



Installation and operating instructions

Programmable Nightlight Function Controller
PR 0606 Night / PR 1010 Night

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1 Safety Notes and Exemption from Liability



Safety notes for personal protection are marked with this symbol.

Notes concerning the functional safety of the system are printed in bold type.

The safety notes supplied by manufacturers for additional components that you may connect to this controller must be observed and are not suspended by these instructions. Please consult a specialist dealer in the event of contradictions between different instructions.

1.1 General Safety Notes



It is imperative that you observe the following for your safety during installation: avoid creating sparks during all work! Solar modules generate electricity on the incidence of light. The full voltage is present even when the incidence of light is low. Therefore please work carefully and take the appropriate safety precautions. Provide the solar modules with an opaque cover securely fixed with adhesive tape. It is possible to de-energise the modules completely by using this cover.

Double the values of the system voltages may occur during assembly and electrical installation in the direct current circuit of the photovoltaic system (up to 24V in the 12V system, up to 48V in the 24V system).

Therefore never touch bare cable ends!

Immediately insulate every bare cable end that is not going to be connected straight away.

Only carry out work on a dry surface! Components (solar modules, cables, etc.) may not be wet or damp during assembly!

Use only well-insulated tools!

Any obstruction to the device's ventilation may lead to overheating and failure of the device. Do not cover ventilation apertures and cooling elements.

The controller may not be installed and operated in wet rooms (e.g. bathrooms) or in rooms where highly flammable gas mixtures may arise due to gas cylinders, paints, varnishes, solvents, etc!

Do not store any of the substances mentioned in rooms where the solar controller has been installed!

The factory-fitted plates and identification symbols may not be modified, removed or disfigured.

Keep children away from the controller's electronics and the battery compartment!

All work must be carried out in accordance with national electrical regulations and the relevant local specifications.

1.2 Exemption from Liability

We cannot accept liability for damage caused by disregarding these instructions within a radius of the controller even if this damage occurs due to malfunctioning of the controller caused by incorrect installation or programming.

It is neither possible for the manufacturer to monitor compliance with these instructions nor the conditions prevailing and methods used during installation, operation, use and maintenance of the system controller. Incorrect execution of the installation may lead to material damage and to subsequent danger to people. The installer himself must be liable for such damage.

We therefore accept no responsibility or liability for losses, damage or costs arising as a result of faulty installation; incorrect operation, improper use and maintenance or that is in any way connected thereto.

Likewise we accept no responsibility for patent infringements or infringements of Third Party rights resulting from the use of this system controller. The manufacturer reserves the right to make modifications with regard to the product, technical data or assembly and operating instructions without prior notice.

The user shall be responsible for use of the controller in areas of application not defined by the manufacturer

Caution: opening the device up and operation contrary to the intended purpose lead to loss of warranty.

1.3 Area of Use

The system controller is used in photovoltaic power supplies with battery store for the hobby and leisure sector, residential, business and trade sectors as well as small businesses.

1.4 Installation Instruction

The controller is only suitable for use indoors protected against the effects of weather such as rain and solar radiation.

The controller must be installed in the same room as the battery for the following reasons:

A built-in temperature sensor detects the ambient temperature

Short battery cables must be used to keep the voltage drop between the controller and the battery low.

The controller is only suitable for controlling solar modules. However, the battery may also be charged using other sources if they have an appropriate battery charging function.

The appropriate manufacturer's installation instructions must be observed for installation of the other components, e.g. solar cells and consumers and for setting up the batteries.

Do not begin installation until you are quite sure that you have fully understood the technicalities of the instructions and only carry out the work in the sequence specified by these instructions!

2 Controller Functions

The charging controller monitors the battery's charging status, controls the charging procedure and switching on and off of the consumers. The battery is utilised to an optimum by the atonic processor and its service life is lengthened considerably.

The charging procedure takes place in accordance with the IU characteristic as a function of temperature. Furthermore, the battery's previous history determines a time-limited rise of the end-of-charge voltage to acid circulation. Boost charging if the charging status drops below 70%, equalising charging if the charging status drops below 40% or every 30 days. The charging voltages are increased for 2 hours in each case.

Voltage drops and the internal resistance of the battery are compensated without the use of sensor cables.

Protective Measures:

- Battery:** Reduction of the charging voltage to protect against overvoltage
 , Switching off of consumers to protect against exhaustive discharge
 Automatic detection of system voltage (12V/24V)
- Controller:** Overcurrent, excess temperature to protect against surges
 Controller resets itself automatically
- Consumers:** Consumers are switched off in the event of overvoltage

The LED status lamps supply all the essential information with regard to the current operating status.

Individually programmable functions:

End-of-charge voltage on equalising charging: possible to choose between 14.7V and 15.0V.

Battery type: possible to differentiate between liquid batteries and batteries with specified electrolytes (e.g. gel batteries).

Charging status controlled / voltage-controlled: If charging units or consumers are connected directly to the battery, the charging status calculation is falsified and there should therefore be a changeover to voltage-controlled.

Permanent nightlight function: the consumer is switched on as dusk falls and off again as the sun rises.

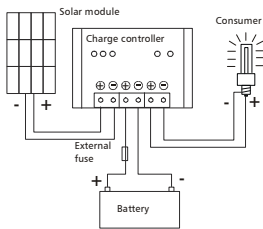
Motion detectors, brief illumination for 5min (special accessories)

Switch off time in the evening, 9 different selectable switch off times

Switch on time in the morning, 9 different selectable switch on times

The controller is protected against polarity reversal, open circuit and short circuit on all inputs and outputs.

3 Connection of the Controller:



Recommended Connection Sequence:

1. Battery (charge controller as close as possible to battery, safety distance at least 30 cm)
2. Solar module
3. Consumer



Ensure that components are connected with the correct poles!

The controller is initialised on connection to the battery during which it flashes red three times and then goes into the normal control mode.

In isolated systems there is no need to earth the components. However, the positive end should be earthed if the components are to be earthed nevertheless. Please consult the specialist dealer for other types of earthing.

The base on which the controller is to be installed may not be made of flammable material. The rear wall of the controller reaches a temperature of up to 85 °C due to heat loss and the base must be able to withstand this temperature.

3.1 Installation Faults

The controller is protected against installation faults such as polarity reversal of the battery and the module, short-circuits at the connection terminals, reversal of the connection cables (connection of the battery to the load terminals, connection of the module to the battery or load terminals).

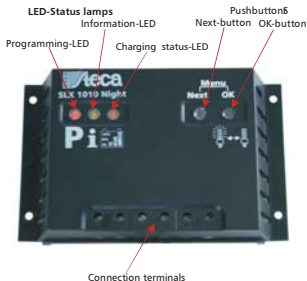
Fault Indications:



Alternate flashing of red and green lamps
Battery connected with reversed polarity



Alternate flashing of red lamps
Various connection faults e.g. no battery connected, battery connected to load output, wrong system voltage.



4 Controller Elements

4.1 LED Status Lamps

The charge controller is fitted with 3 LED status lamps. All controller information may be retrieved using these lamps. In each case the colour of the LED is crucial for orientation in the individual menu levels.

4.1.1 Programming LED

The programming LED only lights up when the controller is in programming mode and not during the normal operating mode.

4.1.2 Info – LED



Green flashing, normal operating mode, everything OK.
During the day the LED flashes every 2 seconds and at night every 5 seconds.



Red flashing, warning: over-current, -temperature, -voltage. Controller has not yet switched off.



Continuously lit red lamp, controller has switched off, will switch on again automatically when fault has been remedied and 1 minute has elapsed.

4.1.3 Charging Status – LED



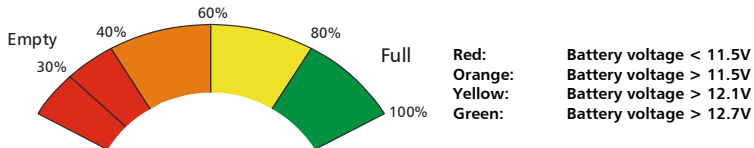
The charging status LED changes colour from green to red depending on the charging status.

Normal mode: continuously lit

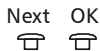
Warning deep discharge protection: rapid flashing (4 times a second)

Active deep discharge protection: slowly flashing (every 2 seconds)

If the controller is set to voltage-controlled, the charging status LED displays the battery voltage:



4.2 Pushbuttons



The controller has two pushbuttons that are used to perform all settings and carry out programming. The buttons may be operated simultaneously or individually.

Functions of the Next button:

- Alternating between the main menus in programming mode.
- Changing a setting in the submenus.

Functions of the OK button:

- The load may be switched on and off manually by briefly pressing the OK button. The LED's briefly light up red when the load is switched off and green when the load is switched on.
- Acknowledge a setting in the submenu.
- Switching from main menu to submenu.
- Returning from submenu to main menu.

Please consult the following section for procedures for programming the controller as well as structuring the programming level.

5 Programming the Controller

5.1 Programming Operations



The 1st program is entered by pressing both buttons simultaneously. The controller exits programming mode by pressing again or after 1 minute elapses without entering data. In any case all changes are stored permanently. Programming mode is displayed by illumination of the red programming LED.

	LED-Display	Programs
		1. Equalising charge voltage
Next		2. Battery type
Next		3. Control type
.		4. Permanent night light
.		5. Factory settings
.		6. Motion detectors
.		7. Evening light
.		8. Morning light

Tabelle 1

Next



Access the desired program by pressing the Next button (see Table 1).

OK



When the desired program has been found, acknowledge with the OK button. This gives access to the respective settings possible.

5.2 Operations for Selecting Possible

Settings

In each of the submenus there is the possibility to alter settings.

Next

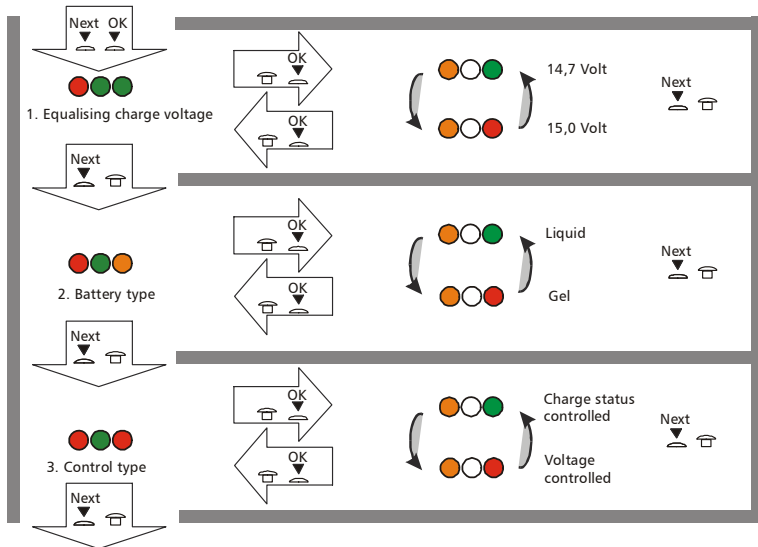


Choose between the possible settings by pressing the Next button. For example between "liquid" and "gel" in the battery type program.

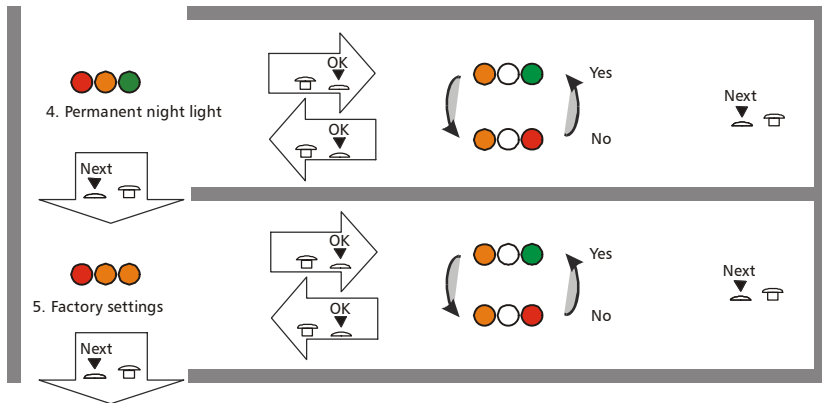
OK



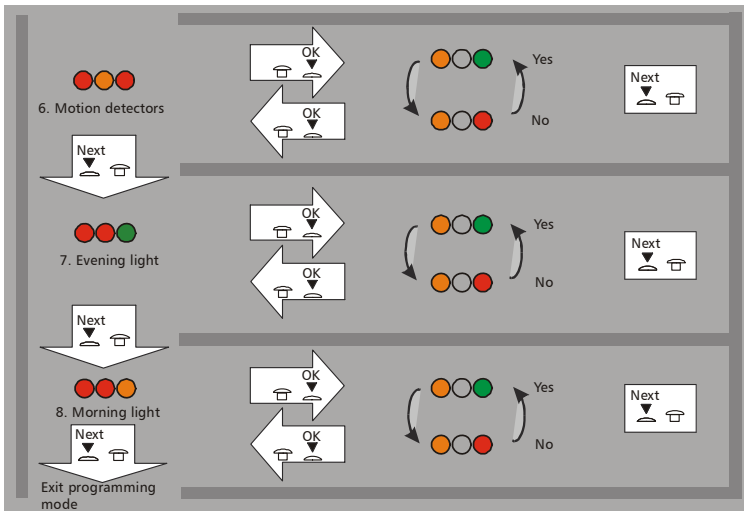
Press the OK button to acknowledge a setting or to leave the possible settings.



All changes are permanently stored on leaving programming mode.



Enter the next submenus in Night version.



Enter "evening light setting" by acknowledging "yes" see Section 5.5

Enter "morning light setting" by acknowledging "yes" see Section 5.6

5.3 Notes on Different Programming Possibilities

Please observe the data specified by the battery manufacturer when programming the controller. Change over to gel battery when using a battery with specific electrolytes (gel or fleece battery [also known as AGM or VRLA batteries]). To protect the gel battery the end-of-charge voltage cannot be increased to 15V in the gel battery setting.

Various functions of the controller are interlocked against each other, e.g. the load cannot be switched on and off manually if the timer functions (permanent night light, evening or morning light) are switched on.

The timer function is based on learning the brightness curve, therefore it must be noted that the charge controller needs approximately 2 days to learn the time from sunrise to sunset and during this time the load is switched on all night.

Since the charge controller learns the time from the brightness curve there may be deviations from the actual time; the deviation depends on the position of the set-up location to the middle of the time zone. The change-over from winter to summer must be performed manually, i.e. if you live in a country with summer time changes, you will have to set the times back one hour in Spring, i.e. if the light is supposed to be switched off at 00:00 in summer then 23:00 must be programmed in.

5.4 Factory Settings

Equalising charge voltage	14,7V
Battery type	liquid
Control type	Charge status controlled
Permanent night light	No
Motion detectors	No
Evening light	No
Morning light	No

The charge controller is supplied with the following settings as standard:
s.Tabelle 2

In the "factory settings" program acknowledge "yes" with the OK button to restore these settings.

Tabelle 2

The controller resets itself to the customer-specific factory settings if it is supplied with non-standard factory settings. (You can tell whether you own a controller with the standard factory settings from the PRESET CONFIGURATION on the back of the controller, if the PRESET CONFIGURATION deviates from 78 11 XX, you own a controller with customer-specific factory settings.

5.5 Time Setting for Evening Light



The evening light function makes it possible to specify the time at which the consumer (e.g. light) is switched off. The consumer is switched on as dusk falls and is switched off again at the time programmed.

	Switch off time
	19:00
	20:00
	21:00
	22:00
	23:00
	00:00
	01:00
	02:00
	03:00

In the evening light program acknowledge using "yes" to specify the time the controller switches off. The left-hand LED then lights up green and you may select the following switch off times: s.Tabelle 3

Press the Next button to switch between the settings and the OK button to store the time.

The timer function is based on learning the brightness curve, therefore it must be noted that the charge controller needs approximately 2 days to learn the time from sunrise to sunset and during this time the load is switched on all night.

Tabelle 3

5.6 Time Setting for Morning Light

The morning light function makes it possible to specify the time at which the consumer (e.g. light) is switched on. The

consumer is switched on at the time programmed and is switched off again as dusk falls.



In the morning light program acknowledge using "yes" to specify the time the controller switches off. The

left-hand LED then lights up green and you may select the following switch on times: s.Tabelle 4

	Switch on time
	23:00
	00:00
	01:00
	02:00
	03:00
	04:00
	05:00
	06:00
	07:00

Press the Next button to switch between the settings and the OK button to store the time.

The timer function is based on learning the brightness curve, therefore it must be noted that the charge controller needs approximately 2 days to learn the time from sunrise to sunset and during this time the load is switched on all night.

Tabelle 4

6 Technical Data

	SLX 0606	SLX 1010
Max. module short-circuit current at 50° C	6 A	10 A
Max. load current at 50° C	6 A	10 A
Max. power consumption		6 mA
End-of-charge voltage at 25°C		13.7 V
Boost charge voltage (time-limited to 2h)		14.4 V
Equalising charge voltage (programmable, time-limited to 2h)		14.7V oder 15.0V
Exhaustive discharge protection / early warning (Values for voltage-controlled)		< 30% / <40% < 11.1V / < 11.5V
Re-set threshold (Values for voltage-controlled)		> 50% > 12.6V
Permissible ambient temperature		-25° ..+ 50°C
Connection terminals (fine/single wire)		6/10 mm ²
Weight		120g
Dimensions		146x94x28 mm
Protection class		IP 22
System voltage		12 V / 24 V
Activation of safety functions		above 110% rated load
The voltages double when using a 24V system		

7 Legal Guarantee

In accordance with German statutory regulations, there is a 2-year legal guarantee on this product for the customer.

The seller will remove all manufacturing and material faults that occur in the product during the legal guarantee period and affect the correct functioning of the product. Natural wear and tear does not constitute a malfunction. Legal guarantee does not apply if the fault can be attributed to third parties, unprofessional installation or commissioning, incorrect or negligent handling, improper transport, excessive loading, use of improper equipment, faulty construction work, unsuitable construction location or improper operation or use. Legal guarantee claims shall only be accepted if notification of the fault is provided immediately after it is discovered. Legal guarantee claims are to be directed to the seller.

The seller must be informed before legal guarantee claims are processed. For processing a legal guarantee claim an exact fault description and the invoice / delivery note must be provided.

The seller can choose to fulfil the legal guarantee either by repair or replacement. If the product can neither be repaired nor replaced, or if this does not occur within a suitable period in spite of the specification of an extension period in writing by the customer, the reduction in value caused by the fault shall be replaced, or, if this is not sufficient taking the interests of the end customer into consideration, the contract is cancelled.

Any further claims against the seller based on this legal guarantee obligation, in particular claims for damages due to lost profit, loss-of-use or indirect damages are excluded, unless liability is obligatory by German law.