HYTEM Subracks

DATA SHEET

Configuration for HYTEM Firmware subracks

Handover & Matrix

With software use.

Herve Helleboid V3.2 (add FAQ)

March 2019

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1.1

Firmware 3.x is the latest generation of test system firmware from HYTEM France. It allows the test system to execute commands and interact with users in ways that were previously not available. Below is a list of features that are available for test systems running firmware 3.x

- Touch Screen display
  Allows you to control attenuators in a simple way.
  Providing an intelligent hand over in a one touch button.

- Ethernet and USB interfaces configurable using the touch
  Screen display.

- DHCP capable
  By default subrack test systems will attempt to obtain network interface information from a listening DHCP server.

- Multi users

Using Ethernet, it could be as many users as attenuators in the subrack

- Auto Execute

  Sequence scenarios can be uploaded to the subrack to run them without the latency of the network using our internal SSD drive

- connection

  Remote connection can be done with scripts, telnet software or our included graphical web server.

1.2 ETHERNET INTERFACE

One RJ-45 connector with 10Base-T interface provides a 10 Mbps Ethernet connection. Using Telnet Software each attenuator is accessible with a unique port. The first attenuator is on 10001 then second 10002 etc…

1.2.1 ETHERNET SETUP

The network interface by default uses DHCP to attempt to obtain IP, net mask, and gateway IPv4 address. If it is successful, then the IP address will be displayed on display. If there is no DHCP server to issue dynamic network address then the network address can be set manually via the touch screen display.

Note: If you update any network options without being physically cabled to a network, then you will need to connect the test system to the network and power cycle the test system for the changes to take effect.

1.3 USB INTERFACE (for Win10: see Appendix Page)

The first time you need to use our subrack with USB interface, you must connect your computer with a USB A-B cable. B connector of our subrack is the one used for USB connection.

A B

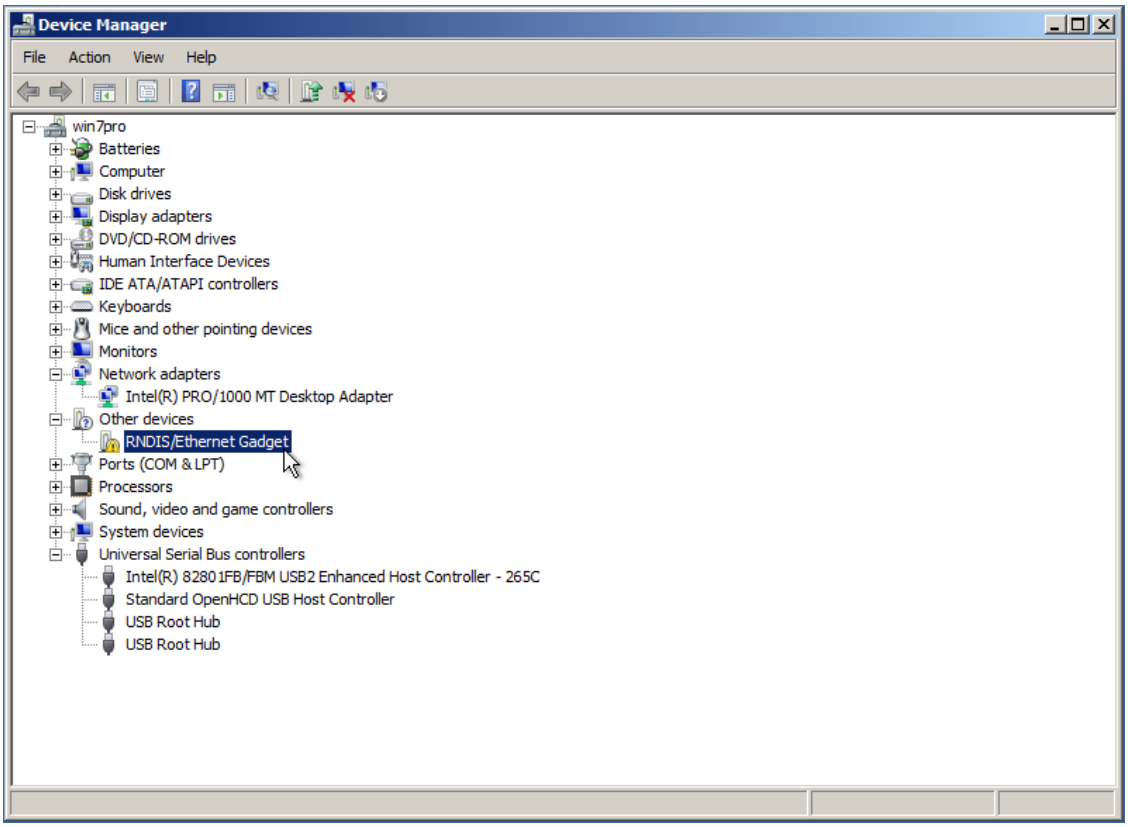
This set of instructions is a bit heavy on screenshots, and it's designed for Windows 7

Please note that these instructions assume a certain familiarity with basic Windows device management. You may need to contact someone to help with the first time setup.

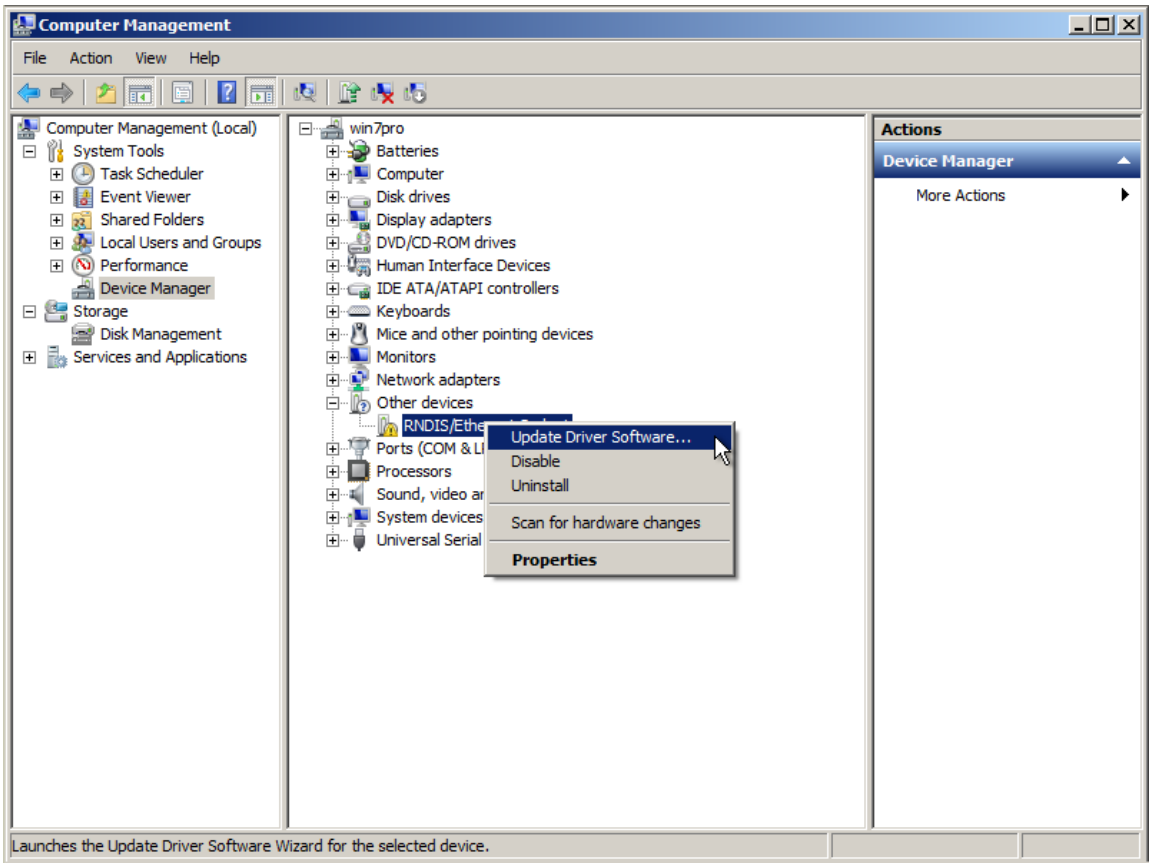
The first time you plug the HYTEM subrack into your Windows machine, one of two things will happen. You'll either see a new RNDIS network device, or you won't. Let's deal with the non-functional cases first.

Open up the Device Manager and locate the RNDIS network device - if it's not working it will look like this. If the RNDIS device shows up in

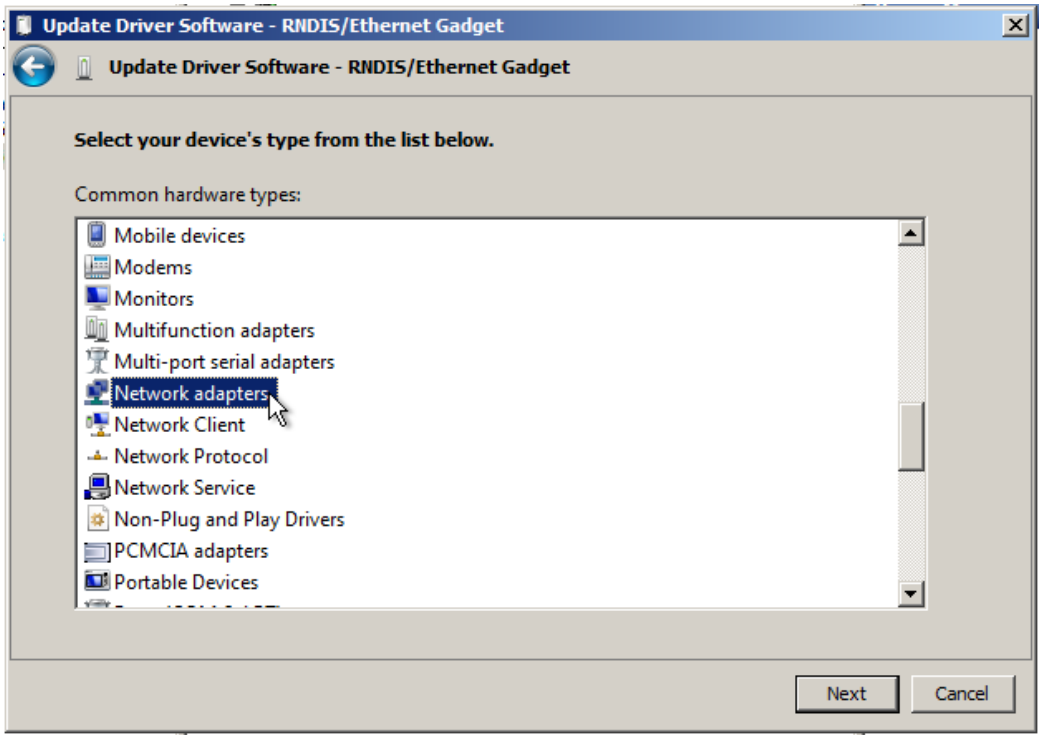
the "Network Adapters" section, then skip ahead to Setting the IP address



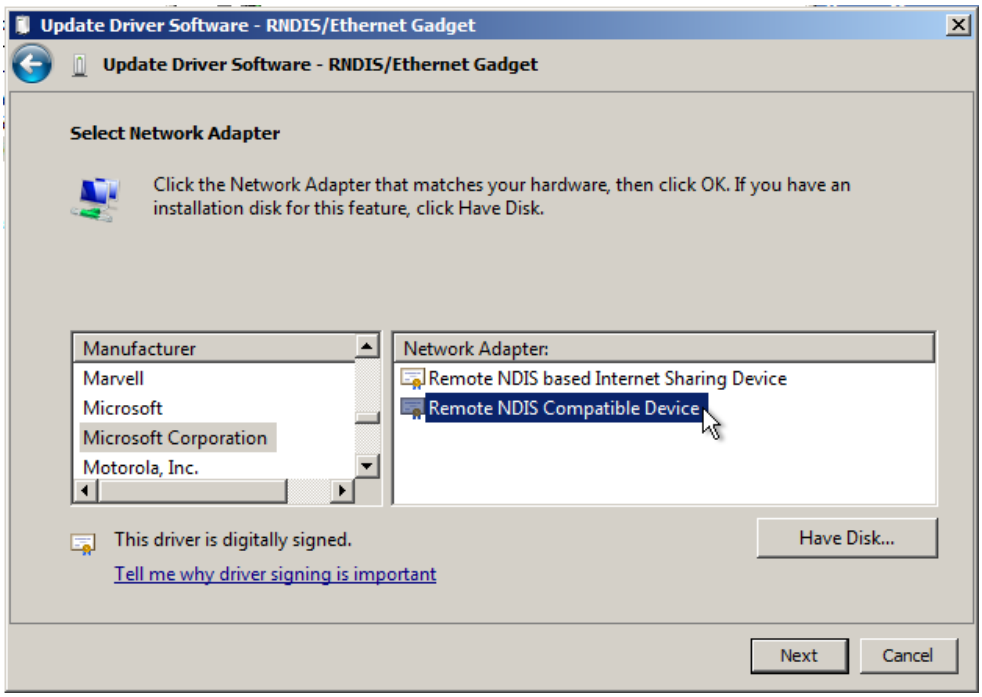
Right click on the "RNDIS/Ethernet Gadget" and choose "Update Driver Software..."



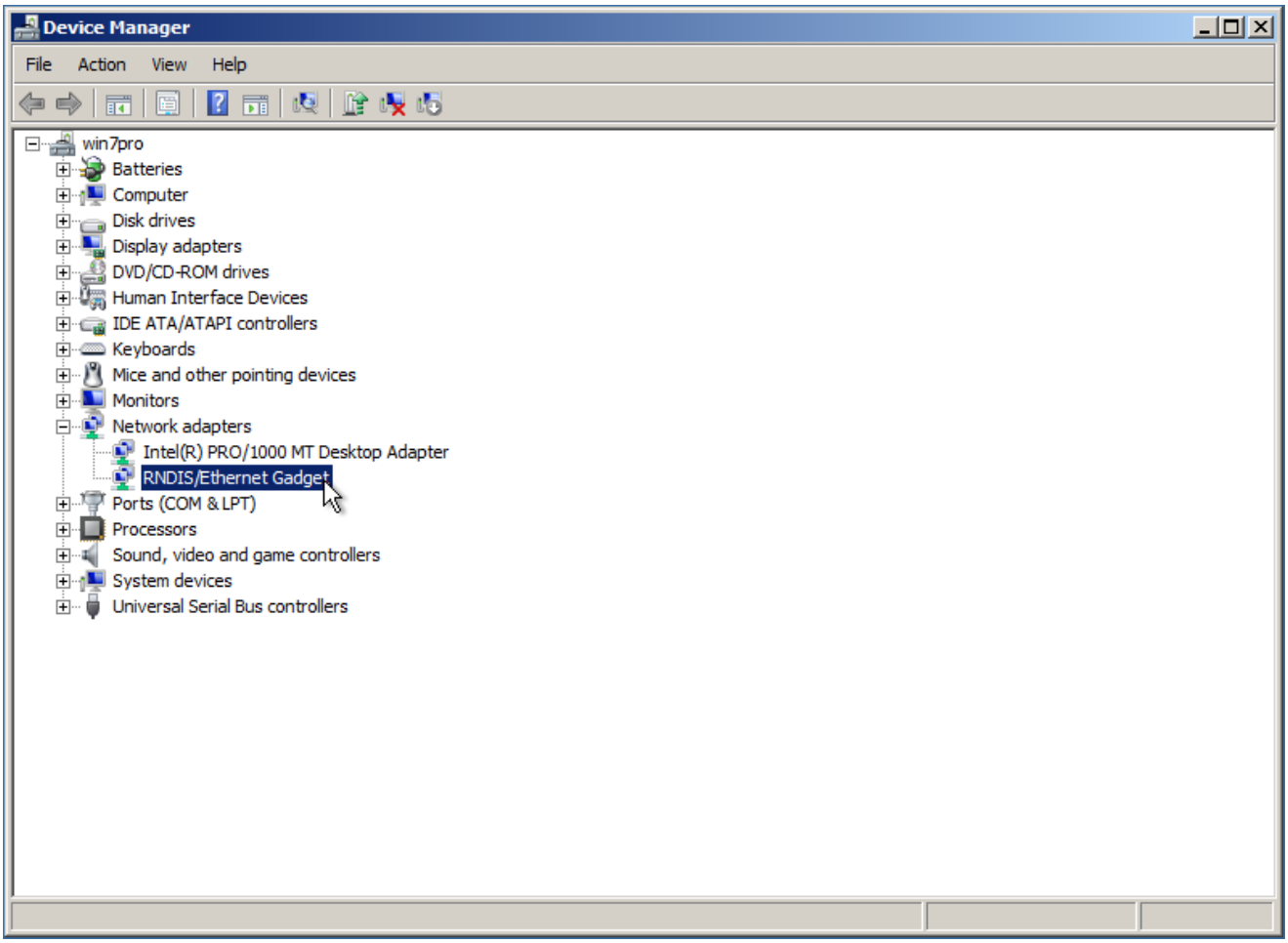
Choose "Browse my computer for driver software" and then "Let me pick from a list of device drivers on my computer". Then choose "Network adapters" as the device type and click "Next".



After a few moments, a drop down list of manufacturers and network adapters will appear, and you want to select "Microsoft Corporation" and "Remote NDIS Compatible Device" as shown here:

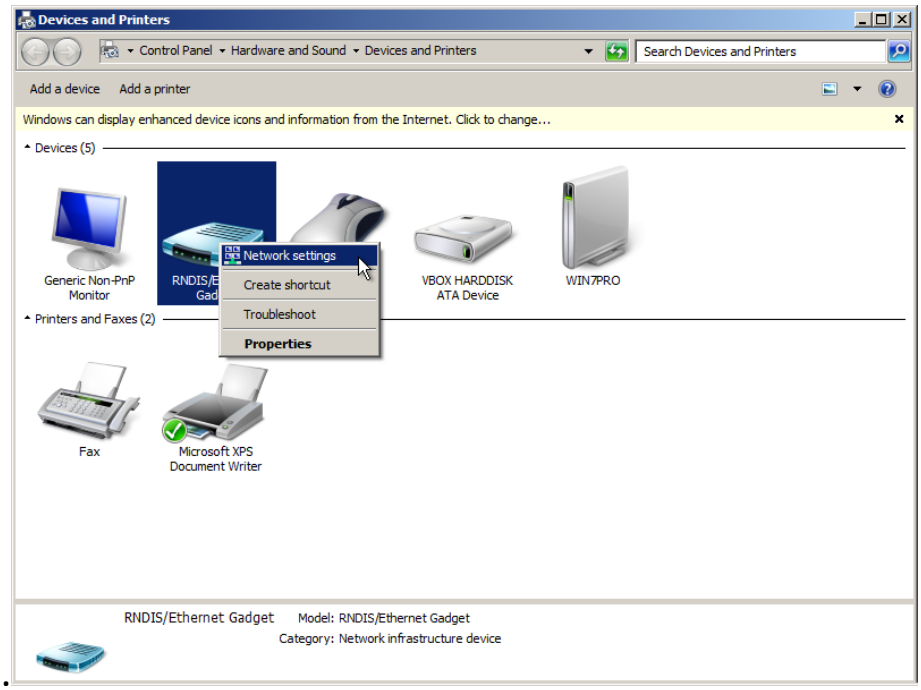


Click "Next" and then click through the "Update Driver Warning Dialog". Now the device should be showing in the "Network adapters" list, like this:

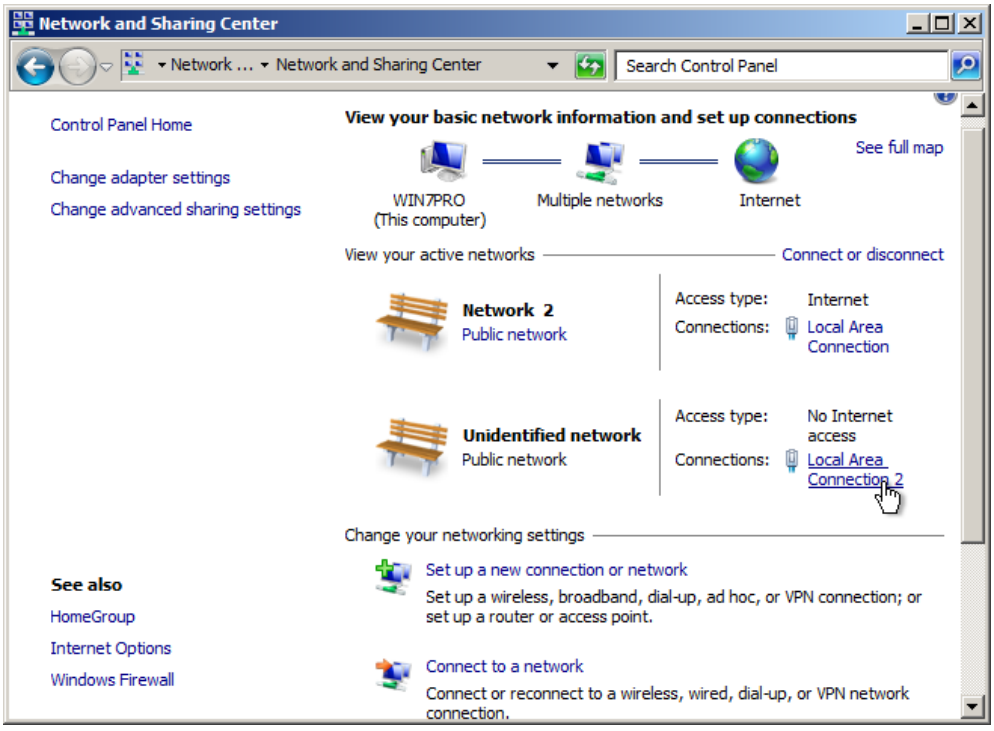


Set the IP Address

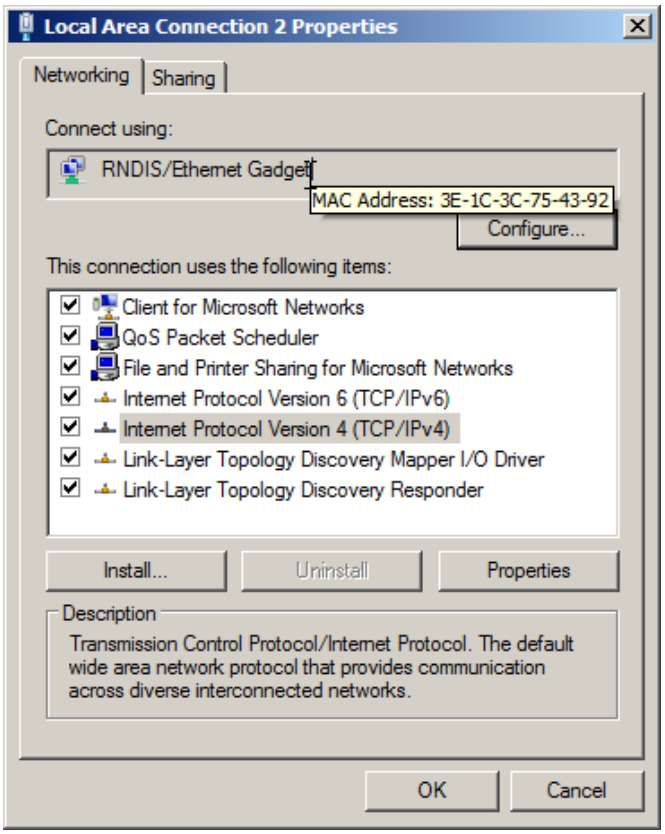
Open the "Devices and Printers" application from the "Start" menu,and right click on the new "Remote RNDIS Compatible Device", then choose the “Network Settings” selection.



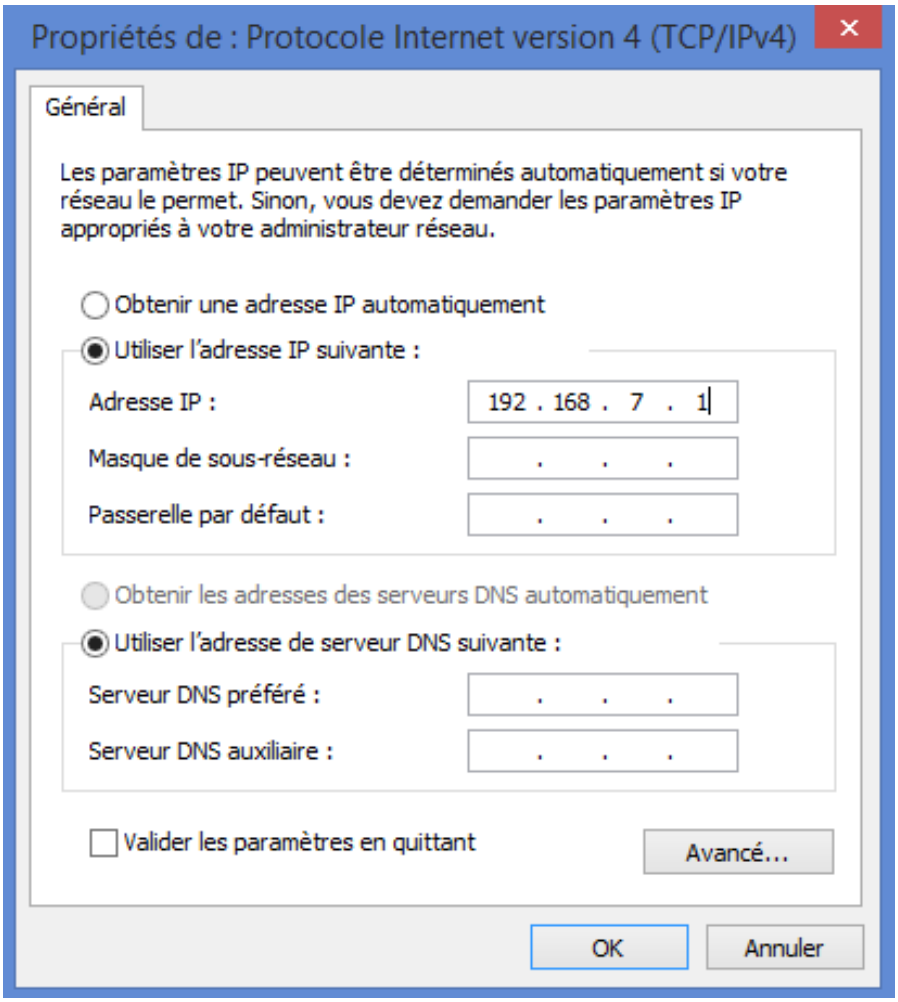
Choose one of the Active Networks in the "Network and Sharing Center" dialog. I can't tell you which one, because there's probably one for your WiFi, one for a hardwired Ethernet and so on. But it's probably the last one on the list.



On my machine, it's "Local Area Connection 2". Click on that connection, then click on "Properties", and you should see a dialog something like this:



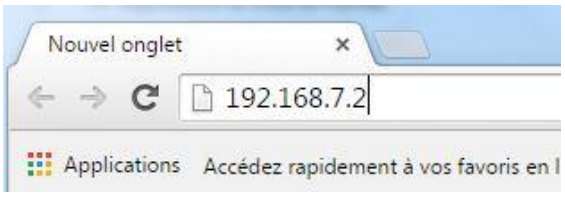
Double click the "Internet Protocol Version 4" setting line, and set the host address of the connection. In this example, I'm using 192.168.7.1 which is my host address, NOT the target address of the Hytem subrack.



After setting the address and mask, click "OK" and back out of the dialogs. You have now set up the RNDIS network adapter!

Test And Connect To the Subrack

Now it's time to test things - a simple ping of the target address could help for test. Open your Browser (Chrome is recommended) and type **192.168.7.2** (this is the fixed USB IP for HYTEM subrack)

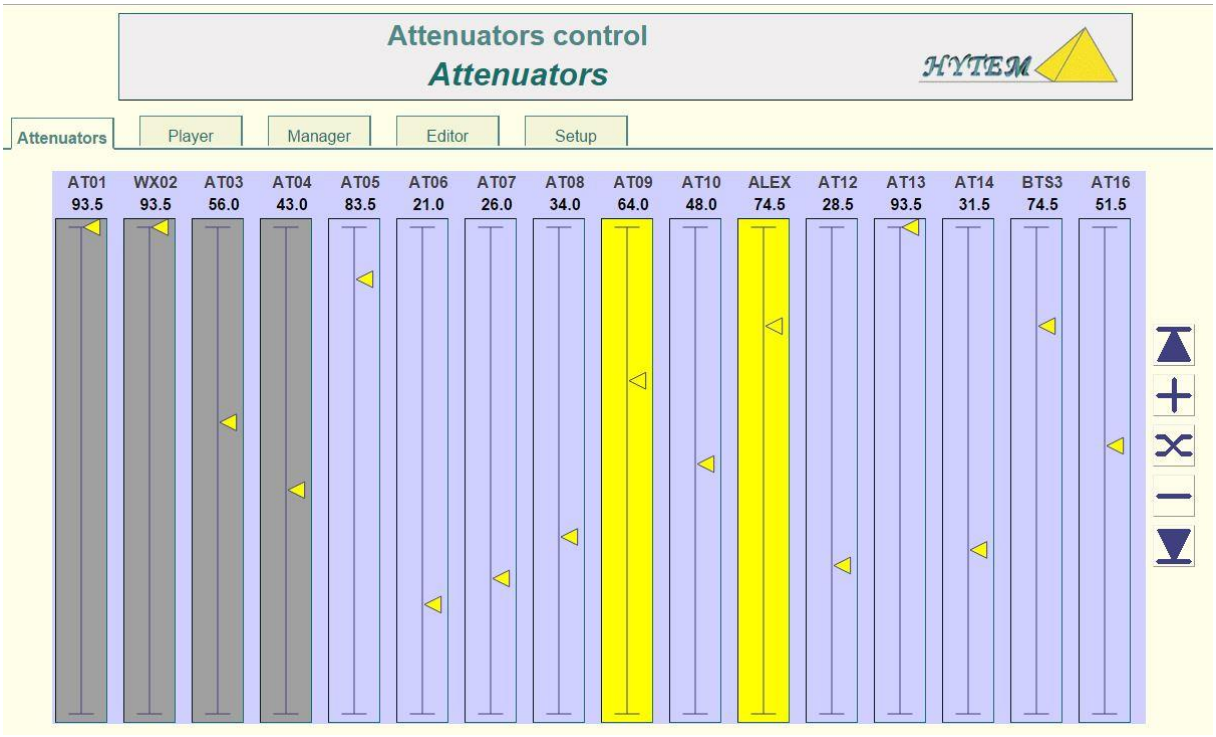


1.4 WEB SERVER connecting

After the subrack is plugged to your network or USB, you can connect it with our internal web server.

Use your Internet browser (Chrome is recommended) and type IP address (given by display for LAN, and **192.168.7.2 for USB)**

1.4.1 Attenuators



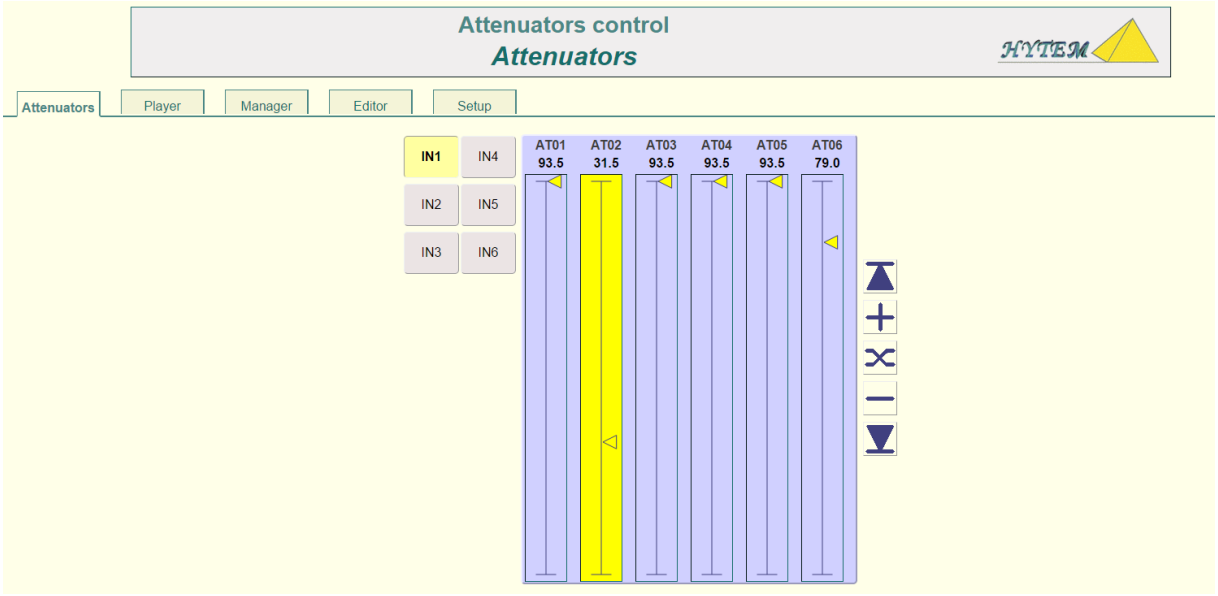
(typical hand-over web page)

The first 4 attenuators are actually remotely connected by one or more users. They are greyed and you cannot move them. You can select attenuators you want to move, background become yellow, then you can change their values with your mouse, the “+” button, the “-“ button, the Max or Min buttons or make a handover with the “cross” button.

To use the handover cross button, you need choose, at least 2 attenuators and as many as you want.

When using a matrix type of subrack with large number of attenuators, these attenuators are splitted in differents groups.

Note the group buttons on picture below.



(typical 6x6 matrix WEB page. In this case Attenuators are splitted 6 groups of 6 attenuators)

1.4.2 Player

Typical Web page for handover subrack

The player permits to launch sequences from the web server. In this case the attenuator number 6 has a sequence in memory named by

the author “cyclic-93dB-20s.sqc” and the attenuator number 5 has his own sequence named “test-patterns-93dB.sqc” in memory.

As the option “Sync. On 5” is selected, and the attenuator 5 is in master mode the player launch 2 sequence (at05 + AT06) at the same time. (synchro)

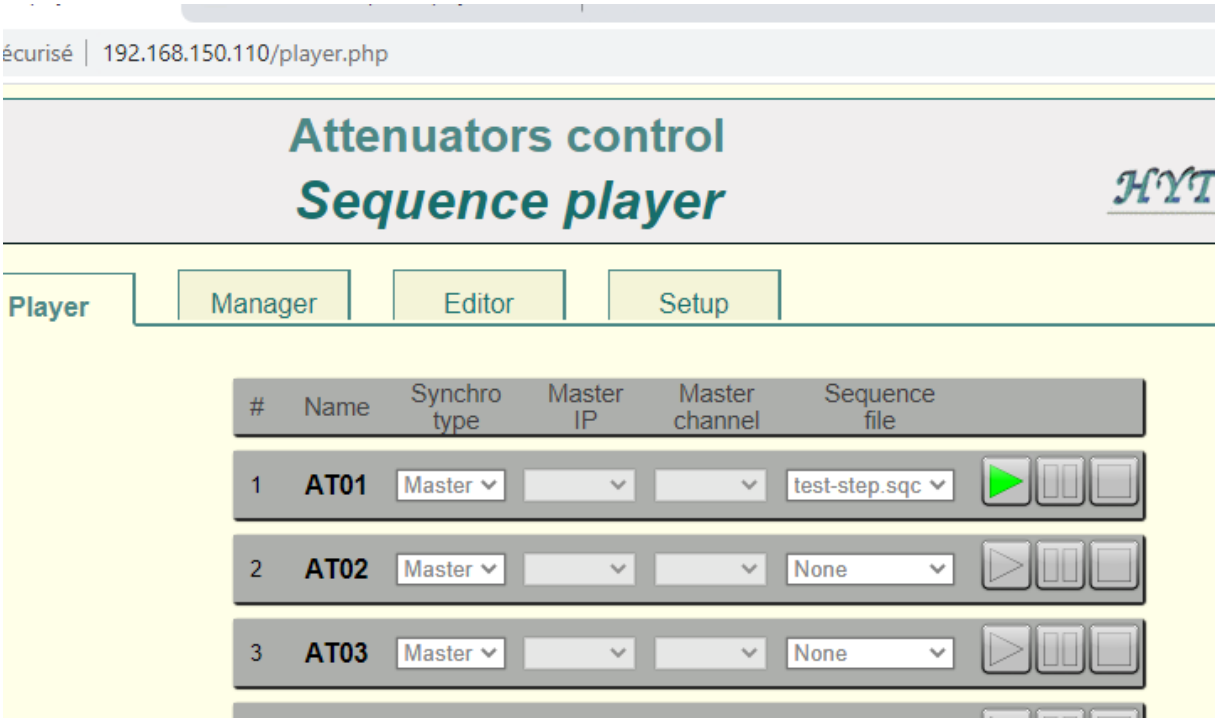
From firmware 1.24 and above:

With the player, you can configure multiple subracks. IE: One subrack start command can automatically start another subrack on the same LAN.

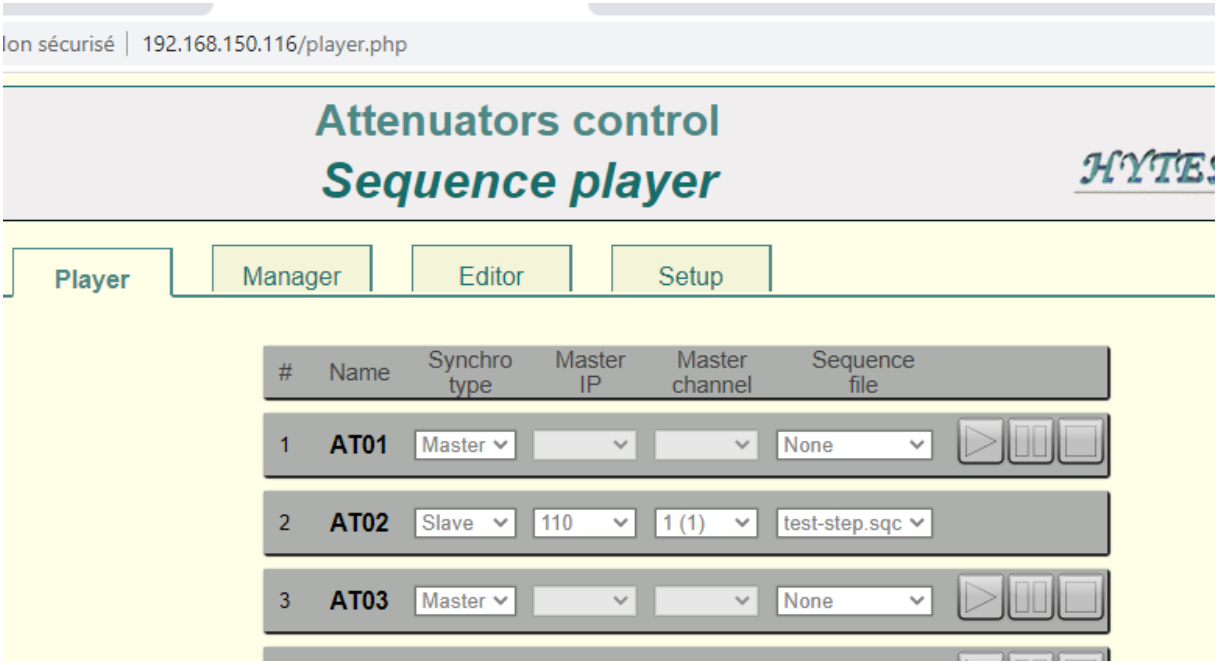
The two IP address must be the same for the 3 first case. In our example we use 2 subracks with IP **192.168.150.110** & **192.168.150.116**

Numbers with underline must be the same.

From firmware 3.0 and above:



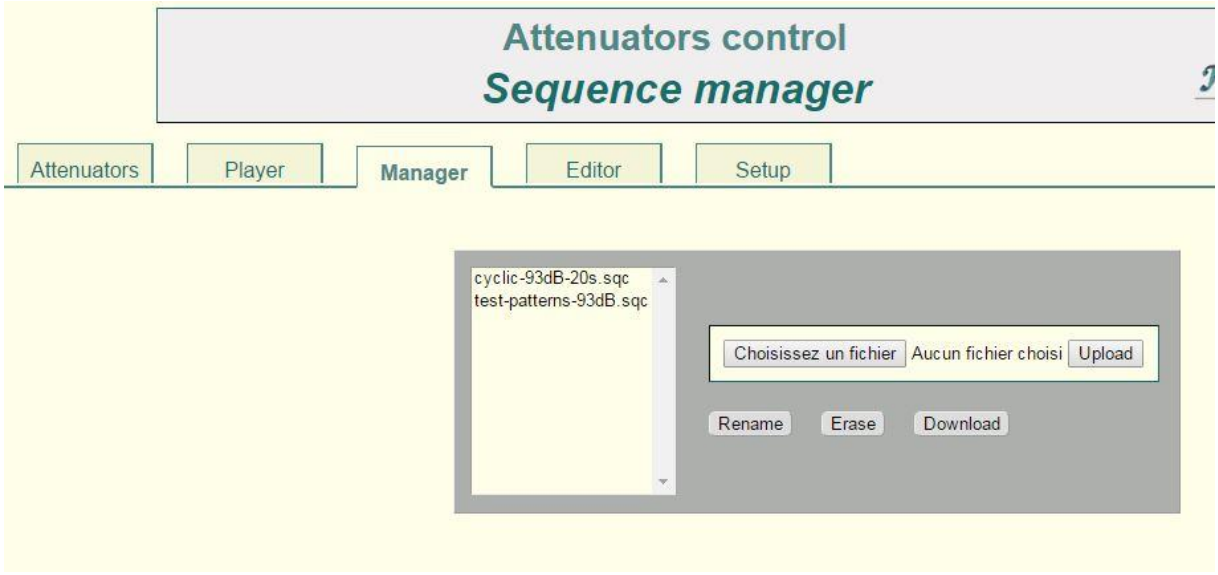
On this first subrack connection (110 here), the AT01 WAY1 is in **MASTER mode** with it's own sequence



On this second subrack connection (116 here), the AT02 WAY2 is choosen to be the slave of the subrack (**110)** (**Slave**) and the WAY1 (**1**). This slave way has it's own sequence too.

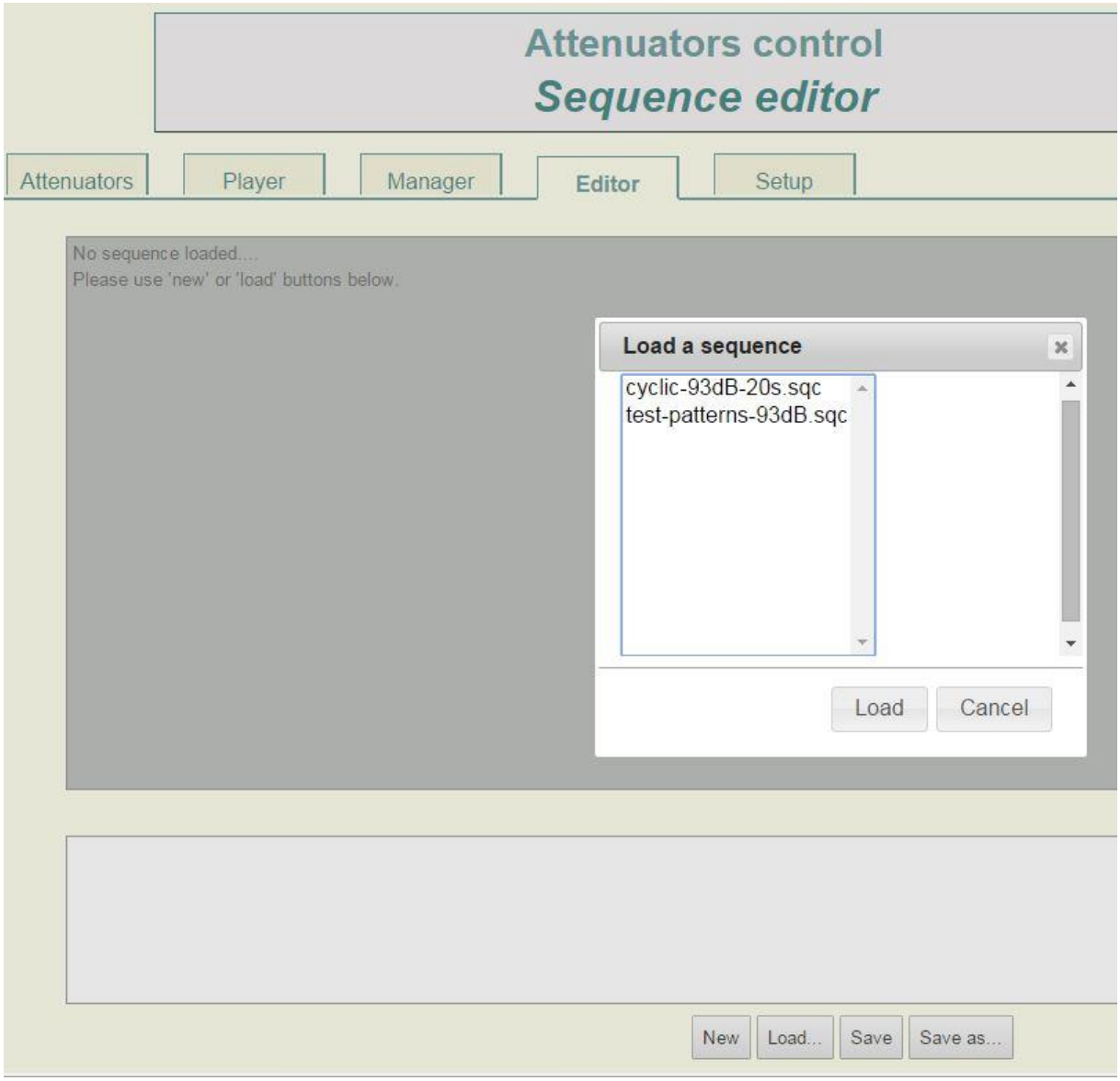
When "Slave" is choosen the PLAY,PAUSE & STOP buttons aren't available because only the MASTER can control them.

1.4.3 Manager



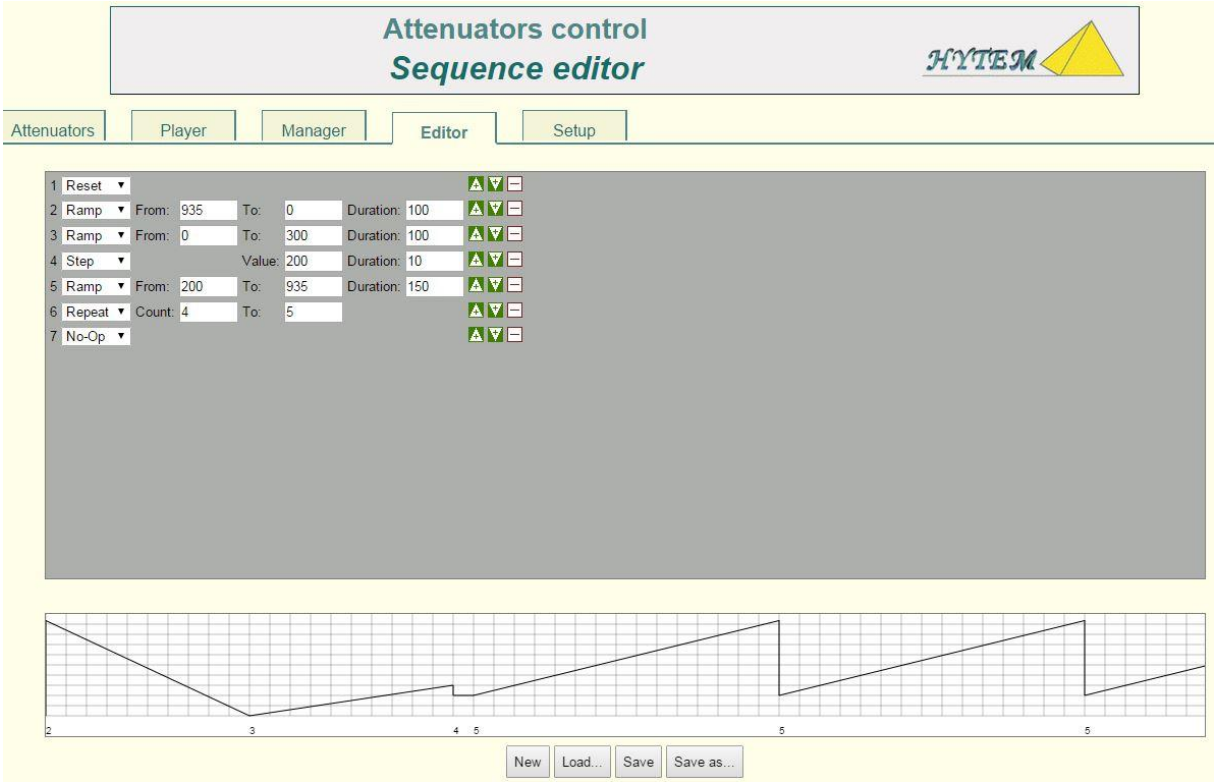
Sequence are uploaded/downloaded into or from the SSD drive with the computer you are using with the **Manager.**

1.4.4 Editor



You can press “New” button to create a new sequence or

Press “load” to read a sequence from the subrack SSD drive, choose the sequence you want to modify.



Sequence are created with the web server but could also be created/modified with a text editor like the notepad++ freeware.

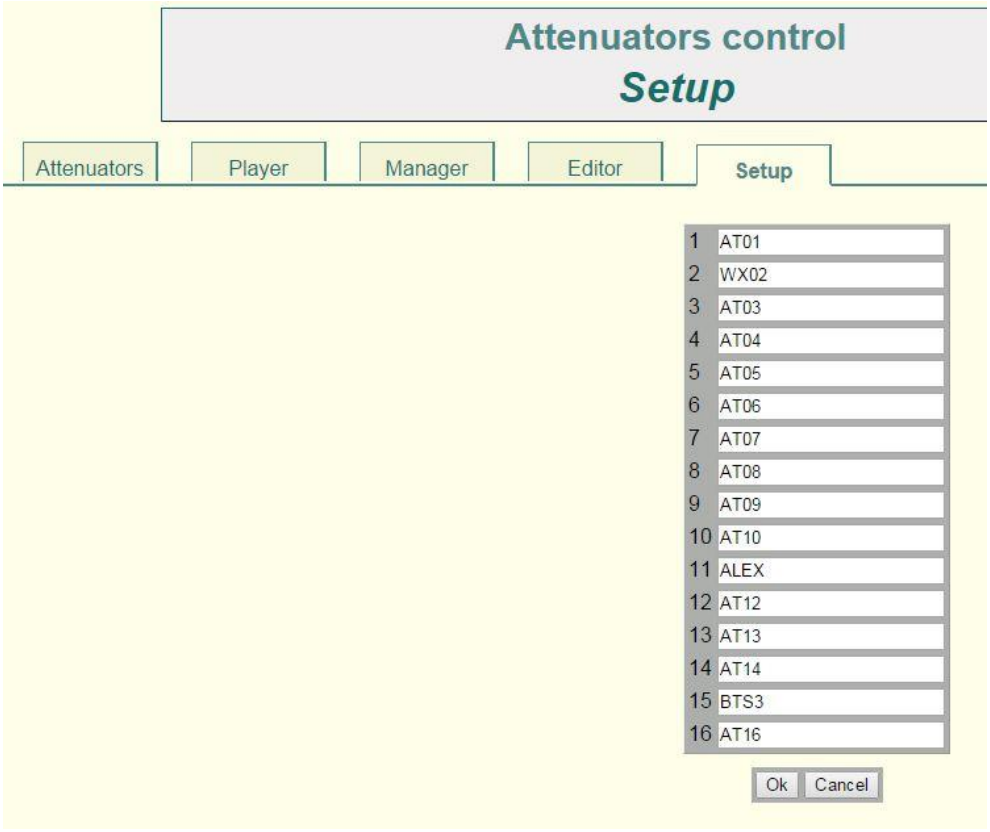
The sequence above appear in text type:

```
1   RACKS SELECTED
2
3   Rack 1 :  att01
4
5   ACTIONS
6   #Num     Time     Action  From    To  Duration
7   1    0    1    0    0    0
8   2    0    2    935  0    100
9   3    100  2    0    300  100
10  4    200  3    0    200  10
11  5    210  2    200  935  150
12  6    360  5    4    5    0
13  7    360  0    0    0    0
14
```

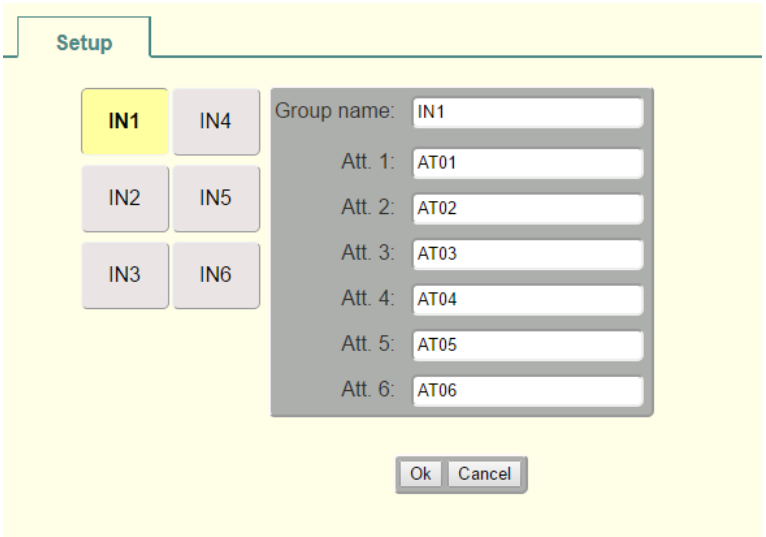
Duration: 100 = 10.0 seconds

Another way to create sequence, is to use our free software HRB (HYTEM RADIO BOX) or your favorite software. Just place attention to the spaces and TAB used.

1.4.4 Setup



With Setup, you can rename Attenuators (4 alphanumerics) Handover webpage type.



Matrix webpage type.

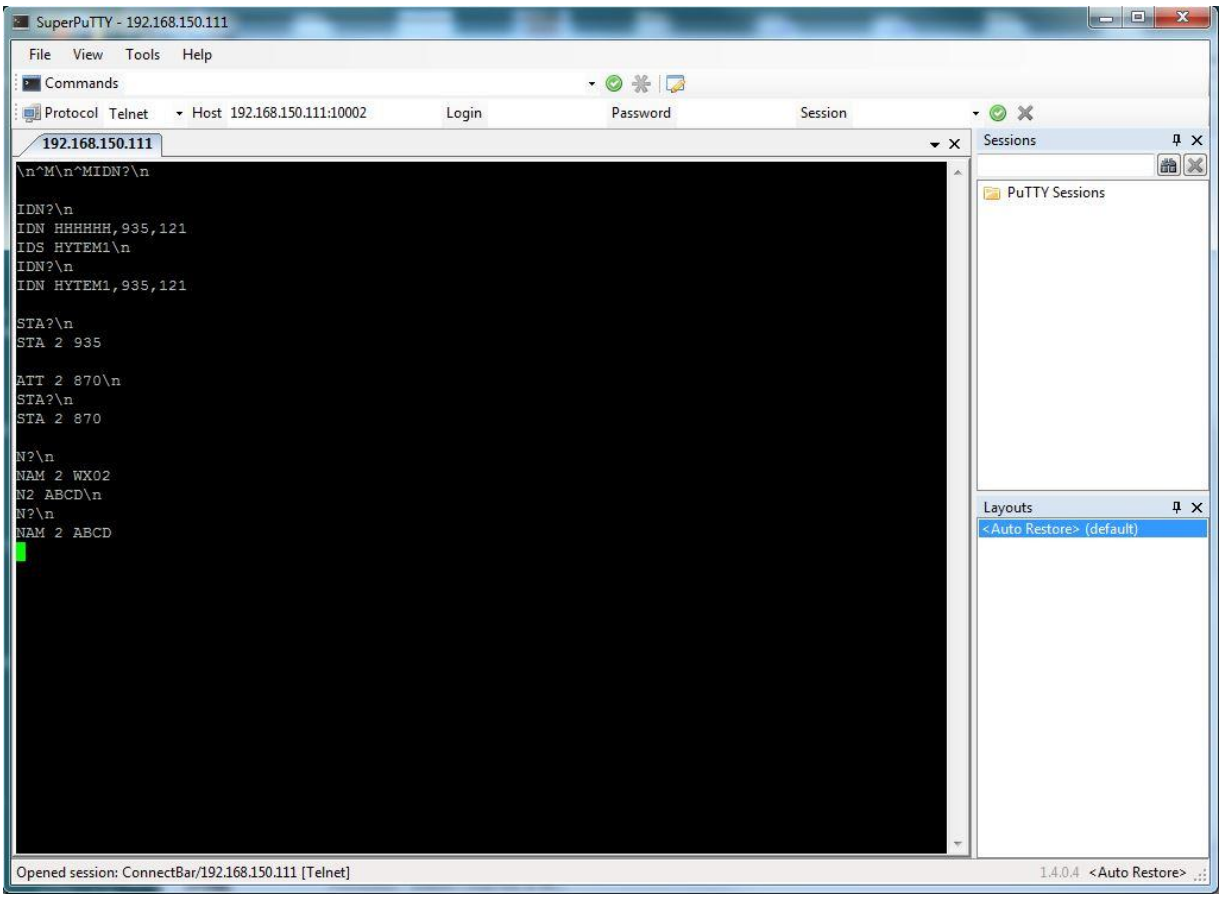
1.5 DISTANT SOFTWARE connecting

Our new firmware is compatible with our ancient windows software named HRB “Hytem Radio Box”. You can use our free windows software HRB.

Limitation: As our HRB was created for max: 8 attenuators, only 8 attenuators could be used.

1.6 TELNET connecting

Our subrack can easily be controlled over TCPIP using a Telnet program. In this example we use the free software: SuperPUTTY

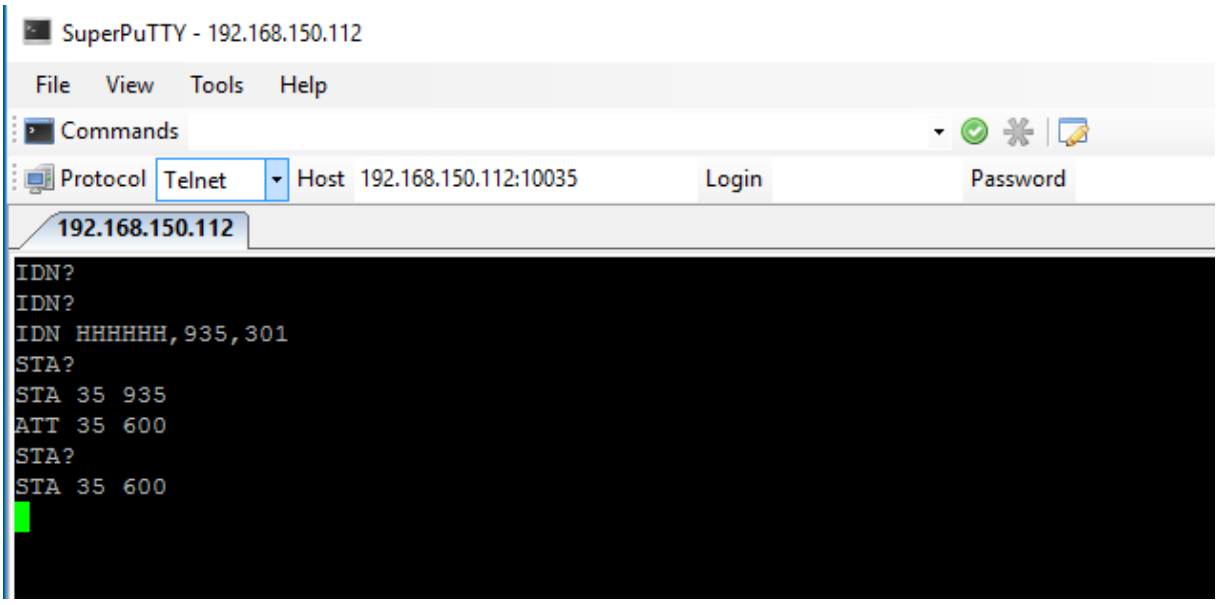


HOST: Input the IP address of the subrack then input the PORT number.

(10001 = attenuator 1, 10002 = attenuator 2…..)

Then select Telnet and Valid

In the above case, the used port is 10002 so we can only change attenuator number with this simple session.



Example of a telnet command for the attenuator number 35 in a 6x6 matrix

1.6.1 Protocol

IDN?\n

Ask for name of the subrack.

Return:

IDN xxxxxx,yyy,zzz

xxxxxx = name of the subrack

yyy = max attenuation (935 = 93.5dB)

zzz = firmware version

IDS xxxxxx\n

Change the name of the subrack.

Return: Nothing

STA?\n

Ask for actual value for the attenuator

Return:

ATT x zzz

X = attenuator number

zzz = actual value (ex:870 = 87.0dB)

ATT x yyy\n

Place attenuator x (dependent on port number) at yyy value

Return : Nothing

N?\n

Ask for name of the actual attenuator (also visible on front display)

Return:

NAM x zzzz

X = attenuator number

zzzz = Name of this attenuator (A-Z and 0-9 with 4 digits)

Nx yyyy\n

Change the name of the actual attenuator. Must be (A-Z and 0-9 with 4 digits)

Return : Nothing

1.6.2 DISTANT SEQUENCE LAUNCHING (from firmware 1.25)

Example for playing a sequence from TCP on attenuator 2, done width Linux Telnet. This must be sent on the TCP 2000 port of the subrack.

Each key word must be followed by the attenuator number

SEQ = key word to give the subrack the sequence to play

START = key word to start sequence

PAUSE = key word to suspend

STOP = key word to stop the sequence

```
[~]$ telnet 192.168.3.143 2000
Trying 192.168.3.143...
Connected to 192.168.3.143.
Escape character is '^]'.

SEQ 2 orig-cyclic-93dB-20s.sqc
Ok
START 2
Ok
   (sequence is starting)
PAUSE 2
Ok
   (sequence suspend)
START 2
Ok
   (sequence continue)
STOP 2
Ok
   (sequence stopped)
    CTRL + ALTGR + ]      <-- Ask for Telnet prompt
telnet> quit
Connection closed.
[~]$
```

1.7 Firmware upgrade

From firmware 3.x and above, it's done with an internet connection.

Connect your subrack to a LAN with internet connection, then power on the subrack. It will automatically verify if there is a new firmware version available then apply it. Do not disconnect before update done.

2.0 FAQ

Webserver – is the configuration (ip setting, groups, attenuator names etc) save in a file that can be backed up for disaster recovery.

Yes these settings are stored in a file on a SD card. This file is write protected and cannot be accessed by user.

Webserver – when discovering other equipment on the same subnet – how is it done – are you using IP broadcast messages for example (we will need to avoid polluting the network with "Hytem" polling etc).

We use UDP/IP socket on the 2016 port.

Webserver - is the webserver aware of what equipment you expect to be there? If it is, does it notify you when it cannot find a device it expect to be there (unit powered off).

No, the webserver discovers the devices emitting their statuses using our protocol on UDP port 2016.

When creating the script in webserver: what are the max value that can be set for the period of a step for example, for no op?.

The duration is an integer. The max value is 2^31, that is 2.147.483.648 x 0.01 sec = 248 days

When you use no-op (idle) setting – what happens – is the state before entering no-op/idle maintained. What is the different between a No-op idle and a step with a long timer – what is the use case

On No-op step we don't do anything to the attenuator. So the previous state is held.

If we autogenerate a script and it is saved on my PC - how can this script be loaded to SSD: I would like to avoid loading the script file into the webserver and saving it from there.

Actually, there is no way to do that. We are working on a way to upload via FTP or SCP but we have to configure an access.

If I am autogenerating the script Is it possible to damage the equipment via some invalid setting?

No we don't think so. It never happen as this time…

Is there a difference between what can be done via the webserver and what can be set via the script - for example can master slave relationship be configured

The script contains only the steps. There is nothing concerning attenuators numbers, groups or master/slave relationship in the script file.
To configure which attenuator plays which script we use a TCP/IP interface (with text commands). It could be possible to access from the LAN to this interface. (option ?)

Is the webserver doing anything other than configuring the boxes? What cannot be setup/managed without a web server (for example SSD, is it possible to delete script from the user interface in the box?

It is not possible to delete scripts from the embedded HMI (only with SSG access)

What error handling is there? Does the box generate any alarms ? if I use a robot to create a telnet session to run a script on the SSD and it is not there, is a warning be generated?

The error are handled localy, no alarm are generated in case of failure.

For our records/automation debugging we may want to review a record the settings of the attenuator during the actually execution – are the values reported by the device kept in a history file (in the webserver or the Hytem) that can be looked at to see what happened?

For the moment no history is generated.

Appendix:

WINDOWS 10 and USB connection

In case you can't install RNDIS USB GADGET on your WINDOWS 10 computer, Verify if the hytem subrack is found as serial (COM) when USB cable is plugged. If yes: download these drivers

Drivers for WIN10: http://hytem3.free.fr/hytem-W10.rar

Unrar these files on your computer drive then choose COM port and change drivers.

Select the above files.

Now RNDIS Gadget appear near printers. You can install as explained Page 9 (Set IP Address)

Firmware version:

V1.0 december 2015
Original file

V1.1 February 2016
Add LAN connection for multiple subracks connection

V1.2 February 2016
Add driver solution for USB connection with Windows 10

V1.3 February 2016
Add distant sequence launching

V3.x November 2016
Add Matrix group type on firmware

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