

ASSEMBLY INSTRUCTION



MLD Control

Energy Converter S1

S100-DR S100-SR

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Abbreviations

EL	=	Elevation (east-west orientation)
CTC	=	Central Tracker Control (software)
EK-S1	=	Energy Converter S1
MLD	=	Maximum Light Detection
MLD Control	=	Energy Converter, MLD sensor, wind sensor, snow sensor
PPE	=	Personal Protective Equipment
UPS	=	Uninterruptible power supply

1 Introduction

These assembly instructions were created for the DEGER system. They are a component of the product and must be saved for the entire lifespan of the DEGER system. The assembly instructions must be included with the DEGER system should it be transferred to another party.

1.1 Basic safety information

- Read these assembly instructions in their entirety before starting assembly work and keep them available at all times during the assembly process.
- Only qualified personnel may perform assembly work.
- Keep all objects out of the the DEGER system's full range of pivoting motion throughout its full range of motion.
- Take necessary actions to protect the installed DEGER system in its full range of motion from unauthorized access, such as enclosing it within a fence. Near the entry area to the DEGER system there must be a warning sign stating that it is prohibited to remain within the range of pivoting motion.
- Lightning protection and grounding must be installed in all photovoltaic systems according to country-specific guidelines as stipulated in DIN VDE 0185 and 0100.
- Do not operate the DEGER system if the wind guard is not functioning. Always keep the module surface in the SAFE position (table position) until the wind guard has been tested for function.
- If snow has accumulated on the module surface, the module surface must first be cleared. This is accomplished by manually control via the CTC software or through the snow sensor. If no functioning CTC remote access and/or snow sensor is available, the module surface must be cleared manually. The snow sensor availability shall not release the module surface from the obligation to be cleared of snow.
- DEGER recommends an Uninterruptible Power Supply (UPS) to ensure the function of the wind monitor.

1.2 Exclusion of liability

As a rule, DEGER's General Terms and Conditions shall apply. The contents of these documents are checked continuously and modified as needed. The assembly instructions are available for download in the dealer section on the website, www.DEGER.biz, and they can also be obtained through the traditional distribution channels.

Warranty and liability claims will be void if any type of damage occurs that results from one or more of the following causes:

- Improper or unauthorized use of DEGER system
- Operation of DEGER system in an improper environment
- Operation of DEGER system without taking into account the statutory safety regulations applicable at the place of installation
- Non-observance of warnings and safety information in all documents relevant to the product
- Operation of DEGER system in the absence of proper safety and protective measures
- Unauthorized modifications to DEGER system
- Drilling holes in any housing, e.g. EK-S1. *Use existing free holes for mounting the housings.*
- Failure of the DEGER system due to the influence of connected or neighbouring devices outside of the the permitted limits
- Catastrophes and force majeure

1.3 For your safety

Intended purpose of the DEGER system

The MLD control with EK-S1 is intended only for the purpose of controlling DEGER's system. DEGER's system can be used in the private and commercial sector. They are designed for outdoor installation and for building integration.

Personal protective equipment

The client must provide enough safety equipment for assembly and maintenance work. Supervisors must ensure safety equipment is worn.

The following safety equipment is mandatory:

- Protective helmet
- Safety shoes
- Safety gloves

Fall protection equipment and PPE to prevent falling when working more than 1 m above the ground

1.4 Symbols used

The following symbols appear on the DEGER system and are used in the present document:



No unauthorized access



Read and follow the operating manuals and safety information before start-up

1.5 Presentation of information

1.5.1 Lists and instructions

Lists

Lists have bullet points:

- List
- List

Instructions in a certain order

Instructions that must be followed in a certain order are numbered:

1. Step 1
2. Step 2

Instructions without a certain order

Instructions that do not have to be followed in a certain order are listed with bullet points:

- Instruction
- Instruction

Results

Results of an action are indicated by a double arrow:

>> Result

1.5.2 Safety information

The following safety information is used in this document:



DANGER!

Imminent danger with a high risk; failure to observe will lead to severe physical injury or death.



WARNING!

Possible danger with a moderate risk; failure to observe can lead to severe physical injury or death.



CAUTION!

Danger with low risk; failure to observe can lead to moderate physical injury.

NOTE!

Failure to observe this information entails the risk of property damage.

2 Energy Converter S1 (EK-S1)

2.1 EK-S1 Functions

The EK-S1 is intended to be connected via CAN-Bus to other EK-S1's and a PC and operated with the Central Tracker Control (CTC) software from the PC.

For the CTC a separate manual (the **CTC User Guide**) is available.

Applies in general:

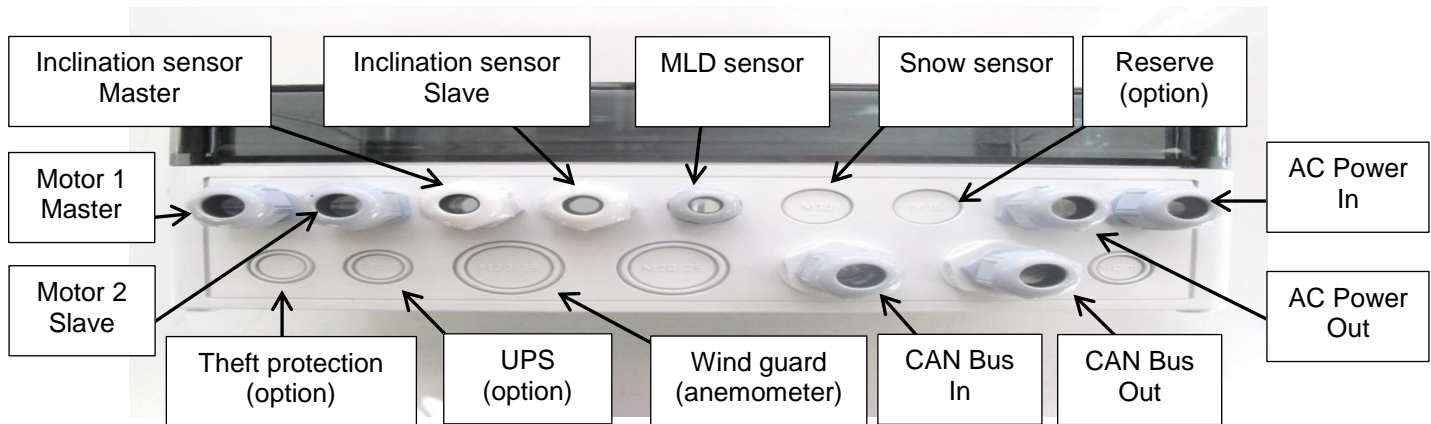
1. External input from CTC (manual control) has priority over MLD sensor.
2. External input from wind sensor has priority over external manual control.

Reverse direction function:

This function ensures the module surface is facing east the next morning to receive the first rays of sunlight. The motor will switch on for 12 minutes once the EK-S1 has not registered a signal at terminal XG1 for more than 4 hours. The external inputs, joystick, MLD sensor and wind monitor have priority.

2.2 EK-S1: Cable connections

The EK-S1 is delivered with prewired MLD-sensor, Inclination sensor cabling and motor cabling. PG glands for the CAN-Bus (M20) and AC power (M16) will be pre-installed.



The PG glands for the wind guard (M20) and the snow sensor (M16) are only needed one time in every installation and are included as an accessory.

PG glands for the UPS and theft protection (both M16) can be provided on request.



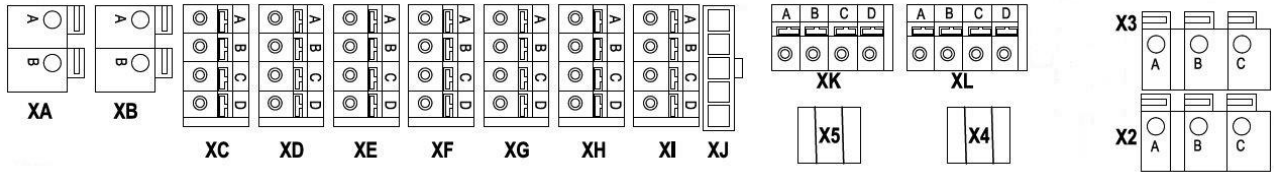
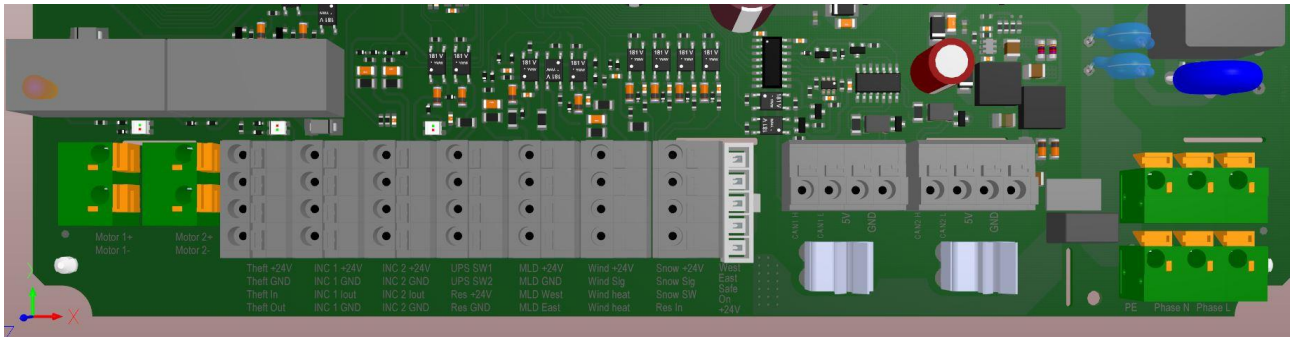
CAUTION!

Please observe the right polarity of the motor cables if disconnecting these during installation. Reverse polarity can lead to serious damage of the system.

Note!

All PG glands must fit with the installed cables from customer side and must hermetically seal the housing to avoid moisture inside. Underground slave cables must be laid in a cable conduit.

2.3 EK-S1: Pin assignments



Motor 1 +	Motor 2 +	Theft +24V	INC 1 +24V	INC 2 +24V	UPS SW1	MLD +24V	Wind+24V	Snow +24V	West
Motor 1 -	Motor 2 -	Theft GND	INC 1 GND	INC 2 GND	UPS SW2	MLD GND	Wind Sig	Snow Sig	East
		Theft In	INC1 Iout	INC2 Iout	Res +24V	MLD West	Wind heat	Snow SW	Safe
		Theft Out	INC1 GND	INC 2 GND	Res GND	MLD East	Wind heat	Res In	On
									+24V

CAN 1	CAN 2
H, L, 5V, GND	H, L, 5V, GND

Power Supply
2 x 90-265 V AC

CAN 1 Shield	CAN 2 Shield
--------------	--------------

PE	N	L
----	---	---

Prewired

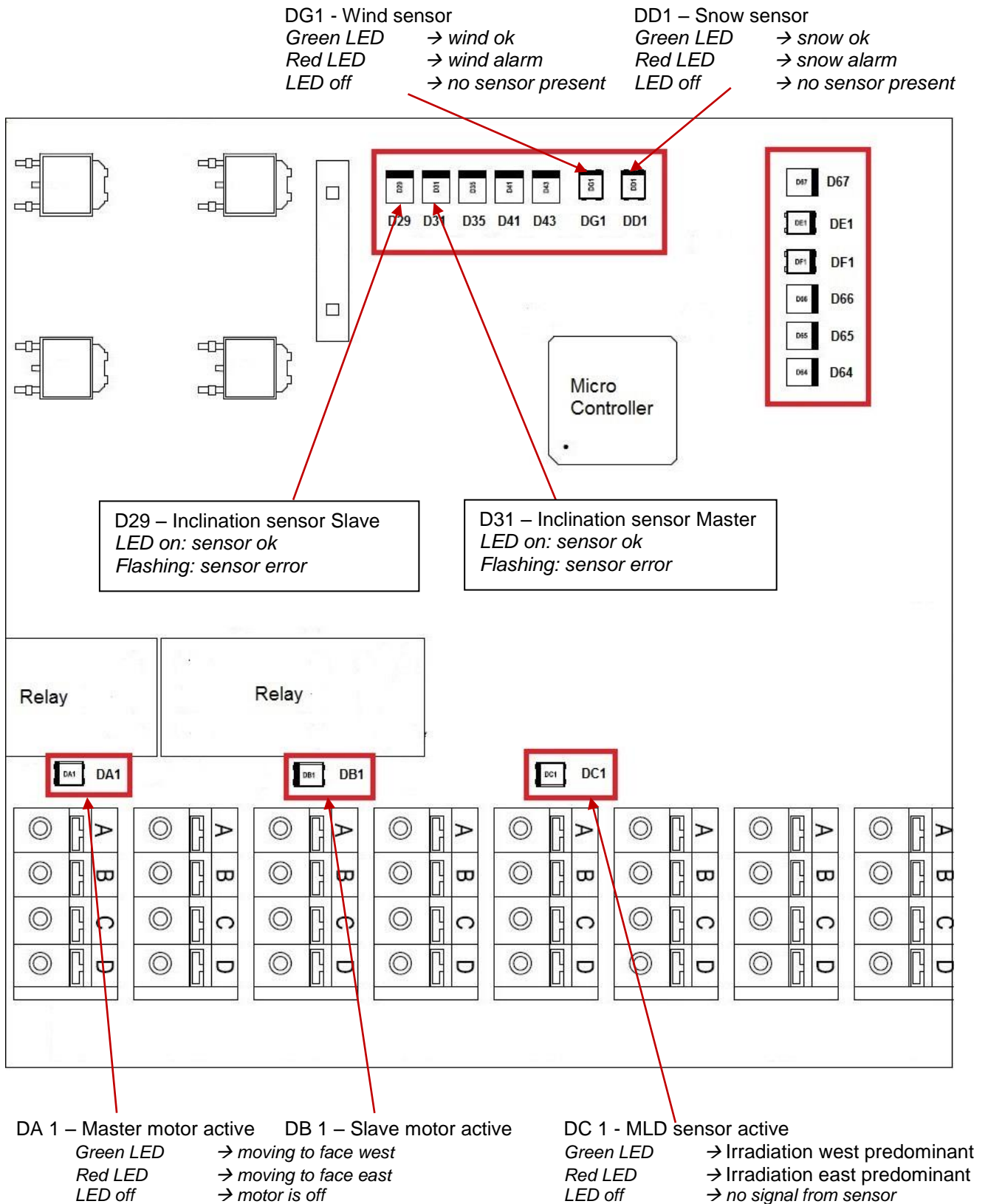
Prewired

Prewired

Terminal	Function	Wire code	Terminal	Function	Wire code
XA XB	Drives 24 Vdc Pin A => Motor 1+ Master Pin B => Motor 1- Master Pin A => Motor 2+ Slave Pin B => Motor 2- Slave	Blue Red 1 (Blue) 2 (Red)	XH	Wind Sensor Pin A: => (+24V) Pin B: => Wind Signal Pin C: => Wind Heat Pin D: => Wind Heat	Wire 5 Wire 4 Wire 1 Wire 2
XC	Theft Protection (optional) Pin A => (+24V) Pin B => (GND) Pin C => (IN) Pin D => (OUT)	User defined	XI	Snow Sensor Pin A: => (+24V) Pin B: => Snow Signal Pin C: => GND Reserve IN	Brown Black Blue
XD	Inclination Sensor Master Pin A => Master (+24V) Pin B => Master (GND) Pin C => Master Current (Iout) Pin D => Master (GND)	Brown White Green	XJ	Manual Control (Joystick) Pin 1: => West Pin 2: => East Pin 3: => Horizontal Safe Pin 4: => On Pin 5: => (+24V)	Plug
XE	Inclination Sensor Slave Pin A => Slave (+24V) Pin B => Slave (GND) Pin C => Slave Current (Iout) Pin D => Slave (GND)	Brown White Green	XK	CAN Bus In Pin A: => CAN High Pin B: => CAN Low Pin C: => (+5V) Pin D: => GND	User defined
XF	Uninterruptible Power Supply (optional) Pin A => Switch 1, Pin B => Switch 2 Pin C => Reserve (+24V) Pin D => Reserve (GND)	User defined	XL	CAN Bus Out Pin A: => CAN High Pin B: => CAN Low Pin C: => (+5V) Pin D: => GND	User defined
XG	MLD Sensor Pin A: => MLD (+24V) Pin B: => MLD GND Pin C: => MLD West Pin D: => MLD East	Brown White Yellow Green	X2 X3	Power (100 – 265 VAC) Pin A: => PE -Potential Earth Pin B: => N - Phase Neutral Pin C: => L - Phase Live	Country Specific

2.4 EK-S1 LED – display

2.4.1 LED's indicating main functions:



2.4.2 LED assignments

Part Code	Assignment	Function	Multi-Color-LED
DA1	Motor 1 (Master) active	Green: Moving to face west Red: Moving to face east LED off: motor is off	X
DB1	Motor 2 (Slave) active	Green: Moving to face west Red: Moving to face east LED off: motor is off	X
DC1	MLD sensor	Green: Irradiation west predominant Red: Irradiation east predominant	X
DD1	Snow sensor	Off: No sensor registered on EK-S1 Green: Sensor connected and OK Red: Snow alarm activated Red Slow Flash: Moving to unload position Red Fast Flash: Sensor fault	X
DE1	Joystick manual control	Red: Joystick plugged in and active Red Fast Flash: Joystick error	X
DF1	CTC manual control	Green: CTC move to face west Red: CTC move to face east Off: No command from CTC	X
DG1	Wind sensor	Off: No sensor registered on EK-S1 Green: Sensor connected and OK Red: Wind alarm activated Red Slow Flash: Waiting for wind alarm end Red Fast Flash: Sensor fault	X
D29	Inclination sensor Slave	On: Sensor ok Flashing: Sensor error	
D31	Inclination sensor Master	On: Sensor ok Flashing: Sensor error	
D35	Motor 2 (Slave)	Off: Motor ok On: Motor error, defective Flashing: Motor waits until next attempt	
D41	Motor 1 (Master)	Off: Motor ok On: Motor error, defective Flashing: Motor waits until next attempt	
D43	System status (Overload)	Off: System status ok On: Excessive heat, Motor stopped Flashing: System waits for ok	
D64	Controller power	On: Microcontroller voltage ok Fast Flash: Power error	
D65	MLD sensor power	On: MLD sensor voltage ok Fast Flash: Power error	
D66	Motor power	On: Motor voltage ok Fast Flash: Power error	
D67	CAN-Bus power	On: Bus voltage ok Slow Flash: Data transfer Fast Flash: Power error	

For interpretation of LED states and resulting actions in case of faults see **Section 10 Troubleshooting**

3 Manual Control

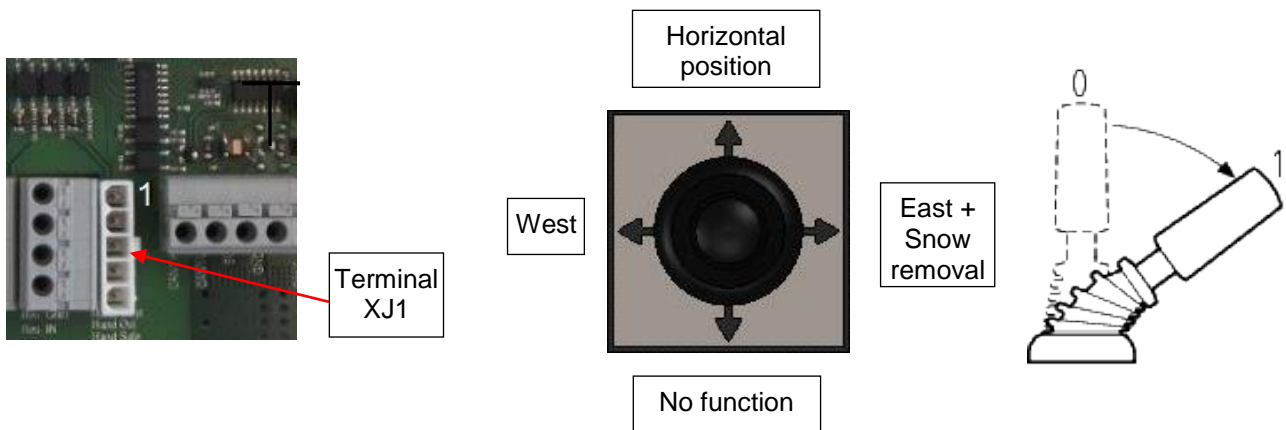
3.1 Joystick Functions

The external Joystick can be plugged into socket XJ1 during operation of the EK-S1 after removing the cover of the housing. Automatic mode and manual mode from CTC is deactivated once the joystick is plugged in. Only the system where the joystick is plugged in will move in the direction indicated by the joystick. For example, the modules can all be set flat, for maintenance work (mowing grass), or at a steep incline, for manual snow removal. The system will switch back to automatic mode once the joystick is removed.



WARNING!

High voltage present! Only qualified personnel may open the housing and connect the joystick.



CAUTION!

Serious damage to the tracker will happen when exceeding the maximum angle values. Use an angle meter to not exceed the maximum physical angles of 70° East and 50° West.

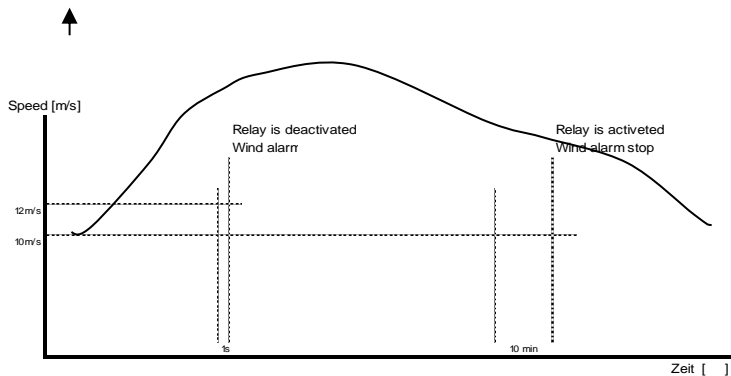
3.2 Pin assignment

Terminal designation	Function
XJ1 Pin 1	Moving to face west
XJ1 Pin 2	Moving to face east
XJ1 Pin 3	Moving to table "SAFE" position
XJ1 Pin 4	"ON" signal to CTC (+24 V)
XJ1 Pin 5	(+24V)

4 Wind Guard

Wind guard

The wind alarm becomes activated when the wind speed continuously exceeds the default setting of 12 m/s. The alarm will stop when the wind speed is continuously slower than the default setting of 10 m/s for a duration of approximately 10 minutes. If the wind speed exceeds 10 m/s within these 10 minutes, the timer will start over for another 10 minutes. The alarm can be cancelled earlier by clicking System Reset button in CTC software Manual Control. Please see a detailed description in CTC software manual.



Cable length 20 m

Terminal designation	Function	
XH1 Pin C	- DC 24 V	Wire 1 of anemometer
XH1 Pin D	- DC 0 V	Wire 2 of anemometer
XH1 Pin B	Signal input - 0 to 20 mA	Wire 4 of anemometer
XH1 Pin A	- DC 24 V	Wire 5 of anemometer

4.2 Assembly



CAUTION!

The anemometer must be installed in a higher location where it is exposed to wind at all times. The anemometer cannot be installed in the wind shadow of objects. The minimum height must be at least the height of the top edge of the module surface when the tracker is in complete east end position!

NOTE!

Anemometer assembly directly on the tracker is not allowed!!!

4.3 Connection

The anemometer is equipped with a 20 m connection cable. The cable has to be connected to the EK-S1 as described in chapters 2.3 and 6.

NOTE!

An anemometer does not have to be installed on every DEGER system in a solar energy plant that has several systems. One anemometer can be used for up to 100 EK-S1.

5 Snow Sensor

5.1 Function

The snow sensor detects accumulations of snow and ice on the DEGER system.

When a certain amount of snow or ice accumulates on the sensor, a signal is sent to the CTC, which moves the solar modules into the greatest inclined position to facilitate the snow to slide off

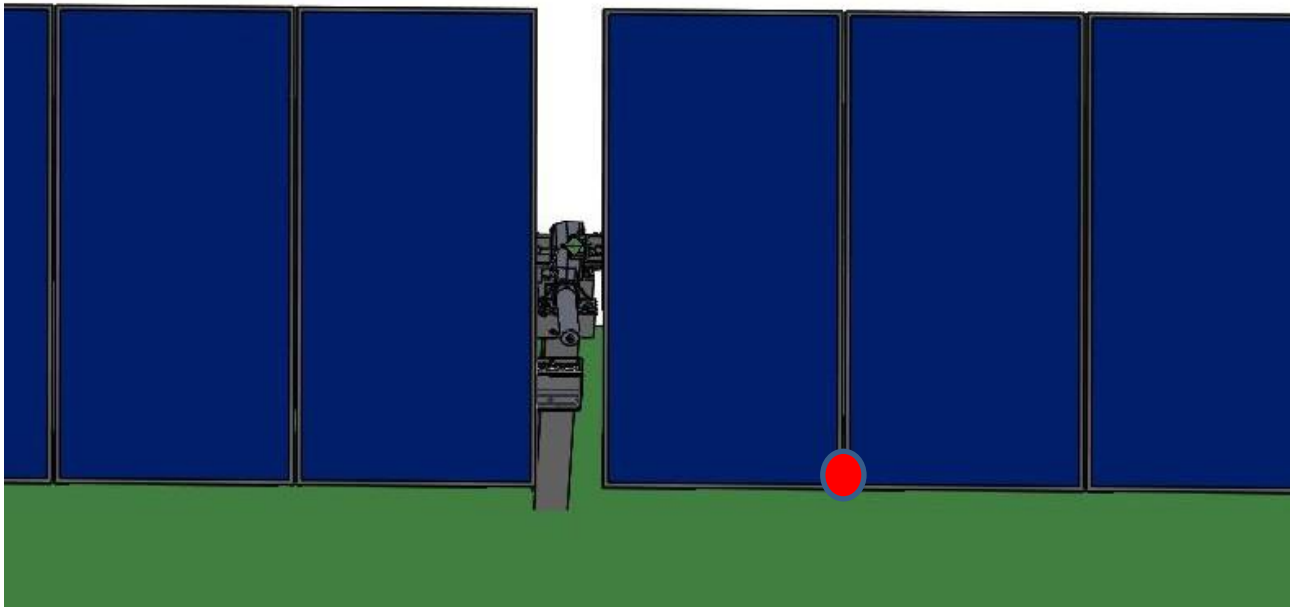


NOTE!

Do not change the default switching threshold on the snow sensor. Changing the default setting will void any warranty claims.

5.2 Positioning

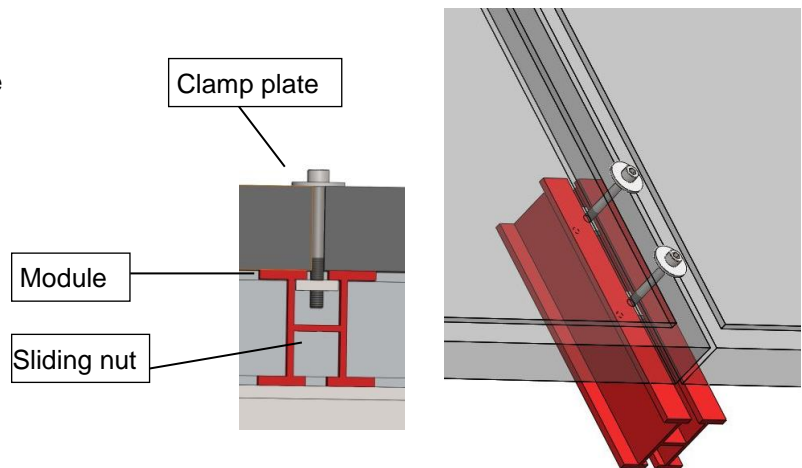
The snow sensor has to be mounted to the eastern side of the modules positioned next to the middle of the tracker. It is suitable for module heights up to 65 mm.



5.3 Assembly

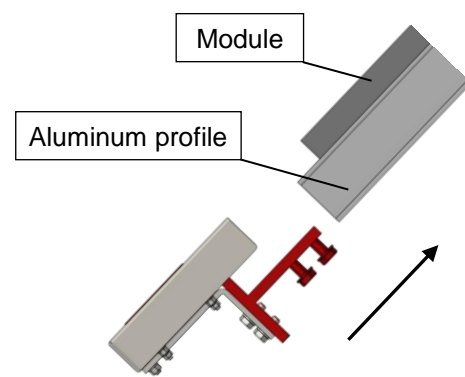
1. The 20 cm aluminum profile has to be mounted to the east side of the module surface using two bolts M6, two clamp plates and two sliding nuts M6.

Torque: 8 Nm



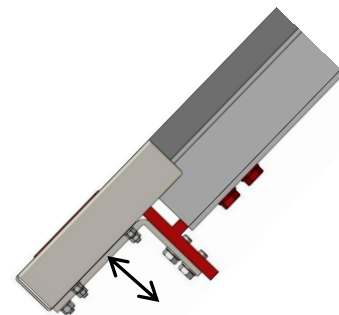
2. Loosen bolts M10x20 and slide the snow sensor into the aluminium profile from underneath until it is flush against the solar module.

Torque: 38 Nm



3. Position the snow sensor so that it is flush with the upper edge of the module surface. To do so, loosen the two bolts, M8x20, on the angle holder and place the snow sensor at the height of the modules. The snow sensor housing should not stick out above or sit below the module surface.

Torque: 19 Nm



5.4 Connection

The snow sensor is equipped with a 5 m connection cable. The cable has to be connected to the EK-S1 as described in chapters 2.3 and 6.

NOTE!

A snow sensor does not have to be installed on every DEGER system in a solar energy plant that has several systems. One snow sensor can be used for up to 100 EK-S1.

6 Connections

6.1 Block diagram



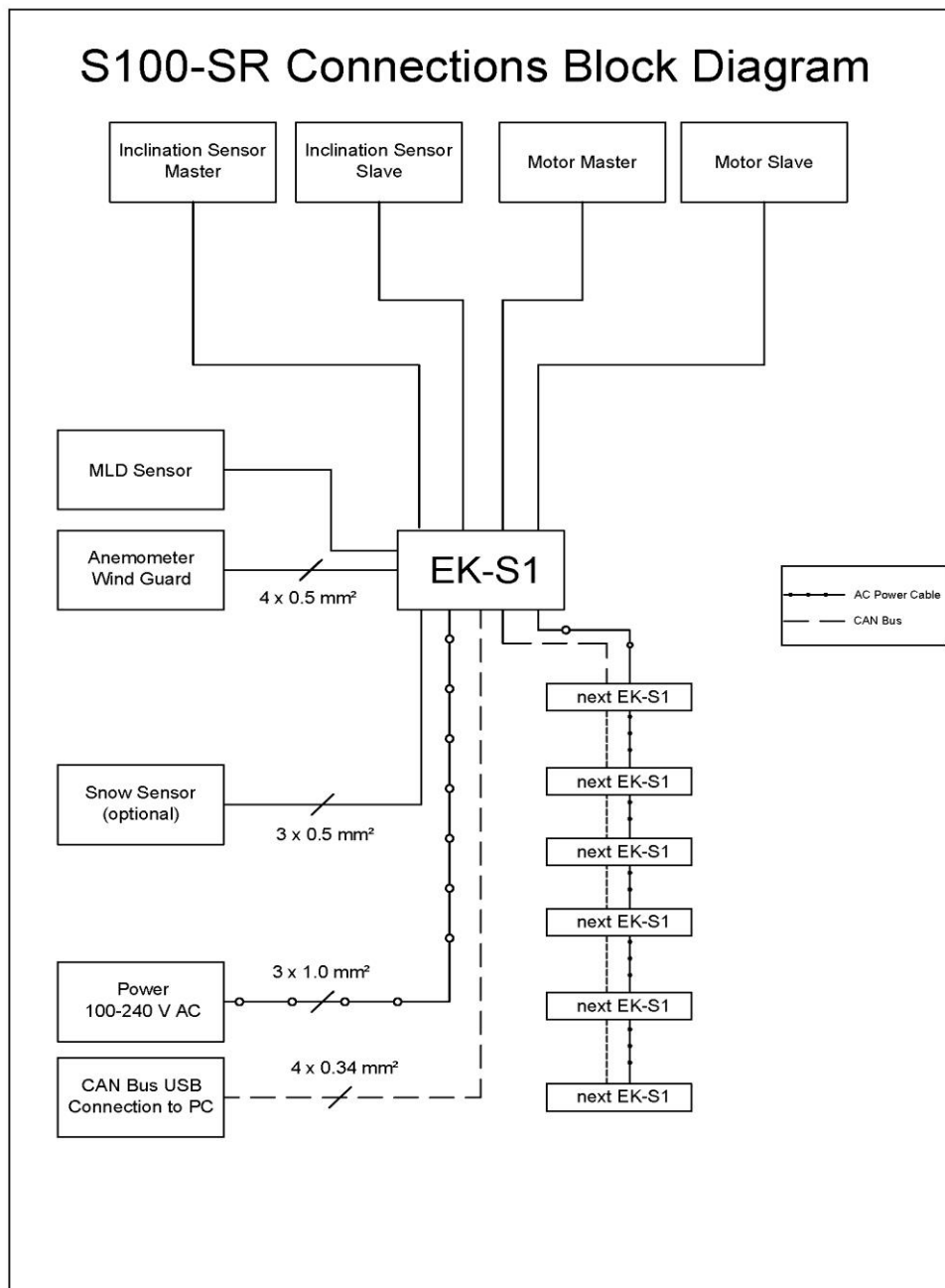
DANGER!

Only trained and qualified personnel may connect the EK-S1 to external devices.



DANGER!

The external voltage supply must meet the regional regulations. The EK-S1 must have mandatory disconnection ability from the supply voltage by a 6A-B circuit breaker. The circuit breaker must be fully accessible.



6.2 CAN-Bus

6.2.1 CAN-Bus connections EK-S1

The EK-S1 offers two connections: CAN Bus In (terminal XK) and Can Bus Out (terminal XL).



The shielding of the CAN-Bus cables must be properly stripped and fixed into the metal clips X4 and X5.

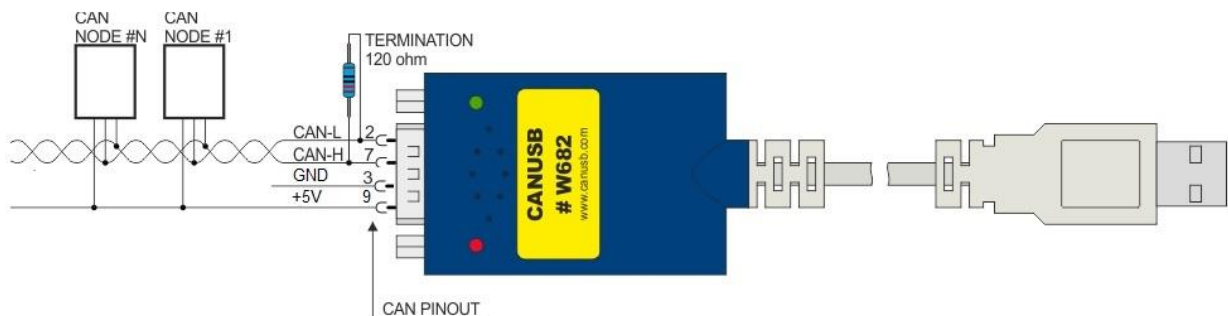
The first EK-S1 in the Can-Bus chain (ID1) is connected to the PC running the CTC (Central Tracker Control) software.

The last EK-S1 in the Can-Bus chain (IDn) is only connected to the terminal XK (CAN Bus In).

6.2.2 Connecting CAN-Bus to the management PC

For connecting the PC running the CTC you need a CAN-USB adapter from Lawicel. More information and sources can be found on the website www.canusb.com.

The CAN-bus cable must be terminated with a 120 ohm resistor at the adapter end between CAN-High and CAN-Low, i.e. pin 2 and pin 7 of the D-Sub 9 female plug, which is needed to connect the CAN-Bus cable to the adapter.



The termination at the EK-S1's is made onboard, so you don't need a resistor at the last unit in the CAN-bus chain.

For more information about CTC functionality and features refer to the “CTC User Guide”.

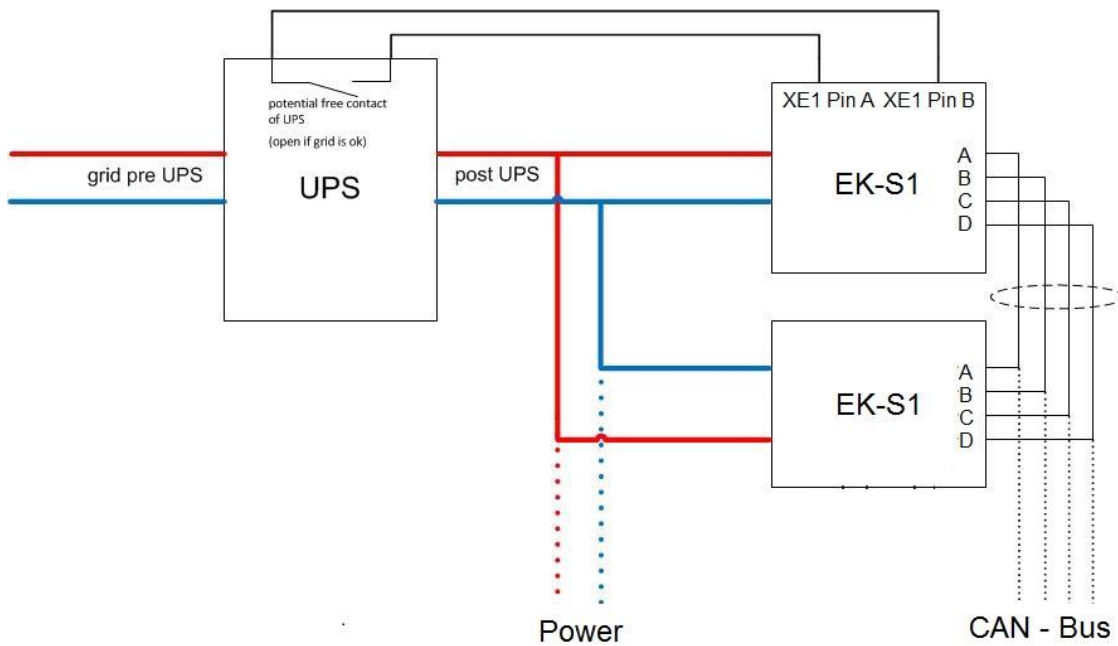
6.3 Uninterruptible power supply for a DEGER system

It is possible to provide an Uninterruptible Power Supply (UPS) for a DEGER system. The power provided will move the DEGER system in case of a power failure into safety position.

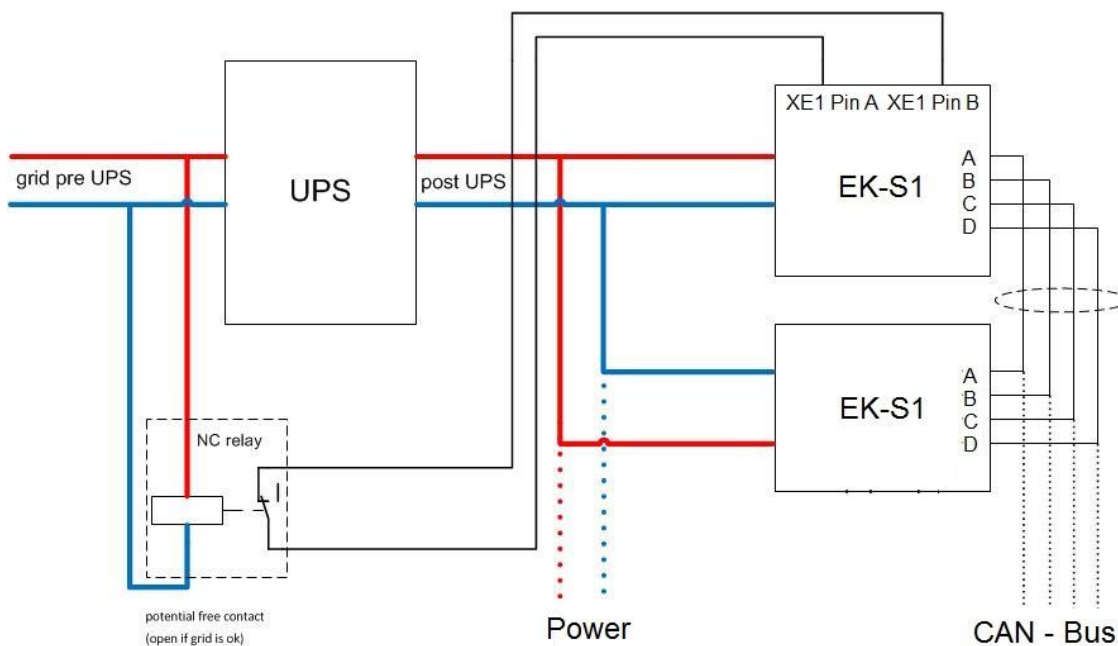
The UPS must be dimensioned to deliver a power of **180 Watt for at least 10 minutes per EK-S1**. Furthermore the UPS has to be designed to be in accordance with local environment and the legal regulations.

The UPS must be wired as shown in the following connection diagrams. The potential free contact has to be connected only to one EK-S1, the power failure information will be forwarded to other EK-S1 via CAN-Bus. The system moves immediately after the failure of the supply voltage to storm position/safety position.

UPS with potential free contact:



UPS without potential free contact:



7 Start-up



DANGER!

Electrical current can be fatal!

Contact with live components can be fatal due to electric shock.

- The external voltage supply must meet the regional regulations.
 - The EK-S1 must be able to be disconnected from the power supply by a 6A-B circuit breaker.
 - The circuit breaker must be fully accessible.
-



CAUTION!

Danger from unintentional movement of the machine!

Moving parts during DEGER system start-up can cause injury.

- Do not remain within the DEGER's system range of rotational motion.
 - Remove objects from the DEGER's system's range of rotational motion.
-

The EK-S1 is delivered with prewired MLD-sensor, Inclination sensor cabling and motor cabling. PG glands for the CAN-Bus (M20) and AC power (M16) will be pre-installed.

Open the cover and connect the CAN-Bus cables as described in section 6.2.1.

If the respective EK-S1 is determined for connecting the Wind sensor and/or the Snow sensor install the PG glands and connect the cables to the designated terminals as described in section 2.2. and 2.3.

Connect the AC power IN- and OUT cables to the respective terminals described in section 2.3.

Close all housing covers. **Torque 1.2 Nm (hand-tight)**

Supply power to the EK-S1 and perform the Initial start-up check as described in chapter 10, check main LED's as described in section 2.4.1.

8 Clearance Check



CAUTION!

Serious damage to the tracker will happen when exceeding the maximum angle values or when connecting the motor with wrong polarity to the EK-S1.

The rotary drive must be moved along the entire path to ensure that the DEGER system mechanism can move freely and that all cables are long enough for the entire range of motion.

- Cables must not be subject to mechanical stress.
- The full rotation spectrum should be achieved.
- There should not be any unusual noise.

8.1 CTC manual control

The easiest way to perform the clearance check is to use the MANUAL CONTROL function of the CTC (central tracker control) management software. See CTC User Guide.

8.2 Joystick

The EK-S1 joystick, as described in chapter 3.1, can also be used.

8.3 Battery pack

Alternatively, the drive motor can be connected to a battery pack (12 V to 26 V). A change in polarity will change the direction of the motor. Use an angle meter to not exceed the maximum physical angles of 70° East and 50° West (equal to the CTC software values of 20° and 140° generated by the inclination sensors).

NOTE!

When several DEGER systems are installed, the clearance check must be performed for every system individually. This ensures that any possible installation errors can be localised before damage occurs.

9 Technical Data

9.1 Electrical ratings

Nominal input voltage	100 to 240 VAC / 110-250 VDC
Line frequency	50 to 60 Hz
Inrush current	≤ 30 A @ Tu 25 °C
Input power	≤ 179W @ U _{in} = 230 VAC
Nominal current	0.78 A
Output voltage motors	24 VDC
Nominal output current	3 A (in Manual Control mode)
Peak output current	3.1 A for 25 min / 5 A for 10 min / 14 A for 100 ms
Output voltage sensors	24 VDC
Peak output current	1.2 A (200 mA sensors, 1.0 A for wind guard heating)
Output voltage CAN-Bus	5 VDC (galvanically isolated)
Peak output current	0.3 A
Max. voltage for UPS potential-free contact	24 VDC
Max. current for UPS potential-free contact	0.1 A

9.2 Electrical norms

IP protection class	IP 65
Flammability	UL50, UL94, UL746C
Safety	EN 60950-1
Electromagnetic Interference (EMI)	EN 55032, EN 61000
Overvoltage Category II	

9.3 Climatic conditions

Installation above sea level	max. 2000 m
Operating ambient temperature	-20 °C to +50 °C
with wind guard heating	-20 °C to +50 °C
Relative humidity	5% - 95%, non-condensing
Expanded air humidity range wind guard	0% to 100%
Pollution Degree 2	

9.4 General

Dimensions	245 mm x 180 mm x 111 mm
Total weight including MLD sensor	Approx. 3 kg

10 Troubleshooting

10.1 Error Recognition & Removal

Please follow the steps below to solve a problem:

- 1st Check which component LED is Red or Flashing Red/Green on EK-S1.
- 2nd Refer to pages 10 & 11 for further information on LED states
- 3rd Find Component Troubleshooting procedure below for solution



DANGER!

When conducting tests on the DEGER system, ensure that all parts have been disconnected from the power supply by an electrical circuit breaker, provided by the client. When conducting tests where there is live voltage, take appropriate actions to prevent injury to persons and property damage.

Please perform a clearance check for free movement like described in chapter 8.2

Problem	Causes	Solutions
AC Power on Clamps L-N Not Present?	<ul style="list-style-type: none"> • Power supply not connected 	<ul style="list-style-type: none"> • Provide AC power
	<ul style="list-style-type: none"> • No AC power 	<ul style="list-style-type: none"> • Check with multimeter if there is 100-240 VAC supplied to EK-S1
	<ul style="list-style-type: none"> • Connections are loose 	<ul style="list-style-type: none"> • Check cables for loose connection • Check with multimeter if power supply on EK-S1 is present <p>Note: If power supply is present and still EK-S1 power error i.e. LED D64 flashing fast Red then replace EK-S1</p>
Motor	<ul style="list-style-type: none"> • LED D66 Fast Flashing (Power Error) • LED DA1/DB2 off (Motor is off) • LED D35/D41 on (Motor error/defective) • Cable connector of motor not connected • Not connected to EK-S1 • LED D43 on (System is overheated) 	<p>Note: Follow the general process mentioned below for all causes.</p> <ul style="list-style-type: none"> • Remove motor from gearbox • Connect motor cables to battery and provide 24VDC and check with multimeter if 24VDC is supplied. • Measure current with no load. Current range should be 0.5-0.8A • Check motor cabling for loose connection. • Provide AC power • Cover one side of MLD manually • Check inclination sensor cabling for loose connection • Replace motor cable connector and check • Replace motor & check <p>Note:</p> <ul style="list-style-type: none"> • If Master & Slave are running in opposite direction, then stop the power supply immediately to avoid damage to gearbox & check the motor cable connections. • If LED D43 is on, it means system is overheated and motor is switched off. It will retry to run after 15 minutes. After 15 mins LED D43 flashes

MLD Sensor	<ul style="list-style-type: none"> • LED DC1 not on (MLD sensor) • LED D65 is flashing (Power Error) 	<ul style="list-style-type: none"> • Cover one side of MLD to see if the tracker changes direction • Disconnect it and check if 24V is present at Brown & White cable. • Replace MLD sensor if no 24V present at Brown & White cable
Inclination Sensor	<ul style="list-style-type: none"> • LED D29 or D31 flashing Green (Sensor Error) • LED D35 or D41 On (Motor Error) • Orientation not exact i.e. not installed correct • Re-programmed with a software & change reference point 	<ul style="list-style-type: none"> • Supply independent 24V & check output of current from 4-20 mA • Check wiring of Inclination sensor for loose connection • Replace the cable of inclination sensor • Install it as described in the Assembly and Operation Manual DEGER system S100 page 35 <p>Note: If reprogrammed then replace it with new one without re-programming it.</p>
Wind Sensor	<ul style="list-style-type: none"> • LED DG1 is off • LED DG1 fast flashing Red (Sensor Error) • LED DG1 Red (Wind Alarm) 	<ul style="list-style-type: none"> • Connect Wind sensor to EK-S1 in solar park • Check wiring instruction in Assembly Instructions page 9 • If Wind Alarm at very low wind speeds. Then check wire 5 & 4 for damage or loose connection • If cable is extended then remove extension and install it with the default cable length i.e. 20m <p>Note: If Wind Alarm is activated except on the tracker it is connected to then assign wind sensor to all trackers in CTC and write command to all trackers.</p>
Snow Sensor	<ul style="list-style-type: none"> • LED DD1 fast flashing Red (Sensor Error) • Sensitivity is increased or decreased via potentiometer using screwdriver 	<ul style="list-style-type: none"> • Check cabling of Snow Sensor. • Supply independent 24V to check if sensor switches LED on. <p>Note: If sensitivity is changed then check range with hand. Increase or decrease it to set up to 6 cm. If still not then replace it with another snow sensor without changing sensitivity</p>
Joystick Manual Control	<ul style="list-style-type: none"> • LED DE1 fast flashing Red (Joystick error) • LED DE1 still off with Joystick connected 	<ul style="list-style-type: none"> • Check wiring of pins of Joystick to connector. See Assembly Instructions page 9. • Reconnect it. Is connected when the clip clicks
CTC Manual Control	<ul style="list-style-type: none"> • LED DF1 is off • The USB adapter connection is loose. • CAN Bus not connected properly 	<ul style="list-style-type: none"> • Provide any manual command from CTC software. • Check CAN bus USB connection • Check CAN In and CAN Out of all EK-S1s <p>Note: Important is to connect 120 ohm resistor at termination and connect CAN Bus Pin C to USB adapter Pin 9 for 5 V for proper Manual Control. Check Assembly Instructions page 17</p>

10.2 Fault Report

Please send completed copy to service@degerenergie.com.

DEGER S100-DR

DEGER S100-SR

Delivery date	Serial No.. DEGER system	Serial No. EK-S1	Serial No. Motor
<input type="checkbox"/> Single system	<input type="checkbox"/> Energy plant with systems		
<input type="checkbox"/> Driven pile foundation	<input type="checkbox"/> Concrete foundation		

Problem description

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.....

.....

Spare part needed:

Measured values according to troubleshooting diagram	YES	NO
East-west axis moves to brightest spot (possibly cover up a solar cell).	<input type="checkbox"/>	<input type="checkbox"/>
East-west drive can move in both directions when controlled by the joystick.	<input type="checkbox"/>	<input type="checkbox"/>
CTC manual control: Moves into horizontal position	<input type="checkbox"/>	<input type="checkbox"/>
Control using wind monitor: Moves into horizontal position	<input type="checkbox"/>	<input type="checkbox"/>
Measured values on Energy Converter S1		
AC Voltage Input EK-S1 Terminal L-N		V
DC Voltage EK-S1 Terminal XE1 Pin C,D		V
LED MOTOR POWER OK D66	LED green <input type="checkbox"/>	LED off <input type="checkbox"/>
LED SENSOR POWER OK D65	LED green <input type="checkbox"/>	LED off <input type="checkbox"/>
LED CONTROLLER POWER D64	LED green <input type="checkbox"/>	LED off <input type="checkbox"/>
LED MOTOR 1 DA1	LED green <input type="checkbox"/>	LED red <input type="checkbox"/>
LED MOTOR 2 DB1	LED green <input type="checkbox"/>	LED red <input type="checkbox"/>
Voltage Inclinator Terminal XC1 and XD1 Pin A,B		V
Voltage CAN-Bus Terminal XK1 Pin C,D		V
LED Wind and Snow sensor (if connected) DD1, DG1	LED green <input type="checkbox"/>	LED red flashing <input type="checkbox"/>

Please provide latest protocol file from CTC

<p>Contact</p> <p><input type="checkbox"/> Installer <input type="checkbox"/> Operator</p> <p>.....</p> <p>Company Name</p> <p>.....</p> <p>Address</p> <p>.....</p> <p>Postal code, city</p> <p>.....</p> <p>Contact partner > phone number, e-mail address</p> <p>.....</p>	<p>Delivery address for return parts:</p> <p>DEGERenergie GmbH & Co. KG Service Industriestr. 70 D-72160 Horb a.N. Germany</p>
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11 Maintenance

No specific maintenance or repair work is required for the EK-S1.

12 Cleaning

- Use soft towels for any necessary cleaning.
- Do not use corrosive or aggressive liquids.
- Follow the safety information in this operating manual.

13 Decommissioning

13.1 Disassembly



DANGER!

Electrical current can be fatal!

Contact with live components can be fatal due to electric shock.

- Switch off the power supply before starting work and prevent the power from being switched back on.
 - Only qualified personnel who have been trained in the tasks to be completed may perform electrical work.
-

1. Move the DEGER system into the horizontal position using the joystick or a commercial battery pack (DC 12 to 26 V). Connect the two wires of the motor to the positive (+) and negative (-) terminal of the battery pack. If the DEGER system moves into the inclined position, switch the wires for the motor at the (+) and (-) terminal of the battery pack.

2. Disconnect the DEGER system from the power supply.

13.2 Disposal

The parts can be recycled after disassembly, or they must be disposed of according to national and regional stipulations. Only trained personnel may dispose the parts.

14 Conformity Declaration

EC – Declaration of Conformity

Company: DEGERenergie GmbH & Co. KG
Industriestraße 70, 72160 Horb, Germany

Authorized representative
for the collation of
technical documents: Hünkar Korkmaz, CEO
Industriestraße 70
72160 Horb, Germany

We hereby declare that the following products

DEGERtracker S60H DEGERtracker S70 DEGERtracker S100

are developed, tested and certified and conform with the essential requirements for protection of health and the safety of the user and any other person and Electromagnetic Compatibility (EMC), as included in following standards.

EC-directives: EC Machine Directive (2006/42/EC)
EC Low Voltage Directive (2014/35/EU)
EC EMV directive (2014/30/EU)

Applied harmonised standards: EN 50102
EN 60529:2014
EN 55032 Class B
EN 60950-1
EN 61000-3-2:2014
EN 61000-6-1/-2/-3/-4:2007
IEC 61000-4-2/-3/-4/-5/-8/-11

Applied national standards
and technical specifications: VDE 0470-1, VDE 0470-100, VDE 0875-14
DIN EN 1090
DIN EN 1990
DIN EN 1991-1-4
DIN 4149:2005-4

and therefore complies with the essential requirements of the EU-Directive of the council on the harmonization of the laws of Member States.

This declaration of conformity will lose its validity, if the product is

- modified, supplemented or changed in any other way without our explicit consent
- and/or components not belonging to the range of accessories offered by DEGER, are used
- and also in case of improper assembly and installation or unintended use.

Date: April, 18th 2018



Hünkar Korkmaz
CEO

15 Publisher Information

DEGERenergie GmbH & Co. KG
Industriestr. 70
D-72160 Horb am Neckar
Deutschland / Germany
Tel: +49 (0) 7451-53914-0
Fax: +49 (0) 7451-53914-10

www.DEGER.biz
info@DEGERenergie.com

Registered Office: Horb a.N.
Registry Court: Stuttgart District Court
HRA 730079
VAT ID No.: DE 295812054

Partner Company: DE Verwaltungs GmbH
Registry Court of Companies: Stuttgart District Court
HRB 749359
CEO: Hünkar Korkmaz
Registered Head Office: Horb am Neckar