

**IE-SW-SL28M-HV****Weidmüller Interface GmbH & Co. KG**

Klingenbergstraße 26

D-32758 Detmold

Germany

[www.weidmueller.com](http://www.weidmueller.com)**Features of SubstationLine managed switch series**

The SubstationLine includes Ethernet switches complying with the IEC 61850-3 and IEEE 1613 standards, making them robust enough for operation in harsh environments. The family includes variants for mounting on DIN rails and in 19" racks.

All products have a redundant power supply to ensure reliability in critical environments. The new family ranges from managed Fast Ethernet switches to 10-Gigabit Ethernet products with all the necessary features to operate according to the most demanding requirements.

- DIN-rail and 19" rack variants
- IEC 61850-3 and IEEE 1613 compliance
- PRP/HSR support according to Clause 4/Clause 5 of IEC 62439-3
- MMS server based on bridge model defined in IEC 61850-90-4
- Redundant power supply modules in all models
- Wide operating temperature range of -40°C up to 85°C
- Modular switch version with high flexibility in number and type of ports
- Fast/Gigabit/10-Gigabit interfaces
- Layer 3 models for hardware supported routing between up to 28 IP-subnets

**General ordering data**

|            |                                                                                                                                                                                                                                |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Version    | Layer 2 Network Switch, Modular, 19" rack mount, managed, Fast/Gigabit/10-Gigabit Ethernet, IEC 61850-3 / IEEE 1613, high voltage, Number of ports: up to 28 (depending on used media interface modules), IP30, -40 °C...85 °C |
| Order No.  | <a href="#">2779010000</a>                                                                                                                                                                                                     |
| Type       | IE-SW-SL28M-HV                                                                                                                                                                                                                 |
| GTIN (EAN) | 4064675048275                                                                                                                                                                                                                  |
| Qty.       | 1 pc(s).                                                                                                                                                                                                                       |

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## Technical data

## Dimensions and weights

|            |         |                 |             |
|------------|---------|-----------------|-------------|
| Depth      | 325 mm  | Depth (inches)  | 12.795 inch |
| Height     | 44 mm   | Height (inches) | 1.732 inch  |
| Width      | 440 mm  | Width (inches)  | 17.323 inch |
| Net weight | 6,450 g |                 |             |

## Temperatures

|                     |                            |                       |                |
|---------------------|----------------------------|-----------------------|----------------|
| Storage temperature | -40 °C...85 °C             | Operating temperature | -40 °C...85 °C |
| Humidity            | 5 to 95 % (non-condensing) |                       |                |

## EMC conformity and approvals

|                                                            |                                                                                                                                                                                                                                                                                      |                 |                                                                                 |
|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------------------------------------------------|
| EMC standards                                              | EN 55032, CISPR 22, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A, EN 55035, IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV, IEC 61000-4-3 RS: 80 MHz to 3 GHz: 10 V/m, IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV, IEC 61000-4-6 CS: 10 V, IEC 61000-4-8, IEC 61000-4-11 | Free fall       |                                                                                 |
| Power Transmission & Distribution Systems acc. to standard | IEEE 1613, IEC 61850-3                                                                                                                                                                                                                                                               | Safety standard | IEC 60870-2-2 class Cm SELV according to EN 62368-1, UL 61010-1, UL 61010-2-201 |
| Shock                                                      | IEC 60870-2-2 class Cm                                                                                                                                                                                                                                                               | Vibration       | IEC 60870-2-2 class Cm and class Bm                                             |

## Environmental conditions

|                             |                            |                                                                                                  |  |
|-----------------------------|----------------------------|--------------------------------------------------------------------------------------------------|--|
| Humidity                    | 5 to 95 % (non-condensing) |                                                                                                  |  |
| Operating altitude          | Altitude, max.             | 2,000 m                                                                                          |  |
|                             | Note                       | in acc. with UL                                                                                  |  |
|                             | Altitude, max.             | 6,000 m                                                                                          |  |
|                             | Note                       | for restrictions, see the manufacturer's declaration for operating altitude in section downloads |  |
| Operating temperature, max. | 85 °C                      |                                                                                                  |  |
| Operating temperature, min. | -40 °C                     |                                                                                                  |  |
| Storage temperature, max.   | 85 °C                      |                                                                                                  |  |
| Storage temperature, min.   | -40 °C                     |                                                                                                  |  |

## Guarantee

|               |         |
|---------------|---------|
| Time interval | 5 years |
|---------------|---------|

## Interfaces

|                        |                                                                                  |
|------------------------|----------------------------------------------------------------------------------|
| Console port interface | RS-232 (RJ45 connector)                                                          |
| Function reset button  | <5 sec: System reboot and set LAN IP to factory Default, >5 sec: Factory default |
| Number of ports        | up to 28 (depending on used media interface modules)                             |

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## Technical data

|                                   |                             |                                                                                                                                                                                                                                              |
|-----------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supported media interface modules | Media module interface slot | M1, M2, M3                                                                                                                                                                                                                                   |
|                                   | Supported module            | <a href="#">IE-SWM-SL04-4SC</a> <a href="#">IE-SWM-SL04-4SCS</a> <a href="#">IE-SWM-SL04-4ST</a> <a href="#">IE-SWM-SL04-4STS</a> <a href="#">IE-SWM-SL08-8GT</a> <a href="#">IE-SWM-SL08-8GESFP</a> <a href="#">IE-SWM-SL02-2GC-PRP/HSR</a> |
|                                   | Media module interface slot | M4                                                                                                                                                                                                                                           |
|                                   | Supported module            | <a href="#">IE-SWM-SL04-4GESFP</a> <a href="#">IE-SWM-SL02-2GESFP+</a> <a href="#">IE-SWM-SL04-4GESFP+</a>                                                                                                                                   |

## MTBF

|      |                              |                  |
|------|------------------------------|------------------|
| MTBF | According to Standard        | Telcordia SR-332 |
|      | Operating time (hours), min. | 647,420 h        |

## Management features

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                             |                                                                                                                                                                                                                                                                                                       |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Device configuration            | Webbrowser (HTTP/HTTPS), SNMP v1/v2c/v3, Local serial console port (RS-232 via RJ-45 port), Upload of a configuration file via web-interface, TFTP-Server or external backup module, Command Line Interface (Telnet/SSH)                                                                                                                                                                                                                                                                                   | Monitoring function         | SNMP v1/v2c/v3, Link Layer Discovery Protocol (LLDP), Port mirroring (local, remote), Port statistics, Port monitoring, Syslog, RMON (Remote monitoring), Event based warning via E-Mail, Event based warning via relay, Event based warning via SNMP trap, Ethernet cable diagnostics on RJ-45 ports |
| Network redundancy              | Spanning Tree Protocol (STP), Rapid Spanning Tree Protocol (RSTP), Multiple Spanning Tree Protocol (MSTP), O-Ring (recovery time <10/30 ms at Fast/Gigabit Ethernet interface), O-Chain (recovery time <10/30 ms at Fast/Gigabit Ethernet interface), Link Aggregation Control Protocol (LACP), Fast recovery, Media Redundancy Protocol (MRP-manager/client), Parallel Redundancy Protocol (PRP) / High-availability Seamless Redundancy (HSR) RedBox function (specific media interface module required) | Network traffic filter      | Quality of Service (QoS), Tag based VLAN, GVRP (GARP VLAN Registration Protocol), IGMP v2/v3, Traffic Rate Limiting, Differentiated Services Code Point (DSCP), Specific prioritization of GOOSE and Sampled Value messages, IGMP Snooping, MLD Snooping, MLD v1/v2                                   |
| IP-address management           | Static, DHCP-Client, DHCP-Server (port based, pool-based), DHCP Option 82, DHCP-Relay, IPv4/IPv6                                                                                                                                                                                                                                                                                                                                                                                                           | Security functions          | VLAN segmentation, Enable/disable ports, TACACS+ and IEEE 802.1X User Authentication, DoS/DDoS auto prevention, Access Control List, DHCP snooping, Loop protection, Management access security via privilege level configuration for different user roles                                            |
| Time synchronization management | SNTP server, SNTP client, PTPv2                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Industrial protocol support | PROFINET device acc. to conformance class B, Modbus/TCP slave, MMS server                                                                                                                                                                                                                             |

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## Technical data

## Power supply

|                             |                                                         |         |
|-----------------------------|---------------------------------------------------------|---------|
| Connection type             | 1x 10-pin fork/ring lug connection                      |         |
| Current consumption         | Voltage                                                 | 110 V   |
|                             | Current                                                 | 0.363 A |
|                             | Voltage type                                            | DC      |
|                             | Voltage                                                 | 220 V   |
|                             | Current                                                 | 0.18 A  |
|                             | Voltage type                                            | DC      |
|                             | Voltage                                                 | 110 V   |
|                             | Current                                                 | 0.67 A  |
|                             | Voltage type                                            | AC      |
|                             | Voltage                                                 | 220 V   |
|                             | Current                                                 | 0.43 A  |
|                             | Voltage type                                            | AC      |
| Overload current protection | Yes                                                     |         |
| Reverse polarity protection | Yes                                                     |         |
| Voltage supply              | 110/220 V DC, 110/220 V AC, 2 redundant isolated inputs |         |
| Voltage supply range        | Voltage type                                            | DC      |
|                             | Voltage, min.                                           | 100 V   |
|                             | Voltage, max.                                           | 370 V   |
|                             | Voltage type                                            | AC      |
|                             | Voltage, min.                                           | 100 V   |
|                             | Voltage, max.                                           | 240 V   |

## Switch characteristics

|                                |            |                                |             |
|--------------------------------|------------|--------------------------------|-------------|
| Bandwidth backplane            | 128 Gbit/s | Jumbo frame support            | up to 10 KB |
| MAC table size                 | 32 K       | Max. number of available VLANs | 4,095       |
| Memory (Flash)                 | 16 MB      | Memory (RAM)                   | 128 MB      |
| Number of IGMP-Groups per VLAN | 128        | Packet buffer size             | 32 Mbit     |
| Priority queues                | 8          | VLAN-ID max                    | 4,094       |
| VLAN-ID min                    | 1          |                                |             |

## Technical data

|                       |                                  |                   |         |
|-----------------------|----------------------------------|-------------------|---------|
| Housing main material | Metal                            | Protection degree | IP30    |
| Speed                 | Fast/Gigabit/10-Gigabit Ethernet | Switch            | managed |
| Type of mounting      | 19" rack mounting                |                   |         |

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## Technical data

## Technology

| Data switching | Store and Forward                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Flow control | IEEE 802.3x flow control |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------|
| Standard       | IEEE 802.3 for 10BASE-T, IEEE 802.3u for 100BASE-TX and 100BASE-FX, IEEE 802.3ab for 1000BASE-T, IEEE 802.3z for 1000BASE-X, IEEE 802.3ae for 10-Gigabit Ethernet, IEEE 802.3x for flow control, IEEE 802.3ad for port trunk with LACP, IEEE 802.1D for the Spanning Tree protocol, IEEE 802.1w for Rapid STP, IEEE 802.1s for the Multiple Spanning Tree Protocol (MSTP), IEEE 802.1p for Class of Service, IEEE 802.1Q for VLAN tagging, IEEE 802.1X for authentication, IEEE 802.1AB for Link Layer Discovery protocol (LLDP), IEEE 1588 PT-Pv2 for time synchronization |              |                          |

## Classifications

|             |             |             |             |
|-------------|-------------|-------------|-------------|
| ETIM 6.0    | EC000734    | ETIM 7.0    | EC000734    |
| ETIM 8.0    | EC000734    | ETIM 9.0    | EC000734    |
| ETIM 10.0   | EC000734    | ECLASS 9.0  | 19-17-01-06 |
| ECLASS 9.1  | 19-17-01-06 | ECLASS 10.0 | 19-17-04-01 |
| ECLASS 11.0 | 19-17-04-01 | ECLASS 12.0 | 19-17-04-01 |
| ECLASS 13.0 | 19-17-04-01 | ECLASS 14.0 | 19-17-04-01 |
| ECLASS 15.0 | 19-17-04-01 |             |             |

## Environmental Product Compliance

|                                      |                                        |
|--------------------------------------|----------------------------------------|
| RoHS Compliance Status               | Compliant with exemption               |
| RoHS Exemption (if applicable/known) | 6c, 7a, 7cl, 7cII                      |
| REACH SVHC                           | Lead 7439-92-1 Lead monoxide 1317-36-8 |
| SCIP                                 | 9229992a-00b9-4096-8962-200a7f33e289   |

## Approvals

Approvals



|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Approvals MAMID         | <a href="https://mdcop.weidmueller.com/mediadelivery/rendition/900_319222/-T1z1mm-S800/">https://mdcop.weidmueller.com/mediadelivery/rendition/900_319222/-T1z1mm-S800/</a> <a href="https://mdcop.weidmueller.com/mediadelivery/rendition/900_319228/-T1z1mm-S800/">https://mdcop.weidmueller.com/mediadelivery/rendition/900_319228/-T1z1mm-S800/</a> <a href="https://mdcop.weidmueller.com/mediadelivery/rendition/900_319260/-T1z1mm-S800/">https://mdcop.weidmueller.com/mediadelivery/rendition/900_319260/-T1z1mm-S800/</a> |
| ROHS                    | Conform                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| UL File Number Search   | UL Website                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Certificate no. (cULus) | E141197                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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## Technical data

### Downloads

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Approval/Certificate/Document of Conformity | <a href="#">EU Declaration of Conformity</a><br><a href="#">RCM Declaration of Conformity</a><br><a href="#">UK Declaration of Conformity</a><br><a href="#">Manufacturer's declaration for operating altitude</a>                                                                                                                                                                                 |
| Engineering Data                            | <a href="#">CAD data – STEP</a><br><a href="#">Configuration tutorials – Video Tutorial Substation Line</a>                                                                                                                                                                                                                                                                                        |
| Product Change Notification                 | <a href="#">Firmware Release Notes</a>                                                                                                                                                                                                                                                                                                                                                             |
| Software                                    | <a href="#">Device description – SNMP private MIB</a><br><a href="#">Firmware – Current Firmware</a><br><a href="#">Device description – GSDML file</a>                                                                                                                                                                                                                                            |
| User Documentation                          | <a href="#">Hardware Installation Guide</a><br><a href="#">User manual Command Line Interface</a><br><a href="#">User manual</a><br><a href="#">Application notes – Security Data Sheet Full Gigabit Ethernet Substation Line Switches</a><br><a href="#">Application notes – Industrial Product Security Guideline</a><br><a href="#">Compatibility information – SubstationLine Configurator</a> |
| Catalogues                                  | <a href="#">Catalogues in PDF-format</a>                                                                                                                                                                                                                                                                                                                                                           |

## IE-SW-SL28M-HV

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## Accessories

## SubstationLine series



## Features of SubstationLine managed switch series

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- MMS server based on bridge model defined in IEC 61850-90-4
- Redundant power supply modules in all models
- Wide operating temperature range of -40°C up to 85°C
- Modular switch version with high flexibility in number and type of ports
- Fast/Gigabit/10-Gigabit interfaces
- Layer 3 models for hardware supported routing between up to 28 IP-subnets

## General ordering data

|            |                            |                                                                     |
|------------|----------------------------|---------------------------------------------------------------------|
| Type       | IE-SWM-SL08-8GT            | Version                                                             |
| Order No.  | <a href="#">2779140000</a> | Media interface module for modular switch, Fast/Gigabit Ethernet,   |
| GTIN (EAN) | 4064675048503              | Number of ports: 8x RJ45, -40 °C...85 °C                            |
| Qty.       | 1 pc(s).                   |                                                                     |
| Type       | IE-SWM-SL04-4GESFP         | Version                                                             |
| Order No.  | <a href="#">2779200000</a> | Media interface module for modular switch, Gigabit Ethernet, Number |
| GTIN (EAN) | 4064675048565              | of ports: 4x 1000BaseSFP slot, -40 °C...85 °C                       |
| Qty.       | 1 pc(s).                   |                                                                     |
| Type       | IE-SWM-SL04-4ST            | Version                                                             |
| Order No.  | <a href="#">2779190000</a> | Media interface module for modular switch, Fast Ethernet, Number of |
| GTIN (EAN) | 4064675048558              | ports: 4x ST Multi-mode, -40 °C...85 °C                             |
| Qty.       | 1 pc(s).                   |                                                                     |
| Type       | IE-SWM-SL04-4SC            | Version                                                             |
| Order No.  | <a href="#">2779170000</a> | Media interface module for modular switch, Fast Ethernet, Number of |
| GTIN (EAN) | 4064675048534              | ports: 4x SC Multi-mode, -40 °C...85 °C                             |
| Qty.       | 1 pc(s).                   |                                                                     |
| Type       | IE-SWM-SL08-8GESFP         | Version                                                             |
| Order No.  | <a href="#">2779150000</a> | Media interface module for modular switch, Fast/Gigabit Ethernet,   |
| GTIN (EAN) | 4064675048510              | Number of ports: 8x 100/1000BaseSFP Slot, -40 °C...85 °C            |
| Qty.       | 1 pc(s).                   |                                                                     |
| Type       | IE-SWM-SL04-4GESFP+        | Version                                                             |
| Order No.  | <a href="#">2779220000</a> | Media interface module for modular switch, 10-Gigabit Ethernet,     |
| GTIN (EAN) | 4064675048589              | Number of ports: 4x 10GBaseSFP+ slot, -40 °C...60 °C                |
| Qty.       | 1 pc(s).                   |                                                                     |

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## Accessories

|            |                            |                                                                     |
|------------|----------------------------|---------------------------------------------------------------------|
| Type       | IE-SWM-SL02-2GESFP+        | Version                                                             |
| Order No.  | <a href="#">2779210000</a> | Media interface module for modular switch, 10-Gigabit Ethernet,     |
| GTIN (EAN) | 4064675048572              | Number of ports: 2x 10GBaseSFP+ slot, -40 °C...60 °C                |
| Qty.       | 1 pc(s).                   |                                                                     |
| Type       | IE-SWM-SL02-2GC-PRP/HSR    | Version                                                             |
| Order No.  | <a href="#">2985050000</a> | Media interface module for modular switch, PRP/HSR RedBox,          |
| GTIN (EAN) | 4099986846364              | Fast/Gigabit Ethernet, Number of ports: 2x combo-ports              |
| Qty.       | 1 pc(s).                   | (10/100/1000BaseT(X) or 100/1000BaseSFP), -40 °C...85 °C            |
| Type       | IE-SWM-SL04-4STS           | Version                                                             |
| Order No.  | <a href="#">2779180000</a> | Media interface module for modular switch, Fast Ethernet, Number of |
| GTIN (EAN) | 4064675048541              | ports: 4x ST Single-mode, -40 °C...85 °C                            |
| Qty.       | 1 pc(s).                   |                                                                     |
| Type       | IE-SWM-SL04-4SCS           | Version                                                             |
| Order No.  | <a href="#">2779160000</a> | Media interface module for modular switch, Fast Ethernet, Number of |
| GTIN (EAN) | 4064675048527              | ports: 4x SC Single-mode, -40 °C...85 °C                            |
| Qty.       | 1 pc(s).                   |                                                                     |

## Configuration backup and restore module (for use with switches of Advanced- and SubstationLine)



## Module for saving and loading a device configuration

- Reduce system downtime by simple reconfiguration in case of replacing devices
- 2 storage spaces selectable via DIP switch
- Compact, rugged, reliable design
- For use with switches of Advanced- and SubstationLine

## General ordering data

|            |                            |                                                               |
|------------|----------------------------|---------------------------------------------------------------|
| Type       | IE-EBR-MODULE-RS232-ALM    | Version                                                       |
| Order No.  | <a href="#">2682610000</a> | Configuration backup and restore module, IP40, -10 °C...60 °C |
| GTIN (EAN) | 4050118692105              |                                                               |
| Qty.       | 1 pc(s).                   |                                                               |