

The FP S-ENGard W600 is an IIoT gateway in a compact wall mounted housing. There are 2 variants: W640 and W667.

### Mobile wireless options

The FP S-ENGard Gateways can be equipped with a mobile wireless module as an option. Suitable FME antennas are available as an option.

The mobile wireless options are coded via a suffix after the "W640" or "W667" model designation.

Suffix	Supported mobile wireless networks
NB	2G / 3G (discontinued model, minimum order quantity required)
BB	2G / 3G / 4G



## 1 Main functions

Main functions	
<b>Alarm and fault indicator</b>	Automatic generation and sending of fault messages from message templates and current values (from PLC or Gateway). Actions can trigger up to 100 definable events depending on the time requirements. Address book with up to 100 addresses. 100 message texts, 100 alarms
<b>Acknowledgement</b>	Acknowledgement option for alarms and triggering of alarm chains if the acknowledgement does not arrive within a set time. Acknowledgement via SMS or e-mail possible.
<b>Alarm chain</b>	Multiple levels of alarm actions and receivers if alarm messages are not acknowledged in time. Alarm actions can be sent by SMS, e-mail or switching actions.
<b>Event</b>	Event, e.g.: Error, PLC communication interrupted, acknowledgement of an alarm. All actions in the Gateway are triggered by events.
<b>SMS</b>	Sending and receiving of SMS
<b>E-mail</b>	Sending and receiving of e-mail (SMTP)
<b>Remote switching</b>	Remote switching of the variable values of the connected controller by sending switching commands as SMS or e-mail to the Gateway. Password protection
<b>Remote maintenance</b>	Configuration of the Gateway and the connected PLC via an existing IP connection.
<b>Security</b>	Local and remote configuration can be protected using access rights.
<b>Web-server</b>	Integrated web-server for local access to web applications (e.g. for commissioning)
<b>PLC protocols</b>	More than 30 integrated PLC and field bus protocols; direct access to PLC data points (read/write), e.g. Siemens, ABB, Mitsubishi, Moeller/Eaton, Allen-Bradley, Schneider, Crouzet, VIPA, ...
<b>Counter protocols</b>	Many integrated field bus protocols, e.g. Modbus, M-Bus, EN 61107, 1-Wire, Aurora, wMBus via optional FP wMBus adapter, ...
<b>EDGE functions</b>	Extensive data handling functions (EDGE computing) integrated by users in a freely programmable way, e.g. logical links, thresholding
<b>Data logging</b>	Large integrated log memory (power failure fail-safe due to flash memory) Up to 100 MB of log memory available for user data; up to 100 log files definable
<b>Cloud protocols</b>	Cloud protocols integrated from notable Cloud providers incl. Cloud command channel -> Gateway e.g. Deutsche Telekom CoT, Cumulocity, AWS, Juconn, generic MQTT
<b>Security Protocols</b>	TLS 1.2, VPN, your own certificates and keys can be configured FTP, SFTP, SMTP, POP3, SMS, MQTT, http, https, telnet, and more

## 2 System architecture

System architecture	
CPU	400 MHz, ARM9, ATMEL SAM9-G25
RAM	128 MB DDR2-RAM
FLASH Memory	128 MB on-board
System clock (Battery-backed)	For logging of events, e.g.: <ul style="list-style-type: none"> <li>- Errors</li> <li>- incoming calls,</li> <li>- PLC or Cloud communication interrupted,</li> <li>- acknowledging an alarm</li> </ul> All actions in the Gateway are triggered by events.

## 3 Interfaces

Built-in inputs and outputs in the basic device					
Connection type		W640	W667	Technical information	Accuracy
Inputs	Digital	2	2	230V AC	-
	Analogue	-	4	0...10 V DC, resolution: 11 Bit; switchable: 0 ... 20 mA	0.2% ± 5 mV
	Pt-1000	-	2	Resolution: 0.4K	± 1.2 K (2.16 °F)
	Digital	-	5	24 V	-
	1-wire	1	1	5V, max. 30 1-wire sensors	Depending on the sensor
	M-Bus	1	1	Master for up to 100 counters; galvanically isolated	-
Outputs	Relay	2	2	Potential-free 230 V AC 5 A or 110 V DC 0.3 A, changeover	-
	Relay	-	3	Close contact max. 30 V DC 2A	-
	Analogue	-	3	0...10 V DC, resolution: 12 Bit; switchable: 0 ... 20 mA	1 % ± 6 mV
Connection terminals		Screw terminal (grid dimension: 3.81 mm / 0.15"), cross-section max. 1.5 mm <sup>2</sup> (16 AWG)			

Serial interfaces	
COM1 RS232	5-pin screw connection max. 230,400 bps, not galvanically isolated ITU-T V.24, V.28, hardware handshake. Signals: RTS, CTS, GND, RxD, TxD Transmission distance: 12 m (39 ft)
COM2 RS485	3-pin screw connection, DTE in accordance with EIA/TIA-485, max. 230,400 bps, not galvanically isolated, integrated termination, can be switched via DIP switch Transmission distance of max. 1200 m (4000 ft) depending on the transmission rate, bus and cable type
COM3 M-Bus	Conformity: DIN EN 13757-2, DIN EN 13757-3  M-Bus master for up to 100 M-Bus loads (counter) short-circuit protection, galvanically isolated 1500 V M-Bus voltage: 36 V, bus length: max. 1000 m (3281 ft) 3 screw terminals, grid dimension 3.81 mm (0.15"), cross-section max. 1.5 mm <sup>2</sup> (16 AWG)  Data rate: 300 Baud – 19200 Baud Data formats: 8 data bits, 1 start bit, 1 stop bit and 1 parity bit (even parity)

USB 2.0 Host	
2x USB host	For USB devices such as USB memory sticks, WiFi sticks, etc.

1-wire interface	
1x 1-wire	For the connection of 1-wire temperature sensors 5 V power supply for max. 30 sensors, 3-pin terminal connection

## 4 Ethernet connection

Ethernet connection							
Connection	10/100 Base-T IEEE 802.3, RJ45 connector (8P8C with 2 LEDs), shielded						
Operating mode	Auto negotiation, Auto MDI-X (crossover cable not required)						
Status LEDs	<table> <tr> <td>Flashing green</td><td>Data is being transferred</td></tr> <tr> <td>Yellow off</td><td>10 Base-T</td></tr> <tr> <td>Yellow on</td><td>100 Base-T</td></tr> </table>	Flashing green	Data is being transferred	Yellow off	10 Base-T	Yellow on	100 Base-T
Flashing green	Data is being transferred						
Yellow off	10 Base-T						
Yellow on	100 Base-T						
Galvanic isolation	1500 V ( $V_{rms}$ min.)						

## 5 S1 expansion modules (optional)

S1 expansion module			
Number of free expansion slots for S1 plug-in modules: model W640 = 5, model W667 = 2			
Inputs	S1-D50	5x digital inputs, max. 24 V	-
	S1-D30G	3x digital inputs, galvanically isolated (0 .. +/- 60 V; input current 2.2 .. 3.1 mA)	-
	S1-AE3	3x analogue inputs 0 .. 10 V / 0 .. 20 mA (can be adjusted using jumpers)	0.2 % +/- 5 mV
	S1-PT3	3x Pt-1000 inputs	+/- 1.2 K (2.16 °F)
	S1-PT3C	3x Pt-100 inputs	+/- 1.2 K (2.16 °F)
	S1-S03	3x pulse inputs S0 for Reed contacts; cable length max. 30 m (98 ft)	-
Outputs	S1-D05	5x digital outputs, max. 48 V, 120 mA	-
	S1-D03G	3x digital outputs, galvanically isolated	-
	S1-AA2	2x analogue outputs 0 .. 10 V / 0 .. 20 mA (can be adjusted using jumpers)	1 % +/- 6 mV
	S1-WL2	2x changeover relay, max. 48 V / 3 A	-

## 6 WiFi stick (optional)

WiFi stick	
WiFi	USB stick model "90.0072.8100.00"
Wireless type	IEEE 802.11b/g/n; WPS (WiFi Protected Setup)
Frequency	1T1R 2.4 GHz
Data rates	IEEE 802.11b: 11 MBit/s max. IEEE 802.11g: 54 MBit/s max. IEEE 802.11n: 150 MBit/s max.
Network modes	Ad-hoc, infrastructure
Encryption	WEP-64, WEP-128, TKIP, WPA2
Antenna connection	Internal
Temperature range	0 .. 40 °C (32 .. 104 °F)

## 7 Operating elements

Operating elements	
Service buttons	Can be freely configured by the user via TiXML programming
Signal LED	Can be configured via TiXML (red/green flashing function, 32 patterns), e.g. "red = error" and "green = functioning properly"
Speakers	Mini speakers for audio signals; can be controlled using TiXML, e.g. continuous sound for alarm
System LEDs	Power, Process/Data out, LAN, Line, Mode, WiFi
WiFi button	For switching the WiFi subsystem on and off or for unloading (unmounting) a USB memory stick

## 8 Mobile wireless modem (optional)

UMTS/HSPA+: (2G, 3G) NB model	
<b>Frequencies</b>	Dual-mode UMTS (WCDMA) / HSDPA / EDGE / GPRS operation Dual Band 900 / 1800 MHz; UMTS Band 1 (2100 MHz), Band 8 (900 MHz)
<b>EDGE features</b>	Multi-Slot Class 12, E-GPRS Mobile Station Class B, Coding Schemes MCS 1-9; up to 236.8 kbps DL
<b>GPRS features</b>	Multi-Slot Class 12, GPRS Mobile Station Class B, Coding Schemes CS 1-4; up to 85.6 kbps DL/UL
<b>UMTS features</b>	UMTS Terrestrial Radio Access (UTRA) HSDPA category 8
<b>GSM features</b>	Call Forwarding, Call Barring, Multiparty, Call Waiting, Call Hold, Calling Line Identity Advice Of Charge, USSD, Closed User Group
<b>Antenna</b>	FME socket (male), coaxial, impedance 50 Ω
<b>Data transmission</b>	GSM: CSD up to 9.6 kbps DL/UL GPRS: max. Downlink: 85.6 kbps, max. Uplink: 85.6 kbps EDGE: max. Downlink: 236.8 kbps, max. Uplink: 70.4 kbps UMTS: max. Downlink: 384 kbps, max. Uplink: 384 kbps HSDPA: category 8: max. 7.2 Mbps DL (peak rate) HSUPA category 6: 5.76 Mbps UL Transmission power: 2 W GPRS/GSM/E-GSM @ 900 MHz 1 W GPRS/GSM/E-GSM @ 1800 MHz 0.5 W EDGE/GSM/E-GSM @ 900 MHz 0.4 W EDGE/GSM/E-GSM @ 900 MHz 0.25 W WCDMA/HSDPA/HSUPA @ 800/850/1900/2100 MHz

LTE: (4G) BB model	
<b>Frequencies</b>	8-Band LTE (B1, B2, B3, B5, B7, B8, B20; all bands with diversity) Quad Band 3G (850, 900 1800, 1900 MHz) Quad Band 2G (850, 900 1800, 1900 MHz)
<b>Antenna</b>	FME socket (male), coaxial, impedance 50 Ω
<b>Data transmission</b>	WCDMA CS: Downlink: 64 kbps, Uplink: 64 kbps GPRS: Downlink: 85.6 kbps, Uplink: 85.6 kbps EDGE: Downlink: 236.8 kbps, Uplink: 236.8 kbps WCDMA PS: Downlink: 384 kbps, Uplink: 384 kbps HSPA+: Downlink: 21.6 Mbps, Uplink: 5.76 Mbps DC-HSPA+: Downlink: 43.2 Mbps, Uplink: 5.76 Mbps LTE FDD: Downlink: 150 Mbps, Uplink: 50 Mbps @ 20M BW cat4 Transmission power: 2 W GSM-GPRS @ 850/900 MHz 1 W GSM-GPRS @ 1800/1900 MHz 0.5 W EGPRS @ 850/900 MHz 0.4 W EGPRS @ 1800/1900 MHz 0.25 W UMTS @ 850/900/1900/1950 MHz 0.2 W LTE @ 800/850/900/1700/1800/1900/1950/2100 MHz

## 9 Firmware


Firmware	
<b>TECom</b>	Tixi Embedded <b>Communication System</b> <b>TECom</b> TECom provides all basic functions which are required for close communication with controllers and remote communication in telephone networks, mobile wireless networks, LAN, Wi-Fi and IP based networks.
<b>Operating system</b>	Embedded Linux
<b>File system</b>	UBIFS: Log data and process variables (in RAM) remain in flash memory in the event of a power failure
<b>OEM functions</b>	The firmware can be expanded for OEM customers, e.g. for: new control protocols, calculating or processing functions or web server functions.
<b>Data security</b>	Use of the industry standard libraries Open SSL and OpenVPN (TLS 1.2)

## 10 General data

Power supply	
<b>Standard device</b>	110 .. 240 V AC, 50 .. 60 Hz PTC overcurrent protective device (Polyswitch); triggers at 2 A  <u>Typical power consumption</u> W640 LAN: 17 W, W640 NB: 21 W, W640 BB: 21 W W667 LAN: 20 W, W667 NB: 23 W, W667 BB: 24 W 3 screw terminals; conductor cross section max. 1.5 mm <sup>2</sup> (16 AWG) Use copper (CU) conductors only!  Fuse protection with a circuit breaker of type max. 10A, characteristic B, switching capacity 6kA required in the electrical system of the building - Fuse protection must be carried out in phase (L)  A two-pole (L, N) disconnecting device with a minimum contact distance of 3 mm (0.12") is required in the electrical system of the building - Disconnecting device must be easy to access for service personnel
<b>RTC Backup battery</b>	CR2032 backup battery for RTC (real time clock), service life >= 10 years
<b>System backup battery (optional)</b>	Slot for optional re-chargeable system backup battery. Running time 30 .. 90 minutes. Battery type: 3,7V / 750 mAh

Housing	
<b>Installation</b>	Wall mounting with screws (screws not included in scope of delivery)
<b>Type</b>	FP S-ENGard W600
<b>OEM housing</b>	OEM wall mounted housing
<b>Dimensions WxHxD</b>	271 mm x 214 mm x 60 mm (10.67" x 8.43" x 2.36") (incl. cable gland)
<b>Weight</b>	approx. 1.3 kg (2 lb 13.9 oz)

## 11 Conformity

Conformity and use	
<b>Conformity</b>	 2014/53/EU Radio Equipment Directive RED 2011/65/EU RoHS 2012/19/EU WEEE
<b>Temperature range</b>	Operation: -25 °C .. +55 °C (-13 °F .. 131 °F) Storage: -25 °C .. +85 °C (-13 °F .. 185 °F)
<b>Permitted humidity</b>	5 .. 95 % relative humidity, non-condensing
<b>Protection class</b>	IP65
<b>Electromagnetic compatibility</b>	Class B

## 12 FCC Compliance Statement

*(FP S-ENGuard W640 NB / FP S-ENGuard W667 NB)*

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Contains FCC ID: XMR201707BG96

Contains IC: 10224A-201709BG96

## 13 Dimensions

**Dimensions** (incl. cable ducts): 271 mm x 214 mm x 60 mm (10.67" x 8.43" x 2.36")

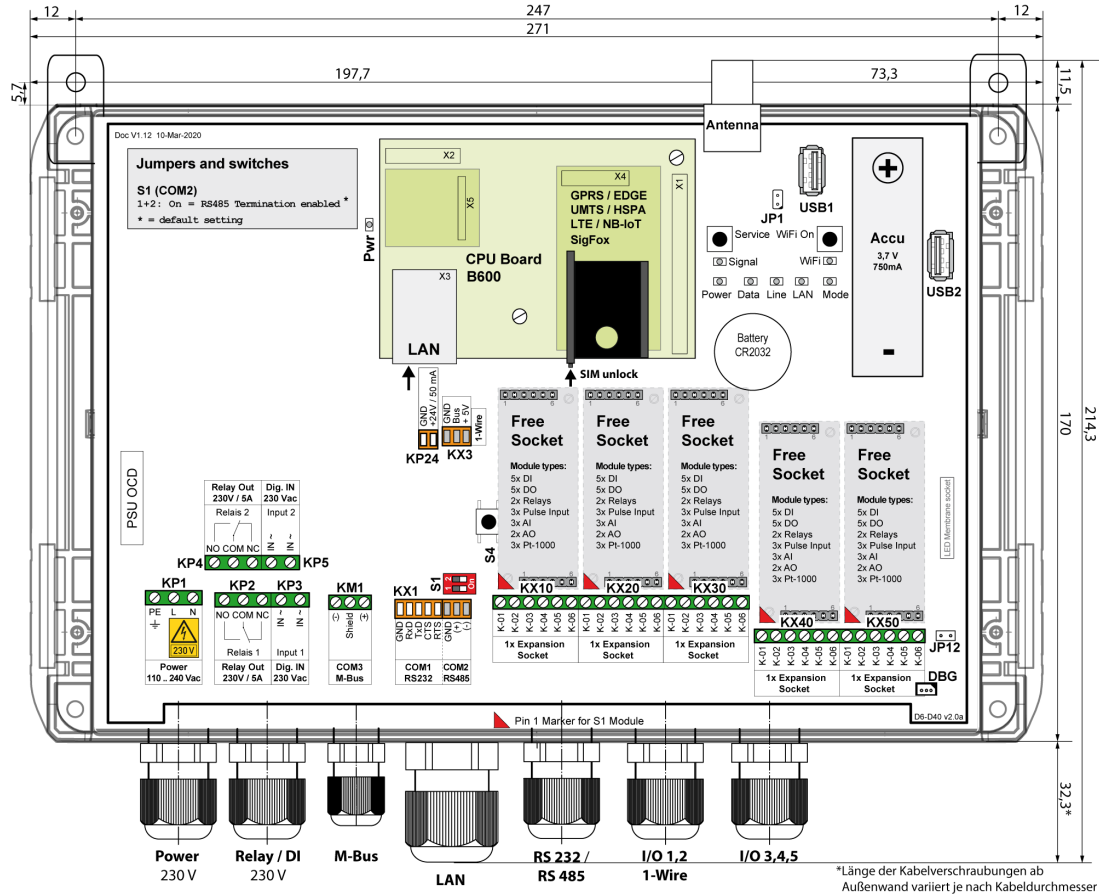


Figure 1: FP S-ENGuard W640 BB

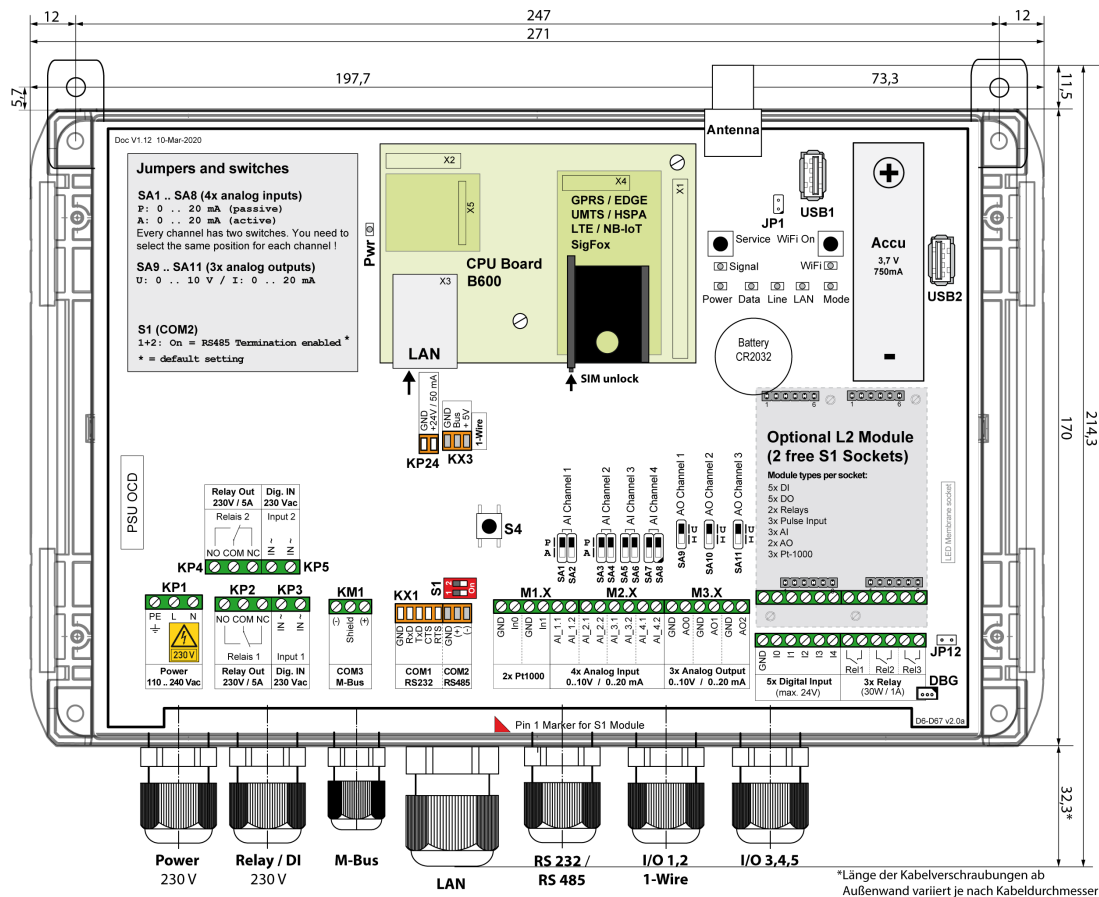


Figure 2: FP S-ENGuard W667 BB

## Contact

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### Disclaimer

This datasheet was created and checked with great care and replaces all previously published versions.

The data is based on the technical information known at the time of creation.

Nevertheless errors cannot be ruled out. We reserve the right to make changes that serve technical progress.