



Fruit

by KiWi Power

Processing Station for Energy Applications

An innovative and low-cost Processing Station designed for Demand Response and Battery Management, with numerous additional uses within the Smart Energy space. The Fruit provides a wide range of metering and control functions, and is integrated with the KiWi Operations Management Platform to allow easy set-up and monitoring whatever your application.

Built on KiWi's long experience of Internet-of-Things solutions, the Fruit is rigorously engineered to provide fast, reliable and effective operation either as a stand-alone Core or in conjunction with a range of expansion Segments.



Cost effective solution - designed to reduce total cost of ownership



Flexible - deploy only the functionality needed



Easy to install - preconfigured modules to minimise on-site works

Product Range

Fruit Core - for cloud communications, local processing, Ethernet, legacy pulse meter and serial interfacing and dual-relay connection

3-Phase Metering Segment - for measurement of voltage, current (via CTs), line frequency, active and reactive power across up to three phases

Analogue Segment (coming soon) - for interfacing with 4-20mA, 0-20mA and 0-10V inputs and outputs

Accessories: Industrial 2G/3G/4G router, DIN-mounted PSU, cabling, connectors and IP-rated enclosure

Typical Applications

Enabling centrally-dispatched Demand Response programmes such as STOR, Capacity Market and Effacement

Battery Energy Storage control (full EMS)

Enabling both static and dynamic Frequency Response programmes, such as FCR, FFR and EFR

Monitoring and control of generation assets

Integration with Building Management, SCADA and PLC systems

Environmental monitoring

Metering and sub-metering of electrical installations

DNO constraint management

Remote Telecoms Unit (RTU) for TSO integration

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Features

Highly integrated Internet-of-Things node developed around the revolutionary Electric Imp platform

Dual-band WiFi

Cloud and local Ethernet ports

Secure, failsafe OTA application and OS updates

Flexible interfacing options including GPIO, RS232, RS485, Modbus/TCP and relay terminals

Clear front-panel status and diagnostic indicator

Easy to install DIN-rail compatible form factor

Pluggable terminal blocks for ease of wiring

Expansion Segments connect via convenient DIN-rail bus

Integrated with KiWi's cloud-based time-series datastore, for highly scalable real-time data capture

Managed, tamper-proof configuration

Combined digital status and pulse-counting inputs

Standards Compatibility

DIN-EN 60715 TH 35 mounting

CE approval

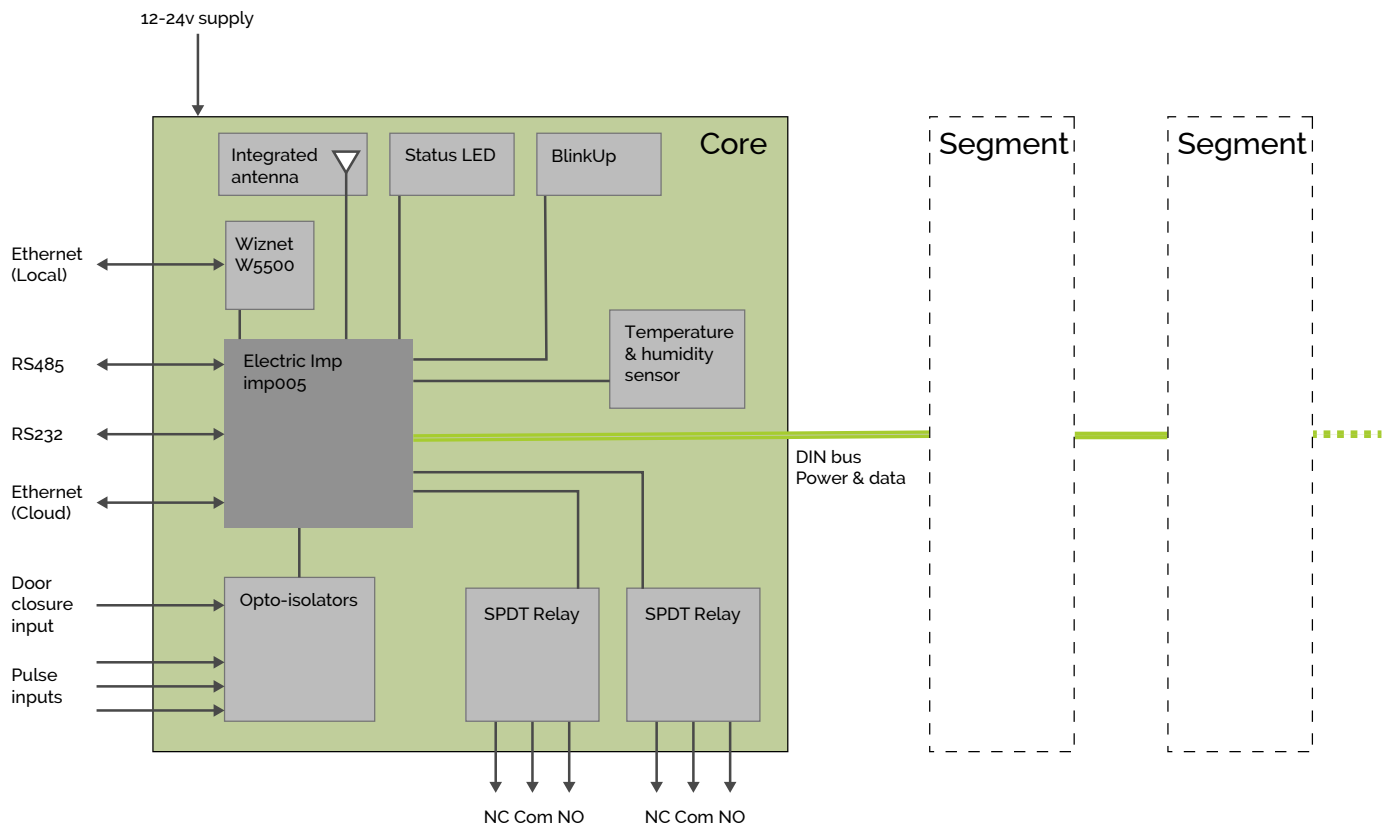
802.11 a/b/g/n WiFi

Modbus/TCP and Modbus/RTU support

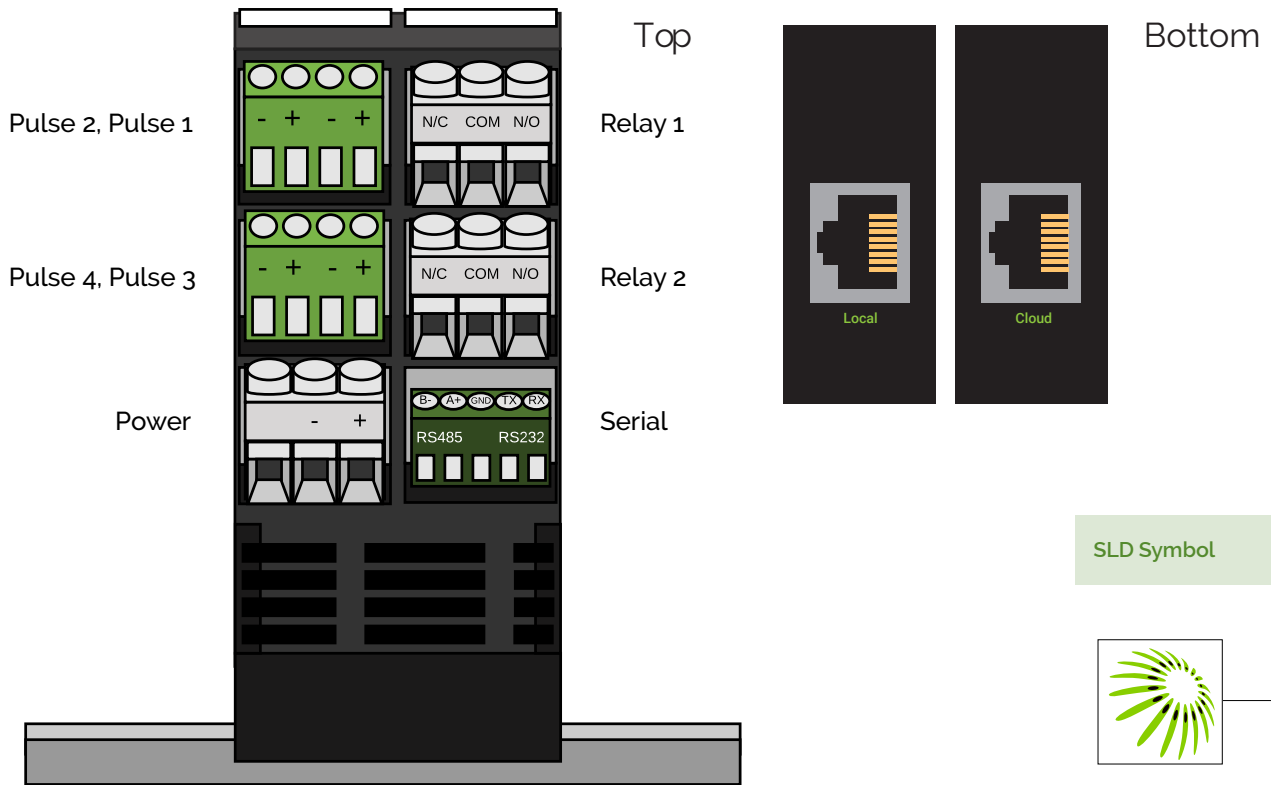


Automatic control equipment - may activate at any time. Isolate connected equipment prior to maintenance to avoid risk of injury.

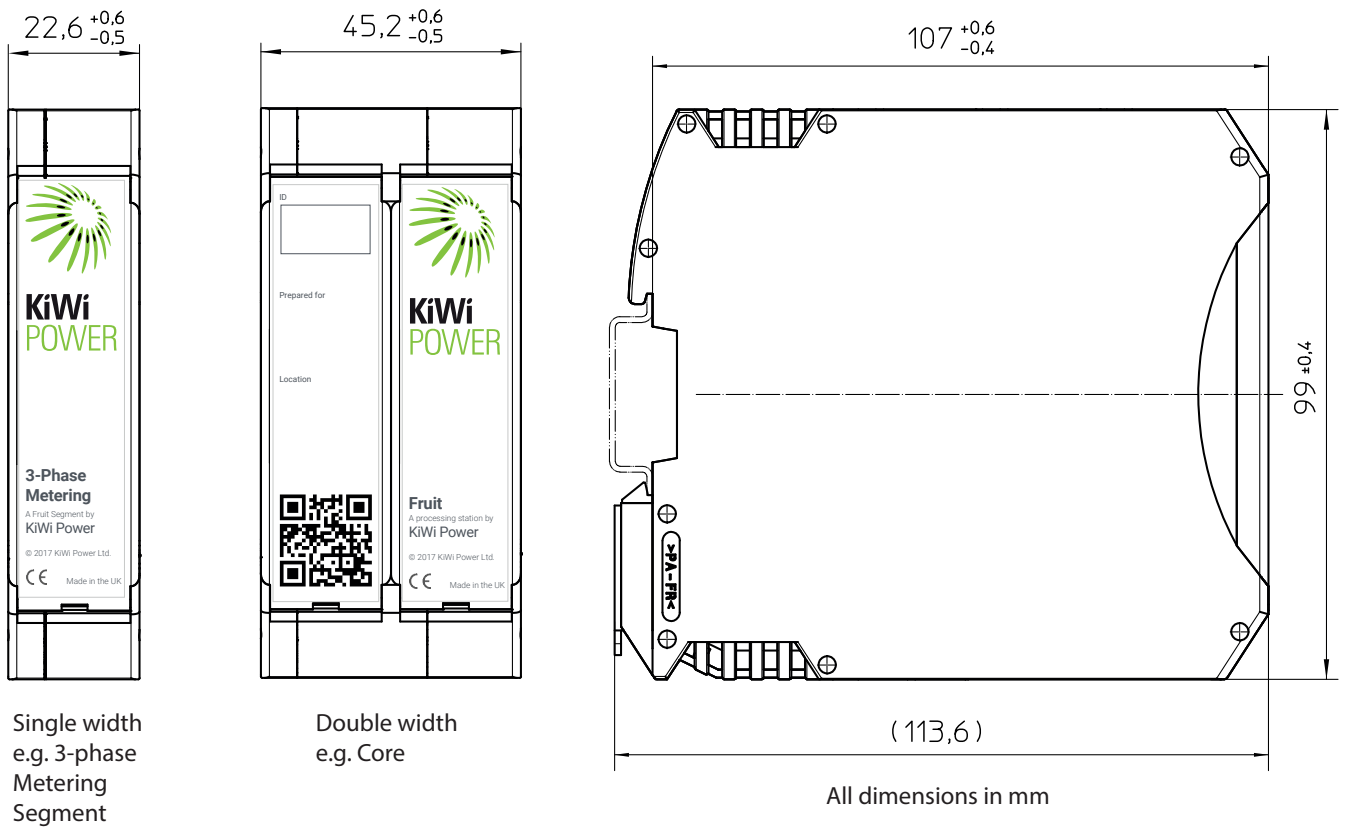
Block Diagram



Connector Reference



Mechanical Drawing



Physical

Parameter	Value
Flammability class according to UL 94	V0
Mounting	DIN-EN 60715 TH35
Operating temperature (recommended)	0-50°C

Communications

Parameter	Value
Maximum Cloud data rate	10 readings/input/s
RS232/RS485 data rate	Up to 1Mbaud
WiFi standards	802.11 a/b/g/n, dual-band 2.4Ghz & 5GHz
RX sensitivity (typical)	-97dBm (@1Mbps)
Ethernet	10/100MHz
Status LEDs	RGB Status, Red/Green BlinkUp™

Computational

Application processor	32-bit ARM Cortex R4 with secure boot
Cache	32kB instruction & data
Application RAM	Over 1.2MB
Flash memory	16MB

Security

WiFi standards	WPA, WPA2, WPS
Cloud data link encryption	TLS1.2-RSA-ECDHE (forward secrecy) Elliptic curve challenge-response
Managed silicon-to-cloud security stack	impSecure™

Electrical

Symbol	Parameter	Min	Typical	Max	Unit
V_{IN}	Supply voltage	12	24	24	V (DC)
I_{12}	Current consumption (at 12V)	-	330	500	mA
I_{24}	Current consumption (at 24V)	-	160	400	mA
f_{pulse}	Pulse measurement frequency	-	50	64	Hz
S_{max}	Maximum number of Segments	-	-	8	
V_{rel}	Relay terminal voltage	-	5 (DC)	30 (DC) or 250 (AC)	V
I_{rel}	Relay terminal current	-	-	8 (DC) or 10 (AC)	A
P_{rel}	Relay switching power	-	-	4,000	VA

Performance

Parameter	Value
Local data storage capacity without cloud access	Up to 1 year (configuration-dependent, average)
Centralised dispatch latency	< 1,000ms (communications-dependent)
Local frequency dispatch latency	< 100ms

Terms and Conditions

KiWi Power reserves the right to make, from time to time, such departures from the detail specifications as may be required to permit improvements in the design of its products. Components made under military approvals will be in accordance with the approval requirements.

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