

# ACORN IoT-SmartNode Datasheet

## Modular & Expandable IIoT Wireless Node

**DAYTECH**

### Key Features

*The ACORN IoT-SmartNode is the foot soldier of your Industrial IoT system, providing a highly modular, flexible and scalable hardware and software node, for a gateway or PLC/SCADA connected remote control and monitoring solution.*

- Easy to use and flexible, easy to wire design;
- Connect to the IoT-SmartNode-Gateway and build your own dashboards and apps with “Drag and Drop” tools;
- Expandable system, with a power and comms bus, powering up to 8A per rail, for 4 modules and many external sensors and controls;
- ARM Cortex M4 MCU - "The Muscle" - Coordinates Mesh Networks, digital and analogue IO and optional RS232/485 with low level RTOS (Real Time Operating System) control.
- DAYTECH's *ControlMesh* Wireless Mesh Network Protocol and API's for ease of setup and control
- Intelligently handles 6 onboard IO, expandable up to 36 local IO and 100s of remote IO, with Mesh Networks, Zigbee wireless and Optional CAN, MODBUS, RS232 and RS485 Communications.
- Sleep modes handled via the industrial grade MCU with hardened RTOS (Real Time Operating System);
- Designed for high reliability industrial control applications
- IP65 housing for outdoor use, or alternatively DIN rail mounted.
- 12VDC OR 24VDC regulated output from the node for supplying power to external industrial controls OR sensors.
- Solar/battery, DC or mains powered, with Intelligent charging.
- Acts as a Wireless Mesh Network Zigbee End-Node, Router or Co-Ordinator and concentrator, with LOS range of up to 15km to remote SmartNodes and multihopping up to 7 times. Connect up to 30 remote IO nodes.



### Applications

- Remote Real-Time IIoT enabled Control and Automation, Remote Monitoring and Control
- Remote Machine, Process and Equipment Monitoring and control,
- Remote PLC, RTU, SCADA, control system and communication equipment integration
- Remote pressure, temperature, flow and other sensor measurement and control
- Remote analytical and environmental measurement and control
- Remote Flow Control of Valves, Pumps and Pipelines
- Can be factory programmed for many applications
- Can be user programmed via the flow programming tool
- Process and Mining Industries, Water and Wastewater treatment, Irrigation and Agriculture

### Description

The DAYTECH IoT-SmartNode Series modular and expandable Industrial IoT nodes are designed for reliable, sophisticated and robust, all-in-one remote monitoring and automation performance. The SmartNode can be installed as a stand-alone monitoring and control unit when connected to a gateway, or it can be integrated with existing control systems such as PLC/SCADA as intelligent remote IO.

The IoT-SmartNodes have many advanced features; however we have designed the software platform to be simple to setup and operate, using function block flow programming over the gateway, or use simple AT/API commands, when integrating with a third-party system.

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### Environmental and Installation Consideration – Rugged Industrial Design

- Designed for high reliability industrial control applications:
- Power supply and all IO has ESD to 15KV, overvoltage, undervoltage, reverse polarity, and overcurrent protection; plus designed for EMC compliance.
- Protection on all IO and wiring interfaces to prevent user damage.
- Designed to allow for noisy EMI (industrial environments).
- Robust and allow for industrial levels of vibration and high levels of environmental moisture.
- Designed for easy wiring into the spring connections, with positioning for easy installation.
- Rugged and robust for industrial and outdoor conditions
- Installation outdoors with no enclosure required and integral antenna, or DIN rail mounted inside an enclosure, with external antenna via coaxial extension cable with the SMA connector.
- High temperature range (-10 to 50degC).
- Impact resistance tested.
- Over current and overvoltage protection.
- Intelligent signal processing.
- SBC Components with RCM and CE Certification



### IO Features

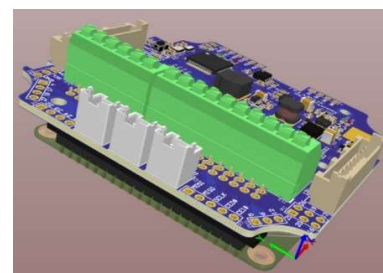
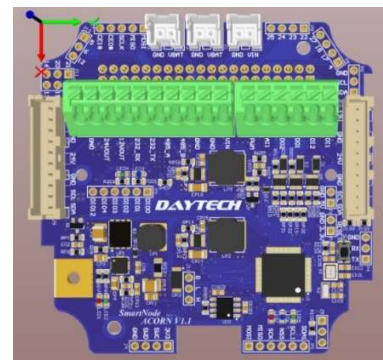
The ACORN IoT-SmartNode system is flexible and expandable. Connect up to 4 modules together, with up to 36 local IO. The locally plugged in expansion units are conveniently connected via ribbon cable, forming one device with a common power and communications bus. The same SmartNode unit can communicate locally or remotely over the wireless mesh network. Wirelessly connect up to 30 remote mesh networked IO SmartNodes to the one gateway or PLC/SCADA system with poll rates depending upon the number of remote nodes.

#### ON Board the ACORN IoT-COMBO Gateway:

- 2 x DI (5-35VDC – opto-isolated and protected), takes 12VDC and 24VDC inputs;
- 2 x DO (5VDC / 12VDC / 24VDC configurable), 24VDC only when factory configured (easy to do, speak to the team at DAYTECH for more info);
- 1 x AI (4-20mA/0-5V/0-10V configurable), connected to high resolution and high speed ADC (12 Bit);
- 1 x High Speed PWN counting inputs (Pulse Input);

#### IO PINOUT:

5-36V DC input	5-36V DC input	12V DC Out	12V DC Out	4-20 mA / 0-10V / 0-5V	PWM Input
DI 1	DI 2	DO 1	DO 1	AI 1	PWM In



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**ACORN IoT-SmartNode Datasheet**  
 Modular & Expandable IIoT Wireless Node  
 IoT-SmartNode – Wireless Communication Options



**IoT-SmartNode – Wireless Application Example**

**DAYTECH SMART SENSOR TECHNOLOGY + ACORN IoT**

Go wireless and control your process and equipment directly from DAYTECH smart sensors.



Wireless smart temperature and pressure – complete with digital display setup for switching at setpoints for remote wireless control.



Wireless flow switch – complete with sensitivity control for switching flow at setpoints for remote wireless control.



Wireless level sensor – point to point for control and switching pumps, motors or valves wirelessly for tanks, dams or bore level control.

You're only limited by your imagination – the possibilities are endless!

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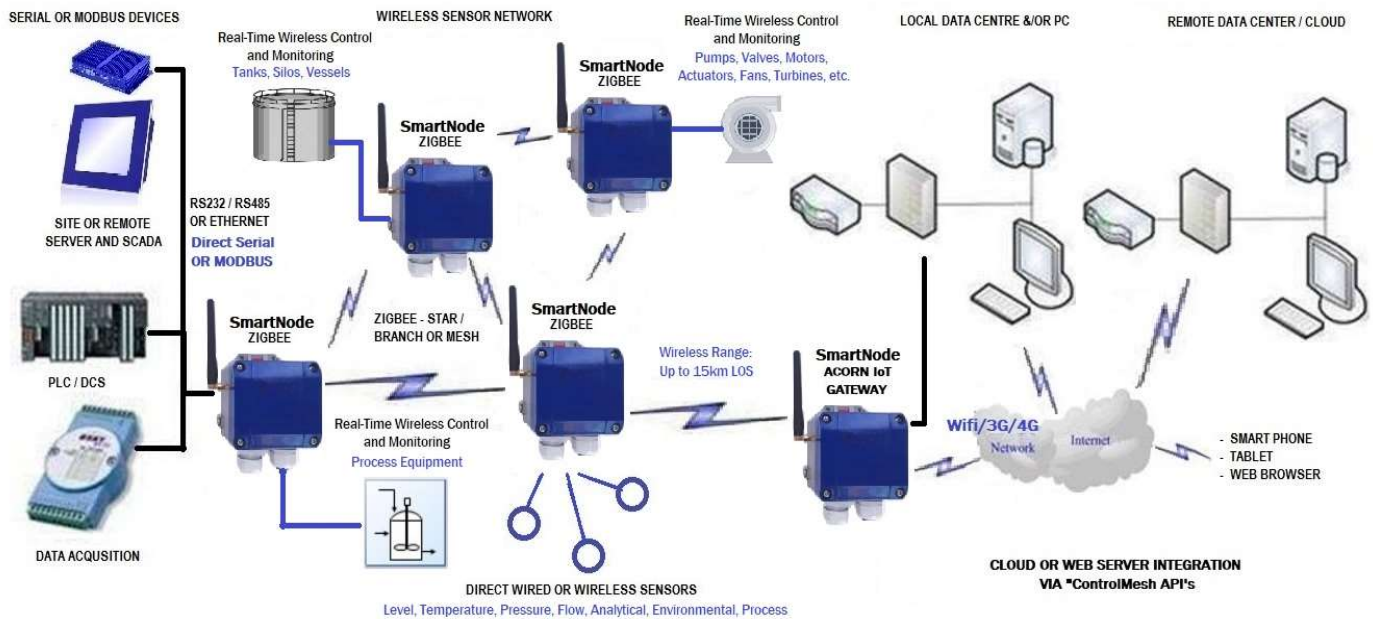
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### IoT-SmartNode – Wireless Network Topology – In Field Example



### IoT-SmartNode – Optional Wireless Protocols

- **Wireless Option 1** - Xbee S2B 802.15.4 Zigbee Module (2.4GHz AUS Certified, ISM Band Unlicensed) - up to 3km range LOS (refer module specifications). Module and Antenna SOLD SEPERATELY - select from options to add factory fitted module.
- **Wireless Option 2** - Xbee S2B PRO 900HP Zigbee Module (900MHz AUS Certified, ISM Band Unlicensed) - up to 14.5km range LOS (refer module specifications). Module and Antenna SOLD SEPERATELY - select from options to add factory fitted module.
- Several options for antennae depending upon requirements. (sold separately).

### IoT-SmartNode – Optional Features

- Takes 10-28VDV input power from 230VAC/12VDC plug-pack adaptor (sold separately), or DC power supply or Solar panel (sold separately).
- Comes standard with IP65 weatherproof enclosure, suitable for mounting outside as standalone, or inside panels on DIN rail or with screws.
- 2600mAh replaceable lithium Ion Battery pack. Can power remote SmartNodes or act as a UPS for mains/DC powered SmartNodes (sold separately), Expandable battery capacity, for supplying larger loads, modular battery pack add-on. (sold separately). *Important Note: the Li-ion batteries have max temperature rating of 50degC.*
- Modular and highly scalable, add up to 3 optional plug-in expansion IO modules for up to 36 local IO and 1000s of remote wireless nodes across multiple protocols!

### Selection Guide

Please login to your account at [www.daytech.io](http://www.daytech.io) for a configuration tool. Please contact our sales and engineering team for application assistance.

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