

# PowerLogic™ P7

Catalog 2026  
Network Protection and Control Devices



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Note: Electrical power systems are dangerous, protection relays are defined and governed by international standards such as IEC 60255 “Measuring relays and protective equipment” and IEEE C37.97 “Protective relay applications to power systems buses”. Never attempt to install or operate protection relays or associated equipment without the necessary qualifications, training and tools. Exposure to electrical arc-flash incidents can be life threatening, no situation can ever be deemed fully safe. Standards such as NFPA 70E define important risk categorization and such standards identify both distance from, and energy of the arc incident to be important factors.

This catalog does not replace the PowerLogic P7 user manual. For further information please see the user manual or contact your local Schneider Electric sales account.

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# General Contents

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# PowerLogic™ P7 Range Description

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# The PowerLogic™ P7 at a Glance



The PowerLogic™ P7 is a high-end protection and control device for most of your demanding protection applications. It offers unparalleled flexibility and digital performance for industry-leading protection relay functionality to secure your power system, improve network reliability and asset condition monitoring, all with advanced and modular connectivity. Part of the PowerLogic range of power monitoring and control solutions, PowerLogic P7 is built on more than 100 years of experience in protection relays, including Sepam, MiCOM, and Vamp ranges, renowned for their reliability and performance.

## Operational Efficiency and Digital Experience

- Tailor and adapt to customer needs throughout the device life cycle with a highly flexible, modular hardware and easy-to-expand application-oriented firmware leveraging a user-friendly licensing concept.
- Modular board design with plug and play concept enhances device maintenance and reduces installation downtime.
- Compliance with IEC 61850 Ed. 2.1 and Ed2.0 compatibility provides more efficient delivery, engineering, operation and maintenance with seamless integration in power automation systems.
- Combined stand-alone merging unit and breaker IED supporting to IEC 61869-13, IEC 61869-9, IEC 61850-9-2LE.
- Easily interact via the large and highly intuitive 7" color industrial touchscreen.

## Electrical Safety and Security

- Enhanced maintenance safety with current transformer auto-shortening capability.
- Reduced exposure to cyber threats with IEC62443 SL2 compliance.
- Condition-monitoring allows targeted maintenance to maximize asset life.
- Increased device robustness with IP54 front face and IK7 protected impact-strength design of the 7" touchscreen.

## Power Availability and Sustainability

- Avoid downtime with best-in-class, easily tailored protection applications.
- Adapt to network evolutions with new flexible firmware application concept.
- Future-ready, long-term solution built on more than 100 years of experience in protection relays.
- Versatile operation range with a mission profile of -40...85 °C (-40...185 °F) and suitable for harsh environment supporting storage and transportation up to -60 °C (-76 °F).

# Enjoy a Package of Sought-After Features in One Device



The PowerLogic P7 presents a major step forward for protection relays, bringing several best-in-class features together in one device.

## Advanced Cybersecurity

IEC 62443 SL2, the PowerLogic P7 has been designed with a native cybersecurity package. This means reduced exposure to cyber threats and improved operational security. By default, the PowerLogic P7 includes important features such as firmware signature, secure boot, LDAP/Radius communication, password management, port hardening, and secured communication compliant to the latest international standards.

## Modular, Flexible Design

Additional hardware like I/O cards, CT/VT modules, communication modules or accessories like RTD inputs or analogue I/O can be added at any time. In addition, the flexible application concept allows you to customize the PowerLogic P7 to your needs at any time of the product life cycle.

## Improved Recovery Time

When maintenance or testing is required, PowerLogic P7 significantly decreases outage time thanks to the intuitive HMI with clear and easily accessible device status information, plug and play boards, clear and simple slot numbering and removable wiring interfaces.

## Greater Connectivity

The protection relay features multiple communication protocols. This includes IEC 61850 Edition 2.1, Modbus (serial/TCP), and DNP3 (serial/TCP as well as IEC 60870-5-103 and IEC 61850 Ed2.0 compatibility). PowerLogic P7 can support up to 3 Ethernet protocols simultaneously, including offering redundancy with PRP/HSR and RSTP protocols. Optional Ethernet communication modules (SFP\*) can be added at any time, including on-site, during the product life cycle to allow you to upgrade your device in line with future network evolutions.

\* SFP – Small Form-factor pluggable module



# Comprehensive Digital Tools for Mobile, Tablet or Desktop

## PowerLogic™ Engineering Suite Saves Time, Improves Efficiency

- PowerLogic Engineering Suite is an easy-to-use, versatile tool with functionalities and features needed throughout the life cycle of Schneider Electric protection and control IEDs, including support for seamless integration into EcoStruxure Power and Grid.
- One Tool Suite for all connected products offline/online
- Flexible and adaptable for multiple personas
- User-experience driven with built in contextual help
- Modern ergonomic design
- Future-proof, IEC 61850 compliant

## Full Operation from a Safe Distance

Digital tools provide simpler installation, configuration, and maintenance, enabling smoother operations, saving both time and money. Digital tools include:

- **PowerLogic Engineering Suite** with our next generation of tools, for device and system architecture configuration, engineering and maintenance
- **mySchneider app** allows to access product information and documentation in a very simple way, just by flashing the QR code on the device
- **Enhance configuration and operation efficiency** through intuitive Schneider Electric Smart App for PowerLogic P7
- **Product Selector tool** helps the user during the selection and configuration steps to choose the right set of product options/features, according to the needs



As an EcoStruxure-ready solution, the PowerLogic P7's digital benefits can be taken even further with best-in-class monitoring of substation equipment health. For example, when paired with **EcoStruxure Asset Advisor**, users get data for predictive maintenance, which helps them reduce OpEx, speed up processes, and boost efficiency.

# Take PowerLogic™ P7 Further with EcoStruxure™

EcoStruxure, Schneider Electric's IoT-enabled, open and interoperable architecture and platform, brings together Connected Products, Edge Control, and Apps, Analytics & Services. EcoStruxure connected products deliver enhanced value around safety, reliability, efficiency, sustainability, and connectivity.

More than 450 000

EcoStruxure systems deployed since 2007 with the support of our 9,000 system integrators

## EcoStruxure ready



### Efficient asset management

Boost your efficiency and reduce downtime using predictive maintenance tools



### 24/7 connectivity

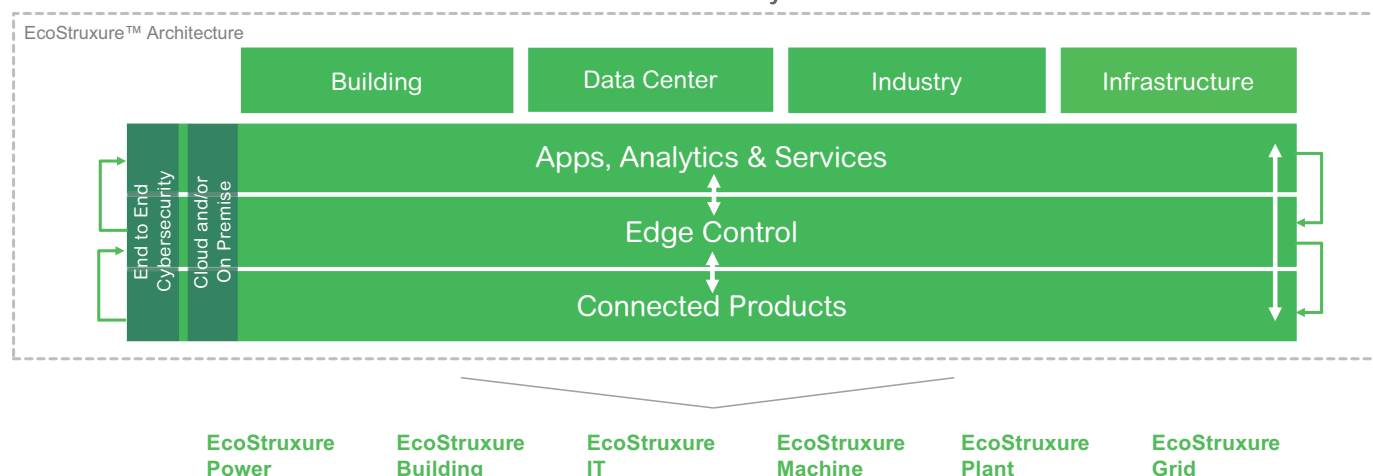
Make better-informed decisions with real-time data that's available everywhere, anytime



### Enhanced safety

Advanced features designed-in based on well-known designs, experience, and technology

**EcoStruxure™**  
Innovation At Every Level



PowerLogic™ P7 protection and control devices are based on state-of-the-art technology concepts and developed in close cooperation with customers, so it is built to meet your toughest demands:

- Flexible and modular design that allows the user to adapt the hardware and firmware to their needs.
- Embeds latest cybersecurity functionality to help prevent intentional misuse and cyber-threats.
- Fast and simple maintenance thanks to modularity and standardized boards and modules.

PowerLogic™ products are designed to be user friendly, a feature that is proven in our customer reports day after day. You'll benefit from features that include:

- A complete set of flexible, configurable protection and control functions related to the application.
- Switchgear control with tailorable single-line diagram, programmable function keys, LEDs, and customizable alarms.
- 7" color touchscreen with intuitive navigation concept.
- Easy-to-use Engineering tool for setting parameters, device configuration, and network fault analysis.
- Both serial and Ethernet communication, including Ethernet redundancy with RSTP/HSR/PRP/failover support.
- Efficient engineering thanks to IEC 61850 Edition 2.1.

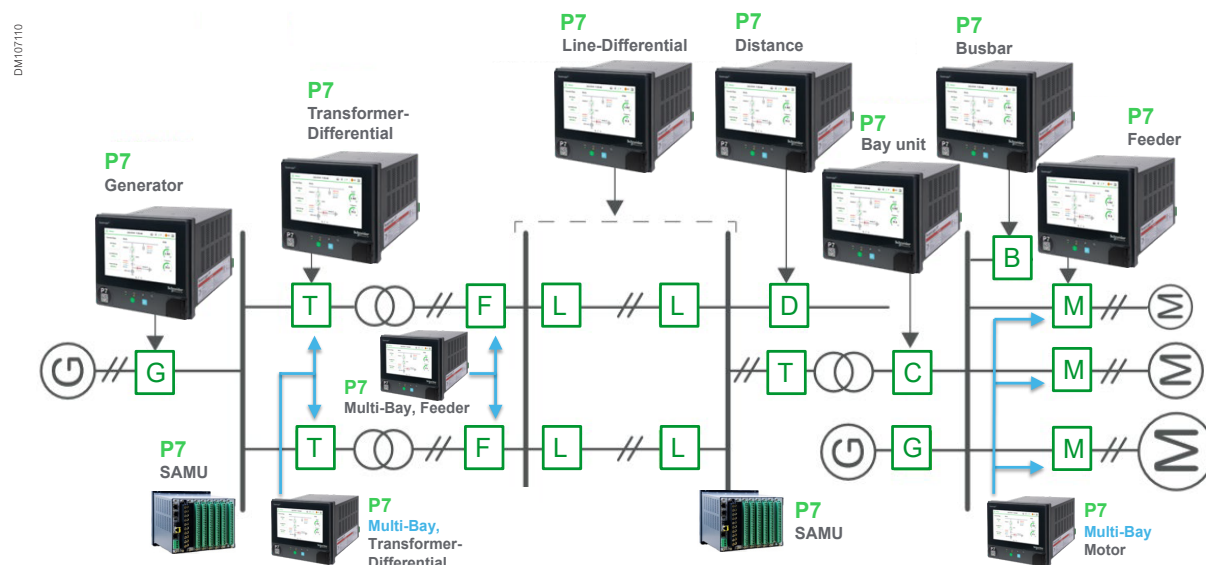


PowerLogic P7

PowerLogic™ P7 high-end protection and control devices are designed for electrical power systems in:

- Power and Grid:
  - Transmission Utilities
  - Distribution Utilities
  - Distributed Energy Resources
  - Wind/Solar Farm
- Critical Infrastructure:
  - Data Center
  - Transportation
- Energy and Chemicals:
  - Oil and Gas
  - Mining
  - Mineral and Metals

## Range Overview



Range overview shows future application scope

|                                                                                                                  |                                           | PowerLogic P7                                                                      |
|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------------------------------------------------|
| PowerLogic™ P7 provides specific functions to address your needs in a one-box design, regardless of application. |                                           |  |
| Feeder                                                                                                           |                                           | •                                                                                  |
| Motor                                                                                                            |                                           | •                                                                                  |
| Generator                                                                                                        |                                           | •                                                                                  |
| Transformer                                                                                                      |                                           | •                                                                                  |
| Stand-Alone Merging Unit                                                                                         |                                           | •                                                                                  |
| Line-Differential                                                                                                |                                           | •                                                                                  |
| Busbar Differential                                                                                              |                                           | •                                                                                  |
| Bay control unit                                                                                                 |                                           | •                                                                                  |
| Characteristics                                                                                                  |                                           |                                                                                    |
| Measuring inputs                                                                                                 | Current                                   | 5CT (1/5A) or 6CT (1/5A per analogue module, max. 3 modules)                       |
|                                                                                                                  | Core balance current                      | 1CT (1A) core balanced (5CT module incl.)                                          |
|                                                                                                                  | Voltage                                   | 4VT or 3VT per analogue module (max. 3 modules)                                    |
| Digital                                                                                                          | Inputs                                    | 8...104 (40TE)                                                                     |
|                                                                                                                  | Outputs                                   | 8...50 (40TE) + Watchdog (WD)                                                      |
|                                                                                                                  | HSHB outputs                              | 0...6 (DMC board)                                                                  |
| Temperature sensor input                                                                                         |                                           | 0...16 (external module)                                                           |
| Current loop input and output (mA)                                                                               |                                           | 0...4 (external module)                                                            |
| Front ports                                                                                                      |                                           | 1 mini-USB for configuration                                                       |
| Power supply                                                                                                     |                                           | 24...34 Vdc; 48...125 Vdc; 110...250 Vdc/ac                                        |
| Ambient temperature, in service                                                                                  |                                           | -40...85 °C (-40...185 °F)                                                         |
| Communication                                                                                                    |                                           |                                                                                    |
| DHMI port                                                                                                        |                                           | Only on wall mount version                                                         |
| Rear Ports                                                                                                       | Serial                                    | •                                                                                  |
|                                                                                                                  | Ethernet                                  | •                                                                                  |
|                                                                                                                  | Redundant Ethernet                        | Optional SFP modules                                                               |
| Protocols                                                                                                        | DNP3 Ethernet <sup>(3)</sup>              | •                                                                                  |
|                                                                                                                  | DNP3 serial <sup>(3)</sup>                | •                                                                                  |
|                                                                                                                  | Modbus Ethernet <sup>(3)</sup>            | •                                                                                  |
|                                                                                                                  | Modbus serial <sup>(3)</sup>              | •                                                                                  |
|                                                                                                                  | IEC 60870-5-103 <sup>(3)</sup>            | •                                                                                  |
|                                                                                                                  | IEC 61850 Ed2.1                           | •                                                                                  |
|                                                                                                                  | IEC 61850-9-2 LE                          | •                                                                                  |
|                                                                                                                  | IEC 61869-9                               | •                                                                                  |
| Redundancy protocols                                                                                             | RSTP                                      | •                                                                                  |
|                                                                                                                  | PRP / HSR                                 | •                                                                                  |
|                                                                                                                  | Failover                                  | •                                                                                  |
| Time synchronization                                                                                             | IRIG-B <sup>(1)</sup> , Protocol          | •                                                                                  |
|                                                                                                                  | SNTP, PTP IEEE 1588                       | •                                                                                  |
| Others                                                                                                           |                                           |                                                                                    |
| Control                                                                                                          |                                           | User configurable mimic                                                            |
| Logic (Matrix + Programmable Logic Equations)                                                                    |                                           | •                                                                                  |
| Cybersecurity according IEC 62443                                                                                |                                           | Security Level 2                                                                   |
| Modular hardware (board withdrawability)                                                                         |                                           | •                                                                                  |
| Mounting variants                                                                                                | Flush                                     | •                                                                                  |
|                                                                                                                  | Rack <sup>(2)</sup>                       | •                                                                                  |
|                                                                                                                  | Wall mounting with detachable HMI support | •                                                                                  |

(1) IRIG-B module is a separate accessory.

(2) Rack mounting frame is a separate accessory (REL70076).

(3) Not supported for P7S (SAMU).

## Function table

The function table gives an overview of product flexibility for different applications and the routing information for each function.

## Product flexibility

Product flexibility allows flexible functionality of the IED. The functions can be selected and loaded into the IED. The functionality is managed by assignment of flex points and is subject to a flex point budget.

The PowerLogic P7 device is pre-configured with basic functionality by default. Device functionality can be extended by adding functions and stages available in the application-specific function library. The additional functionality is subject to a flex point budget which varies by application level and the stage limit of each function. The flex point budget for each application levels are:

- Level 0: Up to 500 flex points.
- Level 1: Up to 1000 flex points.
- Level 2: Up to 1000 flex points.

The flex points for each function varies by the weight of the function. Every function type enabled will use the allocated points. Every stage will also use the allocated points. This means the first stage of any function will consume twice the points of the subsequent stages. The functions not allowing flexibility configuration are fixed and do not affect the flex points.

The flexibility configurability as well as the maximum number of stages for each function are listed in the “PowerLogic P7 Function Table” on page 16.

## Routing Information

The Routing information in “PowerLogic P7 Function Table” on page 16 defines the configurability of the CT/VT source or the analog inputs of the function.

- **Bay : Bay CT/VT routing**, which means the CT/VT source of the function is fixed to the bay. Bay CT/VT routing can be configured with PowerLogic Engineering Suite.
- **Routeable : Functional routing**, which means the CT/VT source of the function can be modified.
- **Flexible : Flexible analog routing**, which means the analog measurement inputs to the function can be flexibly selected.

**NOTE:** To avoid an invalid configuration, not all connections can be modified. When the default functional routing of PowerLogic P7 application or the bay routing for the bay function is modified, verify that the behavior is logical by testing the application.

# Selection Guide by Functionality

## PowerLogic P7 Function Table

| Maximum stage limit for main applications <sup>(2)</sup> |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
|----------------------------------------------------------|-----------|------------------------|----------------------------|-------|-----|-----|-----------|-----|-----|--------|-----|-----|--------------|
| Functions                                                | ANSI code | IEC 61850 Logical node | Flex config <sup>(1)</sup> | Motor |     |     | Generator |     |     | Feeder |     |     | CT/VT source |
|                                                          |           |                        |                            | L 0   | L 1 | L 2 | L 0       | L 1 | L 2 | L 0    | L 1 | L 2 |              |
| Current protection functions                             |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| Phase overcurrent                                        | 50/51     | PHPTOC                 | Yes                        | 32    | 32  | 32  | 32        | 32  | 32  | 32     | 32  | 32  | Routable     |
| Phase direction                                          | 67        | PHRDIR                 | Yes                        | 8     | 8   | 8   | 8         | 8   | 8   | 8      | 8   | 8   | Routable     |
| Ground fault overcurrent                                 | 50N/51N   | EFPTOC                 | Yes                        | 32    | 32  | 32  | 32        | 32  | 32  | 32     | 32  | 32  | Routable     |
| Ground direction                                         | 67N       | EFRDIR                 | Yes                        | 8     | 8   | 8   | 8         | 8   | 8   | 8      | 8   | 8   | Routable     |
| Sensitive ground fault overcurrent                       | 50SG/51SG | VSEFPTOC               | Yes                        | 32    | 32  | 32  | 32        | 32  | 32  | 32     | 32  | 32  | Routable     |
| Negative sequence overcurrent                            | 46        | NPSPTOC                | Yes                        | 32    | 32  | 32  | 32        | 32  | 32  | 32     | 32  | 32  | Routable     |
| Directional negative sequence overcurrent v2.3           | 67Q       | NPSRDIR                | Yes                        | 8     | 8   | 8   | 8         | 8   | 8   | 8      | 8   | 8   | Routable     |
| Inrush detection                                         | 68ID      | IDPHAR                 | Yes                        | 8     | 8   | 8   | 8         | 8   | 8   | 8      | 8   | 8   | Routable     |
| Selective overcurrent logic (SOL)                        | SOL       | SOLGAPC                | Yes                        | 1     | 1   | 1   | 1         | 1   | 1   | 1      | 1   | 1   | NA           |
| Phase undercurrent                                       | 37        | PHPTUC                 | Yes                        | 8     | 8   | 8   | 8         | 8   | 8   | 8      | 8   | 8   | Routable     |
| Voltage dependent overcurrent                            | 51V       | PHPVOC                 | Yes                        | -     | -   | -   | 8         | 8   | 8   | 8      | 8   | 8   | Routable     |
| Sensitive directional earth fault                        | 67SG/32N  | PSDE                   | Yes                        | 1     | 4   | 8   | 1         | 4   | 8   | 1      | 4   | 8   | Routable     |
| Switch on to fault                                       | SOTF      | PSOF                   | Yes                        | 1     | 1   | 1   | 1         | 1   | 1   | 1      | 1   | 1   | Routable     |
| Ground admittance                                        | 21YN      | EFPADM                 | Yes                        | -     | 8   | 8   | -         | 8   | 8   | -      | 8   | 8   | Routable     |
| Broken conductor v2.3                                    | 46BC      | BCPTOC                 | Yes                        | -     | 1   | 1   | -         | 1   | 1   | -      | 1   | 1   | Routable     |
| High speed instantaneous overcurrent v2.4                | 50        | PHPIOC                 | Yes                        | 1     | 4   | 8   | 1         | 4   | 8   | 1      | 4   | 8   | Routable     |
| Voltage protection functions                             |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| Phase overvoltage                                        | 59        | PHPTOV                 | Yes                        | 8     | 8   | 8   | 8         | 8   | 8   | 8      | 8   | 8   | Routable     |
| Neutral overvoltage                                      | 59N       | EFPTOV                 | Yes                        | 8     | 8   | 8   | 8         | 8   | 8   | 8      | 8   | 8   | Routable     |
| Positive phase sequence overvoltage                      | 59D       | PPSPTOV                | Yes                        | 8     | 8   | 8   | 8         | 8   | 8   | 8      | 8   | 8   | Routable     |
| Negative phase sequence overvoltage                      | 47        | NPSPTOV                | Yes                        | 8     | 8   | 8   | 8         | 8   | 8   | 8      | 8   | 8   | Routable     |
| Phase undervoltage                                       | 27        | PHPTUV                 | Yes                        | 8     | 8   | 8   | 8         | 8   | 8   | 8      | 8   | 8   | Routable     |
| Positive phase sequence undervoltage                     | 27D       | PPSPTUV                | Yes                        | 8     | 8   | 8   | 8         | 8   | 8   | 8      | 8   | 8   | Routable     |
| Overfluxing                                              | 24        | PVPH                   | Yes                        | -     | -   | -   | -         | 8   | 8   | -      | -   | -   | Routable     |
| Rate of voltage change v2.3                              | ROCOV     | PVRC                   | Yes                        | -     | -   | -   | -         | -   | -   | -      | 1   | 4   | Routable     |
| Voltage vector shift v2.4                                |           | VVSPAM                 | Yes                        | -     | -   | -   | -         | -   | -   | -      | 1   | 1   | Routable     |
| Reactive power controlled undervoltage v2.4              | 32/27     | DQPTUV                 | Yes                        | -     | -   | -   | -         | -   | -   | -      | 2   | 4   | Routable     |
| Frequency protection functions                           |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| Overfrequency                                            | 81O       | PTOF                   | Yes                        | 16    | 16  | 16  | 16        | 16  | 16  | 16     | 16  | 16  | Bay          |
| Underfrequency                                           | 81U       | PTUF                   | Yes                        | 16    | 16  | 16  | 16        | 16  | 16  | 16     | 16  | 16  | Bay          |
| Underfrequency load shedding v2.2                        | 81LS      | LSPTUF                 | Yes                        | -     | -   | -   | -         | -   | -   | -      | 1   | 1   | Bay          |
| Frequency rate of change                                 | 81R       | PFRC                   | Yes                        | 16    | 16  | 16  | 16        | 16  | 16  | 16     | 16  | 16  | Bay          |
| Differential protection functions                        |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| High impedance diff                                      | 87/64G    | HIZPDIF                | Yes                        | -     | 1   | 1   | -         | 1   | 1   | -      | 1   | 1   | Routable     |
| Bias Differential                                        | 87        | PHPDIF                 | Yes                        | -     | 1   | 1   | -         | 1   | 1   | -      | -   | 1   | Routable     |
| Restricted ground fault                                  | 64G       | RGFPDIF                | Yes                        | -     | 1   | 1   | -         | 1   | 1   | -      | 1   | 1   | Routable     |
| Basic transformer Differential v2.2                      | 87T       | TR2PDIF                | Yes                        | -     | 1   | 1   | -         | 1   | 1   | -      | -   | -   | Routable     |
| Advanced transformer Differential v2.2                   | 87T       | TR3PDIF                | Yes                        | -     | -   | -   | -         | -   | 1   | -      | -   | -   | Routable     |
| Line differential v2.4                                   | 87L       | L2DIF                  | Yes                        | -     | -   | -   | -         | -   | -   | -      | -   | -   | Routable     |

# Selection Guide by Functionality

## PowerLogic P7 Function Table (cont'd)

| Maximum stage limit for main applications <sup>(2)</sup> |           |                        |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
|----------------------------------------------------------|-----------|------------------------|----------------------------|-------------------|----|----|-------------|----|----|--------|----|----|---------------------|----|----|----------------|----|----|--------------|
| Function                                                 | ANSI code | IEC 61850 Logical node | Flex config <sup>(1)</sup> | Line differential |    |    | Transformer |    |    | Busbar |    |    | SAMU <sup>(5)</sup> |    |    | Bay controller |    |    | CT/VT source |
|                                                          |           |                        |                            | L0                | L1 | L2 | L0          | L1 | L2 | L0     | L1 | L2 | L0                  | L1 | L2 | L0             | L1 | L2 |              |
| Current protection functions                             |           |                        |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
| Phase overcurrent                                        | 50/51     | PHPTOC                 | Yes                        | 32                | 32 | 32 | 32          | 32 | 32 | 6      | 18 | 32 | 2                   | 4  | 8  | -              | -  | -  | Routable     |
| Phase direction                                          | 67        | PHRDIR                 | Yes                        | 8                 | 8  | 8  | 8           | 8  | 8  | 1      | 4  | 8  | -                   | 2  | 2  | -              | -  | -  | Routable     |
| Ground fault overcurrent                                 | 50N/51N   | EFPTOC                 | Yes                        | 32                | 32 | 32 | 32          | 32 | 32 | 6      | 18 | 32 | 2                   | 4  | 8  | -              | -  | -  | Routable     |
| Ground direction                                         | 67N       | EFRDIR                 | Yes                        | 8                 | 8  | 8  | 8           | 8  | 8  | 1      | 4  | 8  | -                   | 2  | 2  | -              | -  | -  | Routable     |
| Sensitive ground fault overcurrent                       | 50SG/51SG | VSEFP-TOC              | Yes                        | 32                | 32 | 32 | 32          | 32 | 32 | -      | -  | -  | -                   | 4  | 8  | -              | -  | -  | Routable     |
| Negative sequence overcurrent                            | 46        | NPSPTOC                | Yes                        | 32                | 32 | 32 | 32          | 32 | 32 | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |
| Directional negative sequence overcurrent v2.3           | 67Q       | NPSRDIR                | Yes                        | 8                 | 8  | 8  | 8           | 8  | 8  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |
| Inrush detection                                         | 68ID      | IDPHAR                 | Yes                        | 8                 | 8  | 8  | 8           | 8  | 8  | -      | -  | -  | -                   | -  | 2  | -              | -  | -  | Routable     |
| Selective overcurrent logic (SOL)                        | SOL       | SOL-GAPC               | Yes                        | 1                 | 1  | 1  | 1           | 1  | 1  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | NA           |
| Phase undercurrent                                       | 37        | PHPTUC                 | Yes                        | 8                 | 8  | 8  | 8           | 8  | 8  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |
| Voltage dependent overcurrent                            | 51V       | PHPVOC                 | Yes                        | 8                 | 8  | 8  | 8           | 8  | 8  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |
| Sensitive directional earth fault                        | 67SG/32N  | PSDE                   | Yes                        | 1                 | 4  | 8  | 1           | 4  | 8  | -      | -  | -  | -                   | -  | 1  | -              | -  | -  | Routable     |
| Switch on to fault                                       | SOTF      | PSOF                   | Yes                        | 1                 | 1  | 1  | 1           | 1  | 1  | -      | -  | -  | -                   | -  | 1  | -              | -  | -  | Routable     |
| Ground admittance                                        | 21YN      | EFPADM                 | Yes                        | -                 | 8  | 8  | -           | 8  | 8  | -      | -  | -  | -                   | -  | 1  | -              | -  | -  | Routable     |
| Broken conductor v2.3                                    | 46BC      | BCPTOC                 | Yes                        | -                 | 1  | 1  | -           | 1  | 1  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |
| High speed instantaneous overcurrent v2.4                | 50        | PHPIOC                 | Yes                        | 1                 | 4  | 8  | 1           | 4  | 8  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |
| Voltage protection functions                             |           |                        |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
| Phase overvoltage                                        | 59        | PHPTOV                 | Yes                        | 8                 | 8  | 8  | 8           | 8  | 8  | 8      | 8  | 8  | -                   | 2  | 2  | -              | -  | -  | Routable     |
| Neutral overvoltage                                      | 59N       | EFPTOV                 | Yes                        | 8                 | 8  | 8  | 8           | 8  | 8  | 8      | 8  | 8  | -                   | -  | 2  | -              | -  | -  | Routable     |
| Positive phase sequence overvoltage                      | 59D       | PPSPTOV                | Yes                        | 8                 | 8  | 8  | 8           | 8  | 8  | 8      | 8  | 8  | -                   | -  | 2  | -              | -  | -  | Routable     |
| Negative phase sequence overvoltage                      | 47        | NPSPTOV                | Yes                        | 8                 | 8  | 8  | 8           | 8  | 8  | 8      | 8  | 8  | -                   | -  | 2  | -              | -  | -  | Routable     |
| Phase undervoltage                                       | 27        | PHPTUV                 | Yes                        | 8                 | 8  | 8  | 8           | 8  | 8  | 8      | 8  | 8  | -                   | 2  | 2  | -              | -  | -  | Routable     |
| Positive phase sequence undervoltage                     | 27D       | PPSPTUV                | Yes                        | 8                 | 8  | 8  | 8           | 8  | 8  | 8      | 8  | 8  | -                   | -  | 2  | -              | -  | -  | Routable     |
| Overfluxing                                              | 24        | PVPH                   | Yes                        | -                 | -  | -  | 8           | 8  | 8  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |
| Rate of voltage change v2.3                              | ROCOV     | PVRC                   | Yes                        | -                 | 1  | 4  | -           | -  | -  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |
| Voltage vector shift v2.4                                |           | VVSP-PAM               | Yes                        | -                 | 1  | 1  | -           | -  | -  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |
| Reactive power controlled undervoltage v2.4              | 32/27     | DQPTUV                 | Yes                        | -                 | 2  | 4  | -           | -  | -  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |
| Frequency protection functions                           |           |                        |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
| Overfrequency                                            | 81O       | PTOF                   | Yes                        | 16                | 16 | 16 | 16          | 16 | 16 | 16     | 16 | 16 | -                   | 4  | 4  | -              | -  | -  | Bay          |
| Underfrequency                                           | 81U       | PTUF                   | Yes                        | 16                | 16 | 16 | 16          | 16 | 16 | 16     | 16 | 16 | -                   | 4  | 4  | -              | -  | -  | Bay          |
| Underfrequency load shedding v2.2                        | 81LS      | LSPTUF                 | Yes                        | -                 | 1  | 1  | -           | -  | -  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Bay          |
| Frequency rate of change                                 | 81R       | PFRC                   | Yes                        | 16                | 16 | 16 | 16          | 16 | 16 | 16     | 16 | 16 | -                   | 2  | 4  | -              | -  | -  | Bay          |
| Differential protection functions                        |           |                        |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
| High impedance diff                                      | 87/64G    | HIZPDIF                | Yes                        | -                 | 1  | 1  | -           | 1  | 1  | 1      | 1  | 1  | -                   | -  | -  | -              | -  | -  | Routable     |
| Bias Differential                                        | 87        | PHPDIF                 | Yes                        | -                 | -  | 1  | -           | -  | 1  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |
| Restricted ground fault                                  | 64G       | RGFPDIF                | Yes                        | -                 | 1  | 1  | 2           | 3  | 3  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |
| Basic transformer Differential v2.2                      | 87T       | TR2PDIF                | Yes                        | -                 | -  | -  | 1           | 1  | 1  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |
| Advanced transformer Differential v2.2                   | 87T       | TR3PDIF                | Yes                        | -                 | -  | -  | -           | 1  | 1  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |
| Line differential v2.4                                   | 87L       | L2DIF                  | Yes                        | 1                 | 1  | 1  | -           | -  | -  | -      | -  | -  | -                   | -  | -  | -              | -  | -  | Routable     |

# Selection Guide by Functionality

## PowerLogic P7 Function Table (cont'd)

| Maximum stage limit for main applications <sup>(2)</sup> |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
|----------------------------------------------------------|-----------|------------------------|----------------------------|-------|-----|-----|-----------|-----|-----|--------|-----|-----|--------------|
| Functions                                                | ANSI code | IEC 61850 Logical node | Flex config <sup>(1)</sup> | Motor |     |     | Generator |     |     | Feeder |     |     | CT/VT source |
|                                                          |           |                        |                            | L 0   | L 1 | L 2 | L 0       | L 1 | L 2 | L 0    | L 1 | L 2 |              |
| Temperature protection functions                         |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| Motor thermal overload                                   | 49M       | THM <b>PTTR</b>        | Yes                        | 1     | 1   | 1   | -         | -   | -   | -      | -   | -   | Routable     |
| Thermal overload                                         | 49        | THF <b>PTTR</b>        | Yes                        | -     | -   | -   | 1         | 4   | 8   | 1      | 4   | 8   | Routable     |
| Overtemperature                                          | 38/49RTD  | <b>STMP</b>            | Yes                        | 16    | 16  | 16  | 16        | 16  | 16  | -      | 16  | 16  | Flexible     |
| Machine unbalance                                        | 46        | NPS <b>PTTR</b>        | Yes                        | 1     | 1   | 1   | 1         | 1   | 1   | -      | -   | -   | Routable     |
| Motor protection functions                               |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| Motor monitoring                                         |           | <b>ZMOT</b>            | Yes                        | 1*    | 1*  | 1*  | -         | -   | -   | -      | -   | -   | Routable     |
| Motor start supervision                                  | 48        | <b>PMSS</b>            | Yes                        | 1     | 4   | 8   | -         | -   | -   | -      | -   | -   | Routable     |
| Locked rotor                                             | 51LR      | JAM <b>PTOC</b>        | Yes                        | 1     | 4   | 8   | -         | -   | -   | -      | -   | -   | Routable     |
| Motor restart inhibit                                    | 66        | <b>PMRI</b>            | Yes                        | 1     | 4   | 8   | -         | -   | -   | -      | -   | -   | NA           |
| Voltage check                                            | 47        | VC <b>PTUV</b>         | Yes                        | 1     | 4   | 8   | -         | -   | -   | -      | -   | -   | Routable     |
| Generator protection functions                           |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| Third harmonic undervoltage                              | 27TN      | ST <b>PTUV</b>         | Yes                        | -     | -   | -   | -         | 1   | 1   | -      | -   | -   | Routable     |
| Interturn overvoltage                                    | 59IT      | IT <b>PTOV</b>         | Yes                        | -     | -   | -   | -         | 1   | 1   | -      | -   | -   | Routable     |
| Interturn overcurrent                                    | 50SP      | IT <b>PDIF</b>         | Yes                        | -     | -   | -   | -         | 1   | 1   | -      | -   | -   | Routable     |
| Inadvertent energization                                 | 50/27     | IE <b>PIOC</b>         | Yes                        | -     | -   | -   | -         | 1   | 1   | -      | -   | -   | Routable     |
| Speed protection functions                               |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| Overspeed                                                | 12        | <b>POVS</b>            | Yes                        | -     | 2   | 2   | -         | 2   | 2   | -      | -   | -   | NA           |
| Underspeed                                               | 14        | <b>PZSU</b>            | Yes                        | -     | 2   | 2   | -         | 2   | 2   | -      | -   | -   | NA           |
| Zerospeed                                                | 14        | <b>ZEROPZSU</b>        | Yes                        | -     | 1   | 1   | -         | 1   | 1   | -      | -   | -   | NA           |
| Machine speed                                            |           | <b>TRTN</b>            | Fixed                      | ■     | ■   | ■   | -         | ■   | ■   | -      | -   | -   | NA           |
| Impedance protection functions                           |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| Field failure                                            | 40        | FF <b>PDIS</b>         | Yes                        | -     | 1   | 1   | -         | 1   | 1   | -      | -   | -   | Routable     |
| Underimpedance                                           | 21        | UZ <b>PDIS</b>         | Yes                        | -     | -   | -   | -         | 1   | 1   | -      | 1   | 1   | Routable     |
| Out of step                                              | 78        | OOS <b>PPAM</b>        | Yes                        | -     | 1   | 1   | -         | 1   | 1   | -      | -   | -   | Routable     |
| Capacitor protection functions                           |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| Capacitor bank monitoring v2.3                           |           | <b>ZCAP</b>            | Yes                        | -     | -   | -   | -         | -   | -   | -      | 1   | 1   | Routable     |
| Capacitor overvoltage v2.3                               | 59C       | CAP <b>PTOV</b>        | Yes                        | -     | -   | -   | -         | -   | -   | -      | 1   | 1   | Routable     |
| Capacitor unbalance v2.3                                 | 51C       | UIBC <b>PTOC</b>       | Yes                        | -     | -   | -   | -         | -   | -   | -      | 3   | 12  | Routable     |
| Busbar protection functions                              |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| Busbar differential v2.4                                 | 87B       | BB <b>PDIF</b>         | Yes                        | -     | -   | -   | -         | -   | -   | -      | -   | -   | Routable     |
| Busbar zone v2.4                                         | 87B       | BZ <b>PDIF</b>         | Yes                        | -     | -   | -   | -         | -   | -   | -      | -   | -   | Routable     |
| Busbar coupler v2.4                                      | 87B/86    | BC <b>PTRC</b>         | Yes                        | -     | -   | -   | -         | -   | -   | -      | -   | -   | Routable     |
| Busbar feeder v2.4                                       | 87B/86    | BF <b>PTRC</b>         | Yes                        | -     | -   | -   | -         | -   | -   | -      | -   | -   | Routable     |

# Selection Guide by Functionality

## PowerLogic P7 Function Table (cont'd)

| Maximum stage limit for main applications <sup>(2)</sup> |           |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |
|----------------------------------------------------------|-----------|------------------------|----------------------------|-------------------|-----|-----|-------------|-----|-----|--------|-----|-----|---------------------|-----|-----|----------------|-----|-----|--------------|
| Functions                                                | ANSI code | IEC 61850 Logical node | Flex config <sup>(1)</sup> | Line differential |     |     | Transformer |     |     | Busbar |     |     | SAMU <sup>(5)</sup> |     |     | Bay controller |     |     | CT/VT source |
|                                                          |           |                        |                            | L 0               | L 1 | L 2 | L 0         | L 1 | L 2 | L 0    | L 1 | L 2 | L 0                 | L 1 | L 2 | L 0            | L 1 | L 2 |              |
| Temperature protection functions                         |           |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |
| Motor thermal overload                                   | 49M       | THM <b>PTTR</b>        | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Thermal overload                                         | 49        | THF <b>PTTR</b>        | Yes                        | 1                 | 4   | 8   | -           | 4   | 8   | -      | -   | -   | -                   | -   | 1   | -              | -   | -   | Routable     |
| Overtemperature                                          | 38/49RTD  | <b>STMP</b>            | Yes                        | -                 | 16  | 16  | -           | 16  | 16  | -      | 16  | 16  | -                   | 8   | 8   | -              | -   | -   | Flexible     |
| Machine unbalance                                        | 46        | NPS <b>PTTR</b>        | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Motor protection functions                               |           |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |
| Motor monitoring                                         |           | <b>ZMOT</b>            | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Motor start supervision                                  | 48        | <b>PMSS</b>            | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Locked rotor                                             | 51LR      | JAM <b>PTOC</b>        | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Motor restart inhibit                                    | 66        | <b>PMRI</b>            | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | NA           |
| Voltage check                                            | 47        | VC <b>PTUV</b>         | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Generator protection functions                           |           |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |
| Third harmonic undervoltage                              | 27TN      | ST <b>PTUV</b>         | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Interturn overvoltage                                    | 59IT      | IT <b>PTOV</b>         | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Interturn overcurrent                                    | 50SP      | IT <b>PDIF</b>         | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Inadvertent energization                                 | 50/27     | IE <b>PIOC</b>         | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Speed protection functions                               |           |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |
| Overspeed                                                | 12        | <b>POVS</b>            | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | NA           |
| Underspeed                                               | 14        | <b>PZSU</b>            | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | NA           |
| Zerospeed                                                | 14        | <b>ZEROPZ-SU</b>       | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | NA           |
| Machine speed                                            |           | <b>TRTN</b>            | Fixed                      | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | ■   | ■   | -              | -   | -   | NA           |
| Impedance/lineprotection functions                       |           |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |
| Field failure                                            | 40        | FF <b>PDIS</b>         | Yes                        | -                 | -   | -   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Underimpedance                                           | 21        | UZ <b>PDIS</b>         | Yes                        | -                 | 1   | 1   | -           | 1   | 1   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Out of step                                              | 78        | OOSP- <b>PAM</b>       | Yes                        | -                 | 1   | 1   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Capacitor protection functions                           |           |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |
| Capacitor bank monitoring v2.3                           |           | <b>ZCAP</b>            | Yes                        | -                 | 1   | 1   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | 1   | Routable     |
| Capacitor overvoltage v2.3                               | 59C       | CAP <b>PTOV</b>        | Yes                        | -                 | 1   | 1   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Capacitor unbalance v2.3                                 | 51C       | UIBCP- <b>TOC</b>      | Yes                        | -                 | 3   | 12  | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Routable     |
| Busbar protection functions                              |           |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |
| Busbar differential v2.4                                 | 87B       | BB <b>PDIF</b>         | Yes                        | -                 | -   | -   | -           | -   | -   | 1      | 1   | 1   | -                   | -   | -   | -              | -   | -   | Routable     |
| Busbar zone v2.4                                         | 87B       | BZ <b>PDIF</b>         | Yes                        | -                 | -   | -   | -           | -   | -   | 2      | 4   | 8   | -                   | -   | -   | -              | -   | -   | Routable     |
| Busbar coupler v2.4                                      | 87B/86    | BC <b>PTRC</b>         | Yes                        | -                 | -   | -   | -           | -   | -   | 1      | 4   | 8   | -                   | -   | -   | -              | -   | -   | Routable     |
| Busbar feeder v2.4                                       | 87B/86    | BF <b>PTRC</b>         | Yes                        | -                 | -   | -   | -           | -   | -   | 18     | 32  | 32  | -                   | -   | -   | -              | -   | -   | Routable     |

# Selection Guide by Functionality

## PowerLogic P7 Function Table (cont'd)

| Maximum stage limit for main applications <sup>(2)</sup> |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
|----------------------------------------------------------|-----------|------------------------|----------------------------|-------|-----|-----|-----------|-----|-----|--------|-----|-----|--------------|
| Functions                                                | ANSI code | IEC 61850 Logical node | Flex config <sup>(1)</sup> | Motor |     |     | Generator |     |     | Feeder |     |     | CT/VT source |
|                                                          |           |                        |                            | L 0   | L 1 | L 2 | L 0       | L 1 | L 2 | L 0    | L 1 | L 2 |              |
| Power protection functions                               |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| Overpower                                                | 32P       | PPDOP                  | Yes                        | 32    | 32  | 32  | 32        | 32  | 32  | 32     | 32  | 32  | Bay          |
| Reactive overpower                                       | 32Q       | QPDOP                  | Yes                        | 32    | 32  | 32  | 32        | 32  | 32  | 32     | 32  | 32  | Bay          |
| Underpower                                               | 37P       | PPDUP                  | Yes                        | 32    | 32  | 32  | 32        | 32  | 32  | 32     | 32  | 32  | Bay          |
| Monitoring functions                                     |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| Trip conditioner                                         | 86        | PTRC                   | Yes                        | 8     | 8   | 8   | 8         | 8   | 8   | 8      | 8   | 8   | NA           |
| Battery monitoring <sup>(4)</sup>                        |           | ZBAT                   | Fixed                      | ■     | ■   | ■   | ■         | ■   | ■   | ■      | ■   | ■   | NA           |
| Bay status                                               |           | PDGAPC                 | Fixed                      | ■     | ■   | ■   | ■         | ■   | ■   | ■      | ■   | ■   | Bay          |
| Programmable stage v2.2                                  |           | PSGAPC                 | Yes                        | 32    | 32  | 32  | 32        | 32  | 32  | 32     | 32  | 32  | Flexible     |
| Temperature <sup>(4)</sup>                               |           | RTD TTMP               | Fixed                      | ■     | ■   | ■   | ■         | ■   | ■   | ■      | ■   | ■   | NA           |
| Current loop (mA) input v2.2 <sup>(4)</sup>              |           | CLTGSN                 | Fixed                      | ■     | ■   | ■   | ■         | ■   | ■   | ■      | ■   | ■   | NA           |
| Current loop (mA) output v2.3 <sup>(4)</sup>             |           | CLGGIO                 | Fixed                      | ■     | ■   | ■   | ■         | ■   | ■   | ■      | ■   | ■   | Flexible     |

# Selection Guide by Functionality

## PowerLogic P7 Function Table (cont'd)

| Maximum stage limit for main applications <sup>(2)</sup> |           |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |
|----------------------------------------------------------|-----------|------------------------|----------------------------|-------------------|-----|-----|-------------|-----|-----|--------|-----|-----|---------------------|-----|-----|----------------|-----|-----|--------------|
| Functions                                                | ANSI code | IEC 61850 Logical node | Flex config <sup>(1)</sup> | Line differential |     |     | Transformer |     |     | Busbar |     |     | SAMU <sup>(5)</sup> |     |     | Bay controller |     |     | CT/VT source |
|                                                          |           |                        |                            | L 0               | L 1 | L 2 | L 0         | L 1 | L 2 | L 0    | L 1 | L 2 | L 0                 | L 1 | L 2 | L 0            | L 1 | L 2 |              |
| Power protection functions                               |           |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |
| Overpower                                                | 32P       | <b>PPDOP</b>           | Yes                        | 32                | 32  | 32  | 32          | 32  | 32  | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Bay          |
| Reactive overpower                                       | 32Q       | <b>QPDOP</b>           | Yes                        | 32                | 32  | 32  | 32          | 32  | 32  | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Bay          |
| Underpower                                               | 37P       | <b>PPDUP</b>           | Yes                        | 32                | 32  | 32  | 32          | 32  | 32  | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Bay          |
| Monitoring functions                                     |           |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |
| Trip conditioner                                         | 86        | <b>PTRC</b>            | Yes                        | 8                 | 8   | 8   | 8           | 8   | 8   | 8      | 8   | 8   | 8                   | 8   | 8   | -              | -   | -   | NA           |
| Battery monitoring <sup>(4)</sup>                        |           | <b>ZBAT</b>            | Fixed                      | ■                 | ■   | ■   | ■           | ■   | ■   | ■      | ■   | ■   | ■                   | ■   | ■   | ■              | ■   | ■   | NA           |
| Bay status                                               |           | PDGAPC                 | Fixed                      | ■                 | ■   | ■   | ■           | ■   | ■   | ■      | ■   | ■   | ■                   | ■   | ■   | ■              | ■   | ■   | Bay          |
| Programmable stage v2.2                                  |           | <b>PSGAPC</b>          | Yes                        | 32                | 32  | 32  | 32          | 32  | 32  | 32     | 32  | 32  | 4                   | 4   | 4   | 32             | 32  | 32  | Flexible     |
| Temperature <sup>(4)</sup>                               |           | <b>RTD TTMP</b>        | Fixed                      | ■                 | ■   | ■   | ■           | ■   | ■   | ■      | ■   | ■   | ■                   | ■   | ■   | ■              | ■   | ■   | NA           |
| Current loop (mA) input v2.2 <sup>(4)</sup>              |           | <b>CLTGSN</b>          | Fixed                      | ■                 | ■   | ■   | ■           | ■   | ■   | ■      | ■   | ■   | ■                   | ■   | ■   | ■              | ■   | ■   | NA           |
| Current loop (mA) output v2.3 <sup>(4)</sup>             |           | <b>CLGGIO</b>          | Fixed                      | ■                 | ■   | ■   | ■           | ■   | ■   | ■      | ■   | ■   | ■                   | ■   | ■   | ■              | ■   | ■   | Flexible     |

# Selection Guide by Functionality

## PowerLogic P7 Function Table (cont'd)

| Maximum stage limit for main applications <sup>(2)</sup> |                              |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
|----------------------------------------------------------|------------------------------|-----------|------------------------|----------------------------|-------|-----|-----|-----------|-----|-----|--------|-----|-----|--------------|
| Functions                                                |                              | ANSI code | IEC 61850 Logical node | Flex config <sup>(1)</sup> | Motor |     |     | Generator |     |     | Feeder |     |     | CT/VT source |
|                                                          |                              |           |                        |                            | L 0   | L 1 | L 2 | L 0       | L 1 | L 2 | L 0    | L 1 | L 2 |              |
| Control functions                                        |                              |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| CB group                                                 | Circuit breaker proxy        | 52        | CB <del>X</del> CBR    | Yes                        | 1     | 4   | 8   | 1         | 4   | 8   | 1      | 4   | 8   | Routable     |
|                                                          | Circuit breaker control      |           | CB <del>C</del> SWI    |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | Circuit breaker interlocking |           | CB <del>C</del> ILO    |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | Circuit breaker supervision  |           | CB <del>S</del> CBR    |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | Circuit breaker failure      | 50BF      | <del>R</del> BRF       |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | CB three phase recloser      | 79        | <del>T</del> RIRREC    |                            |       |     |     |           |     |     |        |     |     |              |
| Basic CB group v2.4                                      | Basic CB proxy               | 52        | CB <del>X</del> CBR    | Yes                        | -     | -   | -   | -         | -   | -   | -      | -   | -   | Routable     |
|                                                          | Basic CB control             |           | CB <del>C</del> SWI    |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | Basic CB interlocking        |           | CB <del>C</del> ILO    |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | Basic CB supervision         |           | CB <del>S</del> CBR    |                            |       |     |     |           |     |     |        |     |     |              |
| Switch group                                             | Switch proxy                 | 89        | SW <del>X</del> SWI    | Yes                        | 5     | 20  | 40  | 5         | 20  | 40  | 5      | 20  | 40  | NA           |
|                                                          | Switch control               |           | SW <del>C</del> SWI    |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | Switch interlocking          |           | SW <del>C</del> ILO    |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | Switch supervision           |           | SW <del>S</del> SWI    |                            |       |     |     |           |     |     |        |     |     |              |
| Position indication v2.4                                 |                              | 52/89     | <del>D</del> PGGIO     | Yes                        | 96    | 96  | 96  | 96        | 96  | 96  | 96     | 96  | 96  | NA           |
| Synchro-check                                            |                              | 25        | <del>R</del> SYN       | Yes                        | -     | -   | -   | 1         | 4   | 8   | 1      | 4   | 8   | Routable     |
| Tap changer control v2.3                                 |                              | 84        | <del>Y</del> LTC       | Yes                        | -     | -   | -   | -         | -   | -   | -      | -   | -   | NA           |

# Selection Guide by Functionality

## PowerLogic P7 Function Table (cont'd)

| Maximum stage limit for main applications <sup>(2)</sup> |                              |           |                        |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
|----------------------------------------------------------|------------------------------|-----------|------------------------|----------------------------|-------------------|----|----|-------------|----|----|--------|----|----|---------------------|----|----|----------------|----|----|--------------|
| Functions                                                |                              | ANSI code | IEC 61850 Logical node | Flex config <sup>(1)</sup> | Line differential |    |    | Transformer |    |    | Busbar |    |    | SAMU <sup>(5)</sup> |    |    | Bay controller |    |    | CT/VT source |
|                                                          |                              |           |                        |                            | L0                | L1 | L2 | L0          | L1 | L2 | L0     | L1 | L2 | L0                  | L1 | L2 | L0             | L1 | L2 |              |
| Control functions                                        |                              |           |                        |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
| CB group                                                 | Circuit breaker proxy        | 52        | CB <del>X</del> CBR    | Yes                        | 1                 | 4  | 8  | 1           | 4  | 8  | 6      | 18 | 32 | 1                   | 4  | 8  | 1              | 4  | 8  | Routable     |
|                                                          | Circuit breaker control      |           | CB <del>C</del> SWI    |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
|                                                          | Circuit breaker interlocking |           | CB <del>C</del> ILO    |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
|                                                          | Circuit breaker supervision  |           | CB <del>S</del> CBR    |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
|                                                          | Circuit breaker failure      | 50BF      | <del>R</del> BRF       |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
|                                                          | CB three phase re-closer     | 79        | <del>T</del> RIRREC    |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
| Basic CB group v2.4                                      | Basic CB proxy               | 52        | CB <del>X</del> CBR    | Yes                        | -                 | -  | -  | -           | -  | -  | -      | -  | -  | -                   | -  | -  | 2              | 8  | 32 | Routable     |
|                                                          | Basic CB control             |           | CB <del>C</del> SWI    |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
|                                                          | Basic CB interlocking        |           | CB <del>C</del> ILO    |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
|                                                          | Basic CB supervision         |           | CB <del>S</del> CBR    |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
| Switch group                                             | Switch proxy                 | 89        | SW <del>X</del> SWI    | Yes                        | 5                 | 20 | 40 | 5           | 20 | 40 | 36     | 64 | 64 | 5                   | 20 | 40 | 10             | 40 | 96 | NA           |
|                                                          | Switch control               |           | SW <del>C</del> SWI    |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
|                                                          | Switch inter-locking         |           | SW <del>C</del> ILO    |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
|                                                          | Switch super-vision          |           | SW <del>S</del> SWI    |                            |                   |    |    |             |    |    |        |    |    |                     |    |    |                |    |    |              |
| Position indication v2.4                                 |                              | 52/89     | <del>D</del> PGGIO     | Yes                        | 96                | 96 | 96 | 96          | 96 | 96 | 96     | 96 | 96 | -                   | -  | -  | 96             | 96 | 96 | NA           |
| Synchro-check                                            |                              | 25        | <del>R</del> SYN       | Yes                        | 1                 | 4  | 8  | -           | 4  | 8  | -      | 4  | 8  | -                   | -  | -  | 1              | 4  | 8  | Routable     |
| Tap changer control v2.3                                 |                              | 84        | <del>Y</del> LTC       | Yes                        | -                 | -  | -  | -           | 1  | 1  | -      | -  | -  | -                   | -  | -  | 1              | 1  | 1  | NA           |

# Selection Guide by Functionality

## PowerLogic P7 Function Table (cont'd)

| Maximum stage limit for main applications <sup>(2)</sup> |                                   |                        |                            |       |     |     |           |     |     |        |     |     |              |          |
|----------------------------------------------------------|-----------------------------------|------------------------|----------------------------|-------|-----|-----|-----------|-----|-----|--------|-----|-----|--------------|----------|
| Functions                                                | ANSI code                         | IEC 61850 Logical node | Flex config <sup>(1)</sup> | Motor |     |     | Generator |     |     | Feeder |     |     | CT/VT source |          |
|                                                          |                                   |                        |                            | L 0   | L 1 | L 2 | L 0       | L 1 | L 2 | L 0    | L 1 | L 2 |              |          |
| Logs and records                                         |                                   |                        |                            |       |     |     |           |     |     |        |     |     |              |          |
| Sequence of event record                                 |                                   | GEN <b>GLOG</b>        | Fixed _                    | ■     | ■   | ■   | ■         | ■   | ■   | ■      | ■   | ■   | NA           |          |
| Operation log                                            |                                   | GEN <b>GLOG</b>        | Fixed                      | ■     | ■   | ■   | ■         | ■   | ■   | ■      | ■   | ■   | NA           |          |
| Disturbance recorder                                     |                                   | DRR <b>DRE</b>         | Fixed                      | ■     | ■   | ■   | ■         | ■   | ■   | ■      | ■   | ■   | NA           |          |
| Trend log v2.3                                           |                                   | TR <b>GLOG</b>         | Yes                        | 8     | 8   | 8   | 8         | 8   | 8   | 8      | 8   | 8   | Flexible     |          |
| Fault records                                            |                                   | TCR <b>GLOG</b>        | Fixed                      | ■     | ■   | ■   | ■         | ■   | ■   | ■      | ■   | ■   | Bay          |          |
| Fault measurement                                        |                                   | <b>RFMX</b>            | Fixed                      | ■     | ■   | ■   | ■         | ■   | ■   | ■      | ■   | ■   | Bay          |          |
| Fault locator v2.2                                       |                                   | <b>RFLO</b>            | Yes                        | -     | -   | -   | -         | -   | -   | -      | 1   | 1   | Bay          |          |
| Line parameters v2.2                                     |                                   | <b>ZLIN</b>            | Fixed                      | -     | -   | -   | -         | -   | -   | -      | 1*  | 1*  | NA           |          |
| Power quality record                                     |                                   | PQ <b>GLOG</b>         | Fixed                      | ■     | ■   | ■   | ■         | ■   | ■   | ■      | ■   | ■   | NA           |          |
| Voltage variation                                        |                                   | <b>QVVR</b>            | Yes                        | -     | 1   | 1   | -         | 1   | 1   | -      | 1   | 1   | Bay          |          |
| CT group measurement                                     |                                   |                        |                            |       |     |     |           |     |     |        |     |     |              |          |
| 3ph CT group                                             | 3ph CT                            |                        | PHTCTT                     | Yes   | 1*  | 4*  | 8*        | 1*  | 4*  | 8*     | 1*  | 4*  | 8*           | NA       |
|                                                          | 3ph current                       |                        | VECA <b>MMXU</b>           |       |     |     |           |     |     |        |     |     |              |          |
|                                                          | 3ph RMS current                   |                        | RMSA <b>MMXU</b>           |       |     |     |           |     |     |        |     |     |              |          |
|                                                          | 3ph sequence current              |                        | AM <b>SQI</b>              |       |     |     |           |     |     |        |     |     |              |          |
|                                                          | 3ph CT supervision                | 60P/60N                | CTSS <b>CTR</b>            |       |     |     |           |     |     |        |     |     |              | Routable |
| 1ph CT group                                             | 1ph CT                            |                        | TCTS                       | Yes   | 1   | 8   | 8         | 1   | 8   | 8      | 1   | 8   | 8            | NA       |
|                                                          | 1ph current                       |                        | VECAX <b>MMXU</b>          |       |     |     |           |     |     |        |     |     |              |          |
|                                                          | 1ph RMS current                   |                        | RMSAX <b>MMXU</b>          |       |     |     |           |     |     |        |     |     |              |          |
| 3ph CT summation v2.3                                    | 3ph CT summation                  |                        | CSTCTT                     | Yes   | -   | 1   | 2         | -   | 1   | 2      | -   | 1   | 2            | NA       |
|                                                          | 3ph CT summation current          |                        | VECACSM- <b>MXU</b>        |       |     |     |           |     |     |        |     |     |              |          |
|                                                          | 3ph CT summation RMS current      |                        | RMSACSM- <b>MXU</b>        |       |     |     |           |     |     |        |     |     |              |          |
|                                                          | 3ph CT summation sequence current |                        | CSA <b>MSQI</b>            |       |     |     |           |     |     |        |     |     |              |          |

# Selection Guide by Functionality

## PowerLogic P7 Function Table (cont'd)

| Maximum stage limit for main applications <sup>(2)</sup> |                                            |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |          |
|----------------------------------------------------------|--------------------------------------------|------------------------|----------------------------|-------------------|-----|-----|-------------|-----|-----|--------|-----|-----|---------------------|-----|-----|----------------|-----|-----|--------------|----------|
| Functions                                                | ANSI code                                  | IEC 61850 Logical node | Flex config <sup>(1)</sup> | Line differential |     |     | Transformer |     |     | Busbar |     |     | SAMU <sup>(5)</sup> |     |     | Bay controller |     |     | CT/VT source |          |
|                                                          |                                            |                        |                            | L 0               | L 1 | L 2 | L 0         | L 1 | L 2 | L 0    | L 1 | L 2 | L 0                 | L 1 | L 2 | L 0            | L 1 | L 2 |              |          |
| Logs and records                                         |                                            |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |          |
| Sequence of event record                                 |                                            | GENGLOG                | Fixed                      | ■                 | ■   | ■   | ■           | ■   | ■   | ■      | ■   | ■   | ■                   | ■   | ■   | ■              | ■   | ■   | NA           |          |
| Operation log                                            |                                            | GENGLOG                | Fixed                      | ■                 | ■   | ■   | ■           | ■   | ■   | ■      | ■   | ■   | ■                   | ■   | ■   | ■              | ■   | ■   | NA           |          |
| Disturbance recorder                                     |                                            | DRRDRE                 | Fixed                      | ■                 | ■   | ■   | ■           | ■   | ■   | ■      | ■   | ■   | ■                   | ■   | ■   | ■              | ■   | ■   | NA           |          |
| Trend log v2.3                                           |                                            | TRGLOG                 | Yes                        | 8                 | 8   | 8   | 8           | 8   | 8   | 8      | 8   | 8   | -                   | -   | -   | 1              | 8   | 32  | Flexible     |          |
| Fault records                                            |                                            | TCRGLOG                | Fixed                      | ■                 | ■   | ■   | ■           | ■   | ■   | ■      | ■   | ■   | ■                   | ■   | ■   | ■              | ■   | ■   | Bay          |          |
| Fault measurement                                        |                                            | RFMX                   | Fixed                      | ■                 | ■   | ■   | ■           | ■   | ■   | ■      | ■   | ■   | ■                   | ■   | ■   | ■              | ■   | ■   | Bay          |          |
| Fault locator v2.2                                       |                                            | RFLO                   | Yes                        | -                 | 1   | 1   | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | Bay          |          |
| Line parameters v2.2                                     |                                            | ZLIN                   | Fixed                      | -                 | 1*  | 1*  | -           | -   | -   | -      | -   | -   | -                   | -   | -   | -              | -   | -   | NA           |          |
| Power quality record                                     |                                            | PQGLOG                 | Fixed                      | ■                 | ■   | ■   | ■           | ■   | ■   | ■      | ■   | ■   | ■                   | ■   | ■   | ■              | ■   | ■   | NA           |          |
| Voltage variation                                        |                                            | QVVR                   | Yes                        | -                 | 1   | 1   | -           | 1   | 1   | -      | -   | -   | -                   | -   | 1   | -              | 1   | 1   | Bay          |          |
| CT group measurement                                     |                                            |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |          |
| 3ph CT group                                             | 3ph CT                                     |                        | PHTCTT                     | Yes               | 2*  | 4*  | 8*          | 2*  | 4*  | 8*     | 6   | 18  | 31                  | 1*  | 4*  | 8*             | 1   | 4   | 8            | NA       |
|                                                          | 3ph cur-<br>rent                           |                        | VECAMMXU                   |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |          |
|                                                          | 3ph RMS<br>current                         |                        | RMSAMMXU                   |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |          |
|                                                          | 3ph sequence<br>current                    |                        | AMSQI                      |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |          |
|                                                          | 3ph CT su-<br>pervision                    | 60P/60N                | CTSSCTR                    |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              | Routable |
| 1ph CT group                                             | 1ph CT                                     |                        | TCTS                       | Yes               | 1   | 8   | 8           | 2   | 8   | 8      | 18  | 32  | 32                  | 1   | 8   | 8              | 1   | 8   | 8            | NA       |
|                                                          | 1ph cur-<br>rent                           |                        | VECAXMMXU                  |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |          |
|                                                          | 1ph RMS<br>current                         |                        | RMSAXMMXU                  |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |          |
| 3ph CT sum-<br>mation v2.3                               | 3ph CT<br>summation                        |                        | CSTCTT                     | Yes               | -   | 1   | 2           | -   | 1   | 2      | -   | -   | -                   | -   | -   | -              | -   | 1   | 2            | NA       |
|                                                          | 3ph CT<br>summation<br>current             |                        | VECACSM-<br>MXU            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |          |
|                                                          | 3ph CT<br>summa-<br>tion RMS<br>current    |                        | RMSACSM-<br>MXU            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |          |
|                                                          | 3ph CT<br>summation<br>sequence<br>current |                        | CSAMSQI                    |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |          |

# Selection Guide by Functionality

## PowerLogic P7 Function Table (cont'd)

| Maximum stage limit for main applications <sup>(2)</sup> |                                |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
|----------------------------------------------------------|--------------------------------|-----------|------------------------|----------------------------|-------|-----|-----|-----------|-----|-----|--------|-----|-----|--------------|
| Functions                                                |                                | ANSI code | IEC 61850 Logical node | Flex config <sup>(1)</sup> | Motor |     |     | Generator |     |     | Feeder |     |     | CT/VT source |
|                                                          |                                |           |                        |                            | L 0   | L 1 | L 2 | L 0       | L 1 | L 2 | L 0    | L 1 | L 2 |              |
| VT group measurement                                     |                                |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| 3ph VT group                                             | 3ph VT                         |           | PHTVTT                 | Yes                        | 1*    | 4*  | 8*  | 1*        | 4*  | 8*  | 1*     | 4*  | 8*  | NA           |
|                                                          | 3ph voltage                    |           | VECV <b>MMXU</b>       |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | 3ph RMS voltage                |           | RMSV <b>MMXU</b>       |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | 3ph VT sequence voltage        |           | V <b>MSQI</b>          |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | 3ph VT supervision             | 60        | VTSS <b>SVTR</b>       |                            |       |     |     |           |     |     |        |     |     | Routable     |
| 1ph VT group                                             | 1ph VT                         |           | TVTS                   | Yes                        | 1     | 8   | 8   | 1         | 8   | 8   | 1      | 8   | 8   | NA           |
|                                                          | 1ph VT voltage                 |           | VECVX <b>M-MXU</b>     |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | 1ph VT RMS voltage             |           | RMSVX <b>M-MXU</b>     |                            |       |     |     |           |     |     |        |     |     |              |
| 3ph VT switch v2.3                                       | 3ph VT switch                  |           | VSTVTT                 | Yes                        | -     | 1   | 2   | -         | 1   | 2   | -      | 1   | 2   | NA           |
|                                                          | 3ph VT switch voltage          |           | VECVV <b>S-MXU</b>     |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | 3ph VT switch RMS voltage      |           | RMSVV <b>S-MXU</b>     |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | 3ph VT switch sequence voltage |           | VVS <b>MSQI</b>        |                            |       |     |     |           |     |     |        |     |     |              |
| 1ph VT switch v2.3                                       | 1ph VT switch                  |           | VSTV <b>TS</b>         | Yes                        | -     | 1   | 2   | -         | 1   | 2   | -      | 1   | 2   | NA           |
|                                                          | 1ph VT switch voltage          |           | VECVVSX <b>M-MXU</b>   |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | 1ph VT switch RMS voltage      |           | RMSVVSX <b>M-MXU</b>   |                            |       |     |     |           |     |     |        |     |     |              |
| Virtual VT v2.4                                          | Virtual VT                     |           | VIRTVTT                | Yes                        | -     | 1   | 1   | -         | 1   | 1   | -      | 1   | 1   | NA           |
|                                                          | Virtual VT voltage             |           | VECVVIR <b>M-MXU</b>   |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | Virtual VT RMS Voltage         |           | RMSVVIR <b>M-MXU</b>   |                            |       |     |     |           |     |     |        |     |     |              |
|                                                          | Virtual VT sequence voltage    |           | VVIR <b>MSQI</b>       |                            |       |     |     |           |     |     |        |     |     |              |
| Bay measurement                                          |                                |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| Bay measurements                                         |                                |           | BAY <b>MMXU</b>        | Yes                        | 1     | 1   | 1   | 1         | 1   | 1   | 1      | 1   | 1   | Bay          |
| Demand values                                            |                                |           | DVAL <b>MMXU</b>       | Yes                        | 1     | 1   | 1   | 1         | 1   | 1   | 1      | 1   | 1   | Bay          |
| Active and reactive of energy values                     |                                |           | EM <b>MTR</b>          | Yes                        | 1     | 1   | 1   | 1         | 1   | 1   | 1      | 1   | 1   | Bay          |
| Harmonic measurements                                    |                                |           | M <b>HAI</b>           | Yes                        | -     | 1   | 1   | -         | 1   | 1   | -      | 1   | 1   | Bay          |
| Process bus functions                                    |                                |           |                        |                            |       |     |     |           |     |     |        |     |     |              |
| SV subscription v2.2                                     |                                |           | LS <b>VS</b>           | Fixed <sup>(3)</sup>       | -     | 2   | 4   | -         | 2   | 4   | -      | 2   | 4   | NA           |
| SV publication <sup>(4)</sup> v2.2                       |                                |           | LS <b>VP</b>           | Fixed <sup>(3)</sup>       | -     | 2   | 3   | -         | 2   | 3   | -      | 2   | 3   | NA           |
| vP7 SV subscription v2.4                                 |                                |           | LS <b>VS</b>           | Fixed <sup>(3)</sup>       | 2     | 8   | 16  | 2         | 8   | 16  | 2      | 8   | 16  | NA           |

# Selection Guide by Functionality

## PowerLogic P7 Function Table (cont'd)

| Maximum stage limit for main applications <sup>(2)</sup> |                                |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
|----------------------------------------------------------|--------------------------------|------------------------|----------------------------|-------------------|-----|-----|-------------|-----|-----|--------|-----|-----|---------------------|-----|-----|----------------|-----|-----|--------------|---------|
| Functions                                                | ANSI code                      | IEC 61850 Logical node | Flex config <sup>(1)</sup> | Line differential |     |     | Transformer |     |     | Busbar |     |     | SAMU <sup>(5)</sup> |     |     | Bay controller |     |     | CT/VT source |         |
|                                                          |                                |                        |                            | L 0               | L 1 | L 2 | L 0         | L 1 | L 2 | L 0    | L 1 | L 2 | L 0                 | L 1 | L 2 | L 0            | L 1 | L 2 |              |         |
| VT group measurement                                     |                                |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
| 3ph VT group                                             | 3ph VT                         |                        | PHTVTT                     | Yes               | 1*  | 4*  | 8*          | 1*  | 4*  | 8*     | 2   | 4   | 8                   | 1*  | 4*  | 8*             | 1   | 4   | 8            | NA      |
|                                                          | 3ph voltage                    |                        | VECV <b>MMXU</b>           |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
|                                                          | 3ph RMS voltage                |                        | RMSV <b>MMXU</b>           |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
|                                                          | 3ph VT sequence voltage        |                        | V <b>MSQI</b>              |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
|                                                          | 3ph VT supervision             | 60                     | VTSS <b>VTR</b>            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              | Rotable |
| 1ph VT group                                             | 1ph VT                         |                        | TVTS                       | Yes               | 1   | 8   | 8           | 1   | 8   | 8      | 2   | 8   | 8                   | 1   | 8   | 8              | 1   | 8   | 8            | NA      |
|                                                          | 1ph VT voltage                 |                        | VECVX <b>MMXU</b>          |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
|                                                          | 1ph VT RMS voltage             |                        | RMSVX <b>MMXU</b>          |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
| 3ph VT switch v2.3                                       | 3ph VT switch                  |                        | VSTVTT                     | Yes               | -   | 1   | 2           | -   | 1   | 2      | -   | -   | -                   | -   | -   | -              | -   | 1   | 2            | NA      |
|                                                          | 3ph VT switch voltage          |                        | VECVVS <b>MMXU</b>         |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
|                                                          | 3ph VT switch RMS voltage      |                        | RMSVVS <b>MMXU</b>         |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
|                                                          | 3ph VT switch sequence voltage |                        | VVS <b>MSQI</b>            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
| 1ph VT switch v2.3                                       | 1ph VT switch                  |                        | VSTVTS                     | Yes               | -   | 1   | 2           | -   | 1   | 2      | -   | -   | -                   | -   | -   | -              | -   | 1   | 2            | NA      |
|                                                          | 1ph VT switch voltage          |                        | VECVVSX <b>MMXU</b>        |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
|                                                          | 1ph VT switch RMS voltage      |                        | RMSVVSX <b>MMXU</b>        |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
| Virtual VT v2.4                                          | Virtual VT                     |                        | VIRTVTT                    | Yes               | -   | 1   | 1           | -   | 1   | 1      | -   | -   | -                   | -   | -   | -              | -   | -   | 1            | NA      |
|                                                          | Virtual VT voltage             |                        | VECVVIR <b>MMXU</b>        |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
|                                                          | Virtual VT RMS Voltage         |                        | RMSVVIR <b>MMXU</b>        |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
|                                                          | Virtual VT sequence voltage    |                        | VVIR <b>MSQI</b>           |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
| Bay measurement                                          |                                |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
| Bay measurements                                         |                                | BAY <b>MMXU</b>        | Yes                        | 1                 | 1   | 1   | 1           | 1   | 1   | 1      | 1   | 1   | 1                   | 1   | 1   | 1              | 1   | 1   | 1            | Bay     |
| Demand values                                            |                                | DVAL <b>MMXU</b>       | Yes                        | 1                 | 1   | 1   | 1           | 1   | 1   | 1      | 1   | 1   | 1                   | 1   | 1   | 1              | 1   | 1   | 1            | Bay     |
| Active and reactive of energy values                     |                                | EM <b>MTR</b>          | Yes                        | 1                 | 1   | 1   | 1           | 1   | 1   | 1      | 1   | 1   | 1                   | 1   | 1   | 1              | 1   | 1   | 1            | Bay     |
| Harmonic measurements                                    |                                | M <b>HAI</b>           | Yes                        | -                 | 1   | 1   | -           | 1   | 1   | -      | -   | -   | -                   | -   | 1   | -              | 1   | 1   | 1            | Bay     |
| Process bus functions                                    |                                |                        |                            |                   |     |     |             |     |     |        |     |     |                     |     |     |                |     |     |              |         |
| SV subscription v2.2                                     |                                | LSVS                   | Fixed <sup>(3)</sup>       | 1                 | 2   | 4   | -           | 2   | 4   | 2      | 4   | 8   | -                   | -   | -   | -              | 2   | 4   | NA           |         |
| SV publication <sup>(4)</sup> v2.2                       |                                | LSVP                   | Fixed <sup>(3)</sup>       | 1                 | 2   | 3   | -           | 2   | 3   | -      | 2   | 3   | 1                   | 2   | 3   | -              | 2   | 3   | NA           |         |
| vP7 SV subscription v2.4                                 |                                | LSVS                   | Fixed <sup>(3)</sup>       | 2                 | 8   | 16  | 2           | 8   | 16  | 6      | 18  | 32  | -                   | -   | -   | 2              | 8   | 16  | NA           |         |

### Note:

(1) Flex config = Flexible configuration. **Yes** means the function and stages can be flexibly added or removed. **Fixed** means the function cannot be added or removed and its stages cannot be edited.

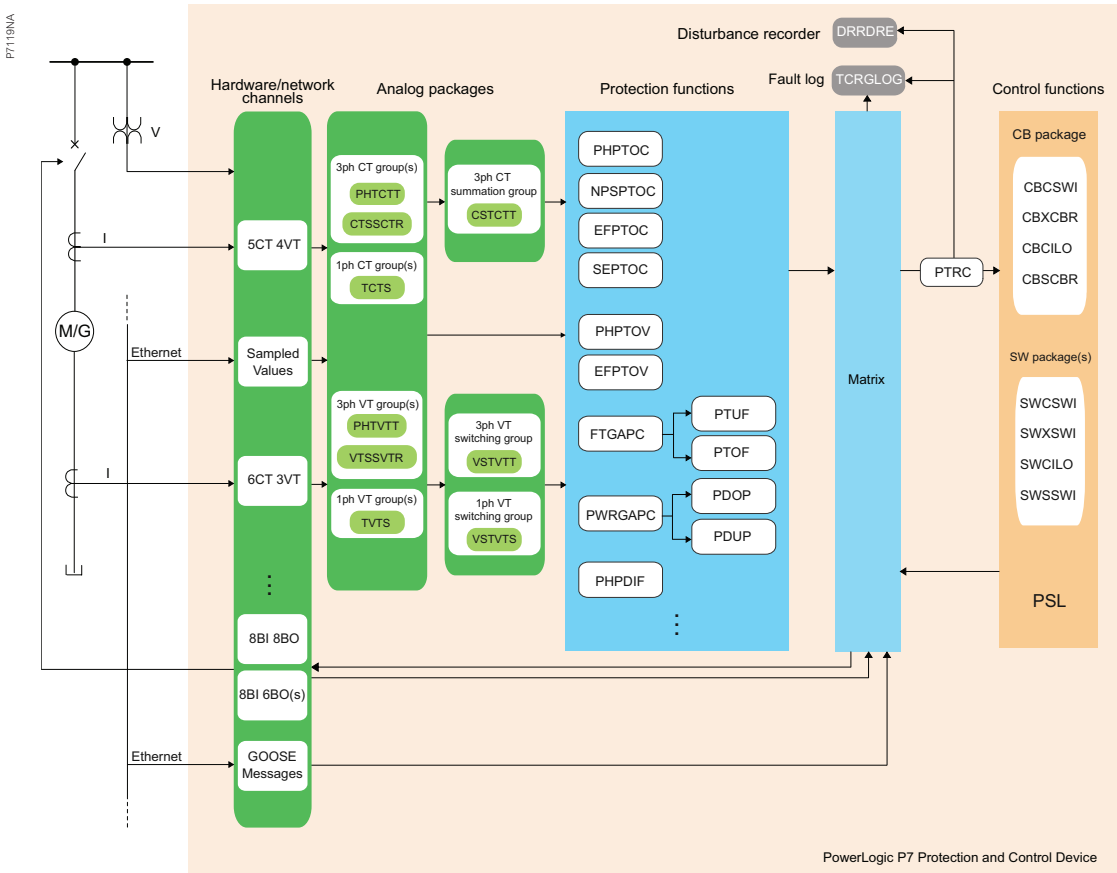
(2) ■ means the function is available for the application. - means the function is not available for the application. Number marked with \* means a minimum of one stage is required for this function.

(3) This comes from the SCD.

(4) This function is not available for Virtual P7.

(5) This function is not available for Virtual P7.

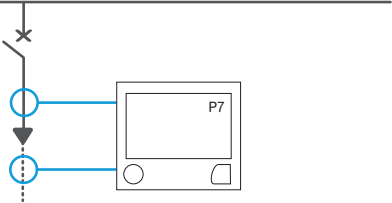
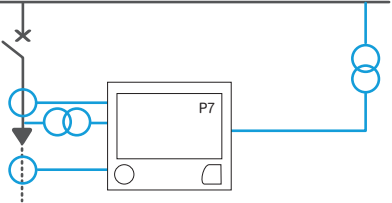
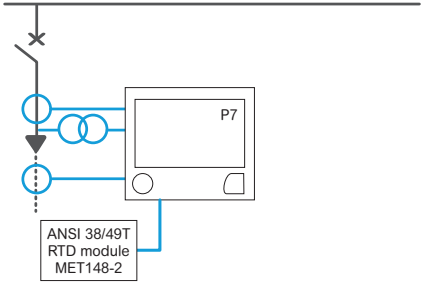
Functional Diagram



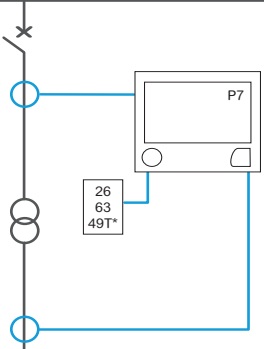
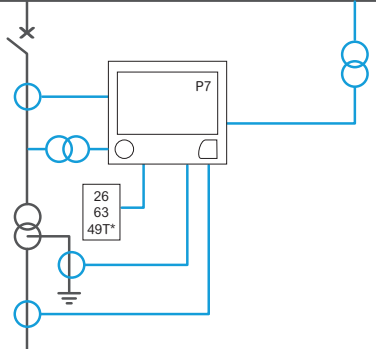
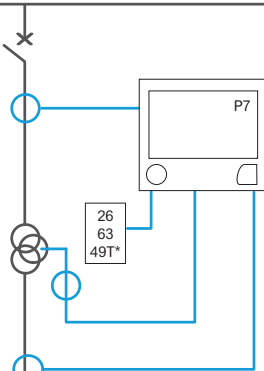
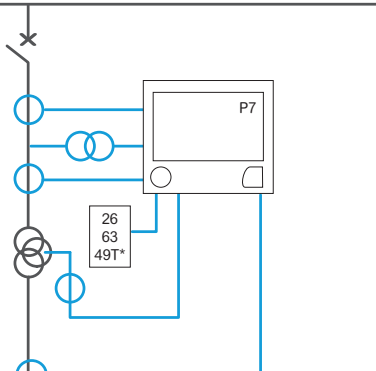
Motor and Motor-Differential Application

| Motor Protection and Control                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Motor overcurrent and earth/ground fault overcurrent</li><li>• Thermal overload</li><li>• Motor start-up supervision</li><li>• Motor restart inhibition</li><li>• Speed protection (Sensor required)</li><li>• Switchgear control</li></ul>                                                                   | <ul style="list-style-type: none"><li>• Motor-Differential voltage and frequency protection</li><li>• Neutral displacement</li><li>• Power protection</li><li>• Field failure</li><li>• Out-of-step</li></ul>                                                                                                                                                                                                  |
| <p>Motor protection without voltage monitoring</p> <p>Diagram DW107125 shows a motor circuit with a switch, a P7 unit, and an ANSI 38/49T RTD module MET148-2 connected to the motor (M). The P7 unit is connected to the switch and the RTD module.</p> <ul style="list-style-type: none"><li>• Temperature measurement (stator, bearings)</li></ul> | <p>Motor/Motor-Differential with voltage monitoring</p> <p>Diagram DB446376 shows a motor circuit with a switch, a P7 unit, and an ANSI 38/49T RTD module MET148-2 connected to the motor (M). The P7 unit is connected to the switch and the RTD module. Additionally, the P7 unit is connected to a voltage monitoring circuit (represented by a circle with a cross) for Motor-Differential protection.</p> |

Feeder Application

| Feeder Protection and Control                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Phase overcurrent protection</li><li>• Ground fault protection</li><li>• Sensitive ground fault protection</li><li>• Recloser</li><li>• Switchgear control</li></ul>                                                                                                                                   | <ul style="list-style-type: none"><li>• Directional phase overcurrent protection</li><li>• Directional ground fault protection</li><li>• Directional sensitive ground fault protection</li><li>• Voltage/Frequency protection</li><li>• Recloser</li><li>• Power protection</li><li>• Synchro-check</li><li>• Power Quality</li></ul> |
| Outgoing/Incomer feeder protection                                                                                                                                                                                                                                                                                                             | Outgoing/Incomer feeder and Overhead line protection with voltage and frequency monitoring                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"><li>• Directional phase overcurrent protection</li><li>• Directional ground fault protection</li><li>• Directional sensitive ground fault protection</li><li>• Overvoltage protection</li><li>• Voltage/Frequency protection</li><li>• Recloser</li><li>• Power protection</li><li>• Power Quality</li></ul> |                                                                                                                                                                                                                                                                                                                                       |
| Outgoing/Incomer feeder and Overhead line protection with voltage and frequency monitoring                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                       |
|  <ul style="list-style-type: none"><li>• Temperature measurement</li></ul>                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                       |

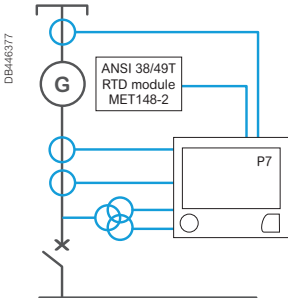
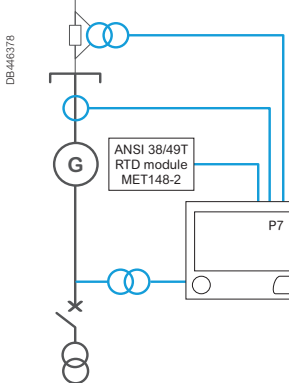
### Transformer and Transformer-Differential Application

| Transformer Protection and Control                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Transformer Differential protection (2 wdg)</li> <li>Transformer Feeder protection</li> <li>Ground fault protection</li> <li>Thermal overload protection</li> <li>External trip form e.g. Buchholz</li> <li>Switchgear control</li> </ul> | <ul style="list-style-type: none"> <li>Transformer Differential protection (2 wdg)</li> <li>Transformer Feeder protection</li> <li>Synchro-check</li> <li>Directional overcurrent protection</li> <li>Directional ground fault protection</li> <li>Underimpedance protection</li> <li>Thermal overload protection</li> <li>Restricted ground fault protection</li> <li>Voltage/Frequency protection</li> <li>Power protection</li> <li>External trip form e.g. Buchholz</li> <li>Power Quality</li> </ul> |
| <p>Transformer Differential protection</p>  <ul style="list-style-type: none"> <li>Temperature measurement</li> </ul>                                                                          | <p>Transformer Differential protection with voltage and frequency monitoring</p>                                                                                                                                                                                                                                                                                                                                       |
| <ul style="list-style-type: none"> <li>Transformer Differential protection (3 wdg)</li> <li>Transformer Feeder protection</li> <li>Ground fault protection</li> <li>Thermal overload protection</li> <li>External trip form e.g. Buchholz</li> </ul>                             | <ul style="list-style-type: none"> <li>Transformer Differential protection (3 wdg)</li> <li>Transformer Feeder protection</li> <li>Directional overcurrent protection</li> <li>Directional ground fault protection</li> <li>Underimpedance protection</li> <li>Thermal overload protection</li> <li>Voltage/Frequency protection</li> <li>Power protection</li> <li>External trip form e.g. Buchholz</li> <li>Power Quality</li> </ul>                                                                    |
| <p>Transformer differential protection (3 wdg)</p>  <ul style="list-style-type: none"> <li>Temperature measurement</li> </ul>                                                                 | <p>Transformer differential protection (3 wdg) with voltage and frequency monitoring</p>                                                                                                                                                                                                                                                                                                                              |

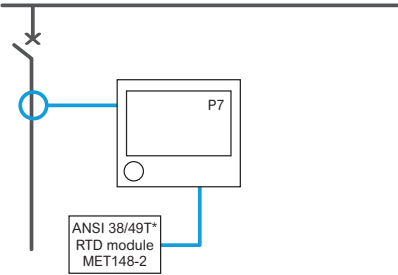
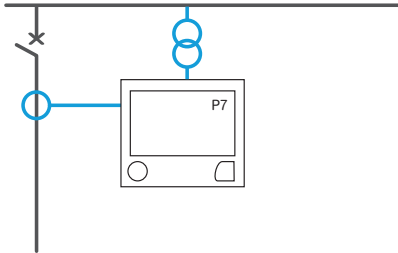
# Selection Guide by Application

## Generator and Generator-Differential Application

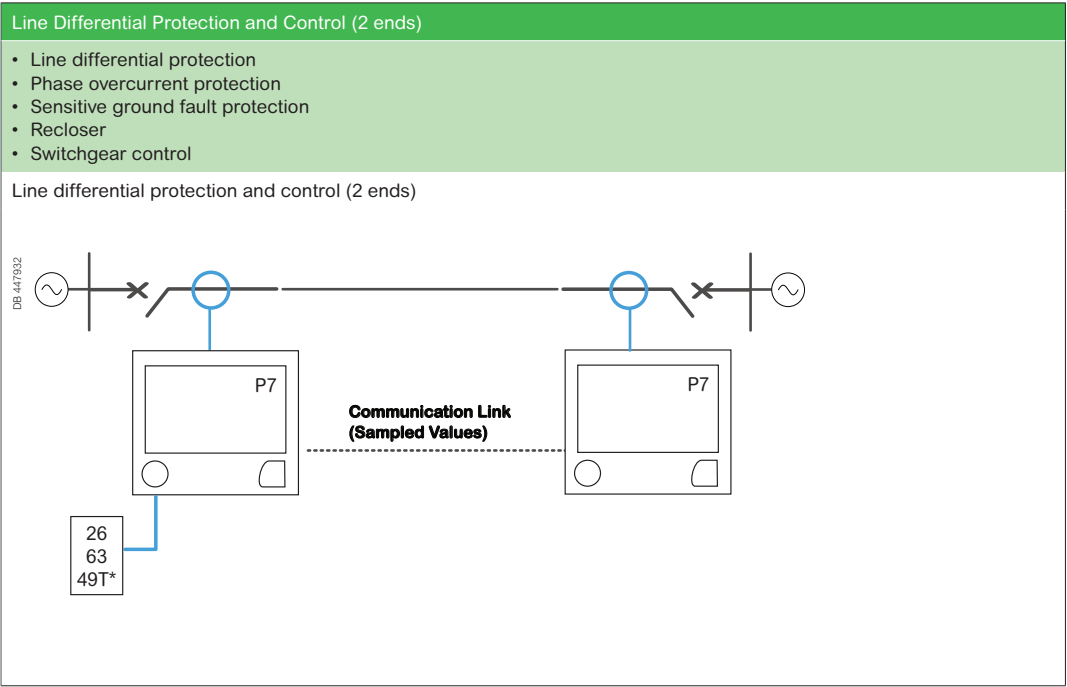
### Generator and Generator-Differential Application

| Generator Protection and Control                                                                                                                                                                                                 |                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Generator Differential</li><li>• Short circuit protection</li><li>• Earth fault protection</li><li>• Voltage and frequency protection</li><li>• Thermal overload (ANSI 38/49T)</li></ul> | <ul style="list-style-type: none"><li>• 100% stator earth fault</li><li>• Neutral displacement</li><li>• Voltage and frequency protection</li><li>• Switchgear control</li></ul> |
| <p>Generator protection with voltage and frequency monitoring</p>                                                                               | <p>Generator protection with voltage and frequency monitoring</p>                             |

Stand-alone Merging Unit Application (Back-up protection application)

| Merging Unit and Control                                                                                                                                                                 |                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Phase overcurrent protection</li><li>• Switchgear control</li><li>• Thermal overload protection</li></ul>                                        | <ul style="list-style-type: none"><li>• Directional phase overcurrent protection</li><li>• Switchgear control</li><li>• Voltage protection</li></ul> |
| <p>Phase overcurrent protection</p> <p>DB446592</p>  <p>*Temperature measurement (stator, bearings)</p> | <p>Directional phase overcurrent protection</p> <p>DB446593</p>    |

### Line Differential Application



Busbar Application

| Centralized Busbar Protection and Control                                                                                                                                              | Distributed Busbar Protection and Control                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Busbar differential protection</li><li>• Phase overcurrent protection</li><li>• Ground fault protection</li><li>• Switchgear control</li></ul> | <ul style="list-style-type: none"><li>• Busbar differential protection</li><li>• Phase overcurrent protection</li><li>• Ground fault protection</li><li>• Switchgear control</li><li>• Back-up protection in the P7bay units</li></ul> |
| <p>Centralized Busbar differential protection</p> <p>DB447934</p>                                                                                                                      | <p>Distributed Busbar differential protection</p> <p>DB447933</p>                                                                                                                                                                      |

## Logging and Recording Functions

The PowerLogic P7 stores time tagged logs and records which can be used for fault analysis. These data can be read from the device and analyzed using the corresponding tools.

The items that are time tagged and logged are:

- SOE (sequence of events)
- Disturbance record
- Operation log
- Maintenance record
- Fault record

The PowerLogic P7 time stamp resolution is 1 ms.

### SOE

The PowerLogic P7 is capable of logging and recording of all events that happen during power system operation. This function is modelled by Logical Node GENGLOG in IEC 61850. All operationally relevant signals, each fully tagged with date and time at signal start and signal end, are registered and stored in chronological order. The maximum size of the buffer is 10000 events.

### Operation Log

The PowerLogic P7 supports logging and recording of all IED operations including command, like:

- Operation (select, operate, select with value, cancel)
- Control block operation (active setting group (SG), edit SG, confirm, edit and enable GOOSE control block)
- Setting change

This function is modelled with SOE log by Logical Node GENGLOG in IEC 61850. The maximum size of the buffer is 500 logs.

### Maintenance Record

The PowerLogic P7 delivers comprehensive diagnostic reports that support users in troubleshooting the device and provide detailed insights that can also assist the Schneider Electric support team in analyzing issues and resolving problems.

## Disturbance Record

The PowerLogic P7 provides for fault events a disturbance recording with the sampled analog values of all used analog currents and voltages before, during and after a fault event. This function is modelled by Logical Node DRRDRE in IEC 61850. The recording is in COMTRADE format. A maximum of 200 records are stored with a mix of analog and binary signals:

- All analog channels used in the bay are recorded.
- All digital channels within the bay are recorded if they are active or changed during the recording period. All device binary signals (for example, binary input and output status) will also be included if active or changed during the recording period.
- All records are stored in non-volatile memory in the PowerLogic P7.

## Fault Record

Fault record provides fault signals including the measured fault data captured during a fault sequence. This function is modelled by logical node TCRGLOG in IEC 61850.

The fault records are logged in chronological order with reference to the specific fault.

Each bay has independent fault record. The fault record is triggered by any start and any trip signals which are connected by default in the matrix to PTRC.

The fault record details any protection operations when the PTRC is started. When any starts or any trip picks up, the fault record starts to record.

The maximum size of the buffer is 50 fault records.

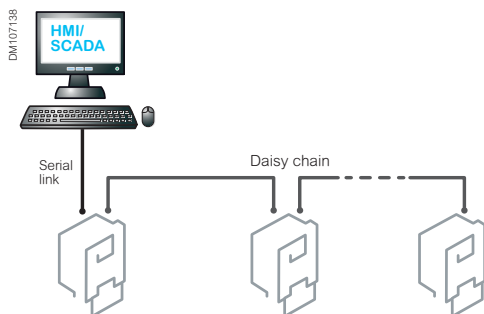
## Communication record

The communication record function is used to capture network traffic of the Ethernet interfaces on the PowerLogic P7. The captured traffic can then be analyzed and help troubleshoot networking problems.

The generated communication records are PCAP files. Each interface can generate and store up to 3 records. Once this limit is reached, the oldest record will be overwritten by a new one.

## Trend log

PowerLogic P7 allows a configurable triggered log to record user-defined events and measurements. The trend log initiates recording upon a configurable trigger event or a manual trigger by user. Once triggered, the configured data points are recorded at the designated intervals for a designated period. All recordings are time-stamped.



### Connection to SCADA using Serial

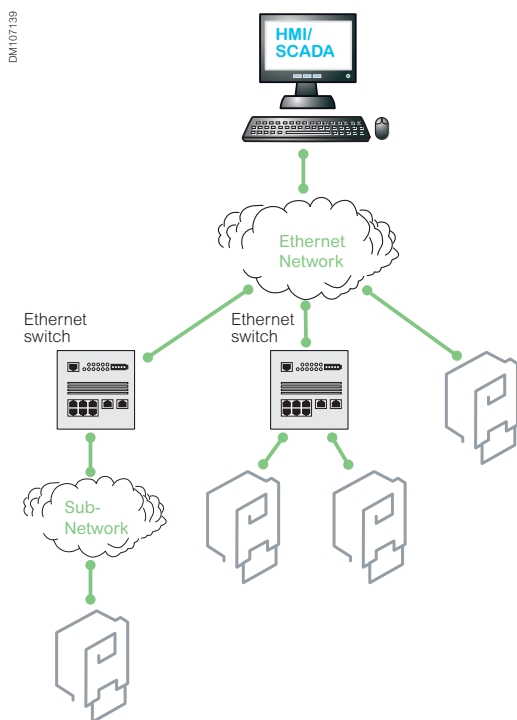
This architecture allows you to connect HMI/SCADA to a set of PowerLogic P7 devices using a multi-drop serial communication link with client-server communication.

#### Available protocols:

- Modbus RTU
- DNP3
- IEC 60870-5-103

#### Time synchronization protocol:

- Modbus RTU/DNP3
- IEC 60870-5-103 or IRIG-B



### Connection to SCADA using Ethernet

This architecture allows you to connect a set of PowerLogic P7 devices directly to an Ethernet network.

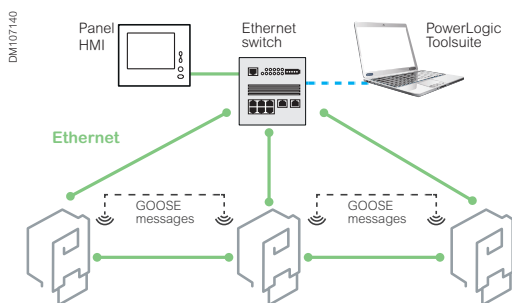
#### Available protocols:

- IEC 61850 Edition 2.1
- DNP3 over Ethernet
- Modbus TCP/IP

#### Time synchronization protocol:

- SNTP
- PTP (IEEE 1588)
- IRIG-B
- Modbus TCP/DNP over Ethernet

NOTE: It is possible to mix any of the three Ethernet protocols (IEC61850, DNP3, Modbus server) on the same SCADA Ethernet network. The architecture allows the use of Generic Object-Oriented Substation Event (GOOSE) messages between devices together with another protocol for communication to Supervisory Control and Data Acquisition (SCADA). It is also possible to connect PowerLogic P7 devices to more than one control system, using the same Ethernet communication port with one of the chosen protocols. PowerLogic P7 devices handle the IEC 61850 station bus, in compliance with standards IEC 61850-6, 7-1, 7-2, 7-3, 7-4 and 8-1 Edition 2.1, according to configuration.



### Switchboard Internal Network

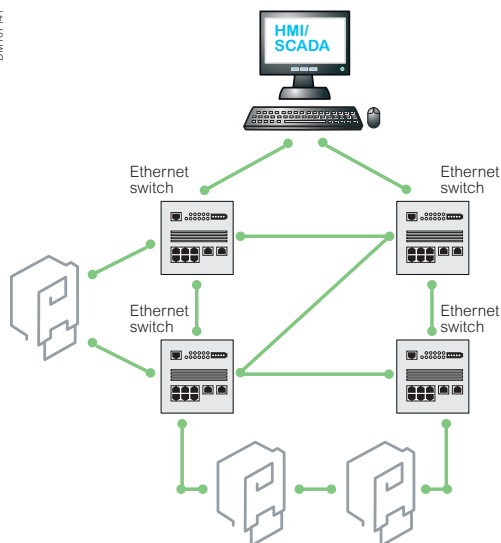
This architecture allows fast GOOSE communication between protection relays in the same switchboard, thus avoiding costly wiring. Typical uses are logic discrimination, load shedding, etc.

In addition, a panel HMI featuring a web browser can be used to monitor and control the entire switchboard.

A spare connection on the panel Ethernet switch can also be provided for connecting the PowerLogic Engineering Suite setting and configuration tool.

On PowerLogic P7 models, two independent Ethernet communication interfaces are available. This allows implementation of the switchboard internal network and the communication to SCADA on two separate Ethernet networks.

DM107141

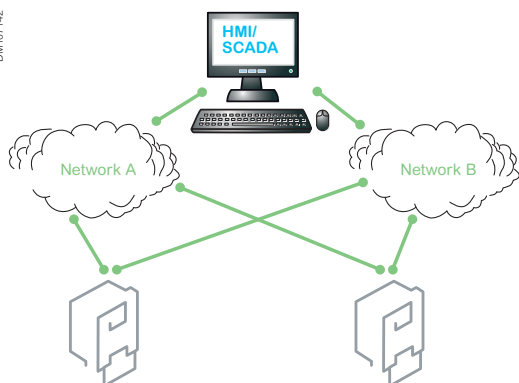


### RSTP (Rapid Spanning Tree Protocol)

The principle of RSTP is to virtually remove all links that are not necessary at a given time, changing the meshed topology into a tree topology.

The main advantage of RSTP is that it is widespread and works on any network topology. On the other hand, RSTP takes milliseconds or seconds to reconfigure the network in case of network interruption.

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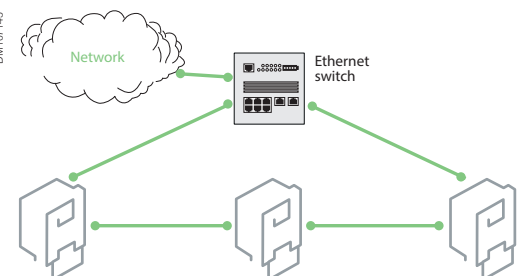
### PRP (Parallel Redundancy Protocol)

The principle of PRP is to transmit frames in parallel on two independent network infrastructures: A and B.

The receiving device is in charge of removing the redundant frame, if it has already been received.

PRP protocol provides an instantaneous recovery time in case of failure, since no re-transmission of the message is needed.

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### HSR (High-availability Seamless Redundancy)

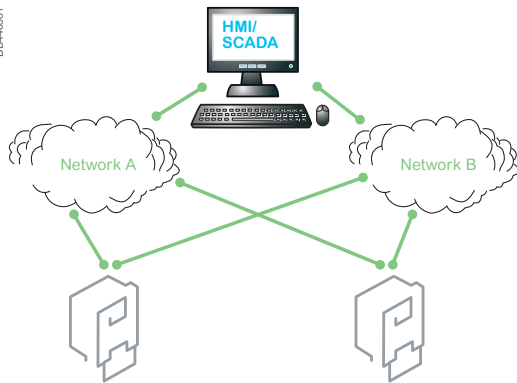
HSR is similar to PRP but only works on a ring architecture.

Frames are transmitted on the ring in both directions and the receiving device eliminates redundant frames.

HSR protocol provides an instantaneous recovery time and is an alternative to PRP when network topology is restricted to a ring.

Both PRP and HSR protocols are listed in IEC 62439-3 as part of IEC 61850 standard. They both provide standardized, interoperable and high performance redundant Ethernet solutions.

DB446591



### Failover Mode

Failover mode is a backup operational mode that automatically switches to a standby Ethernet port. In the Failover mode for a PowerLogic P7, the device looks for an active port and will use it for all traffic until that port is lost. When the active port is lost, it will scan both ports until an active port is found. This mode is often used with RSTP networks providing redundant access to the relay without allowing trunk traffic to flow through the device.

The default redundancy setting is Failover mode, where either port can be used for access.

PowerLogic™ P7 offer several solutions for time synchronization:  
Various communication protocols, IRIG-B, SNTP and PTP.

In modern protective schemes it is required to synchronize the internal real-time clock of the relay, so that events from different relays can be placed in chronological order.

This can be done using the communication interfaces connected to the substation control system using DNP3 or Modbus protocol or via dedicated time synchronization options provided by PowerLogic P7: IRIG-B time code and SNTP or PTP IEEE 1588v2 over Ethernet networks.

### IRIG-B

Inter-Range Instrumentation Group time code B (IRIG-B) is a standard format for transferring timing information. IRIG-B time synchronization standard is based on a frame of 100 data bits sent every second to the device.

This time synchronization standard is supported in PowerLogic P7 by the IRIG-B module connected to the optional extension port of the relay.

The module provides both a modulated and an unmodulated input and can automatically detect which input type is used. The time synchronization accuracy in PowerLogic P7 with this mode is less than 5  $\mu$ s. For more information, see the IRIG-B module details on [page 85](#).

### SNTP

Simple Network Time Protocol (SNTP) is a less complex implementation of Network Time Protocol (NTP), using the same protocol but without requiring the storage of state over extended periods of time. SNTP is used to synchronize the clocks of computer systems over packet switched, variable-latency data networks.

A jitter buffer is used to reduce the effects of variable latency introduced by queuing in packet switched networks, ensuring a continuous data stream over the network.

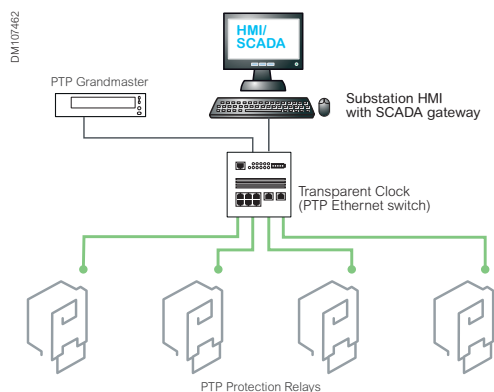
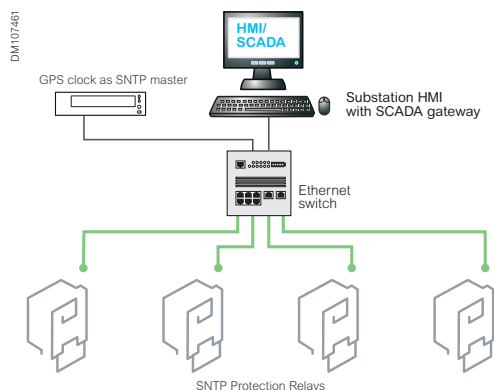
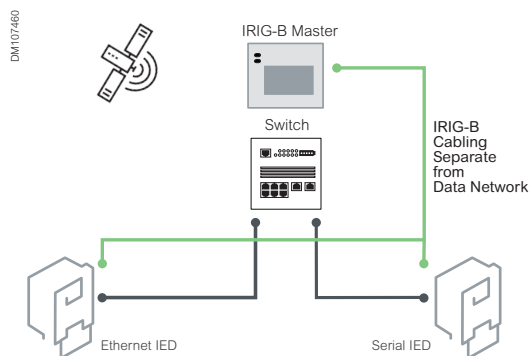
The PowerLogic P7 protection relay receives the synchronization from the SNTP/NTP server. The time synchronization accuracy in this mode is less than 5 ms.

### PTP

Precision Time Protocol according to IEEE 1588-2008 (v2) standard. The PTP implementation in PowerLogic P7 protection relay is compliant to IEC61850-9-3 standard. This protocol enables precise synchronization of clocks in measurement and control systems implemented with technologies such as network communication, local computing, and distributed objects.

The protocol is applicable to systems communicating via Ethernet. Systemwide synchronization accuracy and precision in the sub-microsecond range are supported with minimal network and local clock computing resources. The time synchronization accuracy in PowerLogic P7 with this mode is less than 1  $\mu$ s.

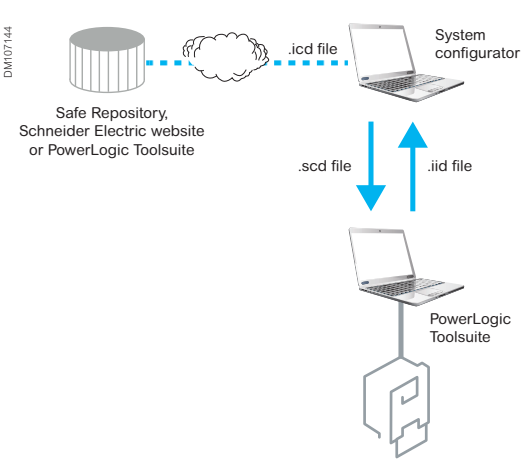
PowerLogic P7 can act as a PTP Master.



Data Exchanged with SCADA

| Protocol                       | Ethernet       | Serial or Ethernet |      |        |
|--------------------------------|----------------|--------------------|------|--------|
| Ports                          | IEC 61850/SFTP | IEC 60870-5-103    | DNP3 | Modbus |
| Real time data                 |                |                    |      |        |
| Measurement                    | •              | •                  | •    | •      |
| Alarms and status              | •              | •                  | •    | •      |
| Controls                       | •              | •                  | •    | •      |
| Time-stamped events            | •              | •                  | •    | •      |
| Historical data                |                |                    |      |        |
| Disturbance records            | •              | •                  | •    | •      |
| Sequence of event record files | •              | -                  | -    | -      |
| Setting management             |                |                    |      |        |
| Setting group change           | •              | •                  | •    | •      |
| Settings                       | •              | -                  | -    | -      |

Data Exchanged According to IEC 61850



The Methodology described in the IEC 61850-6 standard can be applied with PowerLogic P7, to build a protection and control system based on this standard.

.icd file

For each model of PowerLogic P7, the IED capability file will be created by the PowerLogic Engineering Suite during the configuration process of the device.

.scd file

The system description file generated by the system configurator can be processed by PowerLogic Engineering Suite and the relevant system settings integrated in the PowerLogic P7 configuration.

.iid file

When the configuration of an PowerLogic P7 protection relay is completed or modified, PowerLogic Engineering Suite can generate an Instantiated IED Description file to be used by the system configurator to update the system description.

Cybersecurity features implemented in PowerLogic™ P7 help to mitigate cyber threats.

More info on the Schneider Electric Cybersecurity Support portal:

[www.se.com/ww/en/work/support/cybersecurity/overview.jsp](http://www.se.com/ww/en/work/support/cybersecurity/overview.jsp)



## Cybersecurity

Cybersecurity in the scope of energy management is a set of rules, methods, and technical features intended to improve the quality of service and minimize risk of interruption of deliveries, resulting from accidental or intentional actions.

The PowerLogic P7 is designed with special attention to cybersecurity aspects, with compliance to Schneider Electric's [Cybersecurity Policy](#) and following Secure Development Lifecycle process.

Cybersecurity in PowerLogic P7 helps to provide:

- Confidentiality (to help prevent unauthorized access).
- Integrity (to help prevent unauthorized modification).
- Availability/authentication (preventing the denial of service and assuring authorized access).
- Non-repudiation (preventing the denial of an action that took place).
- Traceability/detection (logging and monitoring).

## Cybersecurity Features

Secure-by-design, incorporating IEC 62351 role-based access control principles.

- Secured communication between PowerLogic P7 and associated tools.
- Port hardening
- Local and central user authentication RADIUS / LDAP
- Firmware signature
- Password based user authentication
- Role Based Access Control (RBAC) authorization management
- Secured log storage
- Client IP address filter
- Compliant with CRA
- IEC 62443 SL2, NERC CIP and BDEW Cyber security features
- Security banner

For more information about PowerLogic P7 Cybersecurity capabilities please refer to the user manual.

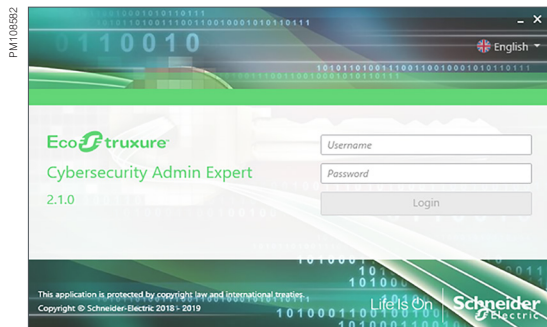
The PowerLogic P7 is delivered with auto-login via the local control panel (HMI) with the default ENGINEER role. It is to facilitate the commissioning work by e.g. panel builder and system integrator. The auto-login function can be configured with the parameter Local Default Access using CAE tool.

In the PowerLogic P7, the control of accessibility to the settings, parameters, configuration, and logs is done with a user authentication with a name and password.

The PowerLogic P7 controls the access:

- through the front panel
- through the PowerLogic Engineering Suite (front and rear connection)

The Ethernet communication with the PowerLogic Engineering Suite is encrypted.



## Cybersecurity with EcoStruxure Cybersecurity Admin Expert

PowerLogic P7 leverages of EcoStruxure Cybersecurity Admin Expert (CAE), a comprehensive and intuitive, software-based, cybersecurity configuration and policy tool for your operational technology environment.

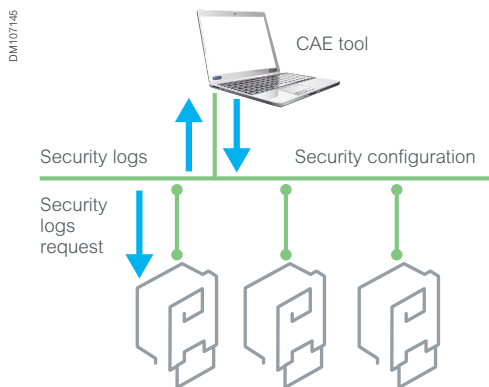
EcoStruxure Cybersecurity Admin Expert (CAE) facilitates operations and maintenance, being a single interface to manage and perform a mass update of your security configuration to the entire system.

CAE is free-of-charge and helps to:

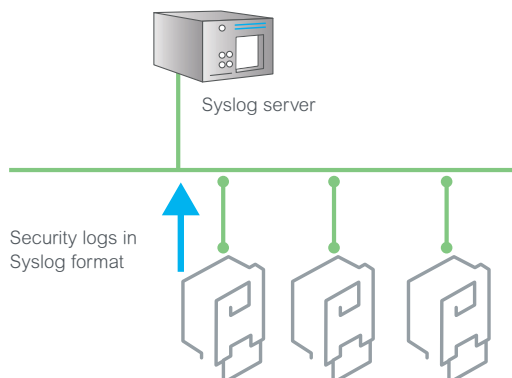
- Define the security policy, including for example: password complexity or password strategy.
- Define rules for security logs, choose between NERC CIP, BDEW, P1686 2014 or a combination.
- Define the RBAC (Role Base Access Control) parameters of your environment.
- Define system or device users and assign one or several roles per user customized based on organization.
- Retrieve security logs including several Schneider Electric devices.

In summary, PowerLogic P7 becomes part of a cybersecurity management system consisting of servers for security logs, authentication, and authorization, using standard network protocols.

EcoStruxure Cybersecurity Admin Expert (CAE) facilitates the management of cybersecurity in your electrical network's operational technology (OT) from policy definition, thru configuration, commissioning, operation, and maintenance stages.



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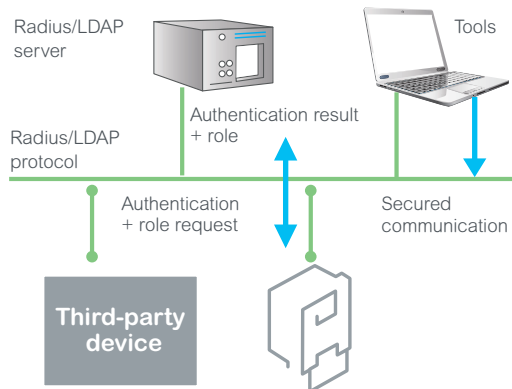


Two use Cases are Available for Authentication and Authorization Features:

### Local Authentication and Authorization

In this use case, local authentication and authorization don't rely on any external servers. Security configuration is stored locally in each PowerLogic P7. User authentication and authorization using associated roles are performed locally (RBAC). CAE is used to update the global security configuration of all the PowerLogic P7 devices located inside the substation, so that users, associated passwords, and other parameters are consistent on all devices.

DM107147



### Centralized Authentication and Authorization

In this use case, centralized authentication and authorization relies on one or two Radius/LDAP servers with the IEC 62351-8 extension.

This allows the use of a Unified Account management system shared across heterogenous solutions. The same credentials are used at the front panel of each device, tools and also third-party devices.

The Radius/LDAP server is in charge of authenticating users and providing the associated role. Then PowerLogic P7 allow access based on this role and the internal security configuration (RBAC).

Schneider Electric can also provide an IEC62351-8 compliant Radius server already configured with authorization. This server allows a fast and reliable solution, managed by the CAE software, including a syslog server.

# PowerLogic™ P7

## Product Description

# PowerLogic™ P7

## Product Description

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|                              |           |
|------------------------------|-----------|
| <b>Base Unit Description</b> | <b>48</b> |
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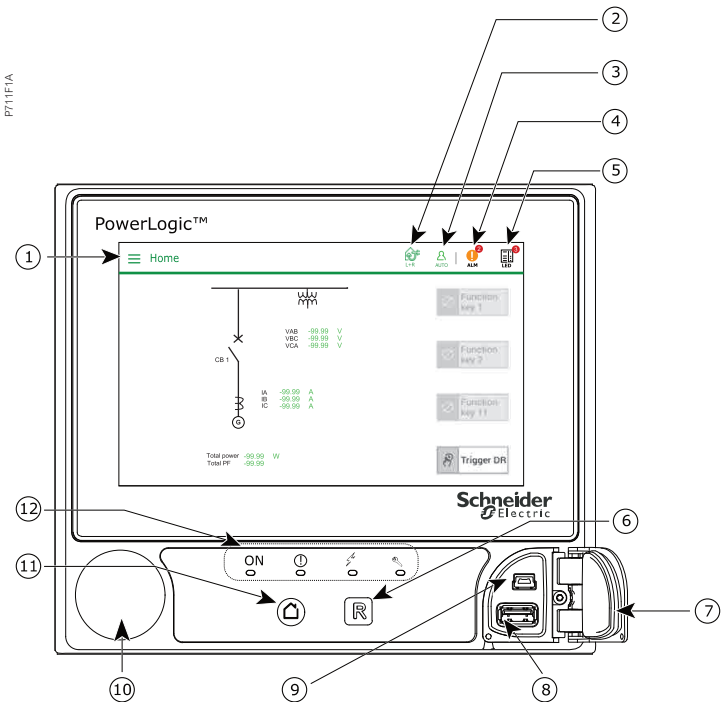
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|                                  |           |
|----------------------------------|-----------|
| <b>Technical Characteristics</b> | <b>64</b> |
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Front panel

| PUSH BUTTONS                                                                      |                                                                                    |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  | HOME key: The main function of the Home key is to return to the Home page          |
|  | Configurable Reset key: Reset control key to release latches, BOs, alarms and LEDs |
| PHYSICAL LEDs                                                                     |                                                                                    |
|  | ON: device is powered on                                                           |
|  | ALARM: an alarm is active                                                          |
|  | TRIP: a trip has occurred                                                          |
|  | MAINTENANCE: the device is not fully functional or in test mode                    |
|                                                                                   |                                                                                    |
| 1                                                                                 | Menu icon on the touchscreen display                                               |
| 2                                                                                 | Remote /Local mode icon on the touchscreen display                                 |
| 3                                                                                 | User icon on the touchscreen display                                               |
| 4                                                                                 | Alarm icon on the touchscreen display                                              |
| 5                                                                                 | Virtual LED icon on the touchscreen display                                        |
| 6                                                                                 | Reset key                                                                          |
| 7                                                                                 | USB door                                                                           |
| 8                                                                                 | Not available (future use: USB A connector for data transfer)                      |
| 9                                                                                 | Mini-USB connector for connecting laptop                                           |
| 10                                                                                | Reference label                                                                    |
| 11                                                                                | Home key                                                                           |
| 12                                                                                | Physical LEDs                                                                      |



LEDs

There are four LEDs located on the front panel representing the status of the PowerLogic P7 regarding power, alarm, trip, and operation mode. Additional virtual LEDs (24 in total) can be configured using the PowerLogic Engineering Suite. They can be configured in one of three colors—green, red, or yellow—with the OFF state representing no illumination. Each LED can be individually set as latched or self-reset. Refer to the PowerLogic P7 User Manual for configuration instructions.

Working Languages

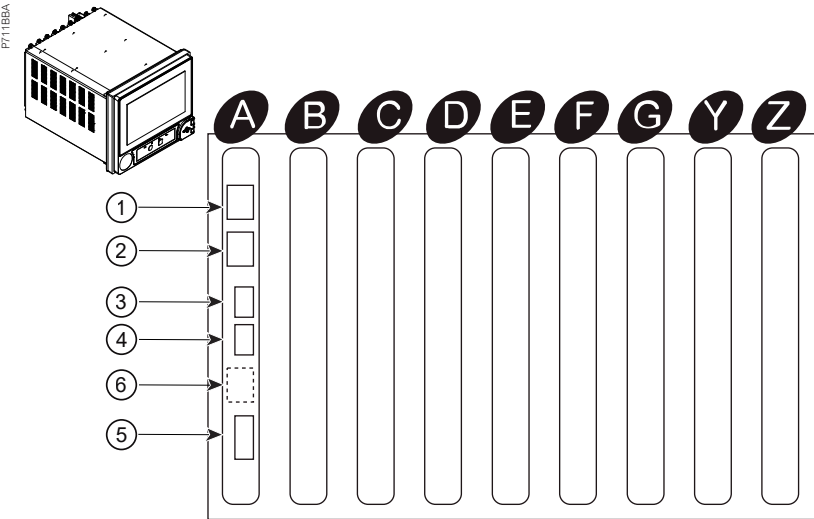
All texts and messages displayed on the PowerLogic P7 HMI are available in English, French, German, Spanish, Polish, Hungarian and Chinese.

Dimensions and Weight

| Dimensions       | mm  | in   |
|------------------|-----|------|
| Height           | 180 | 7    |
| Width            | 205 | 8    |
| Depth            | 280 | 11   |
| Weight           | kg  | lb   |
| Weight (maximum) | 8.8 | 19.4 |

Rear panel layout

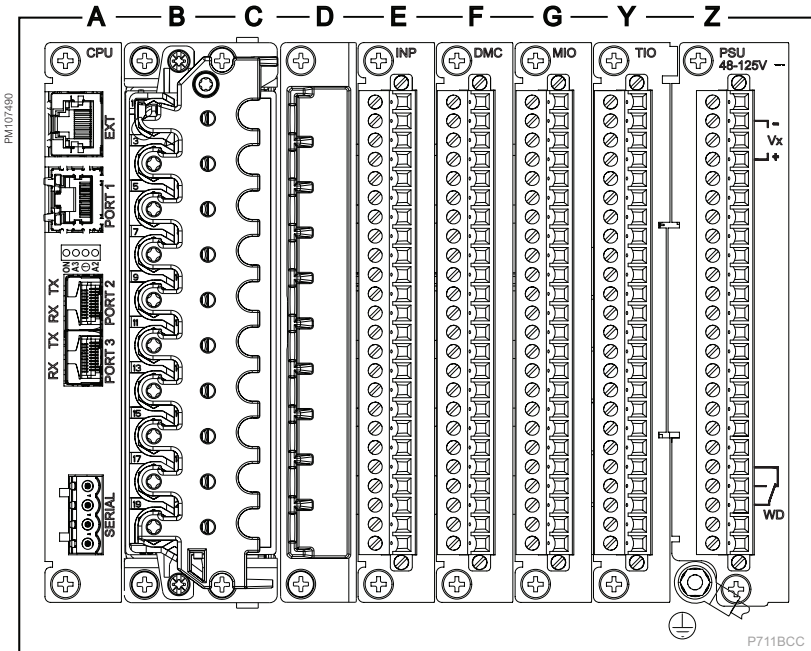
The PowerLogic P7’s rear panel contain the following modules installed in slots and identified by letters.



| PowerLogic P7           | Slot: Module and port                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ✓                       | A: CPU <ul style="list-style-type: none"><li>① EXT: CAN bus port for connection with additional accessories like IRIG-B module, RTD module and CLIO module.</li><li>② Port 1: Ethernet port for single RJ45</li><li>③ Port 2: Ethernet port for optional SFP with HSR/PRP/RSTP/Failover redundancy</li><li>④ Port 3: Ethernet port for optional SFP with HSR/PRP/RSTP/Failover redundancy</li><li>⑤ Serial port: 2-wire RS485</li><li>⑥ DHMI port (only available on the no HMI option): for connection with a detachable HMI, PowerLogic Engineering Suite, or web HMI</li></ul> |
| Optional <sup>(1)</sup> | B-C/D-E/F-G (2 slots): CT/VT analog input module (6CT + 3VT or 5CT + 4VT)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Optional                | B/C/D/E/F/G <sup>(1)</sup> : MIO (mixed binary input/output module), DMC (direct motor control module), or INP (binary input module)                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| ✓                       | Y: TIO (power supply unit auxiliary)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| ✓                       | Z: PSU (power supply unit)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

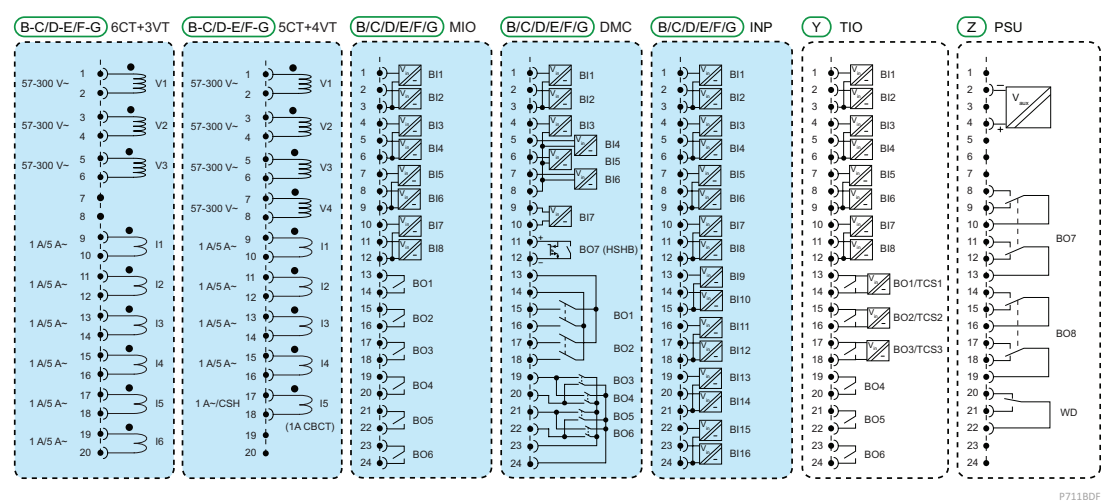
(1) For P7S, one CT/VT analog input module is mandatory.

Rear Panel Terminals



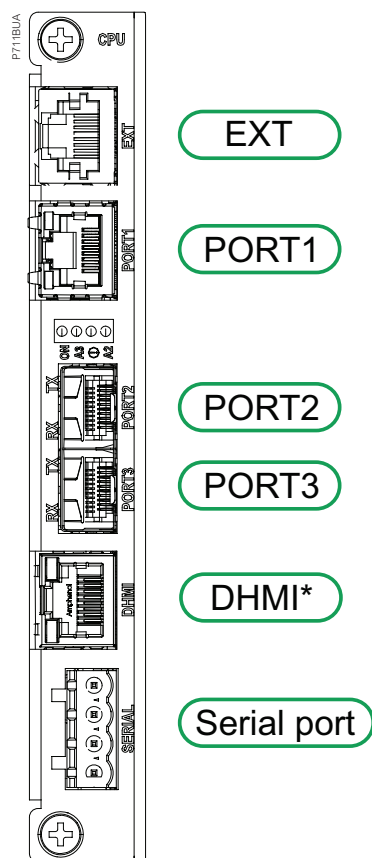
Example with slots B and C for CT/VT analogue input module, slot F-G for mixed I/O modules (IP20 CT/VT cover installed)

Rear Terminal Designations



# Base Unit Description

## Rear Communication Ports



### Extension Port

The extension port is a CAN bus port located at the slot A (CPU) of the device.

The following PowerLogic P7 accessories can be connected to the extension port:

- IRIG-B module (see IRIG-B module (reference REL51045))
- MET148-2 temperature sensor module (see MET148-2 - temperature sensor module (reference 59641))
- CLIO module (4AI, 4AO) (reference REL70071)

### Port 1: Ethernet Communication Port

Port 1 is a single Ethernet communication port with fixed RJ45 connector and it is located at slot A (CPU).

### Port 2 and 3: Optional Ethernet SFP Modules

The SFP modules are inserted in port 2 and/ port 3 of the slot A (CPU). It can be selected as an accessory when ordering the device or purchased later and installed on site.

The SFP modules are available for copper wire, multi-mode fiber optic or singlemode fiber optic connection. The SFP modules with RJ45 or LC connector provide RSTP (Rapid Spanning Tree Protocol), PRP (Parallel Redundancy Protocol), HSR (High-availability Seamless Redundancy) and Failover selectable by configuration.

### RS485 Serial Communication Port

The PowerLogic P7 can be connected to any 2-wire RS485 half duplex communication network and can exchange the data necessary for centralized management of the electrical installation by SCADA.

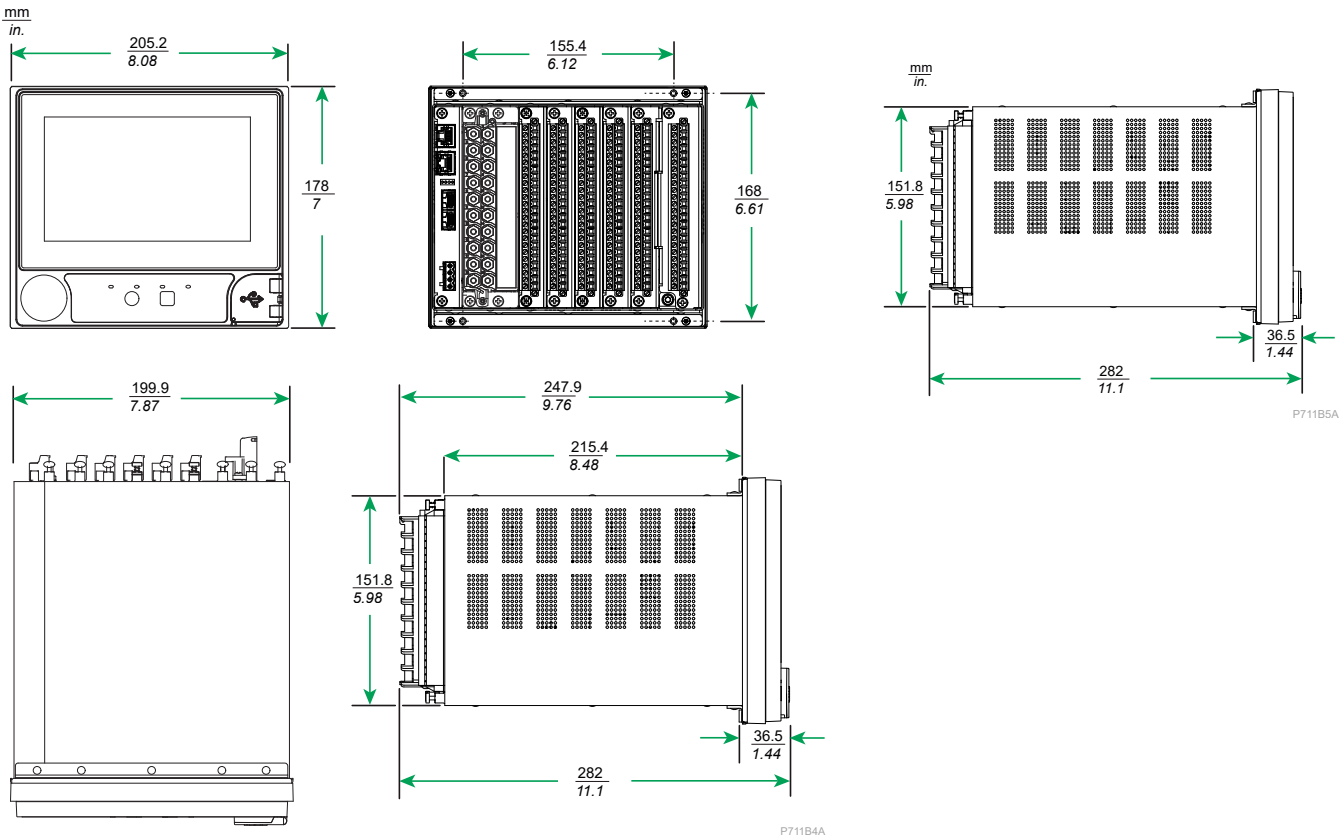
### Detachable HMI (DHMI) Port

DHMI, Ethernet port for connection with the detachable HMI, PowerLogic Engineering Suite, or web HMI.

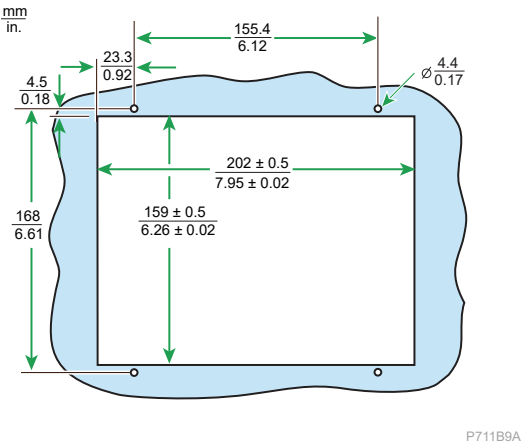
**NOTE :** The DHMI port is only available on PowerLogic P7 (no HMI/ wall mounting option).

# Base Unit Description

## Dimensions and Weight



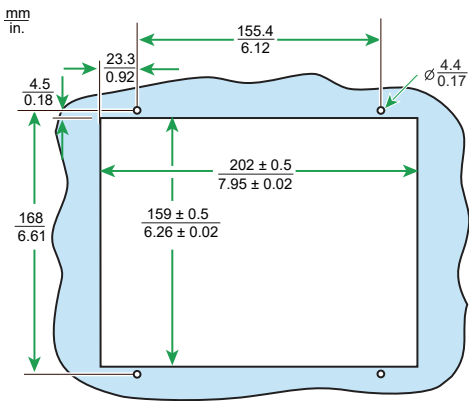
## Flush Mounting Installation



| Cut-out dimensions | mm  | in   |
|--------------------|-----|------|
| Height             | 159 | 6.26 |
| Width              | 202 | 7.95 |

**NOTE:** Please see the appropriate Safety Guide or User Guide for correct installation information.

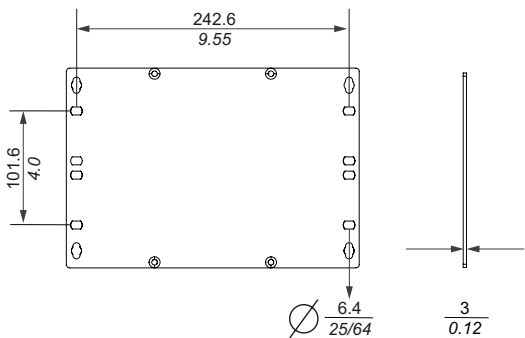
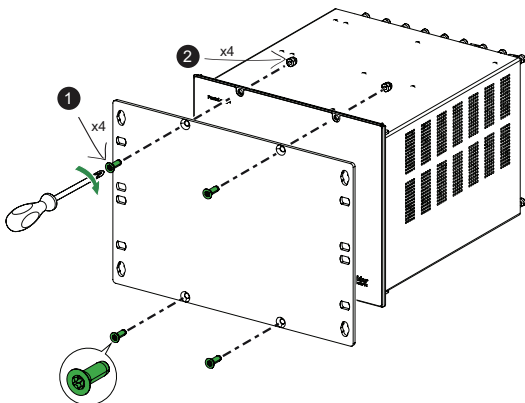
Flush Mounting



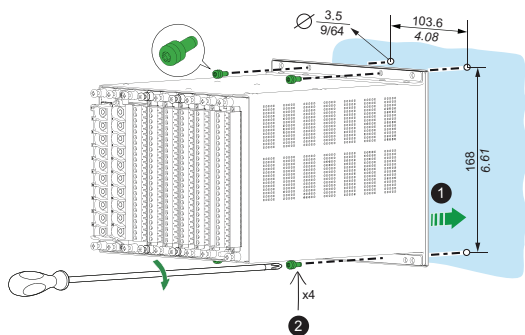
P711B9A

NOTE: Please see the appropriate Safety Guide or User Guide for correct installation information.

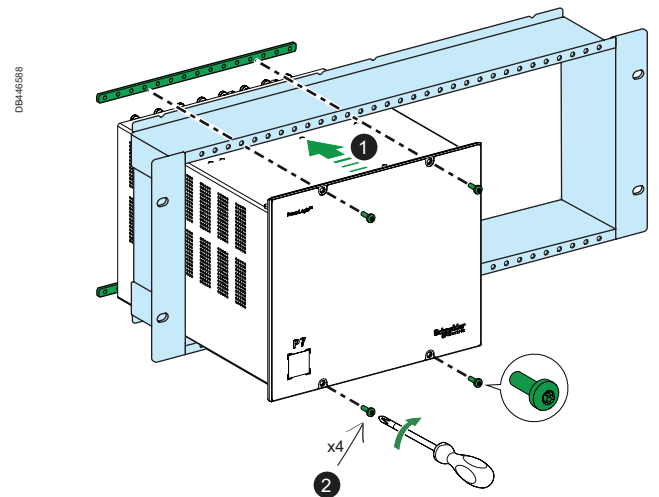
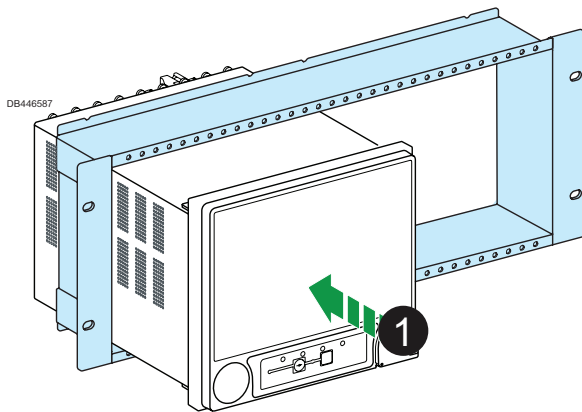
Surface Mounting with Adapter Plate



Surface Mounting without Adapter Plate



### Rack Mounting



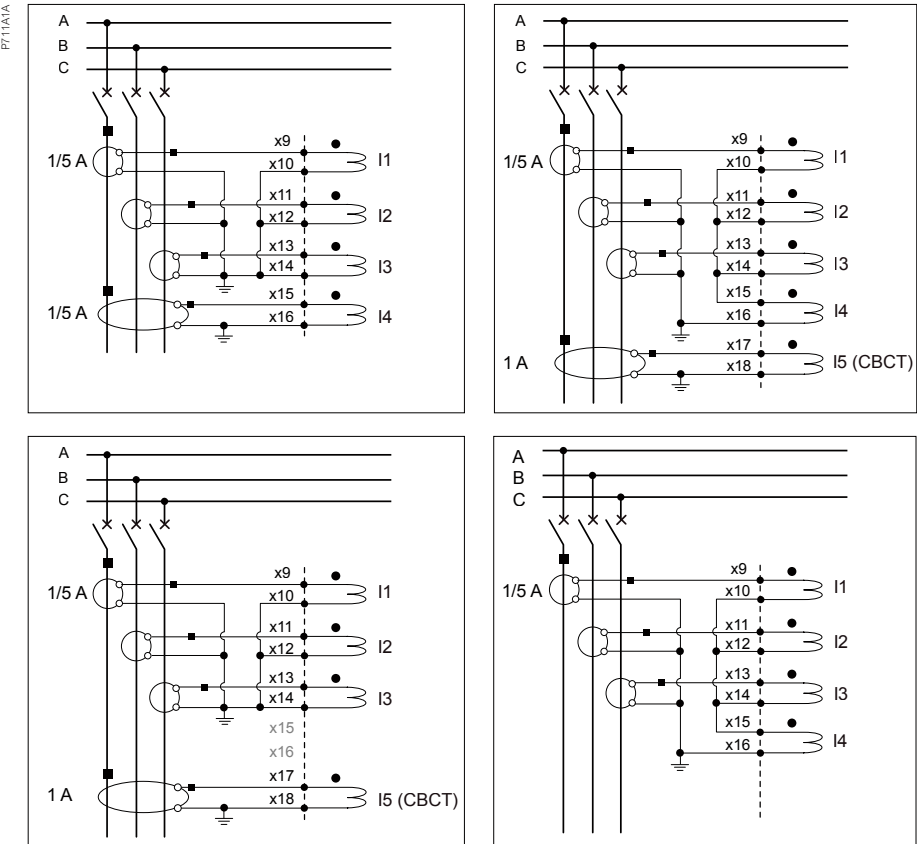
**NOTE:** The PowerLogic P7 can be rack mounted using a rack frame (reference REL70076).

CT Typical Application

The following sections describe typical application diagrams.

**NOTE:** Since the flexible hardware configuration of the PowerLogic P7, the slot number and terminal number of the binary I/O modules in the following diagrams are just for an example. The actual number should be based on the location of the PSU module, CPU module and the number of other modules such as CT/VT, I/O.

Three Phase and Ground Connection



CBCT: Core balance current transformer

x: The first slot used by the CT/VT analog module which takes 2 slots. For example, if the analog module is fitted in slots B and C then x1 becomes B1.

■ P1

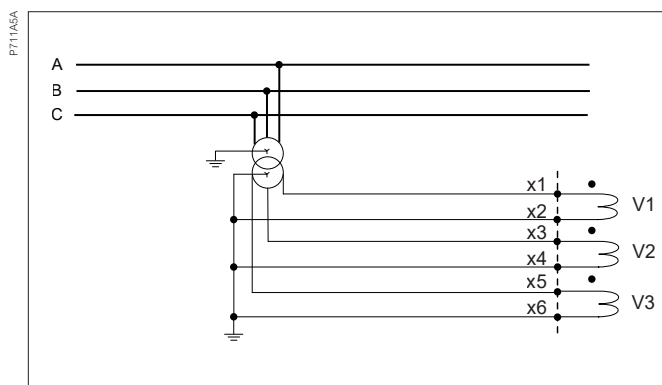
■ S1

**NOTE:** Please see the appropriate User Guide or user manual for correct installation information.

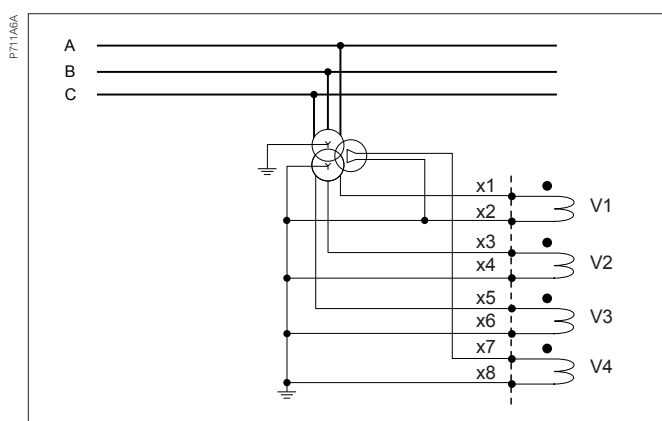


## Voltage Transformer Application

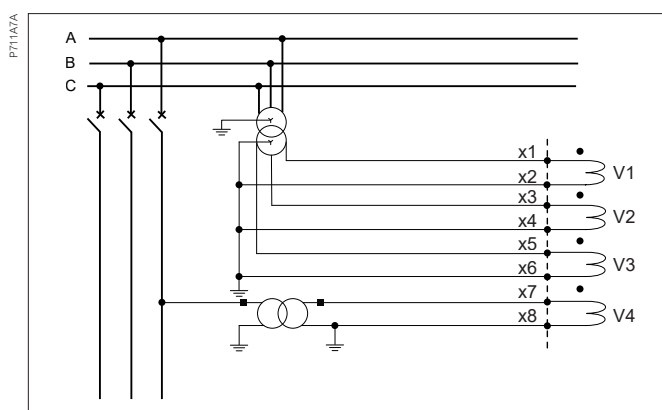
Three Phase-to-Ground Voltages



Three Phase-to-Ground Voltages and One Neutral Voltage



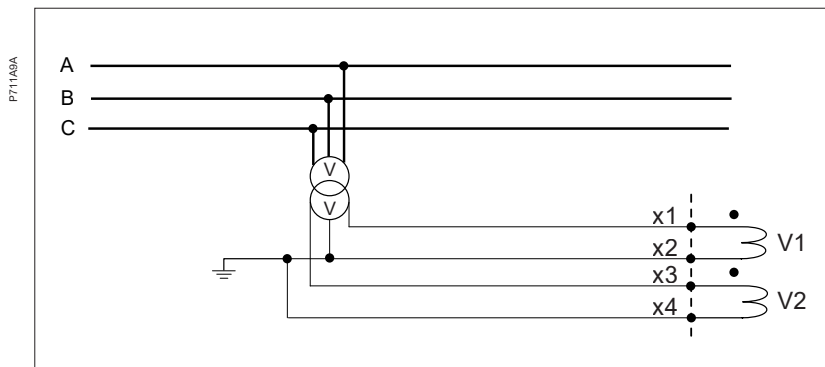
Three Phase-to-Ground Voltages and One Phase-to-Ground Voltage



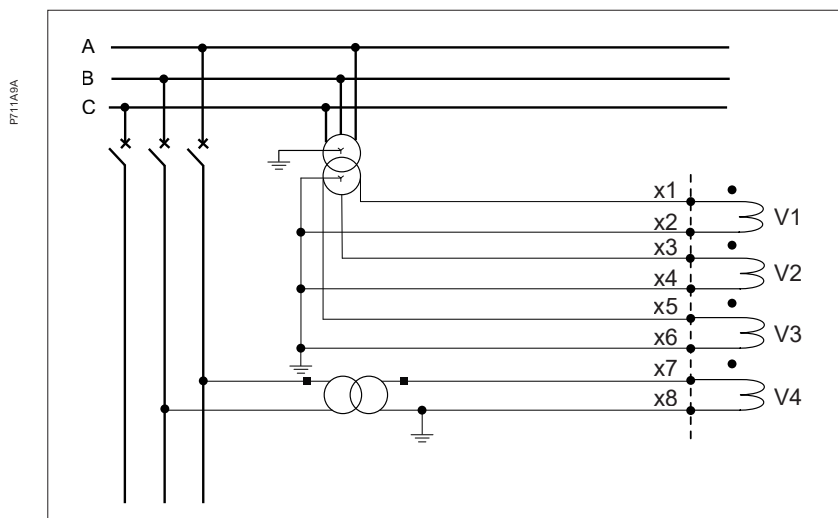
**NOTE:** Please see the appropriate User Guide or user manual for correct installation information.

### Voltage Transformer Application (cont'd)

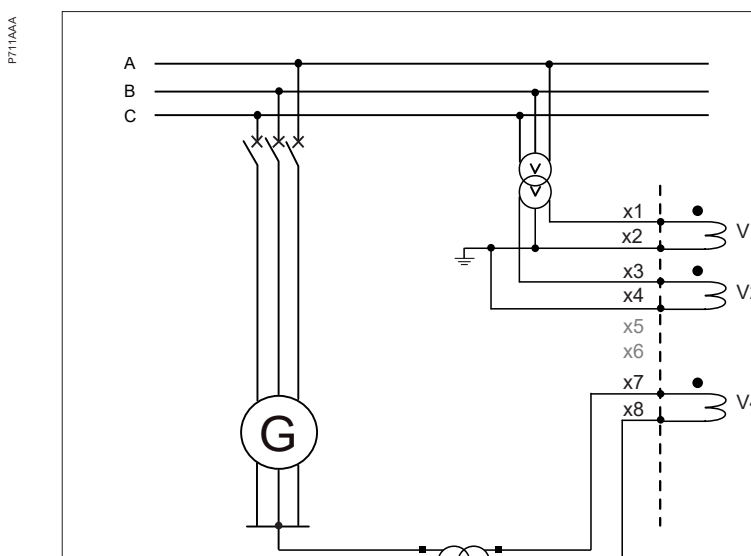
Two Phase-to-Phase Voltages



Two Phase-to-Phase Voltages



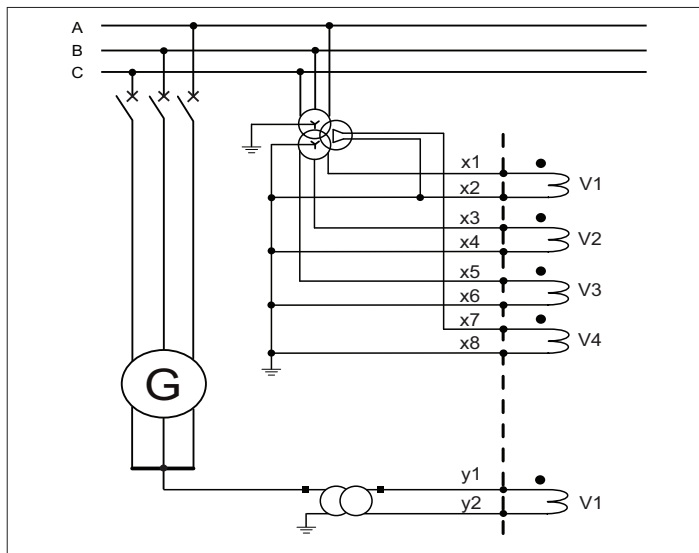
Two Phase-to-Phase Voltages and One Neutral Voltage



**NOTE:** Please see the appropriate User Guide or user manual for correct installation information.

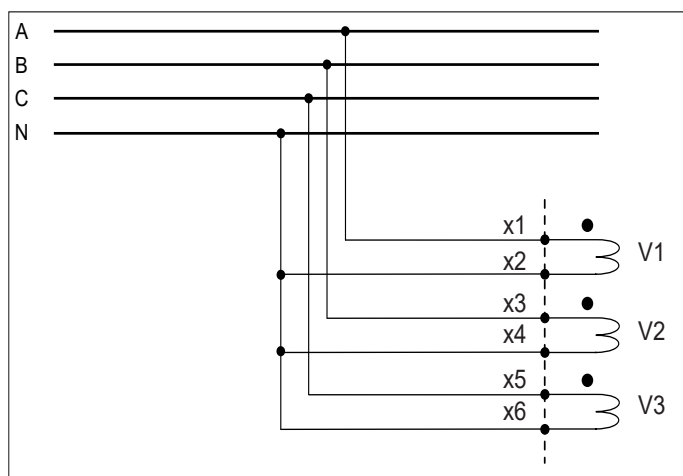
### Voltage Transformer Application (cont'd)

#### Three Phase-to-Ground Voltages and Two Neutral Voltages



#### Direct LV connection (up to 480 V)

Low-voltage systems (up to 480 V) can be directly connected to the voltage input physical channels without VTs using phase to neutral connections.

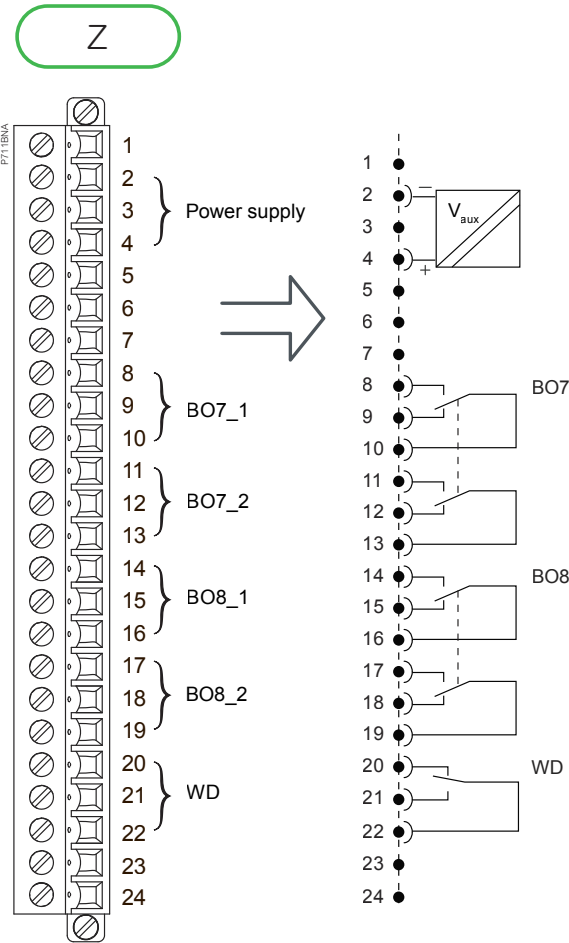


**NOTE:** Please see the appropriate User Guide or user manual for correct installation information.

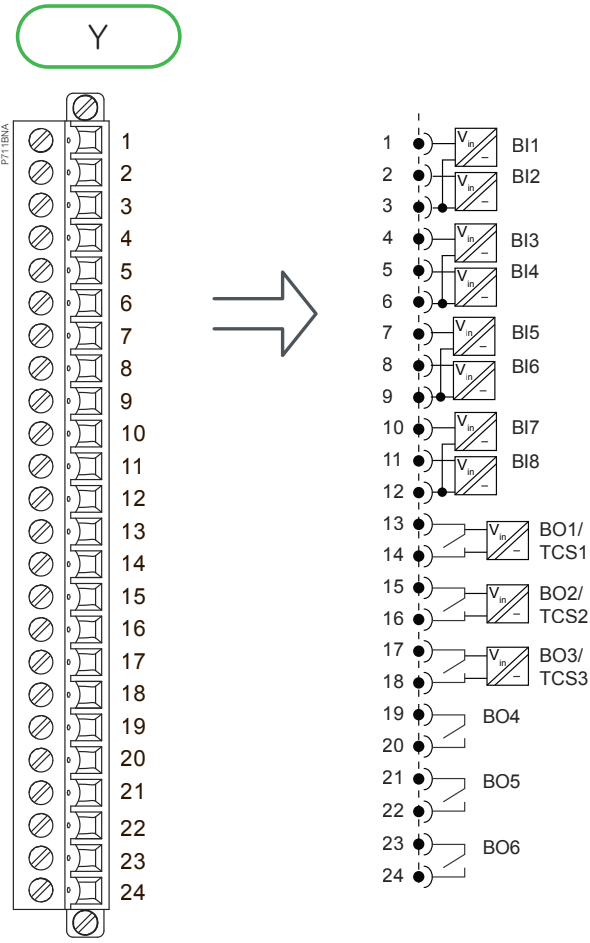
# Connection Diagrams

Power supply, Inputs and Outputs

## Slot Z: Power supply Module (PSU)



## Slot Y: Auxiliary Power supply Module (TIO)

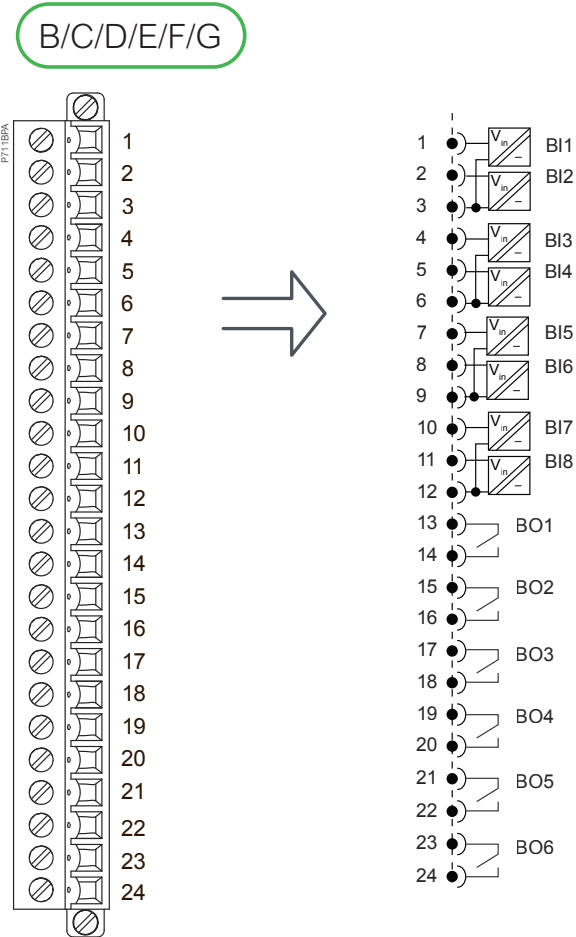


**NOTE:** Please see the appropriate User Guide or user manual for correct installation information.

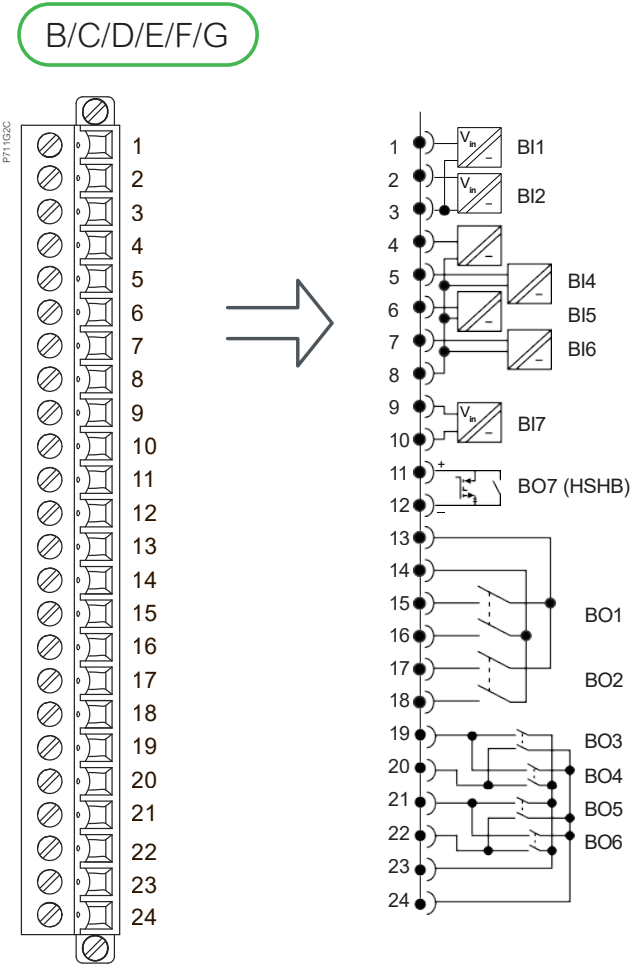
# Connection Diagrams

Power supply, Inputs and Outputs

Slot B, C, D, E, F, G: Additional  
Mixed Binary Input/Output (MIO)  
Modules (8I6O)



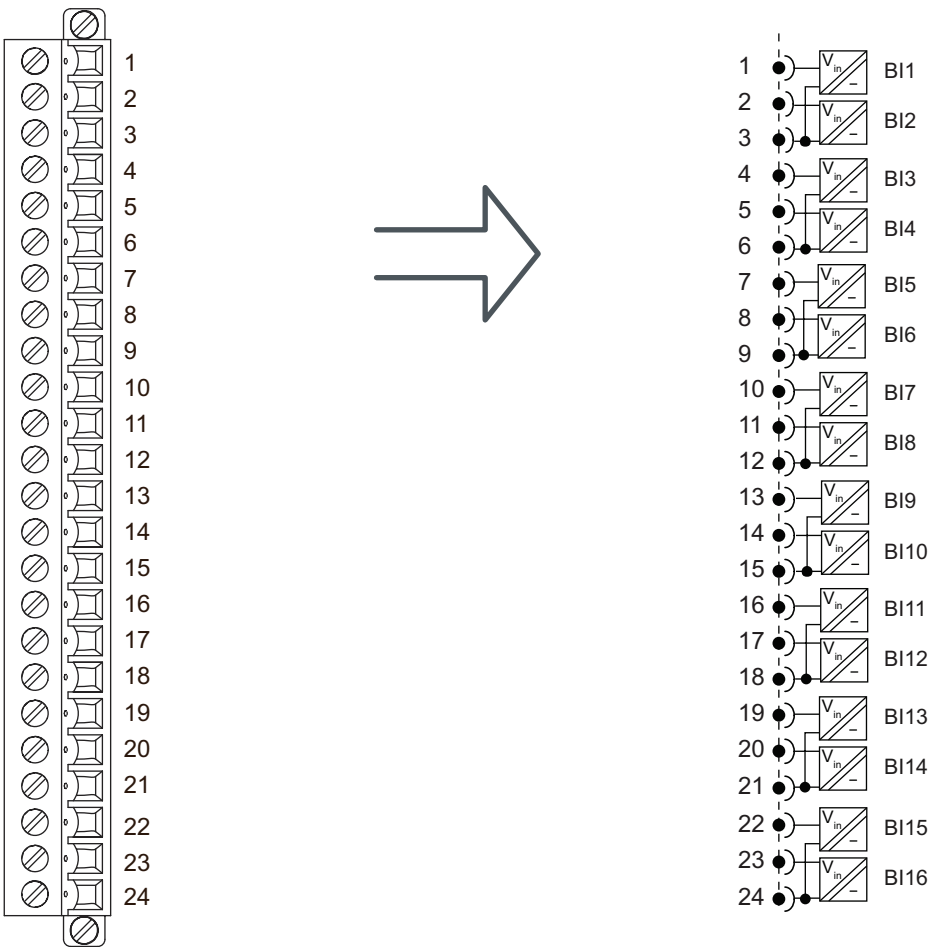
Slot B, C, D, E, F, G: Additional  
Direct Motor Control (DMC)  
Module (7I7O)



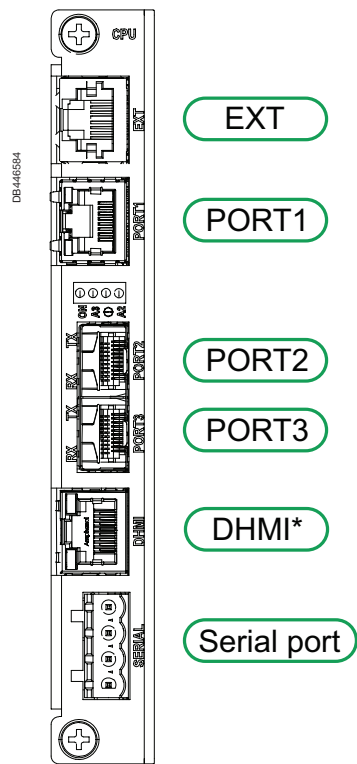
NOTE: Please see the appropriate User Guide or user manual for correct installation information.

Slot B, C, D, E, F, G: Additional Binary Input (INP) Modules (16I)

B/C/D/E/F/G



Slot A: Rear Communication Ports



| PowerLogic P7                    |                                                                                                                                                             |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EXT                              | CAN bus port for connection with accessories like IRIG-B module, RTD module                                                                                 |
| PORT1                            | Single Ethernet communication port with RJ45 connector                                                                                                      |
| PORT2                            | Ethernet port for optional SFP modules:                                                                                                                     |
| PORT3                            | <ul style="list-style-type: none"><li>100/1000 Mbps RJ45</li><li>100/1000 Mbps fiber optic multimode</li><li>100/1000 Mbps fiber optic singlemode</li></ul> |
| DHMI (only on the no HMI option) | Ethernet port for connection with the detachable HMI or the PowerLogic Engineering Suite                                                                    |
| Serial port                      | 2-wire RS485 serial port                                                                                                                                    |

NOTE: Please see the appropriate User Guide or user manual for correct installation information.

## PowerLogic P7 technical characteristics

| Characteristic                        | Value                                                                                                                                                                                     |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Power system frequency</b>         |                                                                                                                                                                                           |
| Rated frequency                       | 50 Hz or 60 Hz                                                                                                                                                                            |
| <b>Operation frequency</b>            |                                                                                                                                                                                           |
| Operation frequency range             | 10...70 Hz                                                                                                                                                                                |
| Frequency range (at claimed accuracy) | 40...70 Hz                                                                                                                                                                                |
| <b>Power supply</b>                   |                                                                                                                                                                                           |
| Operating range                       | <b>Low range:</b><br>DC: 24...34 Vdc, ±20%<br><br><b>Mid-range:</b><br>DC: 48...125 Vdc, ±20%<br><br><b>High range:</b><br>DC: 110...250 Vdc, -20...+20%<br>AC: 110...250 Vac, -20...+15% |
| AC frequency operating range          | 50 Hz, ±10%; 60 Hz, ±10%                                                                                                                                                                  |
| MCB recommendation                    | DC: 6 A; AC: 10 A                                                                                                                                                                         |
| Burden DC                             | Typical: 24 W, maximum: 45 W                                                                                                                                                              |
| Burden AC                             | Typical: 60 VA, maximum: 112 VA at 230 Vac<br>Typical: 48 VA, maximum: 75 VA at 100 Vac                                                                                                   |
| <b>RTC retention time</b>             |                                                                                                                                                                                           |
| RTC retention time                    | 1 month typical, 1 week minimum <sup>(1)</sup>                                                                                                                                            |
| <b>Standard CT inputs</b>             |                                                                                                                                                                                           |
| CT secondary phase current            | 1 A or 5 A                                                                                                                                                                                |
| Dynamic range                         | 64 x CT rated current (or 32 x CT rated current + 32 x CT rated current DC offset)                                                                                                        |
| Thermal withstand                     | Continuous: 20 A<br>1 s: 500 A<br>Half period: 1250 A                                                                                                                                     |
| Input impedance                       | < 0.01 Ω                                                                                                                                                                                  |
| Burden                                | < 0.03 VA at 1 A; < 0.5 VA at 5 A                                                                                                                                                         |
| <b>Core balance CT</b>                |                                                                                                                                                                                           |
| CT rated secondary current            | 1 A                                                                                                                                                                                       |
| Dynamic range                         | 20 A                                                                                                                                                                                      |
| Thermal withstand                     | Continuous: 4 A<br>1 s: 100 A<br>Half period: 250 A                                                                                                                                       |
| Input impedance                       | < 0.05 Ω                                                                                                                                                                                  |
| Burden                                | < 0.05 VA                                                                                                                                                                                 |
| <b>VT inputs</b>                      |                                                                                                                                                                                           |
| VT rated secondary voltage            | 100...480 V RMS (phase-to-phase).<br>Phase-to-neutral connection must be used above 300 V.                                                                                                |
| Voltage withstand                     | Continuous: 600 Vrms<br>1 min: 2200 Vrms                                                                                                                                                  |
| Input impedance                       | 2200 kΩ to ground per pin<br>4400 kΩ between 2 pins, resistive                                                                                                                            |
| Rated frequency                       | Rated: 50 Hz or 60 Hz<br>DC tolerant: 10...1000 Hz                                                                                                                                        |
| Burden                                | < 0.05 VA                                                                                                                                                                                 |
| <b>Binary inputs</b>                  |                                                                                                                                                                                           |
| Operating nominal voltage             | 24...250 Vdc<br>220...250 Vac                                                                                                                                                             |
| Voltage withstand                     | 300 Vdc 300 Vrms                                                                                                                                                                          |

(1) This value can be affected by high temperatures.

### PowerLogic P7 technical characteristics (cont'd)

| Characteristic                         | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pulsed current                         | 30 mA for 20 ms (DC)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Constant current                       | 1 mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Pick-up threshold                      | 40%...80% in 1% steps of nominal voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Drop-off threshold                     | 50%...90% in 1% steps of pick-up voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Threshold accuracy                     | < 1%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Filter time                            | 20 μs...100 ms in 20 μs steps fixed value for speed detection function: 60 μs                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Recognition time                       | < 1 ms (DC)<br>< 20 ms (AC), excluding filter time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Reset time                             | < 1 ms (DC)<br>< 20 ms (AC)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Burden current                         | AC: < 15 mA<br>DC: < 2 mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Voltage withstand                      | 2 kV AC for 1 min to ground and other circuits including other binary input pairs on the same board                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Standard binary output</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Contact rated voltage                  | 250 Vdc or 250 Vac, 50 Hz or 60 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Voltage withstand                      | 300 Vdc, 300 Vrms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Continuous current                     | Max: 8 A (UL: 5 A)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Short duration withstand carry         | 30 A, 3 s<br>250 A, 30 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Make and break capacity                | DC: 50 W resistive<br>DC: 62.5 W inductive (L/R = 50 ms)<br>AC: 2500 VA resistive (cosΦ = unity)<br>AC: 2500 VA inductive (cosΦ = 0.7)                                                                                                                                                                                                                                                                                                                                                                                                  |
| Make and carry                         | 30 A for 3 s, DC resistive.<br>10,000 operations (subject to the above limits of make/break capacity and rated voltage)                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Make carry and break                   | 30 A for 200 ms, AC resistive.<br>2000 operations (subject to the above limits of make/break capacity and rated voltage).<br><br>4 A for 1.5 s, DC resistive.<br>10,000 operations (subject to the above limits of make/break capacity and rated voltage).<br><br>0.5 A for 1 s, DC inductive.<br>10,000 operations (subject to the above limits of make/break capacity and rated voltage).<br><br>10 A for 1.5 s, AC resistive/inductive.<br>10,000 operations (subject to the above limits of make/break capacity and rated voltage). |
| Operate time                           | < 5 ms, bounce time not included                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Reset time                             | < 5 ms, bounce time not included                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Contact material                       | Ag alloy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Loaded contact                         | 10,000 operations minimum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Unloaded contact                       | 100,000 operations minimum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>High break (HSHB) binary output</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Contact rated voltage                  | 250 Vdc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Continuous current                     | Max: 10 A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Short duration withstand carry         | 30 A, 3 s<br>250 A, 30 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Mark and Break capacity                | DC: 7500 W resistive<br>DC: 2500 W inductive (L/R = 40 ms)                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

### PowerLogic P7 technical characteristics (cont'd)

| Characteristic                          | Value                                                                                                                                                                                                                                              |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Make carry and break                    | 30 A for 200 ms, DC resistive<br>10,000 operations (subject to the above limits of make/break capacity and rated voltage)<br>10 A for 1s, DC inductive<br>10,000 operations (subject to the above limits of make/break capacity and rated voltage) |
| Loaded contact                          | 10,000 operations minimum                                                                                                                                                                                                                          |
| Unloaded contact                        | 100,000 operations minimum                                                                                                                                                                                                                         |
| Operating time                          | < 0.2 ms                                                                                                                                                                                                                                           |
| Reset time                              | < 8 ms                                                                                                                                                                                                                                             |
| <b>Watchdog binary output</b>           |                                                                                                                                                                                                                                                    |
| Contact rated voltage                   | 240 Vdc or 240 Vac, 50 Hz or 60 Hz                                                                                                                                                                                                                 |
| Voltage withstand                       | 300 Vdc, 300 Vrms                                                                                                                                                                                                                                  |
| Continuous current                      | 2 A                                                                                                                                                                                                                                                |
| Short duration withstand carry          | 30 A, 0.2 s                                                                                                                                                                                                                                        |
| Minimum making current                  | 10 mA with 50 mW minimum                                                                                                                                                                                                                           |
| Make and carry                          | 1000 W with L/R = 40 ms 250 Vdc<br>1150 VA 230 Vac<br>Duty cycle 1 s ON, 9 s OFF                                                                                                                                                                   |
| Make, Carry and Break                   | 30 W with L/R = 40 ms 250 Vdc<br>1150 VA 230 Vac<br>Duty cycle 1 s ON, 9 s OFF                                                                                                                                                                     |
| Contact material                        | Ag alloy                                                                                                                                                                                                                                           |
| Loaded contact                          | 10000 operations minimum                                                                                                                                                                                                                           |
| Unloaded contact                        | 100000 operations minimum                                                                                                                                                                                                                          |
| <b>Size and weight</b>                  |                                                                                                                                                                                                                                                    |
| 40TE Case size (Width x Height x Depth) | 205 × 180 × 280 mm (8 × 7 × 11 in)<br>250 mm depth in panel<br>205 × 180 × 254 mm (8 × 7 × 10 in) for no HMI option                                                                                                                                |
| Weight                                  | Maximum weight: 9.7 kg (21.3 lb) (three analog boards)                                                                                                                                                                                             |

## CLIO technical characteristics

| Characteristic                             | Value                                                                                    |
|--------------------------------------------|------------------------------------------------------------------------------------------|
| <b>Power supply</b>                        |                                                                                          |
| Operating range                            | DC: 24...250 V dc, $\pm 20\%$<br>AC: 100...250 V dc, $\pm 20\%$                          |
| AC frequency operating range               | 50 Hz, $\pm 10\%$ ; 60 Hz, $\pm 10\%$                                                    |
| MCB recommendation                         | DC: 6 A; AC: 10 A                                                                        |
| Burden DC                                  | Typical: 3 W, maximum: 12 W                                                              |
| Burden AC                                  | Typical: 7.5 VA, maximum: 30 VA at 250 V ac<br>Typical: 6 VA, maximum: 24 VA at 100 V ac |
| <b>Number of channels</b>                  |                                                                                          |
| Number of channels for current loop input  | 4                                                                                        |
| Number of channels for current loop output | 4                                                                                        |
| <b>Ranges</b>                              |                                                                                          |
| Ranges of current loop input               | 0-1 mA<br>0-10 mA<br>0-20 mA<br>4-20 mA<br>4-22 mA                                       |
| Ranges of current loop output              | 0...1 mA<br>0...10 mA<br>0...20 mA<br>4...20 mA                                          |
| <b>Accuracy</b>                            |                                                                                          |
| Accuracy of current loop input             | $\pm 0.2\%$ desirable<br>$\pm 0.5\%$ of full scale compulsory                            |
| Accuracy of current loop output            | $\pm 0.5\%$ of full scale                                                                |
| <b>Interval</b>                            |                                                                                          |
| Sampling interval of current loop input    | 50 ms                                                                                    |
| Conversion interval of current loop output | 50 ms                                                                                    |
| <b>Other characteristics</b>               |                                                                                          |
| Latency of current loop output             | < 100 ms                                                                                 |
| Load resistance of current loop input      | < 300 $\Omega$                                                                           |
| Maximum output load                        | 600 $\Omega$                                                                             |

### PowerLogic P7 environmental characteristics

|                                                                                                       |
|-------------------------------------------------------------------------------------------------------|
| <b>⚠ WARNING</b>                                                                                      |
| <b>UNINTENDED EQUIPMENT OPERATION</b>                                                                 |
| Install PowerLogic P7 according to the environmental characteristics.                                 |
| <b>Failure to follow these instructions can result in death, serious injury, or equipment damage.</b> |

All the binary inputs have been tested with 3 ms filter time.

| Characteristic                       |                                | Description/Value |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------|--------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power Supply                         |                                |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Characteristics                      | Standard                       | Level/Class       | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Voltage dips (DC)                    | IEC 61000-4-29<br>IEC 60255-26 |                   | 200 ms voltage dips 0%, 250 Vdc and above, Criteria A<br>100 ms voltage dips 0%, 110 Vdc<br>50 ms voltage dips 0%, 48 Vdc<br>50 ms voltage dips 0%, 24 Vdc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Ripple (DC)                          | IEC 61000-4-17<br>IEC 60255-26 |                   | 15%; 100 Hz/120 Hz, Criteria A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Voltage dips (AC)                    | IEC 61000-4-11<br>IEC 60255-26 |                   | Criteria A<br>10 cycles, voltage dips 0%, 250 Vac<br>AC 5 cycles, voltage dips 0%, 110 Vac                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Power Supply (CLIO module)           |                                |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Characteristics                      | Standard                       | Level/Class       | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Voltage dips (DC)                    | IEC 61000-4-29<br>IEC 60255-26 |                   | 1000 ms voltage dips 0%, 250 Vdc and above, Criteria A<br>300 ms voltage dips 0%, 24 Vdc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Voltage dips (AC)                    | IEC 61000-4-11<br>IEC 60255-26 |                   | Criteria A<br>50 cycles, voltage dips 0%, 250 Vac<br>25 cycles, voltage dips 0%, 100 Vac                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Product Safety                       |                                |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Characteristics                      | Standard                       |                   | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Insulation characteristics           | IEC 60255-27                   |                   | Insulation resistance > 100 MΩ at 500 Vdc (except VT port)<br>Using only electronic/brushless insulation tester.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Creepage distances and clearances    | IEC 60255-27                   |                   | Pollution degree 2, Overvoltage category III                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Altitude                             | IEC 60255-27                   |                   | Up to 2000 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| High voltages withstand (dielectric) | IEC 60255-27                   |                   | 2 kV rms AC, 1 min: <ul style="list-style-type: none"><li>Between all case terminals connected together (except RJ45 ports), and the case ground</li></ul> 2 kV rms AC, 1 min: <ul style="list-style-type: none"><li>Between all terminals of independent circuits</li></ul> 3.1 kv DC, 1 min: <ul style="list-style-type: none"><li>Between RJ45 (except POE port) and VT ports / PSU port</li></ul> 1 kV rms AC for 1 min: <ul style="list-style-type: none"><li>Across normally open control and signaling contacts</li></ul> 1 kV rms AC for 1 min: <ul style="list-style-type: none"><li>Between RJ45 ports and the case ground</li></ul> None for internal connection EXT port, due to EXT port is earthing.<br>No test should be applied across contacts for high break relay output due to solid state devices across open contact.<br>No test should be applied across contacts for BO1-BO3 (TCS1-TCS3) of TIO board due to transient suppression devices are fitted. |
|                                      | IEEE C37.90                    |                   | 1.5 kV rms, 1 min, across open tripping contacts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

### PowerLogic P7 environmental characteristics (cont'd)

| Characteristic                              | Description/Value                     |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------|---------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Impulse voltage                             | IEC 60255-27                          |             | 1.2 μs, 50 μs, 5 kV, 0.5 J: <ul style="list-style-type: none"> <li>Between RJ45 ports and the case ground</li> <li>Between RJ45 ports and all other independent circuits</li> </ul> 1.2 μs, 50 μs, 1.5 kV, 0.5 J: <ul style="list-style-type: none"> <li>Between all terminals of independent circuits (except RJ45 ports)</li> <li>Between all terminals and case ground (except RJ45 ports)</li> <li>Between the polarities of input circuits</li> </ul>                                                                           |
| <b>Product Safety (CLIO module)</b>         |                                       |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Characteristics                             | Standard                              |             | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Insulation characteristics                  | IEC 60255-27                          |             | Insulation resistance > 1 MΩ at 500 Vdc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Dielectric withstand                        | IEC 60255-27<br>IEEE C37.90           |             | 3.25 kV AC, 1 min, <ul style="list-style-type: none"> <li>Between power port and case,</li> <li>Between power port and all other circuits connected together (except earth).</li> </ul> 2.2 kV AC, 1 min, <ul style="list-style-type: none"> <li>Between power port and earth port.</li> </ul> 1 kV AC, 1 min, <ul style="list-style-type: none"> <li>Between CAN ports and I/O ports connected together, and case.</li> <li>Between each I/O port and all other circuits connected together.</li> </ul>                             |
| Impulse voltage withstand                   | IEC 60255-27<br>IEEE C37.90           |             | 1.5 kV peak value, 1.2/50 μs, 0.5 J <ul style="list-style-type: none"> <li>Between CAN ports and I/O ports, and case.</li> <li>Between each I/O port or each CAN port, and all other circuits.</li> </ul> 6 kV peak value, 1.2/50 μs, 0.5 J <ul style="list-style-type: none"> <li>Between power port and case.</li> <li>Between power port and all I/O ports.</li> </ul> 5 kV peak value, 1.2/50 μs, 0.5 J <ul style="list-style-type: none"> <li>Across power port.</li> <li>Between power port and CAN ports or earth.</li> </ul> |
| <b>Electromagnetic Compatibility</b>        |                                       |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Characteristics                             | Standard                              | Level/Class | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Emission test</i>                        |                                       |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Radiated disturbances                       | CISPR22<br>CISPR11<br>IEC 60255-26    | Class A     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                             | FCC part 18                           |             | This device complies with part 18 of the FCC Rules.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                             | IACS E10<br>CISPR 16-2-3<br>IEC 60945 |             | For equipment installed in the general power distribution zone.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Conducted disturbances                      | CISPR 22<br>IEC 60255-26              | Class A     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                             | FCC part 18                           |             | This device complies with part 18 of the FCC Rules.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                             | IACS E10<br>CISPR 16-2-1              |             | For equipment installed in the general power distribution zone.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <i>Radiated disturbances immunity tests</i> |                                       |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Radiated radio frequency fields             | IEC 61000-4-3<br>IEC 60255-26         | Level 3     | 10 V/m, 80 MHz...6 GHz, 80% AM (1 kHz)<br>30 V/m, 800 MHz...960 MHz/1.4 GHz...2 GHz, 80% AM (1 kHz)                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                             | ANSI C37.90.2                         |             | 20 V/m, 80 MHz...1GHz, 80% AM (1 kHz)<br>35 V/m, 80 MHz...1GHz, 100% pulse                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                             | IACS E10                              | Level 3     | 10 V/m, 80 MHz...6 GHz, 80% AM (1 kHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

### PowerLogic P7 environmental characteristics (cont'd)

| Characteristic                                | Description/Value                        |             |                                                                                                                                                                                                                                                                    |
|-----------------------------------------------|------------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electrostatic discharges                      | IEC 61000-4-2<br>IEC 60255-26            | Level 4     | 15 kV air, 8 kV contact                                                                                                                                                                                                                                            |
|                                               | ANSI C37.90.3                            |             | 15 kV air, 8 kV contact                                                                                                                                                                                                                                            |
|                                               | IACS E10                                 | Level 3     | 8 kV air, 6 kV contact                                                                                                                                                                                                                                             |
| Magnetic field at power frequency             | IEC 61000-4-8<br>IEC 60255-26            | Level 5     | 100 A/m continuous; 1000 A/m, 1...3 s <sup>(1)</sup>                                                                                                                                                                                                               |
| Pulse magnetic fields                         | IEC 61000-4-9                            | Level 5     | 1000 A/m                                                                                                                                                                                                                                                           |
| Oscillatory magnetic fields                   | IEC 61000-4-10                           | Level 5     | 100 A/m, 100 kHz and 1 MHz                                                                                                                                                                                                                                         |
| <b>Conducted Radio Frequency disturbances</b> |                                          |             |                                                                                                                                                                                                                                                                    |
| Conducted Radio Frequency disturbance         | IEC 61000-4-6<br>IEC 60255-26<br>IACSE10 | Level 3     | 10 V rms common mode, 0.15...80 MHz, 80% AM (1 kHz)                                                                                                                                                                                                                |
| Fast transient bursts                         | IEC 61000-4-4<br>IEC 60255-26            | Level 4     | 4 kV common mode, 5 kHz, 100 kHz                                                                                                                                                                                                                                   |
|                                               | ANSI C37.90.1                            |             | 4 kV, 5 kHz, common mode and transversal mode                                                                                                                                                                                                                      |
|                                               | IACS E10                                 | Level 3     | 2 kV line on power supply port/earth;<br>1 kV on I/O data control and communication ports;<br>5 kHz, 5 min                                                                                                                                                         |
| Slow damped oscillatory waves                 | IEC 61000-4-18<br>IEC 60255-26           | Level 3     | 2.5 kV common mode<br>1 kV Differential mode, 100 kHz, 1 MHz                                                                                                                                                                                                       |
|                                               | ANSI C37.90.1                            |             | 2.5 kV, 1 MHz, common mode and transversal mode                                                                                                                                                                                                                    |
| Ring wave                                     | IEC 61000-4-12                           | Level 3     | 2 kV common mode;<br>1 kV, differential mode, 100 kHz<br>Source impedance: 12 Ω                                                                                                                                                                                    |
| Fast damped oscillatory waves                 | IEC 61000-4-18<br>IEC 60255-26           | Level 3     | 2 kV common mode, 3 MHz, 10 MHz, 30 MHz                                                                                                                                                                                                                            |
| Conducted disturbances 0...150 kHz            | IEC 60255-26                             | Zone A      | 50 Hz or 60 Hz:<br>150 V rms, Differential mode;<br>300 V rms, common mode                                                                                                                                                                                         |
|                                               | IEC 61000-4-16                           | Level 4     | 16 <sup>2/3</sup> Hz, 50 Hz or 60 Hz<br>• continuous disturbance, 30 V<br>• short duration disturbance, 300 V<br>15 Hz...150 kHz:<br>• 15 Hz...150 Hz, 30...3 V<br>• 150 Hz...1.5 kHz, 3 V<br>• 1.5 kHz...15 kHz, 3...30 V<br>• 15 kHz...150 kHz, 30 V             |
| Surges <sup>(2)</sup>                         | IEC 61000-4-5<br>IEC 60255-26            | Level 4     | 4 kV, common mode; 2 kV, Differential mode                                                                                                                                                                                                                         |
|                                               | IACS E10                                 | Level 2     | 1 kV, common mode; 0.5 kV, differential mode                                                                                                                                                                                                                       |
| Conducted low Frequency                       | IACS E10                                 |             | AC: rated frequency to 200 <sup>th</sup> harmonic; 10% of supply to 15th harmonic reducing to 1% at 100 <sup>th</sup> harmonic and maintain this level to the 200 <sup>th</sup> harmonic, min 3 V r.m.s, max 2 W<br><br>DC: 50 Hz...10 kHz; 10% of supply max. 2 W |
| Harmonics and interharmonics (AC)             | IEC 61000-4-13                           | Level 3     | Criteria A                                                                                                                                                                                                                                                         |
| <b>Environmental conditions</b>               |                                          |             |                                                                                                                                                                                                                                                                    |
| Characteristics                               | Standard                                 | Test Method | Value                                                                                                                                                                                                                                                              |
| <b>Operation</b>                              |                                          |             |                                                                                                                                                                                                                                                                    |
| Exposure to cold                              | IEC 60068-2-1                            | Ae          | -40 °C (-40 °F), 96 hours.                                                                                                                                                                                                                                         |

(1) A minimum threshold of 0.025 pu (standard CT) or 0.005 pu (core-balance CT) is recommended in applications where a magnetic field of 1000 A/m is possible. Lower settings may be used if required; however, a trip delay of at least 5 s will be required to avoid risk for false tripping during a heavy magnetic field.

(2) It is recommended to use operation time of at least 30 ms at the lowest pickup value setting.

### PowerLogic P7 environmental characteristics (cont'd)

| Characteristic               | Description/Value         |                 |                                                                                                                                                                                                                     |
|------------------------------|---------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Exposure to dry heat         | IEC 60068-2-2             | Be              | 70 °C (+158 °F), 96 hours<br>85 °C (185 °F), 16 hours                                                                                                                                                               |
| UL test                      | UL 508                    | –               | 55 °C (131 °F), device operated continuously with 50% of contacts energized; 5 A                                                                                                                                    |
| Exposure to damp heat        | IEC 60068-2-78            | Cab             | 93% ± 3% RH; 40 °C (+104 °F), 56 days, without condensation                                                                                                                                                         |
| Temperature variation        | IEC 60068-2-14            | Nb              | -40...+70 °C (-40...+158 °F), 1 °C/min (1.8 °F/min) 5 cycles                                                                                                                                                        |
| Damp heat cyclic test        | IEC 60068-2-30            | Db<br>Variant 1 | 55 °C/93% ± 3% RH and 25 °C/97% -2% +3% RH, with condensation, 6 cycles (12 h + 12 h)                                                                                                                               |
| <i>Transport and Storage</i> |                           |                 |                                                                                                                                                                                                                     |
| Exposure to cold             | IEC 60068-2-1             | Ab              | -40 °C (-40 °F), 96 hours                                                                                                                                                                                           |
| Exposure to dry heat         | IEC 60068-2-2             | Bb              | +85 °C (+185 °F), 96 hours                                                                                                                                                                                          |
| Exposure to damp heat        | IEC 60068-2-78            | Cab             | 93% ± 3% RH; 40 °C (+104 °F), 56 days, without condensation                                                                                                                                                         |
| <i>Corrosive atmosphere</i>  |                           |                 |                                                                                                                                                                                                                     |
| Salt mist                    | IEC 60068-2-52<br>IACSE10 | Kb/1            | 4 spraying periods of 2 hours with a storage of 7 days after each                                                                                                                                                   |
| 2 Gas                        | IEC 60068-2-60            | Ke              | +25 °C (+77 °F), 75% RH, 21 days method 1: 0.5 ppm SO <sub>2</sub> ; 0.1 ppm H <sub>2</sub> S                                                                                                                       |
| 4 Gas                        | IEC 60068-2-60            | Ke              | +25 °C (+77 °F), 75% RH, 21 days<br>method 4: 0.11 ppm SO <sub>2</sub> ; 0.071 ppm H <sub>2</sub> S; 0.034 ppm Cl <sub>2</sub> , 0.26 ppm NO <sub>2</sub> ,<br>(according to IEC 60721-3-3 level 3C2 concentration) |
| Sulphur dioxide              | IEC 60068-2-42            | Kc              | 25 °C (77 °F), 75% RH, 21 days<br>25 ppm SO <sub>2</sub>                                                                                                                                                            |
| Hydrogen sulphide            | IEC 60068-2-43            | Kd              | 25 °C (77 °F), 75% RH, 21 days<br>15 ppm H <sub>2</sub> S                                                                                                                                                           |
| <b>Mechanical Robustness</b> |                           |                 |                                                                                                                                                                                                                     |
| Characteristics              | Standard                  | Level           | Value                                                                                                                                                                                                               |
| Vibration response           | IEC 60255-21-1            | Class 2         | 1 Gn, 10...150 Hz                                                                                                                                                                                                   |
|                              | IACS E10                  |                 | 2 to 13.2 Hz - amplitude ±1mm                                                                                                                                                                                       |
|                              | IEC 60068-2-6             |                 | 13.2 to 100 Hz - acceleration ±0.75 Gn                                                                                                                                                                              |
| Vibration endurance          | IEC 60255-21-1            | Class 2         | 2 Gn, 10...150 Hz                                                                                                                                                                                                   |
| Shock response               | IEC 60255-21-2            | Class 2         | 10 Gn, 11 ms                                                                                                                                                                                                        |
| Shock withstand              | IEC 60255-21-2            | Class 1         | 15 Gn, 11 ms                                                                                                                                                                                                        |
| Bump                         | IEC 60255-21-2            | Class 1         | 10 Gn, 16 ms                                                                                                                                                                                                        |
| Seismic test                 | IEC 60255-21-3            | Class 2         | 2 Gn horizontal; 1 Gn vertical                                                                                                                                                                                      |
| <b>Enclosure</b>             |                           |                 |                                                                                                                                                                                                                     |
| Front panel                  | IEC 62262                 | IK07            | Degree of protection against mechanical impacts                                                                                                                                                                     |
|                              | IEC 60529                 | IP54            | Front panel                                                                                                                                                                                                         |
|                              | NEMA                      | Type 12         | Self-declaration                                                                                                                                                                                                    |
|                              | UL                        | Type 1          |                                                                                                                                                                                                                     |
| Rear panel                   | IEC 60529                 | IP20            | With IP20 protective cover                                                                                                                                                                                          |
| Case                         | IEC 60529                 | IP30            | Except area with rear terminals                                                                                                                                                                                     |

### PowerLogic P7 environmental characteristics (cont'd)

| Characteristic                                                                                                        | Description/Value                                 |      |                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------------|
| CLIO module                                                                                                           | IEC 62262                                         | IK06 |                                                                                                                                  |
| <b>Fire resistance</b>                                                                                                |                                                   |      |                                                                                                                                  |
| Fire resistance                                                                                                       | IEC 60695-2-11                                    |      | 650 °C (1202 °F)                                                                                                                 |
| Flame retardant                                                                                                       | IACS E10<br>IEC 60695-11-5                        |      | Flame application: 5 times 15 s each.<br>Interval between each application: 15 s                                                 |
| <b>Packaging</b>                                                                                                      |                                                   |      |                                                                                                                                  |
| Resistance to shocks by free fall (with packaging)                                                                    | IEC 68068-2-31                                    |      | 1 m (3.28 ft)                                                                                                                    |
| <b>Certification/declaration</b>                                                                                      |                                                   |      |                                                                                                                                  |
| <br>European Commission's directives | EN 60255-26:2013                                  |      | Electromagnetic Compatibility Directive (EMCD) 2014/30/EU                                                                        |
|                                                                                                                       | EN 60255-27:2014                                  |      | Low Voltage Directive (LVD) 2014/35/EU                                                                                           |
| <br>United Kingdom regulations       | EN IEC 63000:2018                                 |      | Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (ROHS) Directive 2015/863/EU       |
|                                                                                                                       | BS EN 60255-26:2013                               |      | Electromagnetic Compatibility (EMC) Regulations SI 2016 No. 1091                                                                 |
|                                                                                                                       | BS EN 60255-27:2014                               |      | Electrical equipment (safety) regulations SI 2016 No. 1101                                                                       |
| <br>UL Standards                   | BS EN IEC 63000:2018                              |      | Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (ROHS) regulations SI 2012 No.3033 |
|                                                                                                                       | UL 508<br>ANSI/IEEE C37.90<br>CAN/CSA C22.2 No.14 |      | File E518585, NRGU                                                                                                               |
| <br>II(2) GD                       | EN 50495: 2010                                    |      | Potentially Explosive Atmospheres Directive (ATEX) 2014/34/EU                                                                    |





# Digital Experience

# Digital Experience

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| PowerLogic Engineering Suite | 76 |
| Mobile Application           | 78 |

# Setup Software

## PowerLogic Engineering Suite

### Comprehensive Digital Tools for Mobile, Tablet or Desktop

#### PowerLogic Engineering Suite Saves Time, Improves Efficiency

PowerLogic Engineering Suite is an easy-to-use, versatile tool with functionalities and features needed throughout the life cycle of Schneider Electric protection and control IEDs, including support for seamless integration into EcoStruxure Power and Grid.



- One Tool Suite for all connected products offline/online
- Flexible and adaptable for multiple personas
- User-experience driven with built in contextual help
- Modern ergonomic design
- Future-proof, IEC 61850 compliant

#### Full Operation from a Safe Distance

Digital tools provide simpler installation, configuration, and maintenance, enabling smoother operations, saved time and saved money. Digital tools include:



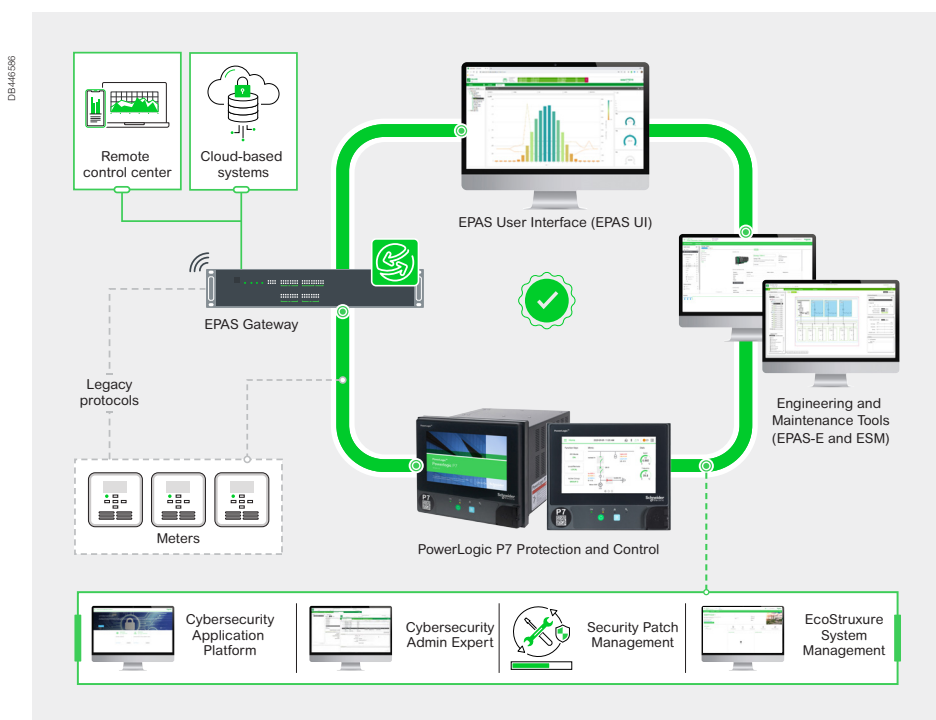
**PowerLogic Engineering Suite** our next generation of tools, for device and system architecture configuration, engineering, and maintenance



**mySchneider** allows to access product information and documentation in a very simple way, just by flashing the QR code on the device



**Product Selector tool** helps the user during the selection and configuration journey to select the product needed.



Configure, integrate, and maintain PowerLogic P7 devices in Schneider Electric's EcoStruxure™ Power Automation System (EPAS)

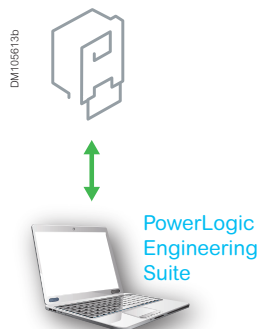
# Setup Software

## PowerLogic Engineering Suite

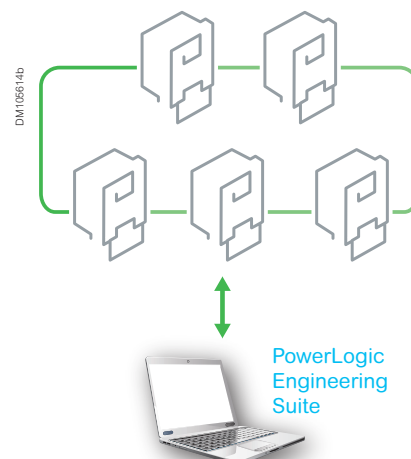
### How to use PowerLogic Engineering Suite?



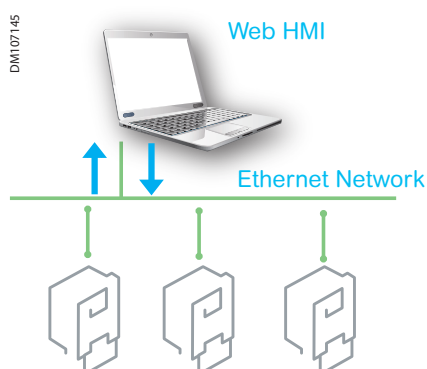
Use PowerLogic Engineering Suite in standalone mode during engineering to prepare the configuration.



Connect the PC running PowerLogic Engineering Suite to the USB port of the PowerLogic P7 during commissioning to adjust the settings and test the protection relay.



Connect the PC running PowerLogic Engineering Suite to the Ethernet network during operation to retrieve data from the protection relays and update the system.



### Web HMI

PowerLogic P7 provides a web HMI function that can be used with a standard web browser. The web HMI has almost the same look and functionality as the physical HMI. If the web HMI and the physical HMI are both available for a device, they can be used at the same time. Depending on the ordered device option, the web HMI can be set up through the Mini-USB/DHMI port or Port 1/2/3. For the web browser, Schneider Electric recommends Edge, Chrome, Safari or Firefox.

EB100314



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- Manage and track your orders
- Advanced support

## Free Download

### MySchneider Application:



MySchneider App



## EcoStruxure™ Power Device app

P812061100



Within the palm of your hand you can be connected to your Schneider Electric:

- Masterpact MTZ air circuit breaker
- TeSys GV4 motor circuit breaker
- PowerLogic P7 protection relays
- ...and more!

EcoStruxure Power Device app is a single mobile application with necessary information and capabilities to operate and efficiently maintain devices in the EcoStruxure architecture.

This app can be installed on your IOS and Android smartphone. The protection devices can be identified on the app by simply scanning their QR codes.

Wireless communication is possible via by WIFI<sup>(1)</sup> technology for operation and monitoring within the proximity of the devices. Get real time notifications about the electrical installation: load levels, health status, warnings and alarms, protection settings, so on and more!

### Free download

### EcoStruxure Power Device on:



(1) WIFI is not embedded in PowerLogic P7, a separate WIFI router connected to an Ethernet port of the device is required.

# Additional Modules and Accessories

# Additional Modules and Accessories

|                           |    |
|---------------------------|----|
| Communication Accessories | 82 |
| Modules                   | 82 |
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| Installation Accessories  | 87 |
| Modules                   | 87 |

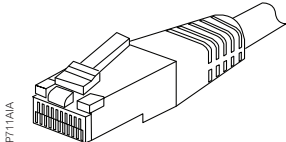
Optional SFP Modules

The optional SFP modules are inserted in port 2 and/or port 3 of the slot A (CPU). It can be selected as an accessory when ordering the device.

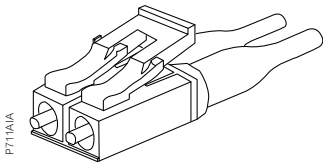
The SFP modules are available for copper wire, multi-mode fiber optic or singlemode fiber optic connection.

The SFP modules with RJ45 or LC connector provide RSTP (Rapid Spanning Tree Protocol), PRP (Parallel Redundancy Protocol), HSR (High-availability Seamless Redundancy) and Failover selectable by configuration.

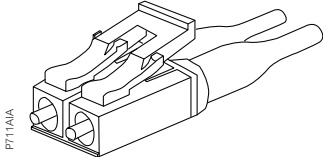
REL70062: Ethernet SFP Module 100/1000 Mbps RJ45

| Characteristics                                                                     |                                               |
|-------------------------------------------------------------------------------------|-----------------------------------------------|
| Location                                                                            | Port 2 or Port 3 at slot A                    |
| Connection                                                                          | RJ45 connectors with communication indicators |
|  |                                               |
| Ethernet connection                                                                 | 100/1000 Mbps                                 |
| Protocol                                                                            | Failover, RSTP, HSR or PRP                    |
| Maximum cable length                                                                | 100 m (32.8 ft)                               |

REL70063: Ethernet SFP Module 100 Mbps multimode

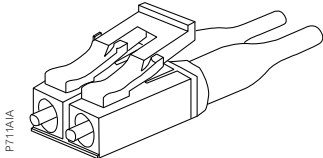
| Characteristics                                                                      |                                                           |
|--------------------------------------------------------------------------------------|-----------------------------------------------------------|
| Location                                                                             | Port 2 or Port 3                                          |
| Connection                                                                           | LC connector                                              |
|  |                                                           |
| Ethernet connection                                                                  | 100 Mbps                                                  |
| Protocol                                                                             | Failover, RSTP, HSR or PRP                                |
| Optical wavelength                                                                   | 850 nm                                                    |
| Fiber type                                                                           | Multi-mode glass fiber                                    |
| Maximum attenuation (fiber optic + connectors)                                       | 14 dB (at fiber optic diameter: 62.5/125 µm or 50/125 µm) |
| Maximum range                                                                        | 2000 m (3280.83 ft)                                       |

REL70064: Ethernet SFP Module 100 Mbps Singlemode

| Characteristics                                |                                                                                                 |
|------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Location                                       | Port 2 or Port 3                                                                                |
| Connection                                     | LC connector  |
| Ethernet connection                            | 100 Mbps                                                                                        |
| Protocol                                       | Failover, RSTP, HSR or PRP                                                                      |
| Optical wavelength                             | 1310 nm                                                                                         |
| Fiber type                                     | Single-mode glass fiber                                                                         |
| Maximum attenuation (fiber optic + connectors) | 14 dB (at fiber optic diameter: 9/125 µm or 10/125 µm)                                          |
| Maximum range                                  | 40 km (25 mi)                                                                                   |

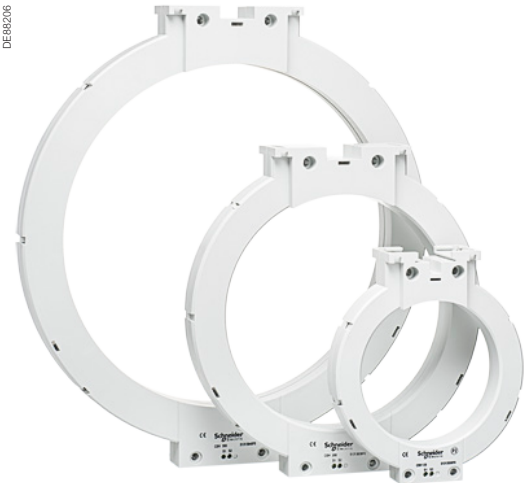
NOTE: Please contact Schneider Electric for availability.

REL70067: Ethernet SFP Module 1000 Mbps Singlemode

| Characteristics                                |                                                                                                   |
|------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Location                                       | Port 2 or Port 3                                                                                  |
| Connection                                     | LC connector  |
| Ethernet connection                            | 100/1000 Mbps                                                                                     |
| Protocol                                       | Failover, RSTP, HSR or PRP                                                                        |
| Optical wavelength                             | 1310 nm                                                                                           |
| Fiber type                                     | Single-mode glass fiber                                                                           |
| Maximum attenuation (fiber optic + connectors) | 14 dB (at fiber optic diameter: 9/125 µm or 10/125 µm)                                            |
| Maximum range                                  | 10 km (6 mi)                                                                                      |

PSU ring-type terminal block (reference REL70153)

PowerLogic P7 is delivered with a pin-type terminal block installed on the PSU module as default. You can also select and order an optional ring-type terminal block to suit your application. The ordered optional ring-type terminal block will be delivered separately and installed on site.



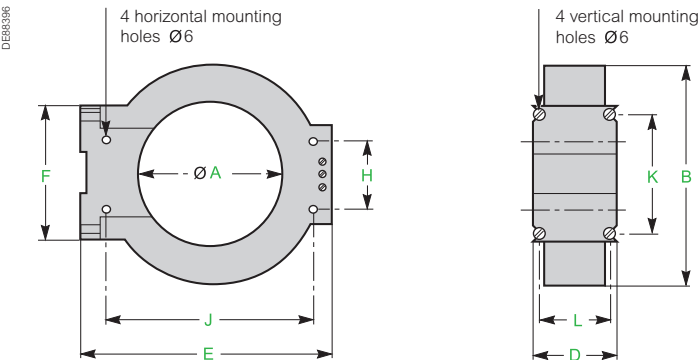
CSH120, CSH200 and CSH300 core balance CTs.

CSH Core-Balance Current Transformers

The CSH120, CSH200 and CSH300 core balance CTs are especially designed for direct residual or earth/ground fault current measurement. The only difference between them is the diameter. They can be connected to a standard or core balance input with a CT ratio set to 470:1

| Core balance CT             | REL59635:<br>CSH120 | REL59636:<br>CSH200 | REL59637:<br>CSH300 |
|-----------------------------|---------------------|---------------------|---------------------|
| Inner diameter              | 120 mm (4.72 in)    | 196 mm (7.72 in)    | 291 mm (11.46 in)   |
| Weight                      | 0.6 kg (1.32 lb)    | 1.4 kg (3.09 lb)    | 2.5 kg (5.51 lb)    |
| Transformation ratio        | 1/470               |                     |                     |
| Maximum permissible current | 20 kA - 1 s         |                     |                     |

Dimensions



|   | 59635: CSH120 |      | 59636: CSH200 |      | 59637: CSH300 |       |
|---|---------------|------|---------------|------|---------------|-------|
|   | mm            | in.  | mm            | in.  | mm            | in.   |
| A | 120           | 4.72 | 196           | 7.72 | 291           | 11.46 |
| B | 164           | 6.46 | 256           | 10.1 | 360           | 14.17 |
| D | 44            | 1.73 | 46            | 1.81 | 46            | 1.81  |
| E | 190           | 7.48 | 274           | 10.8 | 390           | 15.35 |
| F | 80            | 3.15 | 120           | 4.72 | 120           | 4.72  |
| H | 40            | 1.57 | 60            | 2.36 | 60            | 2.36  |
| J | 166           | 6.54 | 254           | 10   | 369           | 14.53 |
| K | 65            | 2.56 | 104           | 4.09 | 104           | 4.09  |
| L | 35            | 1.38 | 37            | 1.46 | 37            | 1.46  |

DM107171



IRIG-B Module

REL51045: IRIG-B module

The IRIG-B module is an external module used for accurate time synchronization. It is connected to the extension port (EXT). It can be selected as an option when ordering the device or purchased later and installed on site. The module provides both a modulated (MOD INPUT) and an unmodulated input (UNMOD INPUT) and can automatically detect which input type is used by the user. No configuration of input type is needed in the PowerLogic P7 protection relay.

It does not require any auxiliary supply connection.

Mechanical characteristics

|          |                      |
|----------|----------------------|
| Assembly | Symmetrical DIN rail |
|----------|----------------------|

Modulated IRIG-B input

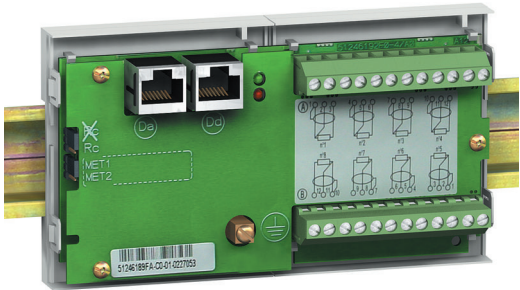
|                    |                           |
|--------------------|---------------------------|
| Connection         | BNC socket                |
| Type of cable      | 50 ohms coaxial           |
| Time code format   | B124, B125 <sup>(1)</sup> |
| Input signal level | 200mV...20V               |

Demodulated IRIG-B input

|                    |                           |
|--------------------|---------------------------|
| Connection         | Screw-type terminals      |
| Type of cable      | Twisted pair              |
| Time code format   | B004, B005 <sup>(1)</sup> |
| Input signal level | TTL                       |

(1) according to standard 200-04

PEB80083



Temperature Sensor Module

59641: Temperature Sensor Module

The Temperature sensor module is an external module used for temperature measurement with Resistance Temperature Detectors (RTDs). It is connected to the extension port (EXT). It can be selected as an option when ordering the device or purchased later and installed on site. It provides 8 RTD inputs. It does not require any auxiliary supply connection.

Mechanical characteristics

|          |                      |
|----------|----------------------|
| Assembly | Symmetrical DIN rail |
|----------|----------------------|

RTD input

|                             |                      |
|-----------------------------|----------------------|
| Connection                  | Screw-type terminals |
| Type of cable               | Shielded cable       |
| Type of RTD                 | Pt100, Ni100, Ni120  |
| Current injected in the RTD | 4 mA                 |

Current Loop Input/Output (CLIO) Module

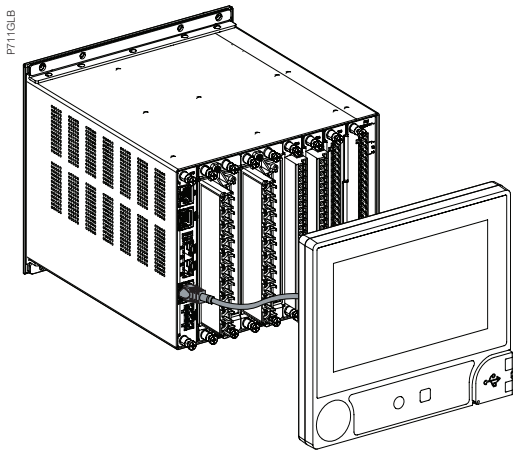
REL70071: CLIO module

The Current Loop Input/Output (CLIO) module is an external module that provides analog input and output capability for the PowerLogic P7. It can be selected as an accessory when ordering the PowerLogic P7 or purchased later as a spare and installed on site.



Cables and Cords

| Part No.              | Qty.                     | Designation                         |
|-----------------------|--------------------------|-------------------------------------|
| Cables and Cords      |                          |                                     |
| <a href="#">59660</a> | <input type="checkbox"/> | 0.6 m remote module connection cord |
| <a href="#">59661</a> | <input type="checkbox"/> | 2 m remote module connection cord   |
| <a href="#">59662</a> | <input type="checkbox"/> | 4 m remote module connection cord   |
| <a href="#">59700</a> | <input type="checkbox"/> | USB cord for PC connection          |

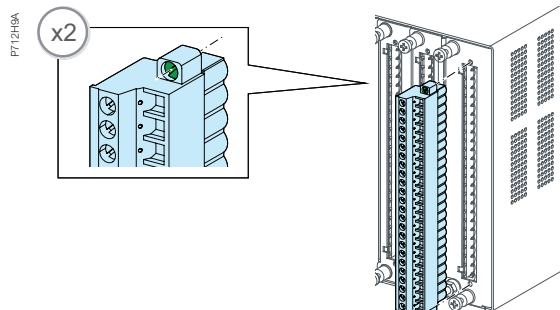


DHMI module (reference REL70124)

Description

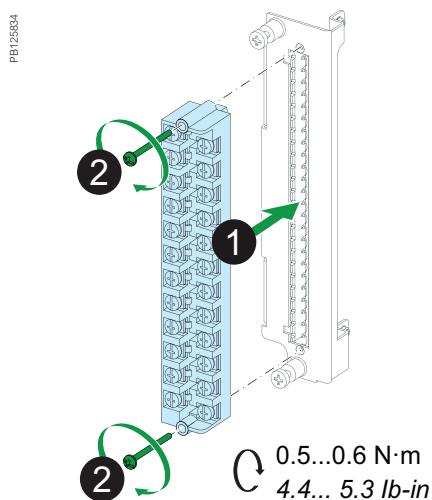
The DHMI module is an external module that can be connected with PowerLogic P7 (no HMI option) through the DHMI port. When connected, the DHMI offers the same functionality as the HMI integrated with PowerLogic P7. It can be selected as an accessory when ordering PowerLogic P7 (no HMI option) or purchased later as a spare and installed on site.

| Charateristic                   | Value                                                                                                                                                 |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Display                         |                                                                                                                                                       |
| Display type                    | Capacitive touchscreen, WVGA color graphic TFT LCD 800 × 480 resolution                                                                               |
| Display backlight               | White LED                                                                                                                                             |
| Viewable area                   | 152.5 × 91.5 mm (6.00 × 3.60 in)                                                                                                                      |
| Width x Height x Depth          | 197 × 175 × 48.2 mm (7.76 × 6.89 × 1.9 in)                                                                                                            |
| Weight                          | 0.9 kg (2.0 lb)                                                                                                                                       |
| Communication ports             |                                                                                                                                                       |
| USB communication ports         | USB device port: Mini-USB<br>USB host port: USB-A                                                                                                     |
| Power supply                    |                                                                                                                                                       |
| Power over Ethernet (PoE) power | PD Type 1 Class 3 per IEEE 802.3af, 10 W maximum                                                                                                      |
| Communication connection        |                                                                                                                                                       |
| Cable type                      | Category 5/5e/6/6a. The cable and RJ45 connectors must be shielded. Clip protection is also required for the RJ45 connectors.                         |
| Cable length                    | < 10 m (33 ft)                                                                                                                                        |
| Connection type                 | Direct, point-to-point                                                                                                                                |
| Environment                     |                                                                                                                                                       |
| Operating temperature           | -40...85 °C (-40...185 °F), 16 hours                                                                                                                  |
| Storage temperature             | -40...85 °C (-40...185 °F)                                                                                                                            |
| Humidity rating                 | 5%...95% RH non-condensing<br>Maximum dewpoint: 37 °C (99 °F)                                                                                         |
| Pollution degree                | 2                                                                                                                                                     |
| Impact rating                   | IK07, per IEC 62262 (2002)/EN 62262                                                                                                                   |
| Altitude                        | < 2000 m (6562 ft) above sea level                                                                                                                    |
| IP degree of protection         | Front: IP54<br>Rear: IP30                                                                                                                             |
| Location/mounting               | For NEMA Type 12 applications, install display on a flat surface of a NEMA Type 12 enclosure<br>Not suitable for wet locations<br>For indoor use only |



### PSU ring-type terminal block (reference REL70153)

PowerLogic P7 is delivered with a pin-type terminal block installed on the PSU module as default. You can also select and order an optional ring-type terminal block to suit your application. The ordered optional ring-type terminal block will be delivered separately and installed on site.





# Services

# Services

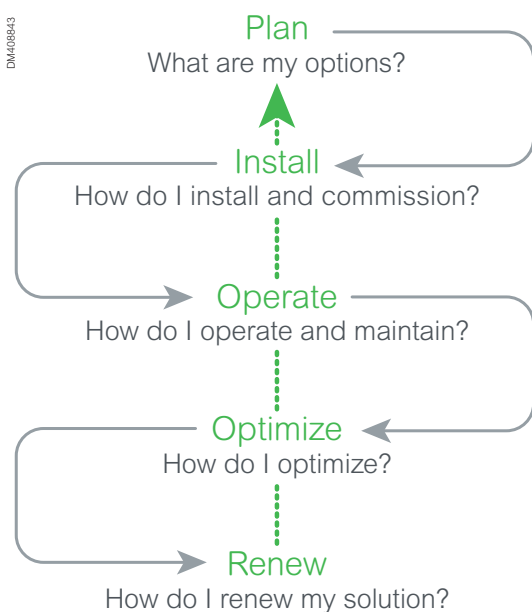
|                                                                 |    |
|-----------------------------------------------------------------|----|
| Greater Peace of Mind Throughout<br>your Installation Lifecycle | 92 |
|-----------------------------------------------------------------|----|

# Greater Peace of Mind Throughout your Installation Lifecycle

## How can you reduce 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



## Plan

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

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

## Install

Schneider Electric will help you to install more efficient, more reliable and safer solutions based on your plans:

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

## Operate

Schneider Electric helps you maximize your installation uptime and control your capital expenditures through its services offering:

- **Asset operation solutions:** Provide the information you need to increase safety, enhance installation performance, and optimize asset maintenance and investment.
- **Advantage service plans:** Customize service plans that include 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 optimized maintenance budget of your spare parts.
- **Technical training:** Build necessary skills and competencies to properly and safely operate your installations.
- **Product repair**

# Greater Peace of Mind Throughout your Installation Lifecycle

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

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

### CONTACT US!

<https://www.se.com/en/work/services/field-services/electrical-distribution/>

## Optimize

Schneider Electric proposes recommendations for improved safety, availability, reliability, and quality:

- **MP4 electrical assessment:** Define an improvement and risk management program.

## Renew

We extend the life of your system while providing upgrades and we can even offer to take full responsibility for the end-of-life processing of old electrical equipment:

- **Retrofit:** Keep up to date and improve the performance of electrical installations.
- **MV product end of life:** Recycle and recover outdated equipment with end-of-life services.

# Ordering

# Ordering

|                                 |     |
|---------------------------------|-----|
| PowerLogic™ P7 Configurator     | 96  |
| Ready-To-Use Configuration      | 97  |
| PowerLogic P7 Order Information | 97  |
| Spare Parts                     | 101 |

# PowerLogic™ P7 Configurator

## Selecting Product

PowerLogic™ P7 CONFIGURATOR:  
The unique web tool to quickly and  
easily configure your PowerLogic™ P7.

## Fast and Simple

See more on:

- [www.se.com](http://www.se.com)

Or click directly on :

**Product Selector**

The screenshot shows the Schneider Electric website with the 'Product Selector' tool highlighted. The header includes the Schneider Electric logo and navigation links. The main banner features the text 'Select products - now easier than ever' and a 'Launch Product Selector' button. Below the banner, a section titled 'Product Selector: Simple, Quick, Reliable' describes the tool's benefits.

**Select products - now easier than ever**  
Discover our Product Selector tool to easily choose the products you need, in just a few clicks.

**Product Selector: Simple, Quick, Reliable**

Our Product Selector tool helps you select the products matching your needs. Catalog reference or configurable product, this tool will help you save time finding the products and compatible accessories. No need to log-in: enjoy the easy selection at any moment, anywhere.

### Select products quickly and easily

The screenshot shows the 'Product Selector' tool interface. On the left, the 'Browse catalog' section lists various product types: Feeder, Transformer (selected), Motor, Generator, and Merging unit. The main area displays two product options: 'P7T Transformer application' and 'P7F Feeder application'.

### Select products quickly and easily

The screenshot shows the configuration details for a 'P7 Transformer application'. The interface includes a 'Select Characteristics' section with various options like '40T base case', 'Flush mounting, touch screen HMI', and 'Flexibility level'. A 'My solution' section on the right lists the selected components: 'REL70000 PowerLogic P7 Latest firmware', 'REL76001 PowerLogic P7 Transformer Application license', and 'REL70020 PowerLogic P7 Touch screen, 7" colour, Plus...'. The bottom of the screen has buttons for 'Save', 'Load', and 'Export'.

**NOTE:**

See your Schneider Electric representative for complete ordering information.

When ordering, please state:

- Product code
- Quantity
- Accessories

| Part No.                     | Qty.                     | Designation                                                                                  |
|------------------------------|--------------------------|----------------------------------------------------------------------------------------------|
| <b>Motor Application</b>     |                          |                                                                                              |
| <a href="#">REL72500</a>     | <input type="checkbox"/> | P7M41-1CR5NNMMNNNNNNNNN-TLB P7 Motor Advanced level 5CT 4VT 24BI 20BO 24-34V Eth RJ45        |
| <a href="#">REL72501</a>     | <input type="checkbox"/> | P7M41-1CR5NNMMNNNNNNNNN-TMB P7 Motor Advanced level 5CT 4VT 24BI 20BO 48-125V Eth RJ45       |
| <a href="#">REL72502</a>     | <input type="checkbox"/> | P7M41-1CR5NNMMNNNNNNNNN-THB P7 Motor Advanced level 5CT 4VT 24BI-20BO 110-250V Eth RJ45      |
| <a href="#">REL72503</a>     | <input type="checkbox"/> | P7M41-1CR5MMMNNNNNNNNNN-TLB P7 Motor Advanced level 5CT 4VT 40BI 32BO 24-34V Eth RJ45        |
| <a href="#">REL72504</a>     | <input type="checkbox"/> | P7M41-1CR5MMMNNNNNNNNNN-TMB P7 Motor Advanced level 5CT 4VT 40BI 32BO 48-125V Eth RJ45       |
| <a href="#">REL72505</a>     | <input type="checkbox"/> | P7M41-1CR5MMMNNNNNNNNNN-THB P7 Motor Advanced level 5CT 4VT 40BI 32BO 110-250V Eth RJ45      |
| <a href="#">REL72506</a>     | <input type="checkbox"/> | P7M41-1CR5R6MMNNNNNNNNN-TLB P7 Motor Advanced level 11CT 7VT 24BI 20BO 24-34V Eth RJ45       |
| <a href="#">REL72507</a>     | <input type="checkbox"/> | P7M41-1CR5R6MMNNNNNNNNN-TMB P7 Motor Advanced level 11CT 7VT 24BI 20BO 48-125V Eth RJ45      |
| <a href="#">REL72508</a>     | <input type="checkbox"/> | P7M41-1CR5R6MMNNNNNNNNN-THB P7 Motor Advanced level 11CT 7VT 24BI 20BO 110-250V Eth RJ45     |
| <b>Generator Application</b> |                          |                                                                                              |
| <a href="#">REL73500</a>     | <input type="checkbox"/> | P7G41-1CR5NNMMNNNNNNNNN-TLB P7 Generator Advanced level 5CT 4VT 24BI 20BO 24-34V Eth RJ45    |
| <a href="#">REL73501</a>     | <input type="checkbox"/> | P7G41-1CR5NNMMNNNNNNNNN-TMB P7 Generator Advanced level 5CT 4VT 24BI 20BO 48-125V Eth RJ45   |
| <a href="#">REL73502</a>     | <input type="checkbox"/> | P7G41-1CR5NNMMNNNNNNNNN-THB P7 Generator Advanced level 5CT 4VT 24BI 20BO 110-250V Eth RJ45  |
| <a href="#">REL73503</a>     | <input type="checkbox"/> | P7G41-1CR5MMMNNNNNNNNNN-TLB P7 Generator Advanced level 5CT 4VT 40BI 32BO 24-34V Eth RJ45    |
| <a href="#">REL73504</a>     | <input type="checkbox"/> | P7G41-1CR5MMMNNNNNNNNNN-TMB P7 Generator Advanced level 5CT 4VT 40BI 32BO 48-125V Eth RJ45   |
| <a href="#">REL73505</a>     | <input type="checkbox"/> | P7G41-1CR5MMMNNNNNNNNNN-THB P7 Generator Advanced level 5CT 4VT 40BI 32BO 110-250V Eth RJ45  |
| <a href="#">REL73506</a>     | <input type="checkbox"/> | P7G41-1CR5R6MMNNNNNNNNN-TLB P7 Generator Advanced level 11CT 7VT 24BI 20BO 24-34V Eth RJ45   |
| <a href="#">REL73507</a>     | <input type="checkbox"/> | P7G41-1CR5R6MMNNNNNNNNN-TMB P7 Generator Advanced level 11CT 7VT 24BI 20BO 48-125V Eth RJ45  |
| <a href="#">REL73508</a>     | <input type="checkbox"/> | P7G41-1CR5R6MMNNNNNNNNN-THB P7 Generator Advanced level 11CT 7VT 24BI 20BO 110-250V Eth RJ45 |

**NOTE:**

See your Schneider Electric representative for complete ordering information.

When ordering, please state:

- Product code
- Quantity
- Accessories

| Part No.                       | Qty.                     | Designation                                                                                    |
|--------------------------------|--------------------------|------------------------------------------------------------------------------------------------|
| <b>Feeder Application</b>      |                          |                                                                                                |
| <a href="#">REL71500</a>       | <input type="checkbox"/> | P7F41-1CR5NNMMNNNNNNNNN-TLB P7 Feeder Advanced level 5CT 4VT 24BI 20BO 24-34V Eth RJ45         |
| <a href="#">REL71501</a>       | <input type="checkbox"/> | P7F41-1CR5NNMMNNNNNNNNN-TMB P7 Feeder Advanced level 5CT 4VT 24BI 20BO 48-125V Eth RJ45        |
| <a href="#">REL71502</a>       | <input type="checkbox"/> | P7F41-1CR5NNMMNNNNNNNNN-THB P7 Feeder Advanced level 5CT 4VT 24BI 20BO 110-250V Eth RJ45       |
| <a href="#">REL71503</a>       | <input type="checkbox"/> | P7F41-1CR5MMMMNNNNNNNNN-TLB P7 Feeder Advanced level 5CT 4VT 40BI 32BO 24-34V Eth RJ45         |
| <a href="#">REL71504</a>       | <input type="checkbox"/> | P7F41-1CR5MMMMNNNNNNNNN-TMB P7 Feeder Advanced level 5CT 4VT 40BI 32BO 48-125V Eth RJ45        |
| <a href="#">REL71505</a>       | <input type="checkbox"/> | P7F41-1CR5MMMMNNNNNNNNN-THB P7 Feeder Advanced level 5CT 4VT 40BI 32BO 110-250V Eth RJ45       |
| <b>Transformer Application</b> |                          |                                                                                                |
| <a href="#">REL76500</a>       | <input type="checkbox"/> | P7T41-1CR6NNMMNNNNNNNNN-TLB P7 Transformer Advanced level 6CT 3VT 24BI 20BO 24-34V Eth RJ45    |
| <a href="#">REL76501</a>       | <input type="checkbox"/> | P7T41-1CR6NNMMNNNNNNNNN-TMB P7 Transformer Advanced level 6CT 3VT 24BI 20BO 48-125V Eth RJ45   |
| <a href="#">REL76502</a>       | <input type="checkbox"/> | P7T41-1CR6NNMMNNNNNNNNN-THB P7 Transformer Advanced level 6CT 3VT 24BI 20BO 110-250V Eth RJ45  |
| <a href="#">REL76503</a>       | <input type="checkbox"/> | P7T41-1CR6MMMMNNNNNNNNN-TLB P7 Transformer Advanced level 6CT 3VT 40BI 32BO 24-34V Eth RJ45    |
| <a href="#">REL76504</a>       | <input type="checkbox"/> | P7T41-1CR6MMMMNNNNNNNNN-TMB P7 Transformer Advanced level 6CT 3VT 40BI 32BO 48-125V Eth RJ45   |
| <a href="#">REL76505</a>       | <input type="checkbox"/> | P7T41-1CR6MMMMNNNNNNNNN-THB P7 Transformer Advanced level 6CT 3VT 40BI 32BO 110-250V Eth RJ45  |
| <a href="#">REL76506</a>       | <input type="checkbox"/> | P7T41-1CR6R6MMNNNNNNNNN-TLB P7 Transformer Advanced level 12CT 6VT 24BI 20BO 24-34V Eth RJ45   |
| <a href="#">REL76507</a>       | <input type="checkbox"/> | P7T41-1CR6R6MMNNNNNNNNN-TMB P7 Transformer Advanced level 12CT 6VT 24BI 20BO 48-125V Eth RJ45  |
| <a href="#">REL76508</a>       | <input type="checkbox"/> | P7T41-1CR6R6MMNNNNNNNNN-THB P7 Transformer Advanced level 12CT 6VT 24BI 20BO 110-250V Eth RJ45 |

**NOTE:**

See your Schneider Electric representative for complete ordering information.

When ordering, please state:

- Product code
- Quantity
- Accessories

| Part No.                                      | Qty.                     | Designation                                                                                             |
|-----------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------|
| <b>Stand - Alone Merging Unit Application</b> |                          |                                                                                                         |
| <a href="#">REL79200</a>                      | <input type="checkbox"/> | P7S40-0CR5NNNNNNNNNNNN-TLB PowerLogic P7 SAMU Essential 5CT 4VT 8BI 8BO 24-34V Eth RJ45                 |
| <a href="#">REL79201</a>                      | <input type="checkbox"/> | P7S40-0CR5NNNNNNNNNNNN-TMB PowerLogic P7 SAMU Essential 5CT 4VT 8BI 8BO 48-125V Eth RJ45                |
| <a href="#">REL79202</a>                      | <input type="checkbox"/> | P7S40-0CR5NNNNNNNNNNNN-THB PowerLogic P7 SAMU Essential 5CT 4VT 8BI 8BO 110-250V Eth RJ45               |
| <a href="#">REL79203</a>                      | <input type="checkbox"/> | P7S41-0CR5NNMMNNNNNNNN-TLB PowerLogic P7 SAMU Advanced 5CT 4VT 24BI 20BO 24-34V Eth RJ45                |
| <a href="#">REL79204</a>                      | <input type="checkbox"/> | P7S41-0CR5NNMMNNNNNNNN-TMB PowerLogic P7 SAMU Advanced 5CT 4VT 24BI 20BO 48-125V Eth RJ45               |
| <a href="#">REL79205</a>                      | <input type="checkbox"/> | P7S41-0CR5NNMMNNNNNNNN-THB PowerLogic P7 SAMU Advanced 5CT 4VT 24BI 20BO 110-250V Eth RJ45              |
| <a href="#">REL79206</a>                      | <input type="checkbox"/> | P7S41-0CR5R5MMNNNNNNNN-TLB PowerLogic P7 SAMU Advanced 10CT 8VT 24BI 20BO 24-34V Eth RJ45               |
| <a href="#">REL79207</a>                      | <input type="checkbox"/> | P7S41-0CR5R5MMNNNNNNNN-TMB PowerLogic P7 SAMU Advanced 10CT 8VT 24BI 20BO 48-125V Eth RJ45              |
| <a href="#">REL79208</a>                      | <input type="checkbox"/> | P7S41-0CR5R5MMNNNNNNNN-THB PowerLogic P7 SAMU Advanced 10CT 8VT 24BI 20BO 110-250V Eth RJ45             |
| <a href="#">REL79209</a>                      | <input type="checkbox"/> | P7S41-0CR6R6MMNNNNNNNN-TLB PowerLogic P7 SAMU Advanced flexibility 12CT 6VT 24BI 20BO 24-34V Eth RJ45   |
| <a href="#">REL79210</a>                      | <input type="checkbox"/> | P7S41-0CR6R6MMNNNNNNNN-TMB PowerLogic P7 SAMU Advanced flexibility 12CT 6VT 24BI 20BO 48-125V Eth RJ45  |
| <a href="#">REL79212</a>                      | <input type="checkbox"/> | P7S41-1CR6R6MMNNNNNNNN-TLB PowerLogic P7 SAMU Advanced flexibility 12CT 6VT 24BI 20BO 24-34V Eth RJ45   |
| <a href="#">REL79213</a>                      | <input type="checkbox"/> | P7S41-1CR6R6MMNNNNNNNN-TMB PowerLogic P7 SAMU Advanced flexibility 12CT 6VT 24BI 20BO 48-125V Eth RJ45  |
| <a href="#">REL79214</a>                      | <input type="checkbox"/> | P7S41-1CR6R6MMNNNNNNNN-THB PowerLogic P7 SAMU Advanced flexibility 12CT 6VT 24BI 20BO 110-250V Eth RJ45 |
| <a href="#">REL79215</a>                      | <input type="checkbox"/> | P7S41-1CR5NNMMNNNNNNNN-TLB PowerLogic P7 SAMU Advanced flexibility 5CT 4VT 32BI 26BO 24-34V Eth RJ45    |
| <a href="#">REL79216</a>                      | <input type="checkbox"/> | P7S41-1CR5NNMMNNNNNNNN-TMB PowerLogic P7 SAMU Advanced flexibility 5CT 4VT 32BI 26BO 48-125V Eth RJ45   |
| <a href="#">REL79217</a>                      | <input type="checkbox"/> | P7S41-1CR5NNMMNNNNNNNN-THB PowerLogic P7 SAMU Advanced flexibility 5CT 4VT 32BI 26BO 110-250V Eth RJ45  |
| <b>Bay Controller Application</b>             |                          |                                                                                                         |
| <a href="#">REL79500</a>                      | <input type="checkbox"/> | P7C41-1CR5NNMMNNNNNNNN-TLB PowerLogic P7 Bay Control Advanced 5CT 4VT 24BI 20BO 24-34V Eth RJ45         |
| <a href="#">REL79501</a>                      | <input type="checkbox"/> | P7C41-1CR5NNMMNNNNNNNN-TMB PowerLogic P7 Bay Control Advanced 5CT 4VT 24BI 20BO 48-125V Eth RJ45        |
| <a href="#">REL79502</a>                      | <input type="checkbox"/> | P7C41-1CR5NNMMNNNNNNNN-THB PowerLogic P7 Bay Control Advanced 5CT 4VT 24BI 20BO 110-250V Eth RJ45       |
| <a href="#">REL79503</a>                      | <input type="checkbox"/> | P7C41-1CR5IIMMNNNNNNNN-TLB PowerLogic P7 Bay Control Advanced 5CT 4VT 56BI 20BO 24-34V Eth RJ45         |
| <a href="#">REL79504</a>                      | <input type="checkbox"/> | P7C41-1CR5IIMMNNNNNNNN-TMB PowerLogic P7 Bay Control Advanced 5CT 4VT 56BI 20BO 48-125V Eth RJ45        |
| <a href="#">REL79505</a>                      | <input type="checkbox"/> | P7C41-1CR5IIMMNNNNNNNN-THB PowerLogic P7 Bay Control Advanced 5CT 4VT 56BI 20BO 110-250V Eth RJ45       |
| <a href="#">REL79506</a>                      | <input type="checkbox"/> | P7C41-1CNIIMMNNNNNNNN-TLB PowerLogic P7 Bay Control Advanced 0CT 0VT 56BI 20BO 24-34V Eth RJ45          |
| <a href="#">REL79507</a>                      | <input type="checkbox"/> | P7C41-1CNIIMMNNNNNNNN-TMB PowerLogic P7 Bay Control Advanced 0CT 0VT 56BI 20BO 48-125V Eth RJ45         |
| <a href="#">REL79508</a>                      | <input type="checkbox"/> | P7C41-1CNIIMMNNNNNNNN-THB PowerLogic P7 Bay Control Advanced 0CT 0VT 56BI 20BO 110-250V Eth RJ45        |
| <a href="#">REL79509</a>                      | <input type="checkbox"/> | P7C41-1CIIIMMNNNNNNNN-TLB PowerLogic P7 Bay Control Advanced 0CT 0VT 88BI 20BO 24-34V Eth RJ45          |
| <a href="#">REL79510</a>                      | <input type="checkbox"/> | P7C41-1CIIIMMNNNNNNNN-TMB PowerLogic P7 Bay Control Advanced 0CT 0VT 88BI 20BO 48-125V Eth RJ45         |
| <a href="#">REL79511</a>                      | <input type="checkbox"/> | P7C41-1CIIIMMNNNNNNNN-TMB PowerLogic P7 Bay Control Advanced 0CT 0VT 88BI 20BO 110-250V Eth RJ45        |

**NOTE:**  
See your Schneider Electric representative  
for complete ordering information.

When ordering, please state:

- Product code
- Quantity
- Accessories

| Part No.                      | Qty.                     | Designation                 |                                                                                                           |
|-------------------------------|--------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------|
| Line Differential Application |                          |                             |                                                                                                           |
| <a href="#">REL75500</a>      | <input type="checkbox"/> | P7L41-1CR5NNMMNNNNNNNNN-TLB | Protection and control relay PowerLogic P7 Line Differential Advanced 5CT 4VT 24BI 20BO 24-34V Eth RJ45   |
| <a href="#">REL75501</a>      | <input type="checkbox"/> | P7L41-1CR5NNMMNNNNNNNNN-TMB | Protection and control relay PowerLogic P7 Line Differential Advanced 5CT 4VT 24BI 20BO 48-125V Eth RJ45  |
| <a href="#">REL75502</a>      | <input type="checkbox"/> | P7L41-1CR5NNMMNNNNNNNNN-THB | Protection and control relay PowerLogic P7 Line Differential Advanced 5CT 4VT 24BI 20BO 110-250V Eth RJ45 |
| <a href="#">REL75503</a>      | <input type="checkbox"/> | P7L41-1CR5MMMMNNNNNNNNN-TLB | Protection and control relay PowerLogic P7 Line Differential Advanced 5CT 4VT 40BI 32BO 24-34V Eth RJ45   |
| <a href="#">REL75504</a>      | <input type="checkbox"/> | P7L41-1CR5MMMMNNNNNNNNN-TMB | Protection and control relay PowerLogic P7 Line Differential Advanced 5CT 4VT 40BI 32BO 48-125V Eth RJ45  |
| <a href="#">REL75505</a>      | <input type="checkbox"/> | P7L41-1CR5MMMMNNNNNNNNN-THB | Protection and control relay PowerLogic P7 Line Differential Advanced 5CT 4VT 40BI 32BO 110-250V Eth RJ45 |
| Busbar Application            |                          |                             |                                                                                                           |
| <a href="#">REL77500</a>      | <input type="checkbox"/> | P7B41-1CR6R6MMNNNNNNNNN-TLB | Protection and control relay PowerLogic P7 Busbar Advanced 12CT 6VT 24BI 20BO 24-34V Eth RJ45             |
| <a href="#">REL77501</a>      | <input type="checkbox"/> | P7B41-1CR6R6MMNNNNNNNNN-TMB | Protection and control relay PowerLogic P7 Busbar Advanced 12CT 6VT 24BI 20BO 48-125V Eth RJ45            |
| <a href="#">REL77502</a>      | <input type="checkbox"/> | P7B41-1CR6R6MMNNNNNNNNN-THB | Protection and control relay PowerLogic P7 Busbar Advanced 12CT 6VT 24BI 20BO 110-250V Eth RJ45           |

| Part No.                 | Qty.                     | Designation                                             |
|--------------------------|--------------------------|---------------------------------------------------------|
| Spare parts              |                          |                                                         |
| <a href="#">REL70130</a> | <input type="checkbox"/> | P7 5 CT+4 VT Ring terminal module                       |
| <a href="#">REL70131</a> | <input type="checkbox"/> | P7 6 CT+3 VT Ring terminal module                       |
| <a href="#">REL70132</a> | <input type="checkbox"/> | P7 5 CT+4 VT Pin terminal module                        |
| <a href="#">REL70133</a> | <input type="checkbox"/> | P7 6 CT+3 VT Pin terminal module                        |
| <a href="#">REL70142</a> | <input type="checkbox"/> | Mixed card - 8DI/6DO                                    |
| <a href="#">REL70143</a> | <input type="checkbox"/> | Mixed card - 8DI/6DO (PSU auxiliary)                    |
| <a href="#">REL70144</a> | <input type="checkbox"/> | Input card - 16I                                        |
| <a href="#">REL70146</a> | <input type="checkbox"/> | Direct motor control board 7DI/7DO                      |
| <a href="#">REL70150</a> | <input type="checkbox"/> | 24-32 Vdc supply 2DO + WD                               |
| <a href="#">REL70151</a> | <input type="checkbox"/> | 48-110 Vdc supply 2DO + WD                              |
| <a href="#">REL70152</a> | <input type="checkbox"/> | 110-250 Vdc/100-240 Vac supply 2DO + WD                 |
| <a href="#">REL70162</a> | <input type="checkbox"/> | SFP ETH module RJ45 100/1000 Mbps, 10pcs in a box       |
| <a href="#">REL70163</a> | <input type="checkbox"/> | SFP ETH module Multimode 100 Mbps, 10pcs in a box       |
| <a href="#">REL70164</a> | <input type="checkbox"/> | SFP ETH module Singlemode 100 Mbps, 10pcs in a box      |
| <a href="#">REL70167</a> | <input type="checkbox"/> | SFP ETH module Singlemode 100/1000 Mbps, 10pcs in a box |



# TOOLS

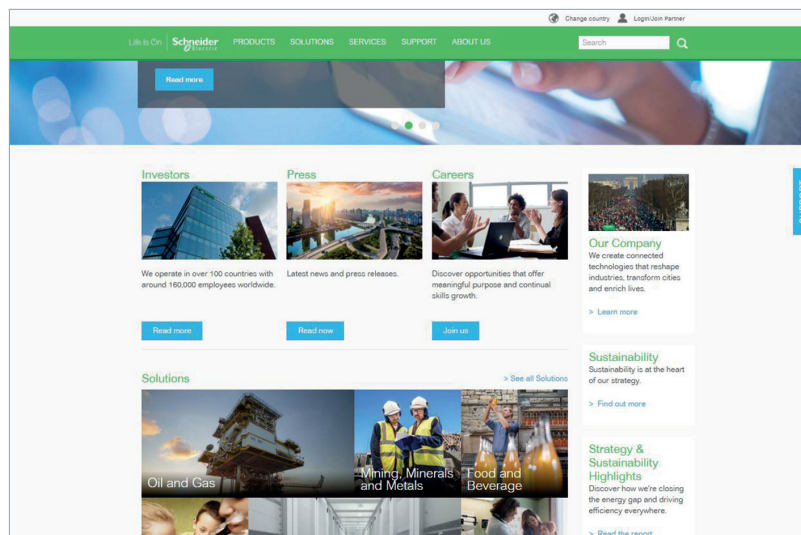
## se.com

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.

PM103687



## Web Selector

This site allows you to access the 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.

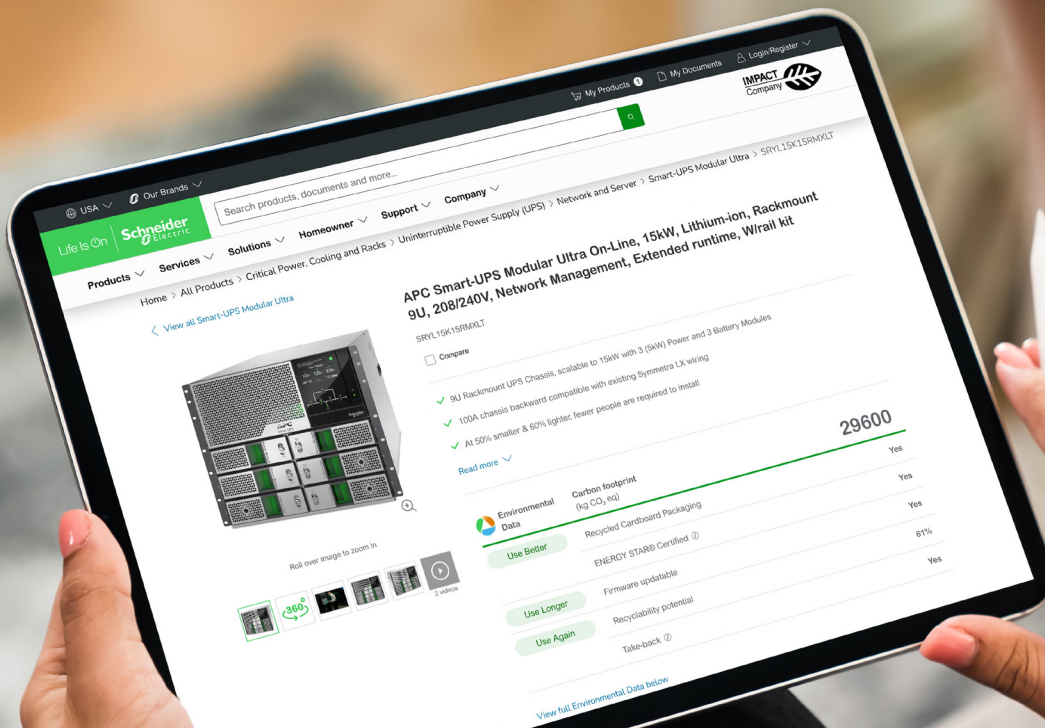
## Training

Training allows you to acquire the expertise (installation design, work 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.



# Environmental Data Program

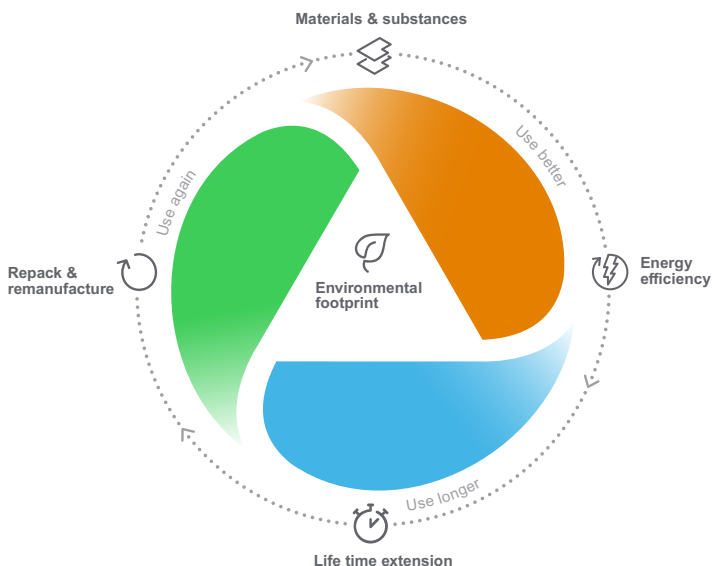


## Next-level transparency for better-informed product choices

The Environmental Data Program is a framework for how we measure, categorize, and compare the environmental attributes and footprint of our products.

Using a rigorous, fact-based methodology, the program provides environmental data from across the product lifecycle.

Five data categories across the product lifecycle



**Use Better:** How sustainable a product is, including environmental footprint, materials and substances, packaging, and energy efficiency.

**Use Longer:** How a product's life time can be effectively extended in terms of repairability and updatability.

**Use Again:** How a product can be reused, from dismantling and remanufacturing to recyclability and manufacturer take back.

With this transparent, verified data, customers and partners are empowered to make conscious environmental choices and accurately evaluate and report on sustainability performance.

All our hardware offers have an associated environmental data available on se.com product pages.



Learn more about the  
**Environmental Data Program**



[www.se.com](http://www.se.com)

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92506 Rueil Malmaison  
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April 2026

PowerLogic™ P7

**NRJED323202EN**

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ask for confirmation of the information given in this document.