C.A.E.N.

Report (REP)

Getting Started with EASY Power Supply

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1 Getting Started with EASY Power Supply System

1.1 Hardware requirements

- 1 SY1527 or SY2527 Universal Multichannel Power Supply System
- 1 A1676A EASY Branch Controller
- 1 or more (up to six) EASY3000 or EASY4000 Crates for Hostile Area
- 1 or more EASY3000 or EASY4000 Power Supply Boards
- OPTIONAL: 1 or more A3486 220/400 Vac – 48 Vdc (2 ch x 2 kW/1 ch x 4 kW) Converters
- Connection cables, according to the used set up

1.2 Hardware set up with EASY Crates and A3486 Converters

The A1676A board can handle, via the CANBUS protocol, up to 6 remote crates in parallel (EASY bus).
Plug the A1676A into the SY1527 or SY2527
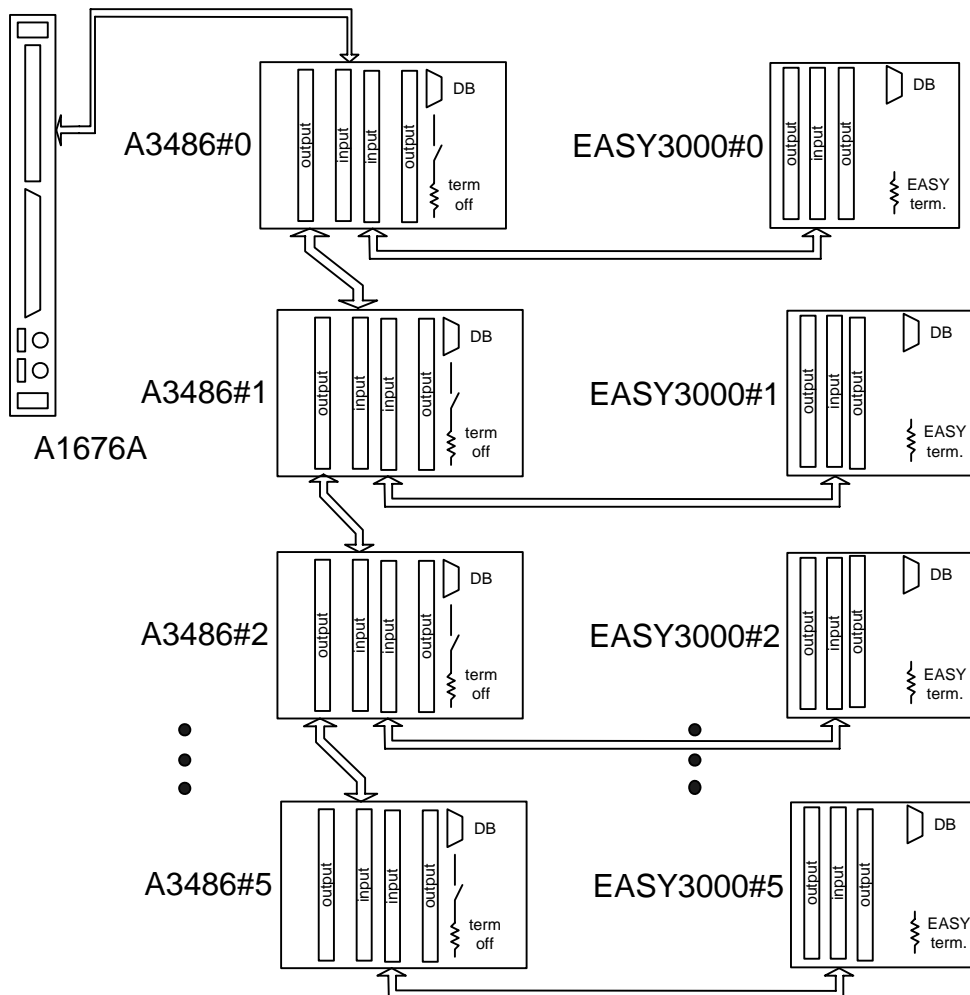Connect the A1676A to the EASY3000 or EASY4000 Crates and the A3486 Converters as shown in the following schemes:

Fig. 1.1 – Bus connection with A3486 modules and EASY crates

The A3486 is handled as a crate slot and the communication is terminated by the crates backplane. The A3486 termination must be OFF.

EASY crates and A3486 modules can be also connected with the A1676A by using split cables, as shown in the following figure (termination provided by the crates backplane).
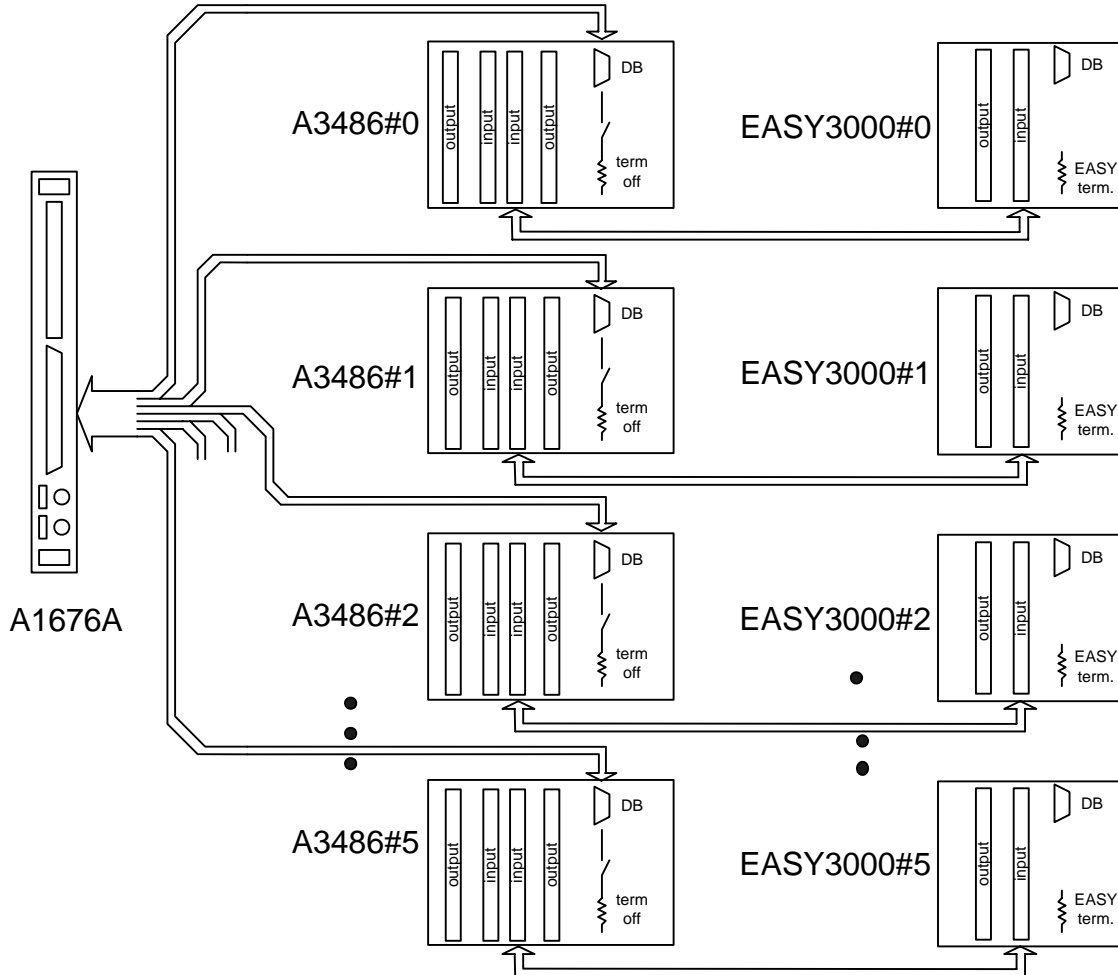

Fig. 1.2 – Bus connection with A3486 modules, EASY crates and split cables

In such cases one A1676A branch handles one A3486 and one EASY crate. 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 A1676A board; maximum suggested cable length between A1676A and EASY crate is 150 m.

N.B.: in these cases the A3486 INPUT connector must be connected with the EASY3000 Crate INPUT connector.

1.3 Hardware set up with EASY Crates only

If the A3486 Converters are not used, there are two different ways for connecting the A1676A Branch controller with up to six EASY3000/4000 crates; the first type of connection uses a 50-wires flat cable between the A1676A and the first crate as well as between the subsequent crates, as shown in the following figure:
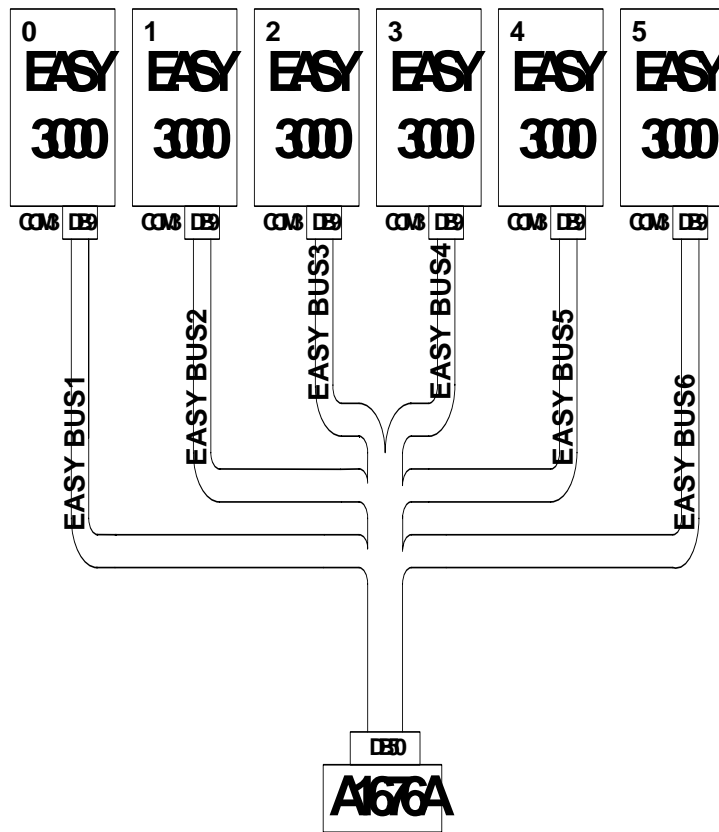
Fig. 1.3 – Connecting A1676A and the crates with 50 wires cable

The A1676A provides the signals for all the crates; the first crate uses only the first section of such control signals arriving into the input connector and passes the other sections to its output connector. Each EASY 3000/4000 crate is connected in series to the subsequent other ones.
The main advantage of this way of connection is the easy manufacturing of cables.
The most evident disadvantage is the unnecessary connection of each crate with 50 wires, while only 4 couples and return would be required.

The second way of connection uses the DSUB50 control connector of the A1676A, 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:
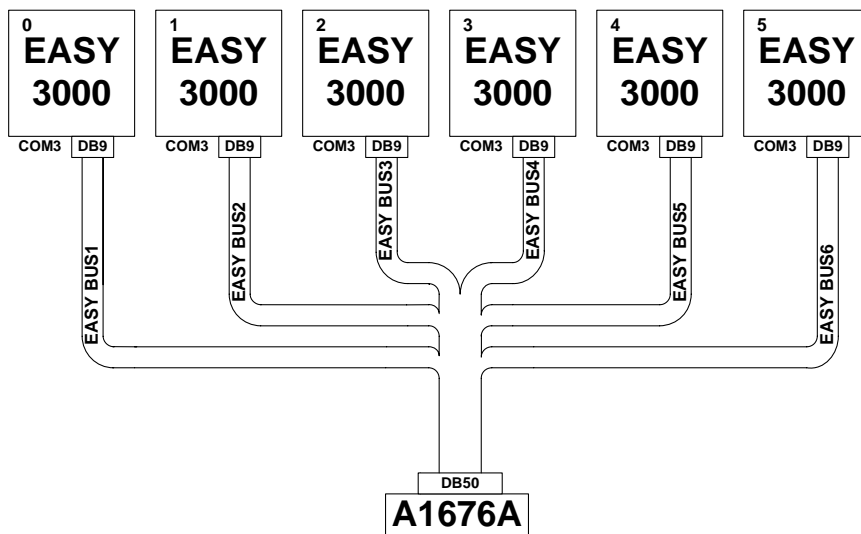
Fig. 1.4 – Connecting A1676A and the crates with split cable

The main advantage of this solution is the lower number of wires (9 for crates).
The most evident disadvantage is the more difficult manufacturing of split cables.
Note that cables must be shorter than 150 m; the Bus line does not require a termination.

Plug the EASY3000 or EASY4000 Power Supply Boards into the crates and connect the output channels to the electronics and detectors to be supplied.

1.4 Software set up

1.4.1 System firmware upgrade

Make sure that the SY1527 or SY2527 Universal Multichannel Power Supply System you are using is running SY1527 Firmware Version 2.01.00 or later (firmware upgrade procedure is explained in the SY1527 User Manual)

1.4.2 Branch Controller firmware upgrade

Make sure that the A1676A EASY Branch Controller you are using is running A1676A Firmware Version 2.04 or later.
WARNING: if the A1676A EASY Branch Controller is running Firmware Version older than 2.00, the upgrade procedure does not work; in this case please contact support.nuclear@caen.it
If it is necessary to update the A1676A Firmware, then follow this procedure:
Download the most recent A1676A Firmware at
http://www.caen.it/nuclear/product.php?mod=A1676A
(Click on the *Software* menu and download the A1676A Firmware file)
First it is necessary to add the A1676A Firmware in the system flash memory via either RS232 or TFTP

– enter the **Utility menu → Board Upgrade → Add File (via RS232 or TFTP)** of the SY1527 Software User Interface from the terminal emulator program: a pop up window will ask for the filename to add to the flash memory;
– if you are using the RS232 port:
  ▪ type the **Filename** you want to assign to the file you will load in the flash memory, select OK and press ENTER (the s*tatus Bar* at the bottom of the window will display a *Waiting data…* message);

- select **Transfer → Send Text File** command in the Command Bar of the terminal emulator program (such commands are an example referring to the Hyperterminal of Windows OS), browse in the directories and select the file you want to load in the flash memory; then click **Open** (the *Status Bar* will display a *Downloading …* message and finally *Download completed.*);
- if you are using the TFTP protocol:
  - run the TFTP Server Software and select the directory containing the file you want to add;
  - type the **Filename** you want to load in the flash memory (in this case the filename must be the real filename of the file you want to add), select OK and press ENTER;
  - type the **IP Address** of the computer where the file is, select OK and press ENTER (the S*tatus Bar* at the bottom of the window will display a *Downloading …* message and finally *Download completed*).

It is then necessary to download the firmware on the A1676A by using the **Download Selected File on Board** command. In order to upgrade the firmware on the board, follow these steps:
- select the firmware you want to download by means of the arrows in the upper area of the Board Upgrade window;
- Select the **Download Selected File on Board** command by means of the TAB key and then press enter: as this command is entered, the software will ask you for the slot where to download the firmware;
- type the number of the **Slot** where the board you want to upgrade is plugged into, select OK and press ENTER: some messages displayed at the bottom of the window will indicate the on-going operations.

To erase a file from the flash memory select the **Delete Selected File** command and press ENTER.

To exit the Board Upgrade window select the **Exit** command and press ENTER.

1.5 EASY Crate Configuration

It is now 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 the remote crates. After the configuration it is not possible to change the crate layout unless the A1676A configuration 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 configuration file, then it is ignored and its channels are signalled as "unplugged" by the SY1527: in this case it is necessary to insert correctly the misplaced board, and then its channels will be accessed.

The User can build his crate configuration file using the **CAEN EASY Rack Builder**, a Java(TM) application which allows EASY Users to create their customised EASY Crate configurations.

1.5.1 CAEN EASY Rack Builder installation and set up

First of all it is necessary to connect the PC, which must run a Java(TM) 2 Platform Standard Edition, and must be connected to the Internet.

Then it is necessary to download the software tool from the web page:
http://www.caen.it/nuclear/product.php?mod=A1676A
Click on the *Software* menu and download the *CaenEASYRackBuilder-x.y.zip* file
Unzip the file then launch the *CaenEASYRackBuilder.jar* Java(TM) application

1.5.2 Configuring the crates

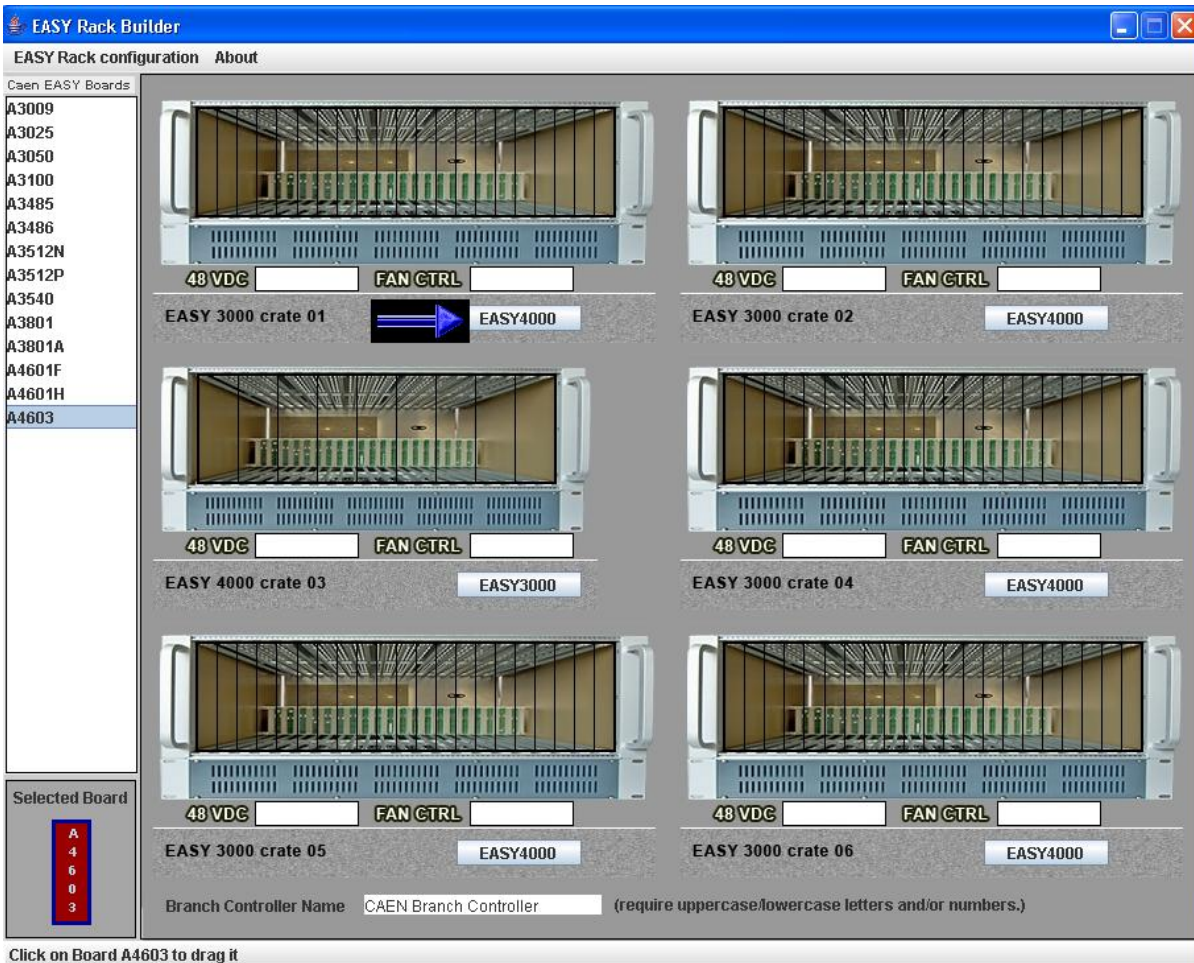Now the following EASY Rack Builder window will open:

Fig. 1.5 – EASY Rack Builder main menu

The EASY Rack Builder shows six empty EASY crates, by clicking on the "Crate button" (see the arrow in figure above) it is possible to choose between EASY3000 and EASY4000 crates (according to the crates connected to the A1676A to be configured).

The menu on the white box on the left lists the EASY boards (including optional AC/DC converters and Fan units) available to fill the crates.

The operating parameters of such boards are stored in the *board.xml* files included in the folder: *\CaenEASYRackBuilder\Boards* of *CaenEASYRackBuilder-x.y.zip*

Each time CAEN EASY Rack Builder is launched, such xml files are compared to those present in the CAEN data base and, if the comparison is successful, the corresponding boards are added in the white box list.

The updated xml files of each board can be downloaded in the software section at:
http://www.caen.it/nuclear/product.php?mod=XXXXX
where "XXXXX" stands for the board name (for example: *A3009*).

In order to configure the crates it is necessary to select the desired board by left clicking on its name and dragging it on the selected crate slot. Left click again to drop.

Boards can be removed from the crates left clicking on them and dragging and dropping them on the white box.
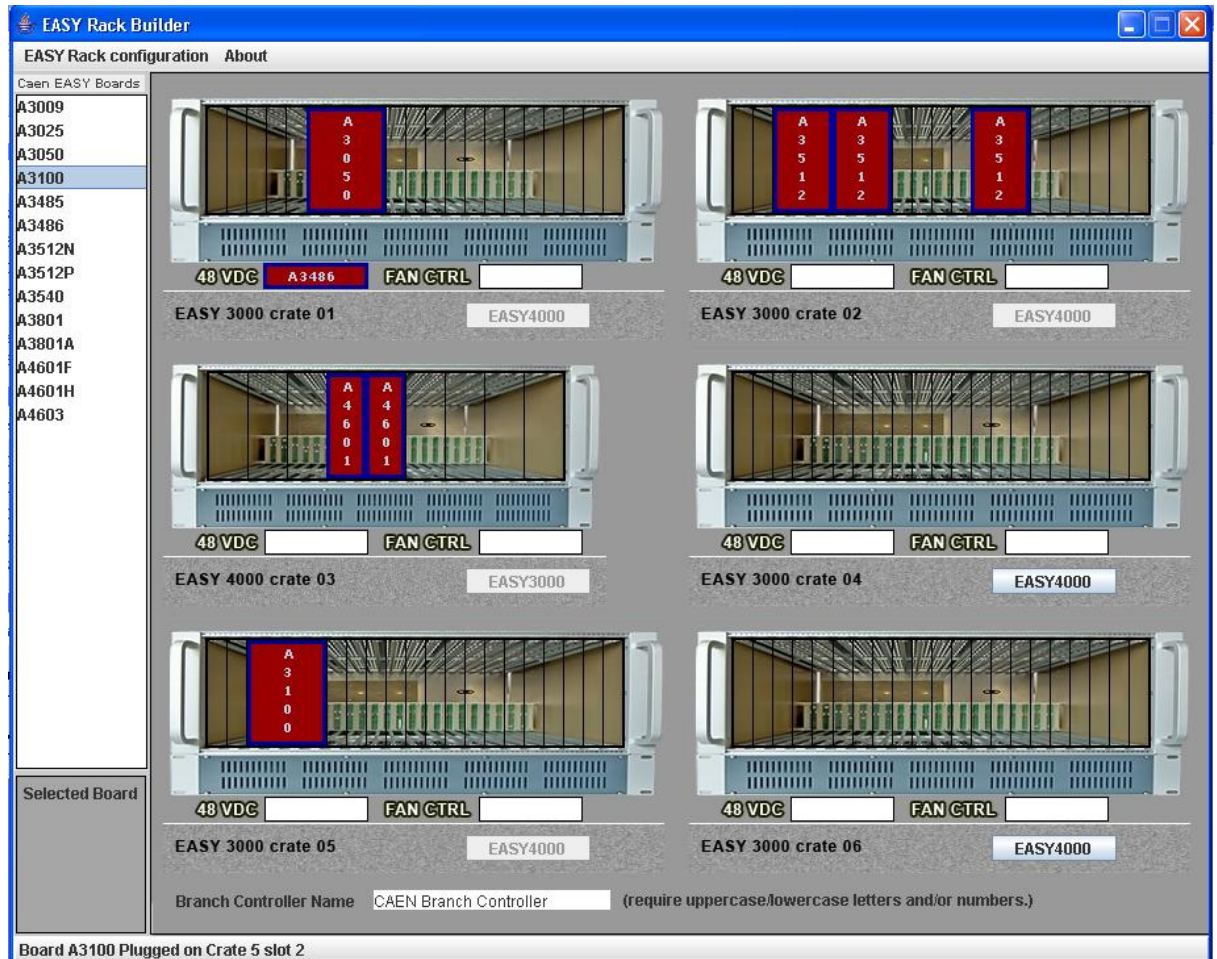
Fig. 1.6 – EASY Rack Builder with populated racks

When the crate configuration is complete, it is necessary to save the file; go to:

EASY Rack Configuration > Save as…

This allow to create an xml file which can be used for future purposes (modify, update etc.).

Now choose:
EASY Rack Configuration > Generate Branch Controller update file

In order to load the Rack Configuration into the A1676A it is necessary to select:

EASY Rack Configuration > Generate Branch Controller update file

This allows to create a binary file that must be used to configure the A1676A via SY1527. Then, in order to actually load the Rack Configuration into the A1676A:
− enter the **Utility menu → Board Upgrade → Add File (via RS232 or TFTP)** of the SY1527 Software User Interface from the terminal emulator program: a pop up window will ask for the filename to add to the flash memory;
− if you are using the RS232 port:
  ▪ type the **Filename** you want to assign to the file you will load in the flash memory, select OK and press ENTER (the s*tatus Bar* at the bottom of the window will display a *Waiting data…* message);
  ▪ select **Transfer → Send Text File** command in the Command Bar of the terminal emulator program (these commands are an example referring to the Hyperterminal of Windows OS), browse in the directories and select the file you want to load in the

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flash memory; then click **Open** (the *Status Bar* will display a *Downloading…* message and finally *Download completed.*);
– if you are using the TFTP protocol:
▪ run the TFTP Server Software and select the directory containing the file you want to add;
▪ type the **Filename** you want to load in the flash memory (in this case the filename must be the actual filename of the file you want to add), select OK and press ENTER;
▪ type the **IP Address** of the computer where the file is, select OK and press ENTER (the S*tatus Bar* at the bottom of the window will display a *Downloading …* message and finally *Download completed*).

It is then necessary to download the Rack Configuration on the A1676A by using the **Download Selected File on Board** command. In order to configure the board, follow these steps:
– select the file you want to download by means of the arrows in the upper area of the Board Upgrade window;
– Select the **Download Selected File on Board** command by means of the TAB key and then press enter: as this command is entered, the software will ask you for the slot where to download the file;
– type the number of the **Slot** where the board you want to upgrade is plugged into, select OK and press ENTER: some messages displayed at the bottom of the window will indicate the on-going operations.

To erase a file from the flash memory select the **Delete Selected File** command and press ENTER.

To exit the Board Upgrade window select the **Exit** command and press ENTER.

1.6 Remote boards firmware upgrade

It is also possible to upgrade the Remote boards handled by the A1676A Branch Controller (running firmware rev. 2.03 or later) with the latest firmware release: First it is necessary to add the Board new firmware in the system flash memory via either RS232 or TFTP:
– enter the **Utility menu → Remote Board Upgrade → Add File (via RS232 or TFTP)** of the SY1527 Software User Interface from the terminal emulator program: a pop up window will ask for the filename to add to the flash memory;
– if you are using the RS232 port:
▪ type the **Filename** you want to assign to the file you will load in the flash memory, select OK and press ENTER (the s*tatus Bar* at the bottom of the window will display a *Waiting data…* message);
▪ select **Transfer → Send Text File** command in the Command Bar of the terminal emulator program (these commands are an example referring to the Hyperterminal of Windows OS), browse in the directories and select the file you want to load in the flash memory; then click **Open** (the *Status Bar* will display a *Downloading …* message and finally *Download completed.*);
– if you are using the TFTP protocol:
▪ run the TFTP Server Software and select the directory containing the file you want to add;
▪ type the **Filename** you want to load in the flash memory (in this case the filename must be the real filename of the file you want to add), select OK and press ENTER;
▪ type the **IP Address** of the computer where the file is, select OK and press ENTER (the S*tatus Bar* at the bottom of the window will display a *Downloading …* message and finally *Download completed*).

It is then necessary to download the firmware on the remote boards: select "Download Sel. File on Board". At this point the following window opens:
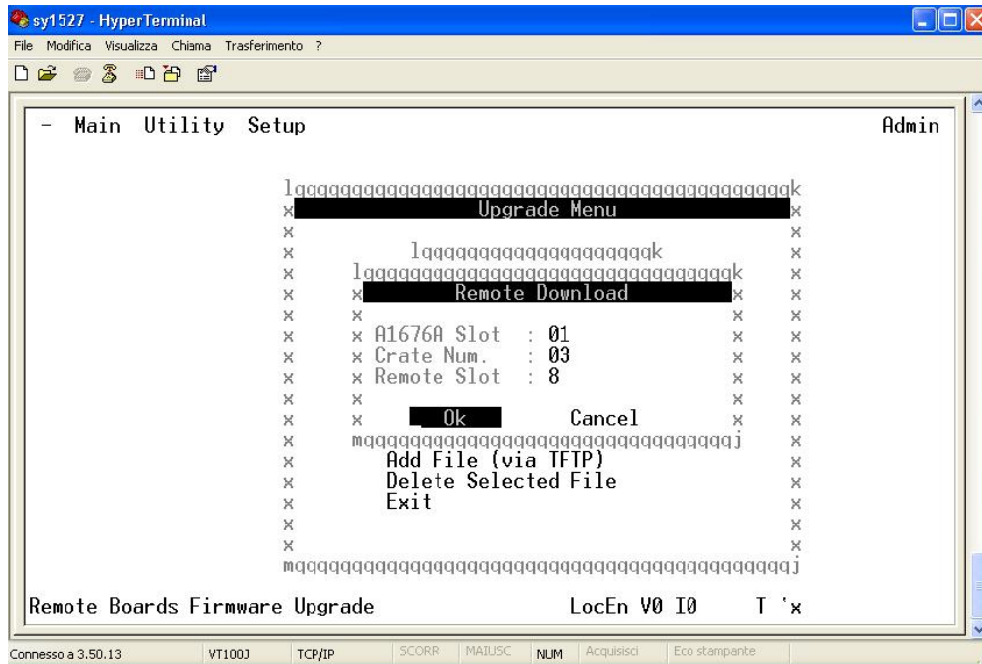
Fig. 1.7 – Remote Board Upgrade pop-up Window

Type in the Remote Download window the "parameters" of the board to be upgraded:

− A1676A slot = the slot where the A1676A (which MUST run firmware rev. 2.03 or later), which handles the board to be upgraded, is plugged

− Remote Crate Number = the number of the remote crate where the the board to be upgraded is plugged

− Remote Slot = the number of the slot in the remote crate where the the board to be upgraded is plugged

To exit the Board Upgrade window select the **Exit** command and press ENTER.

IMPORTANT: This feature is implemented on SY1527 Firmware Rev. 2.01.00 and later.

1.7 Trouble Shooting

Issue	Possible solutions
A Remote board is not detected by the System and all channels are signalled to be unplugged	The board is not plugged in the slot foreseen by the configuration file (see § 1.5): it is necessary to extract the board and insert it in the right slot.
	The board firmware revision is not updated: it is then necessary to upgrade it (see § 1.6)