

RAPTOR - 1000

GATEWAY



iot.nxt
bridging the edge



RAPTOR 1000

Technical Summary (v2.10)

Description

The iot.nxt Raptor is an edge device gateway with a configurable hardware stack - designed to support hundreds of analogue or digital input and output devices.

The Raptor has no Operating system such as Linux or Windows – the firmware was built on a bare-metal CPU, memory and other hardware. This decreases the attack surface in terms of malware and viruses to virtually zero.

With a multitude of electronic interfaces, it supports sensors and devices which has no IP capabilities – it supports various protocols on one-, two-, three- or four-wire connectors, such as I²C or SPI, CAN bus and some others. This effectively enables non-networkable devices to be monitored and controlled as easily as IP-based devices.

The embedded lightweight, yet powerful device abstraction layer allows for the configuration and filtering of out-of-threshold signal levels before data is distributed to Server or Cloud infrastructure. Communication is done via an encrypted message queue which is secure and guarantees delivery of messages across any local LAN, Internet, WAN, VPN or wireless transmission.

The standard fan-less IP53 rating enclosure can be mounted on any standard din rail and can be powered via POE from standard POE switches, or by 12V DC input.

The colour touch LCD screen displays information about all the connected devices, but can also be driven via Workflow to display and collect workflow-related information (such as physical feedback from a field technician via the touch screen).

Raptor Mainboard

Processor	<ul style="list-style-type: none"> Atmel ARM9 400MHz MCU 128 MB DDR SDRAM 4 Mbytes of Serial Flash Storage: MicroSD (FAT32) up to 32GB Field-upgradeable firmware (remotely) Real Time Clock with backup battery 88 GPIOs
Operating System	<ul style="list-style-type: none"> None – All firmware executes on bare-metal within the Open-sourced Microsoft .NET Micro Framework
Power consumption	<ul style="list-style-type: none"> 98mA Powered via 12V DC or Power Over Ethernet (POE)
Operating Temperature	<ul style="list-style-type: none"> -40° to +85°
Lightweight device abstraction	<ul style="list-style-type: none"> Built-in threshold management Encrypted MQTT for Message Queue transmission Modbus/ TCP Fieldbus (PLC Compatible)
Embedded Web Interface	<ul style="list-style-type: none"> Web interface for in-field configuration and upgrades Network setup (DHCP or Static IP) Network time (NTP) setup Device connection configuration Register setup Threshold management

Communication Options

Ethernet/POE	<ul style="list-style-type: none"> Dual Ethernet ports Full TCP/IP stack Power over Ethernet (IEEE 802.3af)
UART	<ul style="list-style-type: none"> Dual UART Serial Port - RS232 or TTL configurable
USB	<ul style="list-style-type: none"> USB Host (Type A Female) USB Client (Type A Female) Micro USB Female (initial setup & diagnostics)
Wireless Options	<ul style="list-style-type: none"> GSM options – Edge, 3G, LTE 3 SMA connectors for Antennas (GSM, Wi-Fi 2.4Ghz & 5GHz) GPS optional 2 N-Type connectors for external Antennas - GSM and Radio Links
Low Power wireless	<ul style="list-style-type: none"> Bluetooth Low Energy (BLE) ZigBee GPS
Vehicle Battery and Ignition	<ul style="list-style-type: none"> Power from vehicle battery Vehicle ignition detection

Interface Modules

Expansion Module	<ul style="list-style-type: none"> ▪ Bus adapter for additional external interface modules ▪ Digitally addressable & configurable I²C interface allows for hundreds of additional input/output connectors
Load Module	<ul style="list-style-type: none"> ▪ 7 isolated 5V/12V power connectors that can switch/power external devices such as Smoke/Sound Bombs, Pepper Bombs, Door locks, etc. ▪ Switch relays to switch on/off any high voltage devices (such as door locks – magnetic or motorised, booms, gates, pumps)
Input Module	<ul style="list-style-type: none"> ▪ 7 digital input connections ▪ 5V or 12V ▪ High or Low Volt switch capable via jumpers ▪ User for digital input sensors such as Passive Infra-Red, Smoke detectors, Door Positioning Sensors, etc.
Protocol Module	<ul style="list-style-type: none"> ▪ 7 digital connectors for various one-wire, two-wire and three-wire, four-wire and more devices which are addressed via multiple protocols. See below – “Supported Protocols” ▪ All connectors are ruggedized and protected against external EMP and power surges ▪ Used for sensors such as Temperature, Humidity, Vibration, etc.

Supported Protocols

1 Wire	<ul style="list-style-type: none"> ▪ Provides low-speed data, signalling, and power over a single signal
2 Wire	<ul style="list-style-type: none"> ▪ Used for devices such as Vibration Sensors that has a Data and a Clock line
I ² C	<ul style="list-style-type: none"> ▪ Used for connecting lower-speed peripheral ICs to processors and microcontrollers
Wiegand	<ul style="list-style-type: none"> ▪ Secure protocol to communicate with Access Control devices
Modbus	<ul style="list-style-type: none"> ▪ SCADA Standard protocol for communication to various devices.
CAN bus	<ul style="list-style-type: none"> ▪ Allows microcontrollers and devices to communicate with each other in applications without a host computer.
BACnet	<ul style="list-style-type: none"> ▪ Data Communication Protocol for Building Automation and Control Networks
SPI	<ul style="list-style-type: none"> ▪ Synchronous serial communication interface specification used for short distance communication

External Overview

Physical Dimensions	370mm x 243mm x 70mm
DIN Rail Mountable	Yes
Material	ABS & Carbon Fibre enclosure
Display	3.2" 320 x 240 Pixel LCD Touch screen display
External ports	IP53 - Dustproof and rainproof

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