

1 Introduction

The esave sControl Gateway device extends the esave sControl product family by bringing your luminaries into the cloud. It can easily be integrated in a new or existing sControl meshing network where it controls and monitors up to 250 luminaries. The gateway automatically connects over a wired network or a mobile UMTS/HSPA/GSM network to the sControl Server infrastructure provided by esave. The luminaries can then easily be controlled, managed and monitored through the web application from any device with internet connection and a modern web browser.

2 Features

- Slim and rigid metal case
- Color TFT Display with touch capabilities for easy configuration and diagnostics
- Optional DIN Rail Mount
- Wide DC supply voltage range (12-28V)
- Low power consumption
- Two digital input and four digital outputs for extensions like relays and custom monitoring tasks
- Two analog inputs to measure DC voltages up to 30 Volts
- Sensor extension port
- Network (internet) connection trough Ethernet (cable) or UMTS/HSPA/GSM
- Built in UMTS/HSPA/GSM modem
- Two USB-Ports for future extensions
- Optional GPS receiver for date / time backup and position
- Internal extension board interface: E.g. for RS485 extension
- Automatically organizing wireless mesh network (sControl mesh network)
- Monitors, controls and supervises up to 250 luminaries
- AES encrypted wireless communication (sControl mesh network)
- Strong encryption of all network traffic (internet traffic)
- Automatic firmware update of the gateway (cable or over the air)
- Automatic, wireless firmware update of monitored luminaries
- Automatic distribution of date / time in the sControl wireless network
- Automatic date / time synchronization with the server



3 Ordering Information

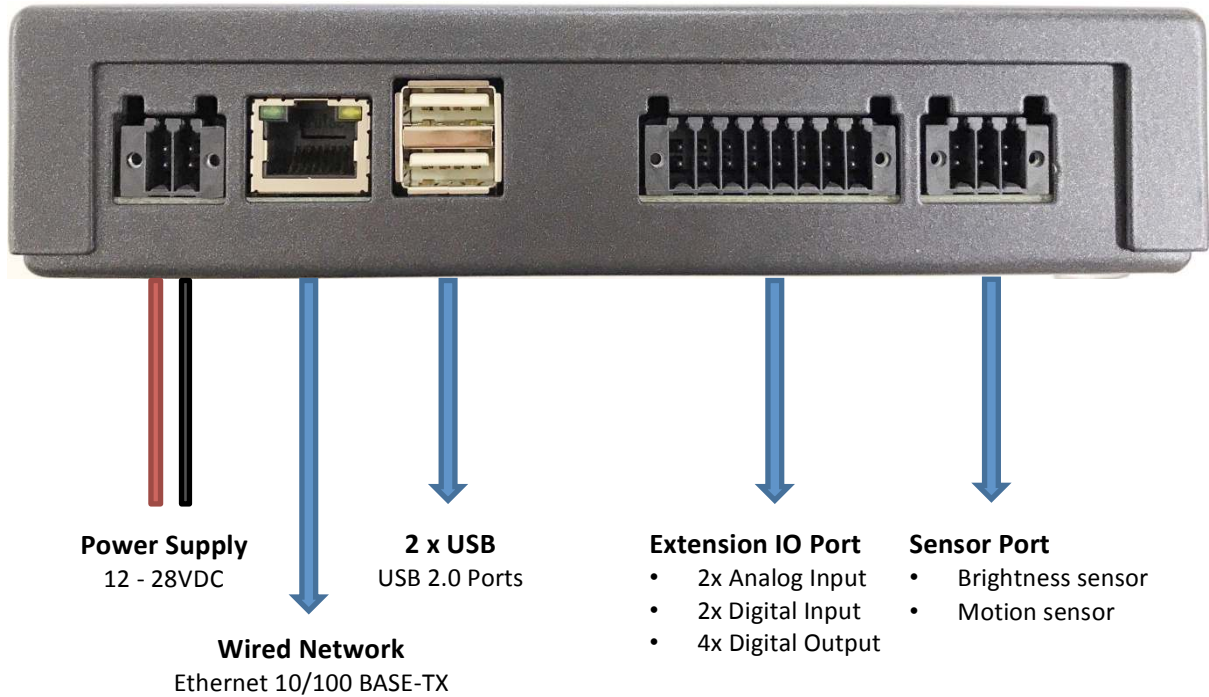
Product codes:

esave sControl Gateway – D

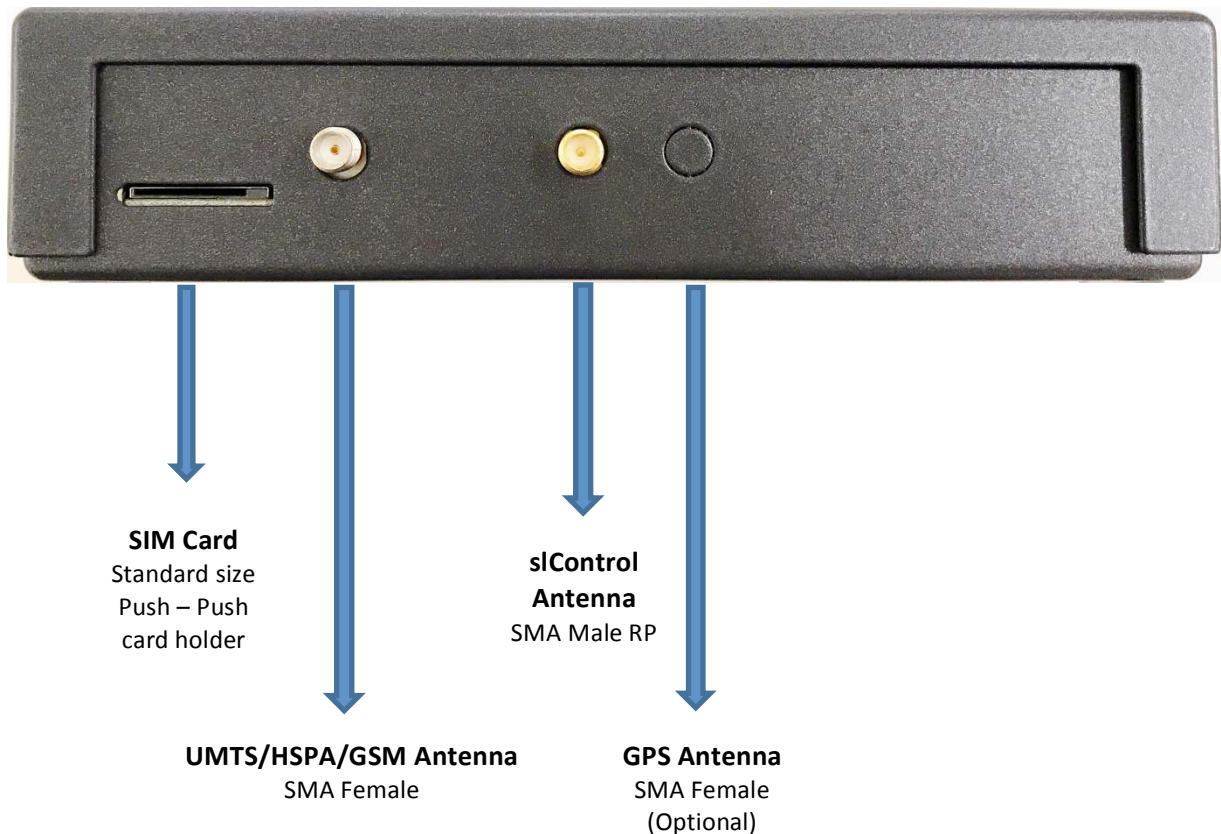
Code	Values	Meaning	Example
D	X	None	esave sControl Gateway – DXX
	D	DIN Rail Mount	

4 Connection Diagram

Bottom Side



Top Side

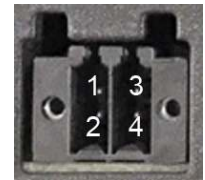


5 Supply Voltage (DC Input)

The Supply Voltage Plug is using a 4 pol B2CF 3.5 Connector from Weidmuller.
Please use the B2CF 3.5/././180F or B2CF 3.5/././180LR plugs for a reliable connection.

Table 1: Power Supply pin out

Port Pin #	Name	Description
1	V_IN (+)	Vin 12-28VDC (positive pole)
2	V_IN (+)	Vin 12-28VDC (positive pole)
3	GND (-)	Ground (negative pole)
4	GND (-)	Ground (negative pole)

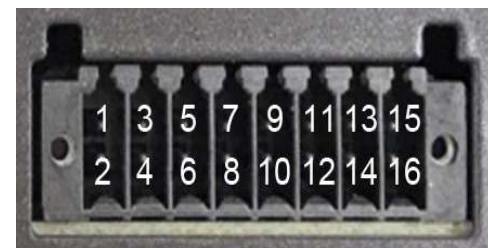


6 Extension IO Port

The Extension IO Port is using a 16 pol B2CF 3.5 connector from Weidmuller.
Please use the B2CF 3.5/././180F or B2CF 3.5/././180LR plugs for a reliable connection.

Table 2: Extension interface pin out

Port Pin #	Name	Description
1	ExtIn1	Analog extension input 1
2	GND	Ground
3	ExtIn2	Analog extension input 2
4	GND	Ground
5	ExtIn3	Digital extension input 3
6	GND	Ground
7	ExtIn4	Digital extension input 4
8	GND	Ground
9	V_IN	Input / Supply voltage
10	ExtOut1	Extension output 1
11	V_IN	Input / Supply voltage
12	ExtOut2	Extension output 2
13	V_IN	Input / Supply voltage
14	ExtOut3	Extension output 3
15	V_IN	Input / Supply voltage
16	ExtOut4	Extension output 4



Analog extension inputs (ExtIn1 and ExtIn2)

The two analog inputs can be used to measure DC voltages from 0 to 30V.
Possible applications are custom sensors, supply voltage supervision etc.

Digital extension inputs (ExtIn3 and ExtIn4)

The two digital inputs can be used to measure the state of a DC voltage line or contacts.
Possible applications are switches or custom meters and sensors with a digital output.

If you want to detect the state of a switch or a relay with potential free contacts, connect the contacts ends to the input (ExtIn3 or ExtIn4) and one of the V_IN.

Extension outputs (ExtOut1 – ExtOut4)

The extension outputs can be used to drive external actuators. Possible applications are switching applications like relays and contactors to control electrical loads.

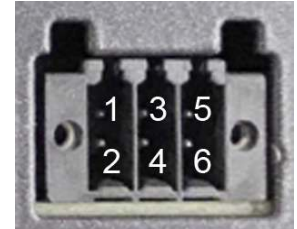
The outputs are designed as open collectors. In active state, the pin is connected to ground and can drive an actuator like an electrical load like a relay. A flyback diode is not required as the outputs have a built in flyback diode for protection.
Make sure that the drive current does not exceed the rated maximum current.

7 Sensor IO Port

The Sensor IO Port is using a 6 pol B2CF 3.5 connector from Weidmuller. Please use the B2CF 3.5/././180F or B2CF 3.5/././180LR plugs for a reliable connection.

Table 3: Extension interface pin out

Port Pin #	Name	Description
1	-	Reserved
2	-	Reserved
3	-	Reserved
4	BRIGHT	Brightness sensor input
5	+3V4	Sensor supply voltage: 3.4V DC
6	GND	Ground



Brightness Sensor (Twilight)

The esave sControl Gateway can optionally be equipped with an environment brightness sensor (twilight) to detect day / night changes. For reliable operation, please use only sensors supplied or approved by esave ag.

Use the following pins to connect the sensor:

- Pin 4 = Brightness sensor input (BRIGHT)
- Pin 5 = +3.4V

8 Network connection

For normal operation, the gateway needs a connection to the internet in order to synchronize with the backend server which provides the web application interface.

The network connection can be provided by cable (Ethernet) or Mobile UMTS/HSPA/GSM connection.

Cable network (Ethernet)

The wired network port is a standard Ethernet 10/100 BASE-TX full duplex port. The port also contains two status LEDs:

- Green LED: Indicates the network speed:
Off = 10 Mbit/s On = 100 Mbit/s
- Orange LED: Indicates an established link and network activity:
Off = No Link On = Link established Flashing = Network activity

By default, the gateway uses the network settings provided by a DHCP server in the network. The wired network properties can also be configured manually. (Static IP)

Mobile UMTS/HSPA/GSM network

The Gateway device has a built in UMTS/HSPA/GSM to provide an alternative network / internet access if no cable network is available at the installation place.

The SIM Card slot is located on the top side of the gateway (see connection diagram on page two) and can be equipped with a standard size SIM card provided by your mobile connection provider.

Before first use, please remove the protection cover by pulling it out. The SIM card can then be pushed into the slid until completely inserted. The card should automatically lock in place. To remove an installed SIM card, push on it until it is released. The card can then be pulled out.

Please do not insert or remove the SIM Card while the Gateway is powered on. Do not try to insert a SIM Card of a different size without a suitable adaptor.

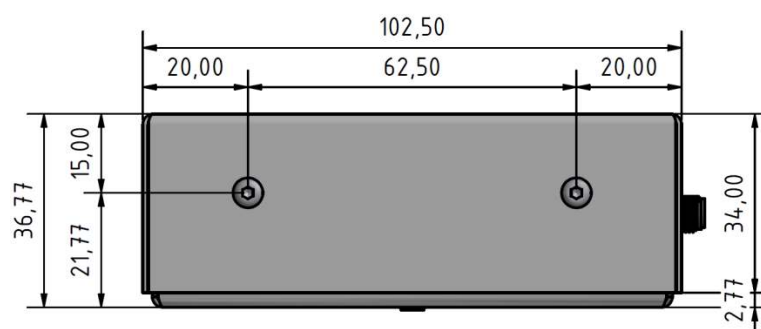
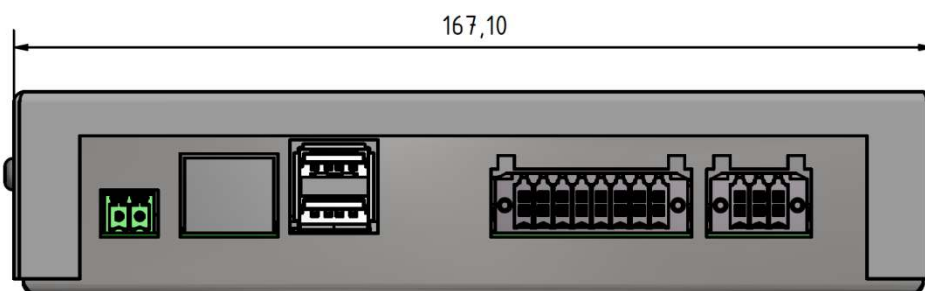
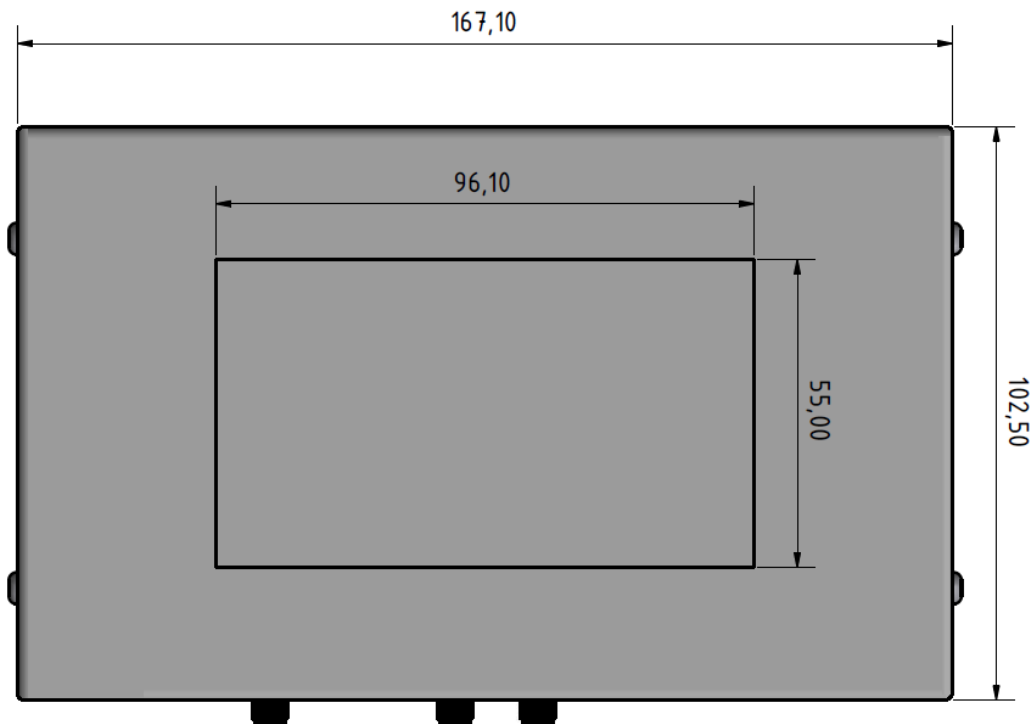
9 USB Ports

The gateway is equipped with two USB 2.0 host ports (Type A).

Currently, these ports are not used. Future functionalities may include:

- Firmware update
- Keyboard / Mouse support
- WLAN Stick support for WLAN connection

10 Physical Dimensions



Values in mm

11 Installation

DIN-Rail Mount (Optional)

The optional DIN-Rail mount supports 35mm wide DIN-Rails according to EN 50022.

Power supply

To supply the gateway, an available industrial 12V or 24VDC power supply can be used. Suitable AC to DC power supplies can be ordered from esave ag.

Earth ground connection

For optimal EMC shielding, the gateway case has to be connected to earth ground.

If mounted onto a DIN-Rail, the earth ground should be provided through the DIN-Rail. Otherwise the earth ground can be provided through any of the mounting holes on the back.

Antennas

All antenna connectors can be found on the devices top side. Please refer to the connection diagram.

Rod antennas for the sControl network and the GRPS modem come included in the gateway package. These rod antennas can directly be screwed onto the SMA connectors. Please make sure to not mix up the antenna types.

If the gateway is installed in a shielded place external antennas might be needed. Please contact esave ag for suitable external antenna options.

12 Electrical and Thermal Characteristics

Table 4: Absolute Maximum ratings

Parameter	Symbol	Min	Max	Unit
Supply voltage	V_{in}	-32	32	VDC
Operating temperature	T_A	-20	70	°C
Storage temperature	T_S	-30	80	°C
Surge / burst input voltage immunity (all connectors)	V_{ps}	-	2.0	kV
Extension input voltage (ExtIn 1 - 4)	V_{extIn}	-0.2	60	V
Extension output off voltage (ExtOut 1 - 4)	$V_{extOutOff}$	-0.2	V_{in}	V
Extension output on drain current	$I_{extOutOn}$	-	300	mA
Sensor IO port pin voltage	V_{sensor}	-0.2	3.5	V

Table 5: Operation characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltage	V_{in}	12		28	V DC
Power usage - No sensor or ext. connected - Ethernet connected - GSM modem off	P_{in}^{*1}		1.7		W
	P_{in}^{*2}		2.0		
	P_{in}^{*3}		1.9		
	P_{in}^{*4}		3.2		
	P_{in}^{*5}		2.1		
*1: V_{in} = 12V DC; Display off *2: V_{in} = 24V DC; Display off *3: V_{in} = 12V DC; Display on max. Bright. *4: V_{in} = 24V DC; Display on max. Bright. *5: V_{in} = 24V DC; Display off; Modem on					

Table 6: Extension IO port characteristics

Parameter	Connector Pin #	Symbol	Min	Typ	Max	Unit
Analog input voltage range	1	V_{extIn1}	0.0		30.0	V
	3	V_{extIn2}				
Digital input low voltage	5	$V_{\text{extIn1 L}}$	0.0		2.0	V
	7					
Digital input high voltage	5	$V_{\text{extIn1 H}}$	9.7		13.0	V
	7					

Table 7: Sensor IO port operation characteristics

Parameter	Connector Pin #	Symbol	Min	Typ	Max	Unit
Extension power output voltage 3.4V		V_{ext3V4}	3.3	3.4	3.5	V
Motion detector inactive high signal	3	$V_{\text{mot H}}$	2.5		3.5	V
Motion detector active low signal	3	$V_{\text{mot L}}$	-0.2		0.5	V

Table 8: sIControl Wireless network characteristics

Parameter	Min	Typ	Max	Unit
RF frequency range (center frequency)	2.420		2.480	GHz
RF nominal output power		4.5	8	dBm
Receiver sensitivity		-97	-92	dBm

Table 9: UMTS/HSPA/GSM Wireless characteristics

Parameter		Min	Typ	Max	Unit
Frequency range UMTS 900 Band 8	Up-Link	880	900	915	MHz
	Down-Link	925		960	MHz
Frequency range UMTS 2100 Band 1	Up-Link	1920	2100	1980	MHz
	Down-Link	2110		2170	MHz
Frequency range E-GSM 900	Up-Link	880	900	915	MHz
	Down-Link	925		960	MHz
Frequency range DCS 1800	Up-Link	1710	1800	1785	MHz
	Down-Link	1805		1880	MHz
Data transfer rate HSPA (PS)	Up-Link		5.76		Mb/s
	Down-Link		7.20		Mb/s
Data transfer rate WCDMA (PS)	Up-Link		384		kb/s
	Down-Link		384		kb/s
Data transfer rate GSM (CS)	Up/Down-Link		9.6		kb/s
Data transfer rate UMTS (CS)	Up/Down-Link		64		kb/s
Receiver input sensitivity	GSM		-109		dBm
Receiver input sensitivity	UMTS Band1 und 8		-110		dBm
Max. output power	E-GSM 900		33		dBm
	DCS 1800		30		dBm
	UMTS		24		dBm

13 Standards and Legislation

Table 10: Approvals

Category	Declaration / Certificates
CE conformity	CE compliant
Hazardous substances	RoHS compliant: Restriction of Hazardous Substance Directive
Electromagnetic compatibility (EMC / ERM)	<ul style="list-style-type: none">EN 300 328 V2.1.1 (2016-11)EN 301 489-1 V1.9.2 : 2011EN 301 489-17 V2.2.1 : 2012EN 61000-6-2 : 2005
Safety	<ul style="list-style-type: none">EN 60950-1 : 2006

14 Revision history

Table 11: Revision history

Revision	Date	Comments	Initials
01	22.08.2017	revised	PM

15 Contact

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