Rev. 3 - June 6th, 2024

PRELIMINARY

R6060C - EASY 6000/3000 Branch Controller

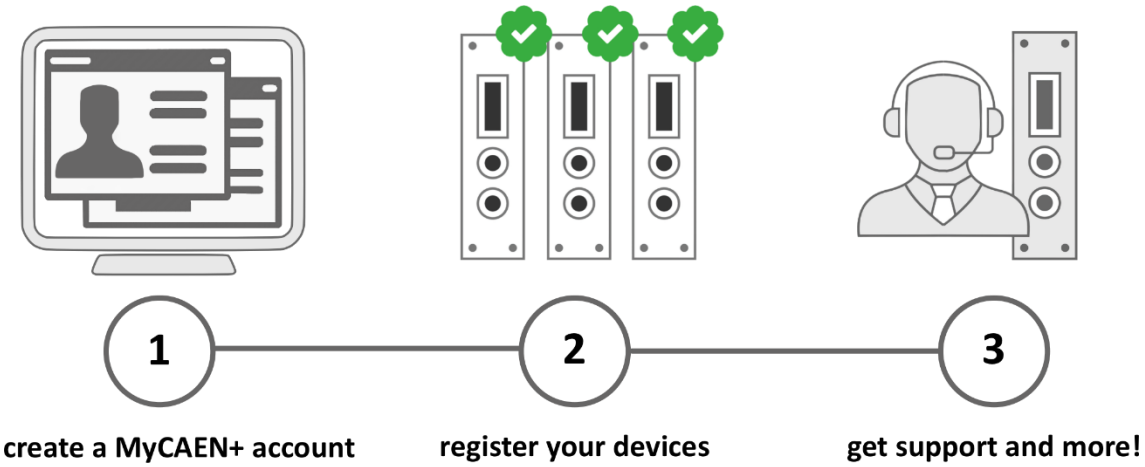
CAEN
Tools for Discovery

User Manual 9823

Register your device

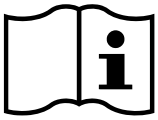
Register your device to your **MyCAEN+** account and get access to our customer services, such as notification for new firmware or software upgrade, tracking service procedures or open a ticket for assistance. **MyCAEN+** accounts have a dedicated support service for their registered products. A set of basic information can be shared with the operator, speeding up the troubleshooting process and improving the efficiency of the support interactions.

MyCAEN+ dashboard is designed to offer you a direct access to all our after sales services. Registration is totally free, to create an account go to https://www.caen.it/become-mycaenplus-user and fill the registration form with your data.



https://www.caen.it/become-mycaenplus-user/

Purpose of this User Manual



This document is the R6060C User's Manual; it contains information about the installation, the configuration and the use of the device.

Change Document Record

Date	Revision	Changes
October 10th, 2023	0	Preliminary Release
December 19th, 2023	1	Updated Recovery Mode
March 8th, 2024	2	Updated System Parameters
June 6th, 2024	3	48V Service Output

Manufacturer Contacts

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www.caen.it | info@caen.it

Limitation of Responsibility

If the warnings contained in this manual are not followed, CAEN will not be responsible for damage caused by improper use of the device. The manufacturer declines all responsibility for damage resulting from failure to comply with the instructions for use of the product. The equipment must be used as described in the user manual, with particular regard to the intended use, using only accessories as specified by the manufacturer. No modification or repair can be performed.

Reference Document

CAENHVWrapper library User's Manual

Disclaimer

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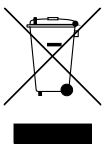
Made in Italy

We remark that all our boards have been designed and assembled in Italy. In a challenging environment where a competitive edge is often obtained at the cost of lower wages and declining working conditions, we proudly acknowledge that all those who participated in the production and distribution process of our devices were reasonably paid and worked in a safe environment (this is true for the boards marked "MADE IN ITALY", while we cannot guarantee for third-party manufactures).



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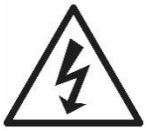
1 Safety Notices

N.B. Read carefully the "SAFETY, STORAGE AND SETUP INFORMATION PRODUCT SUPPORT SERVICE AND REPAIR" document provided with the product before starting any operation.

The following HAZARD SYMBOLS may be reported on the unit:

	Caution, refer to product manual
	Caution, risk of electrical shock
	Protective conductor terminal
	Earth (Ground) Terminal
	Alternating Current
	Three-Phase Alternating Current

The following symbol may be reported in the present manual:

	General warning statement

The symbol could be followed by the following terms:

- **DANGER**: indicates a hazardous situation which, if not avoided, will result in serious injury or death.
- **WARNING**: indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION**: indicates a situation or condition that, if not avoided, could cause physical injury or damage the product and / or its environment.

CAUTION: To avoid potential hazards

USE THE PRODUCT ONLY AS SPECIFIED.
ONLY QUALIFIED PERSONNEL SHOULD PERFORM SERVICE PROCEDURES

CAUTION: Avoid Electric Overload

TO AVOID ELECTRIC SHOCK OR FIRE HAZARD, DO NOT POWER A LOAD OUTSIDE OF ITS SPECIFIED RANGE

CAUTION: Avoid Electric Shock

TO AVOID INJURY OR LOSS OF LIFE, DO NOT CONNECT OR DISCONNECT CABLES WHILE THEY ARE CONNECTED TO A VOLTAGE SOURCE

CAUTION: Do Not Operate without Covers

TO AVOID ELECTRIC SHOCK OR FIRE HAZARD, DO NOT OPERATE THIS PRODUCT WITH COVERS OR PANELS REMOVED

CAUTION: Do Not Operate in Wet/Damp Conditions

TO AVOID ELECTRIC SHOCK, DO NOT OPERATE THIS PRODUCT IN WET OR DAMP CONDITIONS

CAUTION: Do Not Operate in an Explosive Atmosphere

TO AVOID INJURY OR FIRE HAZARD, DO NOT OPERATE THIS PRODUCT IN AN EXPLOSIVE ATMOSPHERE

CAUTION: This product needs proper handling

THE UNIT DOES NOT SUPPORT LIVE INSERTION (HOT-SWAP)! REMOVE OR INSERT THE BOARD WHEN THE CRATE IS POWERED OFF!

CAUTION: This product needs proper cooling

USE ONLY CRATES WITH FORCED COOLING AIR FLOW SINCE OVERHEATING MAY DEGRADE THE MODULE PERFORMANCES!

THIS DEVICE SHOULD BE INSTALLED AND USED BY SKILLED TECHNICIAN ONLY OR UNDER HIS SUPERVISION

ALL CABLES MUST BE REMOVED FROM THE FRONT PANEL BEFORE EXTRACTING THE BOARD FROM THE CRATE!

DO NOT OPERATE WITH SUSPECTED FAILURES.
IF YOU SUSPECT THIS PRODUCT TO BE DAMAGED, PLEASE CONTACT THE TECHNICAL SUPPORT

2 General Description

EASY is the CAEN power supply solution for operation in magnetic field and radioactive environment. CAEN has developed different solutions for the main LHC experiments, where the electronic equipment of the experiment is dealing with high dose radiation and intense magnetic field.

To provide safe and reliable operations in such hostile areas, CAEN started tests with rad-tolerant components and magnetic field resistant solutions, patenting the technology that is used in this line of products, where the power supply can be located directly in the hostile area, providing a wide variety of output voltages to satisfy the requirements of most detectors and front-end electronics.

The control of the EASY power supply system is done remotely using the R6060C Branch Controller located in the control room. Each branch controller can handle up to 6 EASY crates.

All the channels of the EASY boards will be handled as channels of the R6060C branch controller.

The R6060C must be configured to operate with the EASY crate layout by using the provided software tools.

Packaging and Compliancy

The delivered package contains 1 Mod. R6060C - EASY 6000/3000 Branch Controller.

The module is a 1-U, 19” rack (depth: 180mm). Weight is 3.6kg. The device is inspected by CAEN before the shipment, and it is guaranteed to leave the factory free of mechanical or electrical defects.

PID (Product Identifier)

PID is the CAEN product identifier, an incremental number greater than 10000 that is unique for each product. The PID is on a label affixed to the product.

3 Technical Specifications

Environmental Compatibility

Mechanical packaging	1-U, 19” rack (depth: 180mm). Weight: 3.6kg
Installation	Indoor use
Operating Temperature	-20 °C ÷ 50 °C
Operating Humidity	25% ÷ 95% RH non condensing
Storage Temperature	-30 °C ÷ +80 °C
Storage Humidity	5% ÷ 90% RH non condensing
Altitude	≤2000 m
Pollution Degree	2
EMC Environment	Commercial and light industrial
IP Degree	IPX0 enclosure, not for wet location
Compliance	EMC: CE 2014/30/EU Electromagnetic compatibility Directive Safety: CE 2014/35/EU Low Voltage Directive RoHS compliant

I/O Signals

HVCK	625 kHz synchronisation signal (one per branch) for switching parts of remote PS channel boards; however, if this signal fails, remote boards run properly (a synchronisation signal is generated by their controller), though lose synchronisation between each other, and an error message (“Fail”) is returned. The HVCK presence is reported by the remote board parameter “HVSync” (Ok or Fail)
SYNC	50 Hz clock (one per branch) for the board controllers synchronisation; if this signal fails, remote boards do not operate and an error message (“Fail”) is returned. To remove the Fail message, it is necessary to send the “Clear Alarm” command
DATA	Communication data line
RESET	Recovery / Reset lines, one for each remote EASY3000 crate; it is possible to send a command to the controllers of a remote crate either switching off all the channels in the crate (HW Reset) or eventually leaving them on, if they were (Recovery)
48V Service	±48V DC output (350W max) for remote EASY crates

External Connections

Front panel components

REM/LOC/OFF key; key to power on the unit locally or to enable its remote power on
OUT: +8.5V level, refer. to the crate ground; tol. ±10%; 00 LEMO connector. Remote power-on of the adjacent daisy-chained unit.
IN: +5 ÷ 12V, 10mA max., electric. insulated; 00 LEMO connector. Remote power-on

Reset button: “short” pressure; only the CPU is reset and the whole system resumes its operation from the beginning. All the channels which are ON remain ON, channels which are OFF remain OFF
“long” pressure; also the boards are reset and the channels which are ON are dropped to zero at the maximum rate available and turned off.
Reset signal: Std. NIM/TTL (selectable); 00-type LEMO connector. If the duration of the RESET signal is > TRCPU=100÷200 ms, the CPU is reset; if it is > TRCH= TRCPU + 900 ms, also the boards are reset and the channels are turned off. Reset must be enabled via software. Red/orange LED, lights up as a RESET occurs: it is initially red and then becomes orange, depending on the duration of the RESET signal

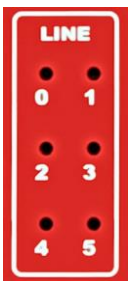
Signal: open/closed contact; 00-type LEMO connector. INTERLOCK command: it turns all the channels off as it is open/closed, according to the position of the relevant switch, that selects whether the INTERLOCK function is active when the contact is closed or open, respectively. Green LED, lights up as the unit is in INTERLOCK condition.

10Base-T female connector, TTL signals (TCP/IP)

No.2 USB A female connectors, USB 2.0 compliant, for keyboard and mouse

DisplayPort 2.0, for external screen

CH-ON	Out Std. NIM/TTL (selectable); at least one channel is ON; LEMO 00 connector, red LED
CHK PASS	Out Std. NIM/TTL (selectable) initial system check successful and system ready; LEMO 00 connector, red LED
OVV	Out Std. NIM/TTL (selectable); at least one channel is in Over Voltage; LEMO 00 connector, red LED
UNV	Out Std. NIM/TTL (selectable); at least one channel is in Under Voltage; LEMO 00 connector, red LED
OVC	Out Std. NIM/TTL (selectable); at least one channel is in Over Current; LEMO 00 connector, red LED
ITRIP	Out Std. NIM/TTL (selectable); at least one channel is in Internal Trip; LEMO 00 connector, red LED
VSEL	In Std. NIM/TTL (selectable); channel voltage selection; LEMO 00 connector, green LED
ISEL	In Std. NIM/TTL (selectable); channel current selection; LEMO 00 connector, green LED
HV SYNC	In/Out Std. NIM/TTL (selectable); sync clock for the PWS Units (RS485 Std., 1.25 MHz); LEMO 00 connector, green LED
KILL	In Std. NIM/TTL (selectable); KILL from the front panel: it turns all channels off; LEMO 00 connector, green LED



6 green LED's; light up when corresponding branch communicates with R6060C

TTL	Green LED, lights up as the relevant standard is selected
NIM	Green LED, lights up as the relevant standard is selected
OVT	Red LED, lights up as at least one channel is in *Over Temperature* condition
FAIL	Red LED, lights up as the *Power Failure* condition occurs
ON	Green LED, it indicates the presence of Mains power supply

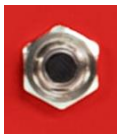
Back panel components

50-pin Header male; EASY Bus

50-pin DSUB female; EASY Bus

2x16-pin Header male; GPIO

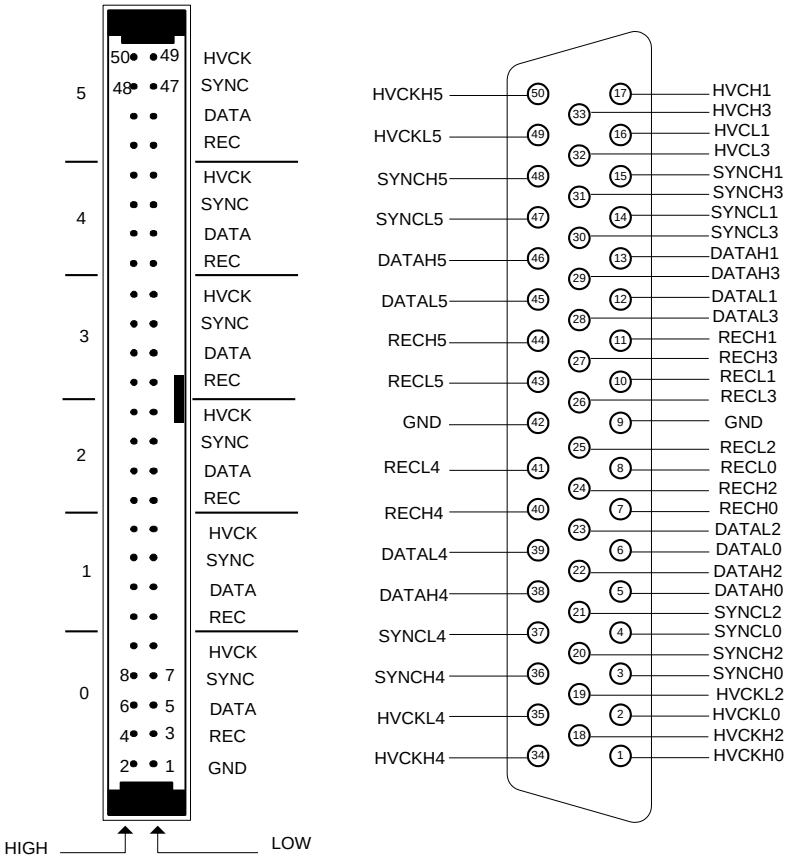
AC Input: to be connected to Mains 100 - 240 Vac (50 - 60 Hz) via provided power cord; IEC 60 320 Socket with switch. Fuse: 6.3x32, 1A; Retarded 250VAC



Recovery: push-button (momentary switch)

48V Service; Industrial Terminal for 4mm plug (black = negative, yellow = positive); 2A output

EASY Bus Connectors Description



Header and DSUB50 Control connector pin assignment

4 Operating Modes

Hardware installation

Prior to shipment this unit was inspected and found free of mechanical or electrical defects. Upon unpacking of the unit, inspect for any damage, which may have occurred in transport. The inspection should confirm that there is no exterior damage to the unit, such as broken knobs or connectors, and that the panels are not scratched or cracked. Keep all packing material until the inspection has been completed. If damage is detected, file a claim with carrier immediately and notify CAEN. Before installing the unit, make sure you have read thoroughly the safety rules and installation requirements, then place the package content onto your bench; you shall find the following parts:

R6060C - EASY Branch Controller

10BASE-T Ethernet cable

Power cord

The R6060C is housed in 19” rack package. The unit is an equipment for BUILDING-IN: install it in a 19” EIA compliant equipment rack. Use the front panel rack-mount brackets to install the unit in the rack, using standard screws; leave at least one rack unit of free space above and below the unit. Plug the power cord into the AC Input and then to the mains AC.

Remote control: unit control takes place remotely, via Ethernet. Connect the R6060C to a PC, via the ethernet cable, either point-to-point or via network.

Local control: Connect the R6060C to external keyboard and mouse, via the USB ports; connect the unit to an external screen, via the HDMI port.

EASY Installation

The R6060C Branch Controller board can control up to six remote crates through the CANbus protocol (250 kbit/sec).

Remote crates controlled by the R6060C can house different sets of EASY3000/6000 boards, then it is necessary to configure the Branch Controller firmware through a set up file containing all the information about number, type and position of the boards in remote crates. After the configuration it is not possible to change the crate layout unless the R6060C crate layout file is updated.

The Branch Controller, in fact, scans the crates expecting to find the sets of boards corresponding to its configuration file; if any board is misplaced (or absent) with respect to the saved layout, then it is ignored by the control software: in this case it is necessary to correctly insert the misplaced board, and then its channels will be accessed.

The User can build his crate configuration using the CAEN EASY Web Controller described on page 14.

Control of remote crates is performed through 2 alternative output connectors (50-pin Header male or 50-pin DSUB female) placed on the front panel of the R6060C board; maximum suggested cable length between R6060C and EASY crate is 150 m.

The front panel houses also six green LEDs (one per branch = remote crate); each LED lights up / blink as the branch communications take place.

The Reset button allows to reset the internal R6060C controller; during this operation all the remote channels continue operating with old settings. It is necessary to wait 15 seconds at least before monitoring or setting once more the remote channels.

The Interlock signal allows to shut down all the remote channels, keeping active the communications between remote boards and R6060C.

Unit Power ON

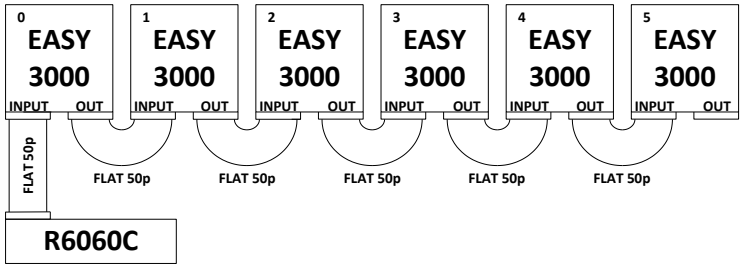
After hardware installation (see above), turn on the module, via the rear panel ON/OFF switch.

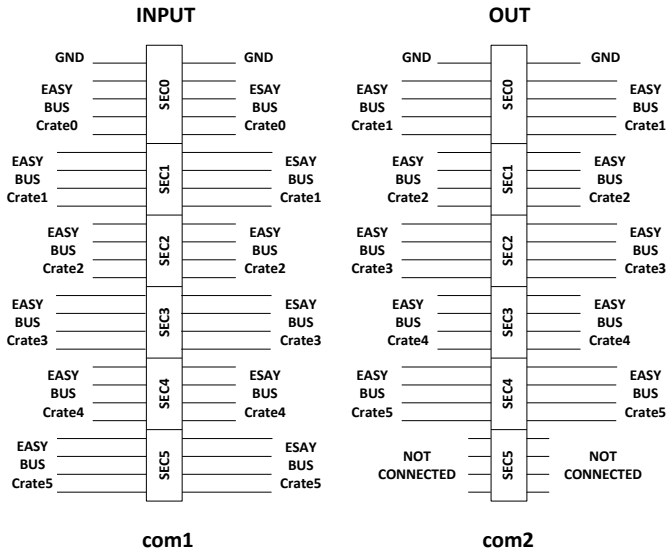
CRATE connection

The R6060C Branch controller can handle with EASY crates (up to six) either via the 50-pin Header connector or via the 50-pin DSUB connector.

Connection with 50-pin Header

This connection uses a 50-wires flat cable between the R6060C and the first crate as well as between the subsequent crates, as shown in the following figure:

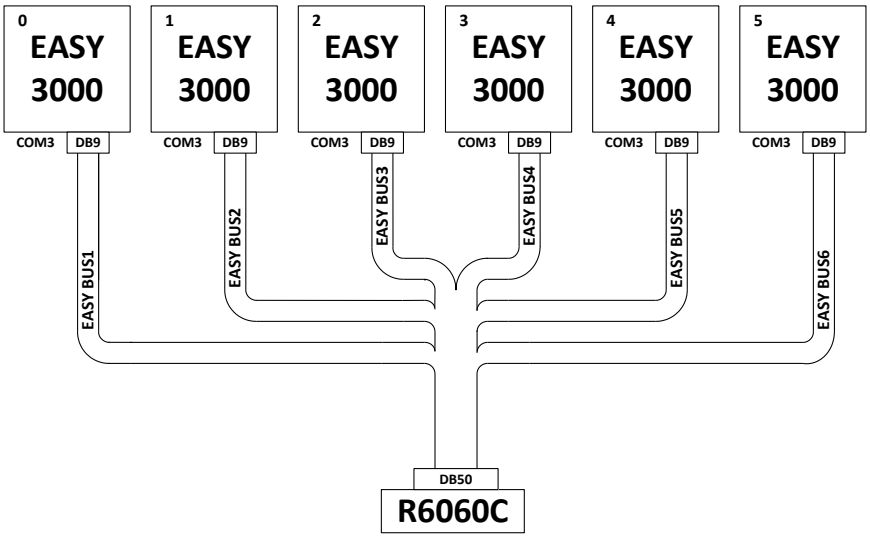




The R6060C provides the signals for all the crates; the first crate uses only “Section 0” of such control signals arriving at the input connector and passes the other sections to its output connector. Each EASY crate is connected in series to the subsequent other ones.

Connection with 50-pin DSUB

This connection uses the DSUB50 control connector of the R6060C, which, via a split cable, is connected with each section of the EASY BUS through the crates DB9 connectors, as shown in the following figure:



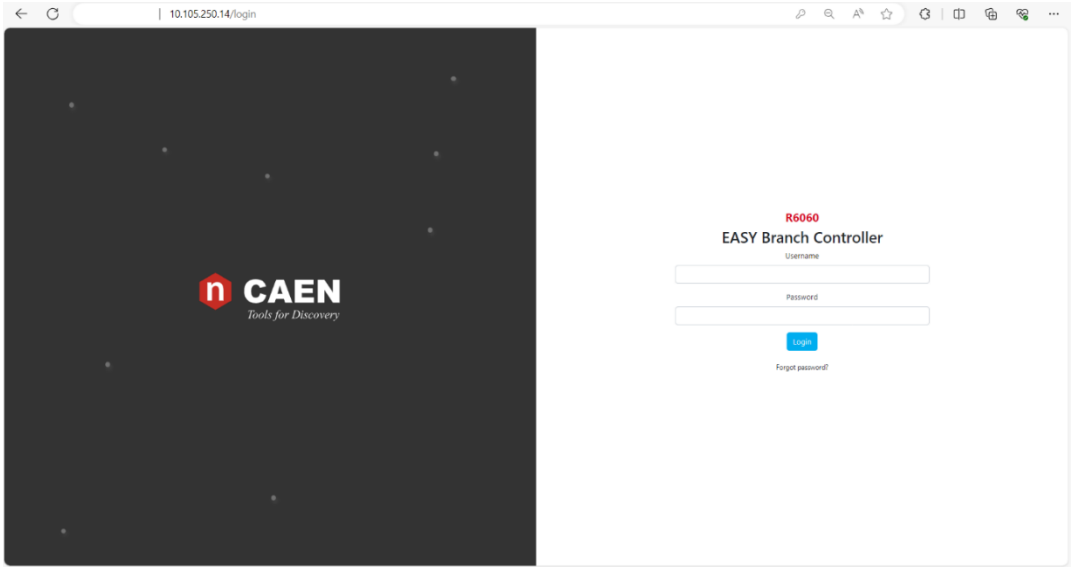
	IMPORTANT NOTE: use different AC/DC Converters to provide 48V Power and 48V Service to EASY Crates.
	Cables must be shorter than 150 m; the Bus line does not require a termination

EASY Crate Configuration

To control the remote power supply boards, the R6060C Branch Controller requires to be loaded with proper configuration files; these can be created using the **CAEN R6060 EASY Web Controller**, a user friendly, web tool; it can be launched in one of the following ways:

- Remote control: external PC connected to the R6060C Ethernet port: open a web browser, then type its IP address; default IP address: 192.168.0.1
- Local control: external keyboard and mouse connected to the R6060C USB ports; external display connected to the Display interface.

To access the EASY Web Controller:



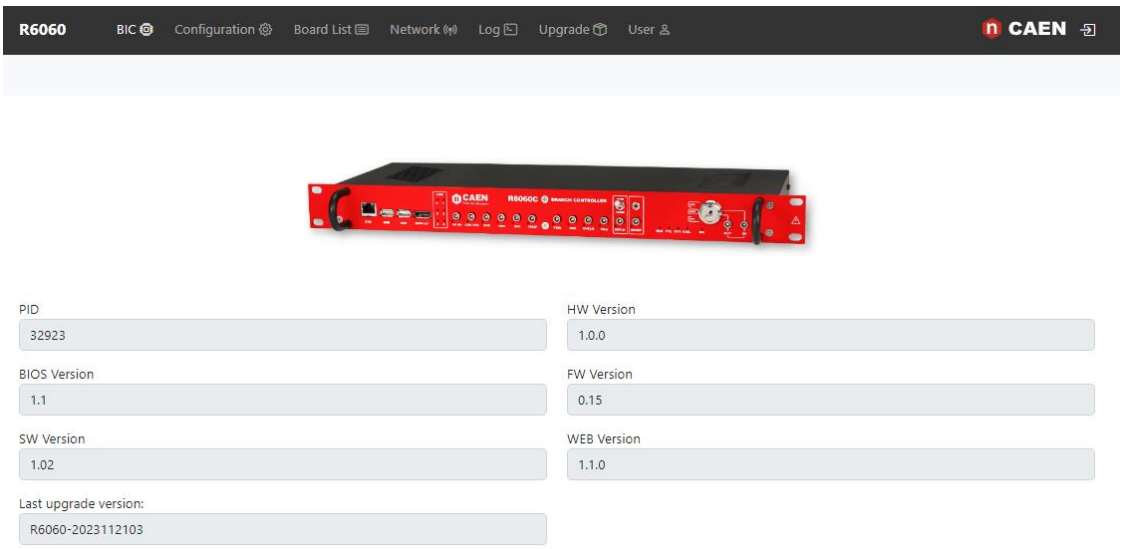
Default settings:

Username: admin

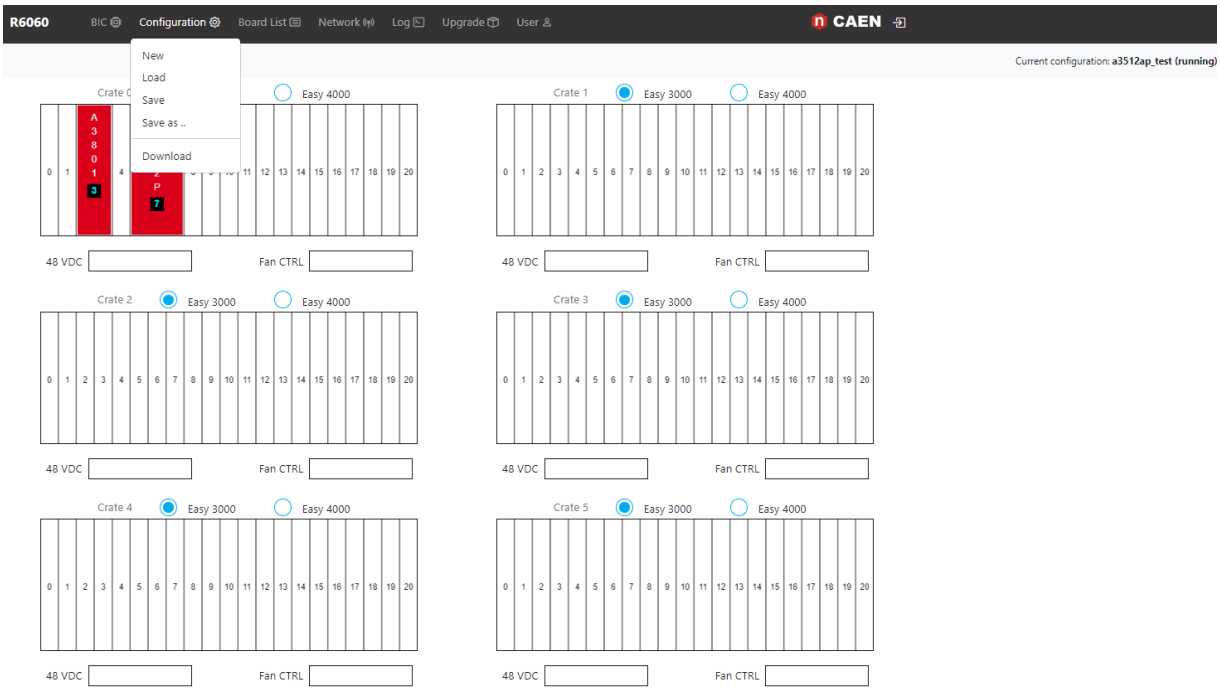
Password: admin

N.B: in case of forgotten password of the user account, it can be reset; in this case, contact CAEN technical support, providing unit's PID and validation code. Then enter the reset code you receive to set a new password.

After authentication, the Welcome menu will be as follows:



To configure one or more EASY crates, select the Configuration option in the tool bar:



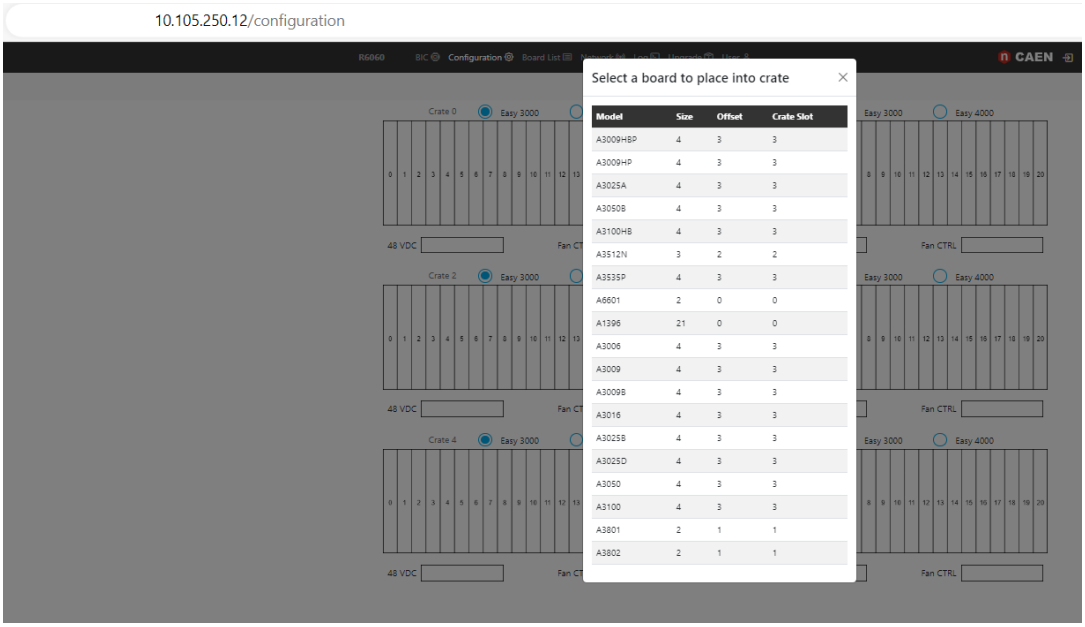
By default, it is shown the configuration that is running at present by the R6060C unit, whose name is shown in the upper right corner.

The scroll down menu has the following options: New, Load, Save, Save As, Download

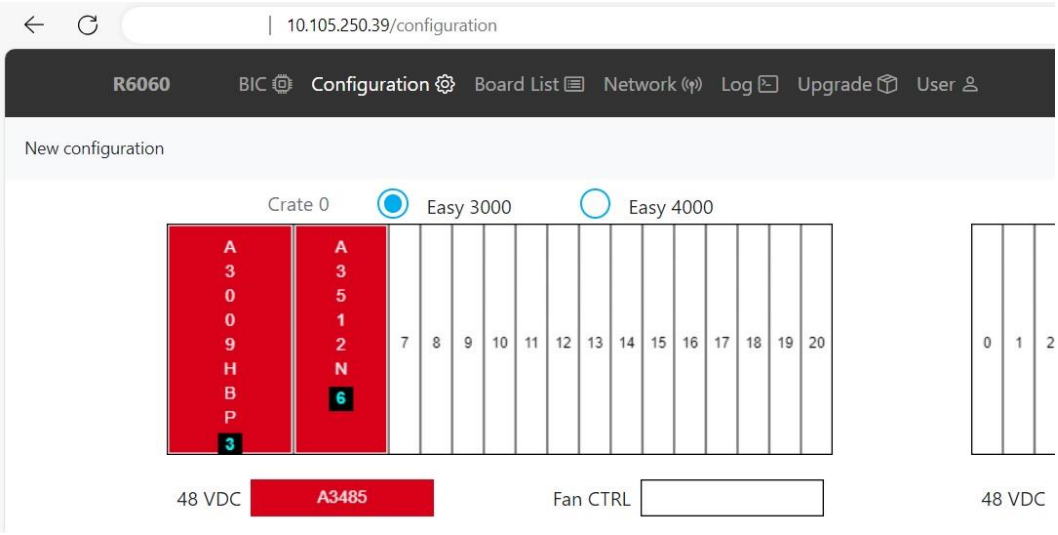
The "Download" option allows to save the current running configuration into the host PC (Remote Control, see p. 11); this option is not available with Local control.

If "New" is selected, the menu shows six empty crate maps, each with one tray for 48V DC power supply and one for the Fan Unit. It is possible to select between EASY 3000 and EASY 4000 crate type.

At this point it is possible to populate the crate; click on a crate slot, the list of the available power supply boards for that crate will be shown:

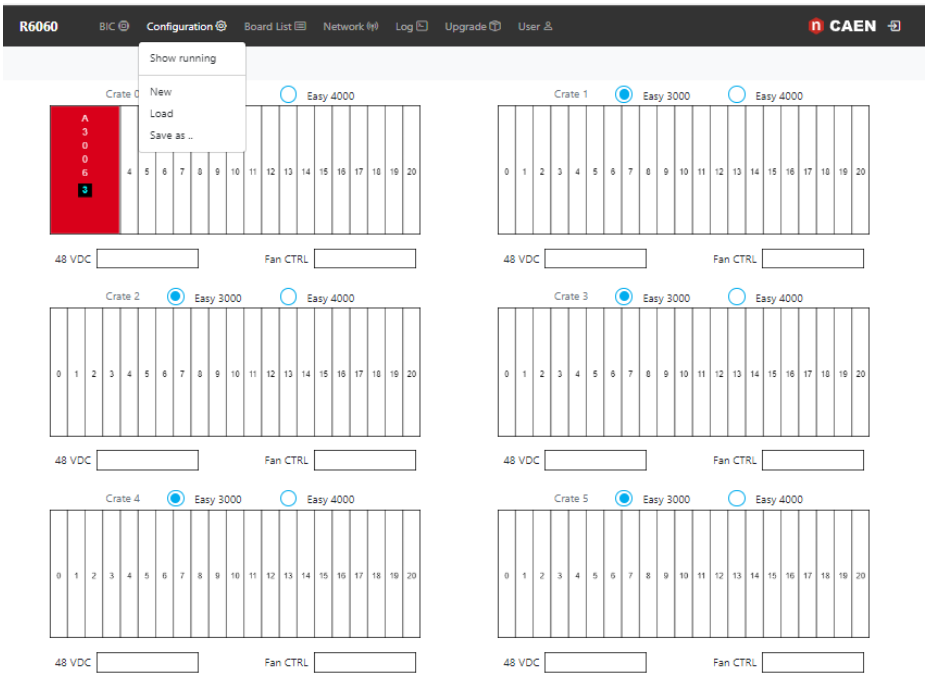


Click on one board name, and it will be inserted on the selected slot(s), depending on its width:

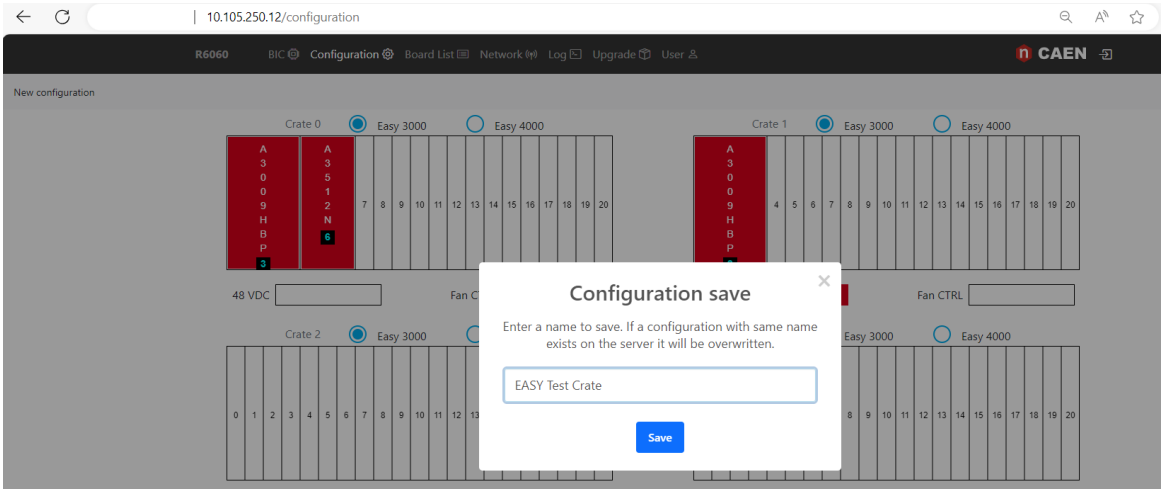


To remove a board from the configured crate, it is necessary to click on the one to be removed.

Once the configuration is ready, it can be saved in the R6060C memory; to do this, click again on configuration, then a scroll down menu will open:



Select “Save as” option:

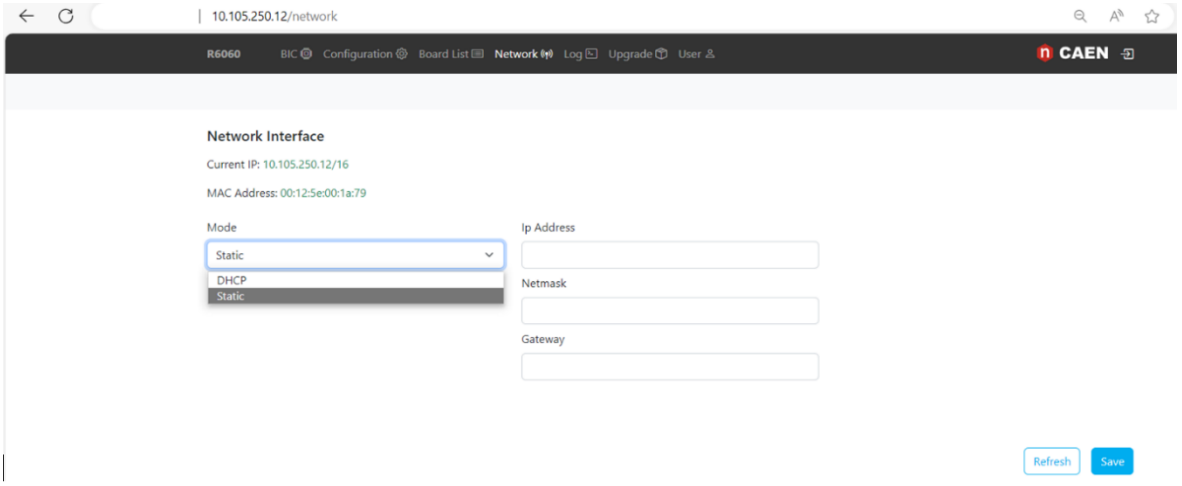


Enter a configuration name, then click “Save”; the set up will be stored into the R6060C memory, and can be loaded later, via the “Load” option.

To go back to the Running configuration, select “Show running” in the scroll down menu.

It is also possible to modify the Running configuration, that can be saved with either the same name or new one. In the first case, the R6060C is immediately rebooted with the new configuration; in the second case, it is stored, as previously described, in the unit’s memory.

Networking



The Networking option allows to configure the R6060C for network connection.

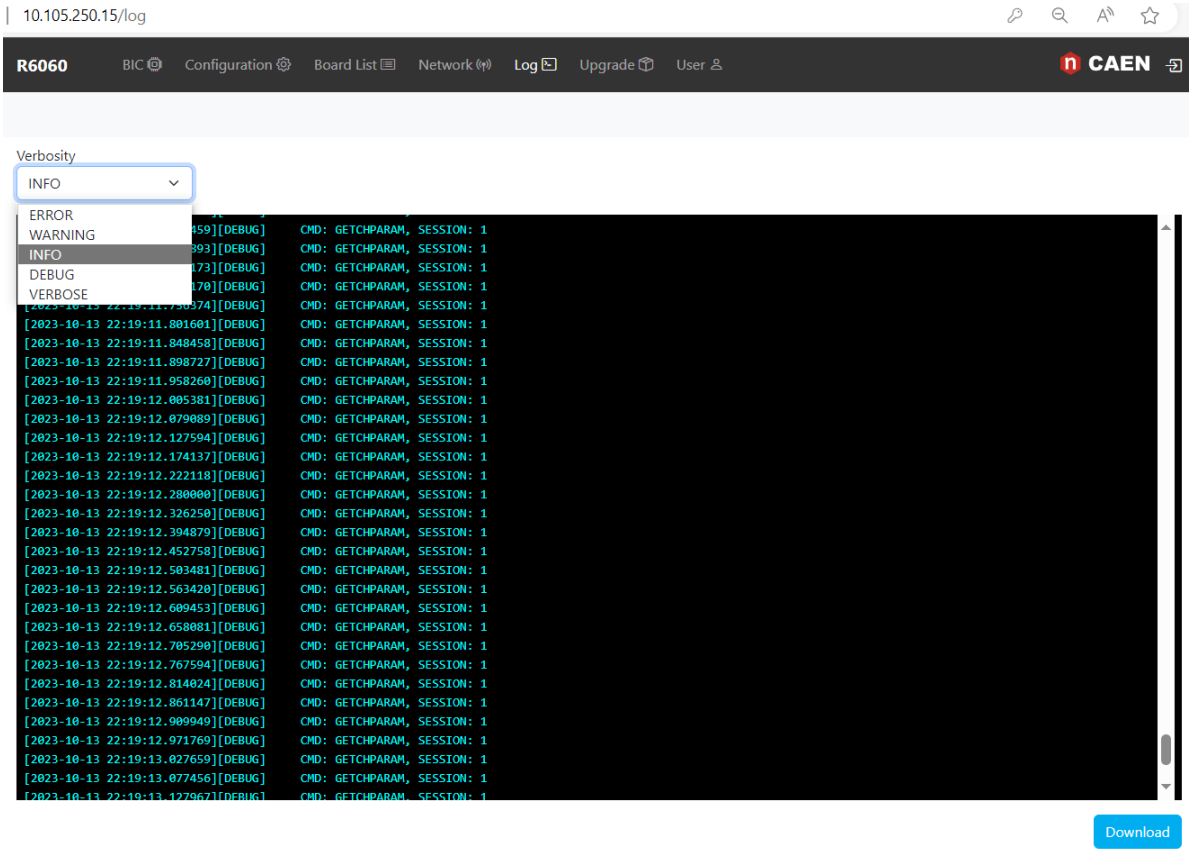
The Ethernet link is a 10/100baseT connector and can be used to interface the R6060C to a LAN. This allows the system control via an external standard PC on a TCP/IP network and running a web browser.

Before establishing a connection to a TCP/IP network, a specific IP Address, IP Net Mask must be assigned by the local Network Administrator to the R6060C.

If the User needs to connect to the R6060C from outside the local network, a Gateway address must be specified in the TCP/IP settings.

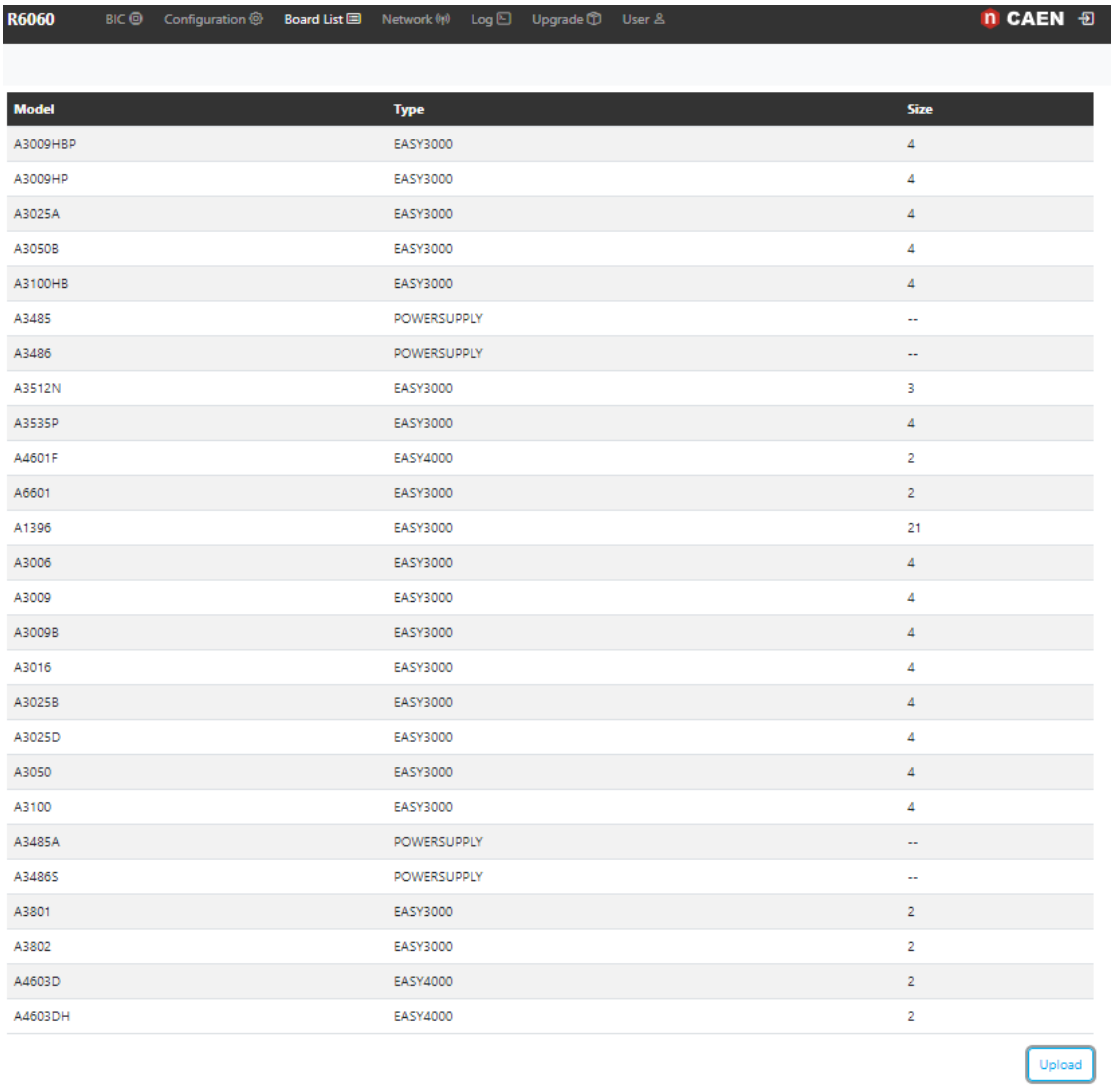
Default address is 192.68.1 with static IP.

Data Logging



The Log option allows to see some debug information about the module. There are several log levels that can be chosen, in order to have more information about the internal status of the system and about the internal communication with the remote boards. This information can be useful for debug operation and can be requested by CAEN in case of issue with the module. The Log file can be saved on local pc by clicking on “Download”. The “Download” option is not available if the page is accessed from local display port.

Board List

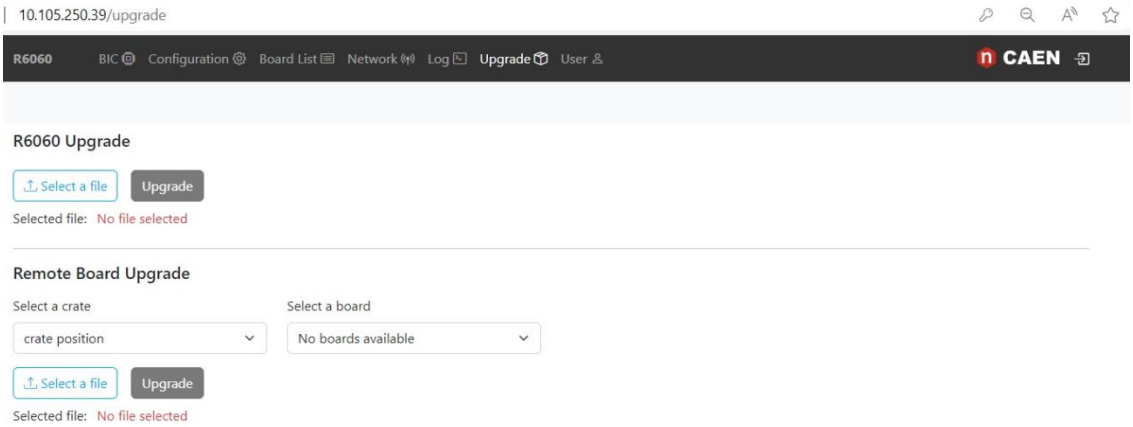


Model	Type	Size
A3009HBP	EASY3000	4
A3009HP	EASY3000	4
A3025A	EASY3000	4
A3050B	EASY3000	4
A3100HB	EASY3000	4
A3485	POWERSUPPLY	--
A3486	POWERSUPPLY	--
A3512N	EASY3000	3
A3535P	EASY3000	4
A4601F	EASY4000	2
A6601	EASY3000	2
A1396	EASY3000	21
A3006	EASY3000	4
A3009	EASY3000	4
A3009B	EASY3000	4
A3016	EASY3000	4
A3025B	EASY3000	4
A3025D	EASY3000	4
A3050	EASY3000	4
A3100	EASY3000	4
A3485A	POWERSUPPLY	--
A3486S	POWERSUPPLY	--
A3801	EASY3000	2
A3802	EASY3000	2
A4603D	EASY4000	2
A4603DH	EASY4000	2

Upload

The Board List option allows to display the remote power supply cards whose configuration file is stored into the R6060C memory; the Upload button allows to add more configuration files (available on CAEN website) to memory, from an external PC (Remote Control, see p. 12). The Upload button is not available in case of Local Display port access.

Upgrade



The Upgrade option allows to update the firmware version of both the R6060C and the boards plugged into the remote crates.

- This option is available only via an external PC connected with the R6060C (Remote Control, see p. 12); it allows to upgrade the firmware that handle the branch controller activities (board control, channels control, OPC Server access etc.). To do this:

o click “select file”

o browse the file to load (.bin extension)

o click <upload>

o wait for the “update done!” message

- The Remote Board Upgrade option allows to upgrade the firmware of a remote board handled by the R6060C. To do this:

o click “select file”

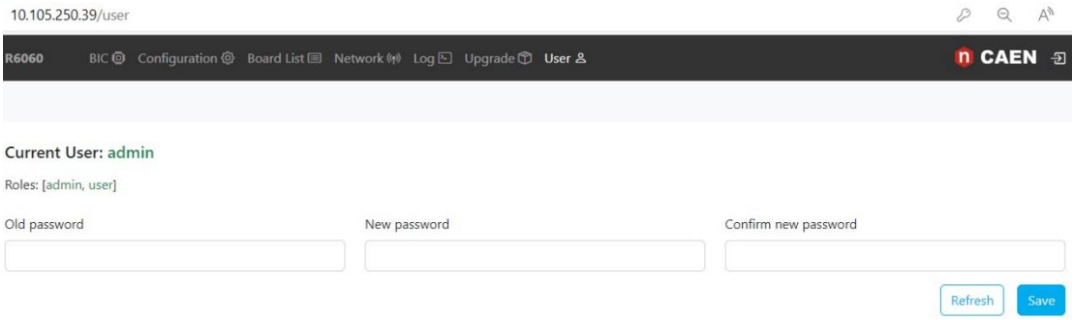
o select the remote crate number

o select the remote slot number

o browse the file to load, which has the format: A3100-558.204 (example of A3100 board)

o click <upgrade>

User

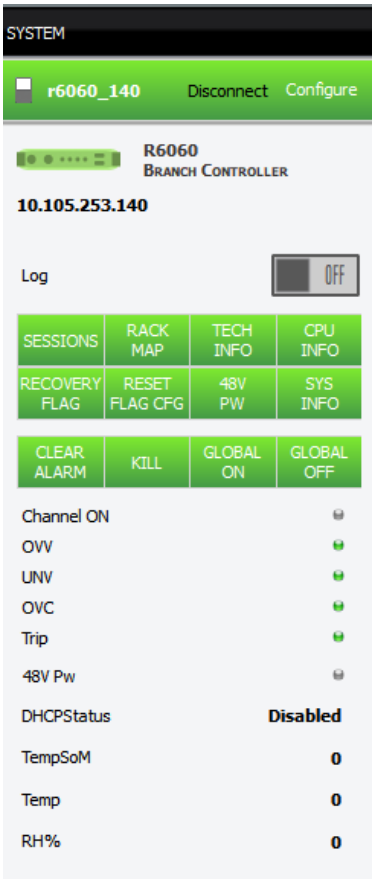


The User option allows to change the authentication keys; this is achieved by entering both the old and new password, then click “save” button.

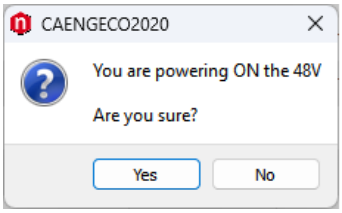
5 48V Service Output

The R6060C provides a 48V service output (350W maximum power), whose purpose is to supply the controlled EASY crates. The output is delivered through two 4mm plugs.

The 48V Service Output is turned on via a button on the CAENGECO2020 control software:

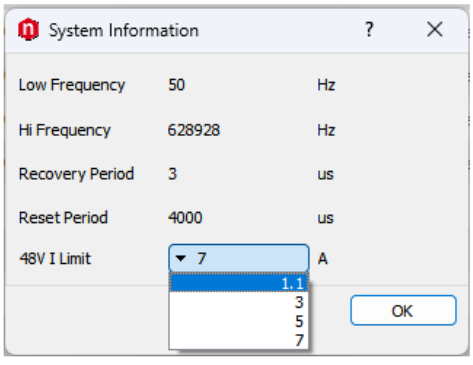


By clicking on “48V PW”, a confirmation message will be issued:



The 48V PW status is reported by the relevant “led” (grey = off, green = on).

The electronic fuse current threshold, beyond which the 48V PW is turned off, is set by clicking on SYS INFO, then choosing the desired value on the scroll down menu (available values: 1.1 A, 3 A, 5 A and 7 A):



6 Recovery Mode

Recovery Mode allows to restore the unit's factory settings. To enter recovery mode, the module must be turned off and then powered on, while, simultaneously, holding down the recovery push-button located on the rear side of the module (see p.8), for a few seconds.

When the module is started in Recovery Mode, the reset led will blink and the display-port connection is not available. The module starts with the IP address 192.168.0.254

To access the Recovery mode functionalities, a pc must be configured to communicate with that IP.

After connected the browser the Recovery Mode page will be as follows:

There are two options available:

Factory Reset: clicking the [Reset] button will restore the module to its factory settings. This means that all module configurations, users, and any uploaded files will be erased, and the default network address will be reinstated.

Module Recovery: this option allows for making significant changes to the module's software and ensuring that these changes become default (i.e., factory settings). To execute the Recovery mode, a special file in a specific format is required, which can be provided by CAEN if regular module maintenance does not yield the expected results. This option can only be used under the guidance of CAEN **Technical Support**.

To exit the recovery mode, simply reset the module. If no options have been selected, the module will return to the same conditions it was in before entering recovery mode. If a factory reset has been performed, the module will restart with default settings. In the case of a recovery, the module's status will be described by the technical support that provided the recovery package.

7 System Parameters

The R6060C branch controller is provided with a set of System parameters, accessible via the CAENHVWrapper library.

In order to access the unit, in the InitSystem function, the system parameter must be set to 16.

Then, the R6060C system parameters are accessed via the relevant functions (GetSysProp, GetSysPropInfo, GetSysPropList, SetSysProp).

The commands are executed via the ExecComm function.

The R6060C branch controller has the following System parameters:

Name	Mode	Type	Description
ModelName	Read only	string	Returns name of the unit (R6060)
SerialNumber	Read only	string	Returns PID of the unit
HwRelease	Read only	string	Returns hardware revision of the unit
FwRelease	Read only	string	Returns firmware revision of the unit
SwRelease	Read only	string	Returns software revision software of the unit
Sessions	Read only	string	Returns the list of connected users, the user level and the type of connection (admin:admin:TCP/IP)
IPAddr	Read only	string	Returns IP address of the unit
IPNetMsk	Read only	string	Returns Subnet Mask of the unit
IPGw	Read only	string	Returns Gateway address of the unit
DHCPStatus	Read only	string	Returns whether Enabled or Disabled.In the latter case, the unit has a static IP
FrontPan	Read only	unsign 2B	Returns the status of front panel and other status (detailed below)
ACDCStatus	Read only	unsign 2B	Returns the status of ACDC 48V present on the unit 0: OFF, 1: ON
LowFreq	Read only	unsign 2B	Returns Frequency in Hz of low frequency clock required by remote boards (circa 50 Hz)
HighFreq	Read only	unsign 4B	Returns Frequency in Hz of high frequency clock required by remote boards (circa 625 KHz)
RecPeriod	r/w	unsign 2B	Allows to set the duration (μs) of RECOVERY pulse for the remote boards
RstPeriod	r/w	unsign 2B	Allows to set the duration (μs) of RESET pulse for the remote boards
RstRecFlag	r/w	unsign 2B	Allows to send Reset and/or Recovey to remote Crates (detailed below)
Logic	r/w	boolean	Allows to set Logic level of front panel: 0: NIM, 1: TTL
ACDCPwr	r/w	boolean	Allows to enable ACDC 48V. 0: OFF, 1: ON
ACDCIlim	r/w	unsign 2B	Allows to set current limit of ACDC 48V. 0: 1.1A, 1: 3A, 2: 5A, 3: 7A
CPULoad	Read only	string	Returns a string with system CPU load (1min:5min:15min)
MemoryStatus	Read only	string	Returns a string with system memory status (total:free:used:buffers)
TempSoM	Read only	unsign 2B	Returns CPU temperature
Temp	Read only	unsign 2B	Returns temperature of the unit
RH	Read only	unsign 2B	Returns humidity of the unit

The fields of the FrontPan parameter are as follows:

BIT	Status Flag	Description
0	ITrip	Active when at least one channel is in ITrip
1	OVC	Active when at least one channel is in OVC
2	OVV	Active when at least one channel is in OVV
3	UNV	Active when at least one channel is in UNV
4	OVT	Active when at least one channel is in OVT
5	CH ON	Active when at least one channel is ON

6	CHK PASS	Active when R6060 is operating
7	INTERLOCK	Status of INTLK input
8	KILL	Status of KILL input
9	VSEL	Status of VSEL input
10	ISEL	Status of ISEL input
11	LowFreq Check	Active when external low frequency clock source is present
12	HighFreq Check	Active when external high frequency clock source is present

The fields of the RstRecFlag parameter are as follows:

BIT	Description
0	Recovery to Crate 0
1	Recovery to Crate 1
2	Recovery to Crate 2
3	Recovery to Crate 3
4	Recovery to Crate 4
5	Recovery to Crate 5
6	Do Not Care
7	Do Not Care
8	Reset to Crate 0
9	Reset to Crate 1
10	Reset to Crate 2
11	Reset to Crate 3
12	Reset to Crate 4
13	Reset to Crate 5

The module also features the following commands:

Command	Description
Kill	Executes the software Kill of any on channels
ClearAlarm	Clears any error states
GlobalOn	Turns on all enabled channels
GlobalOff	Turns off all enabled channels
KeepAlive	Dummy command necessary for the control software to keep the connection with the branch active (one every 10sec)

8 Instructions for Cleaning

The equipment may be cleaned with isopropyl alcohol or deionized water and air dried. Clean the exterior of the product only.

Do not apply cleaner directly to the items or allow liquids to enter or spill on the product.

Cleaning the Touchscreen

To clean the touchscreen (if present), wipe the screen with a towelette designed for cleaning monitors or with a clean cloth moistened with water.

Do not use sprays or aerosols directly on the screen; the liquid may seep into the housing and damage a component. Never use solvents or flammable liquids on the screen.

Cleaning the air vents

It is recommended to occasionally clean the air vents (if present) on all vented sides of the board. Lint, dust, and other foreign matter can block the vents and limit the airflow. Be sure to unplug the board before cleaning the air vents and follow the general cleaning safety precautions.

General cleaning safety precautions

CAEN recommends cleaning the device using the following precautions:

- Never use solvents or flammable solutions to clean the board.
- Never immerse any parts in water or cleaning solutions; apply any liquids to a clean cloth and then use the cloth on the component.
- Always unplug the board when cleaning with liquids or damp cloths.
- Always unplug the board before cleaning the air vents.
- Wear safety glasses equipped with side shields when cleaning the board.

9 Device decommissioning

After its intended service, it is recommended to perform the following actions:

Detach all the signal/input/output cable

Wrap the device in its protective packaging

Insert the device in its packaging (if present)

THE DEVICE SHALL BE STORED ONLY AT THE ENVIRONMENT CONDITIONS SPECIFIED IN THE MANUAL, OTHERWISE PERFORMANCES AND SAFETY WILL NOT BE GUARANTEED

10 Disposal

The disposal of the equipment must be managed in accordance with Directive 2012/19 / EU on waste electrical and electronic equipment (WEEE).

The crossed bin symbol indicates that the device shall not be disposed with regular residual waste.

11 Technical Support

To contact CAEN specialists for requests on the software, hardware, and board return and repair, it is necessary a MyCAEN+ account on www.caen.it:

https://www.caen.it/support-services/getting-started-with-mycaen-portal/

All the instructions for use the Support platform are in the document:

A paper copy of the document is delivered with CAEN boards.

The document is downloadable for free in PDF digital format at:

https://www.caen.it/safety-information-product-support

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