





Revision Control

REV.	DATE	REASON / RESPONSIBLE
07	24/02/2022	Various changes (Installation improvements)

Limitation of Warranty and Liability

The limitation of warranties and liabilities shall be described in the contractual agreements between CEGASA and the buyer.

The information included in this manual has been written for the purpose of providing the user with more detail and clarity in terms of content. Nonetheless, CEGASA reserves the right to modify the contents of this manual through future revisions at any time and without prior notice.

Confidentiality

All information provided by CEGASA by virtue of this User Manual and any data or features that may be disclosed by such shall be completely confidential and may not be shared with third parties or used for purposes other than that for which it is was intended without prior and express written authorization from CEGASA.

Contact

cecoso

C/Marie Curie, 1 Parque Tecnológico de Álava MIÑANO Código postal 01510

Tel. +34 945 313738 www.cegasa.es

TCCv2.0 BTH Revision history

REV.	DATE	RECORD OF CHANGES / RESPONSIBLE
01	02/11/2021	Initial document
02	12/11/2021	Revision
03	17/11/2021	CERBO GX cable
04	25/11/2021	SMA cable 3-phase installations
05	15/12/2021	24h Energy / Total Energy
06	18/02/2022	Binary code explanation

Disclaimer and warranty

The information and established recommendations are made in good faith and are considered to be accurate as of the date of preparation.

Confidentiality

All information provided by CEGASA in this User Manual is confidential and shall not be disclosed to third parties, without prior express written consent from CEGASA.

Contact

cecoso

C/Marie Curie, 1 Parque Tecnológico de Álava MIÑANO Código postal 01510

Tel. +34 945 313738 www.cegasa.es

Contents

1	Intro	duction		06	
	1.2	Product	codes	06	
2	Technical characteristics				
	2.1	Cyclabil	ity test conditions	08	
	2.2	Battery	Management System Technical Specifications	08	
		2.2.1	Safeguards during operation mode	08	
		2.2.2	Standby mode	08	
		2.2.3	Cell balancing	08	
3	Safe	ty		09	
	3.1	General	information	10	
	3.2	Safety In	nstructions- Potential hazards	10	
	3.3	Electrica	al safety	10	
	3.4	Mechan	ical safety	11	
	3.5	User rec	quirements	11	
	3.6	Lockout	t-tagout of machines and installations (L.O.T.O.)	11	
	3.7	Switchir	ng, measurements and checks	11	
4	Asse	mbly of	the equipment	12	
	4.1	Potentia	I hazards	12	
	4.2	2 Unpacking the product 12			
	4.3	Initial ch	neck	13	
	4.4	Final ins	stallation w/ BASE FRAME accessory (109512)	13	
	4.5	Parallel	power connectio	14	
		4.5.1	ULTRA 175 units fitted 1 High	15	
		4.5.2	ULTRA 175 units fitted 2 High	15	
		4.5.3	Case of ULTRA 175 units fitted 1 and 2 High	16	
		4.5.4	Maximum powers depending on set-up	16	
	4.6	TCCv2.0	O CAN system	17	
5	Amb	ient ope	rating conditions	17	
6	Main	itenance	and storage procedure	17	
7	Char	ging WI	THOUT TCCv2.0	18	
8	Disc	harging		18	
9	Over	-dischar	ge	19	
10	10 Transport regulations				
11	11 Product warranty				

т	Cv2.	0 BTH sy	/stem	20	
1	Intro	duction		21	
	1.1	Purpose	e of this document	21	
	1.2	Acronyr	ns	21	
2	тсс	v2.0 BTH	l objective	21	
3	Com	ponent j	parts	22	
4	тсс	V2.0 Inst	allation Steps with ULTRA 175	23	
5	Ope	ration		28	
	5.1	LED Dis	play	28	
	5.2	Operatii	ng with SOF	28	
		5.2.1	Charge voltage based on battery temperature	28	
		5.2.2	Charge current based on battery temperature and SOC	28	
	5.3	Alarms		28	
	5.4	Warning	js	29	
	5.5	SOC up	date	29	
	5.6	FW upd	ate	29	
	5.7	Display	using "PuTTY" SW	29	
6	Com	municat	ions	30	
	6.1	CAN pro	otocol	30	
	6.2 Output pinout				
	6.3 Bluetooth connection				
A	NEX	- 01 TCC	Cv2.0 CAN (109765)	34	
	CON	/IPATIBIL	ITY WITH VICTRON ENERGY EQUIPMENT	34	
A	NEX	- 02 TCC	Cv2.0 CAN (109765)	40	
	CON	/IPATIBIL	ITY WITH SMA EQUIPMENT	40	
A	ANNEX - 03 TCCv2.0 CAN (109765				
	CON	/IPATIBIL	ITY WITH STUDER EQUIPMENT	44	
A	NEX	- 04 TCC	Cv2.0 CAN (109765)	48	
	CON	/IPATIBIL	ITY WITH GOODWE EQUIPMENT	48	
A	NEX	- 05 TCC	Cv2.0 CAN (109765)	53	
	COMPATIBILITY WITH SOLIS EQUIPMENT				
A	NEX	- 06 TCC	Cv2.0 CAN (109765)	57	

1. Introduction

1.1 Purpose

The following document presents the first steps to ensure that the eBick ULTRA 100C systems are installed and used safely. The company recommends reading the whole user manual beforehand, which can be downloaded from the website or requested in electronic format from the company supplying the equipment.

1.2 Product codes

Products:

✓ ULTRA 175 module w/o base frame or v	wheels (48Vdc 280Ah) (109624)
--	-------------------------------

Accessories:

✓ Base frame with wheels	(109512)
✓ TCCv2.0 CAN BLE	(109765)
✓ TCC communications cable (CERBO GX and 3-PHASE)	(109755)
✓ RJ45 COM extender cable	(109642)

1.3 1.3 Acronyms

FAT	Factory Acceptance Tests
BMS	Battery management system
eBick_ULTRA 175	Battery pack de 48V 280Ah
SOC	State of charge. Cantidad de energía en la batería

2. Technical characteristics



	ULTRA 175_48V 280Ah	ULTRA 175_48V 560Ah	3 MODULE SETUP (To busbar)	4 MODULE SETUP (To busbar)
Mechanical characteristics				
Equipment dimensions (mm)				
Width	- 70	65		
Depth	40	05		
Height	60	00		
Height w/o base frame	470	-		
Equipment total weight (kg)	105	210		
Finish / Battery seal	IP	30		
Electrical characteristics	-			
Rated voltage (V)	- 4	18	4	8
Maximum voltage (V)	52	2,2	52	2,2
Minimum voltage (V)	4	13	4	3
Rated capacity (Ah	280	560	840	1120
Rated energy (kWh)	13,5	27	40,5	54
Type of communications	CAN	Bus		
Protecciones eléctricas				
Overload	ok			
Over-discharge	ok			
Short-circuit	ok			
Over-current	ok			
Over-temperature	C	ok		
Passive balancing	ok			
Current level (A)	-			
Maximum continuous charge current	175	320	450	500
Recommended continuous charge current	140	280	400	475
Rated continuous discharge current	140	280	400	475
Maximum continuous discharge current	175; (8kW)	340; (15KW)	500; (22.5kW)	575; (26KW)
Peak discharge (1) current/time	225 (5 minutes); (10kW)	450 (5 minutes); (20KW)	600 (5 minutes); (26KW)	800 (5 minutes); (35KW)
Peak discharge (2) current/time	270 (5s); (12kW)	540 (5s); (24KW)	750 (5s); (32KW)	875 (5s); (40KW)
Peak discharge (3) current/time	400 (<1s)	800 (<1s)	1000 (<1s)	1000 (<1s)
Electrical connections				
Power Connector	REMA SR 350 (Similar connector is sup pins for	Connector Grey oplied for installation with 95mm²)		
Power Connector	RJ45 Cat 5e (parallel cable)			
Type approval				
	CEN	Mark		
UN 38.3				

2.1 Cyclability test conditions

Parameters based on IEC 61960 standard Tested under the following conditions:

Parameter	Conditions as per IEC 61960	Test conditions for eBick ULTRA 175
DoD	100%	80%
Temperature	20 +/- 5°C	20 +/- 5°C
Charge C-Rate / Current	0,2 C	0.2C / 55A
Discharge C-Rate / Current	0,5 C	0.5C / 140A
Final capacity after test	> 60% of rated capacity	> 80% of BOL capacity: > 224Ah
Rest period between charge and discharge	At least 1 hour after each process	1 hour after each process
Storage temperature between charge and discharge	20 +/- 5°C	20 +/- 5°C
Other test conditions	As per IEC 61	960 standard

Table 2.

2.2 Battery Management System Technical

Specifications

The BMS has the following safeguards:

- Overvoltage
- Undervoltage.
- Overcurrent during CHARGE process
- Overcurrent during DISCHARGE process.
- Temperature protection (DISCHARGE)
- Temperature protection (CHARGE)
- Short-circuit

2.2.1 Safeguards during operation mode

OVP (over-voltage protection):

When a cell reaches 3800 mV, the BMS opens the power connections, terminating the charging process, in order to protect the battery.

UVP (under-voltage protection):

When a cell is discharged to a voltage below 2600 mV, the BMS opens the power connections, terminating discharge.

OCP (over-current protection):

OTP (over-temperature protection):

- Discharge: 70 ° C
- Charge: 55 °C

UTP (under-temperature protection):

- Discharge: -20°C
- Charge: 0 °C

2.2. Standby mode

The Cegasa BMS automatically switches to standby mode when it detects that there is no current (charge or discharge) or communications.

Consumption in standby mode is less than 800μ A. E.g., BMS consumption in standby mode over 3 months is less than 1% of initial capacity.

2.2.3 Cell balancing

Balancing is initiated when cell voltage reaches 3450 mV. Balancing current is 30 \pm 5 mA





WARNING:

RISK OF FIRE OR EXPLOSION

Failure to comply with safety messages may cause serious injury, death or damage to property



DANGER!

Check that the voltage is within range before connecting the equipment to the inverter. NEVER connect if the voltage is out of range.



DANGER!

NEVER connect the ULTRA 175 units in SERIES..



DANGER!

All tools shall be approved for working with 60V. All personnel working with low voltage systems shall be duly qualified and certified in accordance with local regulations. The equipment always has a DC voltage at the terminals of both power connectors (top and bottom).



DANGER!

NEVER remove or bypass switching and protection systems.



DANGER!

Do not short-circuit the modules' terminals. The short-circuit current may be several thousand amperes. Prolonged short-circuiting will destroy the battery module and electrolyte may leak out of the cells, causing a fire and/or explosion.



DANGER!

eBick ULTRA 175 installation and maintenance personnel shall wear protective apparel, special gloves and safety glasses. All personal metal objects such as wristwatches, rings, jewellery, etc., shall NOT be worn while working with the Modules.



DANGER!

To avoid short-circuits and electric shock, use safety tools (EN 60900) and protection devices when installing and servicing the equipment.



DANGER! Do not connect or disconnect th

Do not connect or disconnect the load when the equipment is operating (current circulating). This may cause an electric arc and expose personnel to high DC voltage. The electric arc might also destroy connectors, due to a welding effect.



DANGER! In case of fire, disconnect th

In case of fire, disconnect the circuit from the battery and use a CO2 extinguisher to extinguish the fire. The batteries contain flammable materials. Always inform fire-fighters about the lithium batteries.



DANGER!

Do not open the covers on the battery modules. Do not place or drop conductive objects inside the battery module or between the string's terminals.

DANGER!

Do not expose to temperatures above 65°C. The equipment will not be operational beyond these temperatures, however, even with non-operational equipment exposing the cells to high temperatures may cause fire and/or explosion.



DANGER!

Do not immerse the battery in water or any other liquid.



DANGER!

Never drop or knock the modules.



DANGER!

If chargers/converters are used, use only those authorised by CEGASA. Misuse of the battery module during charging or discharging may cause the equipment to age prematurely leading to fire and/or explosion.



DANGER!

In the event of an emergency, read the MSDS (Material Safety Data Sheet) for the cells before proceeding.

3.1 General information

The eBick ULTRA 175 is an energy storage system using Li-ion LFP cells. Under normal conditions there is always a voltage at the terminals of both power connectors (top and bottom).

The whole system contains a high energy capacity. To minimize the risk of electric shock, short-circuit, explosion and/or fire, follow the relevant procedures and local guidelines, as well as the instructions that are included with the system.

Only qualified personnel should perform the installation, in accordance with the applicable regulations. Systems with visible electrical connections have to be isolated from public access. For safety purposes, cover all direct connections and terminals.

Carefully read, understand and apply all requirements presented in this section.

3.2 Safety Instructions- Potential hazards

- The area around the eBick ULTRA shall be kept clear and free of combustible materials, gasoline and/or other flammable fumes, vapours and liquids.
- The area defined by safety margins for the necessary supply and venting of air shall be respected.
- In the event of an emergency, the eBick ULTRA 175 has electrical safety cut-off elements (fuses and MOSFETs).
 It is advisable to install an element that protects against over-current and possible short-circuiting during the final installation. It is also advisable that the cut-off element can be manually operated if necessary.

Remember, that because this deals with batteries, the internal DC bus will always be live.

- Do not use the module if any of its parts have been immersed in water. A water damaged cell is potentially dangerous. Any attempts to use the system could cause a fire or an explosion. In such cases, contact CEGASA ENERGY to have the battery pack inspected.
- The following instructions shall always be followed:
 - Any air inlet or outlet within the room shall be kept clear and free of obstacles.
 - The floor shall be capable of bearing the weight of the system.
 - There shall be no obvious signs of wear on any eBick ULTRA element.
 - As this is a battery, under normal conditions there will always be a voltage on the +/- terminals.

3.3 Electrical safety

- Never remove safety guards or devices that protect against live parts.
- Do not reach inside the modules, nor touch any internal component.
- Do not use or handle any eBick ULTRA 175 component when accidentally wet, or with wet hands or feet.
- In the event of a failure or incident, as a first step cut off the current. To rescue a person being electrocuted, do not touch them but immediately cut the current.



- If it is not possible or takes too long to cut the current, try to disengage them by means of an insulating element (wooden strip or board, rope, wooden chair ...).
- Make sure that the output and input connection cables are not short-circuited.
- Make sure there is no short circuit between positive and negative terminals at any point.
- Make sure there is always protective insulation on the output and input cables and a reliable connection.
- Never use cables that are visibly damaged or that may be suspected of being damaged.
- Minimise conductivity, avoiding surfaces in contact with water. Hands and clothes have to be dry.
- Do not use, install or store the system under wet or damp conditions.

3.4 Mechanical safety

- Due to the weight of the battery modules (>105 kg), mechanical means have to be employed to install them.
- Do not stack eBick ULTRA 175 modules more than 2 high. If this is absolutely essential for the installation, consult CEGA-SA about how to mechanically fasten the modules and the power connection.

3.5 User requirements

- In addition to personnel who work with the module, workplace users should also implement safety measure by applying the minimum provisions of RD 614/2001 on the protection of the health and safety of workers exposed to electrical risk in the workplace.
- Hazards related to electrical risk are specifically identified during the work process with this equipment. This does not exclude the possible existence of other risks present during handling and use, such as overexertion, posture, or other measures against health risks. Operators shall receive the necessary training, sufficient to be able to prevent and avoid any risks arising from use of the equipment.
- By design the equipment protects against these risks under normal operating conditions, however, it is with operations that differ from normal ones (installation, maintenance, ...) where special precautions have to be taken.
- Particular care should be taken when handling modules, due to their weight. Respect guidelines according to current regulations regarding ergonomics in the workplace (Royal Decree 487/1997). Use appropriate handling equipment.

3.6 Lockout-tagout of machines and installations

(L.O.T.O.)

• To perform operations absent of voltage (L.O.T.O.), the device must be locked and tagged to non-hazardous voltage values. The following section is based on the lockout-tagout at several points according to RD 614/2001:

- 1. Restrict access to the work area to prevent entry of unauthorised personnel.
- 2. It shall be disconnected and isolated from the supply network or connection to the converter.
- 3. Given that the batteries are an energy storage system, it is impossible to make certain points of the system free of voltage. If there is any exposed point where the voltage cannot be eliminated, the terminals will have to be tagged, indicating the voltage value at that point.
- 4. Prior to conducting any work, the voltage shall be measured at the point where the work is to be done. Some points may be energised directly from the batteries.
 - To carry this out, it is necessary to do the following:
 - Use only 60V insulated tools
 - If terminals are exposed during the sectioning process, use 60V rated insulating gloves.
 - Use a face shield during the work.
 - Should it be necessary to perform an operation on a battery pack, place the modules on insulating matting.
 - Use insulating footwear.
 - To avoid possible short-circuiting, do not carry any conductive device (e.g. pens, tape measures, etc.) during the work.
 - Do not wear any metal, conductive or sharp edged accessories.
 - It is recommended that the installation's positive and negative cables be of the same cross-section and length.



3.7 Switching, measurements and checks

The regulation permits operations and interventions without lockout-tagout, provided that an equivalent level of safety is guaranteed.

These interventions are called switching, trials and checks. They have to be carried out by authorised personnel with protection devices and personal protective equipment appropriate for the voltages in question.

- Special protection against short-circuits should be ensured. Instructions to follow:
- The operations shall only be carried by authorised, duly trained, personnel.

- Safety apparel that covers the whole body (long sleeves) shall be used. Fireproof or flame retardant, with protection against chemicals and arc flash.
- The work shall be done from a solid, stable support
- If a work table is used, it shall be insulated or covered with insulating matting.
- No terminal with an electrical charge should be left uncovered. If, after removing the connections, the terminals are exposed then they have to be protected with the terminal covers supplied.
- All tools shall be insulated and rated up to 60V
- 4. Assembly of the equipment

Caution: Given that the modules are supplied with electrical charge levels necessary to maintain the chemical properties of the batteries, the entire installation process shall performed with the recommended protection equipment.

Each eBick ULTRA 175 module is pre-wired, pre-set and factory tested. After receiving and unpacking the system, the installer should find the following pre-assembled:

- An eBick ULTRA 175 module, depending on the set-up
- A protective cover to cover the terminal that is left free without a connection
- An SB350 REMA or ANDERSON connector set and pins ref.102753 for connecting the final installation
- A plate and two screws for fastening the front of the modules together (when they are stacked in two high)

4.1 Potential hazards



- Operators shall not wear or carry any metal elements or devices.
- The work area shall be free of obstacles.
- If necessary, when there are exposed terminals nylon slings shall be used instead of chains.
- The operator shall wear a face shield or safety glasses to protect against short-circuits
- Occasionally, depending on the operation, there should be an OHS assistant present.
- This person should satisfy that stated in Annex IV of RD 614/2001



The maximum height of these stackable modules is TWO units.



A two unit TOWER (interconnected) CANNOT be connected to ONE SINGLE battery. Imbalances would be generated in the charge and discharge currents. Please consult CEGASA





4.2 Unpacking the product

The ULTRA 175 eBick system is designed with a special box to facilitate ADR transportation. Cegasa reserves the right to charge the customer for the box and its transportation. It is advisable to keep this box for possible returns due to warranty issues. Otherwise, the customer shall have to ask CEGASA for a new box to accommodate ADR transportation.

Because the equipment is very heavy, it is **ESSENTIAL** to remember to take extreme care when moving or lowering it, as there is always a risk of falls and/or entrapment.



In all circumstances the installer is responsible for unpacking the product from the box and the final installation of the module.

Unpack the equipment, removing the strapping, cardboard box and cardboard supports.



Save all the materials for possible future shipments of the battery due to warranty issues.



4.3 Initial check

Before beginning the installation, it is advisable to check the state of the modules:

- 1. Check the state of the modules. No knocks or apparent damage; The nameplate bearing the serial number fitted to the back of it.
- 2. With the aid of a multimeter measure DC voltage between the positive and negative terminals on each battery module (points 1 & 2). Check that polarity is correct and that the voltage is within range (\approx 48VDC) The retractable red lug on the cable indicates positive polarity, whereas the black one indicates negative polarity.



4.4 Final installation w/ BASE FRAME accessory

(109512)

By purchasing the BASE FRAME accessory with built-in wheels, it is possible mount ONE or TWO modules on the frame and move it about (in a simpler way) before securing it.

Steps to follow:

a) Place the module on top of the base frame, inserting the guides on the bottom of the module into the top slots on the frame.



b)At the front, fasten the module to the base frame using the two plates (flat) and screws supplied with the base frame assembly. An ALLEN key is required.



c) At the back, fasten the module to the base frame using the two plates (bent) and screws (2 metric threads - bottom and 2 plastic threads - top) supplied with the base frame assembly. An ALLEN key and screwdriver are required.



d)When mounting TWO modules, the front of the modules have to be fastened together using the fastening plates (long flat) and screws that are supplied with each of the modules. An ALLEN key is required.



- e) Once the eBick ULTRA 175 is in its final position, the 4 feet on the base frame can be lowered (incorporated into the wheels themselves) by using an adjustable spanner to turn the red wheel.
 - This keeps the equipment "braked" in its final position. It is important to level the legs with respect to the ground.



Wheel for lowering the foot f) If deemed necessary, the base frame can be secured to the wall of floor by using the 3 x Ø10mm holes at the back of it. Please consult CEGASA if the installation has to be secured.



g) In the event that several columns have to be joined together, this is also possible by using a nut-bolt connection through the $2 \times \emptyset 10$ mm holes that are on the sides of the base frame, once the equipment is in position.



4.5 Parallel power connection

As mentioned throughout this document, the ULTRA 175 units can only be connected to each other in parallel, up to a maximum of 4 **ULTRA 175 units**

The equipment is supplied with Connector + Pins (Ref. SB350 REMA grey and pins) to connect to an inverter or the final application. It is advisable to use cable with a cross-section of 95mm2 - 105mm2.

Follow the pin manufacturer's recommendations on cable stripping distance. In this case 33mm.



Cecoso



TYPE	Contact Ref.	Cable Section	"X" in mm (image 1)
>SR50	109356	10/12 AWG	13,5
>SR50	109358	8 AWG	12,5
>SR50	109354	6 AWG	12
>SR175	10936	4 AWG	26
>SR175	109364	2 AWG	26,5
>SR175	109363	1/0 AWG	26
>SR350	109368	1/0 AWG	30,5
>SR350	109371	2/0 AWG	30,5
>SR350	102752	3/0 AWG	33
>SR350	102753	4/0 AWG	33

Important notes:

- ✓ Under no circumstances can ULTRA 175 modules be connected in series.
- ✓ The system is self-powered and does not require any connection to an external supply.
- ✓ The length of the interconnecting cables affects the final voltage detected by the application. It is recommended that the power output cables be of the same cross-section and length.
- ✓ It is advisable to install the battery as close as possible to the element that is going to use it (inverter, DC bus, ...) and avoid sharp curves or bends in the cables.
- ✓ For recommended cable lengths, wire sizes and characteristics, please contact CEGASA.

4.5.1 ULTRA 175 units fitted 1 high

These units can be connected to each other in parallel (up to a maximum of 4 units) **ALWAYS** through an appropriately dimensioned busbar installed by the installer.

It is advisable to use cable with a minimum cross-section of 95mm2 - 105mm2. See point 4.5

It is also advisable to fit a 48Vdc 500A fuse on each positive input to the positive power busbar.



4.5.2 ULTRA 175 units fitted 2 high

These units can be connected to each other in parallel (up to a maximum of 4 units) **ALWAYS** through an appropriately dimensioned busbar installed by the installer.

It is advisable to use cable with a minimum cross-section of 95mm2 - 105mm2. See point 4.5

It is also advisable to fit a 48Vdc 500A fuse on each positive input to the positive power busbar.

On installations stacked 2 high, it is advisable to connect to the general power busbar using two power connectors and their pins (included); The tower's general negative has to be connected to the top connector and the tower's general positive has to be connected to the bottom connector.

This ensures better distribution of high currents through both modules. *As shown in the image below.*



4.5.3 Case of ULTRA 175 units fitted 1 and 2 high

In the case of combining modules of ONE and TWO heights, each module has to be connected to the busbar individually (3 inputs) to prevent imbalances in the modules due to a different distribution of currents during the charging and discharging processes.

It is advisable to use cable with a minimum cross-section of 95mm2 - 105mm2. See point 4.5

It is also advisable to fit a 48Vdc 500A fuse on each positive input to the positive power busbar.

As shown in the image below.



4.5.4 Maximum powers depending on set-up

During discharge:

The maximum power for each of the modules across the entire SOC range is 8kW.

(*) Depending on ambient temperature conditions during the discharge process.

En carga;

(**) If using TCC, the charge parameters (charge voltage and current) are always sent to the inverter via communications.

(***) Even with TCC it is ESSENTIAL to configure the charge values of the solar or wind power controllers in DC (MPPT or similar). Consult CEGASA to establish the ideal charging conditions for the battery.

If the installation has a DIESEL generator set, it is necessary to configure its start and stop values. Consult CEGASA to establish the ideal start/stop conditions for the battery.

16



4.6 TCCv2.0 CAN system

The ULTRA 175 range can work with a TCC CAN system, offering the possibility to communicate via CAN BUS with commercial inverter/charger equipment from VICTRON ENERGY, SMA, STUDER brands, etc. For other brands of equipment, please consult the CEGASA technical team. The TCCv2.0 CAN system is sold separately and offers the following advantages (with an extremely simple connection system):

a) CAN BUS communication based on protocols defined by major inverter/charger equipment brands.

b)Using CAN communications to send the most relevant battery data, such as:

- The battery's actual state of charge (SOC)
- Actual current and voltage during charge or discharge
- Battery temperatures
- **Battery alarms;** if the battery suffers a mishap, it sends an alarm to the inverter to display or notify and in turn a setpoint charge/discharge current value of 0A so that the process can finish but without disconnecting the inverter/ charger equipment. Reset is fully automatic as soon as the alarm is triggered in the battery, and the process continues with no need of a manual reset.
- Data for optimal battery charge; depending on the battery's SOC and its temperature, the inverter constantly

5. Ambient operating conditions

receives CHARGE VOLTAGE and CHARGE CURRENT variables so that the inverter/charger can modulate the charge process.c) LEDs (4) para visualización del estado de carga (SOC) pulsando un botón.

- c) LEDs (4) to display the state of charge (SOC) by pressing a button.
- d)LED status to see if the system is OK or an alarm/warning is active.
- e) USB port for SW updates
- f) Bluetooth connection to display parameters in mobile device APP (iOS and ANDROID).

Example of a of TCCv2.0 CAN connection system with up to 4 batteries:



Parameter	Technical specifications	Comments
Operating Temperature Range during CHARGE (°C)	0°C ~ + 50°C	
Operating Temperature Range during DISCHARGE (°C)	-20°C ~ + 50°C	
Humidity (RH%)	5%≤RH≤85%	

6. Maintenance and storage procedure

The customer is responsible for complying with this procedure:

- ✓ Each month, check the voltage (within the range of the battery) and the visual state of the casing (no dents, swelling or discolouration) and the positive and negative terminals of the power connector (free of oxidation).
- ✓ A full charge is recommended every 7-14 days to update the SoC for measurement errors.

Storage recommendations

- ✓ Do not expose to direct sunlight or rainfall
- ✓ If the battery is to be left off (> 3 months), then it has to be charged up to 40 - 60% SoC.

Parameter	Technical specifications	Comment
RECOMMENDED STORAGE SOC (%)	40-60%	
STORAGE TEMPERATURE RANGE (°C	-20°C ∼ + 45°C	
RECOMMENDED STORAGE TEMPERATURE RANGE (°C)	15°C ~ + 25°C	
HUMIDITY	5% ≤RH≤85%	

Should the module's single-pole fuse need to be changed, then proceed as follows:

1. Reference of single-pole fuse to be changed: Code: 576-155.0892.6301

https://www.littelfuse.com/products/fuses/automotive-passenger-car/high-current-fuses/cf8/155_0892_6171.aspx



2. Use a flat-blade screwdriver to help release the module's left-hand side cover.

7. Charging WITHOUT TCCv2.0

When working without the CEGASA TCCv2.0 CAN system, it is advisable to configure the battery chargers with the following CHARGE parameters per installed module:

Model	Ultra 175 48280F
Charge voltage (BULK)	52V
Recommend charge current (*)	90 A
Float voltage (FLOAT)	51,8V

8. Discharging WITHOUT TCCv2.0

When working without the CEGASA TCC CAN system or working with it but without any communications with the final equipment, it is advisable to configure the inverters using the following DISCHARGE parameters:

Model	Ultra 175 48280F
Minimum discharge voltage (Vcutoff) (*)	44V
MAXIMUM discharge power (**)	8KW

(*) The minimum discharge voltage depends on the level of current and the ambient temperature.

(**) The discharge power may be less than this value but never above it, as this would trigger the system's protection devices.

- 3. Check that there is NO continuity between positive and negative on the fuse to verify that it has blown.
- 4. Use an insulated spanner to remove the fuse, putting the fasteners to one side.
- 5. Insert the new fuse, refit the fasteners and tighten to a torque of 12Nm



The graphs below provide a summary of the battery's different discharge levels and the evolution of State of Charge (SOC) in order to visualize the flatness of the voltage curve during different discharges and to establish a direct voltage/battery SOC relationship.

Summary table					
Voltage	DCH 0,5C	DCH 0,3C	DCH 0,25C	DCH 0,16C	SOC
(V) in DCH	50	50,2	51	51,8	100%
(25°C,	48,5	48,6	49,1	49,2	80%
SOH	48,2	48,4	48,7	48,8	60%
100%)	48	48,2	48,5	48,6	40%
	47,2	47,4	47,8	48	20%
	45,8	46	47	47,2	10%





9. Over-discharge

In the event of battery over-discharge due to an installation problem, the following actions are recommended in order to restart the batteries and proceed to recharge them:

- a) Disconnect the power from all the batteries through its grey connector; (Isolate all batteries)
- b) Remove the TCC communication cable ("battery" position)
- c) Wait 30 seconds

- d) Reconnect power to all the batteries using the grey connector
- e) Reconnect the TCC communication cable ("battery" position)
- f) The TCC light should light up
- g) There is now voltage at the power bus terminals again, starting the inverter/charger
- h) Charge the system to recover the batteries

10. Transport regulations

11. Product warranty

ADR material: Class 9 Hazardous Materials

UN MANUAL OF TESTS & CRITERIA, Subsection 38.3.

The BP complies with the regulations and tests established in the UN MANUAL OF TESTS & CRITERIA.

TBD



TCCv2.0 CAN (109765)

TCCv2.0 BTH SYSTEM





1.1 Purpose of this document

This manual describes the functionality of the TCCv2.0 interface and provides generic instructions for common use cases.

1.2 Acronyms

BMS	Battery Management System
BP	Pack Battery Pack
SOC	State of Charge
SOF	State of Function)

2. TCCv2.0 purpose

The main purpose of the TCCv2.0 is to be able to use a CEGA-SA battery system (ULTRA175) with commercial inverter/charger equipment or other equipment or applications that may have CAN BUS communications.

For such purposes, the TCCv2.0 communicates, on the one hand, with the system's batteries and, on the other, transmits information from these to the application's end equipment via CAN BUS communications.

In the case of the **ULTRA175** the maximum number of batteries that can be connected in the system is 4.

The TCCv2.0 system uses CAN BUS communications to read the present state of the batteries connected on the serial bus. Some of the most important registers read are voltage, current, state of charge (SOC), temperatures, alarms...

Once it has the information about the battery, the TCCv2.0 system transfers this to the end equipment using CAN BUS communications. The CAN registers that are sent to the end equipment refer to the current state of the battery system (voltage, current, temperature, SOC...), it also includes the State of Function (SOF): constantly sending the optimal voltage and current data needed to carry out an optimal charge/discharge process of the battery system based on the SOC and battery temperatures.



3. Component parts

Listed below are the elements that are supplied in with the TCCv2.0 system:

- TCCV2.0 system:



 TCCV2.0 Battery Cable connected between the battery and the TCCV2.0 system; (RJ45 CAT5e PARALLEL TYPE)
 1.5 metre long, connected between the TCCV2.0 system and the HUB (output) or the ULTRA module.



- **120**Ω communications terminating resistor on RJ45 connector; this is connected to the TCCv2.0 housing called *OUTPUT*.



- **USB drive with SW, required to configure** the TCC CAN (compatible inverter brand, battery model, total number of batteries in installation, etc.); Manuals included.
- TCCV2.0 BUS CAN EXT Output Cable



• Victron Inverters:

Use a **standard direct/parallel ETHERNET** cable of the required length for the installation

(**) If using CERBO GX and VENUS GX systems, it is advisable to connect the cable mentioned in the previous point to the port called BMS-CAN.

• SMA and Studer Inverters:

Use a standard **direct/parallel ETHERNET cable** of the required length for the installation

Ingeteam Inverters::

If using Ingeteam inverters, the installer has to prepare a custom cable, since the connection to these inverters is made using quick connectors.

The three available CAN wires (CAN-H, CAN-L and GND) should be connected as follows:

- Pin 2: GND
- Pin 4: CANH
- Pin 5: CANL
- Solis & Goodwe Inverters: Two options
 - a) The installer can prepare a direct/parallel ETHER-NET cable, pinning out only pins 2, 4 and 5 (See initial RJ45 connector image)



- b) Use a **standard parallel ETHERNET** cable of the required length for the installation, making the following changes on the TCC:
 - 1. Remove the 4 rear screws from the back cover and remove the cover:



2. Locate and remove the two jumpers from connectors A and B, then close the back cover:



Before:



After removing the jumpers



4. TCCV2.0 Installation Steps with ULTRA175

Follow these steps to install the TCCv2.0 system with CEGASA ULTRA 175 batteries:

Beforehand, place the modules in their final position and power-connect all the modules to the power busbar.

(DO NOT CONNECT THE COMMUNICATIONS YET)



- 1. Connect the battery pack to the inverter (VICTRON, SMA, STUDER...), leaving it powered up and turned on or started. Still not connecting the communication cable with the batteries.
- 2. Meanwhile, configure the "tccConfig.cfg" installation file as follows:
 - 2.1. Open the "TCC_Configurator.exe" program provided by CEGASA. It is an executable file that does not require installation.

llow- File Help	
Ce	
	GOSC
тсс са	onfiguration Name:
Battery	/ model:
ULTRA	~
BMS:	
CEGAS	iA ~
Applic	ation
CEGAS	iA ~
Numb	er of modules:
1	v
	TCC CC Battery ULTRA BMS: CEGAS Applic CEGAS Numb

- 2.3. In the "TCC Configuration Name" field, write the name of the folder that is going to contain the configuration file (E.g., "EXAMPLE"). After which, choose the path where it is going to be stored.
- 1.4 The "Battery model" field has a drop-down menu. Use this drop-down to select the corresponding battery type. In this case **ULTRA**.



1.5. The "BMS" field has a drop-down menu. Use this drop-down to select the corresponding BMS type. In this case Cegasa.



1.6. The "Application" field has a drop-down menu. Use this drop-down to select the corresponding inverter model or application. In this case **Victron**.

C TCC v2.0				×
File Help				
CC	20	0	C	2
C			-	
TCC	Configurati	on Name:		
	1123			
Bat	tery model:			
ULT	IRA		~	
BM	S:			
CEO	SASA		Ý	
App	lication:			
CEO	5ASA		~	
CEC	ASA			
VIC	TRON			
SM	A			
STU	DER			
GO	ODWE			
	Create con	figuration fil	e	

1.7. The "Number of modules" field has a drop-down menu. Use this dropdown to select the corresponding number of modules. In this case **2.**

er	CC v2.0	1	10	×
File	Help			
	(Child) meeting			
-		-	_	-
C	GC	0		
~				
	TCC Configurat	ion Name:		
	1			
	1) -		12	
	Battery model:			
	ULTRA		~	
	Characteristics			
	BMS:			
	CEGASA		-	
	1			
	Application:			
	CEGASA			
	Number of mo	dules:		
	1		~	
	1			
	2			
	3			
	4			
	5			
_	6		_	
	1			
	8			

1.8. Once all the fields have been filled in, click on "Create configuration file". Choose the location where the folder is to be generated with the name "EXAMPLE" and with the configuration file inside it.

Cegasa

24



The said file is to be used later to configure the TCC.

e sta	a Jac Second	
File Help	C Select certination folder	×
COCOSC	👷 🗧 🗧 - 💠 🚔 - Edu equipo	
	Cramer +	E · 0
	T. Manuales Hor * ~ Carpetas (7)	
TCC Configuration Name:	Goodwe	-
Example		1 Contraction (1)
Battery model) 🔿 DreDrive	
ULTIA -	v III Line epupo	and and a second
-	1 SA SCANER BAT	-
CEGASA	> 🕹 Descargas	Objetos 30
	i 🙎 Documentos	
Application	Escritorio Videes	
	> all indgenes	
Number of modules	 Dispositivos y undades (J) 	
2	Carpata fire envire	
Create configuration file	and a second	Seleccionar carpeta Caecolar
Selecting destination		

1.9. Now copy the "tccConfig" file, found inside the "EXAM-PLE" folder that has just been created, to the root directory of the USB drive.



- 1.10. Our USB drive, now containing the configuration file, should look as follows:
- 1.11. Now remove the USB drive and continue with the following steps:



3. Place the TCCv2.0 into its final position, making sure that the length of the RJ45 cable reaches between the TCCv2.0 and the top position of the RJ45 connector on the top module and fasten it to the wall; having previously attached a DIN rail to the wall with the help of two M5 screws and their corresponding wall plugs. The back of the TCCv2.0 has some guides that fit onto the DIN rail already attached to the wall.



- 4. In the case of **TWO module** towers proceed as follows:
 - a) Plug the USB drive, containing the configuration file saved in the previous step (1), into the TCCv2.0



b) Connect the RJ45 cable between the top module (top position) and the TCCv2.0 in the position marked "BATTERY". NEVER CONNECT THE BATTERIES TO ANY OTHER RJ45 PORT CALLED "OUTPUT OR INVERTER" (in some versions) Do not yet remove the RJ45 format resistor connected to the port called "OUTPUT or INVERTER" (in some versions). NEVER CONNECT THE BATTERIES TO ANY OTHER RJ45 PORT



c) When inserting said cable from the previous point, the LEDs light up progressively while the USB configuration is loaded and then flash when the installation is complete. When all of the LEDs are flashing, the USB drive can be removed. Via the LEDs, the TCC now indicates the next battery to connect. d) Connect the top connector on the second module to the bottom connector on the first module.



e) Connect the bottom connector on the second module to the bottom connector on the third. In the case of several towers of two heights, the communication extension cable (109642) is necessary, see image below. ALWAYS CONNECT IN RJ45 BOTTOM POSITIONS, as in the image.



f) Connect the top connector on the third module to the bottom one on the fourth.



g) Connect the terminating resistor to the top connector of the fourth module, leaving free the RJ45 port called "OUTPUT or INVERTER" (in some versions).



a) Plug the USB drive containing the configuration file saved in the previous step (1) into the TCCv2.0



b) Connect the RJ45 cable between the top connector on the first module and the TCCv2.0, in the position marked "BATTERY". Do not yet remove the RJ45 format resistor connected to the port called "OUTPUT or INVERTER" (in some versions). NEVER CON-NECT THE BATTERIES TO ANY OTHER RJ45 PORT



- c) When inserting said cable from the previous point, the LEDs light up progressively while the USB configuration is loaded and then flash when the installation is complete. When the LEDs are flashing, the USB drive can be removed. Via the LEDs, the TCC now indicates the next battery to connect.
- d) Connect the top connector on the second module to the bottom connector on the first module. NEVER BETWEEN TOP or BOTTOM CONNECTORS always alternating.





e) Connect the top connector on the third module to the bottom connector on the second module. NEVER BETWEEN TOP or BOTTOM CONNECTORS always alternating.



 f) Connect the top connector on the fourth module to the bottom connector on the third module. NEVER BETWEEN TOP or BOTTOM CONNECTORS always alternating.

IN THE CASE OF VICTRON INVERTERS, CONNECT TO THE FOLLOWING PORT:

- BMS-CAN in the case of Cerbo GX

or

- VE-CAN in the case of Colour Control and VENUS GX



Note; If there is no communication with the inverter at this point, then disconnect the cable that goes to the "battery" position on the TCC, wait 5 seconds and reconnect it. This basically resets the communications.

Each time a battery has to be connected to communications, the TCC will ask (USING THE LEDs) to connect the cable for the next battery following the **binary code** (not decimal), leaving the LEDs lit as follows:



g) Connect the terminating resistor to the bottom connector on the fourth module, leaving free the RJ45 port called "OUTPUT or INVERTER" (in some versions).



5. The last step is to connect the OUTPUT on the TCC to the communication port on the inverter using a parallel (not crossover) ETHERNET cable. When the connection is made, the battery data should be visible on the inverter.

BATERÍA 8	STATE	○ ○ ○ 25% 50% 75% 100% □ □ □ □ □
BATERÍA 7	state O	25% 50% 75% 100%
BATERÍA 6	STATE	○ ● ● ○ 25% 50% 75% 100% ■ ■ ■ ■
BATERÍA 5	STATE O	● ○ ● ○ 25% 50% 75% 100% - = = = =
BATERÍA 4	state	○ ○ ● ○ 25% 50% 75% 100% □ □ □ □ □
BATERÍA 3	STATE O	● ○ ○ 25% 50% 75% 100% □ □ □ = = =
BATERÍA 2	STATE O	○ ● ○ ○ 25% 50% 75% 100% 🔓 🔒 🗐
BATERÍA 1	o C	● ○ ○ ○ 25% 50% 75% 100% ○ ○ ● ● ●

5. Operation

5.1 LED Display

The TCCV2.0 system uses 4 LEDs to display the state of charge (SOC) on the right side when the central button is pressed and another LED on the left labelled STATE to show the error status of the connected battery system. The image below shows the position of the LEDs and the button.



The LEDs on the front indicate the following information:

 4 LEDs to indicate the battery system's state of charge (SOC). The front panel displays the SOC only after pressing the button. The SOC is displayed for 10 seconds and then switches off.

LED 100%	(SOC between 76-100%)	->	Steady green
LED 75%	(S0C between 51-75%)	->	Steady green
LED 50%	(S0C between26-50%)	->	Steady green
	(SOC entre el 21-25%)	->	Steady green
LED 25%	(SOC <20%)	->	Flashing green

STATE, bi-coloured LED to indicate state or error code. This state LED remains on as long as the TCCv2.0 has power.

Steady green	->	ALL OK
Flashing red:	->	WARNING
Steady Red:	->	ALARMA

*Note: If the previous installation steps have been followed, then the STATE LED should be on and when the button is pressed, the battery charge level should be shown by corresponding LEDs. Otherwise, please contact the Cegasa Technical dept.

5.2 Operating with SOF

The SOF constantly calculates the maximum and minimum voltage and current allowed in the CEGASA battery system during the charge and discharge processes.

By means of this function, the TCCv2.0 system calculates the maximum permissible current and voltage values at all times, based on the battery system's temperature and SOC. This function ensures that the inverter charges and discharges the battery in an optimal way as well as safeguarding the integrity of the system. This function is only used when working with CAN BUS communications (RJ45 cable) connected.

5.2.1 Charge voltage based on battery temperature

Modelo ULTRA_175					
Temperatura					
0 - 5°C	6 - 10ºC	11 - 40°C	41 - 50°C	51 - 60°C	
51500mV	52000mV	52200mV	51800mV	51500mV	

5.2.2 Charge current based on battery temperature and SOC

Battery	ULTRA	Temperature				
model	175	0 - 10°C	11 - 46°C	>46°C		
	100-94%	0,1C	0,1C	0,1C		
	93-86%	0,3C	0,5C	0,3C		
SUC	85-61%	0,3C	0,5C	0,3C		
500	60-41%	0,20	0,5C	0,3C		
	40-21%	0,20	0,5C	0,3C		
	20-0%	0,1C	0,3C	0,3C		

(*) When connecting several batteries in parallel, the charge currents are limited by a reduction factor; See the manuals for each range to determine the recommended charge currents sent to the inverter.

5.3 Alarms

The detected alarms sent by the TCCv2.0 to the inverters are the following:

- ✓ Battery over-voltage (Over-charge)
- ✓ Battery under-voltage (Over-discharge)
- ✓ Battery over-temperature
- ✓ Battery under-temperature
- ✓ TCCv2.0/Inverter communications fault



5.4 Warnings

The Warnings shown by the STATE LED on the TCCv2.0 are as follows:

- ✓ Communications fault with any battery
- ✓ Battery over-temperature when the temperature exceeds 53°C during charge or 60°C during discharge
- ✓ Battery over-temperature when the temperature drops below 0°C during charge or -18°C during discharge
- ✓ NTC damaged
- ✓ BMS fault

✓ Voltage spread	2V
✓ Temperature spread	10°C
✓ SOC spread	30%

5.5 SOC update

The SOC updates to 99/100% when the following conditions are met:

- Battery voltage 0.5V lower than the charge voltage sent, and current lower than 8% of the capacity of the batteries connected in parallel for 10 seconds

OR

- Vmax for the whole system = 3600mV for 5 seconds

The SOC updates to 20% when the following conditions are met:

- When the discharge current (I <-1A) is enabled for 15 minutes

ULTRA 175 (Vbus < 47,5 Vdc)

The SOC updates to 13% when the following conditions are met:

- The minimum cell voltage reaches 3100mV for 4 minutes

The SOC updates to 2% when the following conditions are met:

- The minimum cell voltage reaches 2900mV for 15 seconds
- At this point, we also send a ZERO discharge current value

It is advisable to configure the DIESEL generator or network start-up by SOC levels and also with the following bus voltage levels depending on the range of the CEGASA batteries being used:

a) First level DIESEL or network start-up (for 5 minutes)

ULTRA 175

b) Intermediate DIESEL or network start-up (for 1 minute or less)

(46,5Vdc)

ULTRA (45,	IVdc)
------------	-------

5.6 FW update

To update the FW (subject to prior communication with CEGA-SA), follow these steps:

- 1. Stop the inverter/charger; no current input or output from the batteries
- Disconnect the communication cable that goes to the battery (BATTERY output)
- 3. Wait 5 seconds and then reconnect the said cable to the TCCv2.0 while pressing the Display button (The Status LED will flash red and amber) at this point
- 4. Plug in the USB drive with the TCC.bin file (supplied by CEGASA for the update), this must be the only file on the USB drive.
- 5. The display LEDs will light up progressively and then finally flash 3 times (in the event of a fault the status LED flashes red)
- 6. When the LEDs are flashing, the USB drive can be removed.
- 7. The system is now operational again and the inverter can be switched back on.

5.7 Display using "PuTTY" SW

To view the information about the battery being sent through the CAN communications, do the following:

1. Connect the TCC to a PC via the USB Type B port.



2. Open the "device manager" on the PC

🛃 Administrador de dispositivos	1075	\times
Archivo Acción Ver Ayuda		
🕨 🐢 🔤 🔤 💷		
- 🛃 PO9015		 - 2
🗉 🖏 Adaptadores de pantalla		
Adaptadores de red		
🛛 🦢 Baterias		
Bluetooth		
🕑 👰 Cámaros		
Colas de impresión		
 P¹ Componentes de software 		
Controladoras ATA/ATAPI IDE		
 Ser Controladoras de almacenamiento 		
 		
Controladoras de sonido y video y dispositivos de juego		
Dispositivos biométricos		
Dispositivos de interfaz de usuario (HD)		
Dispositivos de seguridad		
Dispositivos de software		
Dispositivos de tecnología de memoria		
Dispositivos del sistema		
Dispositivos portábles		
Entradas y salidas de audio		
🛚 🔜 Equipo		- 1
Firmwara		
 Monitores 		
Mouse y otros dispositivos señaladores		
Procesadores		
Buster MARINICH		

- 3. Open the "Ports (COM and LPT)" path and note down the COM value (in this case COM13) for subsequent use in the PuTTY program
- Puertos (COM y LPT)
 XDS100 Class USB Serial Port (COM13)
- 4. Open the "PuTTY" program
- Blue box (Connection type): Select "Serial"
- Red box (Serial line): Enter the COM value from the previous step (in this case COM13)
- Green box (Speed): Enter the value 115200
- Click on "Open"



5. At this point the following window will open:



The said window shows the following parameters:

- Date and time
- Battery Model: eBick Ultra 175
- Number of batteries connected: 2
- Battery voltage: 49.7V
- Battery current: -19A
- SOC: 93.9%
- -Battery temperature: 26°C
- Charge voltage: 52.2V
- Discharge cut-off voltage: 44.5V
- Charge current in battery C-rate (280Ah): 1C
- > 280A
- Maximum discharge current in battery C-rate (280Ah): 1.3C --> 364A

6. Communications

6.1 CAN protocol

	Standard frame format
CAN 2.0A	11-bit identifier
	500 kbps



CAN ID	Offset (bytes)	Name	Data type	Scaling	Unit
	0	Charge voltage	un16	0,1	V
0.054	2	Max charge current	sn16	0,1	А
UX351	4	Max discharge current	sn16	0,1	А
	6	Discharge voltage	un16	0,1	V
0-055	0	SOC	un16	1	%
0x355	2	SOH	un16	1	%
	0	Battery voltage	un16	0,01	V
0x356	2	Battery current	sn16	0,1	А
	4	Battery temperature	sn16	0,1	٥°
	0 (bit 2+3)	Battery high voltage alarm			
	0 (bit 4+5)	Battery low voltage alarm			
	0 (bit 6+7)	Battery high temperature alarm			
	1 (bit 0+1)	Battery low temperature alarm			
	1 (bit 2+3)	Battery high temperature charge alarm			
	1 (bit 4+5)	Battery low temperature charge alarm			
	1 (bit 6+7)	Battery high current alarm			
	2 (bit 0+1)	Battery high charge current alarm			
	2 (bit 6+7)	BMS internal alarm			
	3 (bit 0+1)	Cell imbalance alarm			
0x35A	4 (bit 2+3)	Battery high voltage warning			
	4 (bit 4+5)	Battery low voltage warning			
	4 (bit 6+7)	Battery high temperature warning			
	5 (bit 0+1)	Battery low temperature warning			
	5 (bit 2+3)	Battery high temperature charge warning			
	5 (bit 4+5)	Battery low temperature charge warning			
	5 (bit 6+7)	Battery high current warning			
	6 (bit 0+1)	Battery high charge current warning			
	6 (bit 6+7)	BMS internal warning			
	7 (bit 0+1)	Cell imbalance warning			

6.2 Pineado de salida



	Inverter	Pinout
	Victron	CAN_H: 7 CAN_L: 8 GND: 3
SMA		
	STUDER	
	GOODWE	CAN_1: 4 CAN_L: 5
	SOLIS	GND: 2
	NGETEAM	

6.3 Bluetooth Connection

The TCC has a Bluetooth module and an APP for Android and iOS. The said APP can be used to view different parameters of the battery or set of batteries, such as battery charging current and voltage, module status, power delivered

Steps to follow:

1. Download and install the APP on your mobile device. Just write "eViewer" in the search box.



2. Before beginning to use the application, first activate the Bluetooth module and the location of our device



 After opening the application, the following is displayed. To connect, press the Display button on the TCC. When connecting for the first time it is necessary to enter the following code: **908273**



- 4. The main screen is as follows. This provides general data about the system.
 - ✓ Red box: Battery SOC
 - ✓ Yellow box: Current flowing through the battery
 - ✓ Green box: Main data for the system:
 - Battery voltage
 - Maximum temperature
 - Minimum temperature
 - Number of cycles



5. On the left side of the screen there is a **drop-down menu** used to select the various screens for the APP. "System" is the main window.





6. Module status: This window shows the number of modules in the system (in this case 3) and if any of them have a Warning or Alarm. In which case the cause of the Warning or Alarm is shown.

Est	ado de l	os módu	llos	
1	2	3	4	
5	6	7	8	

7. Module parameters: This window shows different information about each of the batteries that form the system.

10:10 🖷 🕓						*	Sal (20	
≡ P	arán	netro	s de l	los n	nódu	ılos			
	1	2	3	4	5	6	7	8	
Tensión	56	56	56	0	0	0	0	0	
Corriente	0	0	0	0	0	0	0	0	
SOC	100	100	100	0	0	0	0	0	
Temperatura	22	21	24	0	0	0	0	0	
Vmáx (mV)	3.518	3.518	3.516	0	0	0	0	0	
Vmin (mV)	3,458	3.410	3.480	0	0	0	0	0	
MOSFET CHG	No	No	No	£		24	10	ii.	
MOSFET DSG	No	No	No						

8. CAN parameters: This window shows the information that the TCC CAN sends to the inverter or the final application via CAN communications.

10:10 🚭 🕻	9	8 Sal 📧	
	Parámetros CAN		
Tensión c	le carga	56V	
Corriente	de carga máxima	36A	
Corriente	de carga recomendada	21A	
Corriente	de descarga máxima	360A	

9. Statistical data: This window shows a monthly log of power delivered by the battery; maximum and minimum temperatures reached; maximum and minimum currents with which the battery has worked.

(*) The 24h energy and total energy values are not updated until the end of the current day or month, respectively.

10:10 💀 😥			* 54 000	
Histórico al meses	nual de energía entr	egada e	n DCH por	
XWh				
30			-	
8				
20				
15				
10				
6				
LE MA	nous Nous Nous Nous	12 aug	500 II 10 10 10 10	
Energia 24	h entregada en DCH ((kWh)		
Energia TC	TAL entregada en DC	H (kWh)	11	
Corriente	máximo en continuo (DCH (A)	-21	
Corriente	máximo en continuo (CH (A)	25	
Temperati baterias (*	ura méxima alcanzada C)	a en	24	

TCCv2.0 CAN (109765) COMPATIBILITY WITH OTHER EQUIPMENT

VICTRON ENERGY





1.1 Objective

This document describes the steps to follow in order to connect Cegasa battery TCCv2.0 (109637) CAN communications to a Victron inverter.

2. VICTRON ENERGY equipment configuration

To fully integrate the TCCv2.0 CAN system with Victron Energy brand equipment, the inverter/charger has to communicate with the TCCv2.0. To achieve this, the Victron equipment has to be set up as explained below.

Before starting, the first step is to connect the TCCv2.0 CAN system as described in the "TCCv2.0 CAN Technical Manual" as well as connecting the batteries (power and communications) to the Victron Energy equipment, as explained in its own installation manual (if in doubt, consult the dealer).

The next step before starting the set-up is to check that the FW version of the Victron Energy equipment is v2.22 or later. The TCCv2.0 CAN is compatible with Victron Energy equipment from this version onward, so, in the case of a previous version, the equipment FW should be updated as an initial measure, if in doubt consult the dealer of the Victron Energy equipment.

The equipment's FW version can be checked on the equipment's display, under **Settings** /**Firmware Version** (visible on the bottom screen).

irmware	09:32
	v2.73
20	210830181758
	>
JSB	>
	>
	Irmware 20 JSB

At this point, it is possible to start with the Victron Energy equipment set-up so that it communicates with the TCCv2.0 CAN system via CAN BUS communications through the RJ45 cable already connected between both systems.

(*) When the installation uses a CERBO GX unit, it is necessary to connect the CEGASA communications ETHERNET cable (109755) or, failing that, prepare a cable based on CEGASA's instructions (request documentation).

(**) When using VENUS or CERBO GX systems, connect the cable to the port called BMS-CAN on said devices.

1.2 Acronyms

BMS	Battery Management System
BP	Pack Battery Pack
SOC	State of Charge
SOF	State of Function)

2.1 Select communications protocol/speed:

In the main menu, go to *Device Lists / Settings / Services / VE.Can port / Select CANbus BMS Profile (500 kbit/s)*

<	CAN-bus profile	09:30
Disabled		0
VE.Can & L	ynx Ion BMS (250 kbit/s)	0
VE.Can & C	CAN-bus BMS (250 kbit/s)	0
CAN-bus B	MS (500 kbit/s)	۲
Oceanvolt	(250 kbit/s)	0
Ć	x)	\bigotimes

In the main menu, go to *Device Lists / Settings / Services / BMS-Can port / Select Profile CAN-bus BMS (500 kbit/s)*

<	CAN-bus profile	09:31
Disabled		0
CAN-bus BN	IS (500 kbit/s)	۲
6	X	~
0	9	\otimes

2.2 Select automatic mode in the set-up:

On the main menu, go **to Settings /System Setting.** Once here, select **Battery Monitor, Automatic**

<	System setup	09:33	
System name		Automatic	
AC input 1	input 1		
AC input 2	Not available		
Battery monitor		Automatic	
Auto selected: C	EGASA on CAN-bus		
Has DC system		0	
Pages ا	i v	≡ Menu	

2.3 Check that it recognises the TCCv2.0

To check that the Victron equipment recognises the TCC and to ensure that the communication is correct, the name of the equipment connected to the TCC should appear in the main menu. In the case of the image below: CEGASA. In certain cases, VICTRON does not recognise the CEGASA name, however, if the values for SOC, voltage and current appear then the process is still OK.

Device List			09:	34
CEGASA	83%	50.70V	65.0A	>
MultiPlus 48/5000/70-100			Bulk	>
Notifications				>
Settings				>
<u> 새</u> Pages		≣Me	nu	

2.4 Activate the DVCC option

In order for the inverter to control its current and voltage depending on the logs sent by the TCCv2.0 CAN system, the DVCC (Distributed Voltage and Current Control) option has to be activated on the Victron Energy equipment. To do this, from the main menu go to **Settings/System Settings** and activate the DVCC option (in blue)



2.5 Configure BlueSolar MPPT Controller

(Only in PV installations)

Victron's VE.Direct to USB communications cable is required.



Install the VictronConnect software to communicate with the device. This can be downloaded from the Victron Energy website or from the following link:

- https://www.victronenergy.com/support-and-downloads/software

To communicate with the MPPT (with the inverter switched on), connect the USB cable to the computer and the other end of the cable to the MPPT. It connects at the bottom, disconnect the cable that is currently connected and connect the VE.Direct to USB. At the end of the process, reconnect the cable that was initially connected.



When the application is opened it will automatically detect the MPPT. Select it to access its set-up procedure. Once opened go to the settings tab:

S VictronConnect		- 🗆 X
← MPPT 150/100		(*)
	ESTADO	TENDENCIAS
\frown		
		0.02V
		0.0A
Solar		
Citimos 30 dias Defension		49.30V
3.18kWh		0.0A
1 Sixwh		Apagado
28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 Tebrero		
Tiempo de vida total 5kWh Desde el restablecimiento 5kWh		Apagada

Select Battery / Battery Pre-set / User Defined and then modify the following parameters (as shown in the image).





1. Battery voltage	See manual
2. Maximum charge current:	See manual
3. Battery pre-set	User defined
4. Absorption voltage:	See manual
5. Float voltage	See manuall

2.6 VICTRON charger/inverter settings

This can be set up once the battery is installed, and the communication cable is connected.

In order to connect to Victron equipment, the Victron MK3 to USB is required. This device is optional when ordering Victron equipment. Consult the dealer of the equipment.

For further information about MK3, refer to the relevant page in the Victron (VE) manual.



Data to modify:

- 1. Lithium batteries and adaptive curve
- 2. Efficiency of the lithium batteries at 95%
- 3. **Capacity** value of the batteries (depending on the installed project)

4. Charger (voltages and times) configuration

The values of the free BULK charge limits (at maximum power), **ABSORPTION 52.2Vdc** (switch from CC to CV) and **FLOAT 52Vdc** have to be configured by accessing the "Charger" tab. The parameters recommended by Cegasa are shown inside the red box.

Recommend charge current: See manual (if in doubt, consult CEGASA).

(*) The values for both the voltage and the charge current are sent by the TCCv2.0, nonetheless, they are filled in in the same way

Udc Udc ripple Idc	47.4 V 0.8 V -65 A	Charge curve Adapt	tubular plai ive	e traction battery curve)		
		Absorption voltage	2.20 V	Repeated absorption time	1.00	Hr
Ignore AC aux. relay	0	Float voltage 5	2.00 V	Repeated absorption interval	7.00	Days
show VE.8	us monitor	Charge current	A 0	Maximum absorption time	8	Hr
	<u>G</u> et settings Send settings	\square	_	<u> </u>		
COD .						

- 5. Minimum battery voltage: 44Vdc
- 6. Low restart voltage: 50Vdc
- 7. Pre alarm voltage: 45Vdc

13		General Grid Invester Charger Vistual switch Assistants
MultiPlus		
Freq. Out UOut IOut	49.9 Hz 232 V 0.0 A	Inverter output voltage 20 V
Freq. In UMains	50.1 Hz 232 V	DC input low shut down 44.00 V T shut-down on SOC
IMaint	1.2A	DC input low restart 50.00 V: WURKER BOOK OF 10.0
Udc Udc ripple Idc	50.8V 0.3V 30A	DC insuit low prevalarm 45.00 y
SoC Ignore AC		₩ enable AES
show VE	Bus monitor	Start AES when load lower than 59 W Stop AES when load 12 W binker than start level
	Get settings	AES type
((()))	Send settings	C search mode

After making all of these changes, press the "Send settings" button. The VE device will ask to restart. Restart to complete the set up. It is best to perform a cold boot

2.7 VICTRON ESS (Energy Storage System) setup assistant

Add the VICTRON **ESS assistant** and start it by using the "Start assistant" button.

		General Grid Inverter	Charger Virtual switch As	sistants
MultiPlus				
Freq. Out UOut IOut	50.0 Hz 231 V 0.0 A	Assistant Configuration Assi Assistant Setup	stant Tools	
Freq. In	50.1 Hz	Add assistant		
IMains	12.4A	ESS (Energy Storage Sy	stem)	
Ude Ude ripple Ide	49.5V 0.4V 51 A			Ť
SoC Ignore AC aux. relay				
show VE	Bus monitor			
	<u>G</u> et settings	•		,
		Used assistants: (992 bytes	used, 3100 bytes free)	
		Chard associations	Save assistant	Delete assistant
2200	Send settings	Start destatorn	Care aminaire	

• **Battery system** – Enable the FIFTH option (BMS with CAN BUS)



• **Battery capacity** – Enter the number of modules x "X" Ah rated capacity according to the CEGASA battery model

1 ESS (Energy Storage System)	-	×
Battery capacity Please enter the correct battery capacity.		
The battery capacity of the system is 180 Ah.		
X Cancel <<	>>	

• Because the battery does not match any of the VE categories, choose "Do not change battery type".

😘 ESS (Energy Storage System)	
VEConfigure battery type sele Some VEConfigure settings do not (exactly) correspond with the t Li-lon. Would you like the assistant to change the default battery type in (If you decide to let the assistant change the battery type, a summ settings will be displayed when the assistant is finished.)	ection nattery default settings for VEConfigure? nary of the changed
IDo not change battery type: Change battery type as suggested	
X Cancel <<	>>

• Sustain voltage - Enter a value of 52Vdc

SSS (Energy Storage System)	940) -		×
Sustain voltage When batteries are left in a deep, severe chance that they will be di To prevent this, the sustain mech voltage by charging them with a s	discharged state during amaged. anism will kick in and ke mall current whenever r	a prolonged perior rep the batteries a recessary.	d, there is t a minimu	a m
For more into, refer to the controllin manual.	ng depth of discharge c	hapter of the Ener	gy Storag	•
Sustain voltage <mark>52.00</mark> V.				
X Cancel		>		

• The dynamic cut-off values are those given in the table below:

C_RATE	ULTRA 175 – TCC CAN (V)
0,05	47
0,2	44
0,7	43.5
2	42.5

• The **restart offset** will be 1.2V (also valid for the intermittent pre-alarm signal)

Restart	offset			
When inverting	is stopped due to k	ow battery, the batt	ery voltage must	rise above a certain
level before inve	ating is allowed ag	ain.		
fout-off(0) is the	cut-off voltage con	et to cut-on(u). responding with a D	C discharge of I	0A.)
Note:				
TI	the second se	and the second second second	the set of	AND A REAL PROPERTY OF A
This same value Pre-Alarm indica	is used as an offsi tion)	et to the cut off volt	age to determine	e the low bat
This same value Pre-Alarm indica	is used as an offs (ion)	et to the cut off volt	age to determin	e the low bat
This same value Pre-Alarm indica	i is used as an offsi tion)	et to the cut off vol	age to determin	e the low bat
This same value Pre-Alarm indica	; is used as an offs tion)	et to the cut off vol	age to determin	e the low bat
This same value Pre-Alarm indica Inverting is a	: is used as an offsi tion) allowed again when	et to the cut off vol n voltage rises 1.20	age to determin	off(0).
This same value Pre-Alarm indica Inverting is a	: is used as an offsi tion) allowed again wher	ot to the out off volt	oge to determin V above cut-	e the low bat
This same value Pre-Alarm indica Inverting is a	: is used as an offsi tion) allowed again wher	ot to the out off volt	age to determin V above cut-	e the low bat
This same value Pre-Alarm indica Inverting is a	: is used as an offsi lion) allowed again wher	ot to the out off voll	age to determin V above cut-	e the low bat
This same value Pre-Alarm indica Inverting is a	: is used as an offsi tion) allowed again when	ot to the out off volt	oge to determine	off(0).

3.1 Charge

The inverter/charger charges the battery using the "charge current" ordered by the TCC CAN system via communications until reaching the "maximum charge voltage", both values are sent constantly by the TCC CAN based on the batteries' SOC and temperature.

The inverter limits the charge current by using the maximum value that is sent to it via the CAN "Charge current limit" register.

 If the *Limit charge current* option is enabled (ON THE VIC-TRON EQUIPMENT, in the inverter/charger settings), then the maximum charge value will be the lowest of the two (i.e. the value entered in the Victron settings or the value from the CAN register).

<	DVCC	10:50
CAUTION: Re	ad the manual before adju	usting
DVCC		
Limit charge	urrent	
Maximum cha	rge current	50A
Limit manage	d battery charge voltage	
SVS - Shared	voltage sense	
과 Pag	es 🗸	≣ Menu

- If, for some reason (alarm or SOF), the TCCv2.0 CAN system sends a "0" charge current, then the inverter/charger will not

charge the battery system.

3.2 Discharge

If, for some reason (alarm or SOF), the TCC CAN system sends a "0" discharge current, then the inverter/charger will not discharge the battery system.

In the event that the value is \neq "0", then the inverter will allow any discharge.

Both the charge and discharge values sent by the TCCv2.0 CAN to the VICTRON system can be viewed by entering the BMS option for the list of VICTRON devices and then entering the "Parameters" option.

This screen shows the charge and discharge values that the TCCv2.0 is sending to the system.

Device List			10:	51
CEGASA	100%	52.20V	0.0A	>
MultiPlus 48/5000/70-100		Abso	rption	>
Notifications				>
Settings				>
<u>네</u> Pages		≣ Men	u	

<	Parameters	10:51
Charge Volta	age Limit (CVL)	52.2V
Charge Curr	ent Limit (CCL)	28.0A
Discharge C	urrent Limit (DCL)	182.0A
ᆈ Pa	aes	≡ Menu

3.3 Alarms

When there is an active alarm on the battery system, the TCCv2.0 CAN system will inform the inverter/charger of the detected alarm. The TCCv2.0 has real-time data about each of the connected batteries. The alarms indicated to the inverter concern possible over-voltage, under-voltage, over-current, over-temperature and under-temperature of any of the batteries connected to the system.

The TCCv2.0 CAN system constantly informs the inverter about the alarm status of the battery system, so that the inverter knows whether the alarms are activated or not at all times.

When the said alarm is reset, the system automatically resets itself, assuming the inverter/charger equipment is configured to do so.

In addition, the activation of any alarm will be shown on the Victron Notifications screen. This screen shows the activated alarm along with a Warning symbol (the image below shows an example of an activated low temperature alarm).

<	Notificaciones	₫ 06:30
\wedge	CEGASA Alarma Temperatura de carga alta	2021-07-23 06:30 78.0C
Δ	CEGASA Alarma Temperatura alta	2021-07-23 06:30 71.0C
		\otimes

The *Warning* symbol will flash while the alarm is active and be semi-transparent and not flashing if the alarm has been reset. Even if the system is active again, the notification remains on the screen so that the warning (not the system) can be reset manually.





SMA

TCCv2.0 CAN (109637) COMPATIBILITY WITH OTHER EQUIPMENT



1.1 Objective

This document describes the steps to follow in order to connect the Cegasa battery TCCv2.0 CAN to an SMA SUNNY ISLAND brand inverter/charger.

1.2 Acronyms

BMS	Battery Management System
BP	Pack Battery Pack
SOC	State of Charge
SOF	State of Function)

2. Configuration with SMA equipment

To fully integrate the TCCv2.0 with the SMA system, the inverter has to communicate with the TCCv2.0. To achieve this, the SMA inverter/charger has to be set up as explained below.

Before starting, the first step is to connect the TCCv2.0 CAN system as described in the "TCCv2.0 CAN Technical Manual" as well as connecting the batteries (power and communications) to the SMA equipment, as explained in its own installation manual (if in doubt, consult the dealer). Next, switch on the SMA equipment at the front.

Then, open the file explorer on the connected PC and access the inverter using the IP address. The standard IP address used with SMA equipment for Ethernet connections is **169.254.12.3**

After connecting to the SMA, the system asks for the installer to enter a user group and password, which the SMA dealer will have provided (the image below shows this access).

UNNY ISLAND 6.0H				SMA
				••
	inicker sesion			
	1dama	-Equivalent		
	Grupe de unanten	Vetakador	•	
	Contravella			
	(NA CARTAN IN I	-	Inde secon	

Once connected to the inverter, the general system screen, shown below, will appear:



The next step before starting the set-up is to check that the Software Package version for the equipment is

1.2.10.R or later. The TCC-CAN system is compatible with SMA from that version onward, so in case of a previous version, the SW has to be updated. The version of the equipment can be checked using the web program which can be accessed via Ethernet, under *Device parameters / Type Plate / Software Package* (visible on the bottom screen).

🛃 Inicio	Valores actuales	Parámetros del equipo	i≣ Eventos	🔧 Configuración del equipo
Modificar	parámetros			
✓ Place	a de características			
✓ Place	ca de características			
Nombre	e del equipo			SN: 3002310691
Clase d	de equipo			Inversor de la batería
Tipo de	e equipo			Sunny Island 6.0H
Paquet	te de software			1.2.10.R
Número	o de serie			3003242895
Direcci	ón MAC			00:40:AD:A4:BC:00
Direcci	on MAC WLAN			DC:EF:CA:B5:B3:F4
Versión	n de comunicación			1111

2.1 Installation Assistant

The settings vary depending on the customer's application. Shown below are the possible configurations via the web access software (as explained in the previous section).

To start the device configuration, click on the user icon and start the installation assistant.

				SM	^
🗄 Eventos 🛛 🔧 Configuració	òn del equipo	S Datos		1 -	0 -
1		Flujo de capa	Iniciar el as Inicio de se Cerrar ses	istente de instalación sión SMA Grid Guard ón	
Estado funcionamiento batería:	Descargar	De	scarga	Carga:	
	cateria	Hoy:			
Estado de carga actual de batería.	100 %	Ayer		(1111) (1111)	
Descarga momentánea de bateria:	0 W	Total 52	3 kWh	105,7 kWh	

During the first step, the WLAN and Ethernet connections are configured.



Next, set the date and time.

1	2	3		4	5	6	7
Cartanania ini st	Routing Patient	1000	Creig Se	entite one	Sectors re-out	Tariginación teria Asteria	Persona
uustar la fecha y la ho	ra en el equipo					O Informatio	on para el usuario
Peroriageise automatics de l	a bara					Ajuntar la leci	he y le hora en el equipe
Advado Deantivado						Fuede spastar via	multiverse la fecha y la hora
+0%			Hara			servetor 6/10 ⁴	with a banking little color
21 de aust, de 2015						menutario a mare	nat
luna hieraria			.0	41.			
6,PC-0116 Bruselas, Caper	n. Idadvid Paris		+	*			

The third step establishes the use of the system. This requires the following application features to be configured (depending on the user's final application)):

- On-grid / Off-grid
- Nominal voltage / frequency

>	2		3		.4		5		6		7
Conferencial de red	Public china	1	Shar		Configuration (and designing)		Gentla de set		Configuración de la Britana		-
logir uso									• Inform	nación y	para el usuario
Weine configuración del sédere									Nurva co	nfiguraci	on del sistema
ngir visis				Tansien y In	ecuencia nominales				Side tane a orte contigat	pre offenjør te Lacologi slatt ti Lacologi slatt til	de bolen si caroline i informe (pre sportplo; labilitati a cue arcoli
Fassimes para fassimari des	non delated			230V_30	ω.			- 23	sistema mor	rolance co	mo diateme tofilation
eleccionar norma naci ema resistat represente actus	onal								Escap et la reserver det advesticer historisticer Decisi d'un ve a circles optimiser d estrores serves	n constant le constant le y sponte constant le constant e constant	colempo da antecia si a nel pordera la terriscia manenal y la sed accessibilitante fo de cod al ol metri forma de transfato par no o acto an solderas agaste la funciono del
Aceae							Charter	cintriat			
1	2	>	3		4	Σ	5	3.	6	Σ	7
1 Definition of legir uso	2	>	3		4 Longentiem March	Σ	5	2	6 Interes O Inform	ación pr	7 ara el usuario
1 Degenise or Jegir uso Ingli es	2 Tanay kao	>	3	Punción del	4 Congradient States	Σ	5 Street of out	5.	6 Internet O Inform Degri use	ación p	7 Transmi ara el usuario
1 Degrada to a ve Segir uso Teneres pas Secondo en Teneres pas Secondo en Legendo en teneres an en pas Secondo en Legendo en teneres an el legendo	2 Factory loss and and orall	>	3	Presiden del	4 Contraction of Annual Sciences	2	5		6 Design and the first between O Informs Design and the second distant account of the second dis	action pro-	7 Instants are el una artíco restricturas re
1 Degrado e el Segrado Tendro a factorer el Servicio a factorer el Servicio a factorer el Servicio a factorer el Servicio a factorer el servicio	2 Factory trees and and and and and and and and and and		3		4 Contract of the set and states a	2	5 construction of the		6 District of a second	ación po conserver la transmissión minal de la conserver la minal de la min	7 ara el usuario res tel asuala si el majdeta temais sontet y de el a el nevena por a seculario el de el a el nevena no en el secula por el seculo el macionel
1 Degrams or of Degrams and any Process part for own or the for the second of the for the second of the second of the second of the December of the second of the second of the second of the December of the second of th	2 Forthery book and source, at the mark consult		3	Puesder del	4 Compositions and a second stateme) Incir	5 (president of the	- Cont	6 Comparison of the Comparison	actión pro- conserved a ry spore la mena de la reactiona a reactiona a reactio	7 minutes are all usuario and analysis are all usuario and another and another are all usuario as a second to a second and as to be as a second as to be another as to be as

The next step involves selecting the electrical characteristics of the system: single-phase / three-phase. The system's maximum current is also configured here.

1		2	3			5		6		7
Landgace (in the set)		Parise phone	-944		Gardyakanine nak	termini kerend		jarren la la jarren		lizhates
Configuración del	sistema	č.						0 inform	ación p	ara el usuario
ipa .								Configurat	ión del	sistema
Monaldance		 • 						Elize si er sen minghe førser	pria da Te	relates a tribaca) resonante triple el
ierendones preadones	Dered .			Corranta era	ioma de interfactecien			solvera		
Red				16.000			A	Statena mor	nefinice	
				(0.000 A	0.907 A)			Since the management	to arelado tornadore accors for	configure scher con n de la ved madores de la ref.
Aros						dameter o	continuar	TRACTA	actor at the	Prime you control

In the next step involves configuring the battery. In this case, select the *lithium-ion battery*. The TOTAL rated capacity of the battery system connected to the SMA inverter/charger equipment is also entered. *Number of batteries x Rated capacity of the installed battery.*

1 >	2		3	4	5	>	0	7
Carlpoorte ai ref	Participhere		1.000	Configuration and address	Contractor and	Cir	Approximate and the second	Burns
Configuración de la bati	erta						() Information	ción para el usuario
744		Capacitized re	sterind.					
-criestate 100 (04 104)		244	.801				Configuració	in de la batania
		(SCA) 12	100 Au				beencone e b	pe de bateria conechaia
A2106					oundary or	mar	No migri una har capacidati vore descerga de N capacidati de la	ería de pleno totar conta mai de la taterto para una horae (C10, Recontrará lo Esterta en función de terr

The final step shows a summary of the selected configuration.

Ite Congradiate Marcine Ma Arcona Marcine Marc	Configuration on the International States of Automatical States of
Ng (JTD-FDR) Bruselas, Oganes, Hadret, Hara	 Información para el useano Reconent Il insuente la mante latas be apates que la marcera
Na (JTC-CLXI) Bruselan, Coperin, Madrid, Flw'a	Resurses El resurses la mandag tallas for apares que la manzala
No (VTC+01.30) Bruselia, Coperin, Hadrid, Paris	El resultario de mandrá fuñas for apoten que la manzario
(UTC+C1.30) Bruselies, Coperin, Hadrid, Paris	10200
Fundoramienta avitada	
2004_3014	
licrefasta	
Fed	
60,000 A	
tarawa de Min (dar Ming	
30 Av	
Exporter toxis initipartmetros Exporter resum	
	Functionarries and a

This assistant makes it possible to carry out the basic configuration of the SMA equipment. Pressing the "Continue" button on the last screen takes us back to the dashboard screen.

By clicking on the **Device parameters** menu option the parameters for the device, battery, communications, logs, etc. will be shown.

l Inicio	O Valorae actuale	O Parámetros del equipo	E Eventes	 Configuración del equipo 	E Debe	1.0.
Statics	primetro					Experier to be submaring
> Piet	a de características					
> Ec.	po					
> Dere	ches de usuaria					
> L00	Se CC					
> Lol	Se CA					
> tier	tarización de red					
1000	-					
> Bill	a 👘					
-	and aparts					
> Con	unicedión extorne					
> Corr	ponertes del equipo					
> Cont	rsi de equipos e initalàció	ites				
A	munt ferdtestever.or	Forsetana				

This section of the parameters within the *Battery* field gives the charge and discharge values that the TCCv2.0 sends the inverter.

 Carga de la bateria 	
Especificación proceso comente carga batería	319,27
✓ Descarga de la batería	
Free Barrier and the American State in	2010



Given here are also the *Areas of Application and Protection Mode* sections, which should be configured as recommended by SMA, based on the operation of the system (consult the installer). The values shown are by way of example.

(2 % 80 %) (0 % 100 % (4 % 20 %)

(00 00 00 ... 23 59 50) (00 00 00 ... 23 59 50) (00 00 00 ... 23 59 50)

(1.0 % 70.0 %)

(1.0% 70,0%

1.0% raid%

15% 15% 60%

22:00:00

10.00

3.0 %

10%

1.0 %

✓ https://manuals.sma.de/SI-12/es-ES/1414774155.html
 ✓ https://manuals.sma.de/SI-12/es-ES/1414786443.html

The most important battery values sent by the TCCv2.0 system can be checked in the **Battery** field of the Current Values section within the main menu.

Estado de la carga	95 %
Temperatura	24,0 °C
Tensión	50.50 V
Corriente	-52,144 A
Tiempo restante hasta carga completa	
Tempo restante hasta carga de compensación	
Tiempo restante de absorción	
Error de estado de carga	
Estado general de funcionamiento	Cargar bateria
Control de carga mediante comunicación disponible	No hay información
Fase de absorción activa	No hay información

The charge voltage value is given at the bottom of this same field (depending on battery temperature and SOC).

 Carga 	
Tensión nominal de carga actual	52,20 V
Proceso de carga activo	No hay información
Cantidad de carpas de compensación	
Cantidad de cargas completas	
Descarga relat. bateria desde última carga compl.	
Descarga relat, batería desde última carga compen	

3. General operation

3.1 Charge

Hera de Inicio (5) Hera de Inicio (5) Hera de finalización (4) Hera de finalización (4)

Limite de estado de carga de batería (A

Limita de ectorio de corga da batería (3

inte de estario de carsa de barería :

The inverter/charger charges the battery using the "charge current" and "charge voltage" ordered by the TCCv2.0 CAN system via communications until the said voltage is reached.

If, for some reason (alarm or SOF), the TCC CAN system sends a "0" charge current, then the inverter/charger will not charge the battery system.

3.2 Discharge

If, for some reason (alarm or SOF), the TCCv2.0 CAN system sends a "0" discharge current, then the inverter/charger will not discharge the battery system.

In the event that the value is \neq "0", then the inverter will allow any discharge.

3.3 Alarms

When there is an active alarm on the battery system, the TCCv2.0 CAN system will inform the inverter/charger of the detected alarm. The TCCv2.0 has real-time data about each of the connected batteries. The alarms indicated to the inverter concern possible over-voltage, under-voltage, over-current, over-temperature and under-temperature of any of the batteries connected to the system.

(For further information about alarms, see the Alarms chapter of the "TCC CAN Technical Manual" document).

The TCC CAN system constantly informs the inverter about the alarm status of the battery system, so that the inverter knows whether the alarms are activated or not at all times. The inverter will not allow the current flow whenever there is an active alarm, given that the TCC CAN system will send the charge/discharge processes a current "0" value.

When the said alarm is reset, the system automatically resets itself, assuming the inverter/charger equipment is configured to do so.

VIN EX - 03



STUDER

TCCv2.0 CAN (109637) COMPATIBILITY WITH OTHER EQUIPMENT

1.1 Objective

This document describes the steps to follow in order to connect Cegasa battery TCCv2.0 CAN communications to a Studer inverter/charger.

2. Configuration with SMA equipment

In order for the Cegasa battery system to communicate with the Studer inverter, an *Xcom CAN* (supplied by Studer) is necessary. With the Studer inverter/charger, the *Xtender* device, only has an LED display. If we wish to see the values that the battery system is sending via the TCC (e.g. Battery values and alarms) then an external console, such as a Studer *RCC* unit will be needed.

Shown below is an example of a system configuration using the *Xtender, Xcom CAN* and *RCC*.



In this example, the mains supply has been connected to the Xtender inverter as AC In input and an AC output charge. On the DC side, a Cegasa battery system has been connected to the TCC-CAN.

Before starting, the first step is to connect the TCCv2.0 CAN system as described in the "TCCv2.0 CAN Technical Manual" as well as connecting the batteries (power and communications) to the STUDER equipment, as explained in its own installation manual (if in doubt, consult the dealer).

2.1 Xcom-CAN Configuration

Communication between the TCC-CAN system and the inverter is established via the **Xcom-CAN** adapter. This Xcom-CAN device has to be configured correctly to allow it to communicate with the TCC-CAN system.

To do this, first open the adapter. The images below show the adapter closed and open.



1.2 Acronyms

BMS	Battery Management System
BP	Pack Battery Pack
SOC	State of Charge
SOF	State of Function)



Once opened, proceed with the following steps:

- Configure the RJ45 pins using the **black jumpers** (marked in red in the image above) as follows (the RJ45 pins are configured to be the same as on SMA equipment):



 Configure the **DIP switch array** (marked in blue in the image above) as shown below in order to select the protocol, battery and bus speed.



Once the Xcom-CAN has been configured, close it back up and connect it to the inverter (Xtender) and to the TCCv2.0. Both connections are made using parallel (not crossover) Ethernet cables.

2.2 Xcom-CAN connection to TCC

The connections to make on the **Xcom-CAN** device are shown below. The part labelled STUDER (shown in the image below) is connected to the inverter or Xtender by an Ethernet cable. Note that the position of the T-O switch must be the same as shown in the image.



The part labelled EXTERNAL is connected to the TCCv2.0-CAN by using another Ethernet cable. Note that the position of the T-O switch must be the same as shown in the image.



2.3 Communication check

Once the Xcom-CAN is configured and connected, check that the TCCv2.0-CAN is communicating correctly with the inverter. The way to do this using an RCC console is shown below. **Prior to this, it is necessary to have followed the TCCv2.0 installation steps contained in its manual.**

Before checking that it is communicating correctly, check that the battery is connected to the inverter and switch on the equipment. Once switched on, and with the Communications connected, the RCC console will show the most important battery variables, such as state of charge (SOC), voltage and temperature.

The main screen displayed after switching the RCC on will be as follows:



0 Vac 0 Aac	0 Vac 0 Aac	122
18 18	I DN	
: 1 21	48.0 Vdc 0 Adc	

From the main screen, pressing the "down" button selects the screen to be displayed on the console. To view the battery's most important variables, select the *Xcom-CAN BMS* screen, as shown in the image below.



This shows the battery's voltage, current, SOC and temperature. These values are the ones that the TCC-CAN sends the inverter via CAN communications. If the above variables are showing a value (similar to the above image) then this means it is communicating correctly. If there is no communication, then the **Xcom-CAN BMS** screen will not appear or appear without any values (see image below).

family family	I II		
allandinandinadi	Upat	n. a.	Vacin
	<u>ି</u> ଦି(n.a.	Ade
	SOC (P1	a. %
	That	Fh .A	- D a

Once correct communication is established, it is possible to check the values of the other variables sent by the TCC-CAN. To do this, follow these steps on the Xcom-CAN BMS screen:

- Press the SET button
- Press the "down" button to select one of the variables



on the right. In the image, the first variable has been selected. This is configured to display the voltage.



 If we wish to view another CAN register, press SET and the list of registers that the TCC-CAN is sending will appear: Battery voltage, Battery current, Charge voltage limit, Discharge voltage limit, Charge current limit...

Selectió	hT E	info	07063	
Limite de de	e o cai	orr: rga	iente	35 1 3 55
18	30	Ade		Ţ

If we wish to view any of these registers on the *Xcom-CAN BMS* screen, press SET and it will be displayed instead of the variable that was there previously.

3. General operation

3.1 Charge

The inverter/charger charges the battery using the "charge current" ordered by the TCC CAN system via communications until reaching the "maximum charge voltage", both values are sent by the TCC CAN at all times using the SOF function explained in the TCC CAN system manual.

Note: STUDER equipment uses a factor of 0.8 to limit the charge current sent by the battery due to the dynamic regulation of the STUDER equipment.

The inverter limits the charge current by using the maximum value that is sent to it via the CAN "Charge current limit" register.

- If the *Limit charge current* option is enabled (ON THE STUDER EQUIPMENT, in the inverter/charger settings), then the maximum charge value will be the lowest of the two (i.e., the value entered in the equipment settings or the value from the CAN register).
- If, for some reason (alarm or SOF), the TCC CAN system sends a "0" charge current, then the inverter/charger will not charge the battery system.

3.2 Discharge

If, for some reason (alarm or SOF), the TCC CAN system sends a "0" discharge current, then the inverter/charger will not discharge the battery system.

In the event that the value is \neq "0", then the inverter will allow any discharge.

3.3 Alarms

When there is an active alarm on the battery system, the TCC CAN system informs the inverter/charger of the detected alarm. The TCC has up-to-the-minute data about each of the connected batteries. The alarms indicated to the inverter concern possible over-voltage, under-voltage, over-current, over-temperature and under-temperature of any of the batteries connected to the system.

(For further information about alarms, see the Alarms chapter of the "TCC CAN Technical Manual" document).

The TCC CAN system constantly informs the inverter about the alarm status of the battery system, so that the inverter knows whether the alarms are activated or not at all times. The inverter will not allow the current flow whenever there is an active alarm, given that the TCC CAN system will send the charge/discharge processes a current "0" value.

When the said alarm is reset, the system automatically resets itself, assuming the inverter/charger equipment is configured to do so.

ANNEX - 04

TCCv2.0 CAN (109765) COMPATIBILITY WITH OTHER EQUIPMENT

GOODWE





1.1 Objective

This document describes the steps to follow in order to connect the Cegasa battery TCCv2.0 CAN to a GOODWE brand inverter/charger.

2. Configuration with GOODWE equipment

To fully integrate the TCCv2.0 with the GOODWE system, the inverter has to communicate with the TCCv2.0. To achieve this, the GOODWE inverter/charger has to be set up as explained below.

Before starting, the first step is to connect the TCCv2.0 CAN system as described in the "TCCv2.0 CAN Technical Manual" as well as connecting the batteries (power and communications) to the GOODWE equipment, as explained in its own installation manual (if in doubt, consult the dealer). Next, switch on the GOODWE equipment.

The GOODWE inverter set-up is done through the PV Master application. The application, available for Android and iOS devices, makes it possible to connect to the equipment via Wi-Fi or Bluetooth. In this case, the set-up will be done via Wi-Fi.



The inverter's various parameters can be set-up in the "Basic Settings" tab.



1.2 Acronyms

BMS	Battery Management System
BP	Pack Battery Pack
SOC	State of Charge
SOF	State of Function)

To access these settings, it is necessary to enter the installer password, in this case Goodwe2010



Select the "Safety Setting" based on the country you are in:

15:49 🖻	·	😫 🖘 JI 54% 🔒
<	Select Safety S	ettings
Africa		~
America		~
Asia		~
Europe		~
Oceania		~
Other		~
50Hz	Grid Default	0
50Hz	LV Default	0
60Hz	Grid Default	0
60Hz	LV Default	0
IEC61	727 60Hz	0
Wareh	nouse	0
	Next	
	III 0	<

Select the battery model, in this case "Cegasa", or if this is not present "Default (Lithium 50Ah)"

15:49 🖼 着	🖬 🕾 🗐 🖉
Select Batt	ery Model
BYD B-Box	\sim
OLOID	~
AlphaESS	\sim
eSTORE	\sim
LD POWER WORK S2	\sim
NPZ-Battery	\sim
GCL	\sim
DYNESS	~
DEFAULT	~
No battery	\sim
SELF-DEFINE	~
If no available battery mod on mobile data	el is found, please switch and restart app
Previous	Next
) <

Once finished, press "Exit"

15:49 🖼 🖥		🖸 🕾 🖉 54% 🛢
<	Meter Test	0
Meter Test		
Turn on the will be perfo correctly co are communic connected t	meter CT test. The meter rmed only when the batte nnected, the BMS and the nicating normally, and the o the grid.	CT test ry is meter inverter is
Test Status	3	Not tested
This test wil be viewed ir	l take a few minutes. The h the Settings interface.	test results can
Test Result	1	
	Exit	
11	0	<

By default, the equipment is configured for Spain, however, numerous countries can be chosen. Once connected to the system, the first screen monitors the inverter's default setting status:

<	93648EMU196W0092	
Situación laboral Normal (en red)		Unidad.
Código de seguridad		Spai
Modelo de batería		Default(Lithium 50Ah
Modo de trabajo		Modo económic
Estado del medidor		Prueba completa 🤇
Estado BMS		Norma
Suministro de respaldo		Sobr
Limite de potencia		Sidd
	(F) Padmetros	Goodenaa

Default settings:

Safety code:	Spain
Battery model:	Default (Lithium 50Ah)
Work mode:	Economy mode
Meter status:	Normal
BMS status:	Full test
Backup supply:	Over
Power limit:	Over

On the advanced settings screen, the power limit is set to 3600 W and the charge and discharge limits are set at 50 A, which is the inverter's nominal charge and discharge current.



• • Configuration and each		
Linite de poesecia		
ten protectation e tradicio dell'activatione accipio essentiado en el t		
Limite de possecia (64)		California
na polyment, a desiren dine per des bestellen.		
Excerves de sombras		100
The encounters of providence of APP (Add 20) parts (providence providence) and more that extremes indicated at grants (APP) denotes an initial second part energies for providence of	Terra (h.ref	n Diedler beer DV repyble na tele en an er er gereid
Burnensten der rempakter		
25-strengts do strengtor a la sur anarque los una linear de al municipation regido hanno de la lado de reconstana autores mila faretabre na a alterner l mazalem.	sin ener la Larrie de	da di respatiti an di alabeshariti vata kan da
Mada de detección	Dete	cesión de anda completa ()
salida de respalido		
lar ulifize pare monder a la mengia schavar de la Gaeta de securite e Garar de requisit l'arte actar el constitui;	inerali in el	the arts dispetition in
Bateria activeda		
(i) In Antonio en apoga statuta a la planta-contra de bago señago esta fam para senga fa marcanezar (parte se naciona e la barra termo en termo con em antonio), carrantes (parte se neciope de termo esta con se la bale	ilig hi nag Kgilor hof Ka	pain achtaic la hat sein painte hann aithean
Factor de polencia		(1%) (met
Parage an average (1979), 4040 (2020)		
Restablecer fratorial de sobrezarga		timizer 2
litera la primeira de compañía masados arte horitada a la deparación nacionada de dempsión, en oriente de companymentes des	per 19 - 19 - 19 -	when both the sale care cards
Wolkuje de corga	58.0	V.
la yofinga ne maga maanna dalat portiattu ta kaja de debar ete mana	-	5
Comente de cargo	50.00	4
ta paracite de trapp estatua dese consultat la luga medatar. An rea	and the set	
Contente de desadajo	80.00	A.
finality of the second second second second second second second		
SOC Prelimit		which a contemportune
SOC Prelact La fasierie deletere he deut args de actae de peri is perfonitified als deut	12/14 11 11/12	
800 Present op toerne delever 'n deer wys de octen ter oer is oedentided af deel Preferchied de decomps biodo scorentade a lo redi	alle single	
BOC Present La contra - denna la ductarga de acordo por la prefentidad de den Prefenciónad de descorga preciso concentador a lo cell A solar, DDL argentiza e alebrarias riperten de repuesto de reverto	(n. 14, halise)	
BOC Present La faierle desens la destructa de acardir per la probabilidad de des Profonditad de descarga Produ conestado a la red A salas. 2011, aquel os a atenentas repuesto de conesta Profonditad de descarga Produ de republica	(a hthate	

In turn, the TCCv2.0 CAN sends the inverter the operating limits of the charge and discharge current:

Batería(Default(Lithium 50Ah))	
Estado de la batería	SOC:87%,Sin cargo ni descarga
Datos de la batería	53.0V/0.0A/0.00kW
Estado BMS	Normal
SOH (de BMS)	99.0%
Corriente de carga (desde BMS)	30A
Corriente de descarga (desde BMS)	120A
Advertencia (de BMS)	Normal
Temperatura (de BMS)	21.0°C

2.1 Operating modes

	K ∜146% B
Modo general	Modo fuero de la n
0	0-0
Ó Ó	٥
О дроус	Modo económico Precio
0	Hori

The inverter can operate in 4 different modes:

- General Mode: To maximise photovoltaic generation and minimise network consumption, primarily loads are covered with the PV generation and if this is not enough, the battery is discharged. If there is a photovoltaic surplus, this is put into the battery.
- **Support Mode:** This prioritises battery charging; first the battery is charged from the PV and any surplus is used to feed loads.
- Off Grid Mode: There is no connection to the grid. PV and battery generation take charge of supplying loads with power, in the first instance, the photovoltaic covers the loads and if this is not enough, then battery provides power.
- Economy Mode: This mode allows time periods to be set in order to charge and discharge the batteries at a given power (% of nominal power).

3. General operation

3.1 Charge

The inverter/charger charges the battery using the "charge current" and "charge voltage" ordered by the TCCv2.0 CAN system via communications until the said voltage is reached.

If, for some reason (alarm or SOF), the TCC CAN system sends a "0" charge current, then the inverter/charger will not charge the battery system.

3.2 Discharge

If, for some reason (alarm or SOF), the TCCv2.0 CAN system sends a "0" discharge current, then the inverter/charger will not discharge the battery system.

In the event that the value is \neq "0", then the inverter will allow any discharge.

3.3 Alarms

When there is an active alarm on the battery system, the TCCv2.0 CAN system will inform the inverter/charger of the detected alarm. The TCCv2.0 has real-time data about each of the connected batteries. The alarms indicated to the inverter concern possible over-voltage, under-voltage, over-current, over-temperature and under-temperature of any of the batteries connected to the system.

(For further information about alarms, see the Alarms chapter of the "TCC CAN Technical Manual" document).

The TCC CAN system constantly informs the inverter about the alarm status of the battery system, so that the inverter knows whether the alarms are activated or not at all times. The inverter will not allow the current flow whenever there is an active alarm, given that the TCC CAN system will send the charge/discharge processes a current "0" value.

When the said alarm is reset, the system automatically resets itself, assuming the inverter/charger equipment is configured to do so.

SO I XINNA

TCCv2.0 CAN (109765) COMPATIBILITY WITH OTHER EQUIPMENT

SOLIS



1.1 Objective

This document describes the steps to follow in order to connect the Cegasa battery TCCv2.0 CAN to a SOLIS brand inverter/ charger.

2. Configuration with SOLIS equipment

To fully integrate the TCCv2.0 with the SOLIS system, the inverter has to communicate with the TCCv2.0. To achieve this, the SOLIS inverter/charger has to be set up as explained below.

Before starting, the first step is to connect the TCCv2.0 CAN system as described in the "TCCv2.0 CAN Technical Manual" as well as connecting the batteries (power and communications) to the SOLIS equipment, as explained in its own installation manual (if in doubt, consult the dealer). Next, switch on the SOLIS equipment.

The SOLIS inverter set-up is done through a screen on the inverter.

1.2 Acronyms

BMS	Battery Management System
BP	Pack Battery Pack
SOC	State of Charge
SOF	State of Function)





d) Go to the "Control Parameter" tab

Steps to follow:

a) First go to the "Advanced Settings" tab.



b) The inverter will ask for a password, enter the password (0010)

Password	and the second se		2022-01	10.04
-	Personal States	a second real database		
	Please Input	he Curront P	assword	
	X	X	x	international and



e) Assign the following parameters to the inverter:

Backup Supply.	Enable	Floating Charge:	053.20
Backup Voltage:	230.0V	Equalizing Charge:	056.0V
Backup Frequency:	50.00Hz	Battery Overvoltage:	056.5V
Current Direction:	Discharge	Battery Undervoltage:	045.0V
Battery Current:	060.0A	Voltage Droop:	Disable
Charge Limitation:	030.0A		
Discharge Limitation:	060.0A		



Battery Current:	Battery's maximum discharge current * Nº of batteries	
Charge Limitation:	Battery's maximum charge current * N° of batteries	
Discharge Limitation:	Battery's maximum discharge current $\ ^{\ast}$ N° of batteries	
Floating Charge:	Battery floating voltage	
Equalizing Charge:	Battery charge voltage	
Battery Overvoltage:	Battery charge voltage + 0.5V	
Battery Undervoltage:	Battery discharge cut-off voltage	

f) Go to the "Battery Select" tab



g) Select "User-Define"



h) Assign the following parameters to the inverter:



Battery Capacity:	Battery's capacity * Nº of batteries	
Battery OVV_Pro:	Battery charge voltage + 0.5V	
Battery UNV_Pro:	Battery discharge cut-off voltage	
Floating Voltage:	Battery floating voltage	
Equalizing Voltage:	Battery charge voltage	
Overcharge SOC	100%	
Overdischg SOC:	10%	
Discharge Depth:	Battery Depth of Discharge (20% recommended). Battery's maximum discharge current * N° of batteries	
I_Max Discharge:	Battery's maximum charge current * N° of batteries	
I_Max Charge:	3A	
Floating Current:	30 minutes	
Floating time:	20 days	
Equalizing time:	Battery charge voltage + 0.5V	
Dischg UNV_Pro:	Battery discharge cut-off voltage	

i) Set the "ForceCharge SOC" value to 10%; forcing the charging process if the battery reaches this SOC value.j)



j) In turn, the TCCv2.0 CAN sends the inverter the operating limits of the charge and discharge current:

BMS Information		Meter Informatio	n
Battery Voltage:	53.10V	Meter Voltage:	236.2V
Battery Current:	031.0A	Meter Current:	07.53A
Charge Limit:	030.0A	Meter Power:	-001775W
Discharge Limit:	120.0A	Meter Energy:	0000013.20kW
SOC Value:	006%	Input Energy:	0000004.68kWI
SOH Value:	099%	Output Energy	0000008.52kW
BMS Status:	Normal		

2.1 Operating modes

The inverter can operate in 3 different modes, these can be selected from the "Storage Mode Select" tab via the route *Advanced Settings --> Storage Energy Set --> Storage Mode Select*



• Reserve battery:

To maximise photovoltaic generation and minimise network consumption, primarily loads are covered with the PV generation and if this is not enough, the battery is discharged. Any photovoltaic surplus is put into the battery in recharge mode.

• Off Grid Mode:

There is no connection to the grid. PV and battery generation take charge of supplying loads with power, in the first instance, the photovoltaic covers the loads and if this is not enough, then battery provides the power necessary to feed the loads connected to the system.

• Time Charging:

This mode allows time periods to be set in order to charge and discharge the batteries at a given power.

3. General operation

3.1 Charge

The inverter/charger charges the battery using the "charge current" and "charge voltage" ordered by the TCCv2.0 CAN system via communications until the said voltage is reached.

If, for some reason (alarm or SOF), the TCC CAN system sends a "0" charge current, then the inverter/charger will not charge the battery system.

3.2 Discharge

If, for some reason (alarm or SOF), the TCCv2.0 CAN system sends a "0" discharge current, then the inverter/charger will not discharge the battery system.

In the event that the value is \neq "0", then the inverter will allow any discharge.

3.3 Alarms

When there is an active alarm on the battery system, the TCCv2.0 CAN system will inform the inverter/charger of the detected alarm. The TCCv2.0 has real-time data about each of the connected batteries.

The alarms indicated to the inverter concern possible over-voltage, under-voltage, over-current, over-temperature and under-temperature of any of the batteries connected to the system.

(For further information about alarms, see the Alarms chapter of the "TCC CAN Technical Manual" document).

The TCC CAN system constantly informs the inverter about the alarm status of the battery system, so that the inverter knows whether the alarms are activated or not at all times. The inverter will not allow the current flow whenever there is an active alarm, given that the TCC CAN system will send the charge/discharge processes a current "0" value.

When the said alarm is reset, the system automatically resets itself, assuming the inverter/charger equipment is configured to do so.

90 - XEINNV

TCCv2.0 CAN (109765) COMPATIBILITY WITH OTHER EQUIPMENT

INGETEAM



1.1 Objective

This document describes the steps to follow in order to connect the Cegasa battery TCCv2.0 CAN to an INGETEAM brand inverter/charger.

2. Configuration with INGETEAM equipment

To fully integrate the TCCv2.0 with the INGETEAM system, the inverter has to communicate with the TCCv2.0. To achieve this, the INGETEAM inverter/charger has to be set up as explained below.

Before starting, the first step is to connect the TCCv2.0 CAN system as described in the "TCCv2.0 CAN Technical Manual" as well as connecting the batteries (power and communications) to the INGETEAM equipment, as explained in its own installation manual (if in doubt, consult the dealer). Next, switch on the INGETEAM equipment.

The INGETEAM inverter set-up is done through a screen on the inverter.

First go to the "MAIN MENU" tab and then to the "SETTINGS" tab.



Go to the "ENTER PASSWORD" tab



The inverter will ask for a password, enter the password (0332)



1.2 Acronyms

BMS	Battery Management System	
BP	Pack Battery Pack	
SOC	State of Charge	
SOF	State of Function)	

Go to the "BATTERY" tab



Select "LITHIUM"



To ensure communications to work correctly, select "INGE-TEAM STANDARD CAN PROTOCOL"





In the "INVERTER" tab it is possible to configure the voltage and frequency in AC.

17.00	13/01/22
INVERSOR	
TENSION RMS	230 50
FASE AC	0

In turn, the TCCv2.0 CAN sends the inverter the operating limits of the charge and discharge current and voltage:

17:01	13~10~22
MONIT. BMS	
VEAT CHARGE VEAT DISCHARGE SOH TEMPERATURE COMM STATUS	052.20 044.50 099 % 017.0 °C 0K
1101 MONIT, BMS	13/01/22

050.20
000.00 A
099 %
A 850
182 A

3. General operation

3.1 Charge

The inverter/charger charges the battery using the "charge current" and "charge voltage" ordered by the TCCv2.0 CAN system via communications until the said voltage is reached.

If, for some reason (alarm or SOF), the TCC CAN system sends a "0" charge current, then the inverter/charger will not charge the battery system.

3.2 Discharge

If, for some reason (alarm or SOF), the TCCv2.0 CAN system sends a "0" discharge current, then the inverter/charger will not discharge the battery system.

In the event that the value is \neq "0", then the inverter will allow any discharge.

3.3 Alarms

When there is an active alarm on the battery system, the TCCv2.0 CAN system will inform the inverter/charger of the detected alarm.

2.1 Operating modes

The inverter can operate in 4 different modes, these can be selected from the *"OPERATION MODE" tab --> "MODE"*



Isolated:

There is no connection to the grid. PV and battery generation take charge of supplying loads with power, in the first instance, the photovoltaic covers the loads and if this is not enough, then battery provides power.

• Grid Support:

This prioritises battery charging; first the battery is charged from the PV and any surplus is used to feed connected loads.

• UPS (Back-Up):

Designed for systems where grid outages are prolonged and frequent. As long as the grid is present, the batteries are kept charged, but as soon as mains power is lost the loads are powered from the battery.

• Self-consumption:

To maximise photovoltaic generation and minimise network consumption, primarily loads are covered with the PV generation and if this is not enough, the battery is discharged. If there is a photovoltaic surplus, this is put into the battery.

The TCCv2.0 has real-time data about each of the connected batteries. The alarms indicated to the inverter concern possible over-voltage, under-voltage, over-current, over-temperature and under-temperature of any of the batteries connected to the system.

(For further information about alarms, see the Alarms chapter of the "TCC CAN Technical Manual" document).

The TCC CAN system constantly informs the inverter about the alarm status of the battery system, so that the inverter knows whether the alarms are activated or not at all times. The inverter will not allow the current flow whenever there is an active alarm, given that the TCC CAN system will send the charge/discharge processes a current "0" value.

When the said alarm is reset, the system automatically resets itself, assuming the inverter/charger equipment is configured to do so.

Cecoso

+ 85 YEARS OF ENERGY STORAGE EXPERIENCE

CEGASA, a leading brand in energy storage and management systems.

- Specialising in the design and development of energy solutions for residential and industrial sectors.
- Experts in latest generation Lithium-Ion based energy accumulation technologies.
- Manufacturers of Lithium-Ion energy storage systems.
- A highly motivated and qualified team.
- A culture of quality and customer service.
- Own material characterisation laboratories.
- A European group of companies committed to innovation and sustainable development.



HEAD OFFICE & FACTORY

Parque Tecnológico de Álava C/ Marie Curie, 1 01510 Miñano // Spain Tel. +34 945 228 469 info@cegasa.com

DELEGATIONS

Cegasa USA Inc.

1701 Armitage Court Addison, IL 60101 // USA Tel. +1 630 629 6300 sales.usa@cegasa.com

Cegasa Australia

Maroubra, NSW 2035 Sydney - Australia Tel. +61 (0) 431 225 241 sales.australia@cegasa.com



Sistema de Gestión ISO 9001:2015 ISO 14001:2015