Delta-T Devices

Celora

WIRELESS



The Celora W-10 node & W-15 gateway - a powerful and flexible solution for creating wireless SDI-12 sensor networks.

- Connect up to 8 SDI-12 sensors (plus 1 event counter) to each wireless node.
- A single gateway handles up to 10 nodes.
- Send data to your own web platform - or to our sophisticated DeltaLINK-Cloud online data management and viewing solution.
- Long range, low power communications (Cellular 4G / LoRaWAN).
- Celora mobile app enables fast and simple configuration of devices via contactless NFC technology.
- Flexible power options - internal battery or external power source.
- Nodes can be easily upgraded to gateways.

SDI-12

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Celora WIRELESS

Celora is a sophisticated- yet easy to use- wireless network system. It is designed to provide seamless connectivity for environmental monitoring and data collection in scientific research, agritech, and civil engineering applications.

Built upon advanced LoRa and LoRaWAN technologies, Celora offers impressive reliability, scalability, and compatibility.

Key component overview



W-10 Wireless Unit - SDI-12 - Node

- Supports LoRa and LoRaWAN communication protocols.
- Compatible with SDI-12 sensors.
- Up to 8 SDI-12 sensors (plus 1 event counter) per node.
- Compact and rugged design for outdoor deployment.
- Low power consumption for extended battery life.
- Can send data to a third party LoRaWAN or Celora gateway.



W-15 Wireless Unit - SDI-12 - Gateway

- Utilises both LoRa and cellular communication technologies.
- Acts as a bridge between Celora W-10 nodes and the cloud.
- Can also act in isolation as both a node *and* gateway.
- Receives data from W-10 nodes via LoRa communication.
- Sends data to the cloud via its cellular modem functionality.
- Compatible with DeltaLINK-Cloud online platform.
- Can send data directly to third-party servers: MQTT, FTP, TCP.

DeltaLINK-Cloud compatibility

Many users of Celora will find that our DeltaLINK-Cloud online platform provides the ideal data management and visualisation partner. The W-15 Celora gateway can send data directly to DeltaLINK-Cloud, where it may be securely stored, managed, viewed and graphed in multiple formats and styles. DeltaLINK-Cloud enables remote instant access to your data - and real-time manipulation of data charts, not just static images.

DeltaLINK-Cloud can also generate widgets to display live data in animated graphic format on your smart devices - and enables data to be easily shared between project shareholders.

www.deltalink-cloud.com



Operation

Node - sensor data collection

Celora nodes are deployed in the field to collect data from any type of SDI-12 sensor (12 V and up to 500mA) and/or an event counter. Nodes are powered via internal battery by default, but can be externally powered (up to 16V).

Each node can handle up to 8 sensor generated measurement commands. Each command can result in multiple values (from the same sensor). For example, if all of the data outputs of a weather station are combined into a single command - up to 8 individual weather stations can be serviced by just a single node, providing comprehensive monitoring capabilities at low cost.

Each employed node communicates wirelessly with a Celora gateway using LoRa radio. Nodes are also capable of transmitting data directly to a third party LoRaWAN gateway. Communication distances of over a kilometre can be achieved in optimal cases, but challenging local conditions may see that reduced to hundreds of metres.

Gateway - a central hub

A Celora gateway unit serves as a central hub for surrounding nodes- enabling data aggregation and transmission. Once sensor data is received (via LoRa) the gateway transmits it to the cloud using its cellular modem functionality. Data can be sent to the DeltaLINK-Cloud online platform (for storage, analysis, and visualisation) or to third-party websites or servers (for example MQTT, FTP or TCP) for further processing and system integration.

Larger wireless networks may consist of multiple gateways - each with associated data supplying nodes.

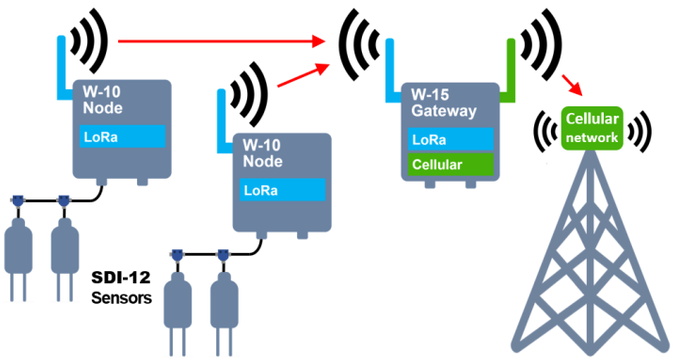
Memory card compatible - *for data back up*

Each Celora unit accepts a memory card - enabling the unit to log sensor data on physical media (in addition to transmitting it to the cloud). Memory card data can be uploaded to a PC for analysis.

Example system configurations

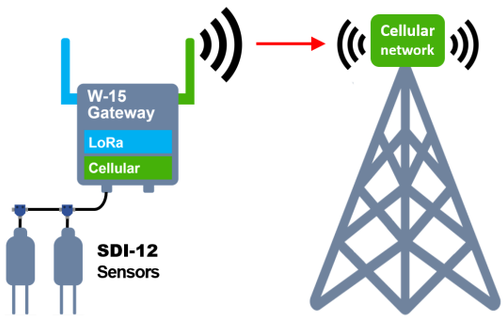
Private LoRa node network with cellular gateway

Users connect multiple nodes to a gateway, which connects to a cellular network. Data can be sent to DeltaLINK-Cloud or other cloud destination.



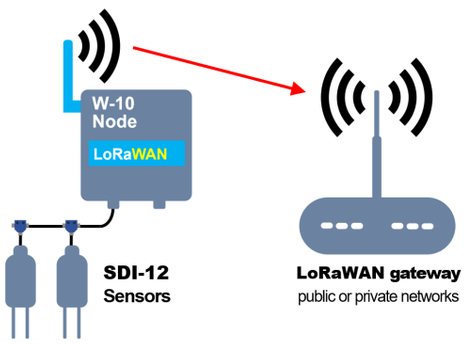
Sensors connected to standalone cellular gateway

Users can connect up to 8 SDI-12 sensors to a standalone gateway which connects to a cellular network. Data can be sent to DeltaLINK-Cloud or other cloud destination.



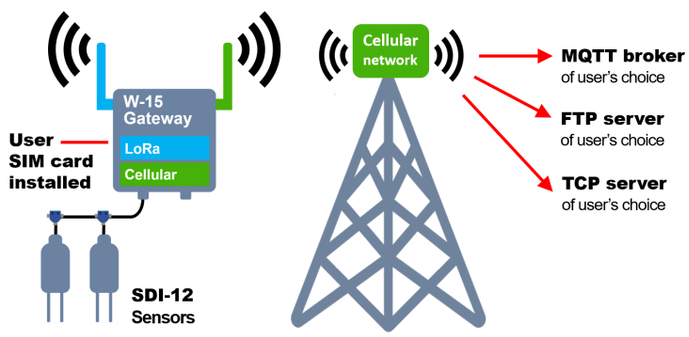
Sensors connected to standalone node (utilsing LoRaWAN)

Users can connect up to 8 SDI-12 sensors to the node and send data to a LoRaWAN network such a KPN or a private gateway e.g. MultiTech or Kerlink.



Direct access - bypass Delta-T servers to send data straight to user's server/broker of choice (requires user SIM card)

Users can have complete control of data by sending it directly to a LoRaWAN network (image above), MQTT broker, FTP server or TCP server of their choice.



Celora mobile app

Wireless unit, sensor & network configuration and management is made easy by the Celora app.

The app utilises contactless NFC technology. This enables the user to configure each node or gateway by simply tapping their smart device against the relevant Celora wireless unit and activating the relevant function on the smart device screen.

The Celora app syncs with DeltaLINK-Cloud to provide a seamless and convenient way to manage both the physical Celora network and your online digital data.

Celora *benefits*

Remote Monitoring: Celora enables remote monitoring of environmental parameters, allowing users to access real-time data and make informed decisions from anywhere with internet connectivity.

Scalability: A Celora system can be easily scaled to accommodate varying numbers of sensors, nodes and gateways- making it suitable for small-scale deployments as well as large-scale networks.

Reliability: Utilising advanced LoRa and LoRaWAN technologies, Celora offers enhanced communication performance - even in challenging environments with long distances between units and interference.

Flexibility: Data from Celora systems can be utilised in a variety of ways, dependent on the aims of the user- including integration with third party servers/systems.

Ease of Integration: Celora seamlessly integrates with the proven and powerful DeltaLINK-Cloud platform, providing users with a ready-made secure solution for data storage, analysis, visualisation and sharing.

Specifications

Celora hardware

W-10 Wireless Unit – SDI -12 – Node	LoRa + whip antenna. See note (1)
W-15 Wireless Unit – SDI-12 – Gateway	LoRa + antenna and 4G LTE modem + antenna. See note (2). (Modem includes Nano SIM holder)
All models	Near field communications (NFC) for local system configuration

Radio bands

W-10 Wireless Unit – SDI -12 – Node	LoRa (EU 868)
W-15 Wireless Unit – SDI-12 – Gateway	LoRa (EU 868) 4G LTE (900/1800) MHz
NFC (All models)	13.56 MHz

Connectivity

SDI-12 (Generally V1.3)	Sequential mode, 10 sensors max. Sensor power - see notes (3),(4).
Event counter	0 to 3.3V, 32KHz maximum (Rain gauge etc.)
External connection	2 x M12 and 1xM8 glands (Ext. power, SDI-12 bus and event counter)

Features

Local data storage	Optional memory card
Integrations	DeltaLINK-Cloud, IOS & Android Apps, MQTT, FTP, TCP
User interface language	English

General specifications

Supply voltage	6 to 16VDC
Power consumption	Less than 67µA (sleep mode) at 12VDC
Operating temperature	-40°C to 85°C. See note (5)
Operating humidity range	0 to 90% RH non-condensing
Enclosure	White (RAL 9002), UV stable polycarbonate
Ingress protection rating	IP67
Dimensions	120mm x 120mm x 60mm (excluding glands and breather)
Weight	< 0.5kg (excluding batteries, antenna, mounting brackets etc.)
Warranty	5 years excluding batteries

Accessories

Included	8 x alkaline AA cells (e.g. Procell Constant)
Included	Antenna(s)
Optional	Memory card (industrial temperature range)
Optional	SDI-12 network cable
Optional	SIM card
Optional	General purpose mounting kit

Compliance information

W-10 Unit (Node) & W-15 Unit (Gateway)	CE including LVD, RED and RoHS 3

Maximum cable lengths

SDI-12 cable (DT-MI2 system)	60 Metres max (5 core + screen)
External power	2 Metres max (2 core + screen)
Event counter channel	2 Metres max (2 core + screen)

Notes:

[1] LoRa radio must be used with supplied antenna to maintain compliance.
[2] 4G modem must be used with supplied antenna to maintain compliance.
[3] Sensor current limited to <250mA with specified internal AA cells.
[4] Sensor current limited to <500mA (thermal fuse) with external power.
[5] Ensure selected power supply/batteries match temperature range of intended application. Specified alkaline batteries have an operating range-20 to +54°C.