CLP 500RTU - Distributed Remote Terminal Unit

Overview

Targeted for station telecontrol and automation of plants, substations or similar technical infrastructures, **CLP 500RTU** is a flexible and scalable distributed remote terminal unit and programmable automation system featuring multiple communication and I/O options as well as integrated HMI.

By adopting international or industry standards together with unified engineering, **CLP 500RTU** provides an open future-proof and straightforward solution that can integrate multi-vendor IEDs and scale according to investment plans.

CLP 500RTU can be deployed in different system architectures from compact systems to high-capacity RTUs including local SCADA and redundancy options. This enables users to select the best fitting solution by balancing cost and performance in light of system requirements.

The worldwide field-proven **CLP 500** platform is complemented with a full range of services from training and product support to engineering, commissioning and maintenance that support the system throughout the whole life-cycle.

Unified Solution CLP 500

IEC 61131-3 flexible programming

IEC 61850 open design

Key CLP500RTU Components

UC 500 Station Server	Multi-protocol station gateway and controller with optional full-fledged web-based SCADA/HMI. **UC 500** units are available with different hardware platforms from standard industrial PC to embedded fanless units with high availability/ redundancy options.
DCU 500 Programmable controller and I/O unit	High-capacity programmable controller and I/O unit featuring modular and flexible hardware configurations with up to 300 I/O points per unit. **DCU 500** provides field-replaceable modules and LED-based local HMI for maximum operational flexibility.
HMI 500 TOUCH Console	A panel PC solution for local HMI consoles featuring multiple display options including touch-screens. **HMI 500TOUCH** shares common **UC 500** user interface providing a uniform user experience across all **CLP 500RTU** solutions.
automation studio Integrated Engineering Tool	An “all-in-one” easy-to-use software that provides an open and productive engineering environment for the automation engineer or system integrator.

Key Features

- Multiple communication and I/O options
- Modular and scalable distributed architecture
- IEC 61850-enabled
- Integrated HMI options
- IEC 61131-3 user programmability
- Unified engineering tool

Customer Benefits

- Open and versatile RTU systems
- High expansibility and adaptability
- Strict conformance to industry standards
- Minimum engineering effort
- Seamless integration with third party products and systems

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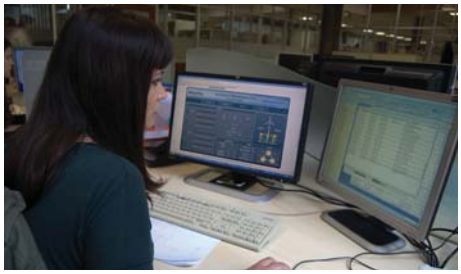
Station Functions

CLP 500RTU provides all conventional telecontrol options including digital, measurement and control processing, alarms and events, interlocking and select-before-operate execution. Different clock synchronization options from GPS, NTP, IRIG-B or telecontrol protocol enable precise time stamping of events.

Peer-to-peer distributed database and user-programmed IEC 61131-3 logic both at station or controller level allows any automation scheme to be deployed with full confidence.

Equipped with **HMI 500** software, **CLP 500RTU** also provides integrated station historian and HMI from console to multi-client web or workstation-based user interfaces, featuring 2D vector graphics, alarm management, reports and notifications, trending, etc.

Full self-diagnostics and troubleshooting tools, including SNMP monitoring, are also included to enable simplified system management.



Multiple Communication Options

Enhanced communications with real-time Ethernet station bus are complemented with over 50 different serial or IP communication protocols including IEC 60870-5, DNP, OPC, Modbus and IEC 61850. This enables the integration of any controller, protection relay, measurement unit or existing RTU for both real-time monitoring and control as well as for non-real-time data extraction and storage.

Multiple channels and redundant links with simultaneous multi-protocol support enable full compliance with requirements in either new systems or system upgrades, where integration options are fundamental.

Distributed Architecture Overview

Supported by either IEC 61850 or IEC 60870-5-104 distributed station bus, **CLP 500RTU** solutions can be deployed in different physical architectures to suit the needs of each application.

By including peer-to-peer capability (GOOSE or Efacec-own Distributed Database Protocol), **CLP 500RTU** allows multiple logical architectures from conventional RTU vertical communications to distributed automation between **DCU 500** units at bay/field level.

CLP 500RTU fully supports IEC 61850 from communication to engineering, hence providing a unique platform for utility automation applications by leveraging know-how and open design.

Unified Engineering

While providing high flexibility and scalability of a distributed system, configuration and management is performed in a single integrated tool so that engineering is not hindered by system architecture, application size or solution flexibility.

Automation Studio provides not only point-based engineering but also template and object based tools for database, communications, HMI and user-programming, that together with intuitive interface and import/export tools provide a straightforward engineering experience. The toolset also provides simulation, debug/monitoring and system management features to support the system from design to operation.

Standard Cabinets

In addition to a product solution Efacec also provides standard pre-tested cabinets and enclosures for control room application such as the **CSC 5000** control system cabinet, including automation devices, communication equipment, electrification and power supply. This allows users to benefit from a complete RTU solution with full confidence.

Engineering Services

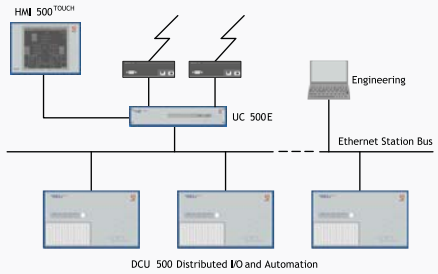
Ranging from systems specification and design, through integration, commissioning and training, up to maintenance and product support, Efacec provides a full set of engineering services either through its own engineering teams or local partners.

Efacec services are delivered by engineering and customer support teams with highly experienced and certified professionals and project managers, which ensure system deployment on-spec, on-time and on-budget.

CLP500RTU Typical Architectures

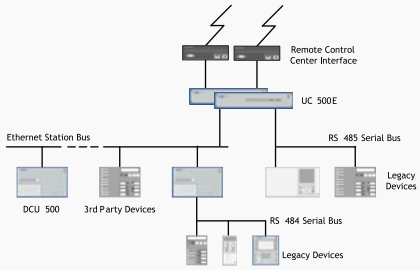
Compact Distributed RTU

Integrated station gateway with local HMI console and distributed I/O.



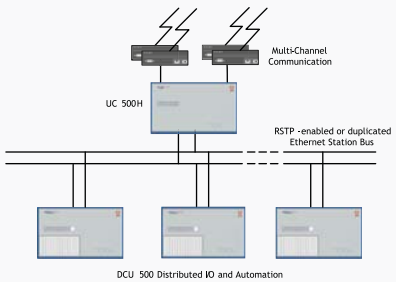
Distributed RTU with Multi-IED Integration

Multi-level integration of external controllers, protection relays or measurement units with optional redundant station gateway.



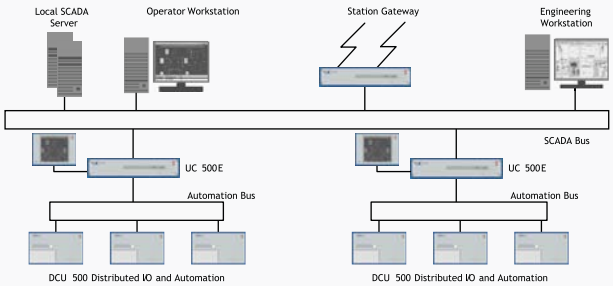
High-availability Distributed RTU

Redundant station bus, high-availability or duplicated station controller/gateway, and multi-channel remote communication links.



Multi-hierarchy RTU with local SCADA and Engineering station

Multi-bus arrangements, multiple remote control centers and local control room.



Feature Summary	
Station Functions	
Web-enabled Local SCADA system	○
Console-based HMI	○
Real-time data and control processing	●
Station SOE and Historian	●
Automation Functions	
Distributed I/O	●
Distributed Automation	○
IEC 61131-3 User Logic	○
Communication Functions	
IEC 61850 and GOOSE Ethernet Station Bus	○
IEC 60870-5-104 and DDP Ethernet Station Bus	○
Remote control center protocols (over 50 protocols available including but not limited to IEC, DNP, OPC and Modbus)	○
Local IED integration protocols (over 50 protocols available including but not limited to IEC, DNP, OPC and Modbus)	○
Architectures	
Distributed RTU	○
Distributed RTU with multi-IED integration	○
Multi-hierarchy Distributed RTU	○
Others - according to the project requirements	○
Engineering Functions	
Single engineering software solution for configuration and management	●

● - Base feature | ○ - Optional feature

Case Studies

Location / Company	Overview	Example
Remote network units for supervision and control of distribution substations		
Portugal / EDP	Over the past years EDP awarded Efacec with several contracts comprising systems for supervision and control of its distribution network based on the **CLP 500RTU** platform. All communication systems include standard protocols such as IEC 60870-5-101/104 or IEC 61850.	
Supervision and control systems for transmission substations		
Kosovo / KOSTT	Efacec provided the Kosovian company KOSTT with supervision and control systems for 21 substations (110 kV). Operational efficiency and security of the KOSTT transmission network has since significantly improved.	
Supervision System for Santa Ana Substation 115/46 kV		
El Salvador / ETESAL	Efacec has supplied ETESAL with a substation supervision system for its transmission Santa Ana substation (115/46 kV). With this implementation ETESAL responded to the increase of electric power demand and, at the same time, provided greater reliability to the transmission system.	
Supervision Systems for Substations		
Greece / PPC	Efacec Automation has been awarded with two projects from Greek Power Public Corporation for supply of supervision and control systems for more than two hundred distribution substations. With the supplied systems , PPC will be able to manage efficiently manage the electric energy distribution network of the Greek Islands and Attica region.	

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Automation Business Unit

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