ENGLISH

Read and understand these instructions and the relevant manual before installing, operating, or maintaining the device. For available software and complete documentation for SWT 3000 see:

Siemens Industry Online Information platform SIOS

Further Support

If special problems arise, or further information are required, please contact your Siemens representative. Our Customer Support Center provides a 24-hour service.

Siemens AG
Smart Infrastructure

Customer Support Center

- Phone: +49 911 2155 4466
- E-Mail: energy.automation@siemens.com

Disclaimer of Liability

Although we have carefully checked the contents of this publication for conformity with the hardware and software described, we cannot guarantee complete conformity since errors cannot be excluded.
The information provided in this manual is checked at regular intervals and any corrections that might become necessary are included in the next releases. Any suggestions for improvement are welcome.

Copyright

OpenSSL

This product includes software developed by the OpenSSL Project for use in OpenSSL Toolkit (http://www.openssl.org/).

This product includes software written by Tim Hudson (tjh@cryptsoft.com).

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com).

Notes on Safety

This document contains notes that must be adhered to ensure personal safety and to avoid damage to property during commissioning and use.
However, it does not constitute a complete description of all safety measures required for installation, service, and maintenance of the device. Details are to be taken from the device manual; those are mandatory. Keep it safe for later usage.

Warning: Danger of severe personal injury or substantial damage to property

Hazardous voltages may occur in devices and modules during operation. Always observe the instructions given in “Qualified Electrical Engineering Personnel” below.

Qualified Electrical Engineering Personnel

Qualified electrical engineering personnel must have up to date technical qualifications as electrical technicians. Only these persons may commission, use, maintain, decommission, and dispose of the device according to the state-of-the-art standards of engineering in the high voltage power line environment.

Warning: Laser radiation! Danger of eye injury

This device may contain a class 1 laser. Do not look directly into the beam.

Warning: Danger of damage due to static electrical charges

The printed circuit boards of numerical relays contain CMOS circuits. These shall not be withdrawn or inserted under live conditions! The modules must be so handled that any possibility of damage due to static electrical charges is excluded.

During any necessary handling of individual modules, the recommendations relating to the handling of electrostatically endangered components (EEC) must be observed.

In installed conditions, the modules are in no danger.

Warning: Prevent the risk of possible over voltages

The cable shield of the communication cable between Line Matching Unit (LMU, AKE) and the power line carrier communication devices (PowerLink) must be grounded on both ends.

The grounding of the cable shield must be carried out on the LMU side itself and once again before entering the station building or a ground connection within the building in which the PowerLink devices or any other powerline carrier communication device are installed.

The grounding must be carried out using a connection that cannot be detached without tools. The grounding of the cable shields must not be removed until it is ensured that by closing the short circuit switch on the LMU and attaching an additional grounding rod to the HV input, the LMU is voltage-free and safely grounded.

(PowerLink with iSWT or detached SWT 3000)

Use as Prescribed

The device may only be used for such applications as set out in the user instructions, and only in combination with equipment recommended and approved by Siemens.

Correct and safe operation of the product requires adequate transportation, storage, installation and mounting in a control cabinet, as well as appropriate use and maintenance.

Only qualified electrical engineering personnel may install, set up, commission, attach communication cables, power supply lines and ground to the device.

Check and follow the electrical operating conditions, mechanics, and climatic max. ambient conditions for safe operation. Connect and operate the device only in conformance with the values as specified in the ‘Technical Data’ below.

Commissioning must be carried out in accordance with good engineering practice and under consideration of local installation rules and laws (also applicable and obligatory for cabinet internal wiring).

Fuses may be required on all phases in the electrical installation, depending on local installation conditions and requirements.

During operation of the equipment, it is unavoidable that certain parts will carry dangerous voltages. Severe injury or damage to property can occur if the appropriate measures during use are not taken:

- Make sure, that the equipment is properly connected to ground at all times and mechanically fixed in the rack.
- Degree of protection by enclosure IP20.
- Device may only be operated in a dry location within a temperature range of -5 to +55 degree Celsius.
- This is a Class A device. It is intended to be operated in an industrial environment only. It may cause harmful interference if operated in residential/light industry environment.
- Hazardous voltages can be present on all components when the device is connected to a power source. Before opening the device, makes sure all power sources are disconnected or switched off. Even after the power supply has been disconnected, hazardous voltages can still be present within the device (capacitor storage).
  - The limit values indicated in the manual must not be exceeded; that also applies to testing and commissioning.

Statement of Conformity

CE The product is in conformity with the regulations of the following European Directives:

- EMC Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- RoHS Directive 2011/65/EU

Used Symbols

Caution, hazard. The documentation must be observed.	Protection class I / protective earthing
CE conformity	Hazardous voltage
Qualified Electrical Engineering Personnel	Note

Distributor statement according to WEEE-Guideline 2012/19/EU

Do not throw the device in the household trash! Please dispose of the device according to the guidelines regarding electronic waste in your country.

Application

SWT3000 - Protection Signaling

The SWT 3000 protection signaling system utilizes the command transmission for protection devices according to the IEC 60834-1 standard. Several types of teleprotection command schemes like permissive, intertripping (direct or transfer) as well as blocking protection schemes are applicable.

Unpacking a Device

- Check the package for external transport damage. A damaged packing may indicate that the device inside is also damaged.
- Unpack the device carefully; do not use force.
- Visually check the device to ensure that it is in perfect mechanical condition.
- Return a damaged device to the manufacturer or dispose it correctly. A defect device may not either be used or repaired by the user.

Note: Before commissioning the device, leave it in the final operation room for at least 2 hours. This allows it to reach room temperature and to prevent dampness and condensation.

Repacking a Device

- If you store devices after incoming inspection, pack them in suitable storage packaging.
- If devices are to be transported, pack them in transport packing.
- Put the accessories supplied in the packing with the device.

Storing a Device

- Only store devices on which you have carried out an incoming inspection, thus ensuring that the warranty remains valid.
- The relative humidity must be at a level where condense water and ice are prevented from forming.
- If the device has been in storage for more than 2 years, connect it to the primary voltage source, and operate it for 1 to 2 days. This will cause the electrolytic capacitors to form on the printed circuit board assemblies again.
- When the device is reshipped ensure that the transport requirements for the selected means of transport are met. The outer package alone is not adequate for transport purposes.

Mounting

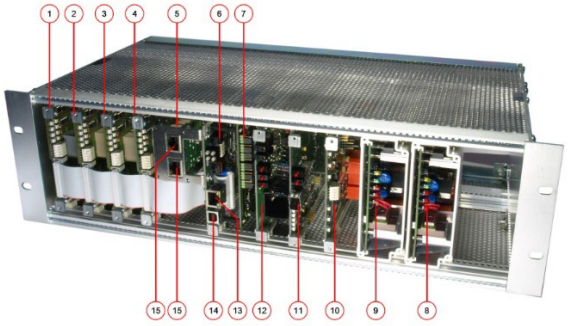
The device is designed for horizontal mounting in a cabinet or rack. Min. distance between two SWT 3000 devices is one unit of height (= 1.75 inches or 44.45 mm). The climatic conditions must be within the specified values (see technical data). Consider the weight and position of the device to avoid personal injuries.

Commissioning

Before making any connections, ground the equipment and the grounding terminal.

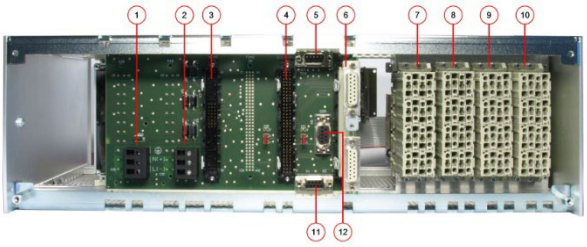
- In order to switch on the power supply of the SWT 3000, switch the external voltage separator in the cabinet or rack to ON position. The device is still switched off because the ON/OFF switch on the PU4 module is in down position.
- The yellow LED (disabled) lights up on the power supply units.
- To switch on the device, put the ON/OFF switch on the PU4 module in up position
- The operate LED (green) must light up on the power supply unit and the OK LED (green or red) must light up on the PU4 module.
- Connecting the Service PC
  A service PC and the service program PowerSys are needed for startup, maintenance, and diagnostic purpose of the SWT 3000 units. The service PC is connected to the USB socket on the front panel of the PU4 module with a USB A/B plug cable.
- The service program PowerSys and the communication to the device via the serial interface from the service PC or via a TCP/IP connection (default IP address 192.168.20.200) is described in the device manual.
- The corresponding software package (formerly delivered on DVD) is available for download on SIOS (Siemens Industry Online Support) platform free of charge, a registration is required.
  Product Support/Energy/Energy automation and smart grid/Telecommunication Products/Download
- Test protocols are available for download under
  https://www.ea-testreports.siemens.com
  Enter BF code of device to view the requested test protocol in pdf format. The installed software package version loaded into the device can be seen in the protocol.

Interfaces and modules



1) IFC-1 in slot 1 for interface module IFC-x (optional)
2) IFC-2 in slot 2 for interface module IFC-x (optional)
3) IFC-3 in slot 3 for interface module IFC-x (optional)
4) IFC-4 in slot 4 for interface module IFC-x (optional)
5) Ethernet EN100 module for IEC 61850/TPoP (optional)
6) Processing unit module (PU4)
7) Digital line equipment module (DLE) (optional if digital data transmission is desired)
8) Slot for the redundant power supply module (PS-2) (optional)
9) Power supply module (PS-1)
10) Alarm module (ALR)
11) Fiber-optic module (FOM-2) (optional, if digital or analog data transmission is desired)
12) Copper line equipment module (CLE) or optionally fiber-optic module (FOM-1) (optional, if digital or analog data transmission is desired)
13) RJ45 socket for PU4 Ethernet interface
14) USB socket (type B)
15) RJ45 sockets for electrical EN100 Ethernet interface (IEC 61850/TPoP)
    SFP sockets if optical EN100 Ethernet interface (IEC 61850/TPoP) are used

Backplane



1) Power supply (redundant)
2) Main power supply
3) ALR
4) CLE
5) SSB (Remote monitoring interface connector)
6) Connector for DSUB adapter with LID1 and LID 2
7) IFC-4
8) IFC-3
9) IFC-2
10) IFC-1
11) SSR (Console for PU4)
12) SC (Service channel interface SWT 3000)

Functions/Features

- Bidirectional and independent transmission of commands
- Up to 16 commands with digital line interfaces
- Up to 4 commands with analog line interfaces or PLC
- Command Interface for normal contact load (IFC-P, fast)
  4 inputs and 4 relay outputs (max. 4 modules)
- Command Interface module for high contact load (IFC-D)
  4 inputs and 4 relay outputs (max. 4 modules)
- Interface module for binary command signaling (IFC-S)
  8 relay outputs (max. 2 modules)
- Command interface module IEC 61850 electr. or optical
- Line Interface modules
  - 2x X.21, 2x G703.1, 2x G703.6 (DLE)
  - 2x fiber, short range SM (FOS1), short range MM (FOS2), long range (FOL1) or C37.94 (FOS3)
  - 1x Analog 2 or 4 wire (CLE)
  - 1x Ethernet electrical or optical (TPoP)
- Interface module for alarm signaling (ALR
  - 3 relay outputs, 1 input for time synchronization
- Configuration via element manager application
  - USB and ETH interface
- Command Input configuration
  - voltage range (24 – 250 V DC)
  - pulse suppression
  - input command limitation and extension
- Command Output configuration
  - output or signaling allocation
  - input command limitation and extension
- Power Supply
  - 2 wide range supplies (DC, AC/DC)
  - redundant assembly
- Event recorder and command counter
- Path protection via 2 different line interfaces in any combination
- Network management SNMP interface

Technical Data

Power Supply	
Input voltage	DC 24 V to 60 V (-20 % / +20 %) or DC 110 V/220 V/250 V (-20 % / +20 %) or AC 115 V/230 V (-20 % to +10 %) 47 Hz to 63 Hz
Power consumption	Approx. 30 W/VA
Cable cross-section	Max. 2.5 mm^2

Climatic Conditions IEC 60721-3	
During operation	-5° C to + 55° C
During storage and transport	-40° C to +70° C
Relative humidity	5 % to 95 %
Absolute humidity	29 g/m3 no condensation

Mechanical Design	
19" frame	
Dimensions	Height: 132 mm/3U Width: 482.6 mm/19 inch Depth: 240 mm
Weight	Approx. 5 kg
Color	White aluminum, RAL 9006
Degree of protection	IP20