

## Overview

XTRA series are advanced maximum power point tracking (MPPT) charge controllers, for off-grid photovoltaic systems, with optional display units (XDB1/XDS1/XDS2).

In order to maximize the energy harvest from PV arrays and simultaneously minimize the power loss within a wide range of operating conditions, XTRA series apply an advanced smart algorithm which results in up to 30% higher efficient charging, compared to a conventional pulse width modulation (PWM) charge controller. Xtra series controller have limit protection function on charging current & charging power, as well as auto derating power operation at high temperature; the above protection ensure the stability of system even at exceeded rated PV power and over temperature conditions.

Protection class IP32 and isolated RS485 communication port further improve the controller's reliability under different application requirements. XTRA series controllers incorporate a self-adaptive three-stage charging algorithm based on a digital control circuit, which effectively prolongs the lifespan of battery and significantly improve the system performance. It also has extensive electronic protection for overcharge, over discharge, PV & battery reverse polarity and etc. to ensure the sustainability and durability of the off-grid solar system.



## Features

- Advanced MPPT technology & ultra-fast tracking speed is up to 99.5 % guaranteed
- Maximum DC/DC transfer efficiency is as high as 98 %, full load transfer efficiency is up to 97.4 %
- Wide MPP operating voltage range
- Low temperature protection and self activate function for lithium battery charging
- Limit charging power & current over rated range
- Real-time energy statistics function
- Multiple load work modes
- Comprehensive electronic protection
- Compatible with lead acid and lithium-ion<sup>①</sup> batteries
- Over temperature protection and power degrading in higher temperature
- Optional LCD display units (XDB1/XDS1/XDS2) and accessories
- High quality and low failure rate components of ST or IR to ensure service life
- Isolated RS485 communication port with 5V/200mA protected output, with standard Modbus protocol
- Monitor and set the parameters via APP or PC software
- Dustproof and waterproof design with IP32<sup>②</sup> protection class
- CE certification (LVD IEC62109, EMC EN3/1-6-61000)

① If using Lithium battery, customer should ask help for "PC software" to set the lithium battery parameters

② Ingress of solid objects: Protected against solid objects over 2.5mm

② Ingress of liquids: Protected against falling drops of water, if the case is disposed up to 15° from vertical



Solar Car



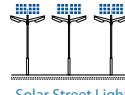
Solar Home



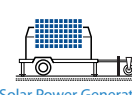
Solar Backpack



Solar Boat



Solar Street Light



Solar Power Generator

## Technical Specifications

| Item                                                                                | XTRA<br>1206N                                       | XTRA<br>2206N    | XTRA<br>1210N                         | XTRA<br>2210N    | XTRA<br>3210N    | XTRA<br>4210N     | XTRA<br>3215N                                  | XTRA<br>4215N     | XTRA<br>3415N                          | XTRA<br>4415N                           |
|-------------------------------------------------------------------------------------|-----------------------------------------------------|------------------|---------------------------------------|------------------|------------------|-------------------|------------------------------------------------|-------------------|----------------------------------------|-----------------------------------------|
| Electrical                                                                          |                                                     |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| System Nominal Voltage                                                              | 12/24VDC <sup>①</sup> Auto                          |                  |                                       |                  |                  |                   |                                                |                   | 12/24/36/48VDC <sup>①</sup> Auto       |                                         |
| Rated Charge Current                                                                | 10A                                                 | 20A              | 10A                                   | 20A              | 30A              | 40A               | 30A                                            | 40A               | 30A                                    | 40A                                     |
| Rated Discharge Current                                                             | 10A                                                 | 20A              | 10A                                   | 20A              | 30A              | 40A               | 30A                                            | 40A               | 30A                                    | 40A                                     |
| Battery Voltage Range                                                               | 8~32V                                               |                  |                                       |                  |                  |                   |                                                |                   | 8~68V                                  |                                         |
| Max. PV Open Circuit Voltage                                                        | 60V <sup>②</sup><br>46V <sup>③</sup>                |                  | 100V <sup>②</sup><br>92V <sup>③</sup> |                  |                  |                   | 150V <sup>②</sup><br>138V <sup>③</sup>         |                   |                                        |                                         |
| MPPT Voltage Range                                                                  | (Battery voltage +2V)~36V                           |                  | (Battery voltage +2V)~72V             |                  |                  |                   | (Battery voltage +2V)~108V                     |                   |                                        |                                         |
| Max. PV Input Power (W/V)                                                           | 130/12<br>260/24                                    | 260/12<br>520/24 | 130/12<br>260/24                      | 260/12<br>520/24 | 390/12<br>780/24 | 520/12<br>1040/24 | 390/12<br>780/24                               | 520/12<br>1040/24 | 390/12<br>780/24<br>1170/36<br>1560/48 | 520/12<br>1040/24<br>1560/36<br>2080/48 |
| Equalization Voltage <sup>④</sup>                                                   | Sealed: 14.6V; Flooded: 14.8V; User: 17~9V          |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| Boost Voltage <sup>④</sup>                                                          | Gel:14.2V; Sealed:14.4V; Flooded:14.6V; User: 17-9V |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| Float Voltage <sup>④</sup>                                                          | Gel /Sealed /Flooded: 13.8V; User: 17~9V            |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| Low Voltage Reconnect Voltage <sup>④</sup>                                          | Gel /Sealed /Flooded: 12.6V; User: 17~9V            |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| Low Voltage Disconnect Voltage <sup>④</sup>                                         | Gel /Sealed /Flooded: 11.1V; User: 17~9V            |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| Self-consumption                                                                    | ≤14mA(12V)<br>≤15mA(24V)                            |                  | ≤35mA(12V)<br>≤22mA(24V)              |                  |                  |                   | ≤35mA(12V) ≤16mA(36V)<br>≤22mA(24V) ≤16mA(48V) |                   |                                        |                                         |
| Discharge circuit voltage drop                                                      | ≤0.23V                                              |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| Temperature Compensate coefficient <sup>⑤</sup>                                     | -3mV/°C/2V (Default)                                |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| Grounding                                                                           | Common negative grounding                           |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| RS485 interface                                                                     | 5VDC/200mA (RJ45)                                   |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| LCD backlight time                                                                  | 60S (Default)                                       |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| Environmental                                                                       |                                                     |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| Working environment temperature <sup>⑥</sup><br>(full rated power with no derating) | -25°C~-+50°C(LCD) ; -30°C~-+50°C(No LCD)            |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| Storage temp. range                                                                 | -20°C~-+70°C                                        |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| Relative humidity                                                                   | ≤ 95% , N.C.                                        |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| Enclosure                                                                           | IP33 <sup>⑦</sup>                                   |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |
| Pollution degree                                                                    | PD2                                                 |                  |                                       |                  |                  |                   |                                                |                   |                                        |                                         |

| Item                   | XTRA 1206N                | XTRA 2206N | XTRA 1210N | XTRA 2210N | XTRA 3210N | XTRA 4210N | XTRA 3215N | XTRA 4215N | XTRA 3415N | XTRA 4415N |
|------------------------|---------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| <b>Certification</b>   |                           |            |            |            |            |            |            |            |            |            |
| Safety                 | EN/IEC62109-1             |            |            |            |            |            |            |            |            |            |
| EMC(Emission immunity) | EN61000-6-3/EN61000-6-1   |            |            |            |            |            |            |            |            |            |
| FCC                    | 47 CFR Part 15, Subpart B |            |            |            |            |            |            |            |            |            |
| Performance &function  | IEC62509                  |            |            |            |            |            |            |            |            |            |
| ROHS                   | IEC62321-3-1              |            |            |            |            |            |            |            |            |            |

| Item                   | XTRA 1206N<br>XTRA 1210N | XTRA 2206N<br>XTRA 2210N | XTRA 3210N               | XTRA 4210N<br>XTRA 3215N | XTRA 4215N<br>XTRA 3415N | XTRA 4415N               |
|------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>Mechanical</b>      |                          |                          |                          |                          |                          |                          |
| Dimension(mm)          | 175×143×48               | 217×158×56.5             | 230×165×63               | 255×185×67.8             | 255×187×75.7             | 255×189×83.2             |
| Mounting dimension(mm) | 120×134                  | 160×149                  | 173×156                  | 200×176                  | 200×178                  | 200×180                  |
| Mounting hole size     | Φ5mm                     |                          |                          |                          |                          |                          |
| Terminal               | 12AWG(4mm <sup>2</sup> ) | 6AWG(16mm <sup>2</sup> ) | 6AWG(16mm <sup>2</sup> ) | 6AWG(16mm <sup>2</sup> ) | 6AWG(16mm <sup>2</sup> ) | 6AWG(16mm <sup>2</sup> ) |
| Recommended cable      | 12AWG(4mm <sup>2</sup> ) | 10AWG(6mm <sup>2</sup> ) | 8AWG(10mm <sup>2</sup> ) | 6AWG(16mm <sup>2</sup> ) | 8AWG(16mm <sup>2</sup> ) | 6AWG(16mm <sup>2</sup> ) |
| Weight                 | 0.57kg                   | 0.96kg                   | 1.31kg                   | 1.70kg                   | 2.07kg                   | 2.47kg                   |

- ① When selecting lithium battery type, the system voltage can't be identified automatically
- ② At minimum operating environment temperature
- ③ At 25°C environment temperature
- ④ When selecting lithium battery type, the temperature compensation coefficient is 0, and can't be set
- ⑤ The parameters are 12V system at 25 °C, ×2 in 24V system at 25 °C, ×4 in 48V system at 25 °C
- ⑥ The controller can full load working in the working environment temp. range, When the internal temperature reach to 81°C, the reducing charging power mode is turned on
- ⑦ 3 - protection against solid objects: protected against solids objects over 2.5mm  
2 - protection against liquids: protected against direct sprays up to 15 ° from the vertical