

YCS451F020: Universal Gateway

Features

- Universal Gateway for various building automation protocols
- VPN gateway for SAUTER Digital Services – Remote Management
- Data connector for SAUTER Digital Services – Customer Portal
- Integrated web server for configuration and monitoring
- LTE Cat 1 including antenna for wireless communication
- USB port, LED indicator
- Painted aluminium DIN rail housing as per DIN 43880



YCS451F020

Technical data

Power supply		
	Power supply	24 VDC $\pm 20\%$, 1 A
	Power consumption	Typ. 5 W, max. 24 W.
Parameters		
	Connection	Screw terminals, plugin terminal block
	Battery (buffer: RTC)	CR2032, backup for up to 7 days
Ambient conditions		
	Operating temperature	0...45°C
	Storage and transport temperature	-20...70°C
	Ambient humidity	10...80% rh, no condensation
Architecture		
	Processor	Quad-Core Cortex-A72 (ARM v8) 64 bit SoC at 1.5 GHz
	RAM	2 GB LPDDR4
	Memory	Flash 16 GB eMMC internal
	Operating system	Embedded Linux
Interfaces, communication		
Ethernet (Eth0, Eth1)	Connection	2 $\times$ RJ45, BASE-T(X)
	Transmission rate	1 $\times$ 1 Gbit/s (Eth0), 1 $\times$ 100 Mbit/s (Eth1)
RS-485 (S1, S2)	Connection	2 $\times$ half-duplex with switchable terminating resistor (S-end) and pull-up/pull-down resistor 560 Ω
	Transmission rate	2400...115,200 bps
Antennas	LTE antenna	SMA connector socket for Cat 1
USB	Connection	2 $\times$ USB 2.0
	Power consumption	Max. 500 mA
Wireless	LTE	Cat 1 with micro SIM card
	Transmission rate	10/5 Mbit/s (Cat 1)
	Mobile frequency bands	GSM900, DSC1800, 4G FDD bands B1/3/4/7/8/20/28, 5G TDD bands B38/40/41
Construction		
	Fitting	On metal DIN rail 35 $\times$ 7.5/15 as per EN 60715
	Dimensions W $\times$ H $\times$ D	108 (6 TE) $\times$ 90 (122) $\times$ 56 mm
	Weight	255 G (330 G with terminal blocks and antennas)
Standards, directives		
	Type of protection	Connections and terminals: IP00 Front in DIN cut-out: IP30 (EN 60730-1)
	Protection class	III (EN 60730-1)
	Software class	A (EN 60730-1, Appendix H)



CE conformity ¹⁾	Environment class	3K3 (IEC 60721)
	EMC Directive 2014/30/EU	EN 60730-1 EN IEC 61000-6-2 EN IEC 61000-6-3
	RED 2014/53/EU (CE)	EN 301908-1, EN 301908-13 EN 301511, EN IEC 62311 EN IEC 62398-1+A11 EN 55032+A11+A1 EN 301489-1, EN 301489-52 EN 55035+A11
	RoHS-D 2011/65/EU & 2015/863/EU (CE)	EN IEC 63000

Overview of types

Type	Description
YCS451F020	SAUTER Universal Gateway with LTE for remote management, VPN and web client

 The device can only be ordered together with a connector subscription, see accessories.

Accessories

Remote Management

Type	Description
YCS452F200	Remote Management basic connector subscription with 5 secured connections

Customer Portal

Type	Description
YCS472F200	Digital Services — Customer Portal annual subscription with automatic renewal
YCS472F600	Digital Services Bundle, consisting of Customer Portal subscription (YCS472F200) and Remote Management subscription (YCS452F200), annual subscription with automatic renewal
YCS474F200	Digital Services upgrade with the Customer Portal for existing Remote Management subscription; requires a valid Remote Management subscription (YCS452F200)

Universal Gateway protocols

Type	Description
YCS455F310	Universal Gateway Customer Portal Azure protocol
YCS455F312	Universal Gateway protocols for CP, RM, BACnet and Modbus
YCS455F314	Universal Gateway protocols for all available drivers
YCS455F300	KNX protocol (IP)
YCS455F301	Modbus protocol (TCP, RTU), master/slave
YCS455F302	BACnet protocol (IP, MSTP), server/client
YCS455F303	SAUTER Vision Center (SVC) API
YCS455F306	Mbus protocol (external level converter required)
YCS455F307	MQTT protocol (TCP, WS), broker/client
YCS455F308	OPC-UA protocol, server/client
YCS455F344	SNMP protocol

 YCS452F200: Annual subscription with automatic renewal. The licence must be ordered together with the Universal Gateway

 YCS472F2**: Annual subscription with automatic renewal. Customers who already use SAUTER Remote Management can upgrade to the Customer Portal subscription

 YCS474F200: The upgrade is based on the DSRM time period of the subscription

 YCS455F300: Only KNX IP as standard. KNX-TP requires accessories

 YCS455F3**: For further protocols, contact the product management.

Digital Services product data sheet (A1.100)

Document number	Type	Language	Title
D100471121	Data sheet	de	YCS 451...453: Digital Services – Remote Management
D100471122	Data sheet	en	
D100471123	Données techniques	fr	

¹⁾ Explanation of abbreviations in the "Further information" section of the product data sheet and in the appendix to SAUTER's product catalogues

Description of operation

The SAUTER YCS451F020 Universal Gateway is a compact, industry-grade communication gateway for connecting diverse building and process networks with control or cloud systems. The communication protocols listed in the "Universal Gateway Protocols" list above are available for the device. These can be licensed individually or as a package. Wireless communication via LTE Cat 1 can also be activated for location-independent installations.

Up to 10,000 logically linked data points can be exchanged, aggregated or archived in real time between Ethernet and RS-485 segments. A web-based interface with bus scan, drag-and-drop point assignment and live monitoring guides the user through commissioning and maintenance. Scriptable edge logic, scheduler and alarm handling allow local data preprocessing and event-driven actions.

The optional remote management function creates an encrypted VPN tunnel through which firmware updates, configuration changes and diagnostics can be carried out centrally. Role-based access rights, TLS encryption and audit logs meet the IT security requirements of IEC 62443.

Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the "Description of operation" section.

All related product regulations must also be adhered to. Changing or converting the product is not admissible.

Improper use

The Universal Gateway does not provide functional safety and is not fail-safe.

This product is not suitable:

- For safety functions
- In transport equipment and storage facilities as per Regulation 37/2005
- In outdoor areas and in rooms with a risk of condensation
- On means of transport, e.g. ships.

Engineering notes

The Universal Gateway includes the device itself with a Linux-based operating system, a VPN client and a web client for configuring the device. An LTE modem is also integrated. It comes with an LTE aerial featuring a magnetic base and a two-metre cable.

The card from the mobile provider must be in micro SIM format (15 × 12 mm). It is not included in the scope of delivery.

Fitting and power supply



Note

Only qualified electricians are permitted to fit and connect the device.
Prevent access by laypersons.

- The gateway is mounted on a DIN rail (EN 60715) inside a cabinet. Installation without a DIN rail is not permitted.
- For safety reasons, a permanent connection to protective earth must be ensured.
- Ethernet and COM are SELV/PELV electrical circuits and must not be connected to an ELV or TNV network.

LED indicator

On the front of the device, there are LED status lights for power supply, operation, I/O signals and LTE signals. After switching on, only PWR lights up. If only PWR is still lit after one minute, there may be a fault with the device.

The following operating statuses of the gateway are displayed:

LED indicator

LED		Indicator	Description
PWR		Continuous red	Power supply present. Device ready for operation
ACT		Flashing green (2 s on, 2 s off)	Communication with I/O board interrupted
		Flashing green (2 s on, 50 ms off)	Communication with I/O board active
X1...X3		Continuous green	Programmable LEDs
TX (S1, S2)		Continuous green	Transmission active
		Flashing green	Sending data
RX (S1, S2)		Continuous green	Reception active
		Flashing green	Receiving data
LTE	SIM	Off	Servicing not in operation
		On	Servicing active
		Slow flashing	No SIM card detected
		Rapid flashing	Invalid PIN
	NET	Off	Device not registered in network
		On	Device registered in network
	SIG	Off	No signal
		On	Signal present
		Flashing	Signal quality (the faster the LED flashes, the stronger the signal)
	INT	Off	No WAN access
		On	Backup active
		Slow flashing	Primary WAN connection
		Rapid flashing	Backup WAN connection
All LEDs		Flashing (600 ms on, 600 ms off)	Device in service mode
		Rapid flashing (80 ms on, 80 ms off)	Updating or backing up operating system (flash process)

Internal clock

The gateway has an integrated real time clock (RTC). The date, time and time zone are set when the user data is loaded.

They can also be set manually via the integrated web server (Node.js). The settings are retained by the built-in backup battery.

RS-485 interfaces (S1/S2)

The S1 and S2 interfaces can be configured for integrating devices and subsystems that support Modbus RTU or BACnet MS/TP.

The maximum bus length depends on the cable type used and correct termination with resistors. A 4-wire shielded cable with twisted pairs is generally recommended. Ensure the correct polarity for all signals. The cable shield must be continuous along the entire bus line. On the device side, the cable shield must be connected on one end and as directly as possible to protective earth. For optimal immunity to interference, the cable length between the protective earth terminal and the cable shield must not exceed 8 cm.

In the case of RS-485 interfaces, the bus wiring must follow line topology. Star, tree or branch topologies are not recommended. The maximum cable length depends on the configured baud rate. The interface has internal switchable terminating resistors as well as pull-up and pull-down resistors.

RS-485 technical data:

D-	S1/S2 terminal A.
D+	S1/S2 terminal B.
Galvanic isolation	Yes (SELV)
ESD protection	±15 kV
Transmission rates	2400...115,200 bps
Input impedance	12 kΩ
Terminating resistor	120 Ω with built-in switch
Pull-up/pull-down resistors	560 Ω fixed

Battery

A plugin lithium button cell ensures that the real time clock retains its date, time and time zone in the event of a power failure.

The lithium battery should be replaced after ten years at the latest. During battery replacement, the current time of the internal clock is lost and must be reset. If necessary, contact SAUTER Service to replace the battery.



WARNING!

Risk of explosion if the battery is short-circuited during replacement.

- Replacement may only be carried out by trained specialist personnel.
- Follow the instructions in the fitting instructions for the device.
- Only replace the battery when the automation station is de-energised.
- Only use insulated tools.

Technical data for the battery

Type (standard)	CR2032 lithium button-cell (UN 3091)
Nominal voltage	3 V
Capacity	210 mAh
Dimensions	20 mm × 3.2 mm

Additional information

Fitting instructions	P100539046
Declaration on materials and the environment	MD A1.400
YCS 472, 474: Digital Services – Customer Portal	A1.300

Abbreviations used

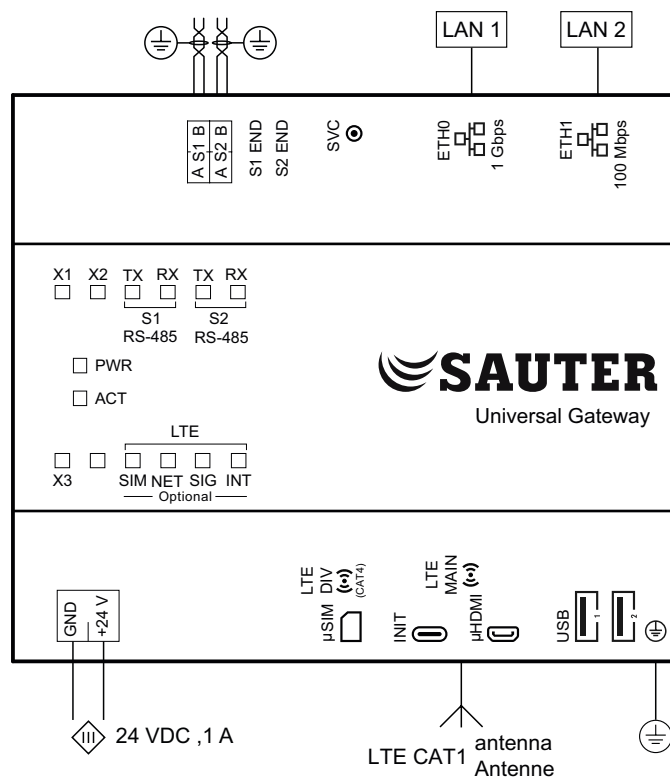
CE	Conformité Européenne (European conformity)
EMC-D	Electromagnetic Compatibility Directive 2014/30/EU
RED	Radio Equipment Directive 2014/53/EU
RoHS-D	RoHS Directives 2011/65/EU and 2015/863/EU

Disposal

When disposing of the product, observe the currently applicable local laws.

More information on materials can be found in the Declaration on materials and the environment for this product.

Connection diagram



Dimension drawing

All dimensions in mm.

