

ORNAVERA Data Collection Device (DCD):



Primary functionality:

- Polls and captures data from attached geo-physical and plant sensing devices
- Forwards data collected to Ornavera Data Aggregation Device (DAD) via fully certified LoRa® radio interface in unlicensed radio spectrum.
- Powered by solar-assisted battery

Specifications:

Wireless network interface: Microchip LoRa low-power, long range transceiver

- Fully certified LoRa® modules (plug & play) for global unlicensed frequency bands:
 - 902.000 MHz to 928.000 MHz
 - 863.000 MHz to 870.000 MHz
 - 433.050 to 434.790 MHz
- Spread spectrum modulation within the Sub-GHz band to enable long range, low power, and high network capacity.
- High receive sensitivity: to -146 dBm
- TX Power: Adjustable up to +18.5 dBm High Efficiency PA
- FSK, GFSK, and LoRa® modulation
- Coverage radius (ideal conditions):
 - Urban: up to 5 km
 - Rural/Suburban: up to 15 km

Controller: low-power, high-performance ARM® Cortex® microcontroller

- 256KB of flash and 32KB of SRAM
- Six serial communication modules (SERCOM) configurable as UART/USART, SPI or I2C
- CRC-32 generator
- One full-speed (12Mbps) Universal Serial Bus (USB) 2.0 interface
- 12-Bit ADC sampling

ESD Suppressors: Each interface point equipped with ESD suppressors / TVS diodes to protect device from external ESD

Devices & I/O interfaces

- I2C x 4
 - Temperature/Humidity sensor
 - Lux sensor
 - 2 spares
- SPI x 2 plant stem dendrometers
- RS485 x 2 soil probes (temp, permittivity, EC)
- UART x 1
- Analog x 1

Power:

- Single Li-ion 18650 3000 mAh battery
- Solar charging
- Backup battery life: 1-2 months depending on number of sensors attached and standby interval

OTA configurational update:

- RF parameters:
 - Transmit power
 - Spreading factor
 - RF frequency
- Device standby interval

Switches (inside enclosure):

- On/off
- Reset switch

Temperature

- Working temperature: -10°C ~ 55 °C
- Storage temperature: -20°C ~ 80° C

Humidity:

- Working humidity: 10%-95%RH (Non-Condensing)
- Storage humidity: 5%-95%RH (Non-Condensing)