



# Energy Controller User Manual

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# 1 Notes and Safety

This manual is an integral part of Energy Controller, it describes the assembly installation, LCD function, troubleshooting. Please read it carefully before operating.

Model: X1-NFI      X3-NFI

Note: "1" means for one phase. "3" means for three phase.

Symbol on the Type Label:



Danger of high voltage.

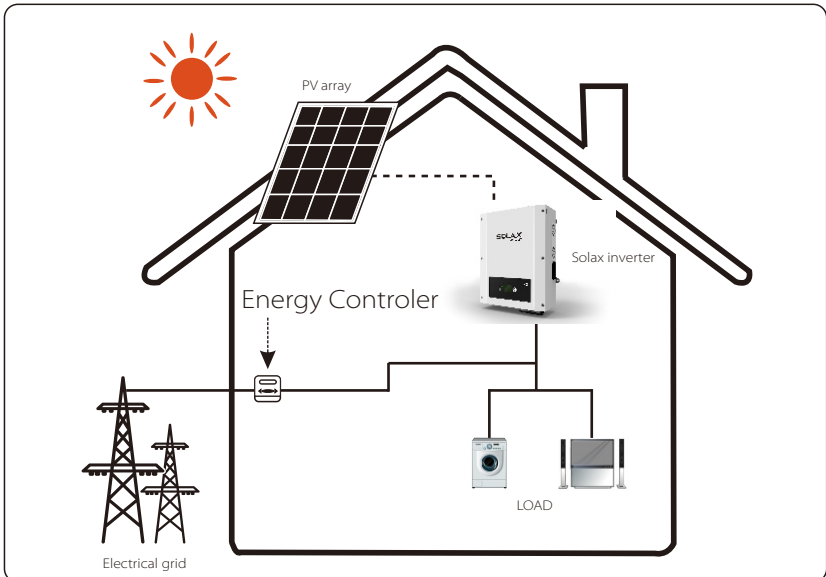
Danger to life due to high voltage of this machine.

- All operations described in this manual only can be performed by qualified electricians.
- Children should be supervised to ensure that they do not play with the appliance.
- Authorized service personnel must disconnect all power from Energy Controller before attempting any maintenance or cleaning or working with Energy Controller.
- Make sure the existing wiring is in good condition and that wire is not undersized. Do not operate Energy Controller with damaged or substandard wiring.
- Keep away from flammable, explosive materials to avoid fire disaster.

## 2 Introduction

### 2.1 Basic features

Energy Controller is integrated with meter, control MCU, RS485 to communicate with the inverter, it can control the power of inverter to assure that the redundant power will not feed into Grid.



Wherever you use the Energy Controller, first you need confirm it can be communicate with the inverter. It is compatible with Solax inverter:

**The model of X1 Series:**

(X1-1.1-S-N X1-1.1-S-D X1-1.5-S-N X1-1.5-S-D X1-2.0-S-N X1-2.0-X-D)  
(X1-2.5-S-D X1-2.5-S-N X1-3.0-S-D X1-3.0-S-N X1-3.3-S-D X1-3.3-S-N)

**The model of X3 Series:**

(ZDNY-TL10000 ZDNY-TL12000 ZDNY-TL15000 ZDNY-TL17000 ZDNY-TL20000)  
(X3-30.0-T-D X3-30.0-T-N X3-36.0-T-D X3-36.0-T-N)

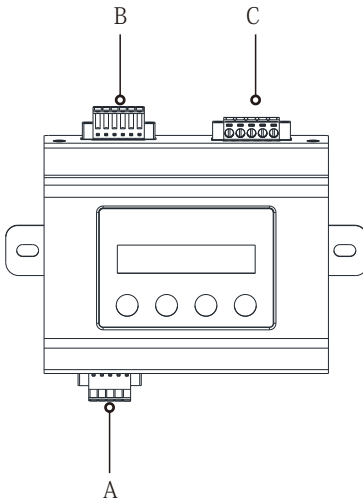


**NOTE!**

The software of compatible inverter should be upgraded if the Energy Controller is chosen.

It's better to contact with Solax Sales department to confirm whether the Energy controller can use or not, if the inverter don't belong to recommended models.

### 2.2 Terminals of Energy Controller



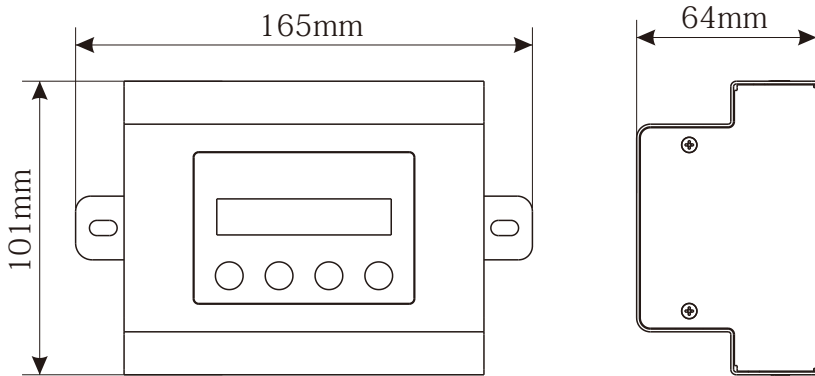
A	RS485 port
B	Current acquisition port
C	Voltage acquisition port



**Warning!**

Only authorized personnel is allowed to set the connection.

## 2.3 Dimension



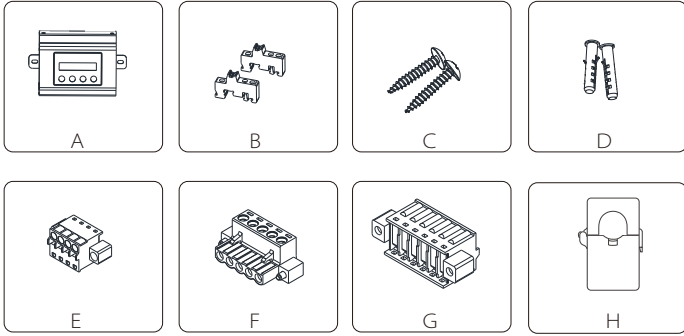
## 3 Technical Parameters

	Model	
	X1-NFI	X3-NFI
INPUT		
Rated Voltage (V)	230V/220V	
Voltage Range(V)	160~300V	
Rated Current(A)	0.5A	
Max Power (W)	5	
AC Terminal	5	
Rated grid frequency (Hz)	50/60	
Environment		
Protection Class	IP20	
Temperature Range(°C)	-25°C~60°C	
Installation mode	Guide rail /Hanging	
Others		
Dimension(W*D*H)(mm)	165*101*64	
Weight(kg)	1	
Terminal	Voltage input /Current input /RS485	
LCD display	80*36	
Control Accuracy	<2%	
Button	4(Up,Down,OK,ESC)	
Certification	EN61000	

# 4 Installation

## 4.1 Packing list

Open the package and fetch out the product, check the accessories at first. The packing list shows as below.



Object	Quantity	Description
A	1	Energy Controller
B	2	Guide rail fastener
C	2	Expansion screw
D	2	Expansion tube
E	1	RS485 terminal(4 PIN)
F	1	Voltage terminal(5 PIN)
G	1	Current terminal(6 PIN)
H	1 for X1-NFI/3 for X3-NFI	CT

## 4.2 Installation Precaution

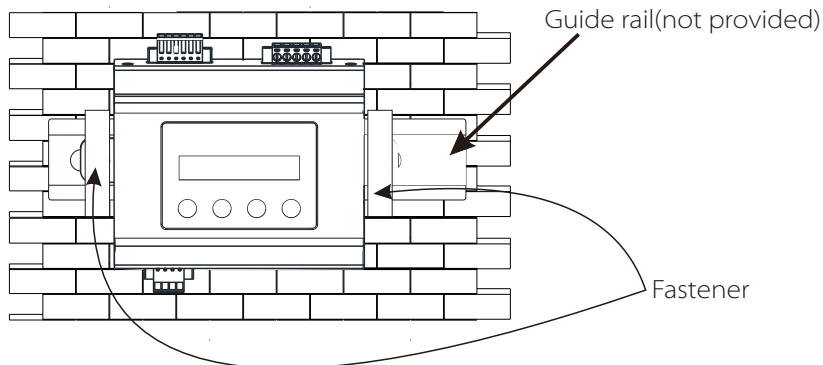
Energy Controller is designed for indoor installation (IP20). Outdoor use is not permitted.

SolaX suggests it is most suitable for switch cabinet or hanged up on the wall indoor only.

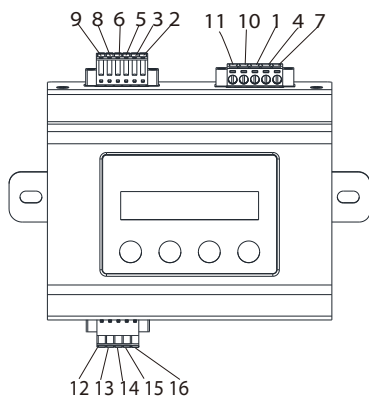
- Check the installation environment. Please avoiding direct sunlight.
- In order to realise optimal performance, the recommended ambient air temperature should be in the range of -10~+50°C.

### 4.3 Mounting

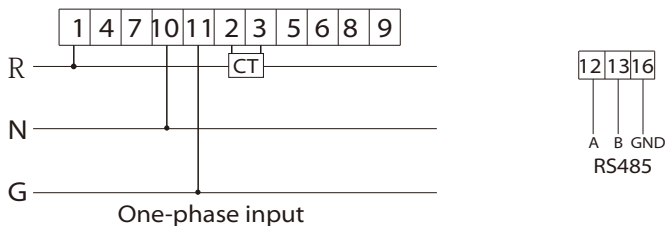
Install the terminal according to meaning, then Fix the Energy Controller on the guide rail by the fasteners in the package.



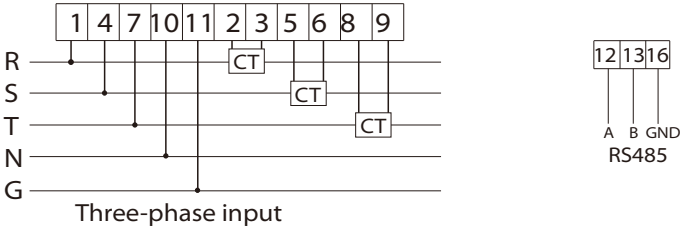
### 4.4 Typical wiring diagram



One-phase wiring instruction(X1-NFI):



### Three-phase wiring instruction(X3-NFI):

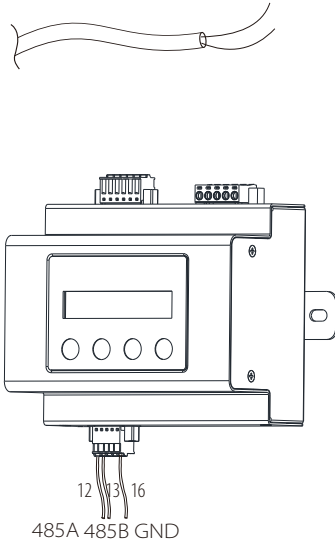


### 4.5 Connection of Energy Controller

#### Step 1: RS485 terminal connection

Insert the wire into the RS485 port of the Energy Controller, insert the other side to the inverter according to the definition.

cable size: 28-16AWG

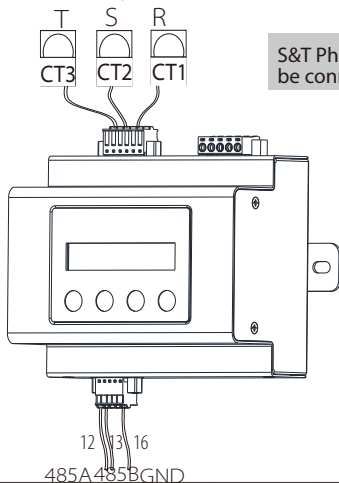




## Step 2: Connect with Grid

### a. Current wire connection

Insert the wire terminal of the CT to the current acquisition port of Energy Controller, connect the buckle of CT to the grid.



Number on the Energy Controller	2	3	5	6	8	9
The color of the CT wire	white	black	white	black	white	black
CT Export	CT1+	CT1-	CT2+	CT2-	CT3+	CT3-
AC Phase	R		S		T	

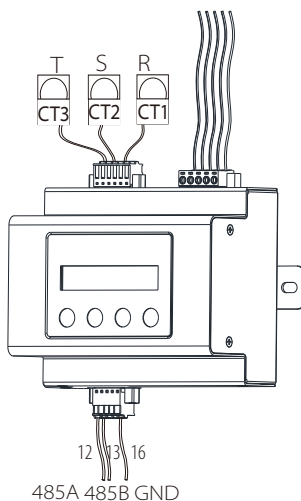
### b. Voltage wire connection

Make wire, insert the wire to the voltage acquisition port of Energy Controller, insert the other side of the wire to the grid following the definition in the table.



cable size: 22-12AWG

S&T Phase of X1-NFI don't have to be connected



Number on the Energy Controller	1	4	7	10	11
AC phase	R	S	T	N	GND

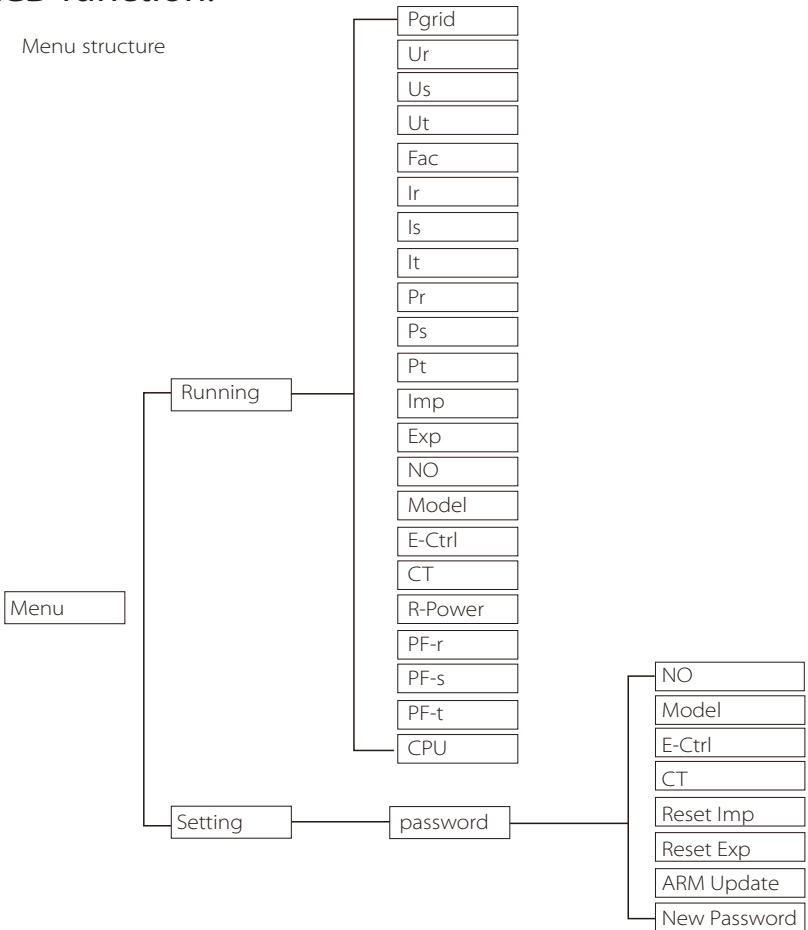


**Warning!**

Please ensure that the wire connection follows the definition , or the unit wouldn't work normally.

## 5 LCD function.

Menu structure



LCD description

Display content	Meaning and description
Pgrid	Grid Power: positive value means the power export to the grid. negative value means the power import from the grid
$U_r$	R Phase Voltage
$U_s$	S Phase Voltage
$U_t$	T Phase Voltage
Fac	Frequency of AC
$I_r$	R Phase Current
$I_s$	S Phase Current
$I_t$	T Phase Current
$P_r$	R Phase Power
$P_s$	S Phase Power
$P_t$	T Phase Power
Imp	totally import energy, can be reset in Setting
Exp	totally export energy, can be reset in Setting
No	Number of Parallel Inverter
Model	Model of the Inverter: "X1" means for single phase inverter, "X3" means for three phase inverter
E-Ctrl	Allowed max power to the grid, the factory default is zero, can be set in Setting, the range is 0-480KW.
CT	Model of the CT, this is match for X-NFI, do not change the setting, or the energy controller can't work normally.
R_Power	Rated Power of the Inverter
CPU	The Version of CPU
PF_r	R Phase Power Factor
PF_s	S Phase Power Factor
PF_t	T Phase Power Factor

## 6 Warranty Regulation and Liability

### Terms and conditions

SolaX grants a warranty of 12 months as standard. Starting from the date of the purchase invoice marked. SolaX will only perform warranty service when the faulty unit is returned to SolaX together with a copy of invoice and warranty card which were issued by the dealer and manufacturer to the users. In addition, the type label of the unit must be fully legible. If these requirements are not fulfilled, SolaX reserves the right for all warranty terms and conditions.

### Exclusion of liability

Warranty claims are excluded for direct or indirect damage due to:

- 1: Use of unit in ways not intended, improper installation and installation that does not comply with standards, improper operation and unauthorized modification to the units or repair attempt.
- 2: Without warranty card and serial number.
- 3: Operating the units with defective protective equipment.
- 4: Influence of foreign objects and force majeure.
- 5: Inadequate ventilation.
- 6: Violate relevant safety regulations.

To register your SolaX product, please mail this warranty Registration Form to:

ADD: Room 206, West Building A Sci. and Tech Park of Zhejiang University  
No.525, Xixi Road, Hangzhou Zhejiang Province, China 310007

Tel: +86 571 56260011 Fax: +86 571 56075753

Email: [service@solaxpower.com](mailto:service@solaxpower.com)

Web: <http://solaxpower.com/en/warranty-registration/>

**Online warranty registration is available at**  
**<http://solaxpower.com/en/warranty-registration/>**



## Warranty Registration Form

Name ..... Country .....

Phone Number..... Zip Code .....

Email .....

Address .....

Product Serial Number .....

Date of Commissioning .....

Installation Company Name .....

Date of Delivery .....

Signature .....



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