



USP Flexible RTU

Distribution Automation Platform



8 SLOT I/O CHASSIS

Flexible & Modular RTU / Controller Perfectly Suited to Secondary Distribution Automation

Features

- ✓ RMU multiple Feeder Monitoring
- ✓ Directional Fault Detection
- ✓ Disturbance Recording
- ✓ Selection of Sensor Interfaces
- ✓ Setpoint Control of DERs
- ✓ DER Net Power Management
- ✓ DER Failsafe Operation
- ✓ Gateway (protocols incl. 61850)
- ✓ Extensive Cyber Security Features
- ✓ Secure Web Server HMI (SLD ...)
- ✓ IEC61131-3 Logic Automation Tool
- ✓ Integrated GPS Clock (Option)
- ✓ Two Ethernet & four Serial Ports
- ✓ Certified to power utility standards
- ✓ Multiple Master Stations connectivity



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Introduction

The Flexible RTU is a modular Controller that is ideally suited to low or medium I/O counts. It supports a range of I/O modules including Status Inputs, Control Outputs, DC Analogues, AC Analogue measurements and Setpoint Outputs. All modules are certified for use in power utility applications.

The unit is ideally suited to Secondary Automation where it can monitor pole top switches or ground-mounted RMUs as well as offering a cost-effective solution for extensible MV/LV switchgear applications.

The Flexible RTU provides powerful local functionality at the secondary distribution level for fault detection and local RMU control, net power flow management from DER sites with failsafe operation, and IED gateway applications (incl. 61850), while meeting the highest performance.



Secondary Substation Platform

The Flexible RTU with its powerful processor and range of communications ports is the core component of any Secondary Substation Automation System. The module supports all the standard protocols for Control Centre communications including Secure IEC 104, DNP3 SAV5, IEC101 and an extensive range of legacy protocols.

The Flexible RTU also has the capability of operating as the gateway for virtually all substation IEDs using protocols such as IEC 61850 Client & Server (KEMA certified), IEC 101/104, DNP3.0 (TCP/IP & Serial), IEC 103 and Modbus (TCP/IP & Serial).

RMU Controller

The unit is used extensively as an RMU / Switch Controller based on its size, interface flexibility, fault detection and cybersecurity. The unit supports a wide variety of interfaces for AC voltages and currents including conventional CT/VTs, LEA (Low Energy Analogues), Rogowski sensors, Line Post sensors and other low voltage input ranges. This ensures that it can interface with different RMU / Switch types.

The unit supports extensive fault detection including Voltage Presence/Absence detection, Fault Current Indication, Broken Conductor (ANSI 47), Directional Fault detection (ANSI 67, 67N,50/51), Non-Directional Fault detection (ANSI 50N/51N), Undervoltage / Over-voltage detection (ANSI 27, ANSI 59), Undercurrent Detection (ANSI 37), LV Power quality including Voltage dip / swell / interruption and Unbalanced Current. It supports Disturbance Fault logging with pre-and post-fault cycle logging and fault file retrieval.

DER Controller

The Flexible RTU is widely used as a DER (Distributed Energy Resource) Controller based on its DER Management capabilities, setpoint controls, failsafe operation, interface flexibility and cybersecurity.

The unit can operate as a standalone DER Controller managing the power import/export limits from a particular DER site or as part of an integrated ANM (Active Network Management) scheme or both. The unit can manage generation to ensure network voltage limits are not violated. It can also monitor that the generator is operating within its allowed P/Q envelope. It supports both hardwired setpoint controls and serial setpoint controls to interface with various types of DERs.



It provides fail safe operation by monitoring the DER against issued setpoints and taking pre-defined action if the setpoint isn't followed. As part of a larger ANM scheme it will take failsafe action in the event of communications failure.



Plant Interface

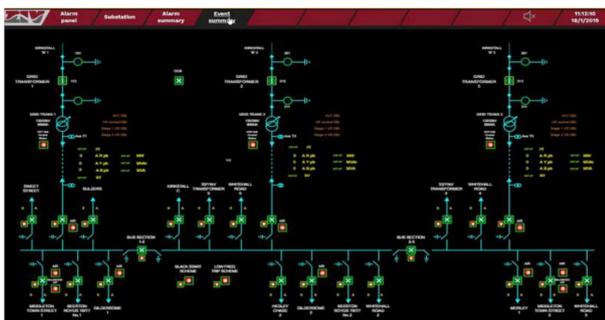
The unit provides two Ethernet ports and four configurable RS232/485 serial ports and one USB configuration port.

It supports a range of plant interface modules:

- AC Measurement Modules with 3 Voltage and 3-4 Current channels providing RMS, Power, Phase & Frequency measurements including support for directional fault detection.
- DC Measurement Modules, each with 8 channels for reading input ranges 0-1V, 0-10V, $\pm 1V$, $\pm 5V$, $\pm 10V$, $\pm 20mA$, 4-20mA.
- DC Setpoint Modules each with 4 channels and each output configurable between $\pm 20mA$ as standard or a build option for $\pm 10VDC$. These provide setpoint controls for controlling generators or variable loads.
- Digital Input Modules each with 16 opto-isolated digital inputs operating as voltage-inputs in two groups of 8 channels with either positive or negative common.
- Digital Output Modules each with 8 outputs providing single-pole relays capable of switching 5A at 30 VDC or 0.5 A at 125 VDC.

WEBHMI

The Flexible RTU supports a webserver-based HMI, offering extensive monitoring and control capabilities. It supports full substation Single Line Diagrams, feeder diagrams or simple push-button displays as required. It provides SOE (Sequence of Events) and Alarm Lists for data points and derived points as configured. Secure Role Based Access Control allows View-Only access or full Plant Control from the HMI depending on the configuration.



Cyber Security

It is designed to meet all the latest Cyber security requirements to fulfil IEC62351. It supports role-based-access-control (RBAC) and centralised user management using secure LDAP and RADIUS. It supports TLSv1.3, IPsec VPN, secure SCADA protocols, secure Syslog and a programmable Firewall., The unit is independently PEN (Penetration) tested and the unit will only run Vendor signed hardware and software modules. Centralised Software / Patch Management is also available.



Technical Information

Communications Interfaces	
Ethernet Serial Ports	2 x 10/100Base-TX (RJ-45 connections) 4 x RS-232/485 (9 way Male D-Type) 1 x USB Port 1 x GPS Integrated Clock (Optional)
Number of I/O Modules	5, 8 or 12 I/O module variants are available (Plug & Play)
Power Supply Module	
Input Voltage Range Power Consumption	18-72 VDC or 36-150VDC Typically < 4W (refer to specific module datasheets) – Power Supply Rating 24W
Fault & Disturbance Functionality	
Directional Fault Indications Disturbance Recording Voltage Presence/Absence detection Fault Current Detection/Indication Broken Conductor detection (ANSI 47)	Directional/ Non-Directional Fault detection (ANSI 67, 67N,50/51, 50N/51N) Under-voltage / Over-voltage detection (ANSI 27, ANSI 59) Undercurrent Detection (ANSI 37) LV Power quality -- Voltage dip / swell / interruption start / duration LV Power quality -- Current unbalanced variation
DER Functionality	
Net Power Flow Management (Import/Export) Voltage Management PQ Envelope Management Hardwired / Serial DER Setpoint Controls Control-Feedback confirmation)	Failsafe Operation (Hold, Pre-set, Disconnect) Local Operator Panel available (Push-button / HMI) Multi-Master Station support (SCADA / ANM) Multi-Protocol Support Flexible measurement collection (Direct / Serial)
Other Functionality	
Cybersecure (TLSv1.3, IPSEC VPN, Secure LDAP, Radius, Secure SCADA Protocols, Signed Software/ Hardware, Secure Syslog, ...)	Secure Web Server HMI with complete substation line diagrams (option) IEC-61131 User Programming Application IED & SCADA Protocols (>70 Protocols incl. IEC 61850) Programmable Firewall (option)
DI Digital Input Module (multiple modules supported)	
Inputs Input Voltage	16 (one common for each 8 inputs) 18-72 VDC or 36-150 VDC (Specified at time of order)
DO Digital / Control Output Module (multiple modules supported)	
Outputs Switching Current	8 (Form A) normally open single pole outputs 5 A @ 250 VAC, 5 A @ 30 VDC 0.5 A @ 125 VDC
AC Measurement Module (multiple modules supported)	
Inputs Interface Measurements	4 Current and 3 Voltage CT/VTs; LEA (Low Energy Analogues); Rogowski; Line Post; Other low voltage input ranges V, I, Freq, MW, Mvar, PF
DC Measurement Module (multiple modules supported)	
Inputs Nominal Range	8 0-1V, 0-10VDC, ±1V, ±5V, 10V, 20mA, 4-20mA
AO Analogue Setpoint Module (multiple modules supported)	
Outputs Range	4 Configurable between +/- 20mA
Environmental Conditions	
Temperature Continuous Operation Transport and Storage Relative Humidity Vibration Drop & Shock	-20° to +70 °C standard - IEC 60068-2-1 & IEC 60068-2-2 -40° to +85 °C 0 to 95% non-condensing - IEC 60068-2-3 & IEC 60068-2-78 IEC 60068-2-6 & 60255-21-1 Class 2 IEC 60068-2-31
Dimensions & Mounting	
Dimensions (W * H * D)	5 I/O Slots: 174 mm (W) x 136 mm (H) x 135 mm (D) (201 mm (W) incl. rear mounting flanges) 8 I/O Slots: 235 mm (W) x 136 mm (H) x 135 mm (D) (262 mm (W) incl. rear mounting flanges) 12 I/O Slots: 317 mm (W) x 136 mm (H) x 135 mm (D) (344 mm (W) incl. rear mounting flanges)