

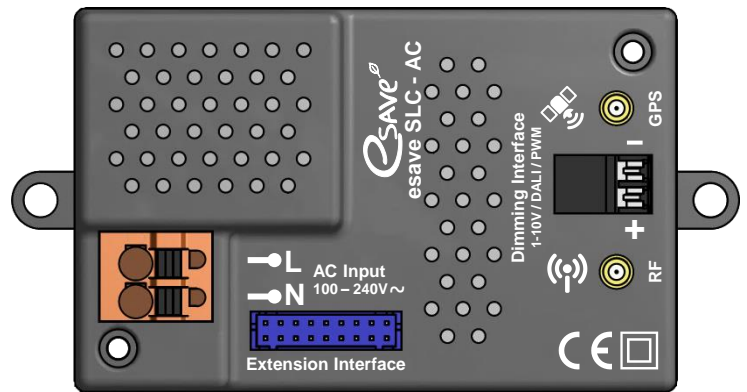
# esave sIController

## Intelligent Street Light Controller



### Features

- Fully configurable dim profiles by time, weekdays and/or sensor inputs
- Automatically organizing wireless mesh network
- AES encrypted wireless communication
- Wirelessly configurable and updateable
- Automatic adjustment of daylight and standard saving time
- Optional GPS connectivity for date/time synchronization (date/time master)
- Automatic wireless distribution of date/time
- Support for most used industry standard dimming interface types (Analog 0-10V; PWM; Dali)
- Optional sensor support such as motion detector, radar, twilight sensor and LED temperature
- Integrated temperature sensor
- Energy usage determination
- Configurable distribution of twilight sensor and motion detection values
- AC and DC supply voltage support
- Low power consumption
- Support for active monitoring and protection of LED temperature
- Configurable LED luminous flux compensation over lifetime (LFC)
- Custom sensors and extensions possible
- Easy to use software for on-site configuration and controlling
- Optional integration into a web based management and control application with on-site gateway devices



### Ordering Information

#### Product codes:

**esave SLC – pp ggg**

#### pp: Power supply type

- AC = 100 to 240 V AC (50/60Hz)
- DC = 12 to 60V DC

#### ggg: GPS receiver functionality

- - = No GPS receiver
- GPS = Contains a GPS receiver for date and time master functionality

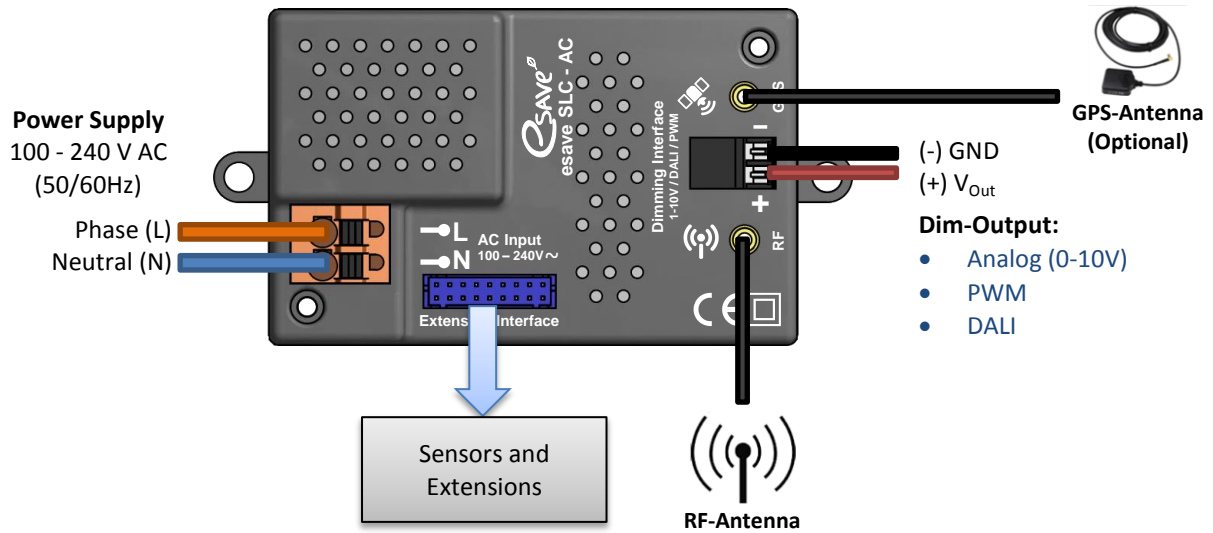
# esave sIController

## Intelligent Street Light Controller

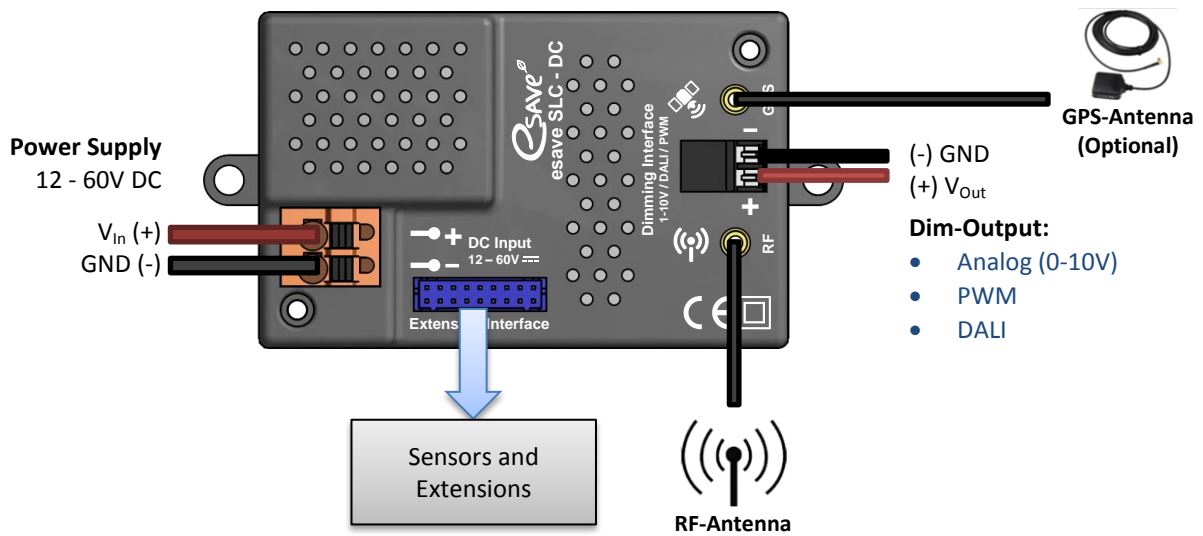


### Connection Diagram

#### esave SLC – AC



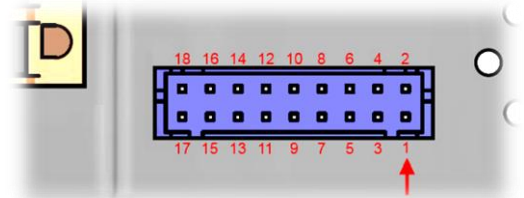
#### esave SLC – DC



### Sensor and Extension Interface

**Table 1: Extension interface pin out**

Interface Pin #	Name	Description
1	V_EXT12	Extension power supply (+12V)
2		Reserved
3	MOT	Motion detector signal
4	LED_TEMP	LED Temperature sensor signal
5	GND	Ground
6	V_EXT3	Extension power supply (+3.2V)
7	BRIGHT	Brightness sensor (Twilight) signal
8-15		Reserved
16	SWITCH_OUT	Extension Switch output: Open collector output
17		Reserved
18	V_EXT3	Extension power supply (+3.2V)



#### Motion Detector

The esave SLC modules can optionally be equipped with a motion detector sensor, such as PIR (Passive Infrared) or radar sensors. For reliable operation, please use only sensors supplied or approved by esave ag.

Use the following pins to connect the PIR sensor:

- Pin 3 = Motion detector Signal (MOT)
- Pin 5 = GND
- Pin 6 or Pin 18 = +3.2V (V\_EXT3)

#### Brightness Sensor (Twilight)

The esave SLC modules 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 6 or Pin 18 = +3.2V (V\_EXT3)
- Pin 7 = Brightness sensor input (BRIGHT)

#### LED Temperature Sensor (PT100)

The esave SLC modules can optionally be equipped with a LED temperature sensor. The modules are calibrated to use with PT100 resistance temperature sensors. Please use PT100 sensors of Class A or Class B.

Use the following pins to connect the PT100 sensor:

- Pin 4 = Led temperature sensor input (LED\_TEMP)
- Pin 5 = GND

#### Extension Switch Output

The esave SLC modules offer an optional switch output to drive (electronic) relays or similar. The functionality can be configured in software. A typical application is to completely turn off the LED power supply mains with a relays while the street light is in standby mode (e.g. during the day).

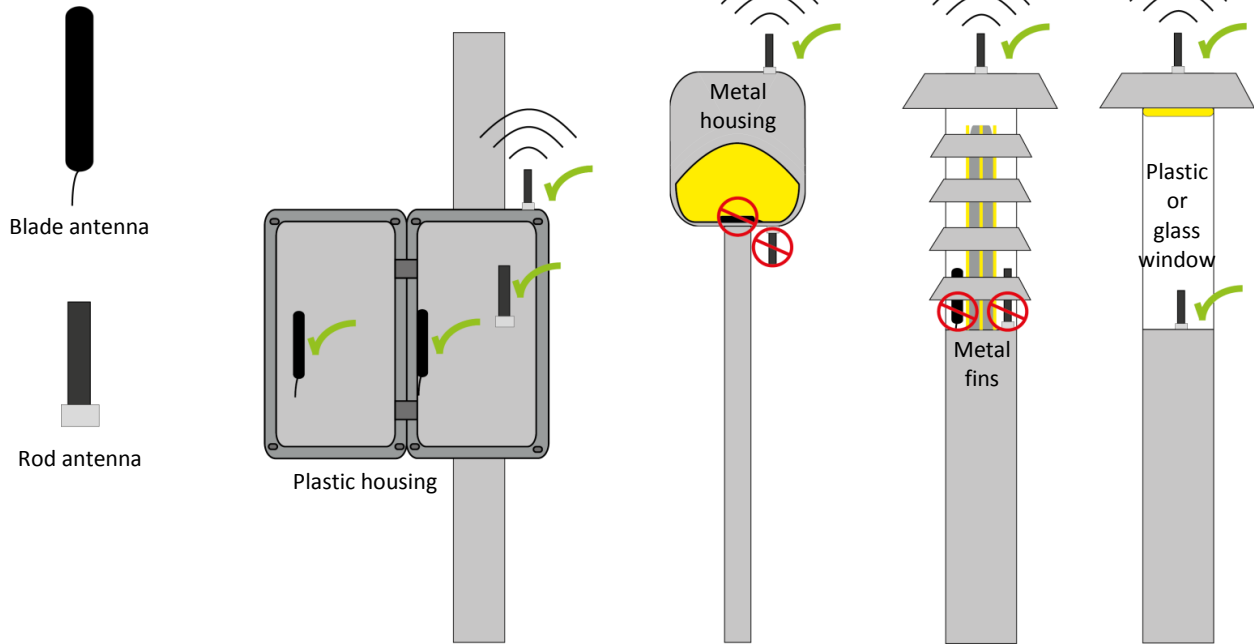
For further information about the usage and configuration, please contact esave ag.

To directly drive a switchable appliance (e.g. electronic relays) without an additional power supply, please use the following pins:

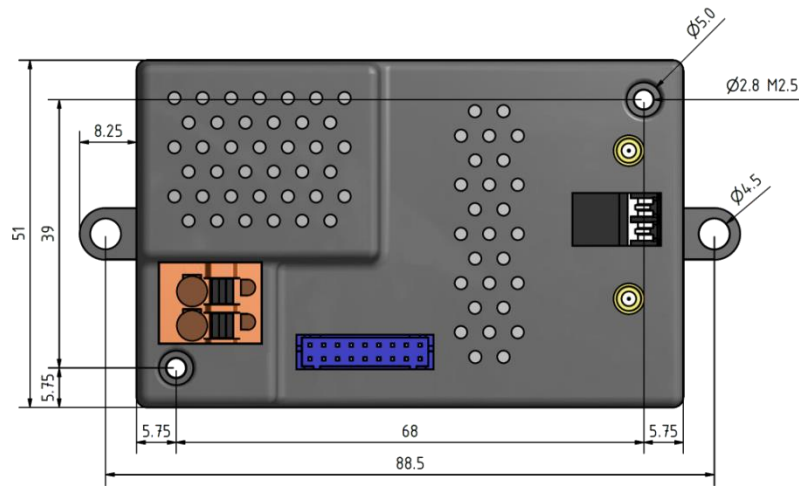
- Pin 1 = +12V (V\_EXT12)
- Pin 16 = External switch open collector output (SWITCH\_OUT)

Please ensure that the rated output current of pin 1 is not exceeded (max. 20mA).

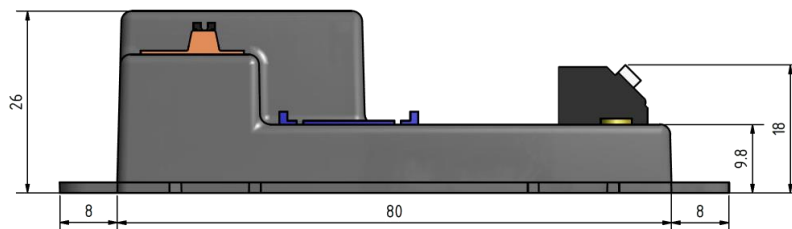
### RF-Antenna Installation



### Physical Dimensions



Values in mm



Values in mm

### Electrical and Thermal Characteristics

Table 2: Maximum ratings

Parameter	Module type(s)	Symbol	Min	Max	Unit
<b>Supply voltage</b>	SLC – AC SLC – AC GPS	$V_{in}$		240	VAC
	SLC – DC SLC – DC GPS		0	60	VDC
<b>Operating temperature</b>	SLC – AC SLC – AC GPS	$T_A$	-25	+80	°C
	SLC – DC SLC – DC GPS		-25	+85	
<b>Storage temperature</b>	any	$T_S$	-40	90	°C
<b>Surge / burst input voltage immunity (all connectors)</b>	any	$V_{ps}$		2.0	kV
<b>Extension connector: Motion sensor input voltage (Pin 3)</b>	any	$V_{mot}$	-0.2	3.3	V
<b>Extension connector: Brightness (Twilight) sensor input voltage (Pin 7)</b>	any	$V_{bright}$	-0.2	5.0	V
<b>Extension connector: 3.2V Power supply output current (Pin 6 &amp; Pin 18)</b>	any	$I_{ext3}$		35	mA
<b>Extension connection: 12V Power supply output current (Pin 1)</b>	any	$I_{ext12}$		20	mA
<b>Extension connector: Switch output max. voltage (Pin 16)</b>	any	$V_{sw}$	-0.2	12	V
<b>Extension connector: Switch output sink current (Pin 16)</b>	any	$I_{sw}$		100	mA
<b>Dim interface output current</b> (Actively limited in DALI and PWM output mode) Output mode: $I_{out A}$ = Analog $I_{out D}$ = Dali $I_{out P}$ = PWM	any	$I_{out A}$	0	25	mA
		$I_{out D}$	0	18	
		$I_{out P}$	0	2	

Table 3: Operation characteristics

Parameter	Module type(s)	Symbol	Min	Typ	Max	Unit
<b>Supply voltage range</b>	SLC – AC SLC – AC GPS	$V_{in}$	100		240	V AC
	SLC – DC SLC – DC GPS		12		60	V DC
<b>Power usage</b> $I_{out} = 0mA$ No sensor or ext. connected  *1 $V_{Sup} = 230V AC$ *2 $V_{Sup} = 12V DC$	SLC – AC	$P_{op}^{*1}$		0.43		W
	SLC – AC GPS			0.68		
	SLC – DC	$P_{op}^{*2}$		0.22		
	SLC – DC GPS			0.48		
	SLC – DC	$P_{op}^{*3}$		0.25		
	SLC – DC GPS			0.52		

# esave sIController

## Intelligent Street Light Controller



Parameter	Module type(s)	Symbol	Min	Typ	Max	Unit
*3 $V_{Sup} = 24V$ DC	SLC – DC	$P_{op}$ *4		0.25		
*4 $V_{Sup} = 40V$ DC	SLC – DC GPS			0.54		
<b>Dim interface output voltage</b> $I_{out} = 0mA$ Output mode: $V_{out A} =$ Analog $V_{out D} =$ Dali $V_{out P} =$ PWM	any	$V_{out A}$	0.0		10.2	V
		$V_{out D Low}$	0.0	0.1	0.2	
		$V_{out D High}$	11.0	11.5	12.5	
		$V_{out P Low}$	0.0	0.1	0.2	
		$V_{out P High}$	11.0	11.5	12.5	

**Table 4: Extension / Sensor connector operation characteristics**

Parameter	Connector Pin #	Symbol	Min	Typ	Max	Unit
<b>Extension power output voltage 3.2V</b>	6 18	$V_{ext3}$	3.0	3.2	3.3	V
<b>Extension power output voltage 12V</b>	1	$V_{ext12}$		12		V
<b>Motion detector inactive high signal</b>	3	$V_{mot H}$	2.5		3.2	V
<b>Motion detector active low signal</b>	3	$V_{mot L}$	-0.2		0.5	V

**Table 5: Wireless and GPS characteristics**

Parameter	Module type(s)	Symbol	Min	Typ	Max	Unit
<b>RF frequency range (center frequency)</b>	any	$f_w$	2.420		2.480	GHz
<b>RF nominal output power</b>	any			4.5	8	dBm
<b>Receiver sensitivity</b>	any			-97	-92	dBm
<b>GPS First time to fix (cold start)</b>	SLC – AC GPS SLC – DC GPS			50		s
<b>GPS accuracy</b>	SLC – AC GPS SLC – DC GPS			2.5		m

## Standards and Legislation

**Table 6: Approvals**

Category	Declaration / Certificates
<b>CE conformity</b>	CE compliant
<b>Hazardous substances</b>	RoHS compliant: Restriction of Hazardous Substance Directive
<b>Housing flame resistance</b>	UL Recognized Flame Class Rating: UL 94 V-0
<b>Electromagnetic compatibility (EMC / ERM)</b>	<ul style="list-style-type: none"> <li>EN 300 328 V1.8.1 : 2012</li> <li>EN 301 489-1 V1.9.2 : 2011</li> <li>EN 301 489-17 V2.2.1 : 2012</li> <li>EN 61000-6-2 : 2005</li> </ul>
<b>Safety</b>	<ul style="list-style-type: none"> <li>EN 60950-1 : 2006</li> </ul>

## Contact

esave ag  
Kupfergasse 15  
CH-7000 Chur  
Switzerland

T +41 81 511 55 50  
F +41 81 511 55 51  
[info@esaveag.com](mailto:info@esaveag.com)  
[www.esaveag.com](http://www.esaveag.com)