Utility Droplet Controller
Secure gateway device & energy management system

Overview

- Robust Droplet optimised for utility roll-out of Virtual power plants and micro-grids at scale
- Optimised for device-to-control room security and managed communications
- Similar functionality as standard Droplet plus the following:
    - secure 4G modem for utility and/or fall-back operation
    - dual port router and firewall for multiple connection options

Key Features & Benefits

- **Vendor agnostic:** Interfaces with most solar & battery inverters, power meters, load controllers & sensors
- **Fleet-wide visibility & control** of distributed assets
- **Utility-grade security** in both comms & cloud portal
- **User engagement:** Customer monitoring portal
- **Improves cost effectiveness,** reduces tech & supply risk

Reported Information

Report data from supported devices, including:

- Battery state of charge
- Power flows (active, reactive, apparent, phase, aggregate)
- Real-time grid real & reactive, voltage, current & frequency
- Instantaneous, day, week, month & year historical records
- DC-side voltages and currents for solar & battery
- Asset & warranty related data (e.g. serial numbers, operating hours, device temperatures)
- Device status & settings (incl grid code), fault logs, alarms

Data available via web & mobile portal, regular & custom reports or CSV export

Controller Actions

Local controller provides automation, remote control & improved device management

- Battery charge & discharge
- Smart control of whole system for AC or DC configurations, inverter & battery management systems, multi-inverter/multi-vendor systems & hybrid systems
- Smart Inverter EMS function for vendor independent functionality across the fleet, including:
    - ✳ optimised self-consumption
    - ✳ managed import/export
    - ✳ tariff optimisation
    - ✳ demand management
    - ✳ managed grid voltage support
    - ✳ solar curtailment & smoothing
    - ✳ time-based charging management
- Economic optimisation based on generation & load forecasts, tariffs & pricing signals
- Microgrid, VPP & utility demand response management support, including availability forecasts, fleet SoC management, and battery pre-conditioning.
- Connects to StormCloud platform for advanced predictive and fleet-wide control functions for VPP, AEMO and NSP service integration

Security and Resilience

- Remote, self-managed firmware upgrades using StormCloud platform
- Factory fitted with X.509 certificates and keys ensure secure authorised access
- Autonomous operation & safe-fall-back during communications outages
- Data logging, repair & maintenance minimises data loss

Connectivity Options

- WAN/LAN - Wi-Fi & Ethernet (standard) & 3G/4G (AMI RF-Mesh also available)
- On-board micro-SIM card socket
- Devices – USB, RS232/422/485, Modbus, CAN, BLE, Ethernet, Wi-Fi
- Appliance adapters – AS4755 DRC, DRED (wired and wireless)
- Utility – Modbus SCADA, DNP3.0, SEP2.0 (please enquire about IEC61850 & IEEE2030.5)
- Inbuilt router and firewall can be configured for secure utility access to device without using customer bandwidth

Device Integrations

Connects directly to many devices for reading data and issuing commands using USB, RS232/422/485, Modbus, CAN, Ethernet, Wifi & Bluetooth. Compatible devices include solar grid & hybrid inverters, battery management systems, power meters, battery chargers, charge controllers & sensors.

Compliance & Installation

- Installation in proximity to metallic parts may impair wireless communications
- Power source required at installation (see specifications)

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Specifications

Network	
LAN	2x 100Mbps Ethernet ports, RJ45 connectors
WiFi	802.11b/g/n WiFi interface (external antenna provided)
Cellular	Options available: 3G, 4G/LTE, on-board micro-SIM card socket (external antenna provided)

I/O	
USB	4x USB2.0 host, type-A connectors
Serial	1x RS232 port, ultra-mini serial connector
CAN	1 x CAN bus, RJ11 connector
RS485	1x RS485 port, half-duplex 2-wire, RJ11 connector
Expansion	RPI HAT expansion interface

Electrical specifications	
Supply Voltage	Unregulated 10V to 36V

Mechanical specifications	
Dimensions	112 x 84 x 25 mm | 112 x 84 x 34 mm (industrial temperature housing)
Enclosure Material	Aluminum housing
Cooling	Passive cooling, fanless design
Weight	450 gram

Compliance, Reliability and Environmental	
Compliance	FCC/CE, RoHS-II
MTTF	> 200,000 hours
Operation Temperature	From -40C/-20C to 60C/80C (please enquire)
Storage Temperature	-40° to 85° C
Relative Humidity	10% to 90% (operation) | 05% to 95% (storage)