

Origo XCS Series - Control Station

The Origo XCS series has been tested in some of the most demanding environments in regional and remote Australia. It uses the Origo X2 Series Industrial Internet of Things (IIoT) Processors Boards and 12 ports. The Origo XCS is a complete package; controllers and related sensors are all certified from the factory and ready to be installed

The core of Origo XCS is the X2 Series Industrial Internet of Things (IIoT) Processors build on five years of development. This is an industrial Processor board with integrated power management systems, protections and flexibility for industrial, agricultural and utility applications. It can control simple relay- and solenoid-based AC and DC systems, 3rd party engine controllers such as Kensho and COMAP, electrical motor drives and solar pumps through digital and analogue interfaces.

The XCS is designed as an autonomous control system with its battery and charging system to ensure that it can monitor any state even if the system it is controlling has lost power. Secondly, a fail-safe mode is implemented to limit risk in case of equipment failure.

The industrial design ensures that all wires and cables are protected inside aluminium or conduit. Also, the electronics and Lilon battery is always protected from direct sunlight using aluminium for heat dissipation.

Product Overview

The Origo XCS Control Station core is the Origo X2 Processor; it builds on the Atmel® SMART™ low-power microcontrollers. Secondly, the X2 series boards have 128MBytes flash memory non-volatile, which means they can store months of controller data in case of network or power outages.

Our default data exchange frequency for XCS is 1 minute and, by default using a private network. Other frequencies require evaluation based on the use case.



Communication

- √ Digimesh, Private Low Power Wide Area Network (LPWAN) using the ISM radio band, default data update frequency 1 minute.

Controls and related Sensors

Sensor and Control ports

- √ XCS supports up to 12 physical ports and bus configurations using 1-Wire or SDI-12 standards.

A wide range of controllers and sensors are available, use cases include:

- √ Diesel pumps and generators.
- √ Desalination plants.
- √ Solar based pumping systems.
- √ Mains powered pumping systems.
- √ Two and Three-way Valves for water management.
- √ Water mixing valves for mixing saline and desalinated water in agriculture.
- √ Pressure reduction valves.

A range of sensors may be relevant to these use cases, including but not limited to:

- √ Flow meters and sensors. Current sensors are certified for water with varying degrees of particles, includes turbine flow and ultrasonic sensors.
- √ Pressure. Current sensors are certified for liquids.
- √ Power Monitoring, DC and AC currents. Appropriate certified electrical installation is required
- √ Conductivity. Option for monitoring salinity of water used in agriculture.
- √ Planned sensors are pH, turbidity, vibration, residual chlorine, and other sensors as required by use cases.

Origo will certify new controllers and sensors for our systems as per our lab testing and integration procedures.

Installation and Mounting Options

Origo supplies the XCS series stations based on an aluminium pole mounting system. We also designed the systems to make it easy to use off-the-shelf brackets and clamps. In addition to this, we are supplying standardised mounting kits and brackets, e.g. for installation on flat surfaces, such as tanks. The XCS series stations have been tested and used successfully under cyclone conditions.

Installation depends on the complexity of the control system, and our certified Service Partners are available to assist you with the installation. A range of installations require official governmental certifications and our Service Partners hold such certifications.

Key Business Benefits

The Origo XCS provide superior services integration and agility. Designed for scalability, the platform's modular architecture enables you to grow and adapt to your business needs.

Service Flexibility	<ul style="list-style-type: none"> √ Device health and remote system monitoring and management of every Origo Station included. √ Origo offers increased levels of services integration with data, security, wireless, and mobility services, enabling greater efficiencies and cost savings. √ Flexible utilisation of networks according to data frequency requirements. Bidirectional communication. √ Standards for data transport and metadata.
Sensors and Controls	<ul style="list-style-type: none"> √ With its support for open and de-facto standards supporting and certifying sensors and controllers as required.
High performance	<ul style="list-style-type: none"> √ Low-power and efficient Processor √ Best-of-class and tested radio network support in regional and remote areas.
Integration	<ul style="list-style-type: none"> √ Open standards for data transfer and systems integration. √ Ability to certify and integrate all 3rd party controllers where appropriate interface specifications are provided.
Network	<ul style="list-style-type: none"> √ Elevated antenna position. √ Digimesh is a mature ISM band technology utilised in millions of devices worldwide. √ Communications protocol standards utilised, such as MQTT with network security features.
Energy Efficiency	<ul style="list-style-type: none"> √ Origo X2 utilise the highly efficient Atmel® SMART™ SAM D21 series of low-power microcontrollers with quality Lilon batteries with around 1000 complete charge cycles, solar power and USB interface that can be used for any standard USB charger. Standard 6V 10W (270x270mm) solar panel used by default.
Future Proof	<ul style="list-style-type: none"> √ Utilising Arduino compatible chipsets, such as the Atmel® SMART™ SAM D21 series with Open standards firmware coding. √ Modularity and standardisation of radio modules utilising the popular Xbee form factor and interface, enabling easy implementation of radio modules as required by business cases and your application. √ Scalability to grow from hundreds to millions, only limited by the data, Cloud and network services.

Origo Service Level Agreement and XDASH Software

Every Origo XCS comes with our Service Level Agreement (SLA), this includes:

- √ Origo software for storing, viewing, and accessing your data on smartphones, tablets, laptops, and PCs.
- √ Data is owned by you, the customer, stored on an Australian Cloud Service (AWS) or a local server.
- √ Third-party licenses for hardware and peripherals are available, if provided, from the manufacturer.
- √ Software Maintenance & Upgrades - All your equipment is regularly updated to the latest software and firmware versions & security patches, as well as a perpetual license for the Origo Dashboard web application, including upgrades to new releases.
- √ Provision of Cloud hosting for your Data and the Origo Dashboard. All your data is stored securely in an Australian Hosting Centre and available through the Origo Dashboard, and all data can be downloaded at any time. All data can be downloaded at any time or accessed by Application Programming Interface (API).
- √ Customer Support - Phone, email and support ticketing system for any support you may require for your installed Origo equipment.
- √ Monitoring & Diagnostics – Our Operations Centre systems monitor your on-farm equipment 24/7, and we respond to faults or outages within agreed service hours.
- √ Scheduled Servicing - This includes planning and scheduling on-site maintenance of your equipment conducted by our Service Partner network on a paid callout.
- √ Remediation – Our technicians work remotely to resolve hardware or software issues with your equipment. Often issues can be resolved remotely. Any callouts of technicians are pre-approved by and charged to customers.
- √ Third-party licenses for hardware and peripherals are available, if provided, from the manufacturer.

XCS XDASH Software Add-Ons

Remote control by on/off slider buttons are included in the standard XDASH software; additional add-ons is available as options:

- √ XDASH Control Scheduler, for automation, based on advanced timer control for multiple starts and stops.
- √ XDASH Event Programmer, advance event-based control, for instance, based on pressure.
- √ XALERT Alerts, email or SMS alerts.

Origo and Partner Services

Services from Origo and our certified partners can help you reduce the cost and complexity of deployments. We have the depth and breadth of experience across technologies to architect a blueprint for an IIoT solution to meet your needs. Planning and design services align technology with business goals and can increase deployment accuracy, speed, and efficiency. Technical services help maintain operational health, strengthen application functions, solve performance problems, and lower expenses.

Summary and Conclusion

As businesses strive to lower the Total Cost of Ownership in managing industrial or agricultural systems and assets and increase their overall employee productivity with more centralised management of all parts of their operation, more intelligent and mature Industrial Internet of Things platforms are required. The Origo X2 Series IIoT processors used in the XCS are designed to remotely control and automate to be able to monitor assets and implement automation and control centre style operations.

Product Specifications - Origo XCS Series Control Stations

General	
Certification and Compliance	Origo X2 version 1.5: AS CISPR 11:2017. ISO 26262 (ASIL B), IEC 61508 (SIL 2) and IEC 60730 (Class B) functional safety standards. Digi XBP9B-DMUT-022 and XBP9X-DMUS-021: ACMA Radiocommunications (Short Range Devices) Standard 2004. Radiocommunications (Electromagnetic Radiation-Human Exposure) Standard, March 2003. UBLOX, SARA-R410M-83B, Telstra LTE CAT-M1 and NB-IoT in 4GX network 24 March 2021 KIM1 (planned satellite module): ITU Recommendation SA.2045, ITU Filing for the satellite systems, both Argos Legacy and Kinéis constellation. EN 301 489-20 v2.1.2 (EMC). EN 62311: 2008 (human exposure), EN 62368-1: 2014 (safety).
Dimensions, Weight	Origo XCS series: 290x310x1200mm at 10kg packaged, 280x310x1800 mm typical installed station with a total weight depending on controllers and sensors ranging from 5.7kg including aluminium poles and solar panel and brackets.
Warranty	1-year limited liability warranty.
Power	
Power Supply	Solar panel 6VDC 10W (included), reverse polarity protected, and any USB charger providing more than 1.1A may be utilised via Origo adapter cable.
Battery	26650 Lithium-ion cells, protection integrated, Max. 1000 complete recharge cycles, 3-5 years battery life, depending on data transmission frequency.
Processor and Memory	
Processor	Origo X2 Version 1.5 IIoT Processor using ARM® Cortex®-M0+ MCU
Memory	256KB in-system self-programmable Flash 32KB SRAM Memory
USB Flash memory	128 MB internal non-volatile Flash, storing up to ~1.3 million data points, calculated as 100 bytes per measurement. If the data sampling frequency is minutely, it can store 30 months of data.
Programming	USB Micro B
I/O and Peripherals	
Exposed pins/ports Interface Boards	Origo Z2b Interface boards: 12, including 1-Wire and SDI-12 bus support.
Protection	ESD and input protection for all sensors and peripheral ports.
Sensors	Please see lists of Origo Certified Controllers and Origo Certified Sensors.
Communication	
Private LPWAN	'DM' - DigiMesh, ISM band 900MHz. DigiMesh is a proprietary wireless mesh networking topology developed by Digi.com which allows for time synchronised sleeping nodes and low-power operation.
Antenna options	Default: Stubby, robust low profile, NMO connector, 3dBi Optional: Omni Load Coil, NMO connector, 5dBi
Environmental Conditions	
Enclosures	XCS, X2c enclosure IP66, Junction Box Z2 IP54 (capillary action drainage), Optional IP66, 3000m Max Altitude, condensing conditions All systems are protected from direct sunlight by solar panel, heat sink provided through aluminium components.
Electronic Components	AEC-Q100 Grade 1: -40°C to 125°C

For More Information

For more information about the Origo XCS contact your local Industry Partner or Origo representative. All inquiries to info@8origo.com will be responded to within 24 hours.