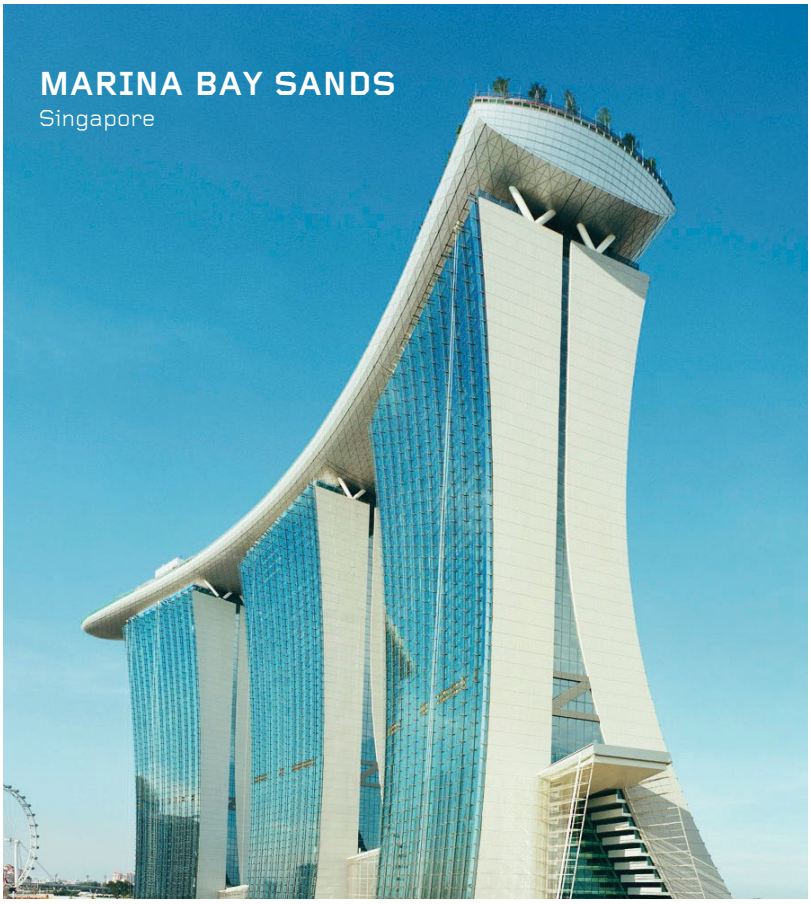
ROHTANG TUNNEL
India

MUHARRAQ SEWER
Bahrain

IDRIS SEWER
Qatar

STRUCTURAL HEALTH MONITORING

High Rise Buildings | Monuments | Foundations
(D-Wall, Piles, Rafts)



ICD BROOKFIELD PLACE
United Arab Emirates

MARSA AL SEEF
United Arab Emirates

AL ZAABI TOWER
United Arab Emirates

MEENA TOWER
United Arab Emirates

DEIRA WATERFRONT
United Arab Emirates

DUBAI WATER CANAL
United Arab Emirates

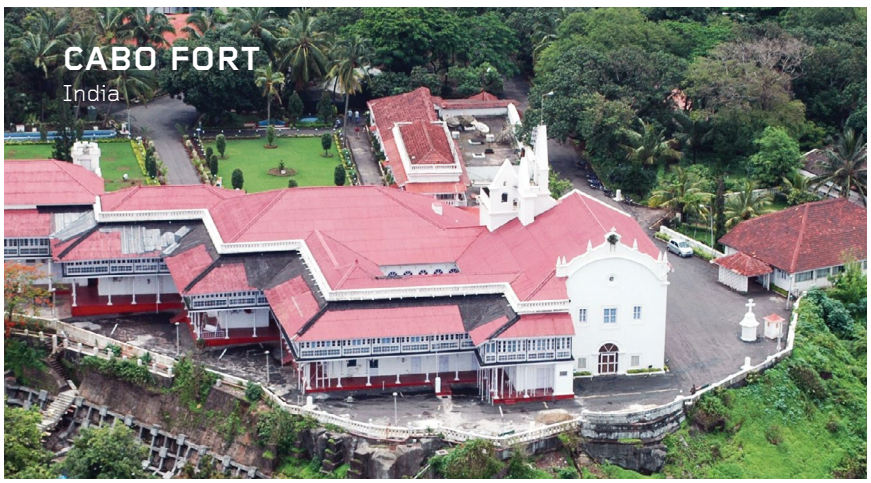
AL QUID TOWER
Qatar

LODHA WORLD ONE
India

HOLY SHRINE MECCA EXTENSION
Saudi Arabia

AL SHINDAGHA CORRIDOR
United Arab Emirates

BASILICA OF S. MARIA
Italy



GROUNDWATER, SOIL CONSOLIDATION

Seaport | Airport

GROUNDWATER LEVEL
Karnataka, Uttar Pradesh, Assam, Punjab, Telangana, Puducherry, West Bengal - India

YAS MARINA ONLINE WATER LEVEL
United Arab Emirates

SEPETIBA HARBOUR COAL STOCKPOLE
Brazil

SLAB STORAGE STOCKPILE
Brazil

MUNDRA PORT
India

DUBAI AIRPORT
United Arab Emirates

ITD GRSE SOIL CONSOLIDATION
Kolkata, India

LNG MUNDRA TANK
India

JAWAHAR LAL NEHRU PORT TRUST
India

KANDLA PORT
India

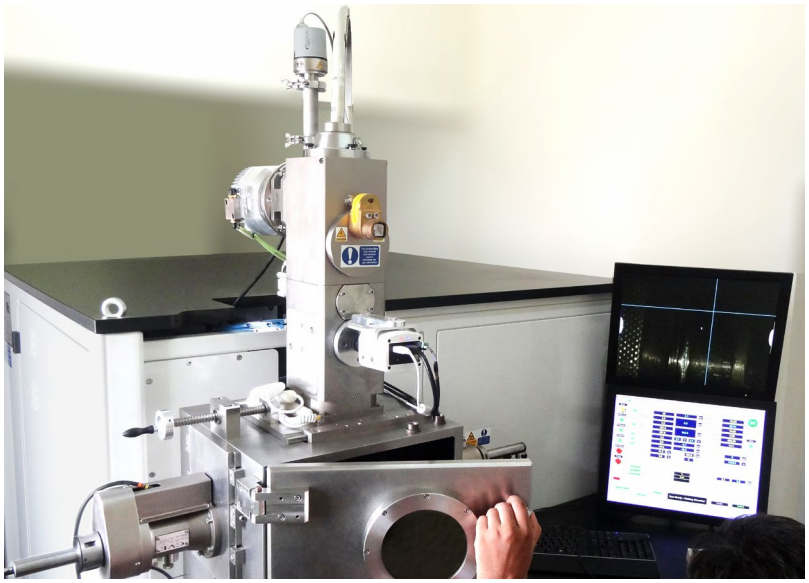
AL GARHOUD
United Arab Emirates

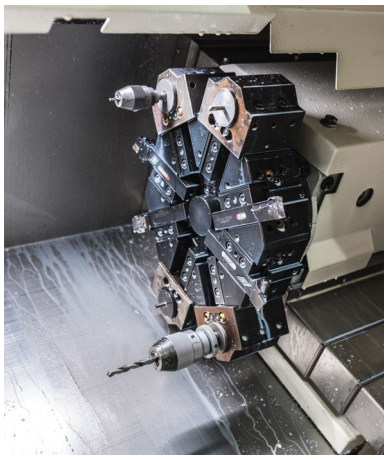
VALLARPADAM PORT
India

VISHAKHAPATNAM SEA PORT
India

BORUSAN GEMLIK PORT SOIL IMPORVEMENT PROJECT
Turkey

COMPANY PROFILE





Encardio-rite Group

Established in India in the year 1966, Encardio-rite Group is a World leader in safety monitoring providing geotechnical, structural, environmental monitoring and geodetic surveying solutions. Over the years, Encardio-rite has become an established brand for its specialized services with high quality products and innovative online solutions.

A sui generis one-stop monitoring solution provider, the Group provides the most comprehensive range of services and products. This includes data collection, database management, complex monitoring, surveying, installation, supply and calibration of geotechnical and geodetic instrumentation with in-house developed advanced software.

Over the last 52 years, Encardio-rite Group has acquired varied and extensive expertise in monitoring of large construction projects. We have worked with some of the best consultants and construction companies in the World and developed great monitoring expertise for turn-key solutions to detect, measure and determine geotechnical, structural and geodetic behaviour for project owners, designers, consultants and contractors. Our excellence is reflected through our key projects like Delhi Metro, Dubai Metro, Expolink, Doha Metro, Marina Bay Sands, Abu Dhabi Underground Sewer System, Tehri Dam, etc. The Group has a physical presence in 8 countries and its globally acclaimed products are used in more than 55 countries worldwide.

With Moniterra, we are the world leaders in providing sophisticated turnkey solutions for topographic, land, aerial and construction surveying and mapping along with online data management that includes onsite surveying, data processing and reporting. With varied experience in geotechnical, geodetic and online solutions, we are now one of the most formidable group of companies in this field.

Advance Facilities

R&D division

We are leaders in technological advancements with cutting-edge software, instrumentation, monitoring and manufacturing techniques to address the dynamic requirements of the evolving construction and environmental sectors.

Quality

Consistent quality services with reliable products, in compliance with the ISO-9001:2015 quality systems conforming to international standards.

Production

State-of-the-art manufacturing and testing facilities, equipped with the best of tools and technology including electron beam welding and load cell calibration facilities up to 15,000 kN. A wide range of sensors are hermetically sealed resulting in IP-68 protection that result in sensors being almost completely resistant to effect of corrosion and ingress of moisture and water, making them best suitable for long term monitoring.

AUTOMATED MONITORING SOLUTIONS

Automated Data Management For Risk Assessment

Encardio Group with partner Moniterra, Europe, offers comprehensive geotechnical monitoring and geodetic survey services which can be summarized as follows:

Geotechnical Monitoring

To ensure zero risk during the construction process, we offer a comprehensive range of sensors with advanced database management. Our monitoring system manually and automaticly facilitate monitoring of sub-surface and surface parameters like stress, strain, load, piezometric pressure, water level, lateral deformation, joint openings, cracks, settlement, convergence, tilt etc. The monitored data is constantly provided to the construction contractor and consultants. The data is provided online or through evaluation reports. This expedites work in the safe zones and takes corrective actions where there is possibility of any risks.

Structural - Asset Monitoring

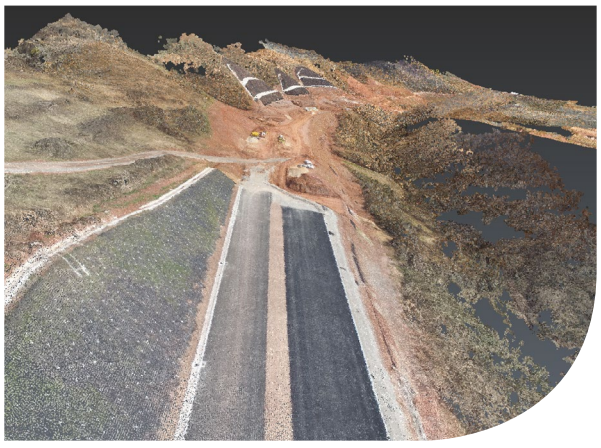
To ensure safety of existing buildings and infrastructures, our structural health monitoring includes sensors, automatic surveying and laser scanning etc. We aim to assist and keep owners/designers/ contractors/architects informed about continued performance of structures under gradual or sudden changes to their state. Encardio Group has great expertise in this field, and has executed a number of projects in Gulf countries and worldwide.

TBM/Tunnel Monitoring

Tunnel excavation has an inevitable association with ground loss, and high pressure conditions which, in turn, result in associated ground movement. Therefore, it is empirical to closely monitor the tunnel boring machine (TBM) parameters during the tunnelling process, especially in urban areas. With our specially designed advance software we can integrate the essential parameters from the TBM with the geotechnical monitoring, survey and geophysical data to provide essential correlations.

Geodetic Survey

Geodetic monitoring offers low costs and hence is commonly preferred over other methods in all projects. We provide manual and automatic monitoring solutions. If used judiciously with geotechnical instrumentation, geodetic monitoring provides co-related data which is extensively used in civil construction and structural monitoring.



Laser Scanning

It is a method to automatically monitor and collect the data in real time with 3D surface coordinates of an object in normal grid. Laser scanning is a rapid and reliable surveying method as it collects the data in static, stop and go or kinematic mode. From the point where cloud is produced, the exported section profiles can be used to monitor deformations or displacements. Although these are mainly used in tunnels, they can also be used in structures, landslides and rock-fall areas.

Deformation Monitoring

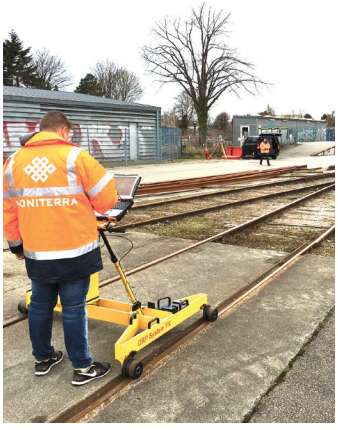
It is a systematic measurement and monitoring of changes in the shape or dimensions of any structure. The monitoring procedure includes applied topography and geomechanics and is directly related to civil engineering, mechanical engineering and rock mechanics. It is useful in application areas like dams, roads, tunnels, bridges and overpasses, multi-storey and historical buildings, foundations, mining - exploitation, landslides and sloping, earthquake prone regions.

Topographic and Aerial Mapping using UAVs (Drones)

UAVs are the latest trend in geodesy's technology for aerial mapping. Unmanned and remotely-piloted aircrafts that follow a pre-programmed path for take-off, flight and landing. These aircrafts are equipped with HD/IR/thermal cameras that compute aerial images and videos over a defined area at a specified height. The point clouds, meshes and 3D models produced are the data to be compared between sequel flights during monitoring time. This is a very fast, accurate and low cost way to monitor the progress of any large scale project, where frequent geospatial and/or imaging information is needed, in order to monitor earthmoving issues or the progress of a running project.

Railway monitoring

Reliable and efficient transport infrastructure needs comprehensive asset management, reliable quality control in the construction process, knowledge of the condition and requirements of the rail network. To-the-millimeter accuracy is vital during track installation. We offer reliable surveying technologies with a guarantee of precision during the construction process. With experience since 2007 in the field, these goals are achieved by giving fast and accurate surveying services. This leads to timely delivery, high quality and cost-effective results.



Model EWLR-101

Automatic Groundwater Level Monitoring

Model EWLR-101 automatic water level monitoring system provides significant quantitative data on the magnitude of water column, water table and temperature in a borehole. The monitoring system is a set of absolute water level sensor with cable, automatic datalogger and required data retrieval/ transmission options. The datal ogger is programmed to automatically store the water head/pressure data at fixed intervals with a minimum scan/upload interval from five seconds to 168 hours with different options to download data. Data can be remotely transmitted at scheduled times with telemetry (GSM/GPRS inbuilt modem) or downloaded on a laptop/mobile in field through Bluetooth or a cable.

The water level data can be corrected for specific gravity variations in water. Automatic correction for atmospheric pressure variation is provided by an in-built barometric pressure sensor in the datalogger, thus eliminating the requirement of a vented tube cable and desiccant chamber.

EWLR-101 monitoring solution allows water level at remote locations to be monitored continuously in near real time from a central location and also sends alerts through SMS and email. The solution enables researchers and decision makers quick access to the groundwater data with little effort and cost.

SPECIFICATIONS

Input	EPP-30V, EPP-40V, EPP-60V pressure sensor
Sensor Range (MPa)	EPP-30V: 0.2, 0.35, 0.5, 0.7, 1.0, 1.5, 2.0, 3.5, (20, 35, 50, 70, 100, 150, 200, 350 m WC) EPP-40V: 0.35, 0.5, 0.7, 1.0, 2.0 (35, 50, 70,100, 200 m WC) EPP-60V: 0.10, 0.20 (10, 20 m WC)
Sensor Accuracy	± 0.2 % fs standard | ± 0.1 % fs optional
Cable	CS-1102 or CS-1302 four conductor
Data logger	ESCL-10VT/ESDL-30
Logger Memory capacity	8 MB Flash RAM, can store 3,145,728 data points
Communication port	One RS-232 serial port
Measuring modes	Linear or event sampling
Power supply	Lithium cells, Battery life is more than 5 years for 4 measurement/day and one transmission/day.
Bluetooth port	Detachable dongle

*For more details please refer to datasheet # 1216.

Model ECTD-30V, ECTD-60V

Conductivity Sensor With Water Level And Temperature

Model ECTD-30V and ECTD-60V CTD sensors are available for monitoring electrical conductivity, water level and temperature in the ground. These arerobust, marine grade sensors.

Model ECTD-30V CTD probe comes with the model EPP-30V absolute pressure sensor and ECTD-60V CTD probe is with model EPP-60V absolute pressure sensor. The ESDL-30CTDB datalogger,that collects the data from these sensors, has much of the complex circuitry, lowering the cost of individual sensors without impacting their accuracy or resolution.

SPECIFICATIONS

Pressure sensor	ECTD-60V - 10, 20, 35, 50 mWC ECTD-30V - 20, 35, 50, 100 mWC
Conductivity sensor	4 Electrode bulls-eye cell; 120 mS range; cell constant 0.42 ± 0.05
Conductivity sensor range	5 – 120,000 µS/cm
Accuracy	± 0.5 % of reading + 1µS/cm (for 5 – 80,000 µS/cm)[1] ± 1 % of reading(for 80,000 – 120,000 µS/cm)[2]
Resolution	0.1µS/cm1; 1.0 µS/cm[2]
Temp. sensor	Thermistor 30k Ohm; 0 – 80°C
Protection	IP-68 (IS-60529:2001)

Model ERG-200/201

Rainfall Gage

Model ERG-200/201 rain gage with a proven tipping bucket mechanism provides a cost effective and reliable method for measuring and recording rainfall.It is corrosion resistant having a stainless steel outer housing, designed for many years of trouble free operation. Each rain gage is individually calibrated for optimum accuracy. It comes with a SDI-12 interface unit that makes it compatible with the ESDL-30VB datalogger.

SPECIFICATIONS

Sensor Type	Tipping bucket
Accuracy	± 2 % at around 30 mm/hour ± 5 % at around 120 mm/hour
Resolution	0.2 mm/tip for model ERG-200 0.5 mm/tip for model ERG-201
Humidity	0 – 100 %
Output	Potential free contact, one momentary switch closure per tip
Catchment area	200 mm diameter

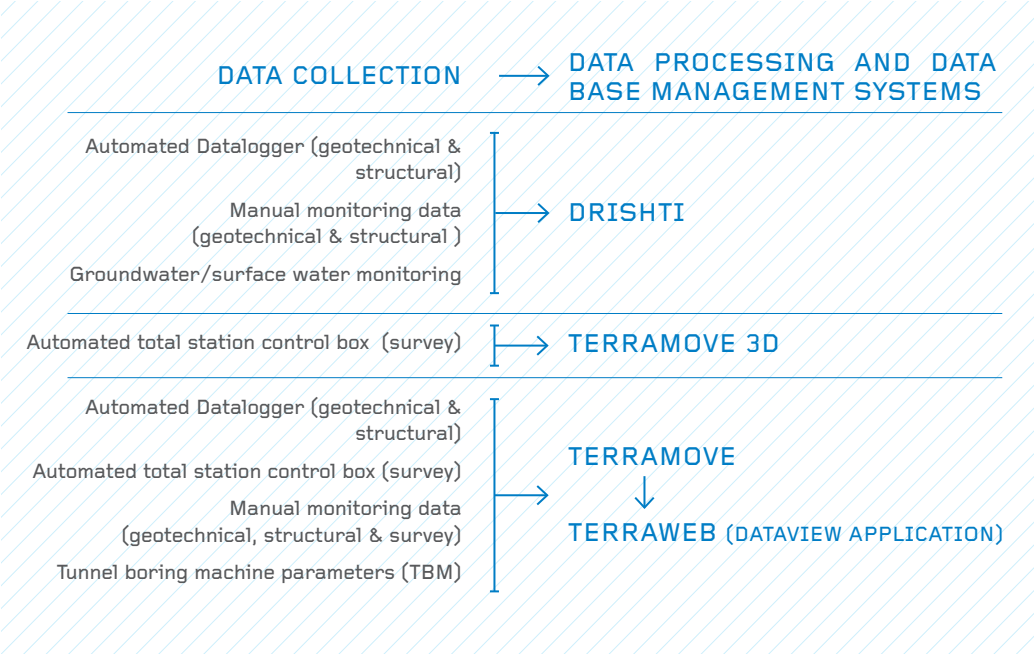
AUTOMATED DATABASE MANAGEMENT

Database Management Systems

Encardio-Rite offers a complete online cloud based or local access data monitoring solution for monitoring water resources or civil engineering/construction projects. Our monitoring system is versatile and can correlate data from structural, geotechnical, geodetic, environmental and Tunnel Boring Machine (TBM) sensors, etc. We offer customized data monitoring solutions to meet specific project requirements.

Few highlights of database management software:

- Comprehensive data management system that can store data from different sources
- Easy access to meaningful instrumentation data. Data is presented in graphical and numerical format
- Results are accessible on tablets and smartphones
- Access to sensors on one screen
- Instant alerts via SMS or email to authorized personnel
- Combined charts in one report (mix deformations, TBM data and water level)
- Live monitoring display of all the incoming measurements from TBM
- Diagrams from every TBM parameter updated in real time
- Creation of diagrams from any combination of parameters and time period.
- Multiple authorized users at different locations can simultaneously interact with the software through a web-browser to view any real time data/changes, graphs or reports from any project site.
- Low operational cost
- User friendly tools for day-to-day operation



Typical scheme of Integrated monitoring solutions available for civil engineering, geotechnical, geodetic, structural, landslide and hydrology applications.

DATALOGGERS

Model SDI-12
Digital Sensor Networking System

The sensors, multiplexers and dataloggers of SDI-12 networking system are equipped with SDI-12 digital interface so that they can all be connected together using a three conductor cable in a bus arrangement. The SDI-12 system allows a huge reduction in cabling costs as only a single three conductor cable is required to interconnect the sensors, multiplexers and dataloggers in a network that can be spread over a wide area. Encardio-rite provides SDI-12 interface units for various types of sensors such as vibrating wire, resistive strain gage, MEMS, 4-20 mA, electro level sensors and tipping bucket rain gage to connect to Encardio-rite model ESDL-30 series SDI-12 interface datalogger.

Model ESDL-30 SERIES/ESCL-10VT
Automatic Datalogger For SDI-12 Interface Sensors

ESDL-30 series datalogger is designed to log data from any geotechnical, structural, groundwater or environmental sensor with SDI- 12 digital interface. It can be programmed to take a measurement from 5 seconds to 168 hours in linear mode. All the measured data is stored together with the current date, time and battery voltage, as a data record in the internal non-volatile memory of the datalogger.

ESDL-30 is a rugged datalogger that features wide operating temperature range, dependable standalone operation, low power consumption, compatibility with many telecommunication options and flexibility to support a variety of measurement and control applications to provide accurate and reliable data.

Model ESCL-10VT single channel vibrating wire datalogger is designed to monitor a single vibrating wire sensor (including temperature) such as a piezometer, crack meter or displacement transducer. The datalogger can additionally monitor barometric pressure and rainfall, using a tipping bucket rain gage.

Following data transmission options are available in above dataloggers:

- Telemetry through GSM/GPRS modem
- Readout/data retrieval using laptop

SPECIFICATIONS

Input	ESDL-30: Sensor with SDI-12 signal interface. ESCL-10VT: Vibrating wire sensor, Frequency range-400Hz to 5kHz
Scan/upload interval	5 seconds to 168 hours
Memory capacity	Flash Memory (64-Mb); 2 Million data points.
Data output format	CSV text file. Can be easily imported in many third party applications like Microsoft® Excel.
Communication port	RS-232 (Standard) 115 kbps
Operating temperature range	-30° to 70°C
Humidity	100 %
Power supply	• 2 x D size 3.6 V/19 Ah Lithium cells, or • 2 x D size 1.5 V Alkaline high power cells, or • 12V SMF battery chargeable from AC mains or solar panel
Housing	Corrosion resistant weather proof enclosure.
Antenna (in telemetry option)	Built-in or separately mounted antenna.

Model EDAS-10
Automatic Data Acquisition System

EDAS-10 delivers accurate and reliable measurement in a variety of applications. It is most suitable for unattended or network applications. We provide multiple options. The options for connecting the data acquisition system to PC, are like RS232C serial interface, short haul modems, GSM/GPRS modem, RF modem etc. Built around the Campbell Scientific middle level programmable measurement and control module, the Encardio-rite data acquisition system is available in multiple configurations depending upon the type, number of sensors used and their locations in a particular project.

Please contact Encardio-rite for any specific requirement giving details of the type, quantity and locations of sensors used in the particular project. The complete system includes datalogger, multiplexers, signal conditioners for vibrating wire sensors, interface cables, power supply, transfer software, etc. Units are available from 16 to 192 channels in different cabinet sizes.

SPECIFICATIONS

Resolution	0.66 micro Volt (analog)
Scan rate	Few times/sec to once/hour
Power consumption	50 mA during measurement
Power requirement	9.6 to 16 V DC
Storage capacity	2 MB data points, (expandable with peripherals)
Temperature limit	-25° to 50°C

Automated Total Station Systems (ATS)

Projects safety requires 24/7, high frequency & accurate measuring monitoring systems. Encardio Group uses an in-house developed system that consists of a series of networked robotic total stations. Every station is controlled by the Terramon software which is installed in the dedicated total station control box.

The system ensures valuable and timely monitoring of the displacements, providing high measurement density, simultaneous wireless transmission and an automatic entry of the results in the Terramove monitoring data base. The system can be accessed and controlled remotely from anywhere by the users.

PIEZOMETER

Model EPP-30V
Vibrating Wire Piezometer

EPP-30V is a vibrating wire piezometer used to measure pore water pressure in soil, earth/rockfills, foundations and concrete structures. EPP-30V is of stainless steel construction and hermetically sealed under a vacuum of 0.001 Torr. Each sensor has built-in thermistor for temperature measurement and surge arrestor for lightning protection. A glass to metal seal solder pin connector is provided for easy cable connection. The piezometers are suitable for mounting at different levels in a borehole using the grout–in technique.

SPECIFICATIONS

Range (MPa)	0.2, 0.35, 0.5, 0.7, 1.0, 1.5, 2.0, 3.5, 5.0, 10.0, specify
Accuracy	± 0.25 % fs standard ± 0.1 % fs optional
Non linearity	± 0.5 % fs
Over range limit	150 % of range
Temperature limit	-20° to 80°C
Thermistor	YSI 44005 or equivalent
Dimension (Ø x L)	42 x 185 mm

Model EPP-40V
Vibrating Wire Slim Piezometer

EPP-40V is a small size vibrating wire piezometer specifically designed to be used for pore water pressure measurement in small diameter boreholes and standpipes. It is of stainless steel construction with built-in thermistor for temperature measurement and surge arrestor for lightning protection. A glass to metal solder pin connector is provided for easy cable connection. The sensor is hermetically sealed with a vacuum of around 0.001 Torr inside it.

SPECIFICATIONS

Range (MPa)	0.35, 0.5, 0.7, 1.0, 2.0
Accuracy	± 0.2 % fs standard ± 0.1 % fs optional
Dimension (Ø x L)	19 x 155 mm

Other specifications same as EPP-30V

Model EPP-60V
Vibrating Wire Low Pressure Piezometer

EPP-60V is a low pressure sensor, extensively used for settlement measurement and water level/water pressure measurement in boreholes. It is available in two versions.

SPECIFICATIONS

Electron Beam Welded

Range (MPa)	0.10, 0.20
Dimension (Ø x L)	30 x 160 mm

Glass to metal solder pin connectors

Vented Tube Cable

Range (MPa)	0.035, 0.07
Dimension (Ø x L)	30 x 160 mm
Cable	CS-1102 vented 1 m long; specify

Other specifications same as EPP-30V

Model EPP-50V
Vibrating Wire Push-In Piezometer

EPP-50V is a push-in type vibrating wire piezometer, designed to measure pore water pressure in soft soil/clays and landfills. It has a pointed cone at one end and drill rod threads at the other end. When threaded into a drill rod, the piezometer can be pushed into soft soil directly. Thread options are EW drill rod thread or M28.

SPECIFICATIONS

Range (MPa)	0.35, 0.5, 0.7, 1.0, 2.0
Accuracy	± 0.2 % fs standard
Dimension (Ø x L)	35 x 166 mm

Other specification same as EPP-40V

Model EPU-20V
Vibrating Wire Uplift Pressure System

EPU-20V is a vibrating wire uplift pressure measurement system that uses a vibrating wire pressure sensor. It is designed for monitoring uplift pressure of water in foundation of dams and concrete structures. The sensor is similar to EPP-30V except that instead of filter, a 25 mm BSP adaptor is provided for pipe connection. A perforated/non-perforated pipe is inserted in the borehole, at the top of which EPU-20V is mounted through valves and fittings.

SPECIFICATIONS

Range (MPa)	0.2, 0.35, 0.5, 1.0, specify
Accuracy	± 0.25 % fs standard ± 0.1 % fs optional
Dimension (Ø x L)	42 x 210 mm

Other specifications same as EPP-30V

Model EPU-20G
Bourdon Gage Type Uplift Pressure System

EPU-20G uplift pressure measurement system is similar to the above excepting that it incorporates a Bourdon gage with dial readout instead of vibrating wire pressure cell that requires an electronic readout.

SPECIFICATIONS

Range (MPa)	1.0 (standard)

STAND PIPE\SEEPAGE

Model EPP-10/10SP
Casagrande Piezometer/Standpipe

EPP-10 porous tube piezometer consists of a porous carborundum or allundum (casagrande) tip covered with geotextile cloth, PVC standpipe, suitable adaptors and an end cap.

EPP-10SP standpipe, used for ground water measurement, consists of a PVC slotted pipe covered with geotextile and a series of PVC riser pipes/standpipes with inbuilt socket & end caps.

SPECIFICATIONS

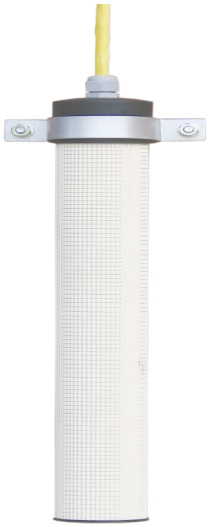
EPP-10	
Casagrande tip	40 mm o.d., 27 mm i.d., 20, 40, 60 cm long
Standpipe	25 mm o.d., 3 m long each
EPP-10SP	
Porous tip	50 mm o.d., slotted pipe -1 m or 3 m
Standpipe	50 mm o.d., 3 m long each

Model EPP-10/6
Water Level Indicator

EPP-10/6 water level indicator is used to measure depth of ground water in standpipes, boreholes and wells. The unit is light in weight, battery operated and gives accurate and quick readings with audible signal. The tape used is a flat, high tensile, non stretch with suitable markings.

SPECIFICATIONS

Length (m)	30, 50, 100, 150, 200, 300
Resolution	1 mm standard
Length (ft)	50, 100, 150, 300, 500
Resolution	0.1" standard



Model ESM-11V
Seepage Measurement Sensor For Weirs

ESM-11V seepage measurement system consists of a submersible cylinder and level sensor to monitor the water head developed over the V-notch weir. Change in level changes the buoyancy on the cylinder that is measured by a highly sensitive vibrating wire sensor. V-notch weirs are additionally available on request if specifically asked for.

SPECIFICATIONS

Level Sensor	
Range (mm wc)	300, 600, specify
Accuracy	± 0.1 % fs
Non-linearity	± 0.5 % fs
Temperature limit	-20° to 80°C
Thermistor	YSI 44005 or equivalent

SETTLEMENT

Model EGS-30V
Settlement Measurement System

EGS-30V settlement measurement system is designed for monitoring settlement in fills, embankments and dams, etc. It comprises of a vibrating wire sensor connected to a reservoir via a fluid filled polyethylene sheathed twin nylon tubing. The sensor is installed in soil fill and the reservoir is mounted on firm ground. As the sensor settles with surrounding soil, the fluid head at the sensor increases. The change in measured head is the settlement relative to the reservoir.

A manifold system is optionally available to connect up to seven sensors to the same reservoir.

SPECIFICATIONS

Range (m)	7, 20, 30, 50, 70
System accuracy	± 0.25 % fs to ± 1 % fs
Temperature limit	-20° to 80°C (sensor)
Reservoir housing	400 h x 300 w x 220 d mm
NOTE	
Sensor accuracy	± 0.1 % fs
Sensor non-linearity	± 0.50 % fs
Thermistor	YSI 44005 or equivalent
Cable	CS-1102 (vented) for 7 m range CS-0702 for other sensors
Fluid tubing	6 mm o.d., 4 mm i.d., twin nylon tube

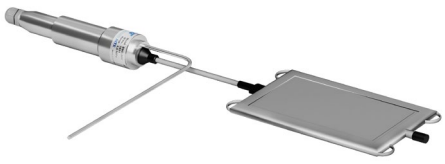
Model ESM-30V
Liquid Level Settlement System

ESM-30V is a high sensitivity liquid level settlement measuring system that uses low range vibrating wire force transducer with a submersible cylinder suspended in a fluid filled vessel. It is designed for remote measurement of minute differential settlement in tunnels, bridges and buildings etc. with high precision. Settlement of any vessel installed, causes change in its fluid level, affecting the buoyancy on the suspended cylinder. The ESM-30V is provided with two or more settlement systems with fluid filled vessels interconnected in series by a fluid filled tube.

SPECIFICATIONS

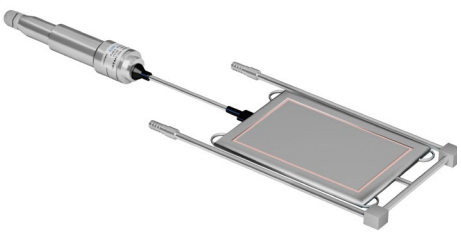
Range (mm)	150, 300, 600 specify
Resolution	0.07, 0.15 mm
Accuracy	± 0.1 % fs
Non-linearity	± 0.5 % fs
Temperature limit	-20° to 80°C
Thermistor	YSI 44005 or equivalent
Vent Tubing (Two lines)	6 mm o.d., 4 mm i.d., nylon tube
Fluid Tubing	12 mm o.d., 10 mm i.d., nylon tube

PRESSURE CELL



Model ESC-30V
Shotcrete-Concrete Stress Cell

ESC-30V is a NATM style shotcrete-concrete stress cell designed for measurement of radial and tangential stresses in shotcrete tunnel lining. The cell consists of a rectangular pressure pad constructed from two stainless steel plates welded around the periphery. The pressure pad is connected to a vibrating wire pressure sensor through a 6 mm ⌀ x 165 mm long stainless steel tube. The cavity inside the pressure pad and the pressure sensor is filled with de-aired fluid. A pinch tube or regroutable arrangement is provided to inflate the pressure pad after concrete around it has fully cured, to ensure proper contact between pressure pad and surrounding concrete.



SPECIFICATIONS

Range (MPa)	1.0, 2.0, 3.5, 5.0, 10.0, 20.0, 30.0, specify
Accuracy[1]	± 0.5 % fs standard ± 0.1 % fs optional
Over range limit	150 % of range
Temperature limit	-20° to 80°C
Thermistor	YSI 44005 or equivalent
Pressure pad sizes l x b (mm)	100 x 200 | 150 x 250 | 200 x 300 | 300 x 300

Other sizes also available on request | [1]Calibrated accuracy of pressure sensor

Model EPS-30V-S Earth Soil Pressure Cell

EPS-30V-S earth pressure cell is designed to measure total pressure in earth fills and embankments. The flexible, circular flat pressure pad is constructed from two stainless steel discs electron beam welded around the periphery. The pressure pad is connected to the vibrating wire pressure sensor through a 6 mm dia x 165 mm long stainless steel tube. The narrow cavity inside the pressure pad and the tube is filled with fluid. Pressure applied by earth on the capsule is transmitted through the fluid to the vibrating wire pressure sensor, which converts it into an electrical signal.

Model EPS-30V-C Concrete Pressure Cell

EPS-30V-C concrete pressure cell is designed to be embedded in concrete. This sensor is similar to EPS-30V-S, excepting that it has a 600 mm long pinch tube. After the concrete is cured to ensure proper contact between the pressure pad and the surrounding concrete, the pinch tube is squeezed to push the fluid into the pressure pad to expand/inflate it.

Model EPS-30V-I Soil And Rock-Concrete Interface Pressure Cell

EPS-30V-I interface pressure cell is designed to measure pressure between soil and rock or concrete interface. The construction is similar to EPS-30V-S, excepting that the diaphragm on rock/concrete side of the pressure pad is thicker to minimise point loading effects.

SPECIFICATIONS

Range (MPa)	0.5, 1.0, 2.0, 3.5, 5.0,10.0, specify
Accuracy[1]	± 0.5 % fs standard | ± 0.1 % fs optional
Over range limit	150 % of range
Temperature limit	-20° to 80°C
Thermistor	YSI 44005 or equivalent
Pressure pad sizes	200 mm Ø x 7 mm thick (EPS-30V-S/EPS-30V-C) 200 mm Ø x 10 mm thick (EPS-30V-I)

[1]Calibrated accuracy of pressure sensor

Model EPS-30V-J Jackout Pressure Cell

EPS-30V-J jackout pressure cell is designed to measure stress on base slabs, diaphragm/slurry walls, etc. It consists of a thin flexible stainless steel round flat diaphragm electron beam welded to a thick, rigid back plate around the periphery, leaving a narrow space between the two. A vibrating wire pressure sensor is electron beam welded concentric with the back plate. The cavity inside the sensor is filled with de-aired fluid.

SPECIFICATIONS

Range (MPa)	0.5, 1.0, 2.0, 3.5, 5.0, specify
Accuracy[1]	± 0.5 % fs standard | ± 0.1 % fs optional
Over range limit	150 % of range
Temperature limit	-20° to 80°C
Thermistor	YSI 44005 or equivalent
Pressure pad sizes l x b (mm)	125 Ø x 190 h 200 Ø x 190 h standard

[1]Calibrated accuracy of pressure sensor

LOAD CELL

Model ELC-30S
Center Hole/Anchor Bolt Load Cell

ELC-30S is a resistive strain gage type center hole load cell used to determine load in rock bolts, tieback anchors, etc. It comprises of a cylinder of high strength steel with eight 350 Ohm resistance strain gages, wired to form a 700 Ohm bridge. To minimize the effect of an uneven and eccentric loading, the eight gages are mounted around the circumference at 45° to each other. The load cell is hermetically sealed by electron beam welding making it immune to ingress of water and to most corrosive environments.

SPECIFICATIONS

Range (kN)/ID (mm)	200/40, 500/52, 1000/78, 1000/105, 1500/85, 1500/130, 2000/105, 2000/155, specify
Over range capacity	120 % fs
Calibration accuracy	± 0.25 % fs
Non-linearity	± 1 % fs
Temperature limit	-20° to 80°C
Cable connection	Six pin glass to metal seal

Model ELC-30S-H
Center Hole/Anchor Bolt Load Cell

ELC-30S-H high capacity center hole load cell is similar to model ELC-30S load cell. Load cell with capacity above 5000 KN comprises of a high strength stainless steel element with sixteen 350 Ohm resistance strain gages, wired to form a 1400 Ohm bridge. The 3500/185 and 5000/202 load cells are electron beam welded.

SPECIFICATIONS

Range (kN)/ID (mm)	3500/185, 5000/202, 7500 /227, 10000/210, specify
Over range capacity	120 % fs
Non-linearity	± 1 % fs (± 0.5 % fs is available)
Output	1.5 mV/V ± 20 %
Excitation	10 V DC (max. 20 V DC)
Temperature limit	-20° to 80°C
Cable connection	Four core shielded 5m long, specify

Model ELC-210S
Compression Load Cell

ELC-210S is a resistive strain gage type load cell designed to measure compressive load or axial forces. The load cell has great resistance to extraneous forces. This increases the fatigue life, permits less stringent mounting alignment and reduces the possibility of reading error. The load cell is protected against dust, moisture and adverse environmental conditions.

SPECIFICATIONS

Range (kN)	1000, 1500, 2000, 3000, 3500
Rated output	1.5 mV/V ± 10 %
Enclosure	IP 68, electron beam welded under a vacuum of 1/1000 Torr
Temperature limit	-20° to 80°C
Cable	Four-core shielded 2 m long; specify

Other specifications same as ELC-30S

Model ELC-150S-H
High Capacity Compression Load Cell

ELC-150S-H is a resistive strain gage type load cell designed to measure large compressive load or axial forces. The load cell has extensive use in pile testing. Like the ELC-210S, this load cell also has great resistance to extraneous forces, and is protected against dust, moisture and adverse environmental conditions.

SPECIFICATIONS

Range (kN)	5000, 6000, 7500, 10000 & 12500
Rated output	1.5 mV/V ± 10 %
Over range capacity	120 % with a maximum upto 14000 kN
Temperature limit	-20° to 80°C
Cable	Four-core shielded 5 m long; specify

Other specifications same as ELC-30S

Model ELC-31V
Vibrating Wire Hydraulic Center Hole Load Cell

ELC-31V is a vibrating wire type center hole load cell used to determine load in rock bolts, tieback anchors, etc. It is fluid filled with a vibrating wire pressure sensor attached to it, to convert the load into a frequency output. Solid load cell for stress measurement in tunnel supports and struts is also available on request.

SPECIFICATIONS

Range (kN)/ID (mm)	250/35, 500/52, 750/78, 1000/105, 2000/130, 2500/0
Overload	110 % fs
Calibration accuracy	± 1 % fs
Non-linearity	± 2 % fs from 10 % to full range
Temperature limit	-10° to 55°C
Temperature effect	± 0.06 % fs/°C
Thermistor	YSI 44005 or equivalent

Model ELC-32V
Vibrating Wire Center Hole Load Cell

ELC-32V is a vibrating wire type center hole load cell used to determine load in rock bolts, tieback anchors, etc. It comprises of a cylinder of high strength martensitic stainless steel with three vibrating wire strain gages mounted at 120° to each other to minimize the effect of uneven and eccentric loading. To determine the load, the average of the three readings is taken. Load cell with six vibrating wire strain gages and nine core cable is available on request. Solid load cell for stress measurement in tunnel supports and struts is also available on request.

SPECIFICATIONS

Range (kN)/ID (mm)	250/27, 500/52, 1000/78, 1500/102, 2000/127, 2000/152, specify (solid load cell available on request)
Overload	150 % fs
Calibration accuracy	± 0.25 % fs
Non-linearity	± 1 % fs
Temperature limit	-20° to 80°C
Thermistor	YSI 44005 or equivalent
Cable	Six core shielded 5 m long; specify

STRAIN GAGE

Model EDS-20V-AW
Vibrating Wire Arc Weldable Strain Gage

EDS-20V-AW vibrating wire strain gage can be arc welded on steel structures and reinforced bars for measurement of stress in tunnel lining, surge shafts, piles, struts and diaphragm walls, etc. Two annular mounting blocks are provided for arc welding the strain gage. Groutable reinforced bar annular mounting blocks are also available for surface mounting the strain gage to a concrete structure. The sensor is of stainless steel construction and has waterproofing to prevent any ingress of water.

SPECIFICATIONS

Range	3000 µ strain
Sensitivity	1 µ strain
Thermistor	YSI 44005 or equivalent
Temperature limit	-20° to 80°C
Size l x b x h (mm)	174 x 28.5 x 30
Cable	Four-core shielded 1 m long; specify

Model EDS-20V-E
Vibrating Wire Embedment Strain Gage

EDS-20V-E vibrating wire strain gage is suitable for embedment in soil or concrete. It is used to measure strain in underground cavities, tunnels, buildings, concrete and masonry dams etc. Waterproofing is provided on the strain gage sensor to prevent ingress of water.

SPECIFICATIONS

Range	3000 μ strain
Sensitivity	1 μ strain
Thermistor	YSI 44005 or equivalent
Temperature limit	-20° to 80°C
Size l x b x h (mm)	170 x 28.5 x 30
Cable	Four-core shielded 1 m long; specify

Model EDS-21V
Concrete Embedment Strain Gage

EDS-21V vibrating wire strain gage is suitable for direct embedment in concrete. It is used in applications where strain measurement of up to 5000 microstrain is required. The sensor is of stainless steel construction and has waterproofing to prevent any ingress of water.

SPECIFICATIONS

Range	5000 μ strain
Sensitivity	2 μ strain
Thermistor	YSI 44005 or equivalent
Temperature limit	-20° to 80°C
Size l x b x h (mm)	170 x 28.5 x 30
Cable	Four-core shielded 1 m long; specify

Model EDS-20V-SW
Vibrating Wire Spot Weldable Strain Gage

EDS-20V-SW vibrating wire strain gage can be spot welded or epoxy bonded on steel structures and struts. It can also be epoxy bonded on concrete structures. A sensor coil housing mounted directly over the strain gage, completely encloses the sensor, forming a watertight enclosure. A pair of clamps are provided to aid in fixing the housing to the substrate using an epoxy adhesive.

SPECIFICATIONS

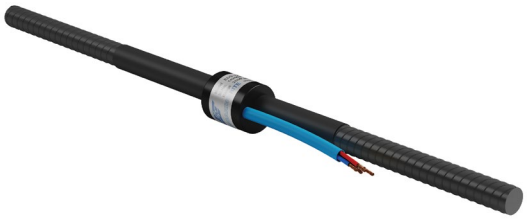
Range	3000 μ strain
Sensitivity	1 μ strain
Active gage length	50.8 mm
Thermistor	YSI 44005 or equivalent
Temperature limit	-20° to 80°C
Size l x b x h (mm)	87 x 22 x 18
Cable	Four-core shielded 1 m long; specify

Model EDS-11V
Hermetically Sealed Vibrating Wire Strain Gage

EDS-11V is a very sturdy and robust high reliability strain gage suitable for embedment in mass concrete or for surface mounting by welding on steel structures. The sensor is electron beam welded, generating a vacuum of 1/1000 Torr inside the sensor. This eliminates any effect of oxidation, moisture and ingress of water. Accessories available include spider for stain rosette, no stress strain container, dummy strain gage and extender

SPECIFICATIONS

Range	± 1500 μ strain
Sensitivity	1 μ strain
Active gage length	140 mm
Thermistor	YSI 44005 or equivalent
Temperature limit	-10° to 80°C
Protection	IP 68
Cable connection	Glass to metal seal solder pin connector



Model EDS-12V
Vibrating Wire Sister Bar Strain Meter

EDS-12V vibrating wire sister bar is used to measure strain in concrete structures such as piles, diaphragm/slurry walls, bridge abutments, tunnel lining, dams, foundations, etc. It consists of a hollow bar with vibrating wire strain gage mounted co-axially inside. The hollow bar is extended on the two sides with 12 mm Ø reinforced bars. Sister bar strain meter is also available with 16 mm Ø reinforced bar option.

SPECIFICATIONS

Range	2500 μ strain
Sensitivity	1 μ strain
Maximum Ø x l (mm)	26 x 1400 (for 12 mm Ø nominal-standard) 30 x 1400 (for 16 mm Ø nominal-standard)
Thermistor	YSI 44005 or equivalent
Temperature limit	-20° to 80°C
Protection	IP 68
Cable connection	Four-core shielded 1 m long; specify

TEMPERATURE

Model ETT-10V
Vibrating Wire Temperature Sensor

ETT-10V temperature sensor is designed for measurement of internal temperature in concrete structures, soil or water. It consists of a magnetic, high tensile strength stretched wire fixed to a material with different co-efficient of linear expansion. Any change in temperature directly affects the tension in the wire, and thus, its natural frequency of vibration. The sensor is of stainless steel construction, and is hermetically sealed under a vacuum of 0.001 Torr.

SPECIFICATIONS

Range	-20° to 80°C
Accuracy	± 0.5 % fs standard; ± 0.1 % fs optional
Dimension (Ø x L)	34 x 168 mm

Model ETT-10TH
Resistance Thermistor Probe

ETT-10TH is designed for measurement of surface temperature of steel and concrete structures, and bulk temperature inside concrete. It can also work submerged under water. ETT-10TH is a low mass water proof temperature probe. Due to its low thermal mass it has a fast response time.

SPECIFICATIONS

Sensor type	R-T curve matched NTC thermistor, equivalent to YSI 44005
Range	-20° to 80° C
Accuracy	1° C
Body material	Tin plated copper
Cable	4 core PVC sheathed

Model ETT-10PT RTD
Temperature Probe

ETT-10PT can be used in similar applications as ETT-10TH. The probe has excellent stability and accuracy that makes it well suited for long-term installations where high accuracy and reliability is required. It consists of a ceramic resistance element (Pt 100) with DIN IEC 751 (formerly DIN 43760) European curve calibration. The resistance element is housed in a closed-end robust stainless steel tubing that protects the element against moisture.

SPECIFICATIONS

Sensor type	Pt 100
Range	-20° to 80° C
Accuracy	± (0.3 + 0.005*t)° C
Calibration	DIN IEC 751
Curve (European)	0.00385 Ohms/Ohm/° C
Dimension (Ø x L)	8 x 135 mm
Cable	3 core shielded

THERMOCOUPLE

Thermocouple wire consists of T-Copper-Constantan conductors, joined at one end to form a hot junction. This end is sealed against corrosion, and placed at the required location of temperature measurement. The other end of the thermocouple wire is connected to a suitable thermocouple connector to form a cold junction. The thermocouple readout displays a direct reading of the temperature at the installed location, and automatically compensates for the temperature at the cold junction.

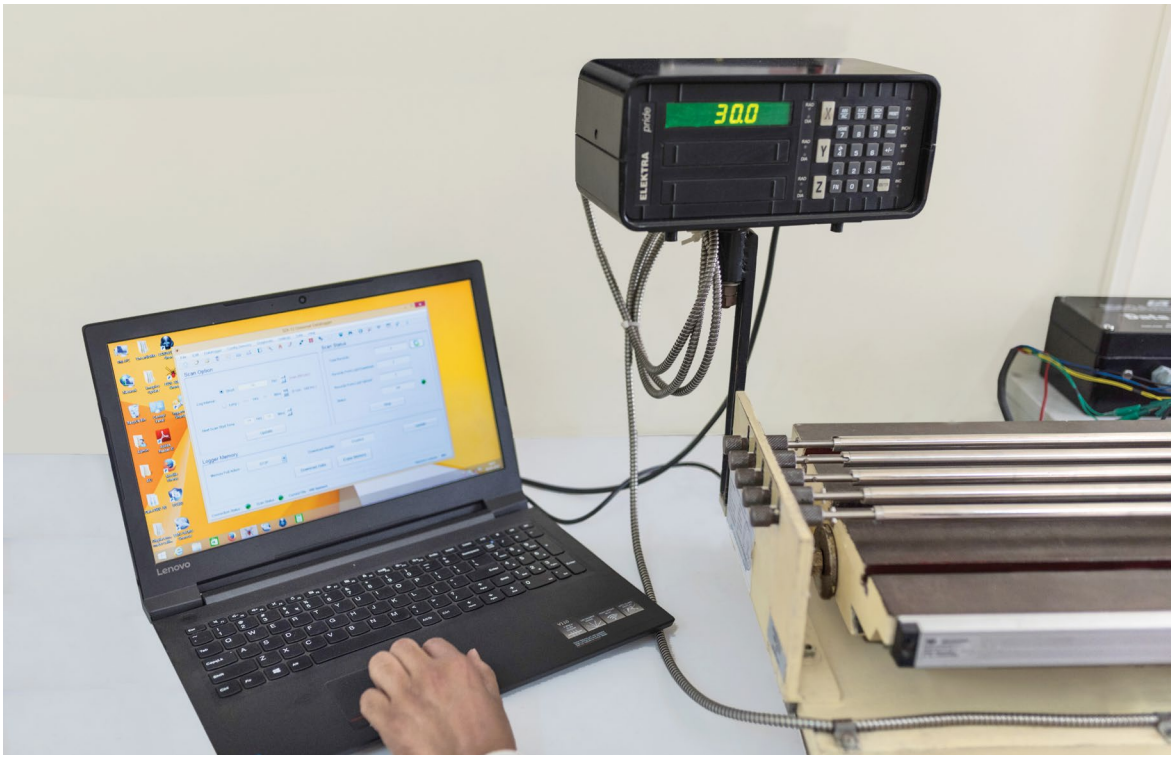
SPECIFICATIONS

Wire Type	T-Copper-Constantan
Wire Insulation	PFA Teflon
Hot junction Temperature	Up to 260°C (Max.)
Cold Junction Temperature	Ambient
Connector Type Miniature	Glass filled Nylon
Service temperature	-20° to 100°C

THERMOCOUPLE READOUT

Sensor Type	T-Copper-Constantan
Input	Two
Display	Two 4 ½ digit + one 6 digit
Range	-200° to 400°C
Accuracy	0.05 %
Alarms	High/Low (audible)

DISPLACEMENT CRACK/JOINT METER



Model EDJ-40C
Crack Meter

EDJ-40C crack meter can measure the change in width of a surface crack. It consists of a graduated scale and a transparent acrylic plate with a hairline cursor mark. When installed across crack, the graduated scale and cursor move relative to each other depending upon crack opening or closing.

Model EDJ-40C2
Biaxial Crack Meter

EDJ-40C2 crack meter can measure the change in width of a surface crack. It consists of graduated scales on X and Y axis and a transparent acrylic plate with a hairline cursor mark. When installed across crack, the graduated scale and cursor move relative to each other depending upon crack opening or closing.

Model EDJ-41M
Crack Meter

EDJ-41M is used for monitoring of cracks, joints and fissures. It consists of two stainless steel round datum blocks that are installed on either side of the opening. A digital inside caliper with a resolution of 0.01 mm is used to measure the distance between the grooves of the datum blocks.

SPECIFICATIONS

EDJ-40C	
Range (mm)	50, 100
Resolution	0.5 mm
EDJ-41M	
Range (mm)	150
Resolution	0.01 mm

Model EDE-VXX
Vibrating Wire Linear Displacement Transducer

EDE-VXX linear displacement transducer incorporates a vibrating wire sensor that converts mechanical displacement to an electrical frequency output. This output can be transmitted over long distances. The sensor can be used in uniaxial joint meters, triaxial joint meters, crack meters, borehole extensometers and soil extensometers, etc. The sensor is available in following variants:

1. EDE-VXX-SC with side cable (suitable for crack gage)
2. EDE-VXX-RC with rear cable (suitable for BHE)
3. EDE-VXX-WP waterproof

Note: If purchase order does not specify, 'RC' version will be supplied.

SPECIFICATIONS

Range (mm)	15, 25, 50, 100 or 150
Accuracy	± 0.2 % fs standard | ± 0.1 % fs optional
Sensitivity	± 0.02 % fs
Non-linearity	± 0.5 % fs
Temperature limit	-10° to 80°C
Thermistor	YSI 44005 or equivalent
Cable	Four-core shielded 1m long; specify

Model EDE-PXX
Potentiometric Linear Displacement Transducer

EDE-PXX linear displacement transducer incorporates a potentiometric sensor. The application is same as that of EDE-VXX.

SPECIFICATIONS

Range (mm)	50, 100, 150
Input	5 ~ 13 V DC
Output	0 - 2 V DC (standard)
Accuracy	± 0.1 % fs
Sensitivity	± 0.02 mm
Temperature limit	-10° to 80°C
Cable	Four-core shielded 1 m long; specify

Model EDJ-40V
Crack/Joint Meter

This crack/joint meter is designed for surface installation, and consists of EDE-VXX vibrating wire displacement transducer fixed between anchors, installed on opposite side of the crack/joint.

SPECIFICATIONS

Range (mm)	15, 25, 50 specify

Refer to EDE-VXX vibrating wire displacement sensor, for sensor specifications

Model EDJ-50V
Embedment Joint Meter

EDJ-50V measures movement between concrete blocks in a concrete dam, and is suitable for embedment applications. It consists of a plastic housing with a stainless steel flange on one end, and a stainless steel socket on the other end. A vibrating wire displacement transducer inside the housing is connected to the stainless steel flange and the socket with flexible joints, to allow small lateral movement.

SPECIFICATIONS

Range (mm)	15, 25, 50, specify
Accuracy	± 0.2 % fs standard ± 0.1 % fs optional
Sensitivity	± 0.02 % fs
Non-linearity	± 1.0 % fs
Temperature limit	-10° to 80°C
Thermistor	YSI 44005 or equivalent

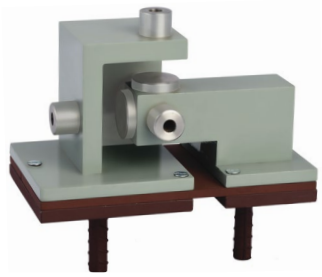
Model EDJ-40T
Electrical Triaxial Crack/Joint Meter

The triaxial joint meter with three EDE-VXX vibrating wire displacement sensors, flexible joints and accessories is available for monitoring joint movements in the X, Y & Z directions. A typical configuration using model EDE-VXX sensor is shown in the picture.

SPECIFICATIONS

Range (mm)	15, 25, 50 specify

Refer to EDE-VXX vibrating wire displacement sensor, for sensor specifications



Model EDJ-40TJ
Mechanical Triaxial Crack/Joint Meter

EDJ-40TJ used for surface measurement consists of two-precision machined elements attached to re-inforced bar anchor stems. Measurement is made by anchoring the two element on either side of joint/crack and accurately measuring the distance between them over a period of time with a depth gage of 50 mm range and 0.01 mm resolution.

SPECIFICATIONS

Range (mm)	± 15 in X, Y, Z direction
Resolution	0.01 mm
Material	Aluminium with stainless steel bushes and pins; epoxy painted
Optional	AISI 304 stainless steel construction on request

EXTENSOMETER

Model EDS-63U/D & EDS-64U/D
Mechanical Borehole Extensometer System

EDS-63U/D borehole extensometer mechanically measures deformation of rock mass and adjacent surrounding soil. It is available in 2-3 points suitable for a 76 mm borehole and 4-6 points suitable for a 102 mm borehole. The system comprises of anchors (groutable or packer), extension rods (stainless steel or fiber glass) in protective covering and a head assembly. A digital caliper/ micrometer depth gage with a resolution of 0.01 mm is used to take readings.

SPECIFICATIONS

Type	Mechanical
No. of points	2-3 points; 76 mm borehole (EDS-63U/D) 4-6 points; 102 mm borehole (EDS-63U/D) Single point; 50 mm borehole (EDS-64U/D)
Extension rod	Stainless steel or fibre glass
Anchor	Groutable or packer

EDS-64U/D is a single point borehole extensometer; the system is similar to EDS-63U/D. The borehole extensometer is suitable for 50 mm borehole.

Model EDS-70V/EDS-70P
Electrical Borehole Extensometer System

The system is similar to EDS-63U/D excepting that the EDS-70V head assembly incorporates vibrating wire displacement sensors (model EDE-VXX, range 50, 100 or 150 mm) and EDS-70P head assembly incorporates potentiometric displacement sensors (model EDE-PXX, range 50, 100 or 150 mm). The electrical output can be transmitted over long distances through multicore cable. The readings can be taken with a portable readout unit/datalogger or through a remote automatic data acquisition system. This system is also available for use with mechanical readout devices.

SPECIFICATIONS

Type	Vibrating wire/potentiometric
No. of points	2 to 6
Extension rod	Stainless steel or fibre glass
Anchor	Groutable or packer
Sensor range	50, 100, 150 mm

Refer to EDE-VXX vibrating wire displacement sensor or EDE-PXX potentiometric displacement sensor for sensor specifications.

Model EDS-71V/EDS-71P
Electrical Borehole Extensometer System

EDS-71V/EDS-71P is single point borehole extensometer. The system is similar to EDS-70V/EDS-70P. This model is suitable for 50 mm borehole.

SPECIFICATIONS

Type	Vibrating wire/potentiometric
No. of points	Single point (50 mm borehole)
Extension rod	Stainless steel or fibre glass
Anchor	Groutable or packer

Refer to EDE-VXX for vw displacement sensor and EDE-PXX for potentiometric displacement sensor

Model EDS-91
Magnetic Extensometer System

EDS-91 magnetic extensometer system measures settlement or heave in foundations, embankments, fills, excavations, etc. The system comprises of access tube, magnet assemblies and a portable magnetic probe with reed switch. Magnet assemblies suitable for inclinometer casing are also available. A similar system for monitoring horizontal displacement is available with a pull cable reel and dead end pulley assembly or with push-in pipes.

Magnet assemblies:

- Datum magnet: for reference
- Spider magnet with 6 leaves: for boreholes
- Spider magnet with 3 leaves: for boreholes; can also be pushed in by a rod or pipe.
- Plate magnet: for fills & embankments.

SPECIFICATIONS

Range (m)	30, 50, 100, 150, 200, 300
Resolution	1 mm
Probe dimension	22 mm ϕ , 150 mm long
Access tube	Vertical: PVC, 25.5 mm i.d., 32.5 mm o.d., fitted at both ends, with telescopic couplings having dimensions 35 mm i.d., 41.5 mm o.d., length 1 m, 2 m, 3 m Horizontal: PVC, 25.0 mm i.d., 33.4 mm o.d.; push pipe with 38.0 mm i.d., 48 mm o.d.
Range (ft)	50, 100, 150, 300, 500
Resolution	0.1" standard

Model EDS-92
Soil Extensometer

EDS-92 soil extensometer is designed for monitoring of soil and rock movement in embankments and dams. The system consists of a specially mounted EDE-VXX vibrating wire displacement sensor installed inside telescopic protective tubing fixed between two anchor beams with connecting rods. Change in relative position between the anchor beams represents the deformation taking place, and is measured by the displacement transducer.

SPECIFICATIONS

Refer to EDE-VXX vibrating wire displacement sensor for sensor specifications

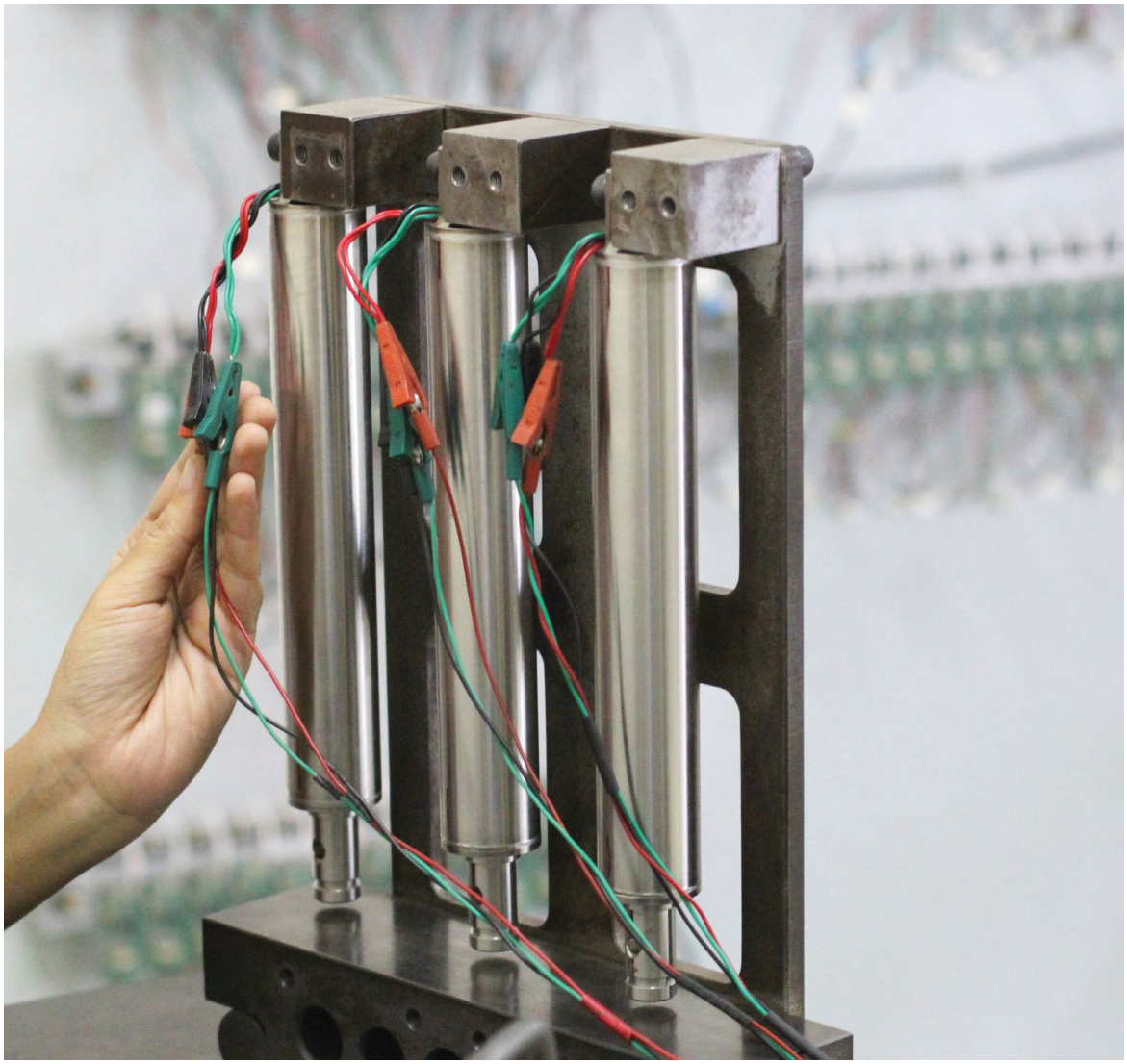
Model EMA-11
Measuring Anchor

EMA-11 measuring anchor, also known as rock bolt extensometer, is used to determine load exerted on rock bolts. It is a precision instrument designed to evaluate anchor system forces and their distribution within the length of the bolt and hence its safety and effectiveness. A digital caliper/micrometer depth gage with a resolution of 0.01 mm is used to take readings. An electrical head assembly consisting of four potentiometric sensors is optionally available for electrical output.

SPECIFICATIONS

		Electrical measurement	
Length	3, 4, 6 m	Loading capacity	250 kN
Fixed points	4	Range	± 5 mm
Borehole diameter	51 mm	Resolution	0.01 mm
Anchor diameter	26.7 mm standard	Enclosure	IP 65

TILT METER



Model ESDL-30MT
Tilt Meter With Automatic Datalogger

ESDL-30MT tilt meter consists of one uniaxial or biaxial MEMS tilt sensor mounted inside an automatic SDI-12 digital interface datalogger. It is a complete unit in itself to monitor tilt at any location. It features a wide operating temperature range, dependable stand-alone operation, low power consumption, compatibility with many telecommunication options and flexibility to support a variety of measurement and control applications. All the measured data is stored, together with the current date, time and battery voltage, as data record in the internal non-volatile memory of the datalogger and can be transferred to a remote server/PC through GSM/GPRS service.

SPECIFICATIONS

Sensor	Uniaxial or biaxial tilt meter
Measuring range	± 15°
Sensitivity	± 10 arc seconds
Accuracy[1]	± 0.1 % fs
Temperature limit	-20° to 80°C

[1]As tested under laboratory conditions.

Model EAN-90M/EAN-92M
Tilt Meter

EAN-90M is a MEMS tilt meter, suitable for monitoring inclination and vertical rotation in structures such as buildings, dams etc. It is a rugged, high resolution tilt meter. The tilt meter is fixed on a vertical or horizontal surface by means of an adjustable bracket and expandable anchor. The stainless steel sensor is electron beam welded with a vacuum of 1/1000 Torr inside it. The biaxial tilt meter option is also available in same enclosure. MEMS tilt meter has a voltage output, which can be read by model EDI-53UTM read-out logger or any indicator that measures differential voltage output. It can also be directly connected to our automatic data acquisition system. EAN-92M option is available with SDI-12 interface such that all sensors can be connected through single bus cable to our compact automatic datalogger.

SPECIFICATIONS

Sensor	Uniaxial or biaxial
Measuring range	± 15°
Output (nominal)	4 V at 15° proportional to sine of angle (EAN-90M)
Sensitivity	± 10 arc seconds
Accuracy[1]	± 0.1 % fs
Temperature limit	-20° to 80°C
Dimension	32 mm Ø x 260 mm L
Cable	6 core cable-2 m long, specify (EAN-90M) 3 core cable-2 m long, specify (EAN-92M)
Dimension (bracket)	65 x 65 x 40 mm, 8 mm (th)

[1]As tested under laboratory conditions.

Model EAN-91M/EAN-93M
Tilt Meter

EAN-91M tilt meter is similar to model EAN-90M tilt meter, with the only difference that it is housed in a compact, weatherproof enclosure (box type). The enclosure can be directly fixed on a wall/structure. Model EAN-93M tiltmeter (box type) is with SDI-12 digital interface such that all sensors can be connected through single bus cable to our compact automatic datalogger.

SPECIFICATIONS

Sensor	Uniaxial
Measuring range	± 15°
Output (nominal)	4 V at 15° proportional to sine of angle (EAN-91M)
Sensitivity	± 10 arc seconds
Accuracy[1]	± 0.1 % fs
Temperature limit	-20° to 80°C
Dimension (mm)	125 x 80 x 57

[1]As tested under laboratory conditions.

Model EAN-70M
Portable Tilt Meter

EAN-70M portable tilt meter is suitable for monitoring change in inclination of a structure. It is rugged in construction, and has excellent temperature stability. The tilt meter system includes tilt plates, a portable tilt meter and a readout unit. Tilt plates (to be separately ordered) available from Encardio-rite are dimensionally stable and weather resistant. Tilt plates are mounted on the structure at specified locations. Tilt readings can be obtained quickly and easily by a single operator. For taking and storing readings, use model EDI-53UTM read-out unit/datalogger (to be separately ordered).

SPECIFICATIONS

Sensor	Uniaxial
Measuring range	± 15°
Sensitivity	10 arc seconds
Accuracy	± 0.1 % fs
Temperature limit	-20° to 80°C
Size l x b x h (mm)	162 x 90 x 145
Dimension (tiltplate)	142 mm Ø x 24 mm high aluminium alloy

MEMS Beam Sensors

The beam sensors are generally attached to structures for monitoring any differential movement and tilting of structures. For monitoring deflection and deformation of retaining walls, sheet piling, etc., the beam sensors are mounted in vertical strings. The beam sensor can also be installed in long horizontal strings to measure differential settlement along railway tracks, tunnels, pipelines, embankments, etc.

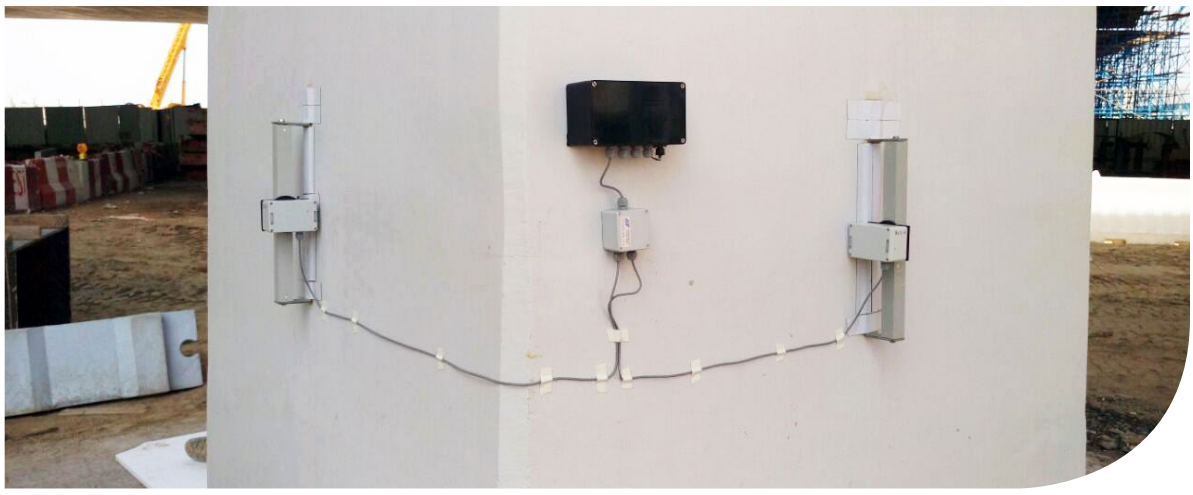
Model EAN-91M-B and model EAN-93M-B

EAN-91M-B and EAN-93M-B beam sensors consists of model EAN-91M and EAN-93M tilt meter enclosures fixed on to a beam (1, 2 or 3 m long) respectively.

Model EAN-41M beam sensor and model EAN-42M(SDI-12)

Model EAN-41M/Model EAN-42M beam sensor consists of the MEMS sensor housed inside a beam (1, 2 or 3 m long and 38 x 38 mm, aluminium).

*Other specifications same as EAN-91M/EAN-93M



Model EAN-31EL/31EL-B/41EL-B
Series of Electrolytic Uniaxial Tilt Meters & Beam Sensors

Model EAN-31EL | Electrolytic Uniaxial Tilt Meter

EAN-31EL tilt sensor is designed to monitor rotation and deflection of structures such as buildings, retaining walls, etc. in a vertical plane. The sensor is housed in a compact weather proof enclosure. These are rugged and high-resolution tilt meters. The enclosure can be directly fixed on a wall/structure using adjustable mounting plate.

Model EAN-31EL-B | Electrolytic Uniaxial Beam Sensor

Model EAN-31EL-B beam sensor consists of model EAN-30EL sensor mounted on a beam (1, 2 or 3 m long) that is fixed on to the structure. The individual beam sensors are generally used in linked form to give a differential displacement profile.

Model EAN-41EL-B | Electrolytic Uniaxial Beam Sensor

EAN-41EL beam sensor also has the same application as the EAN-31EL-B. Only in EAN-41EL, the electrolytic tilt sensor is housed inside the beam (1, 2 or 3 m long). These individual beam sensors are fixed on to the structures, and can also be used in linked form to give differential displacement profile. The voltage output from sensor can be read with the EDI-53ELV read-out logger. The output can also be monitored or logged at a remote location by our automatic data acquisition system/automatic dataloggers.

SPECIFICATIONS

Sensor	Electrolytic level type, Uniaxial
Measuring range**	± 1° (60 arc minutes)
Linear range	± 0.5° (30 arc minutes)
Sensor Output	± 1 Volt (nominal) at 0.5°
Excitation supply	12 Volt dc (nominal) (from data logger)
Resolution	1 arc second
Repeatability	± 3 arc seconds
Temperature limit	-20° to 50°C
Beam	38 x 38 mm, aluminium with 1 m, 2 m & 3 m options

** Note: Polynomial linearisation co-efficients are provided for utilizing full measurement range of ± 1° .

INCLINOMETER & IPI

Model EAN-26M
Inclinometer System

Encardio-rite model EAN-26M is one of the most advanced MEMS digital inclinometer system being produced anywhere in the world. It utilizes the capability of high computational power and large high resolution colour display of an Android OS based mobile phone as a readout and data storage unit.

EAN-26M vertical inclinometer system is used to measure lateral movement and deformation of earth works or a structure. It provides magnitude of inclination or tilt and its variation with time in structures like retaining/diaphragm walls, piles etc.

The inclinometer system basically consists of inclinometer casings with couplings, probe with operating cable and a mobile phone datalogger. Accessories like dummy probe and calibration check jig, are available on demand.

SPECIFICATIONS

System accuracy	± 4 mm/30 m (± 0.60/100 ft)
Cable	6 mm Ø, 2 core kevlar reinforced polyurethane sheathed
Cable reel upto 100 m (330 ft)	300 mm Ø (flange)
100-200 m (330-650 ft)	380 mm Ø (flange)

Model EAN-26M/2
Vertical Inclinometer Probe

EAN-26M digital inclinometer system consists of a traversing type digital biaxial tilt sensing probe that is connected to a reel unit kept at top of the borehole. The reel unit consists of a winding reel that holds the cable and a wireless Bluetooth relay unit that transmits the probe data to the data logger. A rechargeable battery in the reel unit supplies power to the whole system.

Operating cable graduated at every 0.5 m (2 ft) includes a high tensile straining member and is supplied with an easy to carry reel.

The probe is designed for use in all standard inclinometer casings i.e. with OD 70 mm (2.75") & 85 mm (3.34")

Mobile Readout Unit

The mobile phone readout uses wireless Bluetooth connection to communicate with the inclinometer reel unit.

SPECIFICATIONS

Measuring range	± 30° of vertical
Resolution	± 0.008 mm/500 mm (± 0.0003 in/ 2 ft)
Temperature limit	-20° to 70°C
Dist. between wheels	500 mm (2 ft)
Dimensions	25.5 mm Ø x 685 mm long (excluding wheel arm)
Probe Weight	1.4 kg (3 lb)

Model EAN-52MV
Vertical In-Place Inclinometer System

EAN-52MV is used for real time monitoring of lateral movement and deformation of earth works or a structure. Each in-place sensor probe is fitted with a pair of pivoted sprung wheels. A string of sensors can be positioned inside a casing for a complete deflection profile, using a suspension kit and placement tube. A suspension wire rope is also available in case deflection profile of only part of casing is to be monitored.

EDI-52MV in-place inclinometer system provides a solution in which each sensor is equipped with SDI-12 interface. A single 3 conductor bus cable therefore needs to be threaded in a daisy chain fashion, connecting each sensor to its next immediate neighbour and finally to the top of the borehole and directly to the datalogger (without any multiplexer).

Several strings of EAN-52MV in-place inclinometer sensors in different boreholes can be terminated in a single automatic dataloger ESDL-30.

Uniaxial horizontal in-place inclinometer system model EAN-52 MH is also available on request.

SPECIFICATIONS

Measuring range	± 15°
Sensor	Uniaxial or biaxial
Accuracy[1]	± 0.1 % fs
Temperature limit	-20° to 80°C

[1] As tested under laboratory conditions

InclinoView
Digital Inclinometer Analysis Software

ER InclinoView software has been designed to process borehole data from Encardio-rite's EAN-26M digital inclinometer system. It is suitable for plotting mean deviations, absolute borehole profile, cumulative deviation against depth, time vs deviation and vector plots at each depth. It can also plot checksums for assessment of quality of data. Plots can be easily switched between top or bottom reference The plots can be viewed along inclinometer casing grooves or along a skew angle. Spiral correction can also be applied if such data is available.

InclinoView allows inclinometer data for any borehole to be automatically correlated with excavation or fills and benchmark elevation or fill levels with date to be annotated on the plots. Sub soil stratigraphy layers can also be marked on the plots together with user comments.

InclinoView allows data from a large number of boreholes from different sites to be organized and stored on the users' PC. InclinoView can run on both Microsoft Windows (XP and latest operating systems) and Linux platforms.

Model EAN-26M
Inclinometer Casing And Fittings

The inclinometer casings may be installed in a borehole, embedded in fill or concrete during construction or fixed to the face of a completed structure. These are self aligning ABS casings with longitudinal keyways at 90° for probe orientation. The casings and couplings (fixed or telescopic) are joined together with pop-rivets. Mastic tape is used over the joints to make a waterproof joint.

SPECIFICATIONS

Casing	ABS, 70 mm o.d., 58 mm i.d., 3 m long
Fixed coupling	ABS, 77 mm o.d., 160 mm long
Telescopic coupling	ABS, 77 mm o.d., 400 mm long, (150 mm displacement range)
End caps	ABS

Model EDS-50/51
Normal & Inverted Plumb Line With Telecoordinometer

EDS-50 (direct) and EDS-51 (inverted) plumb lines are used for monitoring tilt of a tall structure or a high rise building and for measurement and monitoring of relative displacement in a concrete or masonry dam. Telecoordinometer, the automatic readout device for plumb lines, is very precise providing an accuracy of 0.01 mm. It uses contactless inductive sensors that give position of the pendulum wire in two directions. It is equipped with a temperature gage for temperature compensation.

Pendulums already in situ can be measured by telecoordinometer without additional modification. It only requires a target to be added to the pendulum wire for the device to be effective

SPECIFICATIONS

Telecoordinometer - automatic readout system	
Measuring range	± 40 mm (direct or inverted)
Accuracy	0.01 mm
Repeatability	0.05 % fs
Output	4-20 mA
Operating temperature	-25° to+70°C
Protection	IP67

READ OUT UNIT

Model EDI-51V
Portable Vibrating Wire Read-Out Unit/Datalogger

EDI-51V is used to read any Encardio-rite vibrating wire sensor. It can display the measured frequency in terms of time period, frequency, frequency squared or the value of measured parameter directly in proper engineering units. It has memory to store around 4500 readings with date and time from up to 500 sensors. The read-out unit comes with rechargeable batteries and a suitable battery charger, RS232C serial interface, necessary cables and manual.

Model EDI-53
Portable Read-Out Unit/Datalogger In Five Variants

EDI-53 readout unit comes in five variants as described below. The unit displays the measured parameter directly in applicable engineering units. It has memory to store 3600 readings with date and time from up to 250 sensors. Housing and accessories supplied are similar to EDI51V.

Model EDI-53L

EDI-53L is used for resistive strain gage sensors including load cells.

Model EDI-53ELV

EDI-53ELV is used to read electro level tilt meter and stores data in volts (Value in engineering units can be calculated in Microsoft Excel sheet using polynomials co-efficient given in test certificate of tilt meter).

Model EDI-53P

Model EDI-53P is used to read potentiometric displacement transducers with 0-2 V full scale voltage output.

Model EDI-53I

EDI-53I is designed to read transducers with 4-20 mA DC current output.

Model EDI-53UTM

EDI-53UTM is designed for use with Encardio-rite's range of uniaxial tilt meters. However, with an external switch it can also be used with biaxial tilt sensors.

SPECIFICATIONS

General

Temperature Limit	0° - 50°C

EDI-51V

Frequency range	500 Hz to 5 kHz
Parameters	Time period, frequency, freuqency^2, engineering units
Resolution	0.01 micro-seconds
Temp. Measurement Range	0° - 50°C
Housing	ABS + PU impact resistant plastic moulded housing

EDI-53L

Input	Resistance strain gage bridge load cell with 0 ... 2 mV/V output
Excitation voltage	5 V DC
Preamplifier gain	100

EDI-53ELV

Input	EL tiltmeter (Voltage output)
Excitation voltage	12 V DC (standard)

EDI-53P

Input	0-2 V DC
Excitation voltage	5 V DC

EDI-53I

Input	4-20 mA DC current
Input resistance	50 Ohm

EDI-53UTM

Input	± 2 V, ± 4 V, or ± 8 V (factory configured)
Excitation voltage	± 12 V DC

CABLES

Model Series	Specifications				
	Model	No. of cores	Color code	OD.	Weight(approx.)
CS-0401 Series	7/0.34 mm annealed copper, petroleum jelly filled, 0.5 mm ϕ galvanized steel wire armoured, polythene sheathed black color, variants as follows:				
	CS-0401-2	2 core	red/black	15 mm	0.3 kg/m
	CS-0401-4	4 core	red/black & green/ white	15.5 mm	0.35 kg/m
	CS-0401-6	6 core	red/black, green/white & blue/grey	16.5 mm	0.40 kg/m
CS-0402 Series	7/0.25 mm ATC, twisted pairs screened with water blocking aluminum foil, 0.3 mm galvanized iron wire braid armoured, overall polythene sheathed black color, variants as follows:				
	CS-0402-1P	2-core	red/black	10 mm	0.1 kg/m
	CS-0402-2P	4-core	red/black & green/white	11 mm	0.12 kg/m
	CS-0402-3P	6-core	red/black, green/white & blue/grey	11.5 mm	0.14 kg/m
	CS-0402-4P	8-core	all different	12.5 mm	0.16 kg/m
	CS-0402-6P	12-core	all different	14 mm	0.40 kg/m
	CS-0402-10P	20-core	all different	16 mm	0.3 kg/m
	CS-0402-20P	40-core	all different	19.8 mm	0.60 kg/m
CS-0403	7/0.2 mm silver plated copper with braid, 4 core screened cable in red, black, green, white, screened with aluminized polyester film, with drain wire, PTFE sheathed gray color, 3.5 mm o.d., unit weight (approx.) 0.03 kg/m.				
CS-0404	7/0.2 mm ATC, 4-core cable with red/black & white/black, foil shielded; chrome PVC jacket gray color. Maximum service temperature 80° C, ~ 5.6 mm o.d, unit weight (approx.) 0.35 kg/10 m.				
CS-0407 Series	7/0.2 mm annealed copper, petroleum jelly filled, 0.5 mm ϕ galvanized sheet armoured, overall PE sheathed black color, variants as follows:				
	CS-0407-5P	10-core	all different	18 mm	0.45 kg/m
	CS-0407-10P	20-core	all different	19 mm	0.50 kg/m
	CS-0407-20P	40-core	all different	20 mm	0.55 kg/m
CS-0410 Series	7/0.2 mm ATC, datalene insulated, low capacitance, shielded cable, chrome PVC jacket black color, variants as follows:				
	CS-0410-5	5-core	red, black, white, green & brown	6.25 mm	0.05 kg/m
	CS-0410-8	8-core	red, black, white, green, brown, orange, blue & yellow	7.1 mm	0.08 kg/m
CS-0502	7/0.25 mm annealed copper, dual twisted pair screened cable in red/black & green/white, PVC sheathed red color, ~ 6.0 mm o.d., unit weight (approx.) 0.55 kg/10 m				
CS-0702	7/0.25 mm annealed copper, dual twisted pair screened cable in red/black & green/white, screened with aluminized polyester film, polyethylene insulation, with drain wire, polyurethane sheathed blue color, 6.35 mm o.d.				
CS-0703	7/0.25 mm ATC, 6 core cable in black, white, red, green, brown, blue, screened with aluminized polyester film, polyethylene insulation, with drain wire, polyurethane sheathed blue color, 6.5 mm o.d.				
CS-1002	7/0.25 mm annealed copper, 3 core screened cable in red, black & green, screened with aluminized polyester film, polyethylene insulation, with drain wire, polyurethane sheathed black color, 4.7 mm o.d.				
CS-1102	7/0.2 mm annealed copper, dual twisted pair screened cable in red/black & green/white, with dual vent tube, polyurethane sheathed yellow color, ~ 10 mm o.d., unit weight (approx.) 0.1 kg/m				
CS-1302	7/0.2 mm annealed tinned copper, 4 core screened cable in red/black & green/white, screened with aluminum polyester film, polyethylene insulation, with drain wire, Kevlar core, polyurethane sheathed yellow color, maximum service temperature 85° C, ~ 7 mm o.d, unit weight (approx.) 0.53 kg/10 m.				
CS-1303	7/0.25 mm ATC, dual twisted pair signal cable in red/black & green/white, foil shielded; chrome PVC jacket gray color. Maximum service temperature 60° C, ~ 5.5 mm o.d., unit weight (approx.) 0.3 kg/10 m.				

JUNCTION & SWITCH BOX

JUNCTION BOX

EJB-10-4-YZ

Suitable for connecting input from up to 10 sensors through ten 4-core input cables to one output cable.

EJB-10-6-YZ

Suitable for connecting input from up to 10 sensors through 6-core input cables to one output cable.

EJB-N-X-YZ

Suitable for connecting input through N (specify number) X-core (specify core) input cables to one output cable.

YZ = specify cable code or cable Ø (for input & output cable)

SWITCH BOX

ESB-10-4-YZ

Suitable for connecting and switching input from up to 10 sensors through ten 4-core input cables to readout unit and to one output cable.

ESB-12-4-YZ

Suitable for connecting and switching input from up to 12 sensors through twelve 4-core input cables to readout unit and to one output cable.

ESB-12-X-YZ

Suitable for connecting and switching input from up to 12 sensors through X-core (specify core) input cables to readout unit and to one output cable.

ESB-N-X-YZ

Suitable for connecting and switching input through N (specify number) X-core (specify core) input cables to the read out unit and to one output cable.

YZ = specify cable code or cable Ø (for input & output cable)

CABLE SPLICING/JOINTING KIT

ECS-05-Y

Suitable for extending length of CS-0404-6/CS-0502/CS-1303 cables with butt crimp terminals (Y - specify cable code); material- ABS.

ECS-06-Y

Suitable for extending other cables with butt crimp terminals (Y - specify cable code); material- FRP/aluminium

ECS-07

Crimping tool for above.

ECS-08-Y

Suitable for extending cables with screwed terminals (Y - specify cable code); material- FRP/aluminium.

ECJ-10-Y

Suitable for making joint between two 4/6-core jelly filled or water blocking cable ends (Y-specify cable code); material- AISI 420 stainless steel.

ECJ-11-Y

Suitable for making a heavy duty joint between two 4/6-core jelly filled or water blocking cable ends (Y-specify cable code); material- AISI 304 stainless steel.

GEODETIC TARGET & SURVEY MARKER

TARGETS

Targets are extensively used for measurement of deformation during tunnelling and subway construction, and for monitoring displacement of a bridge, dam, slope or building structure.

Model ERT-10B
Bi-Reflex Target

ERT-10B consists of reflectors on both sides mounted on a universal joint. The target has a small centre hole to allow precise targeting. Targets are interchangeable.

SPECIFICATIONS

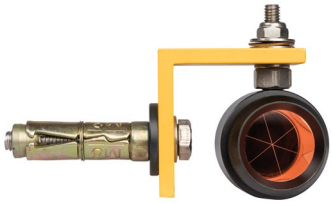
Measuring range[1]	Typically 12 m to 140 m
Material	Reflector support is plastic, mounted on universal joints with reflective foil on both sides.

Model ERT-10P2
Prism Target

ERT-10P2 consists of a mini prism mounted on a universal joint such that it can be oriented in any direction as required. The prism is copper coated.

Optional components for ERT-10B & ERT-10P2

- Adaptor with a plastic reference break-off point.
- Convergence bolt of zinc plated steel constructions, 12 mm diameter x 170 mm long, with 3/8" pipe thread stud with protective cap.



Model ERT-20P2-M1
Mini Prism Target

ERT-20P2-M1 mini prism target consists of a prism mounted on a swivel bracket. The prism is copper coated.

SPECIFICATIONS

Measuring range[1]	Typically 0.3 m to 600 m
Material	Prism support is plastic, mounted on a universal joint.

[1] Maximum measuring distance is highly dependent on atmospheric conditions and EDM model used.

SETTLEMENT POINTS

Model EBS-16
Building Settlement Point

EBS-16 building settlement basically consists of a spherical reference locator with threaded bolt.

Model EPS-12
Pavement Settlement Point

EPS-12 pavement settlement point basically consists of a plastic tapered disc and a special retaining nail.

Model ESMP-10/ESMP-11
Ground Settlement Point

ESMP-10 comprises of an AISI-304 survey pin having a semi-spherical top. A red coloured cross mark is provided at its top. Variations (ESMP-11/ESMP-12) are available with extension rods/ anchors to suit different applications.

AUTOMATIC WEATHER STATION & AGENCY

Model EAWS-101
Automatic Weather Station

Encardio-rite model EAWS-101 automatic web based weather monitoring station provides a precise, reliable and cost effective means of recording meteorological data. Encardio-rite offers weather system with standard sensors for essential parameters as briefly outlined below:

Rain gage: Model ERG-200/201 tipping bucket type rain gage with stainless steel housing.

Wind speed and direction sensor: Model EWV-101S three cup anemometer wind speed sensor along with Model EWV-101D wind direction sensor with dynamically balanced wind vane (coupled to a low torque potentiometer) gives precise wind velocity.

Relative humidity & temperature: Model EWH-101T performs both relative humidity & temperature measurement (with Pt 100). The multi plate radiation shield protects the sensors from direct and reflected solar radiation, thus minimizing error.

Data logger: Provides unattended monitoring & recording.

Other sensors are also available on request. Encardio-rite sensors have an excellent reputation for providing precise results even in the most demanding environment of condition.

The weather station can be configured based on parameters to be measured or sensors required. It handles all data processing requirements, starting with collection and storage of data, performing required calculations on data, presenting results in graphical and numerical format and generating alarm messages. It also has option to monitor meteorological data remotely from an internet connected computer.

These are only supplied as an integrated part of instrumentation of Hydroelectric projects. For more detail, please refer to datasheet # 1407.

AGENCY

Güralp Systems Ltd., UK

(for micro-seismometers, strong motion accelerometers and associated products)

Encardio rite is sole agent in India of Güralp Systems Ltd., UK for its complete range of equipment for seismology, science and engineering Güralp Systems Ltd. is a world leader in the design and manufacture of low-noise broadband seismometers, strong motion accelerometers, analog and digital seismic instruments, digitizers and networking equipment.

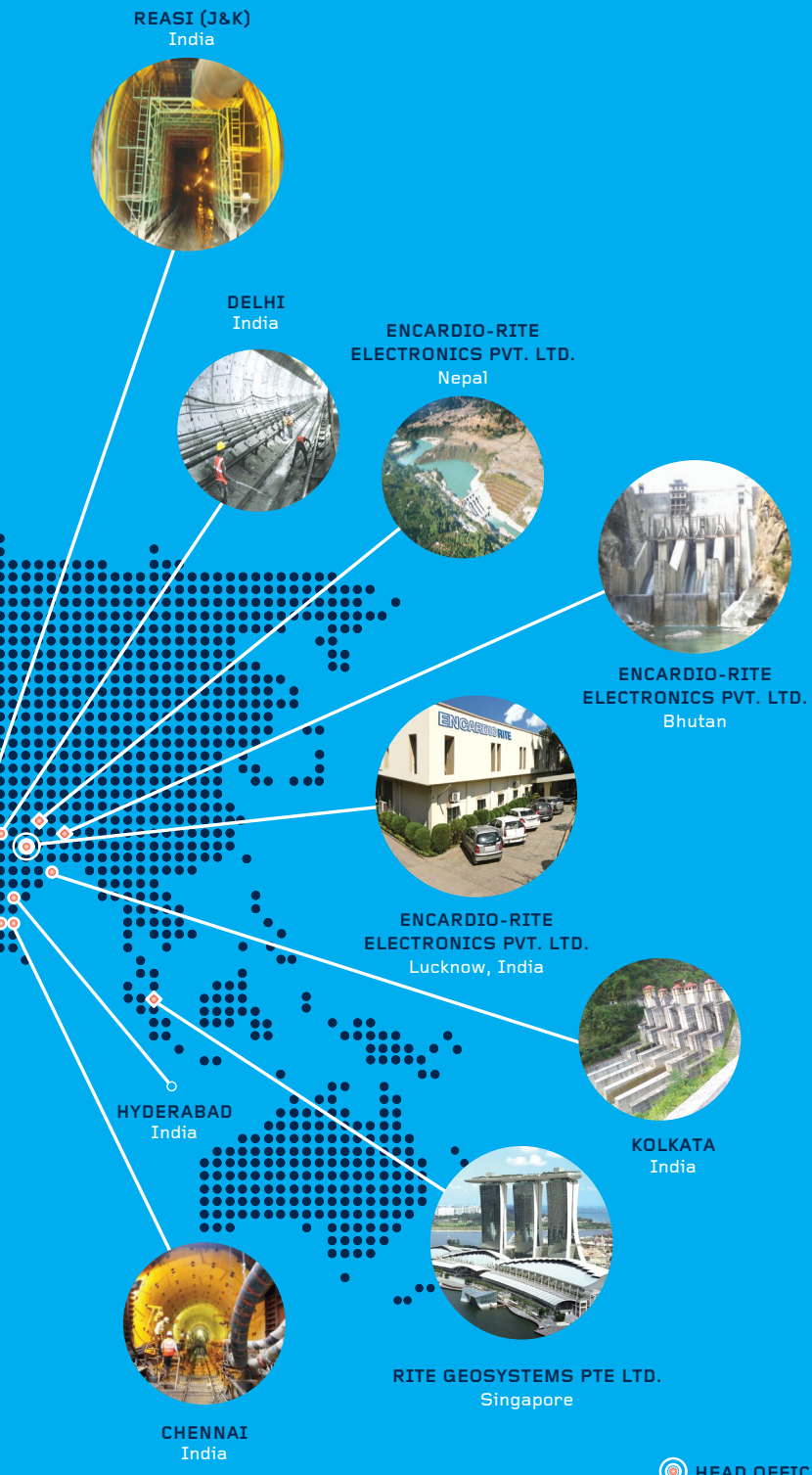
Güralp provides a range of instruments packaged for a number of different operating environments. This includes a range of sensor families that vary in performance from very low frequency, very low noise for global seismology to high dynamic range instruments for local strong motion monitoring. Nearly all sensors are supplied for deployment at the surface, in boreholes and on the ocean bottom suitable for a range of applications such as Earthquake early warnings, Seismic surveying, Civil Engineering/Structural integrity, etc.

Güralp offers a range of data acquisition modules to support its sensors. The digitisers are available in standalone packages or integrated into the sensors. Multi-channel digitisers are also available with low noise, low power consumption and a range of features.

For further details on the range of products visit http://www.guralp.co.uk.

GLOBAL PRESENCE

ENCARDIO-RITE GROUP



Head office

ENCARDIO-RITE ELECTRONICS PVT. LTD.
A-7, Industrial Estate, Talkatora Road
Lucknow, UP-226011, India
+91 522 2661039-42
geotech@encardio.com

International

ENCARDIO-RITE GEOSYSTEMS LLC
P.O. Box-123850, Office 1211, 12 Floor, Yes Business Center, Al Barsha-1, Dubai, U.A.E.
P.O. Box-131126, Abu Dhabi, U.A.E.
+971 50 7153594
ergs.abudhabi@encardio.com

ENCARDIO-RITE GEOSYSTEMS WLL
Bahrain
+91 9820227401
ergs_bahrain@encardio.com

RITE GEOSYSTEMS WLL
P.O. Box-30626, Doha, Qatar
+974 50 151488
prateek.qatar@encardio.com

MONITERRA GROUP
Kennedy Str.72, 1076, Nicosia, Cyprus
+30 6977775230
gp@encardio-moniterra.com

IQ SOFT
11th km Ioannina-Athens Bizani, Ioannina
+30 26510 92287
ntermaris@iqsoft.gr

ENCARDIO-RITE GEOSYSTEMS LLC
8, Elpidos Str. 14121 Athens, Greece
+30 6944798872
nikolas@encardio.com

RITE GEOSYSTEMS INC.
1653 McFarland Rd., Pittsburgh PA 15216, USA
+1 (412) 680 2526
melih@ritegeosystems.com

Visit us at www.encardio.com
for latest updates

August 2018