



PIGEON
PLEX

PIGEON PLEX

IOT DEVICE APPLICATIONS

Overview of our IoT device range, including device capabilities, deployment guidance, and key application considerations for building management.

Device Overview

The Pigeon Plex range is a family of IoT gateway devices designed for building management, energy metering, and facility monitoring applications. Built on a common firmware architecture, all devices support the same core communication protocols and publish data to the cloud via MQTT, providing a consistent and scalable solution that can be deployed across sites of any size.

The range includes four devices, each optimised for a different deployment scenario. The Finch family (Finch, Zebra-Finch, and Zebra-Finch WMBus) is designed for focused applications such as electricity metering, water metering, asset monitoring, and single-bus integrations. The Pigeon+ is intended for more complex installations where multiple systems must be integrated simultaneously, combining metering, BMS integration, sensing, control, and cloud connectivity within a single gateway.

	Pigeon+	Finch	Zebra-Finch	Zebra-Finch WMBus
				
Primary Application	Plant rooms, multi-subsystem BMS gateways, centralised multi-meter metering	Kamstrup Omnipower / Omnia E only — mounts in-meter, powered by the meter	Field device monitoring, multi-meter metering, BMS integration	Combined electrical metering and wireless water sub-metering
RS485 Ports	2	2*	1	1
Power Input	12-24V AC/DC	4.2V (meter)	12-24V AC/DC	12-24V AC/DC

Device Selection Guide

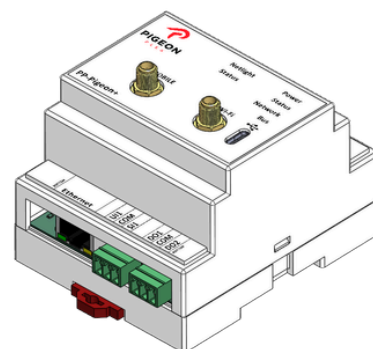
Below is an application guide illustrating common building management and metering scenarios.

Application Requirement	Recommended Device	Key Reason
Single application at one location (one meter, one asset, one bus)	Finch, Zebra-Finch, or Zebra-Finch WMbus	Single-purpose devices — compact, cost-effective, easy to deploy
Multiple applications at one location (metering + BMS + sensors + outputs)	Pigeon+	Multi-application gateway — dual RS485, onboard I/O, Ethernet
Plant room — multiple subsystems, sensors, actuators, two RS485 buses	Pigeon+	Dual RS485, onboard I/O, Ethernet
Kamstrup Omnipower single meter, direct in-meter mount	Finch	Must be installed in a Kamstrup meter — powered by the meter, no external supply
DLMS electricity meters — up to 10 on one RS485 bus, LTE or Wi-Fi uplink	Zebra-Finch WMbus	Single port DLMS, DIN rail, 12-24V
DLMS electricity meters — up to 10 across two RS485 buses, or Ethernet uplink required	Pigeon+	Dual port, Ethernet for reliable uplink
Kamstrup Omnia E — direct in-meter mount	Finch + Omnia E adapter board	Adapter board enables direct plugin on Omnia E
Electrical sub-metering combined with wireless water sub-metering in same riser	Zebra-Finch WMbus	DLMS on RS485 port + WMbus radio on same device
Full building metering — electricity and water across all floors	Zebra-Finch WMbus per floor/riser	One device covers both utilities per zone
BMS integration — expose field data over Modbus to upstream controller	Pigeon+ or Zebra-Finch	Modbus Server on one port, Client on the other
Remote or outlying single-device asset monitoring	Zebra-Finch	Single port, DIN rail, LTE connectivity
Non-intrusive monitoring of existing Modbus bus	Pigeon+ or Zebra-Finch	Passive Listener — no impact on existing comms
Wireless water sub-metering only (no wired metering required)	Zebra-Finch WMbus	WMbus receiver — no cabling to meters required
IP-based Modbus integration (Modbus TCP)	Pigeon+	All devices support Modbus TCP, however, the Pigeon+ is recommended where a wired Ethernet connection is preferred.
Connecting to a metering or field device via TCP/IP (M2M)	Any device	For devices that support TCP/IP communication directly — acts as client or server
Wired network (Ethernet) uplink required	Pigeon+	Only device with Ethernet
Dry contacts for Fire panels (fire and fault)	Pigeon+	Uses dry contacts via inputs
Input pulse counting	Pigeon+	Uses input and EERAM to perform and store pulse counts

Pigeon+

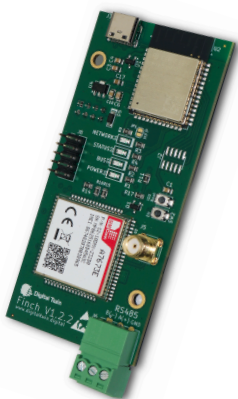
The Pigeon+ is the most capable device in the range, ideal for plant rooms, main electrical intake points, and applications requiring multiple RS485 buses, onboard sensing, or wired Ethernet connectivity. Its two independent RS485 ports can run different protocols simultaneously, such as DLMS meter reading and Modbus Server for BMS integration.

With built-in analogue and digital I/O, a configurable Universal Input, dedicated sensor input, two digital outputs, and an ambient temperature sensor, the Pigeon+ can operate as a complete field gateway without additional I/O hardware.



Designed for DIN rail mounting and powered from 12-24 V AC or DC, it includes Ethernet connectivity for reliable network integration and Modbus TCP applications. The Pigeon+ excels in multi-application deployments where several functions operate concurrently. For example, reading meters on one RS485 port while serving BMS data on another, combining wired sensor inputs with wireless cloud reporting, or acting as the central hub for a cluster of metering devices deployed around a building.

The Finch



The Finch is purpose-built for Kamstrup Omnipower and Omnia E meters, mounting directly onto the meter and drawing power from it—no external power supply is required. An adapter board is available for direct installation on the Omnia E. For other DLMS meter brands, the Zebra-Finch is recommended.

The Finch features two RS485 ports: one dedicated to the host meter and a second for additional DLMS meters or upstream systems. It can read up to 10 DLMS meters in total. In addition to metering, the Finch includes built-in control logic, including PID, on/off control, fan coil control, timers, and mathematical functions, making it suitable for simple local control applications in addition to metering.

The Zebra-Finch

The Zebra-Finch is a compact, single-port gateway for applications where one RS485 connection is all that's required. DIN rail mounted and powered from 12-24 V AC/DC, it supports all the same communication protocols as the rest of the range — including DLMS for up to 10 meters, Modbus TCP, and M2M.

As a single-purpose device, it excels at doing one job, such as reading up to 10 electricity meters in a riser, monitoring a single field asset, or providing cloud connectivity for one RS485 controller. It has one RS485 port and LTE or Wi-Fi connectivity rather than Ethernet — a deliberate trade-off that keeps it compact, cost-effective, and easy-to-deploy in distributed locations across a building.



The Zebra-Finch WMBus

The Zebra-Finch WMBus extends the Zebra-Finch with an integrated Wireless M-Bus (WMBus) receiver module. It retains the full RS485 port and all communication capabilities of the standard Zebra-Finch, while adding the ability to passively receive data from WMBus water meters without any wiring.

This combination makes the Zebra-Finch WMBus powerful in riser and meter room deployments where both electricity and water metering are required. A single device can simultaneously read DLMS electricity meters on its RS485 port and collect water meter readings from WMBus meters in its radio coverage zone – delivering both utilities to the cloud platform from one piece of hardware.



Protocol and Feature Matrix

All four devices support the same set of communication protocols. Hardware features differ only in the Pigeon+ (onboard I/O, Ethernet) and Zebra-Finch WMBus (WMBus radio receiver).

Protocol / Feature	Pigeon+	Finch	Zebra-Finch	Zebra-Finch WMBus
Modbus Client (RS485)	✓	✓	✓	✓
Modbus Server (RS485)	✓	✓	✓	✓
Modbus Passive Listener	✓	✓	✓	✓
Modbus TCP Client/Server	✓	✓	✓	✓
DLMS Client (up to 10 meters)	✓	✓	✓	✓
Machine to Machine (M2M)	✓	✓	✓	✓
Wireless M-Bus (WMBus)	—	—	—	✓
MQTT (data + commands)	✓	✓	✓	✓
Wi-Fi	✓	✓	✓	✓
4G/LTE	✓	✓	✓	✓
Ethernet	✓	—	—	—
Onboard Analogue Inputs	✓	—	—	—
Onboard Digital Outputs	✓	—	—	—
Built-in Ambient Temp Sensor	✓	—	—	—
DIN Rail Mounting	✓	—	✓	✓
In-Meter Mounting	—	✓	—	—
EERAM	✓	—	—	—
MQTT Bridge mode	✓	✓	✓	✓



DLMS Electricity Metering

All Pigeon Plex devices support DLMS meter reading, allowing data collection from up to 10 DLMS-compliant electricity meters, including models from Kamstrup, Landis+Gyr, and other major manufacturers. Readings are published to the cloud platform via MQTT and can be served to a local BMS via Modbus simultaneously.

The Finch is purpose-built for Kamstrup Omnipower and Omnia E meters, mounting directly onto the meter and drawing power from it. As it is a plug-in solution, it does not provide DLMS meter connectivity. For all other DLMS meters, the Zebra-Finch, Zebra-Finch WMBus, or Pigeon+ should be used.

Meter Capacity Per Device

All devices can read up to 10 DLMS meters. Capacity is allocated as follows:

- **Pigeon+:** Up to 10 meters split across Port 1 and Port 2 in any combination, leaving the other port free for a different purpose if needed.
- **Finch:** Up to 10 meters in total – Port 2 is dedicated to the Kamstrup host meter and Port 1 can read up to 9 more DLMS meters (any make).
- **Zebra-Finch:** Up to 10 meters on its single RS485 port.
- **Zebra-Finch WMBus:** Up to 10 meters on its RS485 port. The WMBus radio operates independently.

Single-Bus vs Multi-Bus Deployments

For installations where all meters are on one RS485 bus, the Zebra-Finch provides a compact and cost-effective solution. The Zebra-Finch is DIN rail mounted in the riser board, reading up to 10 meters and reporting via a single LTE or Wi-Fi connection. The Pigeon+ is best suited for applications where meters span two separate buses, or a wired Ethernet uplink is required. The second RS485 port on the Pigeon+ can be used for an additional meter bus or serve a different purpose entirely, such as a Modbus Server connection to the building BMS, enabling multiple applications from a single gateway.

Communication & Integration

All Pigeon Plex devices support a common set of communication protocols, enabling seamless integration with building management systems, energy meters, HVAC equipment, sensors, and cloud platforms. Supported protocols include Modbus RTU, Modbus TCP, DLMS, Wireless M-Bus (WMBus), MQTT, and Machine-to-Machine (M2M) communications. The Pigeon+ and Finch feature dual independent communication ports, allowing multiple integration functions to operate simultaneously. For example, one port can operate as a Modbus Client while the other operates as a Modbus Server.

Modbus Integration

Modbus is the most widely used protocol in building automation and is commonly found on HVAC controllers, variable speed drives, energy meters, sensors, and other field devices.

Pigeon Plex devices support:

- Modbus Client – Poll field devices and publish data to the cloud.
- Modbus Server – Present collected data to an upstream BMS or SCADA system as a standard Modbus register map.
- Modbus Client/Server: Dual-port devices can simultaneously collect data on one RS485 network while serving data to a BMS on the other.
- Modbus Passive Listener – Monitor and observe an existing RS485 network without transmitting or affecting operation.
- Modbus TCP – Integrate with IP-based BMS platforms and devices that communicate over the building LAN rather than RS485.

Communication & Integration

Wireless M-Bus (WMbus)

The Zebra-Finch WMbus includes an integrated Wireless M-Bus receiver for collecting water meter data without additional wiring.

A single device can simultaneously:

- Read electricity meters via DLMS on RS485.
- Receive water meter data wirelessly.
- Publish both utilities to the cloud over a single LTE connection.

This makes the Zebra-Finch WMbus an ideal solution for apartment risers, utility cupboards, and mixed electricity/water metering applications.

Note: The WMbus module supports water meters only.

Machine-to-Machine (M2M)

M2M enables a Pigeon Plex device to communicate directly with a metering or field device that supports TCP/IP – acting as either a TCP client connecting out to the remote device, or a TCP server accepting incoming connections from it. This is the appropriate integration path for devices such as smart meters, controllers, or data loggers that expose a TCP/IP interface rather than RS485. It operates over the existing LTE, Wi-Fi, or Ethernet network connection of the Pigeon Plex device with no additional hardware required.

MQTT Bridge

MQTT Bridge enables remote access to RS485-connected devices from anywhere.

A desktop application creates a virtual COM port on your PC and securely routes communications through MQTT to the remote Pigeon Plex device. Meter configuration, diagnostics, commissioning, firmware updates, and troubleshooting can then be performed exactly as if the device were connected locally.

For organisations managing large numbers of distributed meters, MQTT Bridge significantly reduces site visits, commissioning time, and ongoing maintenance costs.

Pigeon+ Onboard I/O

The Pigeon+ includes integrated onboard analogue and digital I/O, making it suitable for plant rooms where both bus instruments and hardwired sensors are present.

Features include:

- Universal input (0-10 V, thermistor, resistance, or digital signals)
- Dedicated sensor input that supports thermistor, resistive, and digital modes
- Two open-drain digital outputs
- Built-in ambient temperature sensor

This allows a single Pigeon+ to combine metering, Modbus integration, sensor monitoring, equipment control, and cloud connectivity within one device, reducing hardware costs and simplifying installation.

Building Applications

The Pigeon Plex range provides flexible solutions for building management, energy metering, and facility monitoring. The examples below illustrate common deployment scenarios and show how the different devices can be used to simplify installation, reduce infrastructure requirements, and provide valuable operational insights.



Plant Rooms

The Pigeon+ is the preferred solution for plant rooms and central utility areas. A single device can read chiller, boiler, pump, and VSD controllers on one RS485 port and read electrical sub-meters on the other.

Additionally, it can measure hardwired pressure and temperature sensors on its analogue inputs, drive control relay outputs, and serve all aggregated data to the BMS via Modbus Server and to the cloud via Ethernet simultaneously.

It replaces what would otherwise be a combination of a data concentrator, an I/O module, and separate communication gateways.

Electricity Sub-Metering

For Kamstrup Omnipower and Omnia E installations, the Finch provides a simple meter-mounted solution, drawing power directly from the host meter without additional wiring.

For all other DLMS meter types, the Zebra-Finch and Pigeon+ provide flexible sub-metering solutions, supporting up to 10 meters per device. The Zebra-Finch is ideal for single RS485 meter networks connecting via LTE or Wi-Fi, while the Pigeon+ is suited to larger installations requiring two separate buses or where a wired Ethernet uplink is preferred.



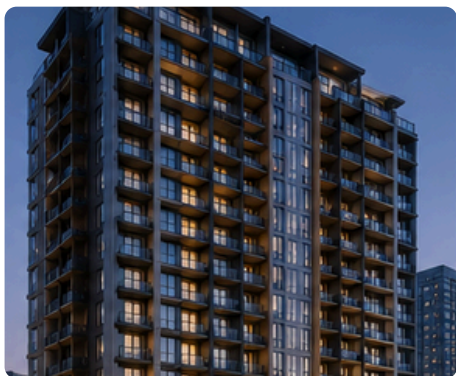
Combined Electricity & Water Metering

The Zebra-Finch WMBus is designed for applications requiring both electricity and water metering.

It can simultaneously collect DLMS electricity meter data via RS485 and water meter readings via Wireless M-Bus radio, delivering both utilities to the cloud through a single gateway.

This makes it particularly well suited to apartment buildings, hotels, student accommodation, and commercial developments.

Building Applications



BMS Integration

All Pigeon Plex devices integrate easily with existing Modbus Building Management Systems. Operating as a Modbus Server, a device can present collected meter, sensor, and equipment data to the BMS while simultaneously publishing the same information to the cloud via MQTT, without requiring any modification to the BMS.

Where the BMS communicates over IP, any device acts as a Modbus TCP Server over the building LAN. Where modifying the BMS configuration is not possible at all, Passive Listener mode silently observes the existing bus and forwards the data to the cloud without the BMS being aware.

HVAC Monitoring & Control

Most commercial HVAC equipment exposes data via Modbus RS485 or Modbus TCP. For central plant – AHUs, chillers, cooling towers – the Pigeon+ combines Modbus communication with onboard I/O for hardwired sensors and digital outputs.

For distributed terminal units such as FCUs and VAV boxes, the Zebra-Finch provides a compact per-unit gateway. The Finch's embedded control logic (PID, on/off, fan coil, timers) also allows simple regulatory control to be handled locally without a dedicated controller.



Remote Asset Monitoring

For distributed building assets such as basement pump stations, rooftop plant, riser boards, and car park ventilation systems, the Zebra-Finch provides a compact and cost-effective monitoring solution. Its DIN rail-mounted design and LTE or Wi-Fi connectivity enable rapid deployment without the need for network cabling, making it ideal for remote or difficult-to-access locations.

High-Density Residential & Hospitality

Hotels, student accommodation, apartments, and multi-tenanted developments often require utility monitoring across many rooms where dedicated cabling is impractical. The Zebra-Finch WMBus collects water meter data wirelessly, while electricity metering is handled by Finch (for Kamstrup meters) or Zebra-Finch gateways.

Operators gain real-time visibility of utility consumption and proactive leak detection. Abnormal usage patterns, such as continuous overnight consumption, can be automatically identified and flagged for investigation.

