

Leading Conversion Technology for Power Resilience

# MPI-1600

## User Manual

### THE NEW GENERATION OF POWER CONVERTERS

- **DUAL AC AND DC OUTPUT CONVERTER**  
Commercial Power as default source
- **AC AND DC BACKUP IN A DC ENVIRONMENT**  
Leverage your existing DC infrastructure
- **ONE STOP SHOP**  
Wide output power range
- **MILITARY AC INPUT CONDITIONS**  
Without compromising the quality of the AC output
- **HARSHEST ENVIRONMENT CONDITIONS**  
Product for extreme MIL-STD-810G environment conditions



Version 1.1

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Release Note:

Version	Release date (DD/MM/YYYY)	Modified page number	Modifications
1.0	24/04/2024	-	First Release.
1.1	28.06.2024		RIPEnergy release

## 1. CE+T Power at a glance

CE+T Power is your trusted partner in advanced power solutions engineered to meet the demands of modern and dynamic industrial applications. With over 60 years of experience in power conversion technology, CE+T Power nurtures the industry with innovative solutions designed for critical power backup and energy management.

Our complete range of power solutions includes modular inverters (DC to AC), UPS (securing AC loads with batteries), and multidirectional converters (inverter, rectifier, and UPS all-in-one). Coupled with our state-of-the-art monitoring solution, you have a real energy blender to connect multiple sources of energy seamlessly!

Whether you require robust backup power solutions, energy management solutions, or a combination of both, CE+T Power delivers tailored solutions to meet your specific needs. Our products are designed with integration in mind, ensuring seamless compatibility with other components of your system. CE+T Power is committed to providing you with the expertise and resources needed to maximize the performance of your power systems.

Thank you for choosing CE+T Power as your partner in advanced power management. Let's power the future together.

## 2. Abbreviations

---

AC	Alternating current
AL	Alarm
DC	Direct current
DHCP	Dynamic Host Configuration Protocol
DSP	Digital Signal Processor
ECI	Enhanced Conversion Innovation
EPC	Enhanced Power Conversion
ESD	Electro Static Discharge
ETH	Ethernet
HTTP	HyperText Transfer Protocol
HTTPS	Secure HyperText Transfer Protocol
LAN	Local Access Network
LVD	Low Voltage Disconnect
MBB	Measure Box Battery
MBP	Manual By-pass
MET	Main Earth Terminal
MIB	Management Information Base
N	Neutral
NTP	Network Time Protocol
NT/KO	Not Okay
NUA	Non-Urgent Alarm
PCB	Printed Circuit Board
PE	Protective Earth (also called Main Protective Conductor)
PWR	Power
REG	Regular
SNMP	Simple Network Management Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
TRS	True Redundant Structure
UA	Urgent Alarm
UMB	Universal Measure Box
USB	Universal Serial Bus

## 3. Warranty and Safety Conditions\*

### 3.1 Disclaimer

- The manufacturer declines all responsibilities if equipment is not installed, used or operated according to the instructions herein by skilled technicians according to local regulations.
- Warranty does not apply if the product is not installed, used or handled according to the instructions in the manual.
- This equipment is shipped with a SHOCKWATCH monitor. If the SHOCKWATCH shows that the equipment was exposed to excessive force the warranty will be void.

### 3.2 Technical care

- This electric equipment can only be repaired or maintained by a “qualified employee” with adequate training. Even personnel who are in charge of simple repairs or maintenance are required to have knowledge or experience related to electrical maintenance.
- Please follow the procedures contained in this Manual, and note all the “DANGER”, “WARNING” AND “NOTICE” marks contained in this Manual. Warning labels must not be removed.
- Qualified employees are trained to recognize and avoid any dangers that might be present when working on or near exposed electrical parts.
- Qualified employees know how to lock out and tag out machines so the machines will not accidentally be turned on and injure employees working on them.
- Qualified employees also know safety related work practices, including those by OSHA and NFPA, as well as knowing what personal protective equipment should be worn.
- All operators are to be trained to perform the emergency shut-down procedure.
- Never wear metallic objects such as rings, watches, or bracelets during installation, service and maintenance of the product.
- Insulated tools must be used at all times when working with live systems.
- When handling the system/units pay attention to sharp edges.
- This product is suitable for use in a computer room.

### 3.3 Installation

- This product is intended to be installed only in restricted access areas as defined by local regulations and in accordance with the National Electric Code, ANSI/NFPA 70, or equivalent agencies.
- The Converter System may contain output over current protection in the form of circuit breakers. In addition to these circuit breakers, the user must observe the recommended upstream and downstream circuit breaker requirements as defined in this manual.
- Please use extreme caution when accessing circuits that may be at hazardous voltages or energy levels.
- The modular converter rack is a dual input power supply. The complete system shall be wired in a way that both input and output leads can be de-energized when necessary.

\* These instructions are valid for most CE+T Products/Systems. Some points might however not be valid for the product described in this manual.

- REG systems and EPC systems that have no AC input wired and connected can be seen as independent power sources. To comply with local and international safety standards N (input) and PE shall be bonded. The bonded connection between N (input) and PE must be removed once the AC input is connected.
- AC and DC circuits shall be terminated with no voltage / power applied (de-energized).
- The safety standard IEC/EN62040-1-1 requires that, in the event of an output short circuit, the converter must disconnect in 5 seconds maximum. The parameter can be adjusted on Inview; however, if the parameter is set at a value > 5 seconds, an external protection must be provided so that the short circuit protection operates within 5 seconds. Default setting is 60 seconds.
- The system is designed for IP65 environment.
- Environment Conditions:
  - Storage Conditions: -50 to 70°C
  - Relative Humidity: 95%, non-condensing
  - Altitude above sea without de-rating: Less than 2000 m  
Greater than 2000 m – derated to 40°C
- All illustrations in the manual are for general reference, refer to the technical drawing which is received along with the system for exact information.

### 3.3.1 Handling

- The cabinet shall not be lifted using lifting eyes.
- Remove weight from the cabinet by unplugging the converters.

### 3.3.2 Surge and transients

The mains (AC) supply of the modular converter system shall be fitted with Lightning surge suppression and Transient voltage surge suppression suitable for the application at hand. Manufacturer's recommendations of installation shall be adhered to. Selecting a device with an alarm relay for function failure is advised.

Indoor sites are considered to have a working lightning surge suppression device in service.

- Indoor sites Min Class II.
- Outdoor sites Min Class I + Class II or combined Class I+II. The modular converter system/rack can reach hazardous leakage currents. Grounding must be carried out prior to energizing the system. Grounding shall be made according to local regulations.

#### Note:

Choosing and installing surge arrestors must obey to precise technical rules. Distance to equipment to protect, cable gage and cable routing have significant influence on proper device service.

Some areas are more susceptible to be hit by electrical strikes, especially when altitude increases. Good earthing is also crucial for surge arrestors to work properly.

CE+T declines any liability in regard to damaged caused to equipment not correctly or not sufficiently protected.

### 3.3.3 Other

- Insulation test (Hi-Pot) must not be performed without instructions from the manufacturer.



## 3.4 Maintenance

- The converter system/rack can reach hazardous leakage currents. Earthing must be carried out prior to energizing the system. Earthing shall be made according to local regulations.
- Prior to any work conducted to a system/unit, make sure that AC input voltage and DC input voltage are disconnected.
- Prior to accessing the system or modules, make sure all source of supply is disconnected.  
**CAUTION** – Risk of electric shock. Capacitors store hazardous energy. Do not remove cover until 5 minutes after disconnecting all sources of supply.
- Some components and terminals carry high voltage during operation. Contact may result in fatal injury.

## 3.5 Replacement and Dismantling

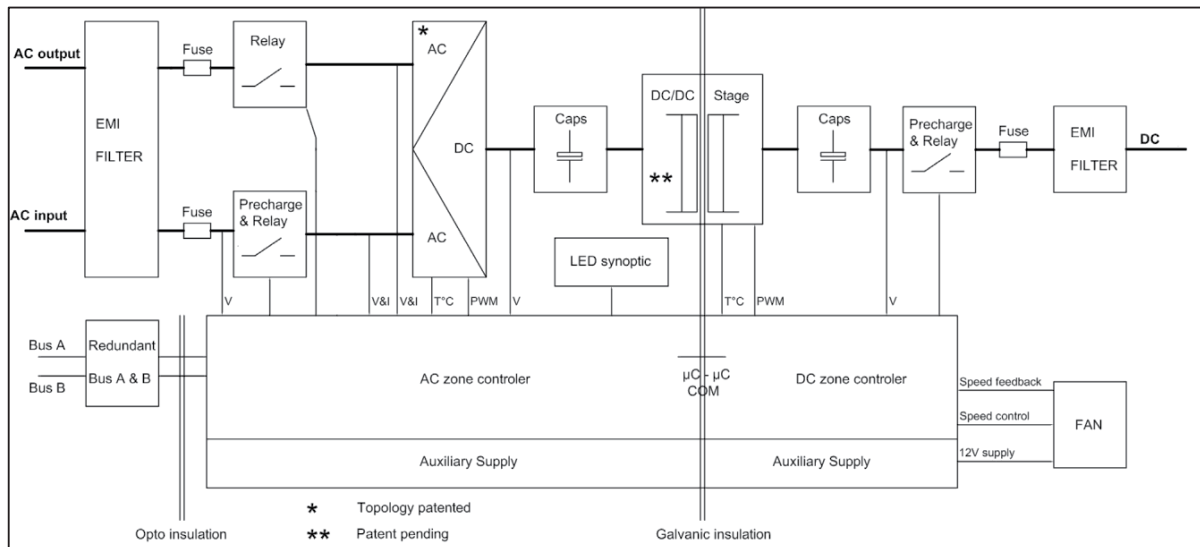
- ESD Strap must be worn when handling PCB's and open units.
- The converter system/rack is not supplied with internal disconnect devices on input nor output.
- CE+T cannot be held responsible for disposal of the converter system and therefore the customer must segregate and dispose of the materials which are potentially harmful to the environment, in accordance with the local regulations in force in the country of installation.
- If the equipment is dismantled, to dispose of its component products, you must comply with the local regulations in force in the country of destination and in any case avoid causing any kind of pollution.

To download the latest documentation and software, please visit our website at [www.cet-power.com](http://www.cet-power.com)

## 4. ECI Technology<sup>1</sup>

A MPI-1600 module is a triple port converter built with ECI technology. This module delivers pure sinusoidal output and ripple free DC output from battery or AC mains.

The below block diagram gives an explicit description of the topology and its operation.



ECI technology has AC to DC, DC to AC, and DC to DC converters to provide constant and disturbance-free output power regardless of the input source.

The power flows either from AC or DC source under the control of the DSP controller. Thanks to the module's internal energy buffering, transferring the load between two input sources is achieved in 0 ms.

ECI can detect short circuit conditions at the AC output level. It will provide high current to clear the fault, and thus keeping other critical loads in operation.

MPI-1600 module works on True Redundant Structure (TRS) that features decentralized, independent logic, and redundant communication bus.

Each MPI-1600 module has three levels of protection, and it will help to isolate from other modules in case of any fault in the corresponding module. Due to this functionality in each module, it provides no single point of failure in modular systems.

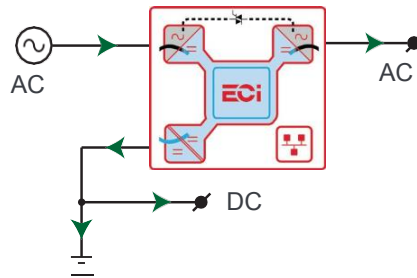
The MPI-1600 modular systems provide quality output power with higher efficiency.

<sup>1</sup> Information and data given in this chapter is intended to serve as an overview of the ECI Technology. Detailed features and parameters for each individual module type in the range may differ and should be referred to in the dedicated data sheet.

## 4.1 AC-AC mode

In EPC mode, the AC Mains is the primary source and DC source works as a backup. When AC mains is present, the MPI-1600 module takes energy from the AC source and feed to:

- AC Load via a double conversion to provide a pure sine wave.
- DC load and also charges the battery with a regulated DC.



The total output power of a module can be shared between the AC load, DC load and charging power based upon the requirement.

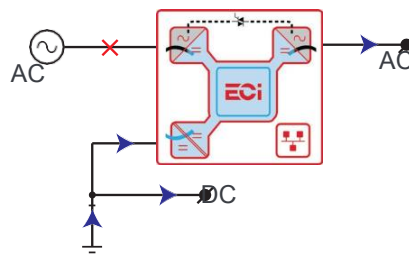
If the AC source is not present, the module seamlessly switches to DC source without impacting the critical loads and resumes to EPC mode once AC source returns. The transfer time between AC to DC and DC to AC is 0 ms.

The EPC mode provides a higher efficiency of  $\geq 96\%$  without compromising the purity of the output sine wave.

## 4.2 DC-AC mode

In back up mode, module operates in DC source and feed to:

- AC Load via a double conversion to provide a pure sine wave.
- DC load directly.
- Measure Box Battery (MBB) is used for DC power calculation.



## 5. Basic Information

### 5.1 MPI-1600

Telecom / Datacom:	Input	28 Vdc 230 Vac, 50/60 Hz
	Output	230 Vac and 28 Vdc
	Power	2000 VA / 1600 W



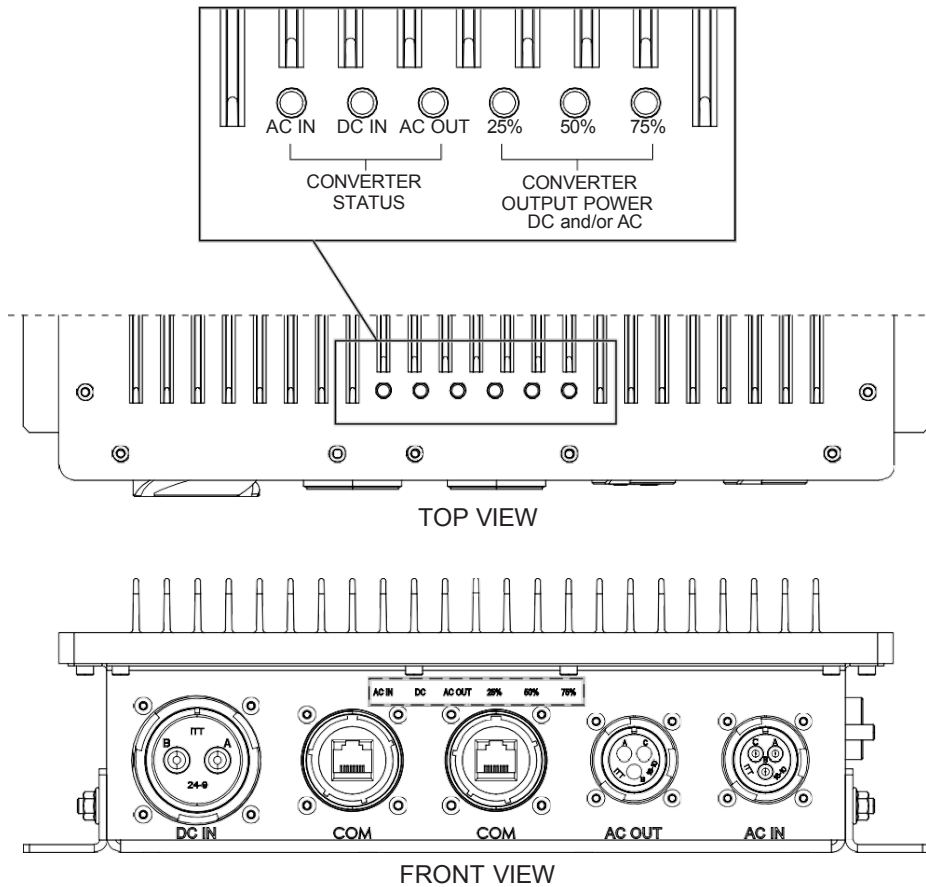
- The MPI-1600 converter is a triple port converter.
- Each converter can supply 1600 W on any DC, AC or combination of both AC and DC output ports. AC output load is the highest priority. Even if AC output is fully loaded (1600 W), still 200 W is available for DC output.
- The LEDs on the top indicate the converter status and output power.
- Module is equipped with soft start.
- 658 mm (D) x 293 mm (W) x 88 mm (H).
- 14 Kg.

#### 5.1.1 MPI-1600 Specifications

Model	MPI-1600
Part Number	T7317200000
Cooling	Natural convection
MTBF	200 000 hrs (MIL-217IF)
Dielectric strength DC/AC	4300 Vdc
RoHS	Compliant
Operating T° / Relative Humidity (RH) non-condensing	Tested according ETSI 300-019-1-4 class 4.1E -40°C to +70°C derating above 50°C / 0-95% Designed to sustain 10 x 24h-cycles - Method 507.5 Procedure II (Figure 507.5-7) - MIL-STD-810G
Storage T° / Relative Humidity (RH) non-condensing	According to ETS 300 019-1-1 from -50°C upto +70°C / 0 to 95%
Shock	Designed to withstand according to MIL-STD-810G, Method 516.6, Procedure I according following levels: Peak acceleration: 40 g Shock duration: 11 ms
Vibration	Designed to withstand according to ETSI EN 300 019-1-5 Class 5M3 according Method 514.6D Procedure I, Ground Vehicle Category 20 Wheeled/Tracked/Trailer from MIL-STD-810G
Material (casing)	Aluminium
<b>AC Input Data</b>	
Nominal voltage / current	230 Vac / 7.2 A

Voltage range	90 - 295 Vac (Derating below 125 Vac) Note: Derating on components not guaranteed above 265 Vac
Brownout	900 W @ 90 Vac / 1600 W @ 125 Vac linear decreasing @ 50°C
Power factor / THD	> 0.99 / < 3%
Frequency (Synchronization range)	50 Hz (47 - 53 Hz) or 60 Hz (57 - 63 Hz)
<b>DC Input Data</b>	
Nominal voltage (range)	28 Vdc (16 - 32 Vdc)
Nominal current (at 1600 W output)	72 A
Maximum input current (for 15 seconds) / voltage ripple	116.4A @ 22V / <10mV RMS
<b>AC Output Data</b>	
Efficiency AC to AC / DC to AC	> 96% / 93%
Nominal voltage (Adjustable)	230 Vac (100 - 240 Vac) (Derating below 125 Vac)
Frequency / frequency accuracy	50 or 60 Hz / 0.03%
Nominal Output power	2000 VA / 1600 W @230 V 1500 VA / 1200 W @120 V
Short time overload capacity	150% (15 seconds)
Admissible load power factor	Full power rating from 0 inductive to 0 capacitive
Total harmonic distortion (resistive load)	< 3%
Load impact recovery time (10% - 90%)	≤ 0.4 ms
Nominal current	8.7 A @ 230 Vac 12.5 A @ 120 Vac
Crest factor at nominal power	3 : 1 for load P.F. ≤ 0.7
Short circuit current	22.5 A for 15 seconds
AC output voltage stability	±1% from 10% to 100% load
<b>DC Output Data</b>	
Nominal voltage (Adjustable)	26.5 Vdc (16 - 32 Vdc)
Maximum power	1600 W
Maximum current at 24 Vdc	67 A
Reverse polarity protection	Yes
Efficiency AC to DC	> 93%
<b>In Transfer Performance</b>	
Max. Voltage interruption / total transient voltage duration (max)	0 sec / 0 sec
<b>Signalling &amp; Supervision</b>	
Monitoring device / Part Number	INVIEW XC (RIPE) / T602004141
<b>Safety &amp; EMC</b>	
Safety	EN60950
EMC	MIL-STD-461G ( CE102, RE102, RE102, CS101, CS114, CS115, CS116, RS103 ) / CISPR22 Class B / VG95373 / EN 61000-4-2 / EN 61000-4-6 Level 3 / EN 61000-3-2 / MIL-STD-1275E

## 5.1.2 Converter - LED Indications



Converter Status LED	Description	Remedial action
OFF	No input power or forced stop	Check environment
Permanent green	Operation	
Blinking green	Converter OK but working conditions are not fulfilled to operate properly	
Blinking green/orange alternatively	Recovery mode after boost (8 In short circuit condition)	
Permanent orange	Starting mode	
Blinking orange	Modules cannot start	Check Inview
Blinking red	Recoverable fault	
Permanent red	Non recoverable fault	Send module back for repair

Output Power (redundancy not counted)						
<5%	5% to 40%	40 to 70%	80 to 95%	100%	100% = overload	Output Power (redundancy not counted)
o x x	o x x	o o x	x o o	o o o	o o o	Status output power LED
1B	1P	2P	2P	3P	3B	Behaviour (B = Blinking, P = Permanent)

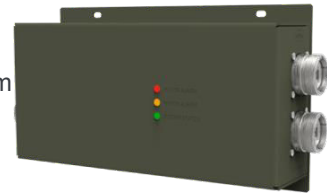
## 5.2 Inview XC (RIPE)

Inview XC (RIPE) is an advanced monitoring and controller unit especially suited for MPI-1600 power systems. It allows the user to easily access the system information through the web interface and SNMP protocol.

The Inview XC (RIPE) interface provides the user to access the configuration and setup files of the modules in the system. Like the other Inview interfaces, it is also a controller for DC regulation.

Inview XC (RIPE) is featured with the following:

- Monitors up to 32 converters.
- Three LEDs to indicate Major alarm, Minor alarm and System
- Two Digital Inputs and two Output Relay contacts.
- Higher temperature resistance.



### 5.2.1 Inview XC (RIPE) Specifications

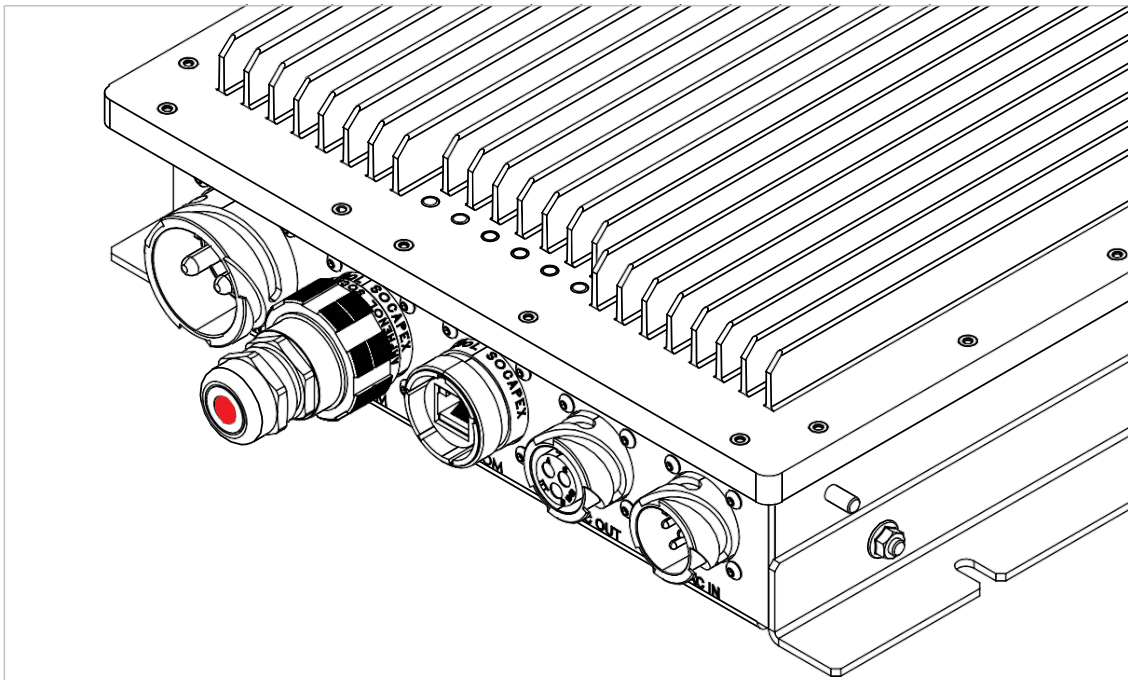
Model	Inview XC (RIPE)
Modules Compatibility	MPI-1600
Display	None (IP67 protected)
Hardware interfaces	1 x ETH, 1 x RS485, 1 x CAN, 1 x 19 Pin connector
Supported protocols	Modbus RS485, Modbus TCP, SNMP v1, v2C and v3, HTTP/ HTTPS
Digital input / Output relay	2 / 2
Accessories	Measure Box Battery (MBB) with external power supply
Buzzer	None
Mounting	Pole / Wall / Panel / Door
Power supply	Internal power supply 12 Vdc (from modules)
Power consumption	5 W
Operating Temperature Range	-40 to 65 °C
Dimension (WxHxD)	300 x 155 x 70 mm
Weight	2.5 kg
Part number	T602004141

For more information, refer to the Inview User Manual - <https://datasheet.cet-power.com/CET - Monitoring - User Manual - Inview - EN.pdf>.

## 5.3 Accessory - Bridging COM plug (Optional)

A 'Bridging COM Plug' is used to bridge the Remote A pin and GND pin, when Remote ON/OFF function is not used. The Rem A and GND pins are internally bridged inside this plug. This can be ordered separately from CE+T.

**Note:** If the Bridging COM Plug is used, that particular COM port is not usable anymore. The secondary COM port can be used for other signals.

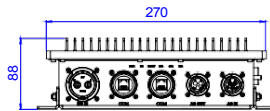




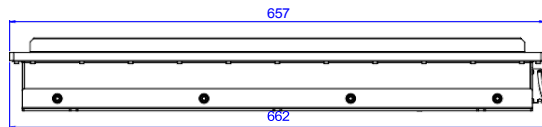
## 6. Installation

- Read safety instructions prior starting any work.

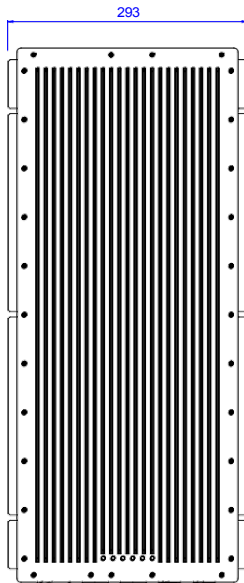
### 6.1 MPI-1600 dimensions



FRONT VIEW



LEFT VIEW



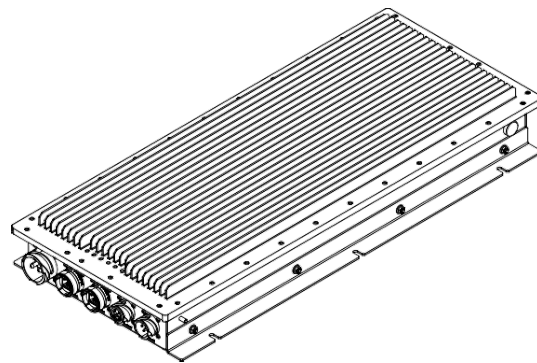
TOP VIEW

Width = 293

mm Height =

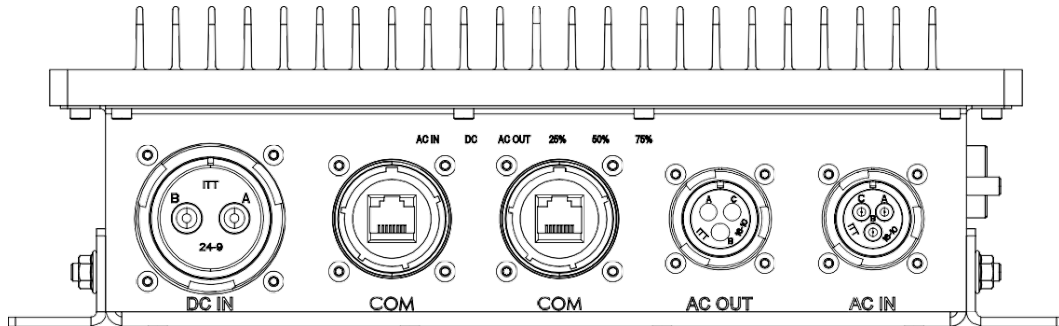
88 mm Depth

= 657 mm



ISOMETRIC VIEW

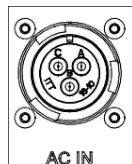
## 6.2 Front Panel Connectors



### 6.2.1 Pin Assignment

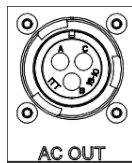
#### AC Input:

- A - Line
- B - Neutral
- C - Safety ground



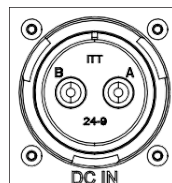
#### AC Output:

- A - Line
- B - Neutral
- C - Safety ground



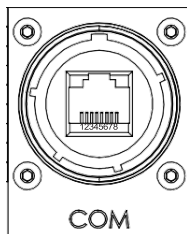
#### DC:

- A - DC positive
- B - DC negative



#### COM:

- 1 - Bus A
- 2 - Bus A-
- 3 - Remote K
- 4 - Ground
- 5 - (+)12 V
- 6 - Remote A
- 7 - Bus B
- 8 - Bus B-



**Warning:** The internal RS485 BUS comes in COM connector. The internal bus connectors are sensitive and special caution must be taken during installation, to keep them out of harms way.

## 6.3 Remote ON/OFF

The remote ON/OFF connection is present within COM port. Refer to “6.2.1 Pin Assignment”, page 18 for more details.

- The function of remote ON/OFF is used turn off the module/system output.
- AC and DC inputs are not affected by the remote ON/OFF function.
- The remote ON/OFF can be operated from any module when many modules are connected in parallel.
- The remote ON/OFF requires changeover relay/contactors, one input opens as the other close. If both transitions are not picked up the status is not changed.
- When DC input is only present, Remote ON/OFF will switch OFF the module input & output and enter the standby mode. Standby mode power consumption shall be  $\leq 1$  W.

### Relay/Contactor characteristics for Remote ON/OFF

- Signal voltage +5 VDC (galvanic insulated)
- Max wire size 1 mm<sup>2</sup>

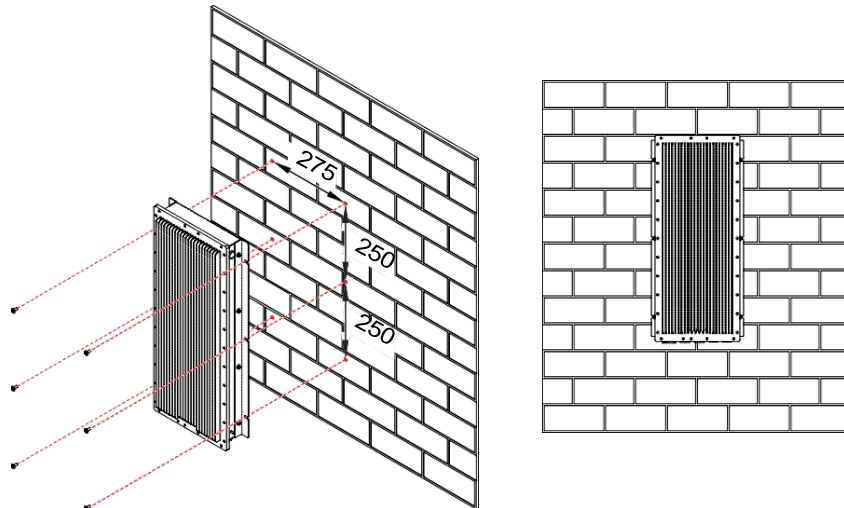
### Functional table for remote ON/OFF function

#	Rem K - GND	Rem A - GND	Status	Indication
1	Open	Open	Normal operation	All (Green)
2	Closed	Open	OFF	AC output (OFF) AC Input (Green) DC Input (Green)
3	Open	Closed	Normal operation	All (Green)
4	Closed	Closed	Normal operation	All (Green)

**Warning:** If remote ON/OFF is not used, pins 4 and 6 (Remote A and GND) MUST be bridged together. It can be done at the customer-end of the COM cable that is connected to the COM port of MPI-1600. It can also be done using the accessory ‘Bridging COM Plug’. Refer Section 5.3, page 16 for more details.

If more than one MPI-1600 module is used in parallel and their COM ports are interconnected, then the bridging can be done at any one common junction.

## 6.4 Wall mounting



- Clean the wall surface
- Mark six hole positions on the wall according to the picture (dimensions in mm).
- Drill holes on the marked points.
- Fix the module on the wall, using the screws.

Note: When installing multiple modules, minimum clearance of \_\_mm must be maintained between the modules.

## 6.5 Cable sizing

### 6.5.1 DC input connection

Model	DC input current at 28 Vdc	DC breaker	Cable size	Max size
2000 VA	72 A	100 A	16 mm <sup>2</sup>	16 mm <sup>2</sup> per pole


### 6.5.2 AC input connection

Model	Input current at 230 Vac	AC breaker	Cable size	Max size
2000 VA	7.2 A	10 A	2.5 mm <sup>2</sup>	4 mm <sup>2</sup>

### 6.5.3 AC output connection

Model	Input current at 230 Vac	AC breaker	Cable size	Max size
2000 VA	8.7 A	10 A	2.5 mm <sup>2</sup>	4 mm <sup>2</sup>

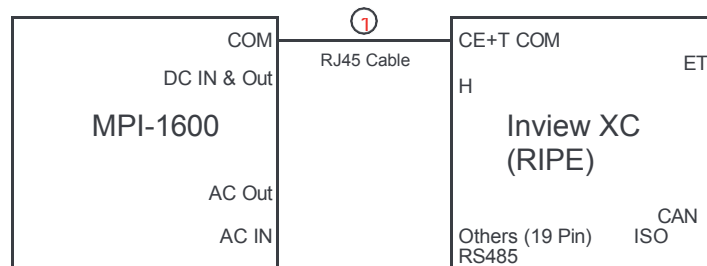
## 6.6 Grounding

“PE CHASSIS GROUND”  shall be wired to MET or distributed earth bar connected to MET, according to local regulations.

## 6.7 Hardware Connections

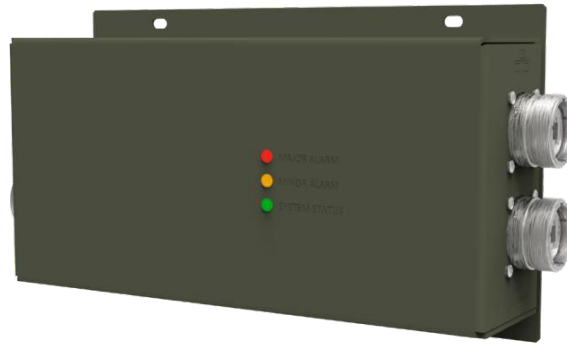
In MPI-1600 module, the Inview XC (RIPE) must be connected according to the following steps:

1. Connect “COM” port in MPI-1600 System and “CE+T COM” port in Inview X using RJ45 straight cable.
2. Connect “CAN ISO RS485” port in Inview XC (RIPE) and “CAN1” port in MBB.



## 7. Monitoring device - Inview XC (RIPE)

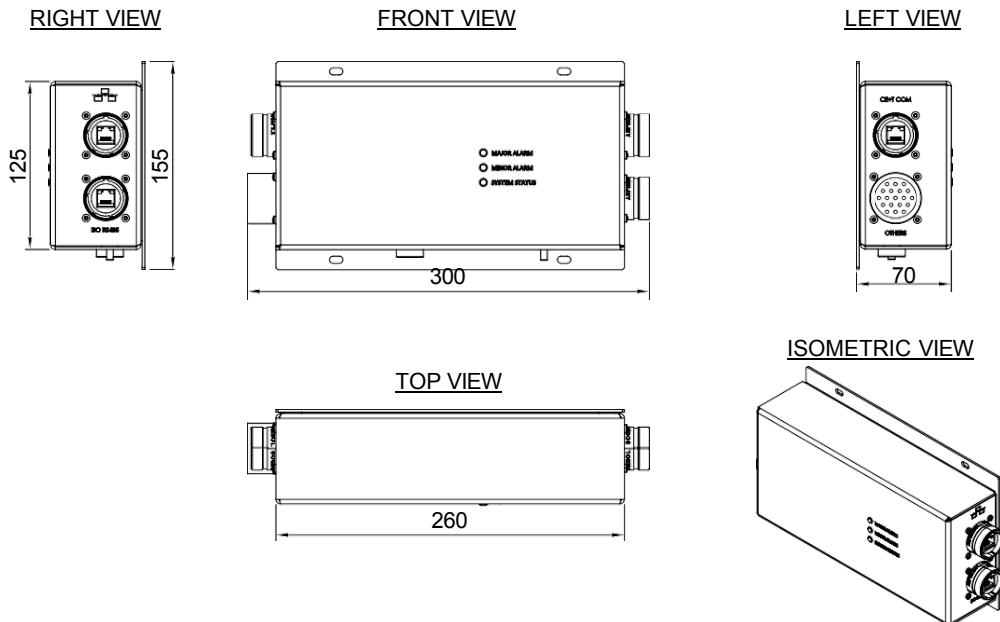
MPI-1600 can be monitored through Inview XC (RIPE). The Inview XC (RIPE) has IP65 protection.



In Inview XC (RIPE), the connection to CE+T COM, CAN ISO RS485, and ETH ports must be connected through the IP65 connector.

The Alarm, Digital inputs, Customer CAN and USB connection, must be connected to Inview XC (RIPE) through the below connector. Refer to “7.4 Hardware Connections”, page 24 for pin details.

### 7.1 Inview XC (RIPE) dimensions



## 7.2 Inview XC (RIPE) - LED Indications

Three LED's are present at top side of the controller to indicate major alarm, minor alarm, and system status.



**Red:** Major

**Alarm Orange:**

Minor Alarm

**Green:** System status (Normal Operation)

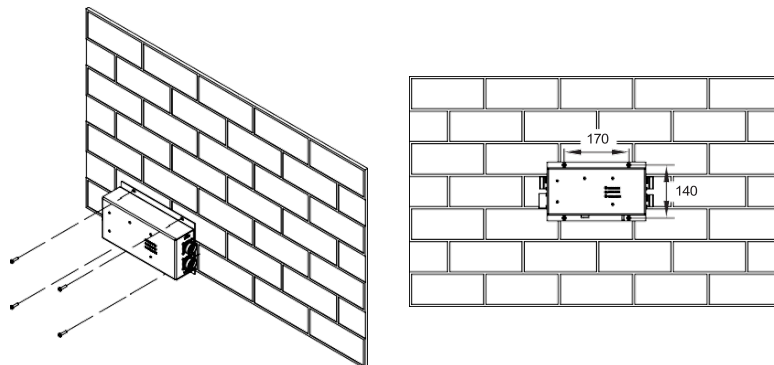
## 7.3 Inview XC (RIPE) Installation

### 7.3.1 Site preparation

- Before mounting the Inview XC (RIPE) in the system, route all the required connection cables from the system and place them near the Inview XC (RIPE) mounting location.
- All cables should be copper wire and must be rated for min 90°C (194°F).
- All cables must be sized according to the rated current of the Inview / Measure Box Battery and to the customer terminal connection.
- All power and signal cables should be routed properly.

### 7.3.2 Wall mounting

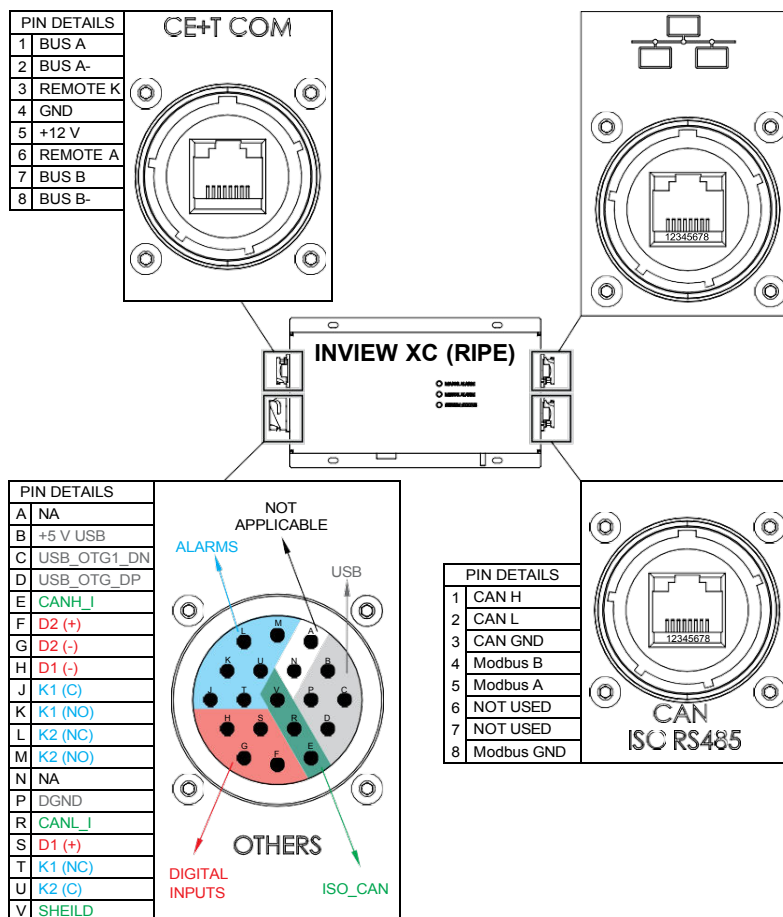
- Clean the wall surface.
- Mark four holes according to the dimensions given in the picture below.
- Drill holes on the marked points.
- Fix the controller on the wall using the screws.



## 7.4 Hardware Connections

This section describes the hardware connections of the Inview controllers and some measure boxes (MBB/UMB).

- CE+T COM port is dedicated to establish connection between Inview XC (RIPE) and converters.
- ETH port: used for network connectivity and user can access the system information in the Web Interface and SNMP. The default static IP address is 10.250.250.1/24.
- CAN / ISO RS485 port: for Modbus RTU and CAN communication. This port should be used for the communication with a Measure Box Battery. An external power supply is needed for the Measure Box Battery. To know about the pin details, refer to the following figure.
- An “Others” port that comprises:
  - Digital inputs (D1 and D2): Two potential free Digital Inputs are available for customer connections.
    - Digital Input 1 is assigned for MBP operation if used.
    - Digital Input 2 is assigned for Surge Arrester if used.
  - Output relays (K1 and K2): Two output relays are available and can be used for Major and Minor alarms.
  - An additional iso CAN for CAN communication.

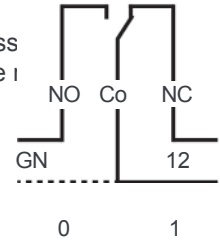


ISO CAN on the 19 pin connector must be used if the communication has to be isolated. For more details about this monitoring device, refer to the Inview user manual. Inview XC has slightly different connections but same functionalities.



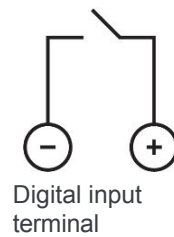
## 7.4.1 Output Relay Connections

Each output relay terminal should be connected according to the diagram. A possible way of connecting Ground and 12 Vdc in order to get a "0" or a "1" based on the state.



## 7.4.2 Digital Input Connections

In digital input terminal, the external voltage should not be applied and it is mandatory to connect only like switches. Each output relay terminal should be connected according to the diagram.



## 8. Inview web interface

Some specific and helpful information for the Inview XC web interface is given in this chapter.

For more information, read the Inview User Manual: [CET - Monitoring - User Manual - Inview - EN.pdf \(cet-power.com\)](https://cet-power.com/EN.pdf)

### 8.1 Connection to Inview web interface

Connect your PC to the ETH port of Inview XC.

Open the web browser, type the default IP address **10.250.250.1** in the address field, and press enter.

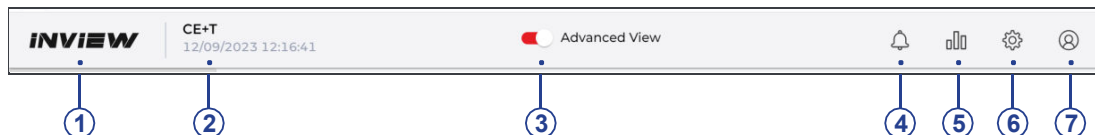
**Note:** Use any of the latest web browsers: Google Chrome, Mozilla Firefox, Safari, or Microsoft Edge.

Inview XC has three logins: Basic, Expert, and Admin. All three logins are password protected. The default password for all three logins is “1234”.






An auto-logout feature is available to avoid a user being connected all the time. When no action is performed for more than **10 minutes**, the session will expire and go to the login screen.

### 8.2 Navigating through the interface

#### 8.2.1 Header



The icons on the header provide quick access to the corresponding pages.


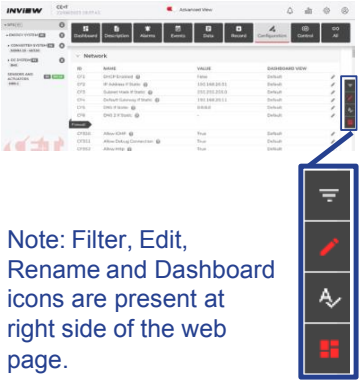










- 1 → **Home:** Clicking on **INVIEW** logo goes to the home page from any page you are accessing in the interface.
- 2 → Display the date, time and site name of the system.
- 3 → **Configuration:** Click on  to toggle between Configuration and Widget or Dashboard page.
- 4 → **Alarms:** Clicking on  goes to the Alarm page, where active alarms and last events are listed.
- 5 → **Reporting:** Clicking on  goes to Reporting page, where Data records and Site details are available.
- 6 → **Administration:** Clicking on  goes to the Administration page and provides access to many action pages such as User management, Software update, Configuration files, Reports, References, Languages selection, Support package, Time management, Events log and Licensing.
- 7 → **User Context:** Clicking on  provides the information of login account such as Basic,



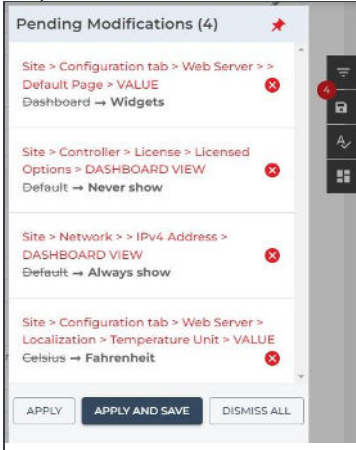
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Expert or Admin, Quick Links to Save Configuration and reboot controller, Website links to download software and documents, Device and network information, Change Password and Logout.

## 8.2.2 Web page Controls

Placing or clicking on it performs the corresponding action.

Controls	Description	
	Filters: Page displays depending upon the filter selection.	 <p data-bbox="1034 775 1310 925">Note: Filter, Edit, Rename and Dashboard icons are present at right side of the web page.</p>
	Page changes to edit mode and the user can change the parameters. If any parameter value is changed, the edit icon changes to modification icon and displays the list.	
	Rename the parameter name.	
	Select the corresponding parameter to either display or not on the Dashboard tab of the Advanced View page.	
	On-Board help: Provide a short description to help to know about the corresponding parameters.	
	Page or section expands.	
	Page or section collapse.	
	Particular section opens in a new tab.	
	Particular section open as a pop-up.	
	Drop down list – more options are present.	
	Delete / Clear the corresponding parameter.	

Controls	Description
	<p>Modifications list: It appears at right side of the “Advanced View” page. This list helps the user to overview the changes and can apply the required parameters.</p> <p>Apply: Clicking on “APPLY” button, the controller accepts all the parameter changes in the modifications list.</p> <p>Apply and Save: Clicking on “APPLY AND SAVE” button, the controller accepts all the parameter changes in the modifications list and saves them in the configuration file.</p> <p>Dismiss All: Clicking on “DISMISS ALL” button, the controller rejects all the parameter changes in the modifications list.</p> <p>Clicking on  button, the controller rejects only the particular modification from the list.</p> <p>Note: The number on the icon indicates the number of modifications in the list.</p> 

## 8.3 Inview Licenses

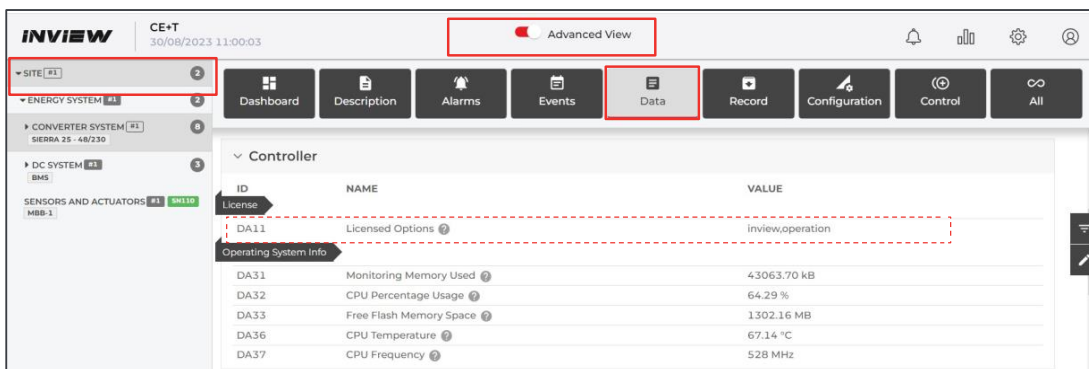
### 8.3.1 Basic License

Pre-installed in all Inview devices, the basic license includes:

<b>Communication with a limited number of CE+T devices</b>
One type of CE+T Converter, i.e. MPI1600
CE+T accessories such as MBB without limitation
<b>Real Time Monitoring and Configuration via Web Interface, including relay mapping</b>
Access to Inview web interface
Alarms reflecting the system status
Events
Widget View
Real-Time Data
Access to controls to send manual setpoints via web interface
<b>System Remote Interaction for data collecting: Modbus read, email alerts, SNMP traps, NTP</b>
Modbus TCP/RS485 Read Only
Email Notification from a certain alarm level (SMTP)
SNMP V1, V2c, V3 Read Only and Traps
NTP Protocol
<b>Cybersecurity Capabilities</b>
Firewall access
https with self-signed /standard certificate

<b>3 Levels of User Roles</b>
Basic, Expert, Admin roles give access to different parameters
<b>Provides basic power management capabilities, including battery regulation:</b>
UPS for AC loads & UPS for AC and DC loads → Bidirectionality on DC port
Battery Regulation Algorithms: CC-CV, Boost, Temperature Compensation, Battery Test, Battery Disconnect

To know about the available license options, log in to the web interface, go to *Advanced View > Site > Data > Configuration*, and check the **ID DA11** in the Controller section.



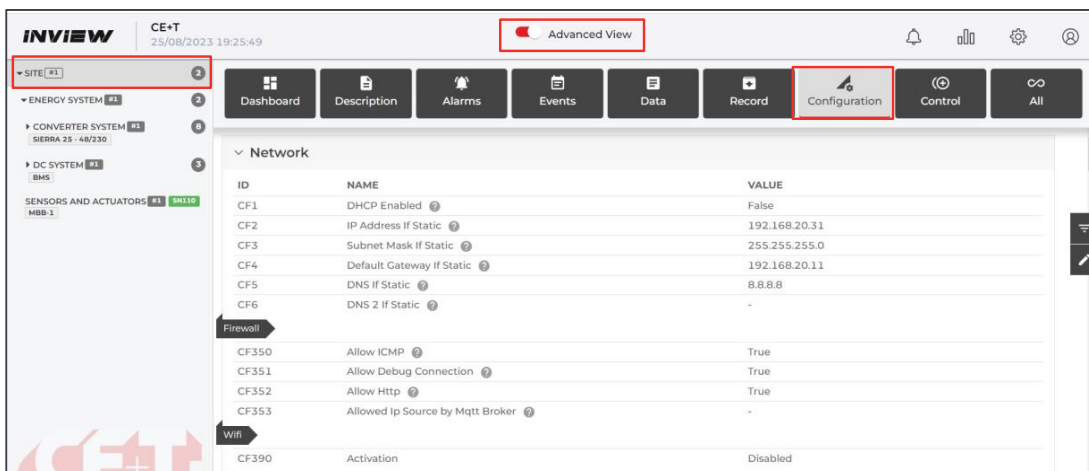
### 8.3.2 Specific licenses

Information about more specific licenses can be found in the Inview User Manual: [CET - Monitoring - User Manual - Inview - EN.pdf \(cet-power.com\)](#)

### 8.4 Network settings

Go to *Advanced View > Site > Configuration*

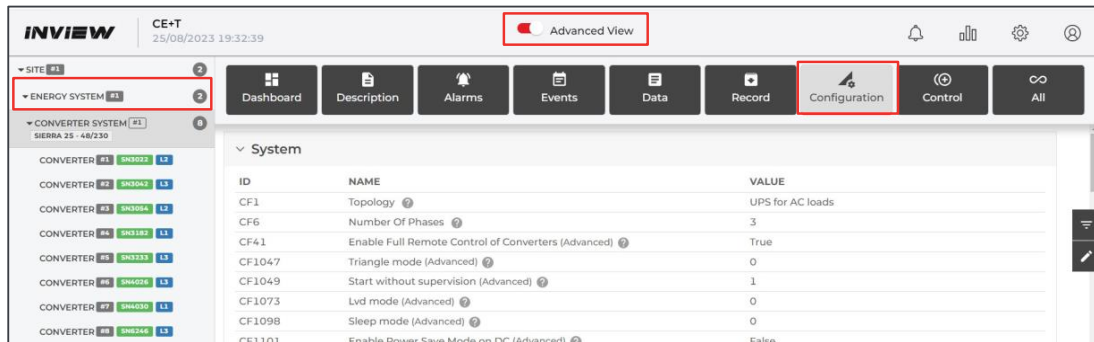
Enter the network details such as *IP address, Firewall settings, NTP time, web server*, and applicable parameters.



## 8.5 System configuration

### 8.5.1 Converter system configuration

To configure the converter systems, In Advanced View, go to *Site > Energy System > Converter System > Configuration*.



The list of related parameters is the following:

ID	Name	Recommended values (comments)
<b>System</b>		
CF1	Topology	UPS for AC loads UPS for AC & DC loads (presence of an MBB is mandatory)
CF6	Number Of Phases	1 or 3
CF41	Enable Full Remote Control of Converters (Advanced)	True or False
CF1047	Triangle mode (Advanced)	0 or 1
CF1049	Start without supervision (Advanced)	0, 1 or 2
CF1073	Lvd mode (Advanced)	0 or 1
CF1098	Sleep mode (Advanced)	0 or 1
<b>Phase 1</b>		
CF121	Configured Converters	-
CF122	Redundant Converters	-
CF123	Nominal Phase Shift (Advanced)	0°
<b>Phase 2</b>		
CF141	Configured Converters	-
CF142	Redundant Converters	-
CF143	Nominal Phase Shift (Advanced)	120°
<b>Phase 3</b>		
CF161	Configured Converters	-
CF162	Redundant Converters	-
CF163	Nominal Phase Shift (Advanced)	240°

ID	Name	Recommended values (comments)
<b>AC-output</b>		
<b>Alarms</b>		
CF111	Saturated: Set	80 %
CF112	Saturated: Clear	70 %
<b>Phase 1</b>		
CF124	Nominal Voltage (Advanced)	230 V
<b>Phase 2</b>		
CF144	Nominal Voltage (Advanced)	230 V
<b>Phase 3</b>		
CF164	Nominal Voltage (Advanced)	230 V
<b>Frequency</b>		
CF1016	Nominal Frequency (Advanced)	0, 50 or 60 Hz (50 Hz is default)
<b>Short-Circuit</b>		
CF1034	Short Circuit Threshold Voltage (Advanced)	80V -> 150V
CF1035	Short Circuit Hold Time (Advanced)	60s -> 1s
CF1042	Booster 8x Inom (Advanced)	0 or 1
<b>Power Limitation</b>		
CF1038	Max Current (Advanced)	Between 100 and 150 %
CF1039	Max Power (Advanced)	Between 100 and 150 %
<b>AC-input</b>		
<b>Power Limitation</b>		
CF301	Override Max Consumed Power Timeout (Advanced)	20s
CF1068	Max Consumed Power (Advanced)	-1
CF1069	AC-in Power Limitation per phase (Advanced)	-1
<b>Alarms</b>		
CF311	Saturated: Set	80 %
CF312	Saturated: Clear	70 %
<b>Voltage</b>		
CF1006	Low Start (Advanced)	120
CF1007	Low Transfer (Advanced)	89
CF1008	Low Stop (Advanced)	89
CF1009	High Start (Advanced)	285 V
CF1010	High Transfer (Advanced)	295 V
CF1011	High Stop (Advanced)	295 V
<b>Frequency</b>		
CF1012	Low Start (Advanced)	47.3 Hz
CF1013	Low Stop (Advanced)	47.0 Hz
CF1014	High Start (Advanced)	52.7 Hz



ID	Name	Recommended values (comments)
CF1015	High Stop (Advanced)	53.0 Hz
<b>Modes</b>		
CF1036	Bravo Priority Input Source (Advanced)	0 %
CF1037	Synchronization tracking speed (Advanced)	-2
CF1041	Bravo Reg Mode (Advanced)	0
CF1044	Reinjection allowed (Advanced)	0 (when grid reinjection is not allowed) 1 (pure UPS systems)
CF1046	Walk in mode (Advanced)	0 (with grid) 1 (with genset)
CF1051	AC 1 stop power (Advanced)	0
CF1070	Phase compensation (Advanced)	1
CF1097	Backfeed detection mode (Advanced)	0
<b>DC</b>		
<b>Bus 1</b>		
CF501	Override Voltage SetPoint Timeout (Advanced)	20s
CF503	Override Power SetPoint Timeout (Advanced)	20s
<b>Alarms</b>		
CF511	Saturated: Set	80 %
CF512	Saturated: Clear	70 %
<b>Voltage</b>		
CF1000	Low Start (Advanced)	18 V
CF1001	Low Transfer (Advanced)	16 V
CF1002	Low Stop (Advanced)	16 V
CF1003	High Start (Advanced)	30 V
CF1004	High Transfer (Advanced)	32 V
CF1005	High Stop (Advanced)	32 V
CF1072	V DC Low Stop charger (Advanced)	0 V (no critical DC loads) 10 V (with critical DC loads)
<b>Fallback</b>		
CF1066	Charging Voltage	26.8 V
CF1067	Charging Power	See help
CF1074	Maximum Voltage Increment Rate	See help
<b>Modes</b>		
CF1071	Sierra Mode (Advanced)	1
CF1087	Slope (Advanced)	0 W/V
<b>Hidden</b>		
CF1084	Temperature Derating Mode (Advanced)	0

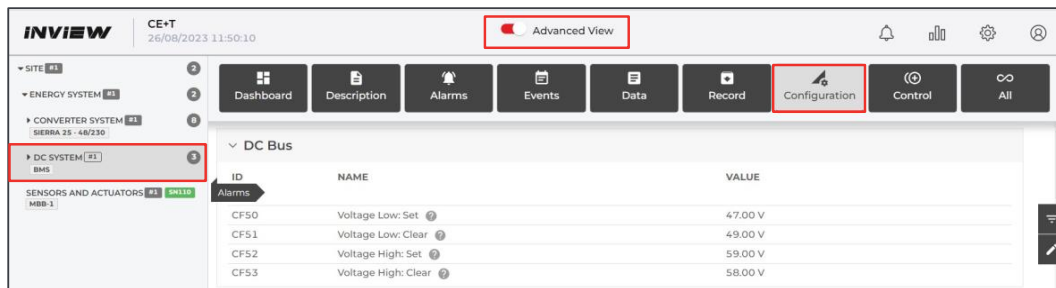
## 8.5.2 DC system configuration

The following configuration is to be used with classical lead-acid batteries (not a smart battery, no BMS), without DC load, without an LVD (Battery Disconnect), without the configuration for battery tests, with the configuration for battery boost, without temperature compensation and without MBB for battery measurements.

Information about more specific battery configurations can be found in the Inview User Manual: [CET - Monitoring - User Manual - Inview - EN.pdf \(cet-power.com\)](#)

To configure the DC System, go to *Advanced View > Site > Energy System > DC System > Configuration*.

In the DC Bus section, set the parameters depending upon the DC voltage. The below page is configured to 48 Vdc.



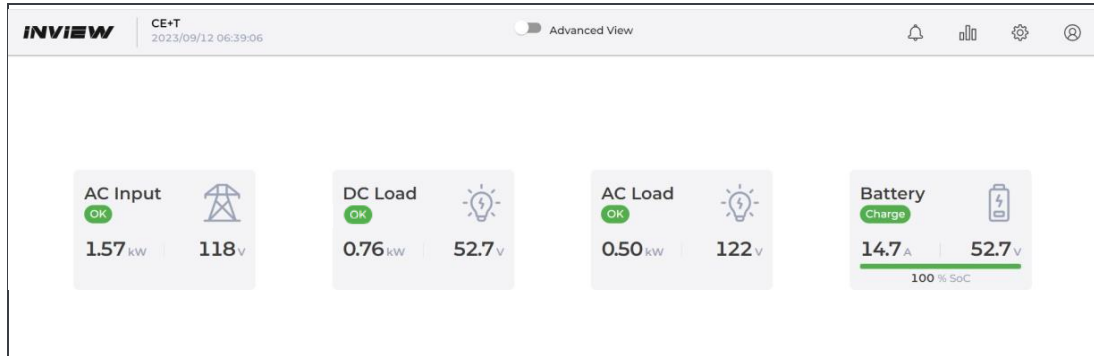
The list of related parameters is the following:

ID	Name	Recommended values (comments)
<b>DC Bus</b>		
<b>Alarms</b>		
CF50	Voltage Low: Set	20.50 V
CF51	Voltage Low: Clear	21.00 V
CF52	Voltage High: Set	28.50 V
CF53	Voltage High: Clear	28.25 V
<b>Battery</b>		
CF90	Presence	True
<b>Measurement Source</b>		
CF100	Voltage (Advanced)	Autodetected
CF101	Current (Advanced)	Modules
<b>Characteristics</b>		
CF102	Type	Lead-Acid
CF103	Number of Cells	12
CF104	String Capacity	-
CF105	Number of Strings	1
<b>Autonomy</b>		
CF106	Peukert Number	See help
CF107	Max Depth of Discharge for Estimation	See help (100.00 by default)

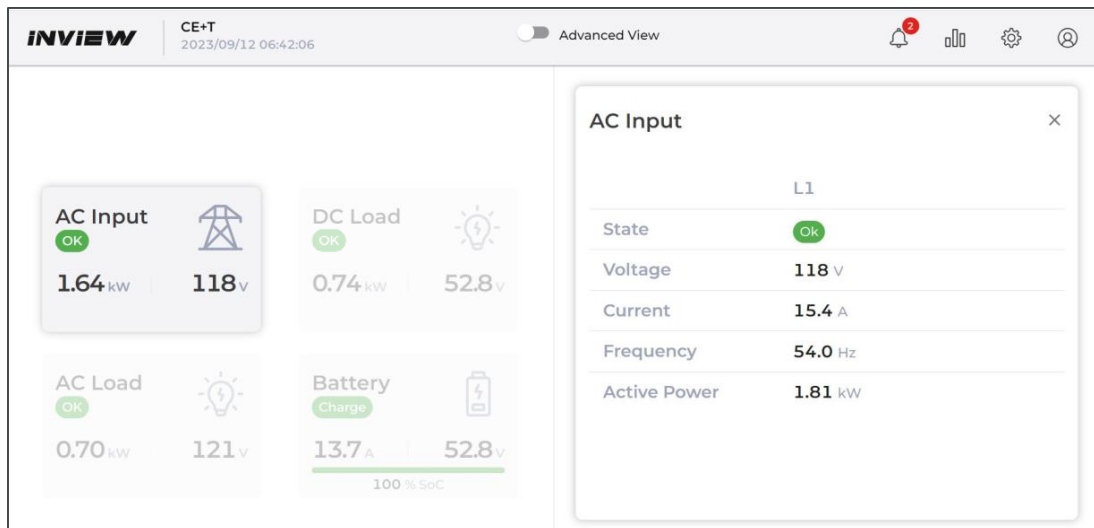
ID	Name	Recommended values (comments)
<b>Temperature alarms</b>		
CF121	Alarm Low Threshold	Without MBB and temperature measurement, these alarm threshold cannot be taken into account.
CF122	Alarm High Threshold	
CF123	Alarm High Hysteresis	
<b>Battery charging</b>		
<b>Voltage (Float)</b>		
CF111	Voltage Per Cell	2.26 V
CF112	Source	Configuration
<b>Current Limitation</b>		
CF113	Enabled	True (by default : False)
CF114	Current Limit	Set according to the battery's datasheet
CF115	Source	Configuration
<b>Start/stop criteria</b>		
CF126	Disable Charge When Too High	Without MBB and temperature measurement, this criteria cannot be taken into account
<b>Temperature Compensation</b>		
CF151	Enabled	False (Without MBB and temperature measurement, this compensation cannot be taken into account)
<b>Boost</b>		
CF201	Enabled	False
<b>Battery test</b>		
CF251	Enabled	False
<b>Battery Disconnect</b>		
CF301	Presence	False (Without a physical LVD and relay configuration, it is not possible to use this feature)

## 8.5.3 Widget configuration

Widgets of different sorts are available. Up to 20 widgets can be configured on the home page. The configuration will appear on the web interface (toggle Advanced View).



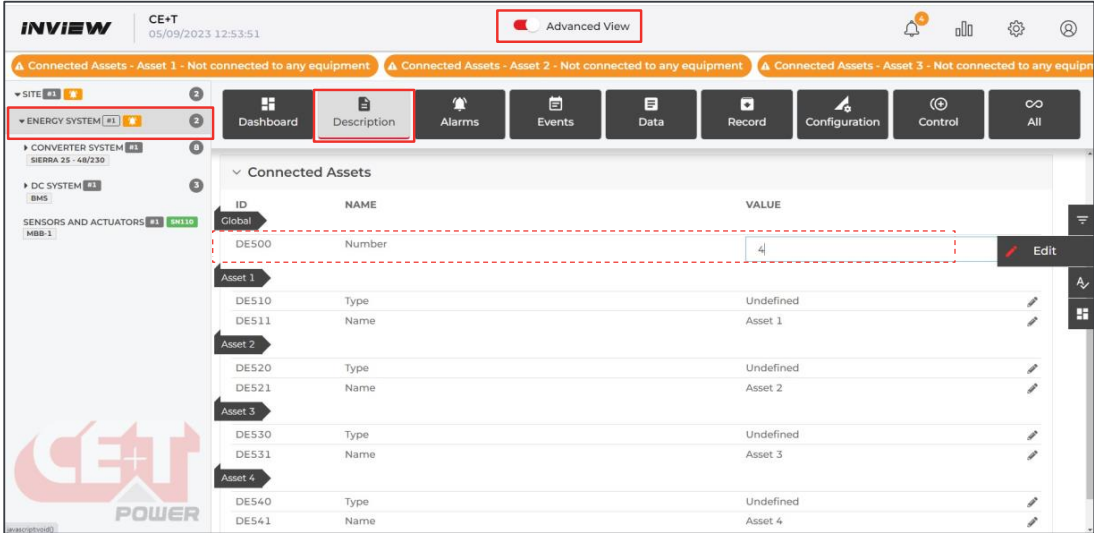
Clicking on any widget displays the corresponding details on right side of the page.



**Perform the following step for Widgets configuration:**

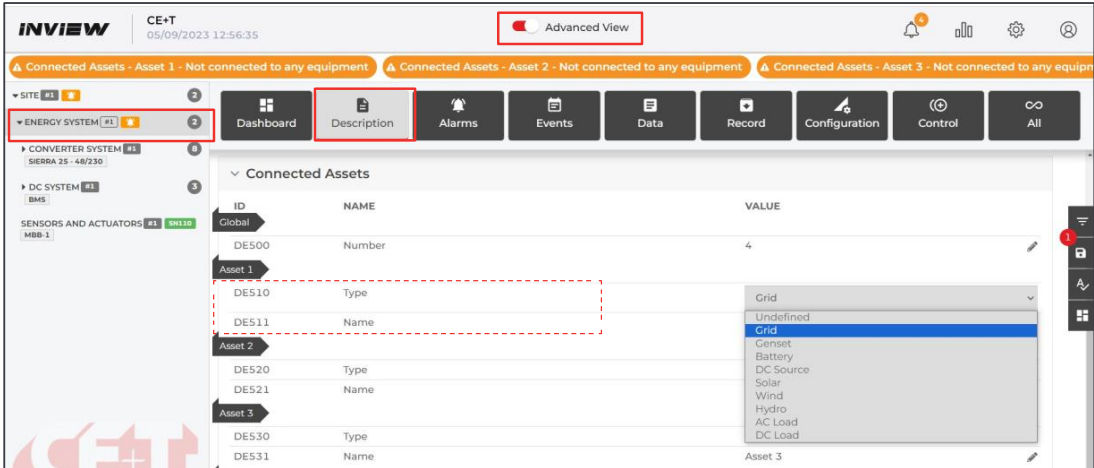
1. Assigning number of widgets: Go to *Advanced View > Energy System > Description > Connected Assets*. Click the edit icon and enter the number of assets connected to the system in the ID DE500. Click “Apply and Save” to apply changes.

For example, the Sierra System has four assets: AC Input, Battery, AC Load and DC Load. So, in the below screenshot, the number 4 is entered.

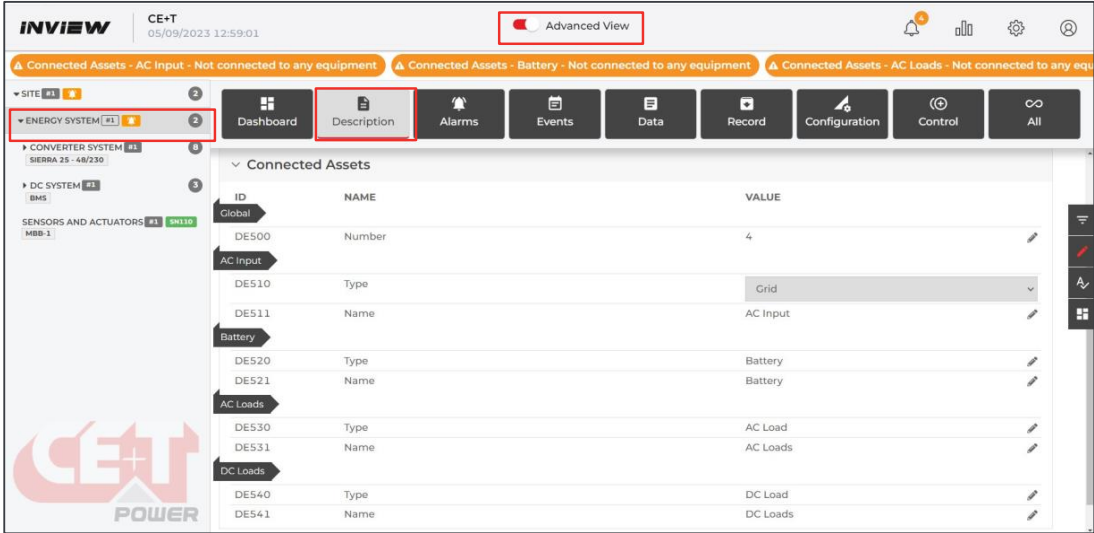


Note: As soon as you start customizing your assets, the default one will be deleted, and you have to create all the assets you want to display. You can get the default assets back by setting DE500 to 0 again.

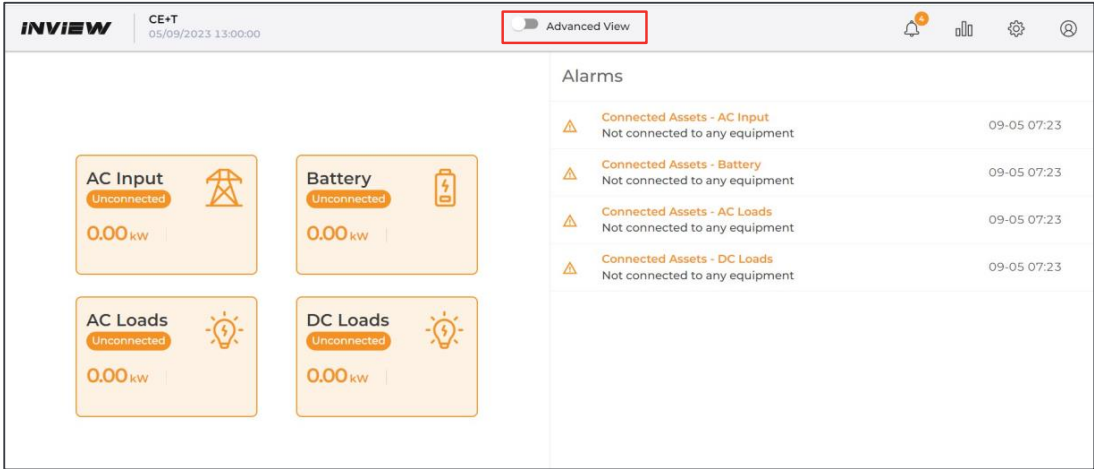
2. Widget settings: Go to Asset 1 in the ID DE510, select the type of widget and enter the desired name for the widget in ID DE511.



A) Similarly, configure for other remaining Assets. In the below screenshots, Assets 1, 2, 3 and 4 are assigned for AC Input, Battery, AC Loads and DC Loads, respectively.

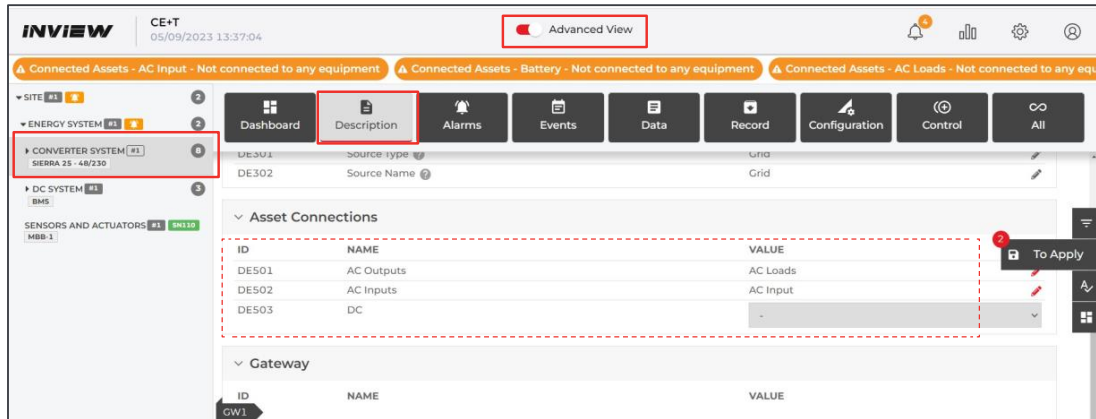


B) Toggle the Advanced view switch and verify all assigned widgets appear on the home page.

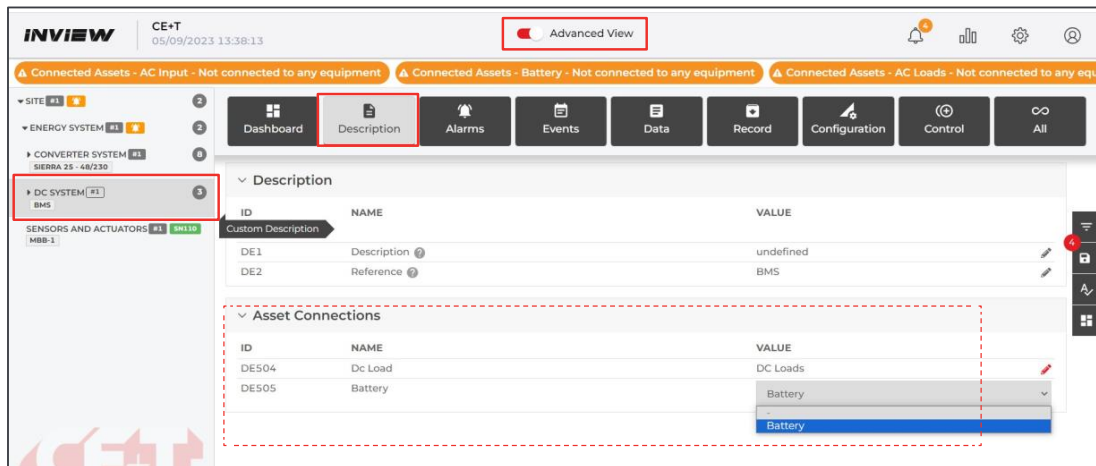


In Widget settings, the type and name are assigned to the widget, which is not connected to the appropriate measurements. Follow the next step for connections.

Go to *Advanced View > Converter System > Description > Asset Connections*.

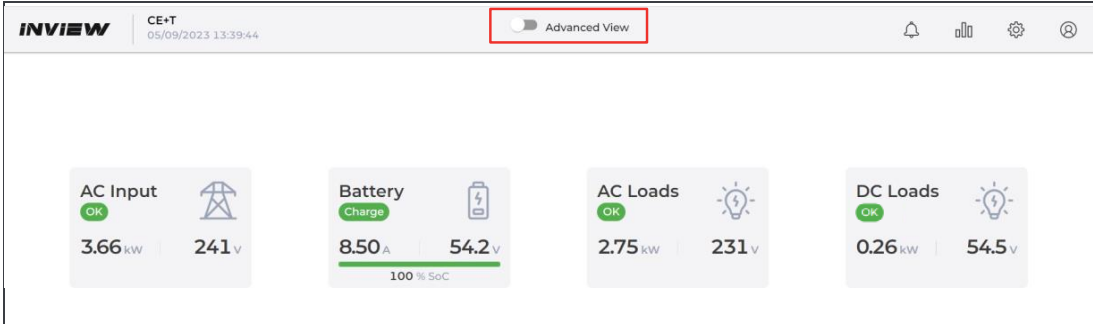


- AC Outputs: In the ID DE501, Select the Asset name from the list connected to the system's AC Output.
- AC Inputs: In the ID DE502, Select the Asset name from the list connected to the system's AC Input, such as Grid, Genset, etc.
- DC: In the ID DE503, Select the Asset name from the list connected to the system's DC Input, such as Rectifier, MPPT, etc. No DC input is connected to the system, so in the above screen shot, it is left blank.
- DC Load and Battery: Go to *Advanced View > DC System > Description > Asset Connections*.



- DC Load: In the ID DE504, Select the Asset name from the list connected to the system's DC Output.
- Battery: In ID DE505, Select the Asset name of the Battery from the list connected to System.

- Toggle the Advanced view switch and verify all assigned widgets are configured correctly on the home page.





## 9. Finishing

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- If cabinets are used, make sure that they are properly fixed to the cabinet/floor and connected to Ground.
- Make sure that all DC and AC input breakers are switched OFF.
- Make sure that all cables are according to recommendations and local regulations.
- Make sure that all cables are strained relieved.
- Make sure that all breakers are according to recommendation and local regulations.
- Make sure that DC polarity is according to marking.
- Re tighten all electrical terminations.
- Make sure that no converter/controller positions are left open.
- Cover empty converter positions with blanks.
- Make sure that the Remote ON/OFF is appropriately wired according to local regulations.
- Make sure that the point of AC supply meets local regulations.

## 10. Commissioning

The DC breaker is a protection device. Modules are plugged in a system and DC breaker is then engaged. Please make sure the corresponding DC breaker is engaged in the ON position. Failure to observe this rules will result not to have all module operating when running on DC and have module failure when AC input recover from fault condition.

Installation and commissioning must be done and conducted by trained people fully authorized to act on installation. It is prohibited to perform any isolation test without instruction from manufacturer.

Equipments are not covered by warranty if procedures are not respected.

## 10.1 Check list

DATA	
Date	
Performed by	
Site	
System serial number	
Module serial numbers	
Inview XC (RIPE) Serial number	
ACTION	OK/ N.OK
Check the commercial AC voltage before closing the AC input breaker.	
Switch ON the commercial AC	
Check the DC power supply and switch ON the DC breakers (Ensure the DC Polarity)	
Check if converters are working (Green led)	
Check output voltage (on bulk output or on breaker)	
Power ON if more modules are connected in parallel (3to 6 modules) one by one	
Check if all converters are working properly	
Check if system has no alarm (Disable the alarm if any)	
Set the Battery parameters (as per OEM datasheet) mainly on charging voltage and current	
Check the Battery charging status	
Check the Battery discharging status by disconnecting the AC Input power supply	
Read configuration file and review all parameters. Some parameters should be adapted according to the site condition.	
Test on load (if available)	
ALARM	
Switch ON AC input and DC input and check that no alarm are present	
Switch OFF AC input (commercial power failure) and check the alarm according to the configuration	
Check the different digital input according to the configuration (when used)	
If the converters are working in normal condition, save the configuration file and clear all the event logs	

## 11. Trouble Shooting and Defective Situations Fixing

### 11.1 Trouble Shooting

<p>Converter module does not power up:</p>	<p>Check AC input present and in range (AC breakers)            Check DC input present and in range (DC breakers) Check that the converter is properly inserted            Remove converter to verify that slot is not damaged, check connectors Check that module(s) is (are) in OFF state            Check for loose terminations</p>
<p>Converter system does not start:</p>	<p>Check that Inview is present and properly connected            Check remote ON/OFF terminal Check the configuration and setting            Check threshold level</p>
<p>Converter only run on AC or DC:</p>	<p>Check AC input present and in range (AC breakers)            Check DC input present and in range (DC breakers) Check the configuration and setting            Check threshold level(s)</p>
<p>No output power:</p>	<p>Check output breaker</p>
<p>All OK but I have alarm:</p>	<p>Check the type of event and log file in the controller</p>
<p>No alarm:</p>	<p>Check relay delay time of alarms in the controller Check configuration file</p>

## 11.2 Defective modules

- A repair request should follow the regular logistics chain: End-user => Distributor => CE+T Power.
- Before returning a defective product, a RMA number must be requested through the <http://my.cet-power.com> extranet. Repair registering guidelines may be requested by email at [repair@cet-power.com](mailto:repair@cet-power.com).
- The RMA number should be mentioned on all shipping documents related to the repair.
- Be aware that products shipped back to CE+T Power without being registered first will not be treated with high priority! (Label shown here is only for representation)

### MPI-1600

### Sinewave Inverter / Charger

Input Voltage: 28VDC (16-32VDC)

Output Voltage: 120-230VAC, 50/60Hz

Output Power: 1600W



## RIPEENERGY

The Power Conversion Company

P/N: T731720000 S/N: 030669

### INVIEW XC

Mac ad.: AA-BB-CC-00-11-12



## RIPEENERGY

The Power Conversion Company

P/N: T602004141

S/N: 394155

## 12. Maintenance

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Maintenance should be performed by properly trained people.

### 12.1 Access Inview XC (RIPE) with Laptop

- Download system LOG FILE and save
  - Analyze log file and correct errors
- Download system CONFIGURATION FILE and save
  - Check/correct configuration file according to operation conditions
  - Check/correct alarm configuration
- Check module internal temperature for deviation between modules
  - Temperature deviation may indicate build up of dust. Clean the module by air suction blower or vacuum cleaner.
- Check module/system load
- Check/Correct inverter mapping (DC group/AC group/ Address)

### 12.2 Manual check

- Check voltages of AC input, DC input, AC output and DC output using the multi-meter
- Replace door filter if more dust is accumulated.
- Take a snap shot of the cabinet and site condition

### 12.3 Optional

- With an infrared camera check termination hot spots
  - Tighten terminations

### 12.4 Manual By-Pass

- Make sure AC input source is available during MBP operation. Otherwise the LOAD will be affected.

## 13. Defective modules

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For Service

- Check Service Level Agreement (SLA) of your vendor. Most of the time they provide assistance on call with integrated service. If such SLA is in place, you must call their assistance first.
- If your vendor doesn't provide such assistance (\*) you may contact CE+T through email:
  - USA and Canada: [tech.support@cetamerica.com](mailto:tech.support@cetamerica.com)
  - Rest of the world: [customer.support@cet-power.com](mailto:customer.support@cet-power.com)

(\*) CE+T will redirect your call to your vendor if he has such SLA in place.

## 14. Appendix

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### 14.1 Modules - Parameter List

With Inview, you can access the modules' parameter list and descriptions. Refer to the Inview user manual to access the Inview web interface - <https://datasheet.cet-power.com/CET - Monitoring - User Manual - Inview - EN.pdf>.

If you want to have an overview of standard systems' parameters, you can also view the parameters in our Monitoring Emulator - <https://www.cet-power.com/en/monitoring-emulator/>.

NOTE! Do not hesitate to use the help buttons to get more information about the parameters.