Communication

Residential

Smart Meter Gateway

S560

Technical Data

The Smart Meter Gateway S560 meets the requirements from BSI and PTB and provides all demanded interfaces. There are two variants for WAN Communication, an integrated LTE Modem or a versatile Ethernet interface for any transparent modem. Short booting time, smallest FW update images and low power consumption offer additional important benefits. The optional load switch box enhances the Smart Meter Gateway S560 to a universal device for load and power management.

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Revision history

Version	Date	Comments
V 0.7	06.11.2015	First edition
V 0.8	22.01.2016	Corrigendum
V 0.9	16.12.2016	Type Designation
V 0.95	21.12.2016	Corrections
V 0.98	02.02.2017	Type Designation
a	13.02.2017	First official release

General

The Smart Meter Gateway S560 is based on the requirements of Protection Profile PP-0073 published by BSI. It provides three mandatory physical interfaces:

- the Local Metrological Network, LMN
- the Wide Area Network, WAN
- the Home Area Network, HAN.

The Smart Meter Gateway S560 communicates internally with its Security Module, which is the component defined by the Protection Profile PP-0077. It provides cryptographic operations to the Smart Meter Gateway S560 and a secure memory for keys and certificates.

Main Functionality

The Smart Meter Gateway S560 is capturing values from the LMN and save them in the original measurement list. Depending on different tariffication applications the values are stored in tariff registers. The measurement values were sent to different External Market Participants (EMT) through the WAN. Furthermore, the S560 offers some functionality for End Consumer and Service Technician on the HAN interface. The integrated web server delivers energy data and system information. In addition to the HAN interface the S560 provides a CLS interface. Devices connected to the CLS interface may communicate via a transparent proxy-server to an External Market Participant. Additionally, the S560 works as firewall between all connected networks. The S560 is the central unit in the Intelligent Meter System (iMsys). It stores End Consumer related meter data and profiles which on the basis of regulations and contracts are sent to authorised parties only. The Privacy-by-Design approach in the S560 ensures data protection and data security for the End Consumer.

S560 Smart Meter Gateway – Technical Data

Functionalities

WAN communication

- Communication with SMGW Administrator (GWA)
- Communication with up to 24 Market Participants (EMT)
- Transmission of values according to application and communication profiles
- Reception of administration and configuration information
- Pseudonymisation
- Firmware Update
- Wake-Up Service

WAN protocol

COSEM Application layer	IEC62056-53
COSEM/OBIS	IEC62056-62; IEC62056-61
XML	UTF-8
CMS	BSI TR-03109-1 Anlage I
RESTful COSEM web services	BSI-TR-03109-1 Anlage II
HTTP	RFC 7230 – RFC7235 (IETF)
TLS	RFC 5246 (IETF)

LMN communication

- Capturing, time stamping, tariffication and storage and archiving of measurement values

LMN protocol RS485

COSEM/OBIS	IEC62056-62; IEC62056-61
SML	IEC 62056-5-3-8
TLS	RFC 5246 (IETF)
HDLC	ISO/IEC 13239
CRC	IEC 62056-46

LMN protocol wM-Bus unidirectional

OMS Vol 2, Issue 4.0.2	EN13757-3:2013
M-Bus EncryptionMode-7 AES	EN13757-3:2013
OMS Security-AFL	
Wireless M-Bus	Mode T1 (EN13757-4:2013)

HAN communication

- Providing of data for End Consumer
  - Actual status of gateway and meters
  - Actual consumption and historical values
  - Contracts with energy suppliers
  - End consumer log
- Providing of data for Service Technician
  - Actual status of gateway and meters
  - Diagnose of WAN communication (RSSI)
  - System log
  - GW-Admin information

CLS communication

- Transparent communication channel between CLS and EMT (proxy server)

User administration / multi-tenant capability

- Multi-tenant capability
  - Up to 3 active End Consumers
  - Archived End Consumers

Time synchronisation

NTPv4 over TLS	RFC5905

Crypto graphical functions

Protocolling

- System log
- End consumer logs
- Calibration log
- Event logs

Tariffication application
- TAF1 Data economical tariff
- TAF6 Retrieval of values when needed
- TAF7 Meter values measurement
- Further TAFs upgradable in field

Non-functional requirements	
Technical lifetime	20 years
Firmware update	Image-size <1.5 MB

Functional requirements	
Physical operational status	<10 s

Specifications

Power Supply

Mains operation	230V
Operation voltage	1x230 V
Operation range	0.8 U_n to 1.15 U_n
Frequency	50 Hz
Current drain (Capacitor loaded)	
Without communication	4.5 W / 7 VA
Active communication over LTE	7 W / 9 VA
Power reserve RTC (Capacitor loaded)	72 h
Power jack	Phoenix MSBTVA 2,5/3-G-5.08

WAN Interface

LTE modem		WAN-1
LTE-Modem Type		integrated
GSM 850/900	Class 4	(2W, 33dBm)
GSM 1800/1900	Class 1	(1W, 30dBm)
EDGE 850/900	Class E2	(0.4W, 26dBm)
EDGE 1800/1900	Class E2	(0.5W, 27dBm)
UMTS 900/2100	Class 3	(0.25W, 24dBm)
LTE 800/1800/2600	CAT1	(0.2W, 23dBm)

Antenna jack	
FAKRA-Connector	Bordeaux, violet, coding D
Impedance	50 Ohm

SIM card	
SIM Card Format	ID-000-Format (size ca. 25 × 15 mm)

Slot in sealed area with push-push locking

LMN Interface

LMN wired (RS485)	LMN-1
Maximum load	3.5W (20°C)
Baud rate	921.6 kBits/s
Jack	RJ12 / 6p6c

LMN wireless (wM-Bus)	
FAKRA Connector	Signal Blue, Coding C
Frequency	868.95 MHz

HAN Interface

HAN interface (covered by flap)	HAN
Jack	RJ45

CLS interface (in sealed area)	CLS
Jack	RJ45

Status-Interface

LED indicator (front)	
- PWR	Powered, Operational State, Critical Error
- TLS	Active TLS Session of Type Management
- LMC	Local Meter Connect
- wMT	Wireless M-Bus Traffic
- RSSI	Received Signal Strength (Mobile)

Controllable Outputs (Option)

Controllable outputs	
N/O contact	3 Solid State Relays
Change Over Contact	1 bistable Relay
Max. Voltage	230V AC
Max. Current	90 mA (20°C)

Environment

IEC-specific Data

Electromagnetic compatibility	
Surge Immunity	4 kV, 50 Hz (IEC 610-0-4-5)
Electro Static Discharge	Air 8 kV /Contact 4 kV (IEC 610-0-4-2)
Electrical Fast Transient	4 kV (IEC 610-0-4-4)
Impulse Voltage	7 kV, 1.2/50 µs (IEC 62052 11)
Electro Magnetically Field Immunity	10 V/m (IEC 610-0-4-3)

Environmental

Temperature range	
Ambient Temperature Operation	–25°C to +55°C
Ambient Temperature Storage	–40°C to +70°C

Protection class	
Protection Class	IP51 (IEC 60529) With module cover
Isolation	Protection Class II
Over Voltage	Category III

Approvals and certifications

CC-PP-0073 protection profile	
	Planned June 2017

PTB 50.8 type approval test	
G1-Gateway	Planned April 2017

TR-03109 BSI conformity	
TR Version 1.0	self-declaration
TR Version 1.1	depending on TR1.1 launch

Housing

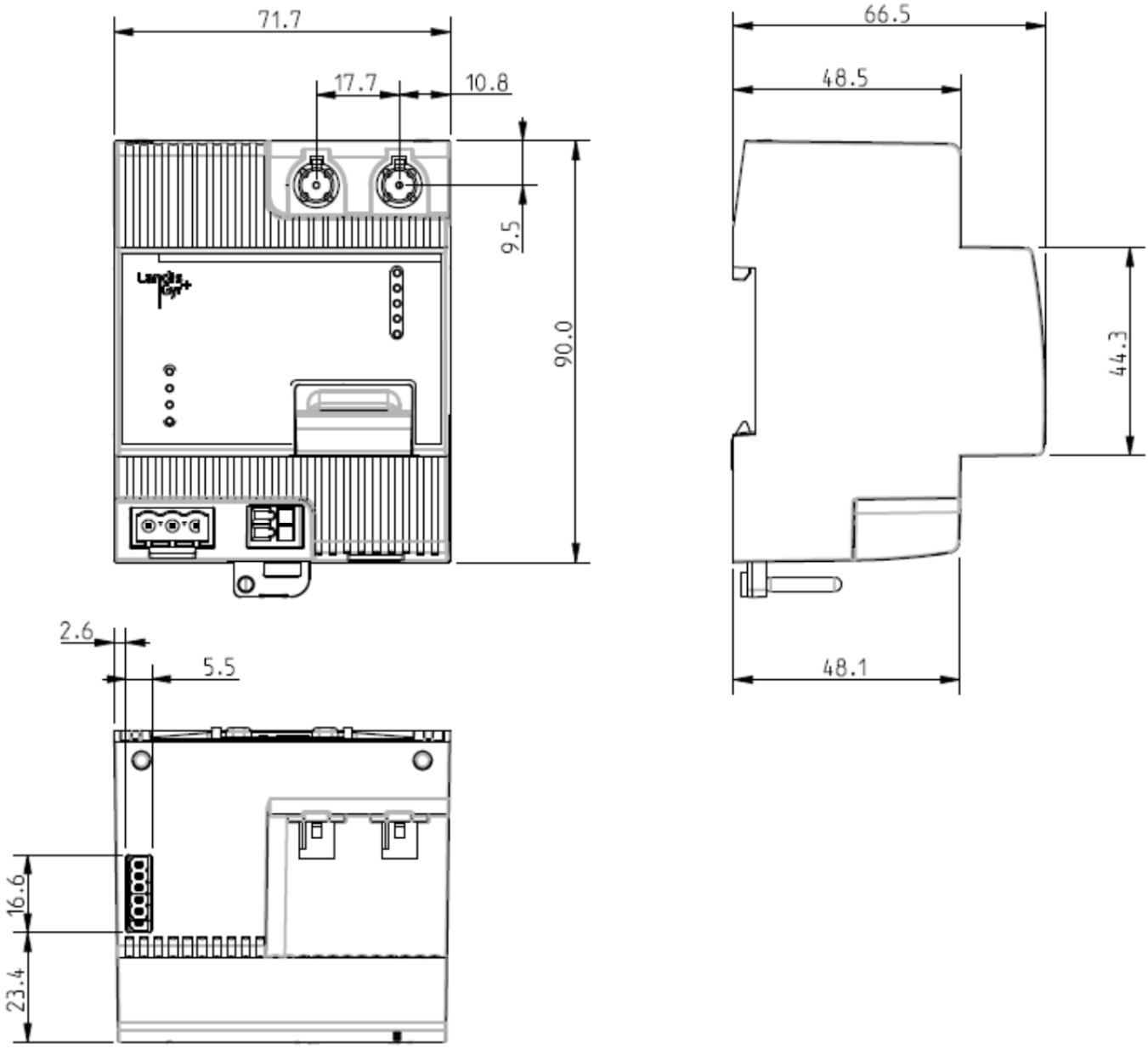
Dimensions

DIN rail	DIN 43880
Size 1, 4 TE (units)	72 mm

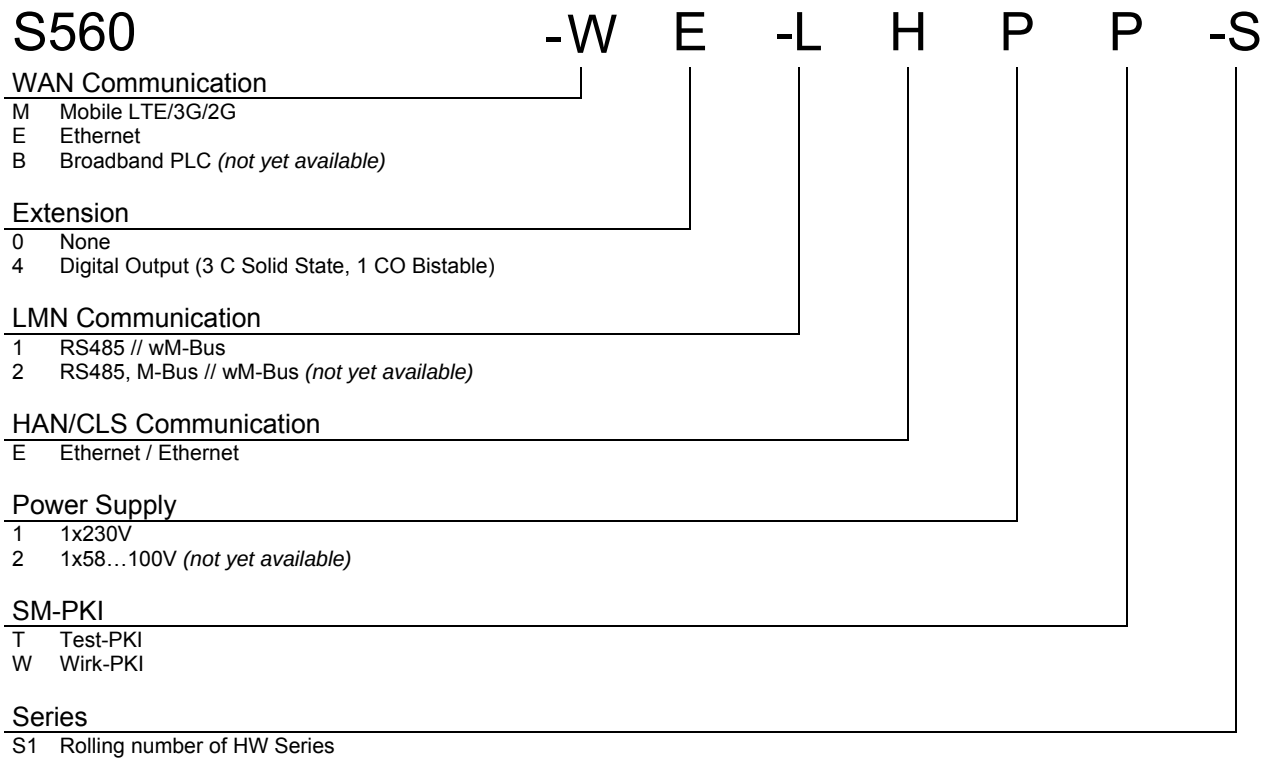
Material

Housing	Polycarbonate UV, FR, V0 PPC016

Dimensions



S560 Type Designation



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