EcoStruxure™
Innovation At Every Level

PowerLogic™ T500

Catalog 2024
Substation Controller

se.com/powerlogict500

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Notes

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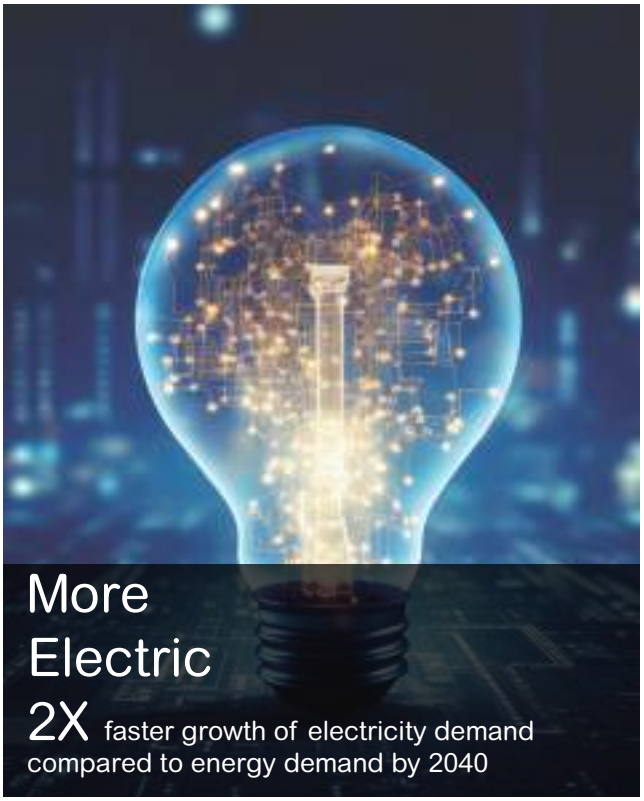
General Contents

PB125558

We Have an Opportunity to Co-Create the Future



More Electric

2X faster growth of electricity demand compared to energy demand by 2040

More Digitized

20X more incremental connected devices than connected people since 2020

More Decarbonized

82% of the economic potential of energy efficency in buildings and more than half in industry, remains untapped

More Decentralized

70% of new capacity additions will be in renewables by 2040

Power Industry is Facing Unprecedented Changes

Increasing Complexity and Challenges Ahead

DER Integration

Impact on planning and operations new regulation and practices: Grid codes, Cybersecurity, and IEC 61850

New Power Grid Design

National/Interco-regional Intermediate Microgrids (municipal, regional)

Operational Efficiency

Reliability (SAIDI…), losses, customer satisfaction, affordability, investment, and OPEX

Digital Transformation

IT/OT integration readiness, IoT enablement, and Cyber Security

Digitization Presents Tremendous Opportunities to Enhance Grid Efficiency

Self-immune

Digital substation improves energy supply reliability and quality.

Streamlined

Digital tool suite optimizes all steps from design, build to Operate and maintain.

Predictive

Collecting and analyzing right asset data is the foundation of efficient maintenance operations.

Future-proof

An open and modular digital infrastructure is crucial to support the forthcoming active network challenges.

Digitization Presents Tremendous Opportunities to Enhance Grid Efficiency

Manage increasing complexity: integrate with specialized IEDs and systems

- Integrate devices from multiple vendors and protocols.
- Communicate simultaneously with several upstream systems.
- Advanced remote monitoring of system performance.

Increase availability: improve control system uptime

- Minimize downtime with hot-swappable hardware modules and extensive redundancy options.
- Deploy customized network reconfiguration schemes.

Manage costs: reduce installation, operation, and maintenance

- Optimize investment thanks to the modular approach.
- Perform maintenance tasks and diagnostics remotely.
- Deploy different applications - RTUs, gateways, and controllers - using the same offer and tools.

Deliver efficiency: optimize network control

- Reduce control system power consumption by using state of the art embedded electronic products.
- Tailor solution hardware footprint to your needs.

Improve cybersecurity: help defend against malicious software and unauthorized access

- Secure boot hardware and firmware signatures.
- Leverage embedded firewall.
- Apply RBAC policies as recommended by IEC 62351, IEC 62443, and IEEE 1686.
- Conduct telecontrol communications using TLS encrypted channels.

PB125559

PowerLogic™ T500

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Next Generation Substation Controller

One single platform with a modular and flexible hardware, firmware, and software for all your demands!

Highly scalable solution for demanding substation control applications

PowerLogic™ T500 Key Features

Secure: Features based on IEC62443

- Secure RBAC, logging, and certificate management
- FW signatures, secure boot, and TLS encryption

Powerful

- Redundant and hot-swappable hardware
- Client/server for IEC 61850 and OPC-UA (2025)
- SCADA protocols: DNP3 and IEC101/4
- Legacy IED protocols: DNP3, IEC101/3/4 and Modbus
- Embedded logic engines: formulae and IEC61131
- Fully integrated with ESM and EPAS-E

Scalable

- Up to 100k datapoints
- 512 concurrent TCP connections

Easergy Builder

- Configuration/Engineering
- Multi-user environment

Web-based User Interface

- WebApp: maintenance and diagnostics
- WebUI: lightweight substation HMI

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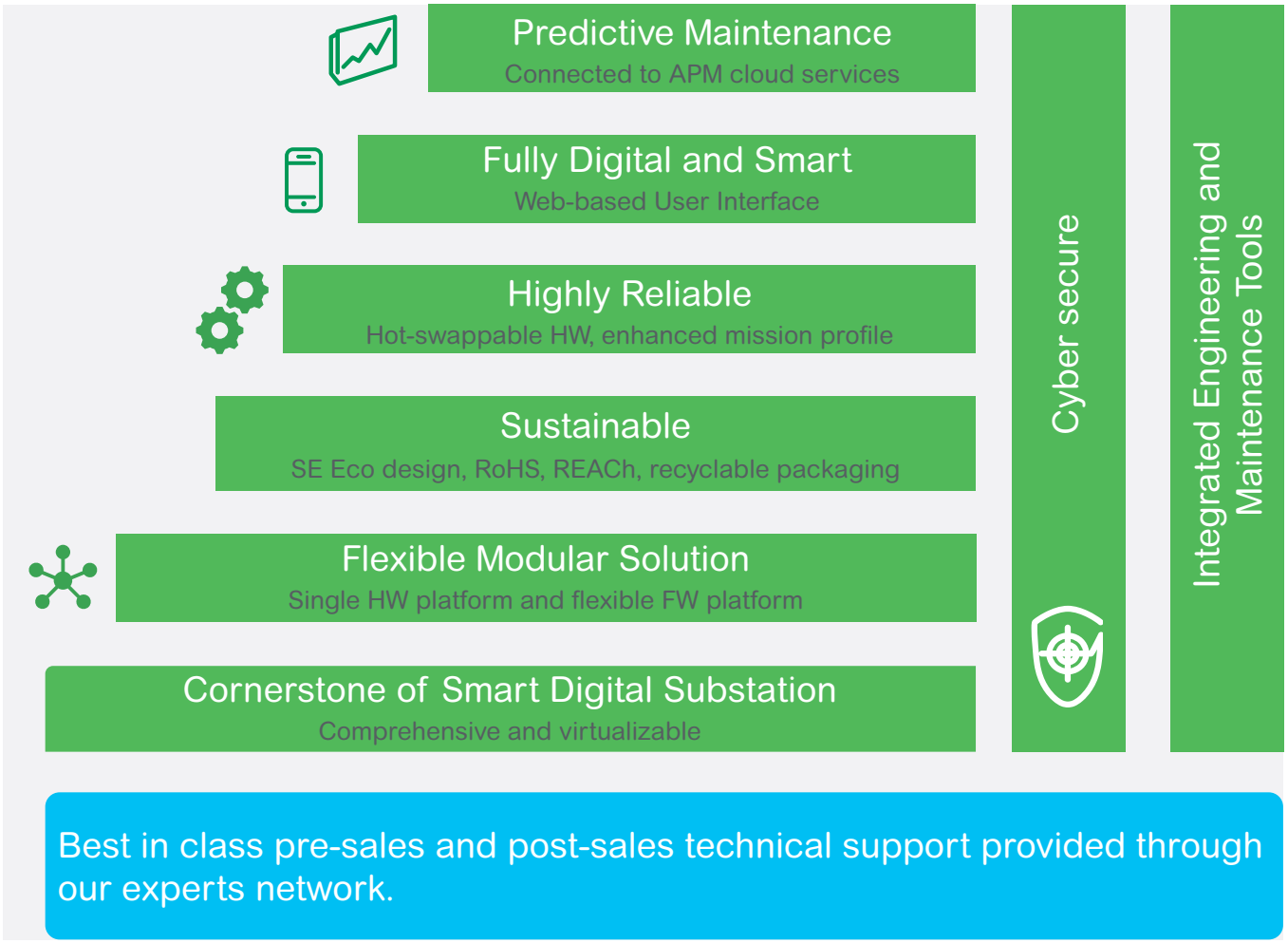
Next Generation Substation Controller



Easy	Engaging	Enabling
Simplify the user experience by easy to order, configure, integrate, use, and maintain.	Deliver an engaging and intuitive digital experience throughout the entire customer lifecycle.	Enabling the Digital Energy transition by leveraging our EcoStruxure architecture, global footprint, and leveraging retrofit.

Integration of PowerLogic™ T500 with EcoStruxure™

500 000

EcoStruxure™ has been deployed in almost 500 000 sites with the support of 20 000+ developers, 650 000 service providers and partners, 3 000 utilities, and connects over 2 million assets under management.

EcoStruxure™ ready

Efficient asset management

Greater efficiency with **predictive** maintenance helping to reduce downtime.

24/7 connectivity

Real-time data **everywhere anytime** to make better-informed decisions.

Increased safety

Proven design and experience to enhance people's safety and equipment's protection.

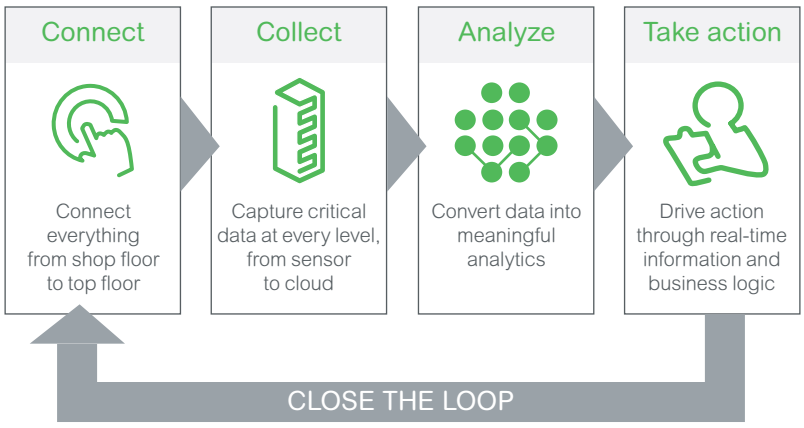
EcoStruxure™ is our open, interoperable, IoT-enabled system architecture and platform. EcoStruxure delivers enhanced value around safety, reliability, efficiency, sustainability, and connectivity for our customers. EcoStruxure leverages advancements in IoT, mobility, sensing, cloud, analytics, and cybersecurity to deliver Innovation at Every Level. This includes Connected Products, Edge Control, and Apps, Analytics & Services which are supported by Customer Lifecycle Software.

Turn data into action

EcoStruxure™ architecture lets customers maximize the value of data.

Specifically, it helps them:

- Translate data into actionable intelligence and better business decisions.
- Take informed decisions to secure uptime and operational efficiency thanks to real-time control platforms.
- Gain visibility to their electrical distribution by measuring, collecting, aggregating, and communicating data.



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EcoStruxure™
Innovation At Every Level

General Presentation

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General Presentation

Applications

PowerLogic™ T500

Different Solutions for Different Markets

Traditional

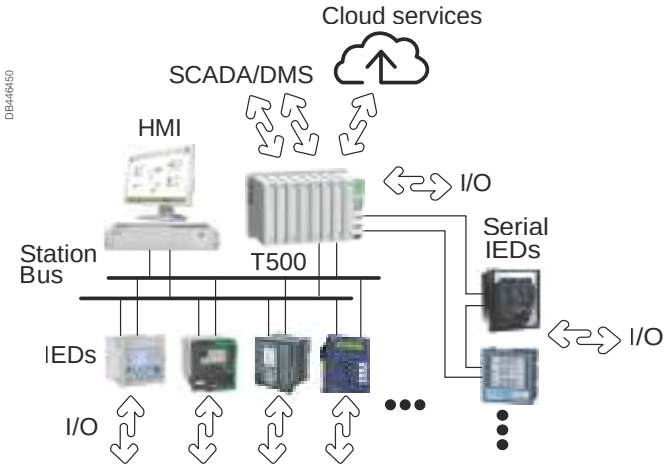
Centralized systems

- Few bays
- Protection via IEDs
- Optional HMI
- Flexible automation
- Centralized control

Engineering

- Focused on data acquisition and integration
- Requires general knowledge on substation automation

Unmanned substations: Distribution, Rail, RenGen



Modern

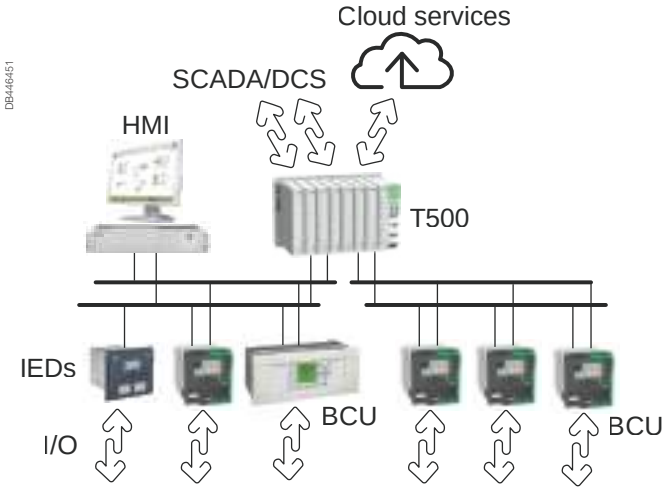
De-centralized systems

- Many bays/stations
- Protection cord
- Advanced HMI
- Fast automation
- IED local HMIs

Engineering

- Focused on tailored protection schemes
- Requires expert knowledge on specific technologies

Manned substations: Transmission, Large O&G



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Applications

PowerLogic™ T500

PowerLogic™ T500 Utility Customers

Core Applications:

- High range RTU's high capacity + multifunctional gateway
- HV and MV network – IEC 61850 or legacy protocols (up to 200 protection relay devices)
- Legacy serial devices (brownfield market)

Upstream Interfaces:

- Local SCADA: IEC61850 or DNP3/IEC10x
- Regional SCADA: DNP3 or IEC101/4 (up to four redundant clients)

Advanced Features:

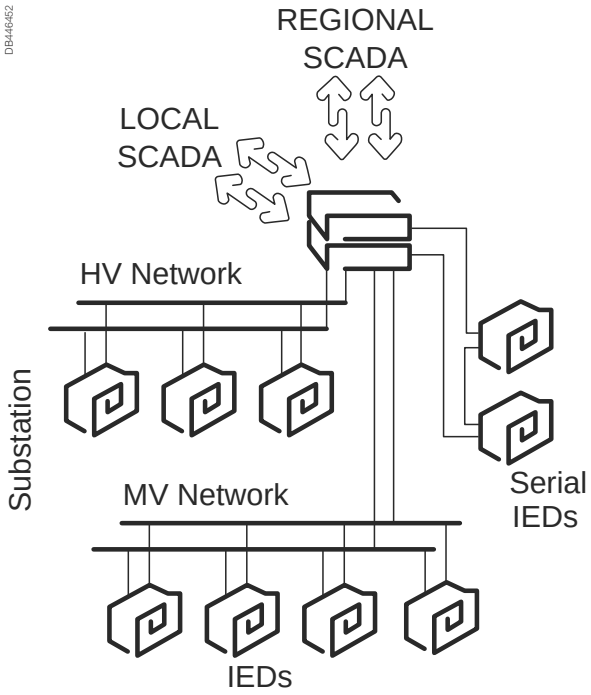
- Hot-swappable
- Redundancy CPU (HOT-STANDBY), PS, and Eth (HSR/PRP)

Time Synchronization:

- IEEE1588

Actual Market Trend

- Cybersecurity IEC 62443-4-2 (target SL2)
- Align with engineering management and device management
- Web HMI integrated



PowerLogic™ T500 Electro-Intensive

Core Applications:

- High range RTU's high capacity + multifunctional gateway
- MV/LV network - IEC 61850 (up to 1000 protection relays and meters devices)
- Legacy serial devices (brownfield market)

Upstream Interfaces:

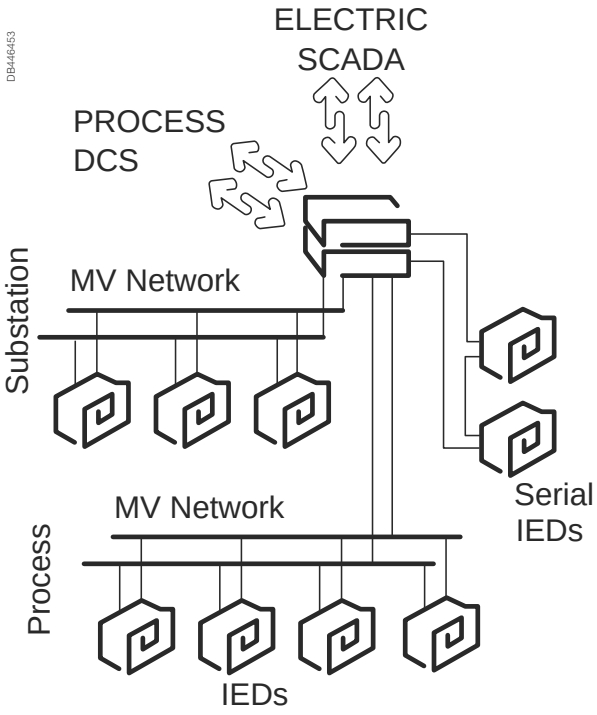
- Process DCS: Modbus TCP
- Electrical SCADA: IEC61850 or Legacy (up to 4 redundant clients)

Advanced Features

- Hot-swappable
- Redundancy CPU (HOT-STANDBY), PS, and Eth (PRP with IEEE1588)

Actual Market Trend

- Cybersecurity IEC 62443-4-2 (Target SL2) and NERC/CIP
- Web HMI integrated

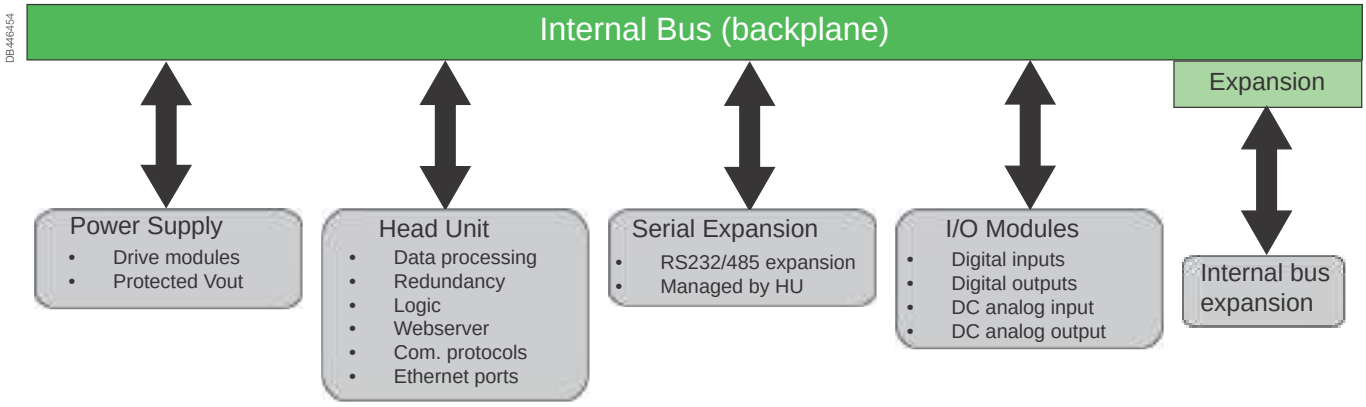


Product Overview

Modular Architecture

PowerLogic™ T500 is highly scalable solution for demanding substation control application.

This open architecture supports different applications, from a single communication gateway to large substation management with third-party devices. The modules, with their supported applications are:



- 19” rack or wall-mount installation
- Internal bus: high-speed serial (redundant)
- Legacy serial devices (brownfield market)
- Modular hardware - 9 modules per bus
- Hot-swappable electronic modules
- Redundancy: PSU, Head Unit, and Comms
- Expand installation over multiple backplanes
- 100% backwards compatible with Saitel DP

T500 configuration can have up to 96 I/O modules - regardless of backplane number. Backplanes can be expanded via the dedicated connectors.
XS280 expansions can only be managed by an HU280 it they are installed in the same backplane.
I/O modules can be managed by an HU280 as long as they are available in the same bus - same backplane as HU280 or a remote backplane connected via expansion ports.

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Product Overview

The Modules

PB125563

PowerLogic™ HU280 - High Performance Head Unit

HU280 can communicate with peers (SCADA and other devices) on one or several communication channels

- Communication channels can be configured individually to fit application needs (DMS, local automation, etc.).
- Channels can be created and setup using Easergy Builder.
- Configuration settings - for example, IP addresses - can be modified using the embedded webApp.
- Embedded firewall can be configured to improve overall security.
- T500 is delivered with no default protocols or channels preconfigured.

Characteristics:

- Processor: Quad-core ARM64 @1GHz
- Memory:
  - RAM: 4 GB (DDR4)
  - NVRAM: 2 MB
- Storage:
  - FLASH: 32 GB (eMMC)
  - SD-card slot for cards up to: 64 GB
- Communications:
  - 2xRS-232/485
  - 7xEthernet: (4xGigabit - PRP/HSR supported)
- Synchronization: GPS, IRIG-B, SNTP, and PTP.
- Cybersecurity: RBAC, Logging, and Cryptography
- Maximum power consumption: 15 W

PB125564

PowerLogic™ PS280 - Power Supply

The PowerLogic™ PS280 module converts the input power into a regulated 5.4 Vdc output to power the electronic control components of the modules within the backplane. Additionally, depending on ordering option, this module can provide an auxiliary voltage for the polarization of the I/O interfaces of the acquisition modules.

The functional features of this block are:

- Compliance with EMC standards for industrial environments.
- Depending on ordering option:
  - Direct and/or alternating input current can be used.
  - Auxiliary output of 24 Vdc is available.
- Galvanic isolation.
- Communication of power faults to the CPU.
- A test device (two terminals) is available allowing to check the level voltage on the bus using a voltmeter.

Characteristics:

- Input voltage level: 24, 48 and 110/125 Vdc
- Input range: ±20 % nominal value
- Isolation:
  - Input-Output: 3 kVrms
  - Input-Functional ground: 1.5 kVrms
  - Output-Ground: 500 Vrms
- Main output voltage: 5.4 Vdc
  - 40 W at 25 °C
  - 30 W at 70 °C
- Auxiliary output: 24 Vdc (25 W) – optional
- Protection: short-circuits, over-voltage/current

Product Overview

The Modules (cont.)

PB125565

PowerLogic™ XS280 – Serial Port Expansion

The PowerLogic™ XS280 is the serial communication module available in PowerLogic™ T500. It expands the control module communication capability. This module is linked with the PowerLogic™ HU280 through a bi-directional high-speed channel.

The PowerLogic™ XS280 communicates with the CPU module through the internal bus, at a transmission rate of up to 1.5 Mbps. The multiplexing operation allows transfers the message streams bidirectional from input channels and its signals.

The communication protocol between the PowerLogic™ XS280 and CPU module follows a client-server (poll-response) structure, in which the client is the CPU module, and the server are the different PowerLogic™ XS280 modules which are installed.

Characteristics:

- Number of channels: 8 (asynchronous)
- Isolation between channels: 1.5 kVrms
- Signal levels: RS-232/RS-485/RS-422
- Transmission: configurable per channel
- Baud rate: Up to 38400 bps
- Typical consumption: 3.9 W

PB125566

PowerLogic™ DI180 – Digital Input

PowerLogic™ DI180 can manage 32 digital inputs with or without timestamp, that can be configured as single, double or slow counter. These signals can be associated to simple or double points in coreDb.

The main features of this module are:

- 32 configurable and high-precision digital input and distributed in two 16-signal blocks.
- Each digital input can be configured as: Single/Double/Slow counter.
- Filtering the information before transmitting it to the CPU.
- Advanced processing of digital inputs, including the management of simple or processed inputs with chronological register and time stamping.
- The parameter **change memory time** can be set for each signal.
- The module is synchronized via a message received from the CPU.
- 36 light indicators are available on the front side.

Characteristics:

- Number of inputs: 32
- Polarization voltage (PV): 12...125 Vdc (autodetect)
- Polarization range: From 80% PV to 120% PV
- Polarization blocks isolation (optocouplers): 2.5 kVrms
- Time-stamping resolution: 1 ms
- Connection to field: flat ribbon or terminals
- Typical consumption: 1 W (idle)

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Product Overview

The Modules (cont.)

PB125667

PowerLogic™ DO180 – Relay Digital Output

PowerLogic™ DO180 can manage standard digital signal controlled by a direct execution command. They can operate as latched signals or pulsing variable pulse time. These signals can be associated to simple or double points in coreDb.

The PowerLogic™ DO180 module includes:

- 16 independent free-contact digital outputs (DO) in two independent blocks.
- All DO are SPST (Single Pole Single Throw) or NO (Normally open).
- Relay coils for each DO are powered via dedicated power inputs for each block. DO switching mechanisms require 24 Vdc nominal power inputs - available from PS280 modules.
- Polarization power level is monitored for each block.
- A Select before operate command management system is used to control field operation.
- Auto check of DOs every time that the polarization is reset.
- Commands continuously supervised to prevent execution of outputs when abnormal functioning mode detected.
- Address and communication rate in the bus are setting using microswitches located on the rear side.
- 20 LED indicators giving information about the status of the module and each DO.
- The software in the module can be upgrade remotely, from the CPU.

This module implements hot-swapping function, that is, it can remove and install on the backplane while the RTU is working without affecting the proper functioning of the system.

Characteristics:

- Number of outputs: 16
- Switching mechanism power voltage (PV): 24 Vdc
- Polarization range: 20% PV
- Isolation (optocouplers):
  - Switching mechanism power block: 2.2 kVrms
  - Between outputs and power: 2.2 kVrms
- Maximum nominal current per block: 8 A (4 latched outputs per block)
- Output switching capacity:
  - 50 W, 250 Vrms; L/R ≤1 ms
- Typical consumption:
  - Idle: 1.1 W
  - Polarization: 16 mA/relay for 24 Vdc (regular)

Product Overview

The Modules (cont.)

PB125568

PowerLogic™ DO280 - Transistor Digital Output

The PowerLogic™ DO280 module provides 32 passive digital configurable outputs to transistor. According to IEC-60870-3, a passive output is defined when the polarization source is external to the control equipment.

The PowerLogic™ DO280 module:

- Two blocks with 16 digital outputs each.
- A controller block.
- An indication block.
- A Select before operate command management system.

Characteristics:

- Number of outputs: 32
- Switching mechanism power voltage (PV): 24/48 Vdc - auto-range
- Polarization range: 20% PV
- Isolation (optocouplers):
  - Switching mechanism power block: 2.5 kVrms
  - Between outputs and power: 2.5 kVrms
- Max. current/output: 500 mA (non-simultaneous)
- Typical consumption:
  - Idle: 1.1 W
  - Switching mechanism (using TO180/Px): 0.8 W per active relay
  - Switching mechanism (using TO180/H): 1.2 W per active relay

PB125569

PowerLogic™ AI160 – Analog Input

The PowerLogic™ AI160 module supports up to 16 configurable analog inputs, with two removable terminal blocks to connect eight analog inputs.

This module consists of:

- Two blocks with 8 analog inputs each.
- A controller block
- An indication block

Characteristics:

- Number of outputs: 16 (differential, ±10 V)
- Multi-range voltage inputs – current (using an external resistor) conversion in TA160
- Conversion:
  - Eight channels multiplexing
  - Amplifier with programmable gain by channel
  - 16-bit sigma-delta converter
  - Accuracy: < 0.1% at 25 ºC
- Input impedance > 200 kΩ
- Common-mode voltage tolerance > 30 V
- Overvoltage protection
- Isolation (optocouplers): 2.5 kVrms
- Typical consumption: 2.4 W

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Product Overview

The Modules (cont.)

PB125570

PowerLogic™ AX160 - Combined Analog I/O

The PowerLogic™ AX160 module supports up to 8 analog inputs and 4 analog outputs, which can be configured separately.

This module consists of:

- A block with 8 analog inputs each.
- A block with 4 analog outputs
- A controller block
- An indication block

Characteristics:

- 8x differential inputs (±10 V) – same specs as AI160
- 4x outputs:
  - Output range: Voltage outputs/multi-range current
  - Conversion: 14-bit sigma-delta converter
  - Accuracy: < 0.15% at 25 ºC
  - Maximum output power: 200 mW
  - Line noise filtering: 80 dB rejection for 50/60 Hz
- Isolation (optocouplers): 3.75 kVrms
- Overvoltage protection – inputs and outputs
- Typical consumption: 5 W (idle)

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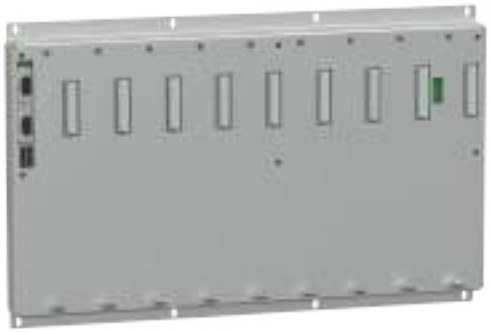


PowerLogic™ BP260 – Wall-Mount Backplane

This is the wall mount version of T500 base unit offering distribution of internal bus communications, power supply lines and bus expansion to remote backplanes

Characteristics:

- Available slots:
  - Four modules (EMS70140)
  - Nine modules (EMS70190)
- Bus Expansion:
  - High-speed RS-485 – 2x DB9
- Indications:
  - Internal bus activity (TX & RX)
  - Voltage supervision

Product Overview

The Modules (cont.)

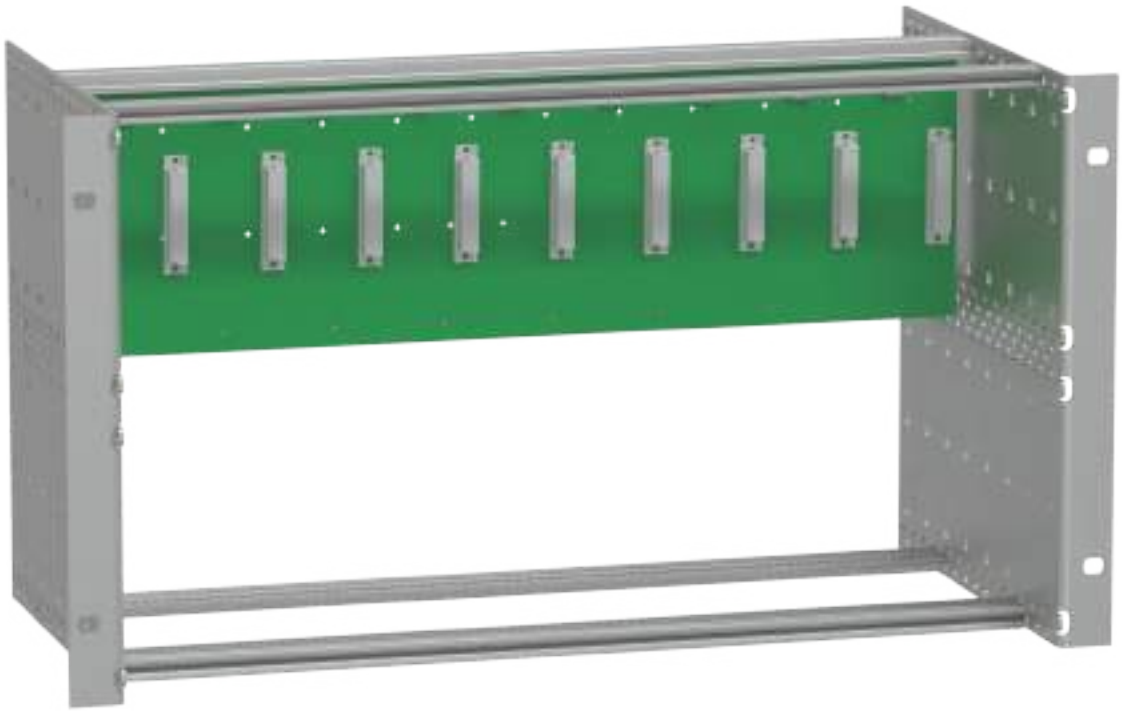
PowerLogic™ BP270 – Rack-Mount Backplane

This is the rack mount version of T500 base unit offering distribution of internal bus communications, power supply lines and bus expansion to remote backplanes

Characteristics:

- Available Slots:
  - Eight modules (EMS70280) – twin 4-slot buses
  - Nine modules (EMS70290)
- Bus Expansion:
  - High-speed RS-485 – 2x DB9
- Indications:
  - Internal bus activity (TX and RX)
  - Voltage supervision

PB125572



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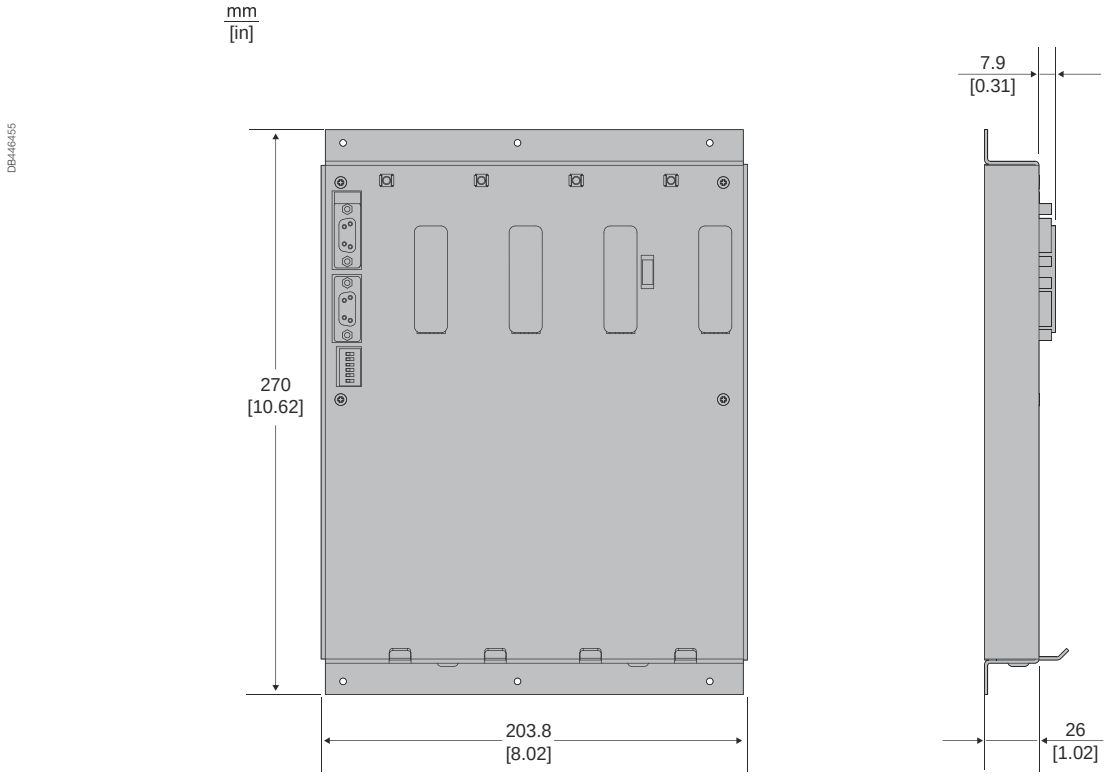
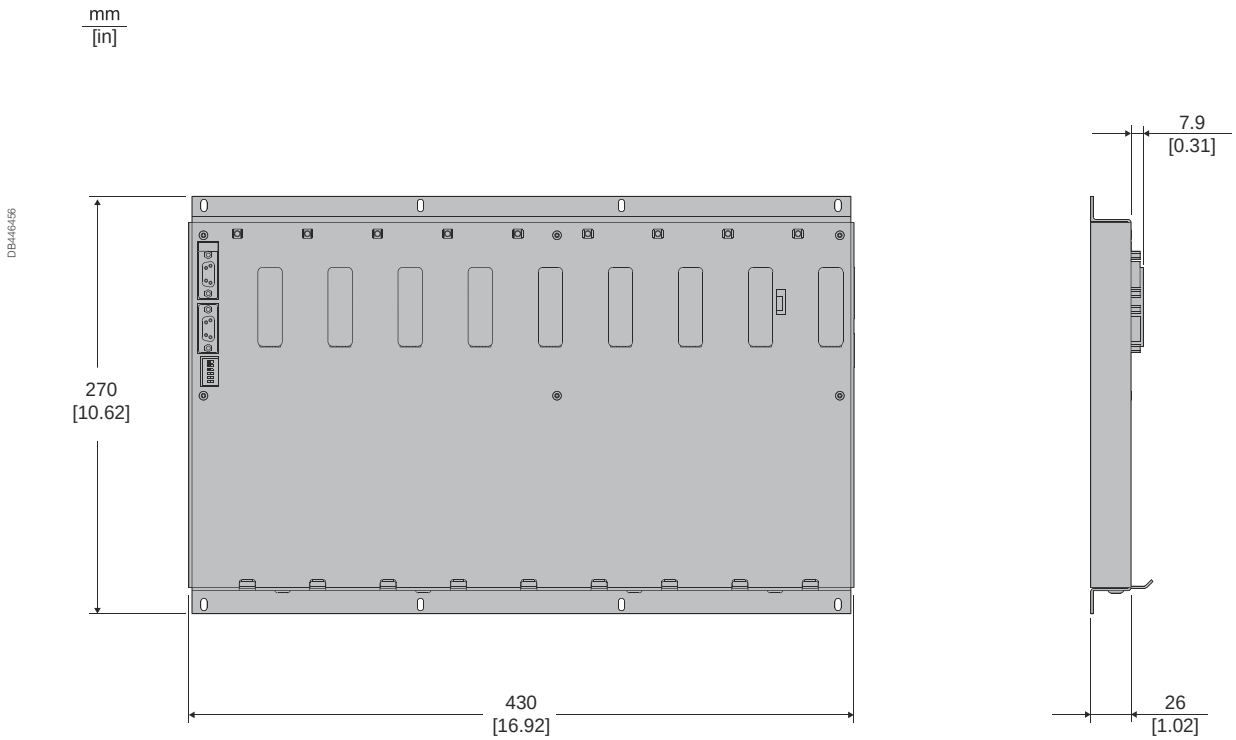
Product Overview

Dimensions



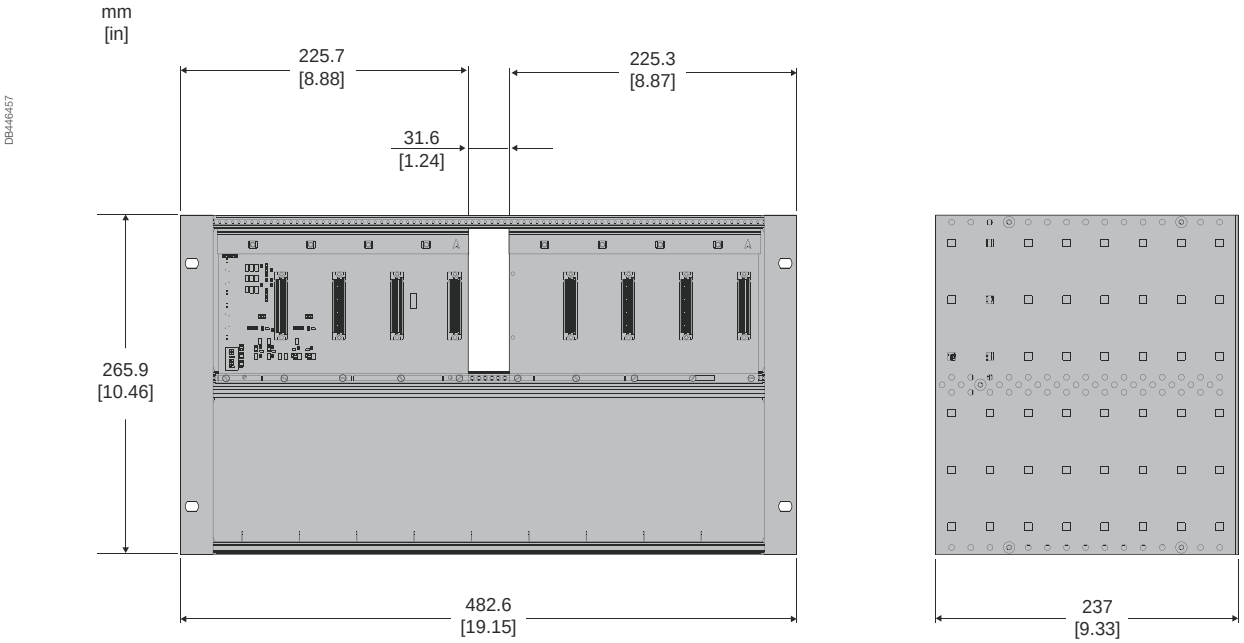
T500 4-slot wallmount backplane



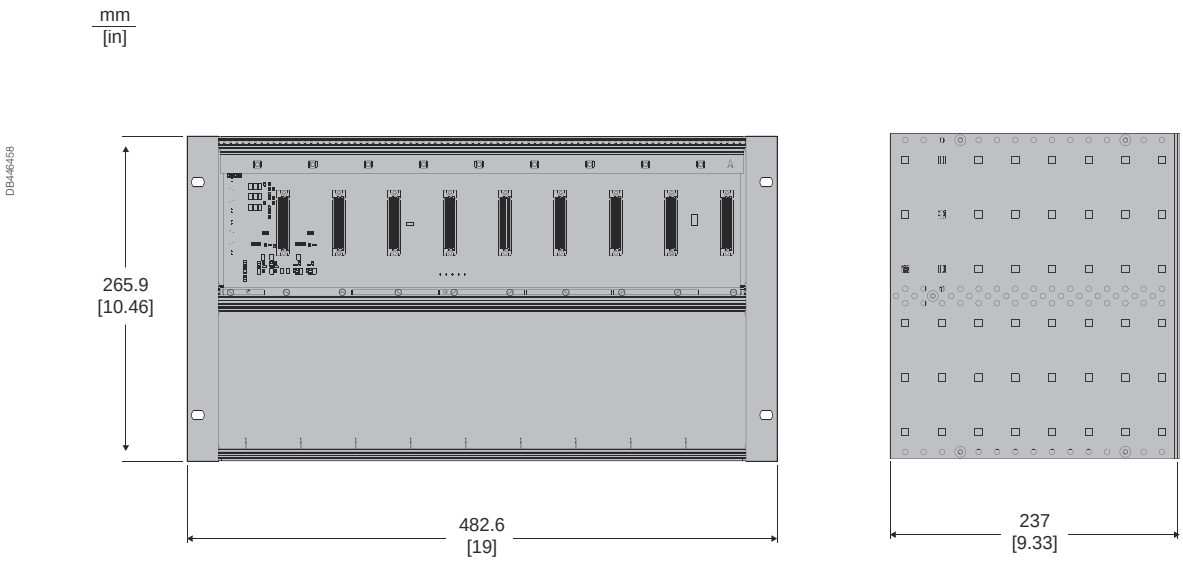
T500 9-slot wallmount backplane

Product Overview

Dimensions



T500 dual 4-slot rackmount backplane



T500 dual 4-slot rackmount backplane

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Product Overview

Dimensions

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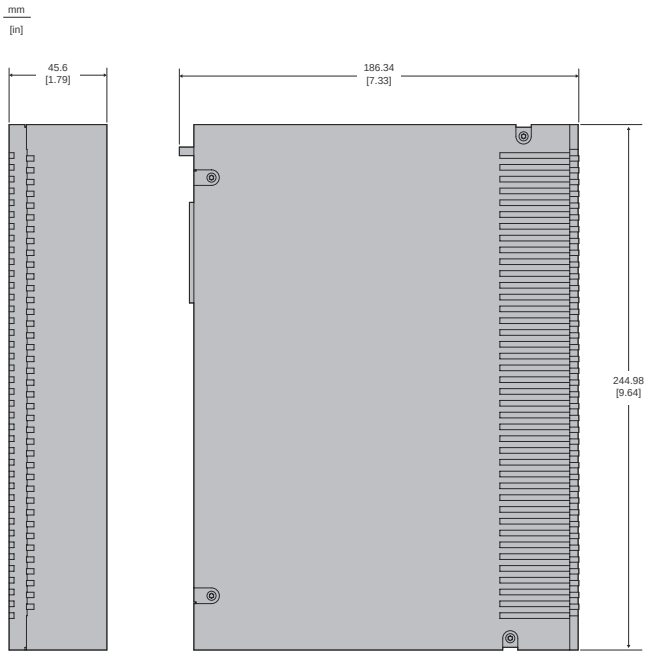

T500 backplane power supply

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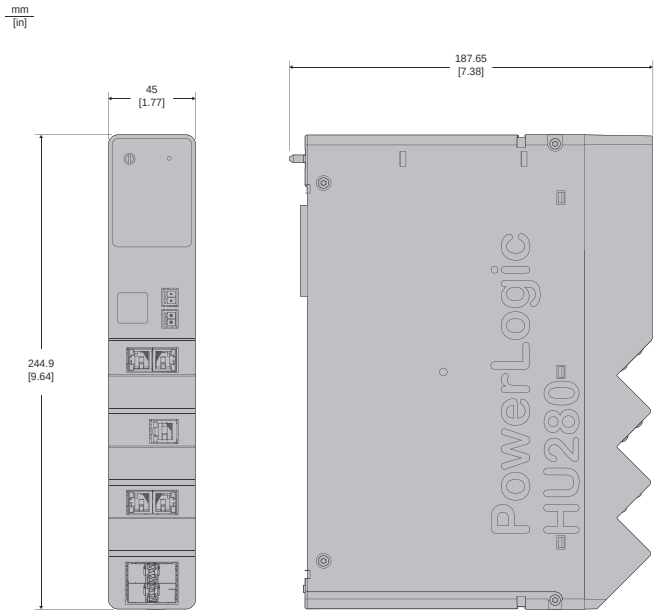
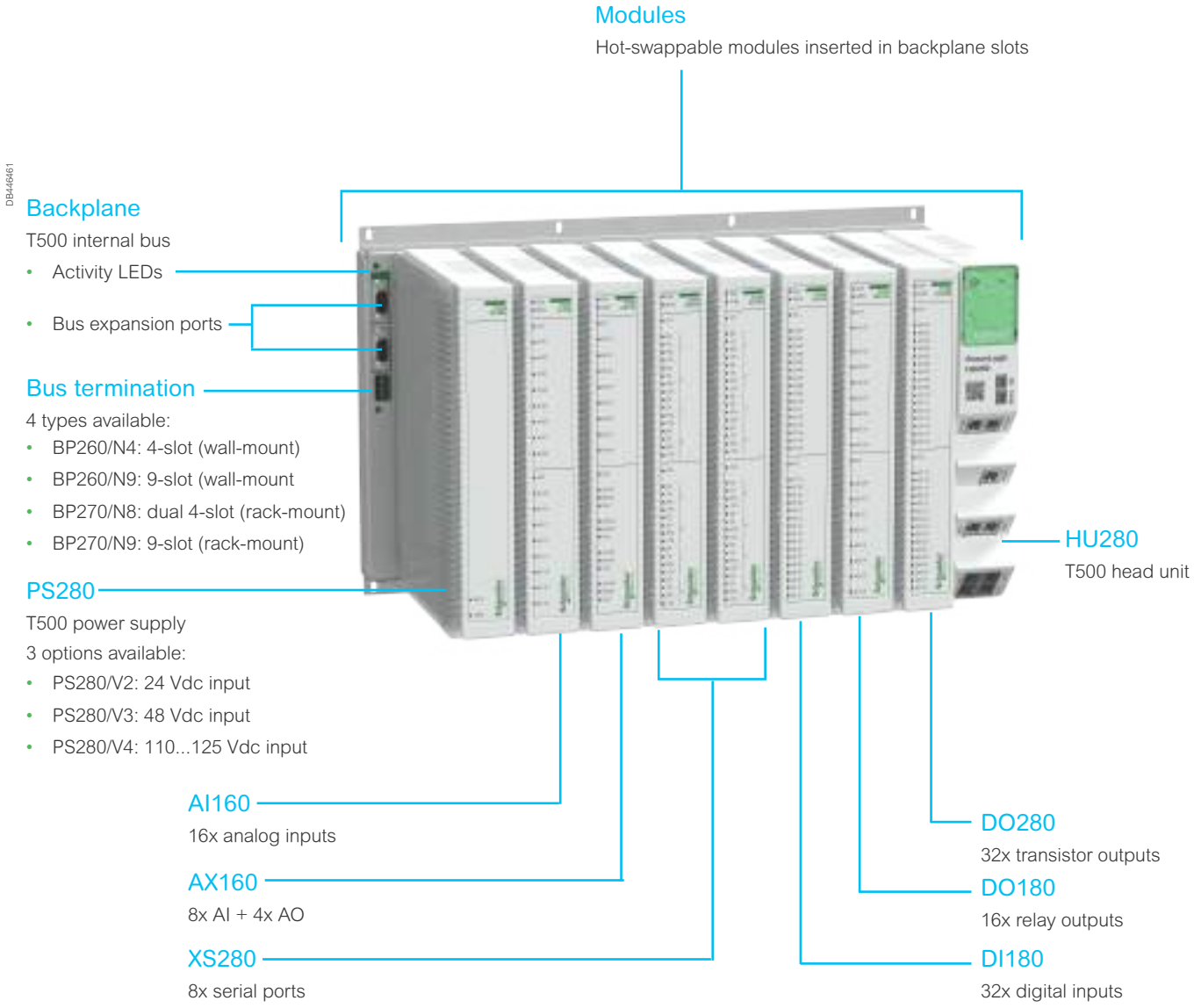


T500 Hot-swappable Head Unit

Product Overview

Installation and Update

Quick and easy installation. Combine different types of modules to suit your needs, including redundant power supplies and head units.



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Product Overview

Lifecycle Tools

PowerLogic™ T500 offers several tools for the different stages of the lifecycle of the product.

Access is possible locally and remotely. Local access can be made by Ethernet.

PowerLogic™ T500 is supplied with a standard configuration or a dedicated customer configuration.

Commissioning and maintenance do not require special tools, only a web browser on a PC, tablet, or smartphone.

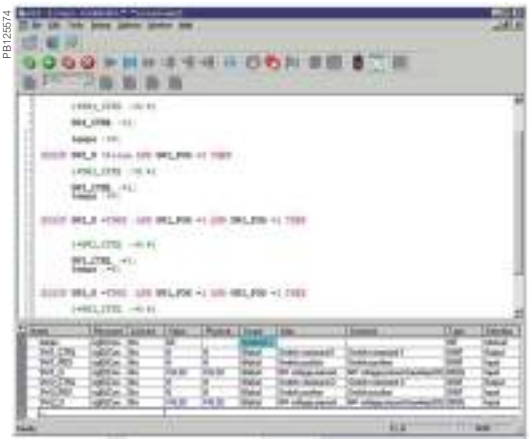
PB125573

Easergy Builder for Configuration

Easergy Builder is Windows® UI tool to setup:

- I/O database and parameters
- Communication channels and protocols
- Creation and re-use of device templates
- Mapping of IEC61850 data
- Synchronization parameters

PB125574



ISaGRAF for Programming

ISaGRAF Workbench is used as T500 PLC programming environment:

- Support for all IEC 61131-3 languages
- User friendly interface (OS Windows®)
- C supported as programming language
- Tightly integrated with Easergy Builder

Functions and Description

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Functions and Description

PowerLogic™ HU280
Head Unit Communication

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PowerLogic™ HU280 Head Unit Communication

General Description

PowerLogic™ HU280 is a powerful and flexible communication gateway for all PowerLogic™ T500 configurations.

- PowerLogic™ HU280 can be used as a standalone or reduntant gateway for substation IEDs
- Open to any communication system and protocol
- Compliant with Cybersecurity standards
- Advanced configuration tools
- Web server for easy commissioning, maintenance, and operation
- Open to IEC 61131 applications
- Easy remote and local firmware updates

The PowerLogic™ Head Unit HU280 is the communication module of the PowerLogic™ T500.

PowerLogic™ HU280 Manages:

- Cybersecurity management
- Communication with control center
- Communication with other substations (peer-to-peer communication)
- PowerLogic™ T500 modules gateway
- Local network communication with third-party IEDs
- Local and remote configuration access for all modules of PowerLogic™ T500
- Web server with local and remote access
- Automation system with programmable logic control
- Global function as remote/local operation, automation enable/disable

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The figure shows an example of the communication architecture and the capabilities of PowerLogic™ T500.

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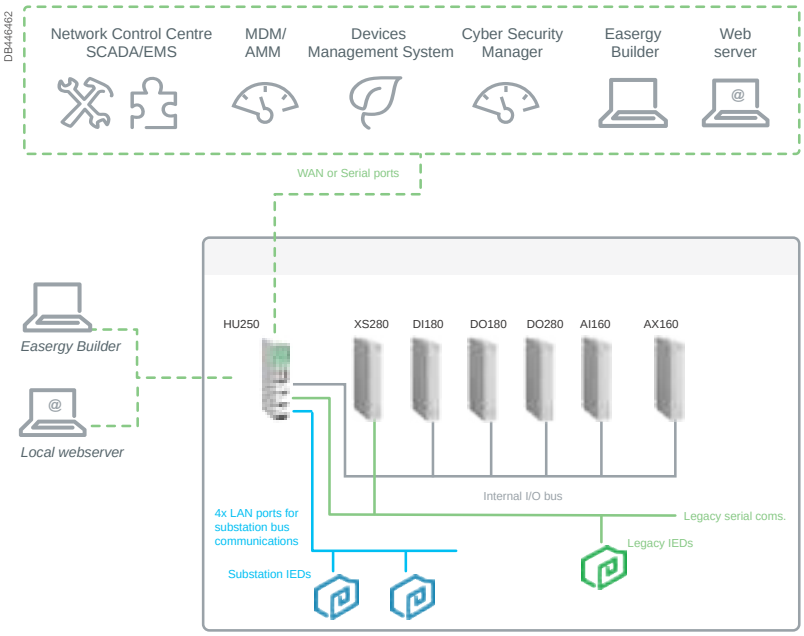

PowerLogic™ HU280 Head Unit Communication

General Description (cont.)

Physical Interface

PB125576

Reset button

PowerLogic Ring
Visual indication of device status

Watchdog
Watchdog output (health monitoring)

IRIG-B
IRIG-B synchronization input

2x RS-232/485 (RJ45)
Communication with serial comms.

MNT (ETH-RJ45)
Engineering, configuration and maintenance.

2x LAN/WAN (ETH-RJ45)
Communication with
upstream SCADA/DCS

4x station ports (Gbit-SFP)
Communication with substation IEDS

PB125577

Backplane connector
Connect to internal bus
and power supply.

SD-card slot
Expand internal file storage

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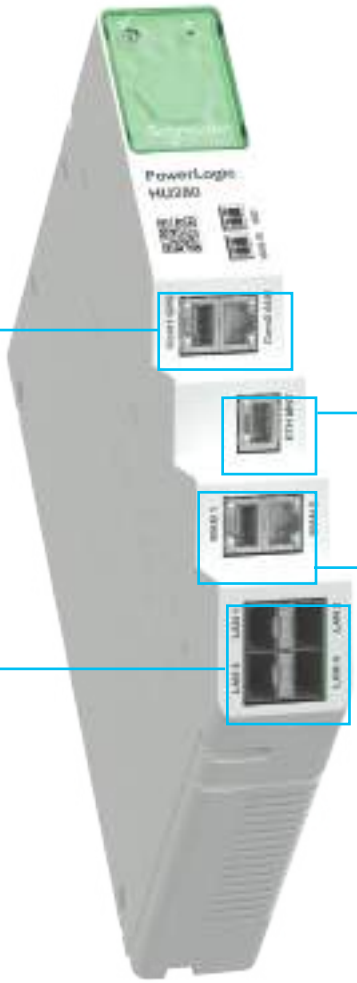
PowerLogic™ HU280 Head Unit Communication

General Description (cont.)

Configurable Communication Ports

PB125578



2x RS-232/485 (RJ45)

Communication with serial comms.

All serial protocol client/servers can be associated to these ports.

MNT (ETH-RJ45)

Access embedded webserver.

Available to connect with engineering tools.

2x LAN/WAN (ETH-RJ45)

Communication with upstream SCADA/DCS.

All supported protocol servers can be mapped to make use of these ports.

4x LAN ports (Gbit-SF)

LAN1 to LAN4 - these require insertion of SFP transceivers.

To communicate using copper (RJ45) or fiberoptic links. Configurable as standalone links or redundant pairs (IEC 62439 PRP & HSR supported). All supported protocols can be associated to any of these. Also supporting client and server for time synchronization over NTP & IEEE 1588.

PowerLogic™ HU280 Head Unit Communication

Protocols and Communication Architecture

HU280 can communicate with peers (SCADA and other devices) on one or several communication channels.

- Communication channels can be configured individually to fit application needs (DMS, local automation, etc.)
- Channels can be created and setup using Easergy builder.
- Configuration settings – e.g., IP addresses – can be modified using the embedded webApp.
- Embedded firewall can be configured to improve overall security.
- T500 is delivered with no default protocols or channels preconfigured.

Protocols

PowerLogic T500 communicates with IEDs and control systems using open protocols. PowerLogic™ HU280 can also be used to act as data concentrator or protocol converter for downstream devices.

PowerLogic HU280 can manage several communication channels and protocols concurrently.

IEC 60870-5-101 controlling station and controlled station

- UDP and Serial (RS232/485)
- Supports secure authentication as per IEC 62351-5
- Redundant connections with several controlling stations

IEC 60870-5-103 client – manage legacy serial IEDs

IEC 60870-5-104 controlling station and controlled station

- TCP only
- Supports secure authentication as per IEC 62351-5
- Redundant connections with several controlling station IPs

For more information on the IEC 60870-5 protocol, visit www.iec.ch.

DNP3 master station and outstation

- Supports secure authentication as per IEC 62351-5
- UDP, TCP (including dual end point), and Serial (RS232/485)

For more information on the DNP3 protocol, visit www.dnp.org.

Modbus client and server

- TCP and Serial (RS232/485)

For more information on the Modbus protocol, visit www.modbus.org.

IEC 61850 client and server

- IEC 61850-8-1 ed 1 client
- IEC 61850-8-1 ed 2 client and server
- GOOSE messages between IED and HU280

For more information on the IEC 61850 protocol, visit www.iec.ch.

Other protocols

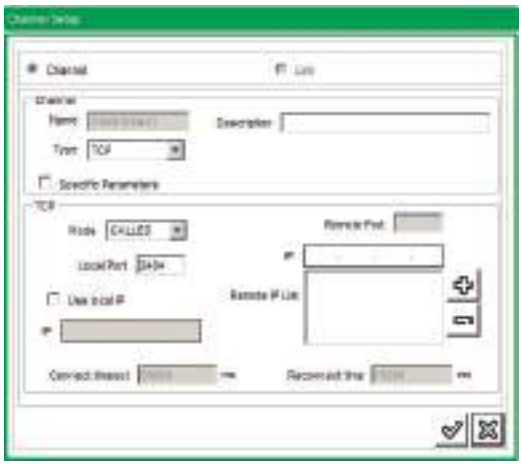
- HTTPS for secure web server connection
- SNTP for time synchronization
- SNMP client and agent*
- Radius and LDAP* server
- Webservices with devices management system (ESM)

* Please contact Schneider Electric service representative for availability.

PowerLogic™ HU280
Head Unit Communication

Protocols and Communication Architecture

PB125579

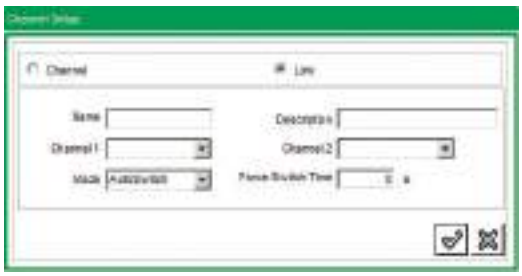


TCP channel configuration from Easergy Builder

PB125580

Serial channel configuration from Easergy Builder

PB125582



Association of channels

Channels

The ports used to communicate are configured as communication channels.
A channel can support one or more protocols according to the compatibilities with the physical layers.

The possible channel types are:

- Serial (RS232/RS485)
- TCP (Called, Calling or Both) or UDP

For TCP and UDP channels, a remote IP list can be created to limit access to identified peers.

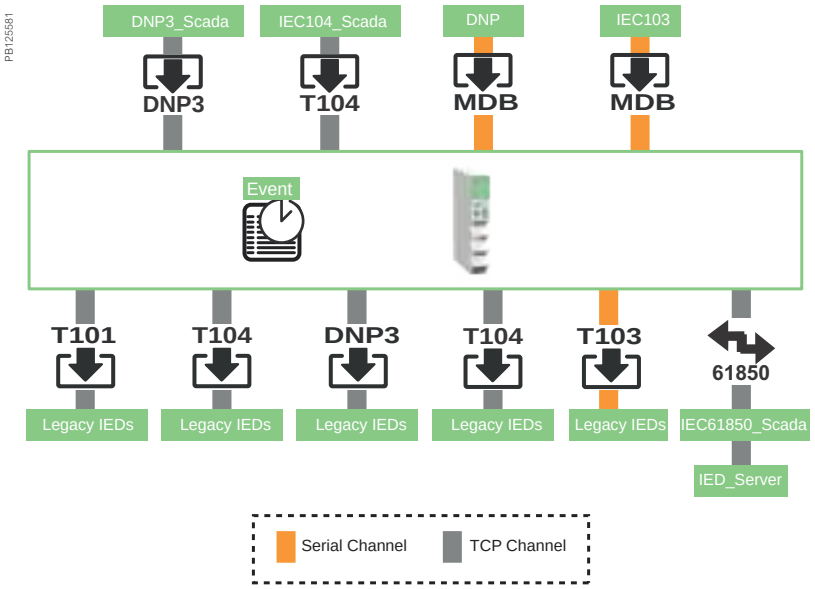
Channel Association - Links

Some control centers or IEDs support double channels. The functionality can be different for each protocol. The links are associations of two channels and they are used to identify a double channel. Two modes of channels switching are possible:

- AutoSwitch: used with secondary protocols. When the active channel stops receiving, it switches to the other channel, which becomes active.
- SwitchByMaster: used with the primary protocol, the HU280 controls the channel switching. A periodic switching between channels can be defined to verify channel state TIME_FORCE_SWITCH.

Example of PowerLogic™ T500 Communication Channel

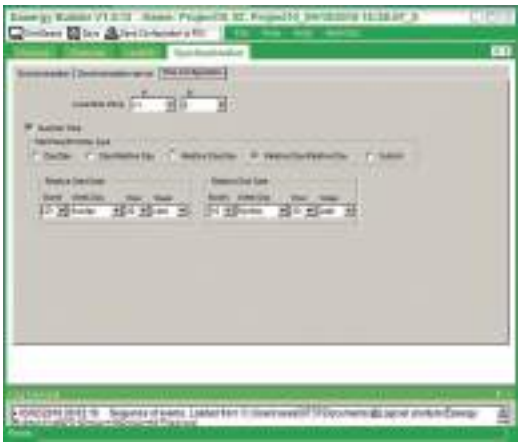
PB125581



PowerLogic™ HU280 Head Unit Communication

Time Synchro and Sequence of Events

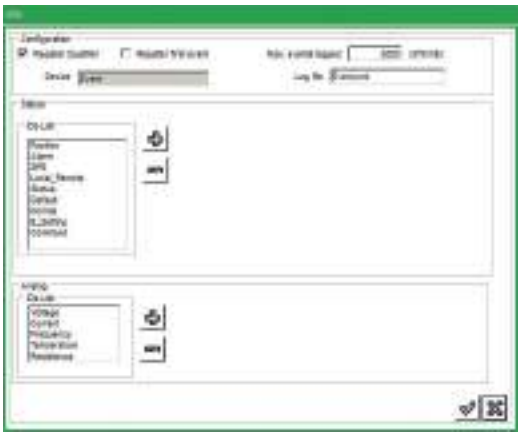
PB125583



PowerLogic™ T500 can accommodate several kinds of clock synchronization and manages:

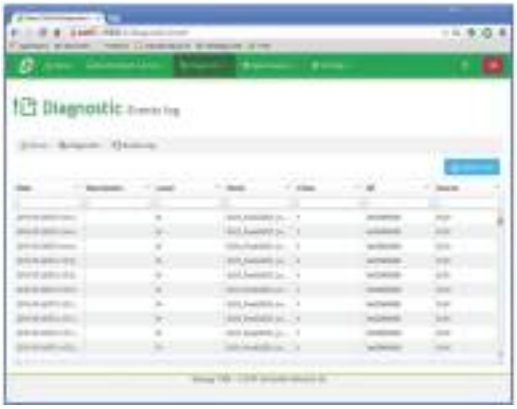
- *Local time zone*
- *Summer/wintertime*

PB125584



SOE configuration

PB125585



Web server view of SOE

Time Synchronization

Proper timestamping of events and alarms requires that correct time information is provided to the PowerLogic™ T500. The PowerLogic™ T500 time synchronization is managed by PowerLogic™ HU280. Time synchronization can be achieved in numerous ways, depending on the overall system architecture and the required precision.

- **Protocol:** Most data-transmission protocols allow secondary devices to synchronize from a control. The time accuracy depends on the implementation and the communication media.
- **SNTP or NTP:** Ethernet communication networks provide SNTP clocks to synchronize devices. PowerLogic™ HU280 can manage a list of SNTP servers: The time accuracy depends on network topology.
- **PTP (IEEE 1588):** High-accuracy clock synchronization for substation ethernet networks.

PowerLogic™ T500 Modules Time Synchronization

PowerLogic™ HU280 operates as a time server to synchronize:

- T500 modules using the Precision Time Protocol (IEEE 1588)
- IEDs in the substation
  - Primary protocol
  - SNTP server
  - PTP server

Sequences Of Events (SOE)

The Sequence Of Events (SOE) records all data changes in log files. Each PowerLogic™ T500 has its own SOE management. The recording mode for each variable can be configured from the HU280 via Easergy Builder.

- Up to 4 log files can be configured
  - These logs can be defined from Easergy Builder
  - The names of these logs are configurable
  - Any data from the database can be assigned to a log file
- The logs files may be downloaded locally from the web server
- SOE time accuracy
- Time resolution: 1 ms
- Discrimination between two events: 1 ms
- Event storage capacity
  - Up to 3000 events can be stored by PowerLogic™ T500
  - The size of logs files is configurable

For all logs, when the storage capacity is reached, the most recent event clears the oldest from the list.

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PowerLogic™ HU280 Head Unit Communication

Cybersecurity

Cybersecurity features implemented in PowerLogic™ T500 help to mitigate cyber threats as per IEC 62443 standard.

Cybersecurity requirements are designed to meet the international cybersecurity standards and support the security systems necessary to fulfill NERC and IEC 62351 requirements.

PowerLogic™ T500 includes as standard and without external devices, the following cybersecurity features as per IEC 62443-4-2:

- Software integrity with firmware signature on all modules
- Secure communication between PowerLogic™ T500 and associated webserver tool with local or remote connections using HTTPS
- User identification and authentication as per IEC 62351-8
- User's interface certificate management as per IEC 62351-8
- Communication authentication as per IEC 62351-5 when using DNP3 and IEC 60870-5-104 protocols.
- Port hardening management.
- IP communication filter
- Security events log storage and transmission according to Syslog protocol

Cybersecurity log

PowerLogic™ T500 supports advanced logging and monitoring features for cybersecurity implementations. Logs are protected against unauthorized access, modification and deletion and are preserved in the security events log.

Port Hardening

All HU280 physical ports (LAN and WAN) not used by the application are disabled on startup. Additional firewall rules can be defined for each configured port.

At least one of the Ethernet ports of HU280 module must be enabled to give the possibility to connect the unit.

Firewall

For each network interface (LAN and WAN), the firewall can be configured :

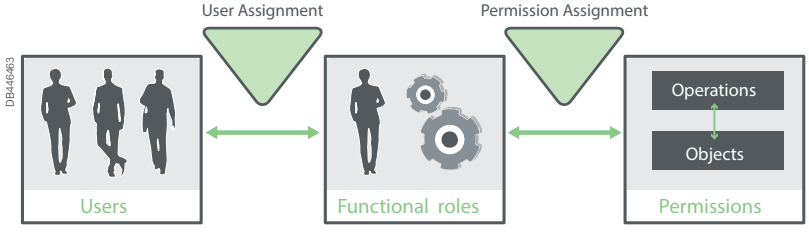
- To block TCP ports
- To block an IP address (blocklist)
- To allow an IP address (allowlist)

Local and Remote-Control Access (RBAC)

The device uses Role-Based-Access-Control (RBAC) to provide defined levels of access for users. RBAC is predefined as per IEC 62351-8.

PowerLogic™ T500 is provided with a pre-defined RBAC. It can be customized with the Cybersecurity manager tool CAE or T500 Web server.

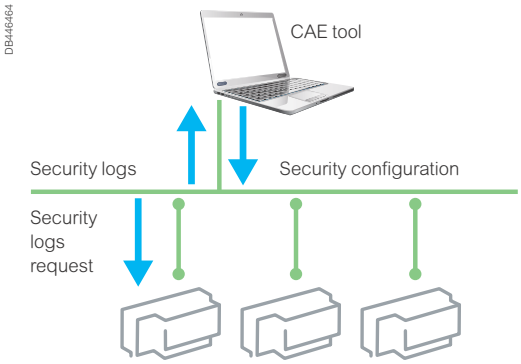
	Right								
Role	DATA BASE	FIRMWARE	WEB Services	BUILDER	TOOLS	LOG & SOE	SECURITY	DATA	RESET
VIEWER			●					●	
OPERATOR	●		●			●		●	
ENGINEER	●	●	●	●	●	●		●	●
INSTALLER	●	●	●	●	●	●		●	●
SECADM			●				●		



RBAC Role structure

PowerLogic™ HU280
Head Unit Communication

Cybersecurity



Cybersecurity Administration Expert Tool (CAE)

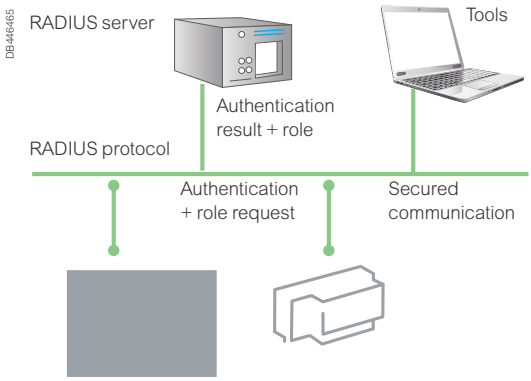
The EcoStruxure Cybersecurity CAE is a windows-based tool that allows a central management of Security configuration and access to security logs of each PowerLogic™ T500.

Security configuration includes:

- Security policy, including for example: password complexity or password strategy.
- Define rules for security logs, choose between various standards.
- Roles and permissions: Role Base Access Control (RBAC).
- Users with associated roles.

Local Authentication and Authorization

Local authentication and authorization can be achieved without any external servers. Security configuration is stored locally in each PowerLogic™ T500. Users authentication and authorization using associated role are performed locally (RBAC). CAE is used to update globally the security configuration of all the PowerLogic™ T500 located inside the substation, so that users, associated passwords, and other parameters are consistent on all devices. Centralized authentication and authorization can be achieved also with one or two Radius and LDAP server, with IEC 62351-8 extension. In order to coordinate the authentication from a unique customer security policy management system.



Radius and LDAP Server

This allows to use Unified Account management system shared across heterogenous solutions. The same credentials are used for each PowerLogic™ T500, at tools and at third party devices.

Radius server is in charge of authenticating users and providing associated role. Then PowerLogic™ T500 allows access based on this role and the internal security configuration (RBAC).

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PowerLogic™ HU280 Head Unit Communication

Characteristics

Characteristics

Main	
Range	PowerLogic™
Product name	PowerLogic HU280
Device short name	HU280
Product or component type	Communication gateway
Installation	
Type of installation	Indoor and outdoor
Cabinet specifications	Ventilated metallic cabinet Mechanic resistance IK08 Fire resistance V-1 or V-0 Outdoor cabinet minimum recommended IP65
Fixing Mode	By screw Only vertical orientation
Maximum relative humidity	95%
Ambient air temperature for storage	-40 °C to 85 °C
Ambient air temperature for operation	-40 °C to 70 °C
Pollution degree	PD2
Overvoltage category	CAT-II
Maximum operation altitude	2000 m
Dimensions	Height: 244 mm Width: 44 mm Depth: 180 mm
Lifting and transport	In case of installed in cabinets with weight >18 kg follow instructions of cabinet manufacturer
Hardware	
Maximum power consumption	15 W
Processor name	ARM Cortex-A53 quad core at 1.1 GHz ARM Cortex-M4 at 400 MHz
Realtime clock	Built-in clock Clock drift +/-2ppm from 0 to 40 °C Clock drift +/-3.5ppm from 40 to 85 °C
Communication port support	4 x Gbps Ethernet ports SFP 100/1000 Mbps 3 x 10/100 BaseT RJ45 ports 2x RS232/485 RJ45 serial ports
Validated SFP devices	Copper SFPs: FINISAR: • FCLF8520P2BTL • FCLF8521P2BTL • FCLF8522P2BTL 6COM: • 6C-SFP-F • 6C-SFP-T Fiber SFPs: AVAGO/BROADCOM: • HFBR-57E5APZ

PowerLogic™ HU280 Head Unit Communication

Characteristics (cont.)

Characteristics (cont.)

Memory capacity	32 GB eMMC 4 GB RAM DDR4 Up to 64 GB slog for Secure Digital (SD) card
Validated SD cards	Kingston Canvas Select Plus SD - SDS2/32 GB Class 10 UHS-I Kingston Canvas Select Plus SD - SDS2/64 GB Class 10 UHS-I
IP Degree of protection	IP20 conforming to IEC 60529
IK Degree of protection	IK07 conforming to IEC 62235
Software	
Communication port protocol	IEC/BS 61850 client/server DNP3 serial and TCP client/server IEC/BS 60870-5-101 client/server IEC/BS 60870-5-104 client/server IEC/BS 60870-5-103 client Modbus serial and TCP client/server
Cybersecurity	Role-Based Access Control TPM secure storage Certificate management Secure boot Encryption engine Firmware signature Security log
Encryption algorithms	AES (Advanced Encryption Standard) 3DES MD5/SHA RSA/ECC Single-pass authentication encryption
Communication service	TLS DHCP client Syslog Protocol RADIUS client LDAP client Web server (HTTPS)
Data recording	Event logs Sequence of Events Alarms
Time Synchronization protocols	IRIG-B GPS PTP IEEE1588 SNTP
Functionality provided by web applications	Device identification Device status Data monitoring and control Events log TCP/Serial traces System log Clock management Firmware management Configuration management User management Certificate management Cybersecurity log Customizable HMI screens including Single Line Diagram

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PowerLogic™ HU280
Head Unit Communication
Characteristics and Standard Compliance

Characteristics (cont.)

Programming language	ST (Structured text) IL (Instruction list) LD (Ladder) FBD (Function block diagram) SFC (Sequential function chart) Calculation Formula
Packaging	
Unit Type of Package	PCE
Number of Units in Package 1	1
Package 1 Height	8.5 cm
Package 1 Width	23 cm
Package 1 Length	31 cm
Package 1 Weight	1.366 kg

Standard Compliance

Directive / Test	Identification	Details
CE Mark and UKCA Mark		
Low Voltage Directive (LVD)	2014/35/EU	CE Mark Directive
	SI 2016 Nº 1101	UKCA Mark Directive
Electromagnetic Compatibility (EMC)	2014/30/EU	CE Mark Directive
	SI 2016 Nº 1091	UKCA Mark Directive
RoHS	2011/65/EU	CE Mark Directive
	Regulations 2012 and SI 2012 Nº 3032	UKCA Mark Directive
WEEE	2012/19/UE	CE and UKCA Mark Directive
EMC - Emission tests (Aligned with IEC/BS 61850-3 and IEC/BS 60255-26		
Radiated emission EF measure	CISPR 32:2015+A1:2019	30 MHz to 6 GHz
Continuous conducted emission	CISPR 32:2015+A1:2019	0.15 MHz to 30 MHz
EMC - Immunity tests (Aligned with IEC/BS 61850-3 and IEC/BS 60255-26)		
Radiated RF Electromagnetic field immunity test	IEC 61000-4-3:2020	80 – 3000 MHz, AM 1 KHz Prof: 80%, 10 V/m 80 – 2700 MHz, AM 1 kHz Prof: 80%, 10 V/m 27 – 6000 MHz, AM 1 kHz Prof: 80%, 3 V/m
Immunity to conducted disturbances, induced by radiofrequency fields	IEC 61000-4-6:2013	Range A; 150 kHz - 80 MHz, AM 1 kHz Prof: 80%, 10 Vrms Range B: 27 ± 0.135 MHz, AM 1 kHz Prof: 80%, 10 V/m, 10 s
Electrical fast transient/burst immunity test	IEC 61000-4-4:2012	±4 kV, 5 kHz
Surges immunity test	IEC 61000-4-5:2014+A1:2017	±0.5, ±1, ±2 kV (Symmetrical coupling) ±0.5, ±1, ±2 kV, ±4 kV (Asymmetrical coupling)
Damped oscillatory wave	IEC 61000-4-18:2019	1 kV (1 MHz) for differential mode 2.5 kV (1 MHz) for common mode

PowerLogic™ HU280 Head Unit Communication

Standard Compliance (cont.)

Standard Compliance (cont.)		
Power frequency magnetic field immunity test	IEC 61000-4-8:2009	50 Hz, 100 A/m continuous 50 Hz, 1000 A/m for 1 s
Electrostatic discharge immunity test	IEC 61000-4-2:2008	±2 kV; ±4 kV, ±8 kV (Direct and indirect contact discharge) ±2 kV; ±4 kV; ±8 kV, ±15 kV (Air discharge)
DC Voltage dips, short interruptions and voltage variations	IEC 61000-4-29:2000	10 ms voltage dips 0% Criteria A 200 ms voltage dips 40% 500 ms voltage dips 70% 5000 ms voltage dips 100%
DC supply voltage –Ramp up Ramp down	IEC 61000-4-17:1999 +A1:2001+A2:2008	Shut-down ramp duration: 60 s Power off duration: 5 min Start-up ramp duration: 60 s
Mains frequency voltage	IEC 61000-4-16:2015	30 V continuous perturbation 300 V 1 s
Ripple on DC input power port	IEC 61000-4-17:1999 +A1:2001+A2:2009	15% Un, 100 Hz 10% Un, 100 Hz
Impulse magnetic field	IEC 61000-4-9:2016	Level 5, 1000 A/m peak, pulse 1,2/50 µs and 8/20 µs
Damped oscillatory magnetic field	IEC 61000-4-10:2016	Level 5, 100 A/m peak, 0.1 MHz and 1 MHz
Electrical Safety		
Aligned with all requirements	IEC/BS 60255-27:2013	
	IEC/BS 61010-1:2010	
Electrical Safety		
Cold test	IEC 60068-2-1:2007	Test Ad: (-40 ºC/16 h) Test Ab (-40 ºC/96 h)
Dry heat test	IEC 60068-2-2:2007	Test Bd: (+70 ºC/16 h) Test Bb (+70 ºC/96 h)
Damp heat, cyclic test	IEC 60068-2-30:2005	+25 ºC/+55 ºC/95%RH/6 cycles (24 h)
Damp heat steady state test	IEC 60068-2-78:2001	Test Cab (93 ± 3) %/+40°C/10 days
Damp heat steady state test	IEC 60068-2-14:2009	Test Nb -40 ºC/+70 ºC/1 ºC/min/3 h/5 cycles
Mechanical tests (Chassis mounting)		
Vibration (sinusoidal)	UNE-EN 60068-2-6:2008 UNE-EN 60255-21-1:1996	Test Fc Section 1
Shock and bump	UNE-EN 60068-2-27:2011 UNE-EN 60255-21-2:1996	Test Ea and guidance Section 2
Seismic tests	UNE-EN 60255-21-3:1996	Section 3
Drop test	IEC 60068-2-31:2008 ISO 4180:2019	60 cm (with packaging)

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PowerLogic™ HU280 Head Unit Communication

Configuration Tool

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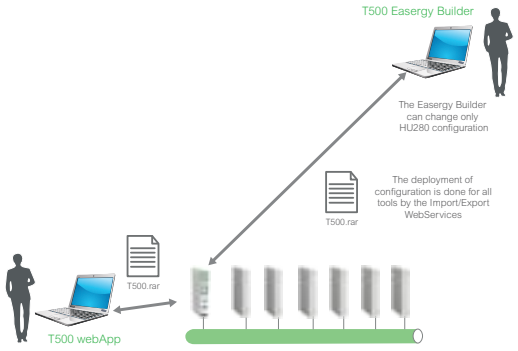


Interaction between the three T500 configuration tools

PowerLogic™ T500 Configuration Tool

One configuration tool is available with T500:

- **Easergy Builder**
  Advanced Engineering tool for experts, this tool enables adding/modifying the configuration of the T500 application, for example:
  - Adding/modifying communication architecture (protocol, modem, etc.)
  - Adding/modifying local network and IEDs and associated variables
  - Adding/modifying ISaGRAF® automation applications or PLC programs

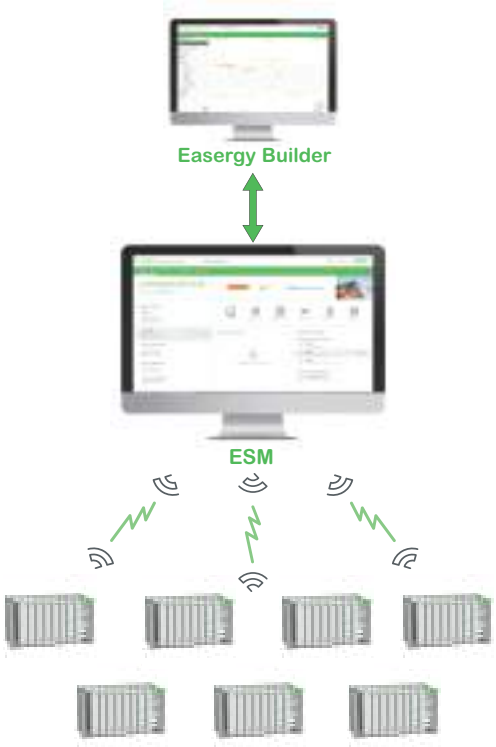
- **Some settings can be modified via the embedded webApp.**
  - IP addresses of the Ethernet ports
  - Communication protocol parameters

With the use of this Easergy Builder, the user is able to:

- Modify the configuration downloaded to Easergy Builder, in order to adapt/add/modify new advanced functions or unit settings.
- Transfer the configuration file to the T500 unit once modified.
- Change functional settings directly on the unit from a PC connected to the web server.

This tool is interactive and can be used to transfer the configuration file from one to another.

PB125686



EcoStruxure™ Power Automation System Maintenance Tool

EcoStruxure™ Power Automation System Maintenance tool allows to track the evolution of all the configuration and software artifacts throughout the lifecycle.

Device Management

- FW version
- HW version
- Serial number

Baseline Management

- Backup configuration.
- Track evolution of changes with Time.
- Track versions of Baseline Vs Real.

Mass Firmware and Configuration Update

- Mass firmware upgrades.
- Mass configuration downloads.
- Mass incremental configuration updates.

Central Cyber Security Configuration (CAE embedded)

- Manage RBAC configurations.
- Backup all RBAC configurations and trace evolution.

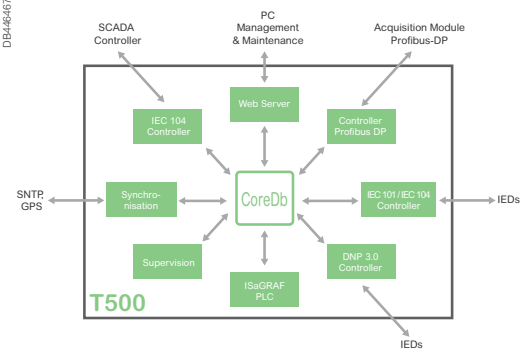
Access to T500 Web Interface

- Identify devices and connect without needing to remember URLs.

PowerLogic™ HU280 Head Unit Communication

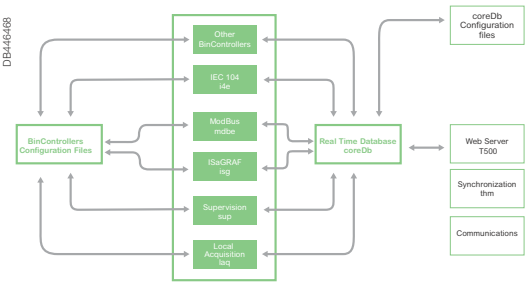
Configuration Tool (cont.)

DB446467



Easergy Builder: Relationship between coreDb and other applications

DB446468

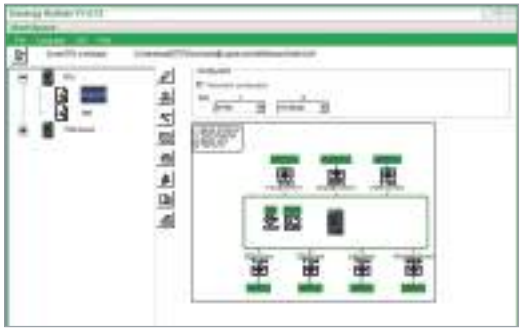


Easergy Builder: Real-time operating system architecture

PB125587

WorkSpace: RTU setting

PB125588



WorkSpace: Device architecture page

Easergy Builder

Easergy Builder is the advanced configuration tool of the PowerLogic™ T500 RTU, reserved for the expert engineering team.

The basic use of PowerLogic™ T500 does not require advanced modifications of the PowerLogic™ T500 configuration.

The web server is sufficient for the user to personalize the system and change basic settings.

Interface

Easergy Builder permits the modification of an existing PowerLogic™ T500 configuration from the main page WorkSpace.

This page includes the following general settings:

- IP parameters for LAN and WAN (IP address, delays, etc.)

The Workspace can manage several PowerLogic™ T500 RTU configurations. The Workspace page displays as a diagram the architecture of each PowerLogic™ T500 application (architecture of the different devices included in the configuration).

Each of the following elements (named devices) can be associated with a PowerLogic™ T500 RTU application:

- Primary/secondary protocol setting (IEC 104, DNP3)
- ISaGRAF® project interface
- Supervision setting
- Local acquisition setting (input/output)
- SOE setting (Sequence of Events)
- CoreDb signals (real-time database), including status, command, analog, setpoint
- Synchronization setting

To personalize the RTU application, Easergy Builder uses four main groups of settings pages:

- Devices: one device for each function (protocol, modem port, SOE, ISaGRAF, input/output)
- Channels: one channel for each internal or external communication link
- CoreDb: database including variables, labels and mapping of the application
- Synchronization: setting to synchronize the unit by SNTP server, GPS, or by the protocol

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PowerLogic™ HU280
Head Unit Communication

User Interface

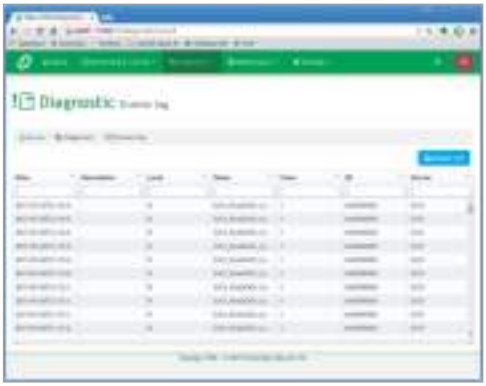
PB125589

Home

PB125590

Monitoring/Data/Status

PB125591



Diagnostic/Events

T500 Web Server - Commissioning, Operation and Maintenance

HU280 includes an embedded Web Server as HMI interface and local supervision of the substation for the user.

Basic configuration, operation and diagnosis are carried out by connecting a laptop, tablet or smartphone to the T500 Web Server. This web server can be accessed:

- Locally via any configured Ethernet port; allowing connections to the embedded HTTPs server.
  (laptop directly connected to one of the T500 Ethernet ports)
- Remotely via any configured Ethernet port; allowing remote connections to HTTPs from the remote connecting IP.
- The menu on the home page enables the user to select the language
- The web data server's HTML format pages includes different pages and subpages:
  - Home page: local map, GPS coordinates, photos and notes to identify the substation.
  - Monitoring and control page: physical view of the system, data view including display of status and analogs, control of commands and set points.
  - Diagnostic page: to consult and export.csv file (events log, cybersecurity log, system log, protocol traces and disturbance records).
  - Maintenance page: user settings, clock synchronization, IP configuration settings, device status, firmware version update, configuration download.
  - Settings page: These settings include the configuration of functional parameters for communication, protocol, and detection, etc.

Operation and Control

Alongside operation and control of the network from the SCADA system, it is possible to operate the equipment locally or remotely using data pages:

- Displaying status and measurement.
- Issuing commands: switches, automation system on/off, other digital outputs with a selection and confirmation process.
- Consultation of archived data
  - On-screen consultation of archive logs
  - Extraction of logs on a PC as a .csv file for analysis

PowerLogic™ HU280
Head Unit Communication

User Interface (Cont.)

PowerLogic webApp

PowerLogic webApp is embedded web interface to the device enabling authorized users to:

- Monitor device configuration.
- View current state of all the processed.
- Check firmware versions.

Dedicated to the end user for the operation, commissioning, and maintenance, this tool allows (according to the cybersecurity access and roles):

- Data consultation
- Events consultation
- Firmware updating
- Configuration saving/uploading
- Functional setting of T500

PB125592

PowerLogic webUI

The PowerLogic webUI is a lightweight web-based HMI built on webApp services, placing minimal load on CPU hardware. It offers 'just-enough' features, including configuration in Easergy Builder, system view, single line diagram, alarm, and event management, and utilizes the same RBAC model defined for controller CPU.

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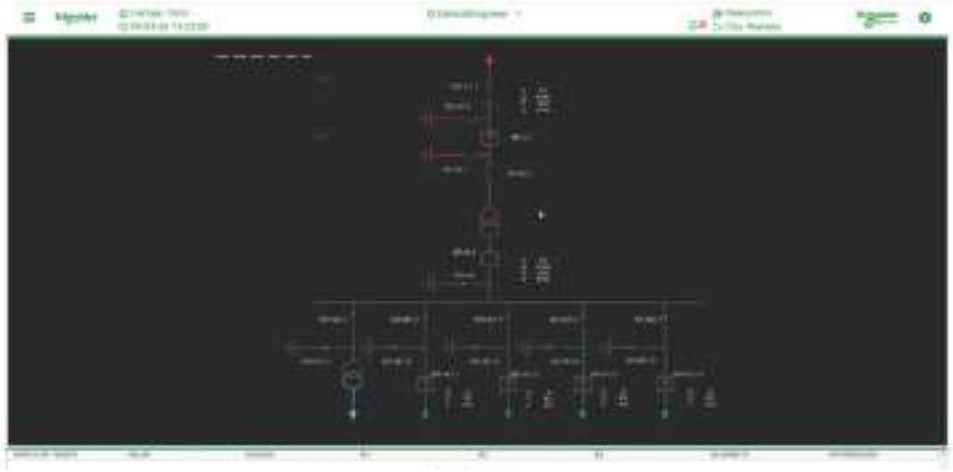

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Notes

Schneider-Electric Service

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Schneider Electric Service

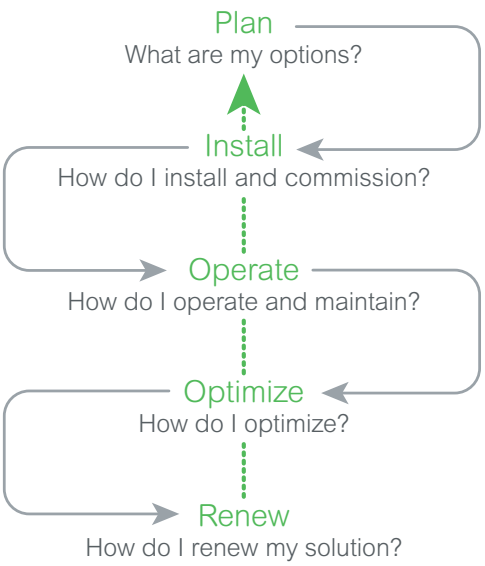
Peace of Mind Throughout your Installation Life Cycle

How can you cut costs and improve performance at the same time?

When it comes to your electrical distribution infrastructure, the answer is straightforward: get professional expertise.

Life Cycle Services

DB446469



When it comes to your electrical distribution installation, we can help you:

- Increase productivity and reliability
- Mitigate risk and limit downtime
- Keep equipment up to date and extend lifespan
- Cut costs and increase savings
- Improve your return on investment

CONTACT US!

https://www.se.com/ww/en/work/services/

Plan

Schneider Electric helps you plan the full design and execution of your solution, looking at how to secure your process and optimize your time:

- **Technical feasibility studies:** Design a solution in your environment
- **Preliminary design:** Accelerate turnaround time to reach a final solution design

Install

Schneider Electric will help you to install efficient, reliable and secured solutions based on your plans.

- **Project management:** Complete your projects on time and within budget
- **Commissioning:** Ensure your actual performance matches the design, through on-site testing and commissioning, and tools and procedures

Operate

Schneider Electric helps you maximize your installation uptime and control your capital expenditure through its service offer.

- **Asset operation solutions:** Provide the information you need to enhance installation performance, and optimize asset maintenance and investment
- **Advantage service plans:** Customize service plans that cover preventive, predictive and corrective maintenance
- **On-site maintenance services:** Deliver extensive knowledge and experience in electrical distribution maintenance
- **Spare parts management:** Ensure spare parts availability and an optimized maintenance budget of your spare parts
- **Technical training:** Build the necessary skills and competencies to properly and efficiently operate your installations

Optimize

Schneider Electric can make recommendations for improved availability, reliability and quality.

- **MP4 electrical assessment of customer installations:** Define an improvement and risk management program

Renew

Schneider Electric extends the life of your system while providing upgrades.

We offer to take full responsibility for the end of life processing of old electrical equipment.

- **ECOFIT™:** Keep up to date and improve the performance of your electrical installations (LV, MV, protection relays, etc.)
- **MV product end of life:** Recycle and recover outdated equipment with end of life services

Notes

Commercial References

Commercial References

Digital Configuration and Ordering Tools

PowerLogic™ T500 CONFIGURATOR:
The unique web tool to quickly and easily configure your PowerLogic™ T500 substation controller.

Fast and simple

You will find a detail of PowerLogic™ T500 offer on the Schneider Electric Website.

The commercial reference with description is available on the Product Selector and a webconfigurator allows you to define a configuration and accessories:

https://www.se.com/ww/en/product-range/203452520-PowerLogic™-t500

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PowerLogic™ T500

PowerLogic™ BP260 - Wall - Mount Backplane

Comm. Ref	Description	
EMS70140	PowerLogic T500 - BP260/N4	T500 4-slot wallmount backplane
EMS70190	PowerLogic T500 - BP260/N9	T500 9-slot wallmount backplane

PowerLogic™ BP270 - Rack - Mount Backplane

Comm. Ref	Description	
EMS70280	PowerLogic T500 - BP270/N8	T500 dual 4-slot rackmount backplane
EMS70290	PowerLogic T500 - BP270/N9	T500 9-slot wallmount backplane

PowerLogic™ HU280 - High Performance Head Unit

Comm. Ref	Description	
EMS72000	PowerLogic T500 - HU280	T500 Hot-swappable Head Unit, 7xETH + 2xSerial

PowerLogic™ PS280 - Power Supply

Comm. Ref	Description	
EMS71120	PowerLogic T500 - PS280/V2	T500 backplane power supply (In=24 Vdc. Aux.Out=24 Vdc)
EMS71130	PowerLogic T500 - PS280/V3	T500 backplane power supply (In=48 Vdc. Aux.Out=24 Vdc)
EMS71140	PowerLogic T500 - PS280/V4	T500 backplane power supply (In=110/125 Vdc. Aux.Out=24 Vdc)

PowerLogic™ XS280 - Serial Port Expansion

Comm. Ref	Description	
EMS73100	PowerLogic T500 - XS280	T500 serial port expansion (8x RS232/485) RJ45

PowerLogic™ DI180 – Digital Input

Comm. Ref	Description	
EMS74110	PowerLogic T500 - DI180/C1	T500 32x Digital inputs (12 - 125 Vdc autorange) (Terminals)
EMS74120	PowerLogic T500 - DI180/C2	T500 32x Digital inputs (12 - 125 Vdc autorange)

PowerLogic™ DO180 – Relay Digital Output

Comm. Ref	Description	
EMS74210	PowerLogic T500 - DO180/C1	T500 16x Relay outputs (powered with 24Vdc)(Terminals)
EMS74220	PowerLogic T500 - DO180/C2	T500 16x Relay outputs (powered with 24Vdc)

PowerLogic™ T500

PowerLogic™ DO280 - Transistor Digital Output

Comm. Ref	Description	
EMS74310	PowerLogic T500 - DO280/C1	T500 32x Transistor outputs (24/48Vdc powered) (Terminals)
EMS74320	PowerLogic T500 - DO280/C2	T500 32x Transistor outputs (24/48Vdc powered)

PowerLogic™ AI160 - Analog Input

Comm. Ref	Description	
EMS75410	PowerLogic T500 - AI160/C1	T500 16x Analog input module (Terminals)
EMS75420	PowerLogic T500 - AI160/C2	T500 16x Analog input module

PowerLogic™ AX160 - Combined Analog I/O

Comm. Ref	Description	
EMS75510	PowerLogic T500 - AX160/C1	T500 combined analog module (8 inputs + 4 outputs) (Terms)
EMS75520	PowerLogic T500 - AX160/C2	T500 combined analog module (8 inputs + 4 outputs)

Accessories

Comm. Ref	Description	
REL70062	SFP ETH module RJ45	RJ45 SFP for LAN ports
REL70063	SFP ETH module multimode	Multimode 100Mbps fibre SFP for LAN ports
REL70064	SFP ETH module single mode	Single mode 100Mbps fibre SFP for LAN ports
EMS78100	PowerLogic T500 - TI180	T500 terminal block for DI180 (32x DI)
EMS78200	PowerLogic T500 - TO180/P0	T500 terminal block for DO180 (16x DO without relay)
EMS78320	PowerLogic T500 - TO180/P2	T500 terminal block for DO280 (with 16x relays at 24 Vdc)
EMS78330	PowerLogic T500 - TO180/P3	T500 terminal block for DO280 (with 16x relays at 48 Vdc)
EMS78340	PowerLogic T500 - TO180/H	T500 heavy duty terminal block for DO280 (16x relays at 24 Vdc)
EMS78400	PowerLogic T500 - TA160	T500 terminal block for AI160 or AX160 (8x AI)
EMS78500	PowerLogic T500 - TS160	T500 terminal block for AX160 (4x AO)
EMS78600	PowerLogic T500 - CX160	T500 terminal block cable (unshielded) (2.5 m)
EMS78610	PowerLogic T500 - CX160/S	T500 terminal block cable (shielded) (2.5 m)
EMS78910	PowerLogic T500 - CP020/C1	Unused T500 backplane connector dust cover (x2)
EMS78920	PowerLogic T500 - CP020/C2	Dust cover for unused DB9 connectors (2X)
EMS78930	PowerLogic T500 - CP020/C3	Dust cover for unused RJ45 connectors (2X)
EMS78940	PowerLogic T500 - CP020/C4	Dust cover for unused SFP connectors (2X)

TOOLS

www.se.com

This international web site allows you to access all the Schneider Electric solutions and product information via:

- Comprehensive descriptions
- Range datasheets
- A download area
- Product selectors

You can also access information dedicated to your business and contact your Schneider Electric country support.

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TOOLS

Web Selector

This site allows you to access Schneider Electric products in just two clicks via a comprehensive range of datasheets, with direct links to:

- Complete libraries: technical documents, catalogs, FAQs, brochures
- Selection guides from the e-catalog
- Product discovery sites and their animations

You will also find illustrated overviews, news to which you can subscribe, and a list of country contacts

Training

Training allows you to acquire the expertise (installation design, working with power on, etc.) to increase efficiency and improve customer service.

The training catalog includes beginner's courses in electrical distribution, knowledge of MV and LV switchgear, operation and maintenance of installations, and design of LV installations, to give a few examples.

www.se.com

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www.se.com

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