RITE GEOSYSTEMS

ENCARDIO RITE METASENSING FOR MEGA STRUCTURES

DATASHEET

CONDUCTIVITY, TEMPERATURE& WATER LEVEL MONITORING

ModelECTD-30V/60V

INTRODUCTION

Encardio-rite models ECTD-30V and ECTD-60V CTD sensors are a low cost, accurate tool for monitoring electrical conductivity, temperature and water level (depth) in ground water as well as surface water. ECTD sensor is a robust, marine grade sensor. Much of the complex circuitry is in the datalogger, lowering the cost of individual sensors without impacting their accuracy or resolution. This makes the system cost effective.

FEATURES

- Robust and suitable for use in harsh environments.
- Compact sensor body to fit into tight spaces.
- External logger with remote transmission option to deliver data to desktop.
- Permanent connection allows one to collect data continuously without pulling up the sensor.

APPLICATION

- Discharge monitoring
- Groundwater contamination monitoring
- Aquifer recharge and recovery.
- Surface water/storm water monitoring.
- Saltwater intrusion, de-salination and wastewater.
- Wetland monitoring.

CTD SENSOR DESCRIPTION

Conductivity:

With a range of 5 to 120,000 µS/cm, the ECTD sensors have the ability to make accurate electrical conductivity measurements in a broad range of application.

Temperature:

Temperature is measured through inbuilt thermistor sensor

Water level (depth):

The CTD sensors utilize a pressure transducer to obtain accurate water level measurements. The range of sensor depends on the application. Model ECTD-30V CTD probe come with model EPP-30V absolute or gauge pressure sensor and Model ECTD-60V CTD probe is with EPP-60V absolute or gage pressure sensor.

Option I - Absolute pressure sensor with individual barometric pressure sensor

The absolute pressure sensor with an integral water proof four conductor signal cable is supplied with an individual barometric pressure sensor (fitted inside the datalogger) which allows the water level to be corrected for barometric pressure variation.The use of barometric pressure sensor eliminates the apparent variation in water level due to variation in atmospheric pressure. The system provides the correct value of water level along with barometric pressure and temperature to the user.

Advantage: The use of an individual barometric pressure sensor eliminates the necessity of using a vent tube in the sensor cable for atmospheric pressure correction. This results in a reliable system as the output is free from any error that may be generated due to clogging of the vent tube. The system is almost maintenance free as no desiccant is used which requires periodic replacement to avoid moisture ingress in the vent tube and consequent blockage of the vent tube.

Option II- Gauge pressure sensor with vent tube

- Gauge pressure sensors are supplied with an integral water proof four conductor signal cable with a vent tube. The vent tube allows the interior of the pressure sensor to be connected to the atmosphere at ground level thus eliminating any effect of atmospheric pressure variation on the water table reading. A desiccant chamber is provided in the datalogger housing. The desiccant cartridge needs to be changed regularly whenever its colour changes from blue to pink. Care should be taken that desiccant is replaced regularly because if the vent tube gets blocked, it will result in an error in the water table reading.

SENSOR SPECIFICATIONS

Pressure sensor type	Vibrating wire absolute or gauge pressure sensor with barometric correction ECTD-60V - 10, 20, 35, 50 m WC ECTD-30V - 20, 35, 50, 100 m WC
Temperature sensor type	Thermistor 30 kOhms
Conductivity sensor type	4 Electrode bulls-eye cell with cell constant of 0.42 ± 0.05
SDI-12 Version	1.3
Vibrating wire pressure sensor range (model EPP-30V or EPP-60V)	7 mWC / 20 mWC
Conductivity sensor range	5 – 120,000 µS/cm
Accuracy	± 0.5 % of reading + 1 µS/cm (for 5 – 80,000 µS/cm)[1] ± 1 % of reading (for 80,000 – 120,000 µS/cm)[2]
Resolution	0.1 µS/cm (for 5 – 80,000 µS/cm) 1 µS/cm (for 80,000 – 120,000 µS/cm)
Power supply	12 VDC nominal
Operating supply voltage range	9.0 – 15.0 VDC
Environmental protection	IP-68 (IS-60529:2001)
Working temperature range	0° to 60°C
Storage temperature range	-30° to 75°C
Dimension (Ø x L) AISI 304	30 mm x 390 mm (ECTD-60V) 42 mm x 420 mm (ECTD-30V)
Cable (option I)	Two pair screened cable with Kevlar strength member
Cable (option II)	Two pair screened cable with Kevlar strength member and vent tube

** When measured under laboratory conditions at 25°C using KCl conductivity calibration standard solutions.*

DATALOGGER

ESDL-30CTDB datalogger is suitable for ECTD sensors. In case the CTD sensor has absolute pressure sensor (option I), the datalogger has in built barometric correction interface that removes the effects of barometric pressure on water level/depth measurements. However, for CTD sensors with gauge pressure sensor (option II), the dataloggershave desiccant chamber instead of individual barometric sensor.

The datalogger can be programmed to take a measurement from 5 seconds to 168 hours in linear mode. The number of measurements taken per day should however be kept to a minimum as higher frequency of measurement drains the power supply battery at a faster rate. 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.

The datalogger offers a remote transmission option to deliver data wirelessly to a central server. With this option, electrical conductivity, temperature and water depth can be monitored from any internet-connected computer in near-real time.

DATA RETRIEVAL AND TRANSMISSION

Telemetry through GSM/GPRS modem

In a location covered by any GSM/GPRS service provider, the data from the automatic datalogger can be transmitted remotely to a central or cloud server. The user will need to arrange a data SIM card for each datalogger, under a suitable data plan from the local mobile phone service provider depending on the volume of data transfer expected.

The system is supplied with Windows based datalogger application software with many features which allows the user to set the sensor calibration coefficients, recording intervals, datalogger or borehole code (identification tag numbers), sensor serial number, real time clock time etc. of the datalogger conveniently.

User can monitor readings and GPRS signal strength or can manage data files, download data from the datalogger, perform data correction and save and export the data files.

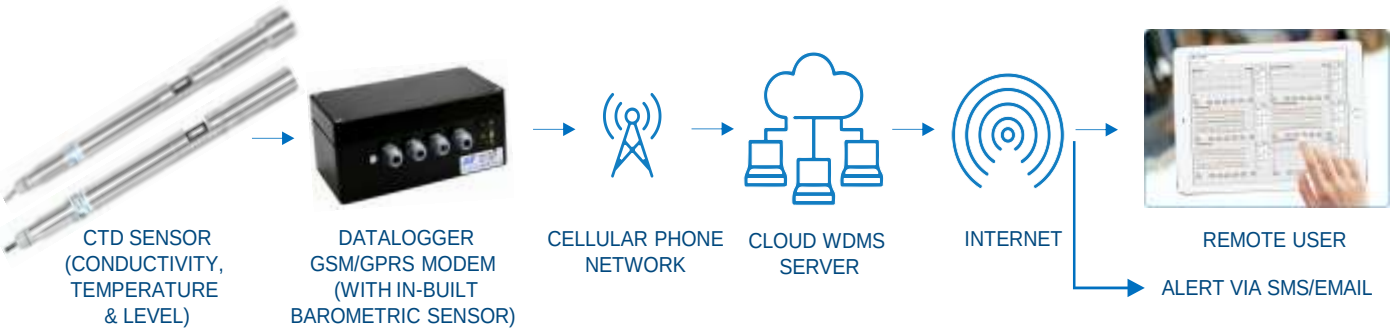
DATALOGGER SPECIFICATIONS

Input	ECTD sensors
Scan/upload interval	5 seconds to 168 hours
Memory capacity	Flash Memory (64-Mbit); 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
Temp. measurement	-20° to +70°C with 0.1°C resolution
Barometric pressure	950 – 1050 hPa; Accuracy ± 2 hPa
Power supply	Lithium cells or Alkaline high power cells or 12V SMF battery chargeable from AC mains or solar panel options available
Housing	Corrosion resistant weather proof enclosure 220 x 140 x 90 mm
Antenna (in telemetry option)	Built-in or separately mounted antenna

The logged data from the datalogger in the field can be directly downloaded to a laptop. Data can then be transferred to the server or central PC from the laptop using either a USB pen drive or through Internet.

Mobile phone readout/data retrieval

The datalogger can also communicate with an Android mobile phone readout running the supplied datalogger configuration/application software through a detachable Bluetooth dongle. Data can then be transferred to the server or central PC from the mobile phone either by USB cable/Bluetooth interface or through Internet.



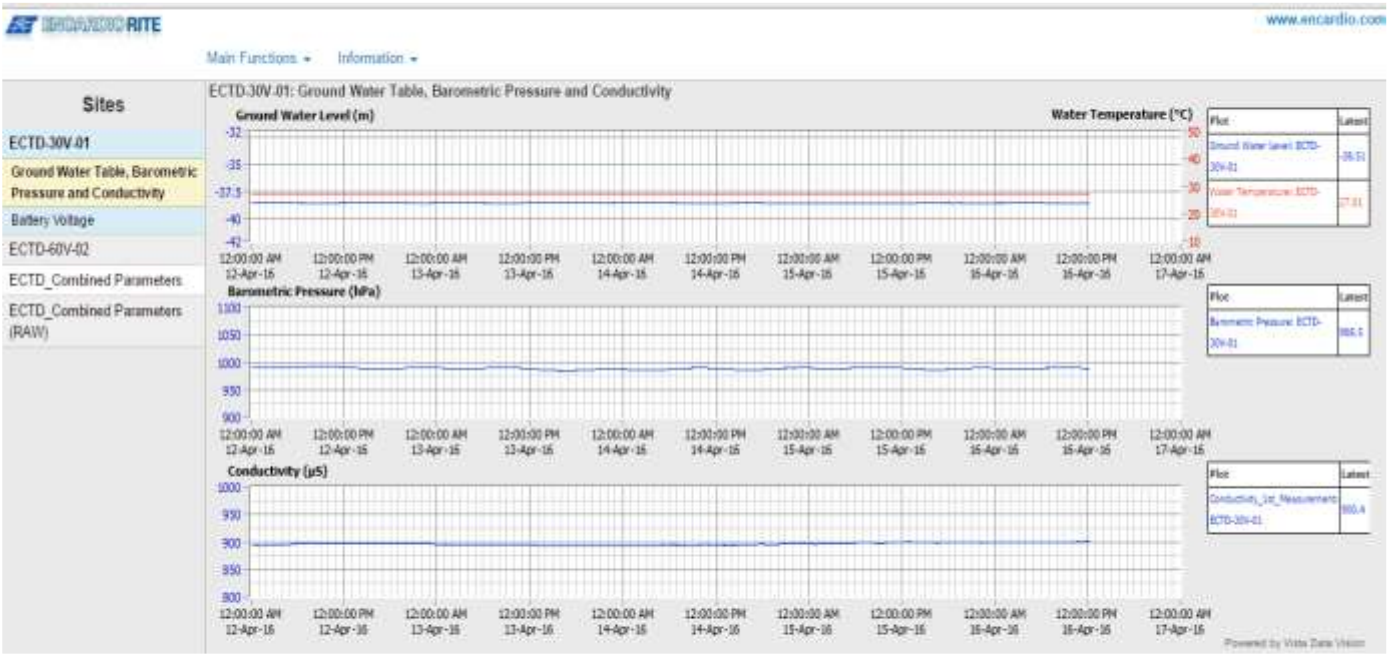
DATA PRESENTATION, ARCHIVING AND WORLD WIDE ACCESS THROUGH ENCARDIO-RITE PUBLIC CLOUD SERVICE

Encardio-rite offers public cloud based web monitoring service to its customers for retrieving data from ESDL-30CTD dataloggers, archiving the retrieved data in a SQL database, processing the data and presenting the processed data in tabular and most suitable graphical forms for easy interpretation of logged data. The tables and graphs related to any site or sites can be accessed by authorized personnel who can login to their site using the supplied login ID and access password from anywhere in the world over the internet.

Users can have two types of access – any user with lower level access can only view or access the data whereas a higher level user has the authority to set or modify some of the settings.

No special software is needed for accessing the user sites as the information can be viewed using most standard and popular web browsers like Microsoft Internet Explorer, Mozilla Firefox, Google Chrome etc.

Encardio-rite cloud services work on a rental model. User has to pay a small setup fee for first time and then a monthly rental has to be paid for accessing the data over the cloud as long as required.



*All specifications are subject to change witout prior notice

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