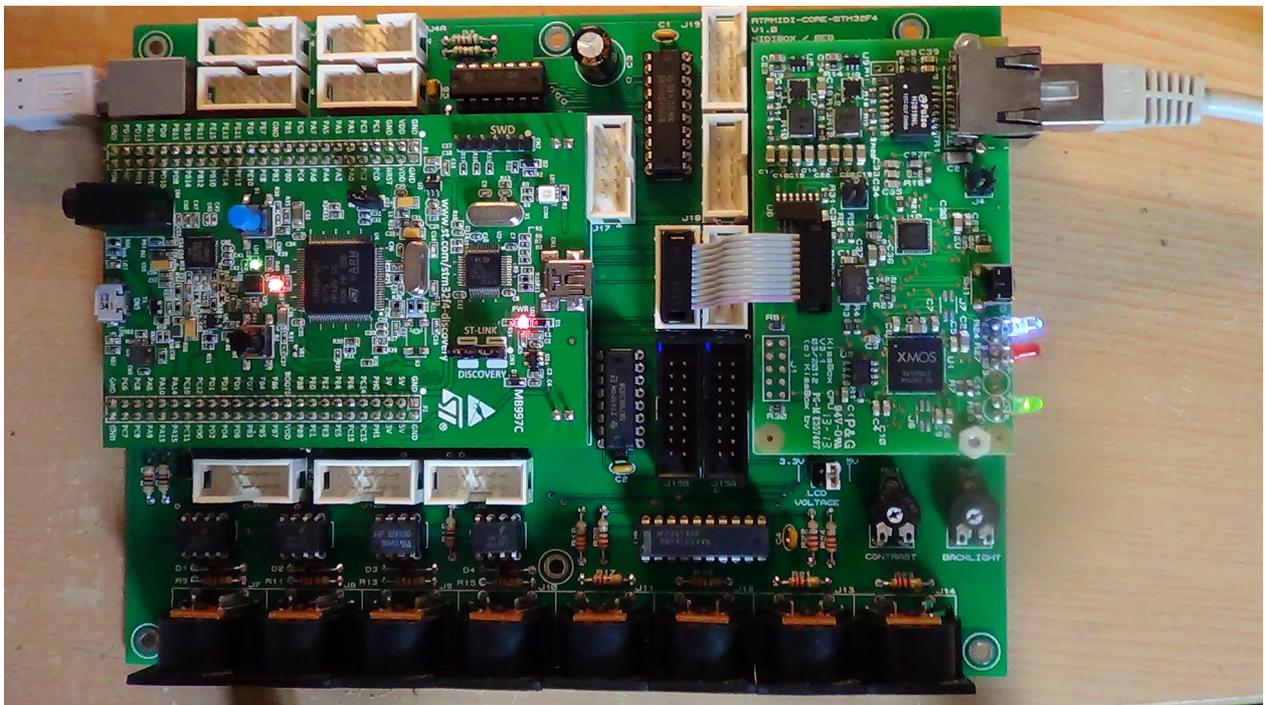


RTP-MIDI CORE STM32F4 KIT ASSEMBLY AND CONFIGURATION GUIDE



VERY IMPORTANT NOTICE: latest MIDIBox bootloader (V1.018 and greater) include specific support for RTP-MIDI and requires to be activated before use!

Please refer to bootloader configuration section in this document for details

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1 - Before you start

1.1 - Required tooling

- Soldering iron with 1 to 2mm tip
- Thin soldering wire (1mm)
- Small cutting pliers (for components leads)
- Pair of pliers to form components leads
- Screwdriver for 3mm screws (adapted to the model of screws you have chosen – See Bill of Material)
- Cleaning flux

1.2 - Bill of material

Reference	Qty	Value	Notes
R1,R2,R3,R4	4	Resistor 2k2 1/4W	
R25,R26,R27, R28,R29,R30, R31,R32,R33, R34,R35	15	Resistor 10k 1/4W	Possible to use values from 10k to 22k
R9,R11,R13,R15, R17,R18,R19, R20,R21,R22, R23,R24	12	Resistor 220R 1/4W	220R = 220 ohms
R5,R6,R7,R8, R10,R12,R14,R16	4	Resistor 1k 1/4W	
RV1,RV2	2	Trimmer resistor 10k, horizontal mount	Pin pitch = 5mm x 10mm Suggested model : Piher PT10V
C1,C2,C4,C5,C6	5	Capacitor 100nF 2.54mm pitch	Ceramic or film Applicable models: AVX Skycap, KEMET C315, KEMET C320, MULTICOMP MC, MULTICOMP MCRR, etc...
C3	1	Electrolytic capacitor 100uF/16V	
U1	1	STM32F4 DISCOVERY	
U2	1	74HC595	DIL16
U3	1	74HCT541	DIL20. Can be replaced by 74HC541
U4,U5,U6,U7	4	6N138	
U8	1	74HC125	DIL14
U9	1	74HCT244	DIL20. Can be replaced by 74HC244
Q1	1	BD135	
D1,D2,D3,D4	4	1N4148	
J1,J2,J4A,J4B, J5A,J5B,J10A, J10B,J16,J17, J18,J19	12	2x5 pins male header connector, pitch 2.54mm	Simplified model without plastic surrounding can be used (sold as 10 pins or breakable bar)

Reference	Qty	Value	Notes
J3	1	2x2 pins male header connector, pitch 2.54mm	
J4	1	2x1 pins male header connector, pitch 2.54mm	
J5	1	SD-CARD connector, model AVX/Kyocera 5638 family Ref : 14 5638 009 211 859+	Multiple models available in the serie, with different option (ejector, etc...). Recommended model is the simplest one (no ejector), since the PCB was not checked for other models
J6	1	USB-B connector for PCB	Recommended model: EDAC 690-004-621-023 CONEC 33UBBR-04SW11 or equivalent
J7,J8,J9,J10,J11, J12,J13,J14	8	5 pins 180° DIN connector for PCB mount	Recommended model: CUI SDS50J or equivalent
J15A,J15B	2	2x8 pins male header connector, pitch 2.54mm	Simplified model without plastic surrounding can be used (sold as 10 pins or breakable bar)
Accessory	2	DIL20 socket	
Accessory	1	DIL16 socket	
Accessory	1	DIL14 socket	
Accessory	2	2x25 pins female header	Recommended for the STM32F4DISCOVERY board Can be purchased as a 2x25 connector or breakable bar Recommended models: 3M 929974-01-36-RK GARRY MPE 094-2-050
Accessory	4	Dia. 3mm screw Length 15 to 20mm	Can be metal or nylon (see below for nuts and washers)
Accessory	10	3mm nuts	Metal nuts with insulating washers OR Nylon nuts
Accessory	7	3mm insulating washers	To use if metallic nuts are used Not needed if nylon nuts are used

2 - Mounting instructions

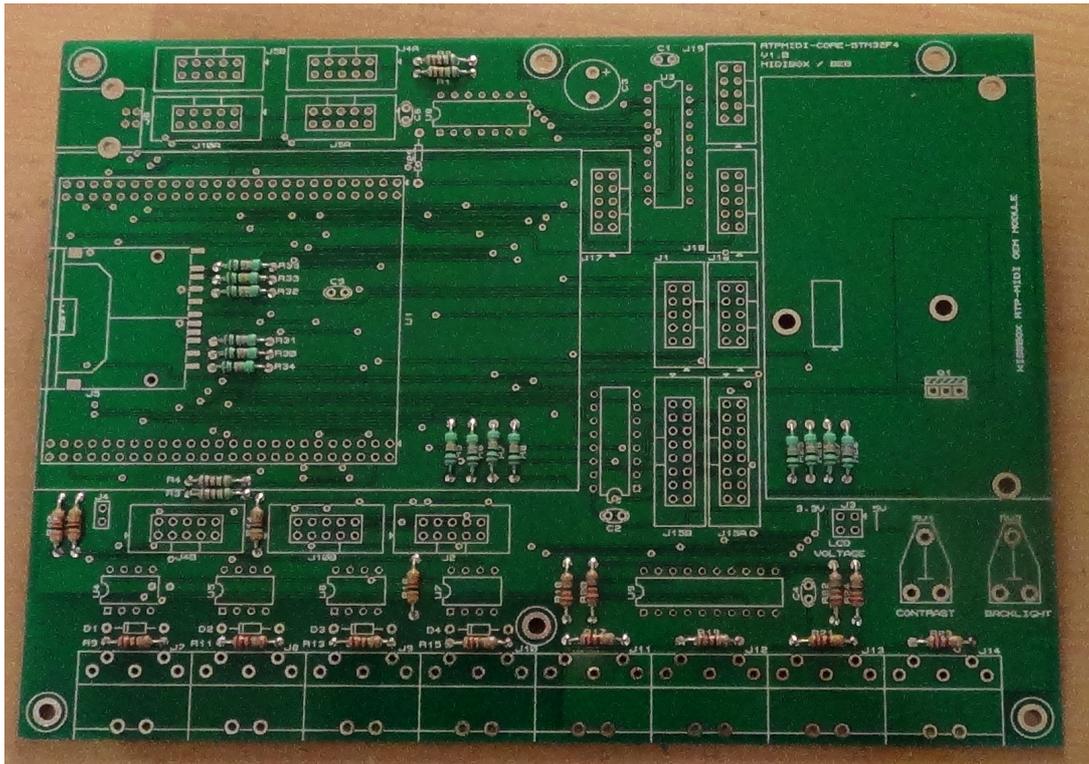
2.1 - Installation of components

Instructions given hereafter are just recommendations, based on our own knowledge of mounting PC boards, mainly intended for beginners. Based on your own tastes and knowledge, you can of course use a different mounting sequence.

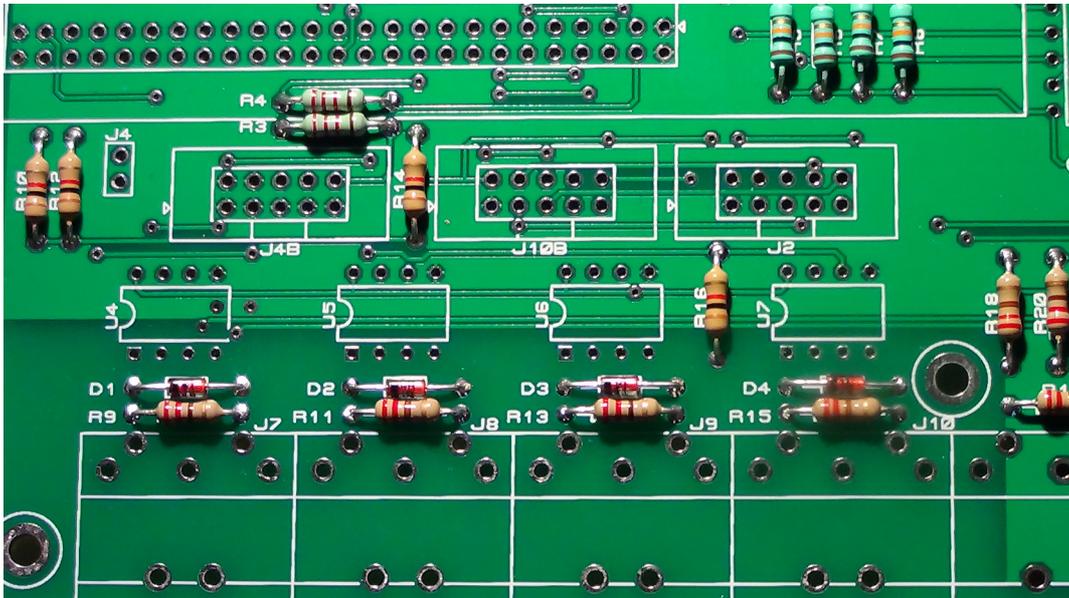
However, please note that some steps are mandatory. Please follow instructions given in these steps to avoid any problem like short-circuits or damaging components.

Before starting, we highly recommend you to check visually the PCB for any scratch or other visual defects.

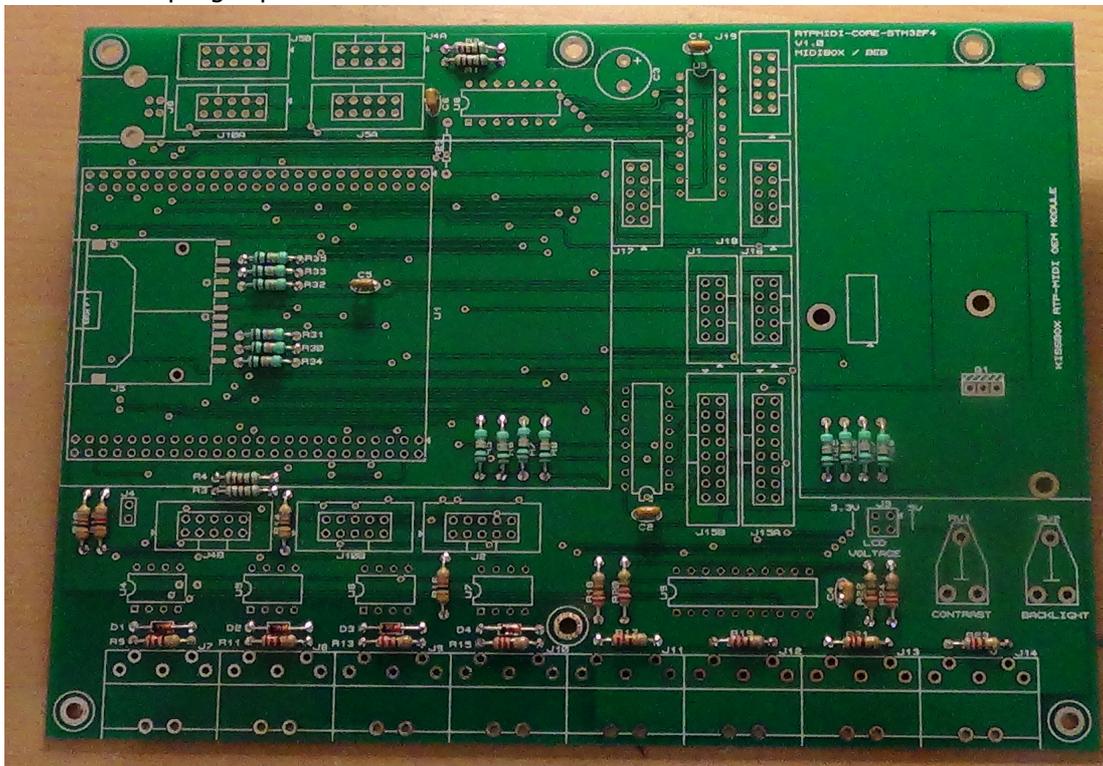
- Mount all the resistors



- Mount the four 1N4148 diodes. Verify orientation of the diodes (black ring on diode body shall match the white line on the PCB)



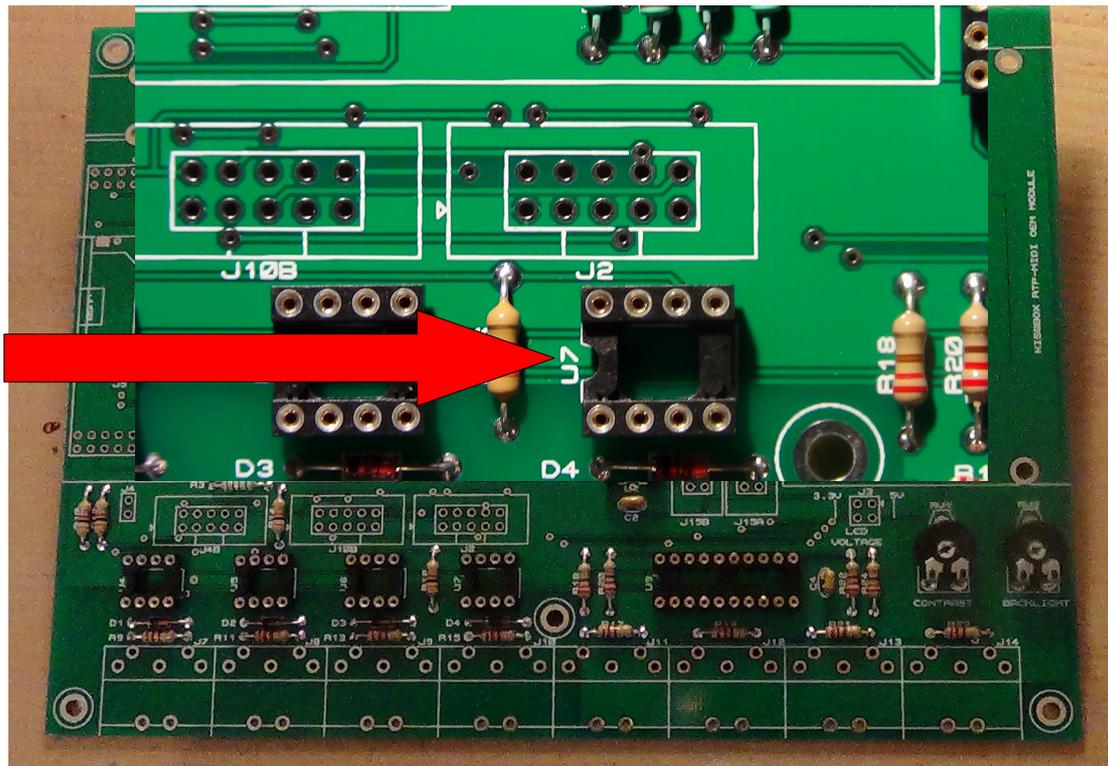
- Mount the decoupling capacitors



The PCB is designed for 2.54mm pitch capacitors. In case you have difficulties to get them, you can use 5.08mm pitch capacitor with bended pins. These capacitors are in fact 2.54mm models, but their pins are bent to give a 5.08mm pitch. Using pliers, remove the bending area to make the pins straight. Take care not to damage the capacitor body.



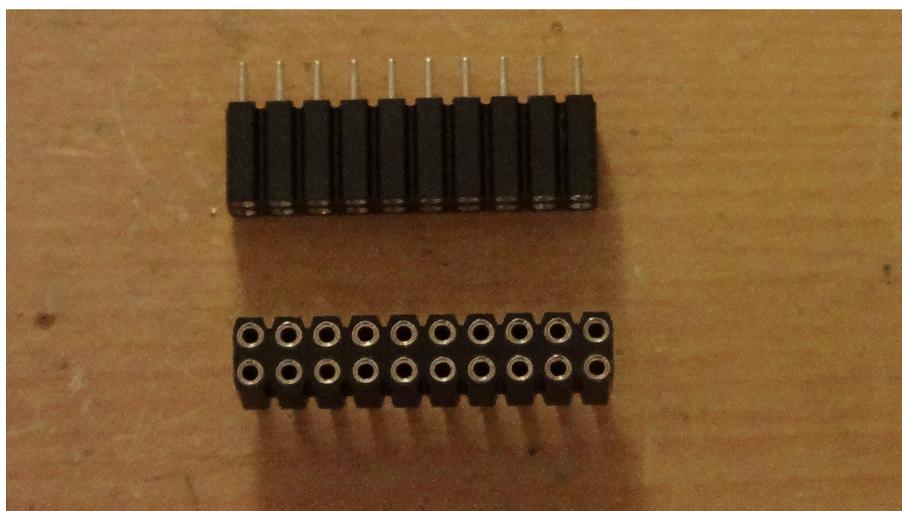
- Mount the sockets for the integrated circuits. Make sure to align the socket notch with the round mark on the PCB. The notch side for pin 1 is also identified on the PCB by a square pin.



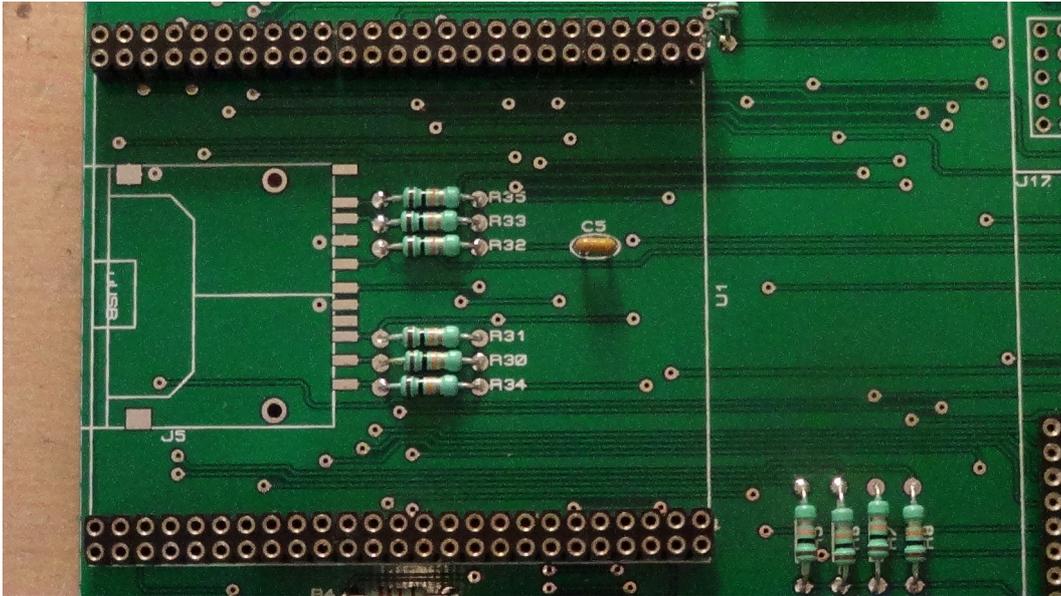
- Mount the two adjustable resistor RV1 and RV2

The STM32F4DISCOVERY module is fitted with two 2x25 male connectors which can be soldered directly on the PCB. However, we **DO NOT RECOMMEND AT ALL THIS WAY OF MOUNTING** the STM module, since it is almost impossible to remove it for any maintenance purpose. We highly recommend to use female connectors soldered on the motherboard PCB, on which the STM32F4DISCOVERY will be installed. This allow the STM32F4DISCOVERY module to be removed if necessary at any moment.

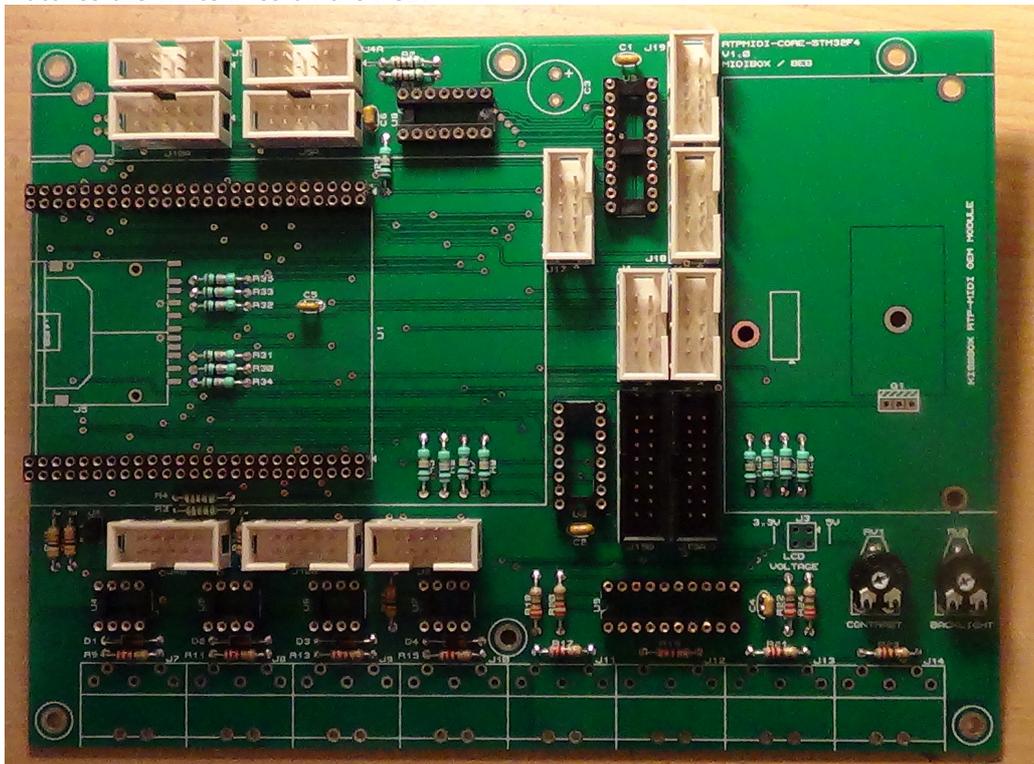
These connectors can be found either as a 2x25 pins version, or as a "breakable bar". In the last case, you have to cut the connector at the correct length. You can also use shorter models, and place multiple connector side by side to get the correct number of pins, like the model you see on the picture below



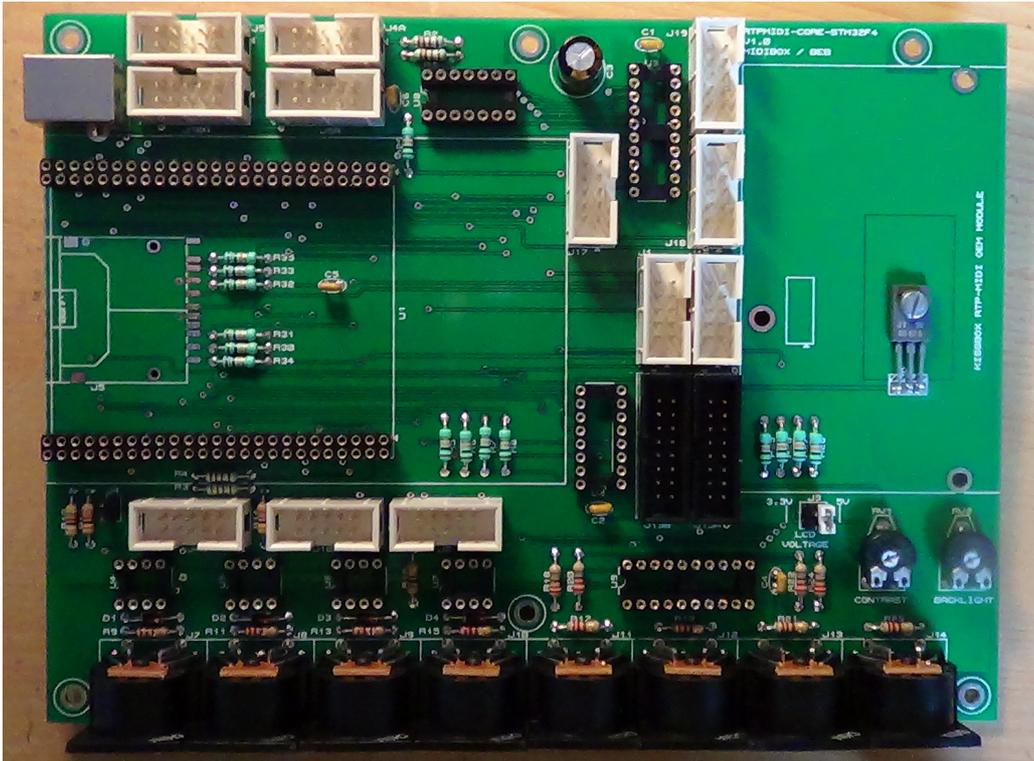
- Mount the two 2x25 pins connectors for the STM32F4DISCOVERY



- Mount the HE10 interface connectors (10 pins and 16 pins). Make sure that the notch in the connector body matches the white lines on the PCB.



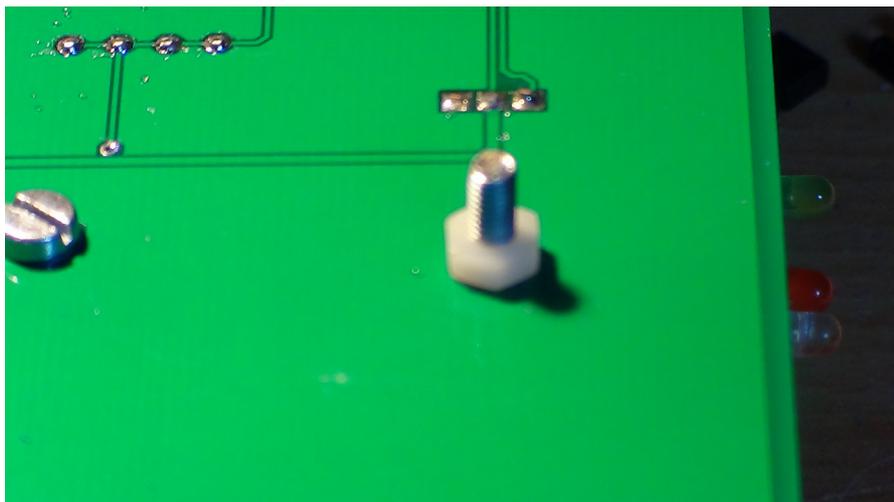
- Mount the J3 (2x2 pins), J4 (1x2 pins) and the USB connector



- Mount the transistor Q1. This transistor does not heat much (it depends on the consumption of the backlighting of the displays). Heatsink is then not required. In case you would need one for a big display, the PCB has a provision area around the transistor for a small aluminium heatsink

VERY IMPORTANT: if a screw is used to mount the transistor, it must be insulated from the back side of the PCB. If a metallic nut is used, you must place an insulating washer between the PCB and the nut (nylon or fiber washer).

If your display does not make Q1 dissipate a lot of heat, you can also use a nylon nut like on the following picture.



If you have decided to use the RTP-MIDI OEM option, you will to install the module on the main board. The RTP-MIDI OEM is fixed using three holes for 3mm screws.

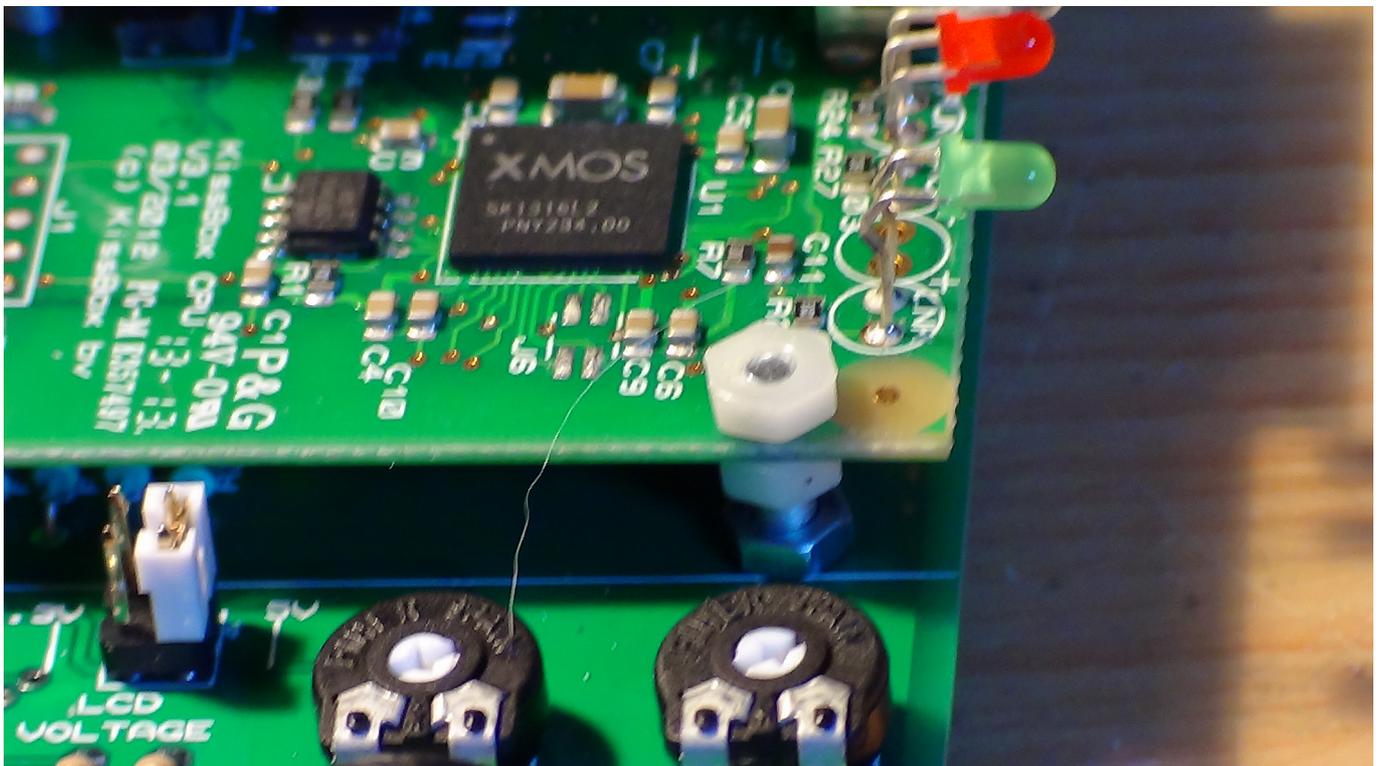
VERY IMPORTANT: IT IS MANDATORY TO USE INSULATED SCREWS FOR THE RTP-MIDI OEM BOARD!

You can use either:

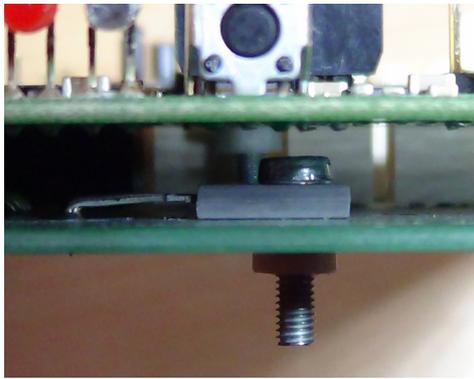
- Nylon screws with nylon nuts (preferred solution since the whole mechanical assembly is insulated)
- Metallic screws with nylon nuts
- Metallic screws with metallic nuts and insulating washers

NEVER INSTALL THE RTP-MIDI OEM BOARD WITH METALLIC NUTS DIRECTLY IN CONTACT WITH THE PRINTED CIRCUIT OF THE DAUGHTER BOARD. YOU MAY SERIOUSLY DAMAGE THE COPPER TRACK NEAR THE HOLES AND MAKE A DESTRUCTIVE SHORT-CIRCUIT!

The following picture shows you how to mount the RTP-MIDI OEM board with insulating nuts. **Note that the nylon nuts are installed on each side of the PCB!**



IMPORTANT : Make sure that the screw used to maintain the transistor Q1 located under the OEM module does not touch the underside of the RTP-MIDI OEM PCB.



2.2 - Final check before first power-up

The RTPMIDI-CORE-STM32F4 can be powered by two different ways:

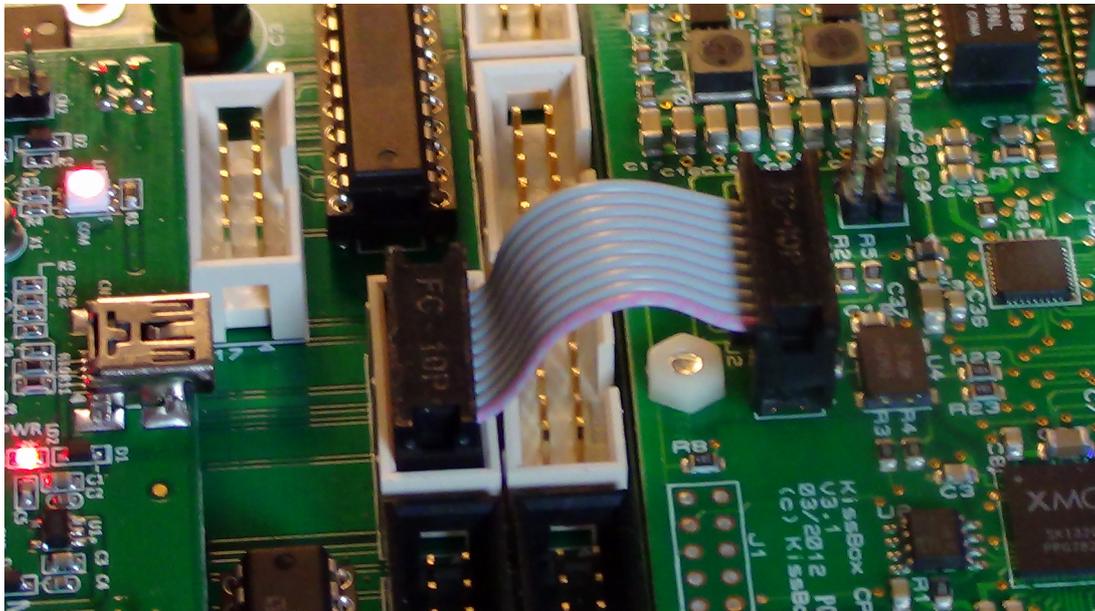
- USB charger connected to J6
- Power Over Ethernet option on the RTP-MIDI OEM module

Note that these two sources are exclusive and shall not be used at the same time!

VERY IMPORTANT: do not install the integrated circuits and the flat-cable between the motherboard and the RTP-MIDI OEM module before the final check is done and successful.

Follow carefully the next steps:

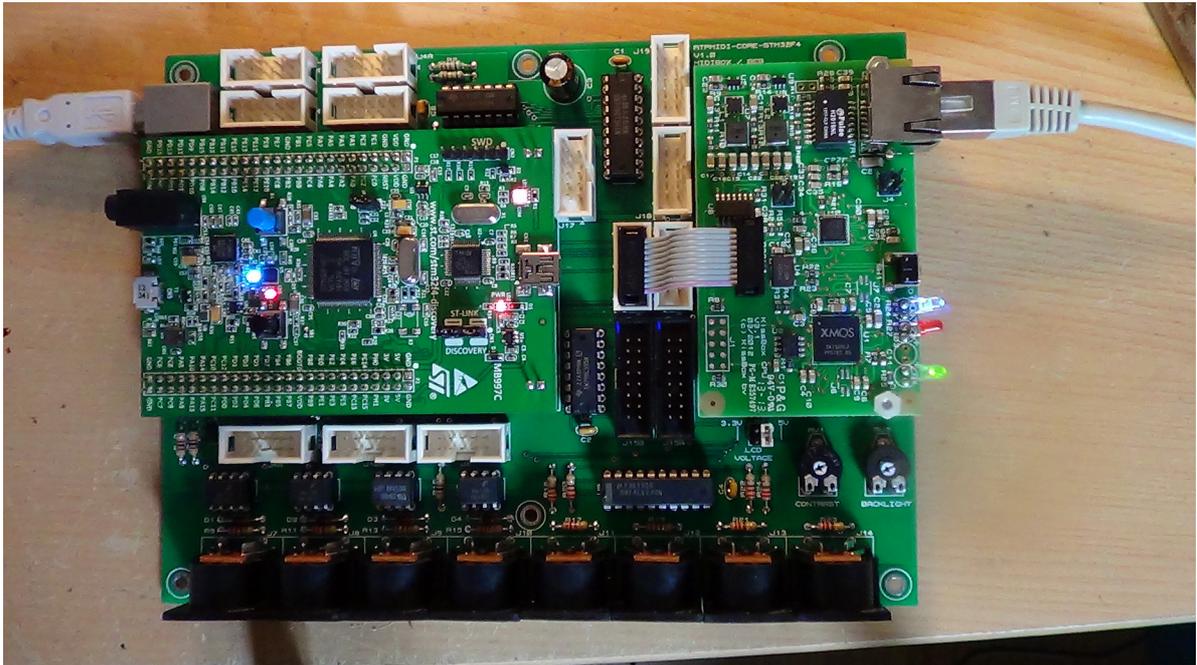
- Perform a careful visual inspection of all solder joints. Verify that there is not solder bridges between pins.
- Install the STM32F4DISCOVERY module on the female connectors. The module generates the 3V for the main board and is required for the next step.
- Connect a USB charger to J6 using a USB cable.
- Using a voltmeter, check the voltage between pin 10 and pin 20 of U9 socket. You must find a voltage between 4.8V and 5.1V. If you find a different voltage, immediately disconnect the power supply and check for any short-circuit.
- Check the voltage between pin 7 and pin 14 of U8 socket. You must find a voltage of between 2.95V and 3.1V. If you find a different voltage, immediately disconnect the power supply and check for any short-circuit.
- Check also that none of installed component is heating
- Disconnect power supply
- Install integrated circuits U2, U3, U4, U5, U6, U7, U8, U9 on their sockets. Make sure that the notch on the integrated circuit package matches the notch on the corresponding socket
- Install a flat-cable between J1 and the RTP-MIDI OEM module as on the following picture (if you use the RTP-MIDI OEM option)



- Connect the USB power supply back to J6 and verify that the whole system starts correctly. In particular, you must see the blue LED blinking slowly on the RTP-MIDI OEM module if it is installed.

CONGRATULATIONS!!!

Your RTP-MIDI CORE STM32F4 board is now ready for your next MIDIBox project!

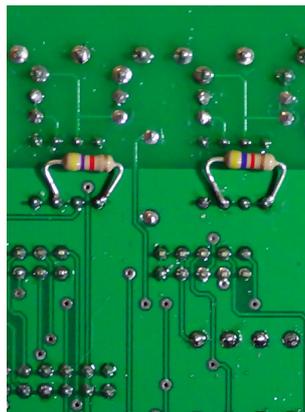


2.3 - Optional components

Some 6N138 exhibit a slower output slew-rate (switching speed) than others. In this case, the quality of MIDI signal is degraded and can lead to communication errors in some extreme cases.

This problem can be easily solved by soldering a 4k7 resistor (4700 ohms) between pins 5 and 7 of U4, U5, U6 and U7. The best way is to solder the components directly on solder side (see picture)

Note that you can do that by default if you want, even if you do not see any communication error. Adding these resistors has no impact on fast 6N138 optocouplers, and future updates of the PCB will include them.



3 - MIDIBOX Bootloader configuration

Starting from V1.018, the MIDIBOX bootloader include a specific support for the RTP-MIDI OEM board. The bootloader now includes a specific flag that need to be activated in order to enable communication with the RTP-MIDI OEM board.

The "spi_midi" flag must be enabled in the bootloader configuration to enable communication with the RTP-MIDI module.

The following command must be entered in the bootloader : `set spi_midi 1`

This allows KissBox OEM users to use upcoming MIOS32 application without any change.

4 - Configuration of RTP-MIDI OEM module

The RTP-MIDI OEM module is delivered with the OEM firmware for the MIDIBox pre-installed. When the board is installed, the blue LED blinks slowly to indicate that the RTP-MIDI firmware is operating properly.

If you see that the blue LED blinks faster (ten times per second), it signals that the RTP-MIDI firmware has been erased from the Flash (or has been corrupted). In that case, you just need to upload a new firmware in the module. Please report to Appendix B for instructions about re-installing/upgrading the RTP-MIDI firmware.

4.1 - Get the free tools from KissBox

The KissBox Editor is a free tool used to configure and maintain all KissBox products, including the RTP-MIDI ones. It is available both for Mac OS and Windows platforms. Note that both versions of the KissBox Editor provide the same commands and menus.

You can download the KissBox Editor on KissBox website ("downloads" page). You can also use the "RTP-MIDI Editor" tool, which is a simplified version of the KissBox Editor, dedicated to RTP-MIDI devices configuration.

We recommend you to always use the latest version available, to make sure that you are able to access the latest functionalities implemented in the KissBox products.

You can easily check the KissBox Editor version if needed, once it is installed. On Windows computers, click the "About" menu. On Mac computers, open "KissBox Editor" and click "About KissBox Editor". The version will be displayed in an information window like the following one:



4.2 - KissBox Editor installation

The KissBox Editor is delivered as a self installing package both for Windows and Mac OS platforms.

On Windows machines, execute the program named "setup.exe".

On Mac OS machines, open the dmg installation package

Just follow the instructions given by the installer once the installer is running.

Once installed, we recommend you to go in the "Network" menu in order to configure the maximum reply time allowed when you try to connect to a RTP-MIDI OEM. Go in the the "Reply TimeOut" menu and select the value you want to use.

By default, the value is set to 5 seconds when the KissBox Editor is installed. This high value allows to work with any network, including over WiFi and Internet.

You can safely use the value of 0.5 seconds if you will access to the RTP-MIDI OEM via cabled Ethernet networks only.

If you intend to use WiFi networks, you may need to use 1 second or 2 seconds reply timeout values.

4.3 - Configuration of IP address

The KissBox Editor uses the network to communicate with the KissBox modules, so you will need to know the address of the modules before configuring them. All KissBox modules use a default IP configuration when they leave the factory (address 192.168.0.253 / subnet 255.255.255.0).



If you have changed the IP address of your KissBox and you can not remember it, just keep the reset button depressed until the blue LED stops blinking. The factory default values are then restored into the KissBox configuration memory.

WARNING: this operation not only resets the IP address, but also all other parameters (including the RTP-MIDI ones). If you have performed a factory reset on a CM-MIDI, do not forget to reconfigure all of its parameters.

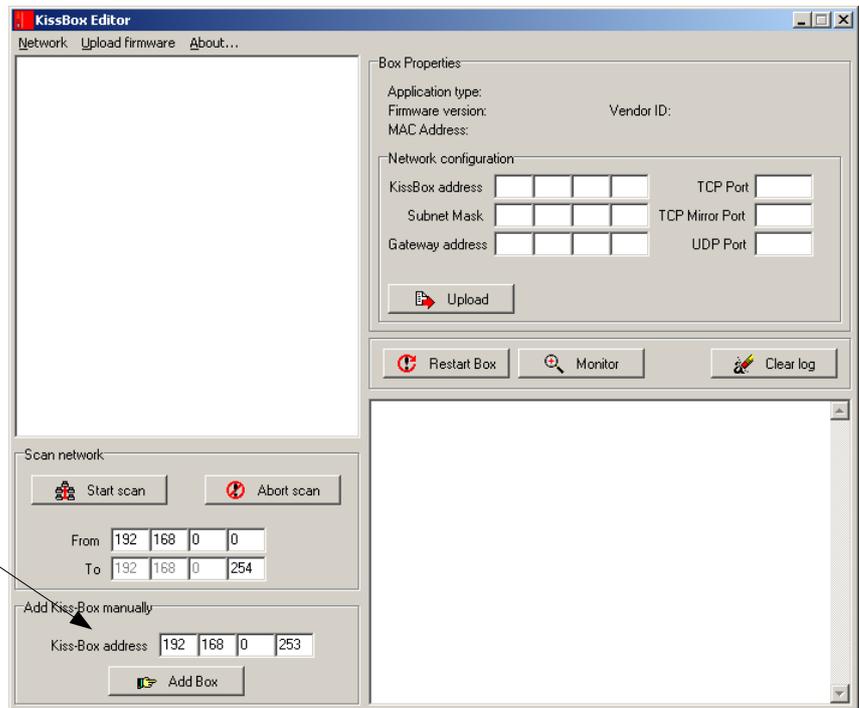
Connect the MIDIBox module and the computer running the KissBox Editor to the network. Make sure that your computer network is configured correctly (same subnet mask, same network number).

Start the KissBox Editor.

If you want to configure a new OEM module (or an OEM module which has been "factory reset"), your computer must use 255.255.255.0 subnet mask, and the network number shall be 192.168.0.xx (for example, the computer can use 192.168.0.10 address).

Enter the IP address of the OEM module in the four edition boxes located in the "Add Kiss-Box manually" panel and click "Add Box" button. The KissBox Editor will then try to connect to the OEM module. You will see "Trying to connect to Box xx.xx.xx.xx" in the log window (bottom right).

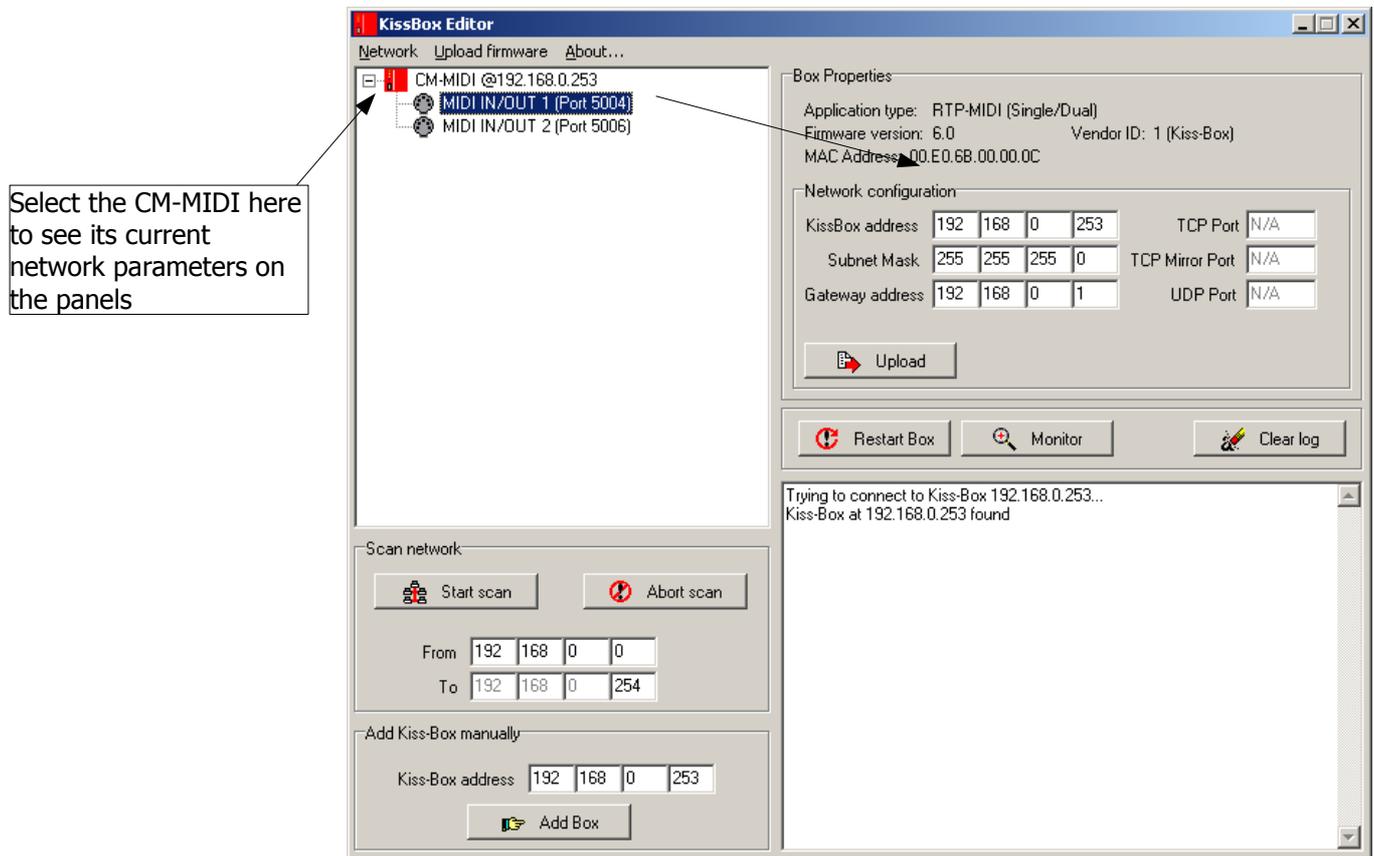
Enter the module IP address here and click "Add" button



After a few seconds, you will normally see "Found Kiss-Box xx.xx.xx.xx" indication appear in the log window (with the Box IP address of course, not "xx.xx.xx.xx").

If the Editor can not find the RTP-MIDI module (the indication "Found" does not appear in the log window), check your computer's network parameters and make sure they are adapted to the module you want to connect to. A wrong subnet mask or a wrong network number are the most common problems (for example, a computer using address 192.168.1.10 trying to access a KissBox configured with address 192.168.0.200). Another common source of problem is a too small value for Reply Timeout. This typically happens when you pass over a WiFi link to access the module. If you experience difficulties to reach your RTP-MIDI device over WiFi, just use a larger timeout (Menu "Network / Reply Timeout")

When the Editor has found the RTP-MIDI module, you will see it appear in the tree display on left side (you may need to click on the "Network" line if the tree display is collapsed). Each time you add a new device with a different IP address, it will be added in the tree display.



Click on the OEM module you want to work with in the tree display. The current network parameters used by the module are also displayed on the right side of the window.

You can then modify all the network parameters of the module (address, subnet mask, gateway address). Note that the TCP port, TCP mirror port and UDP port are not used by the RTP-MIDI application.

If you change any network parameter of the RTP-MIDI OEM module, do not forget to click on "Upload" button to store the new parameters in the module (do that **only when all parameters are defined in the Editor!**). Note that this will reset the module, so the new IP parameters are activated immediately after uploading them.

So, if you have changed the IP parameters of a module, you will need to "add" it in the Editor (by using the "Add Box" button ou the scan network fonctionnality), since the Editor needs to connect to the new IP address used by the module before being able to do any further configuration.

4.4 - DHCP/Zeroconf

DHCP/Zeroconf is supported by all KissBox products.

To activate the DHCP/Zeroconf mode, just enter 0.0.0.0 in the KissBox Address and click "Upload" to restart the KissBox.

If a DHCP server is found on the network, the module will use it to get an IP address. If no DHCP server is found, the module will automatically switch to ZeroConf mode and will use a 169.254.xx.xx IP address.

Note that it is not possible to know which address the OEM module will receive from the DHCP server, apart if you have specifically configured the server for it. You will then need to use the Scan Network function to locate the KissBox module in the network.

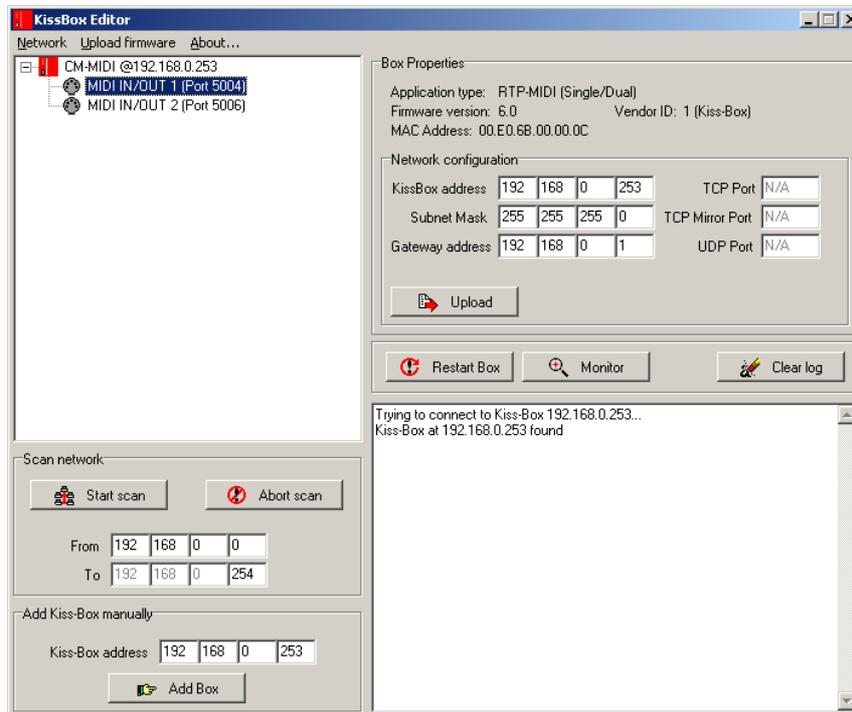
Do not forget that your DHCP server may be configured to provide addresses in a different network. In that case, you will need to adapt the computer's configuration once the KissBox is restarted otherwise the KissBox Editor will not be able to reach the KissBox module anymore.

If you decide to use the DHCP/Zeroconf, you will need to use the "Scan network" mode to locate your module. Just enter the first address of your DHCP server range in the "From" cells, then enter the maximum address in the "To" cells. Note that the first three bytes of the IP address are automatically copied from the "From" line (you can not enter them manually).

We recommend you to keep the scan range as small as possible, since it can take a lot of time to find the module automatically on the network using this method when the timeout value is large.

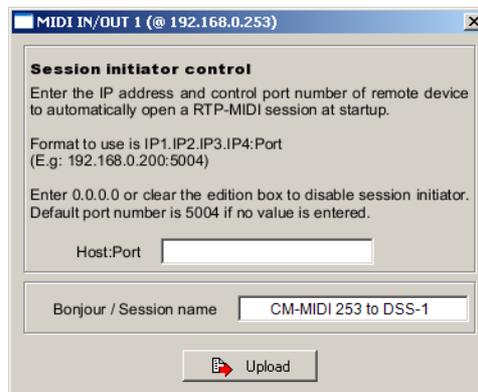
4.5 - RTP-MIDI configuration

Click on the "+" (on Windows machines) or the triangle (on Mac machines) in the network tree of the KissBox Editor. You will see two lines appearing just under the "CM-MIDI @ xx.xx.xx.xx" line.



The two lines you see now represents the two RTP-MIDI endpoints available in the CM-MIDI. The configuration process is exactly the same for both of them.

Double click on the RTP-MIDI endpoint you want to configure. The following window will then open:



The "Bonjour / Session name" is used to identify the KissBox in Bonjour service. You can use any name (limited to 24 characters length). For example, you can use a text to remember what is the application of the current RTP-MIDI KissBox (the name of the synthesizer being driven by the CM-MIDI in the previous screenshot).

Click then on "Upload" button to load the configuration. The CM-MIDI will then restart automatically with the selected RTP-MIDI parameters.

4.5.1 - Session initiator functionality

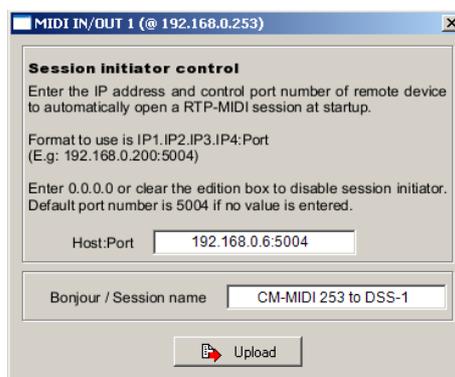
The two RTP-MIDI endpoints in the CM-MIDI can become session initiators. These session initiators are in charge of opening automatically a RTP-MIDI session with a remote device when the CM-MIDI starts. This function is extremely useful when used with devices being only session listeners like the older KissBox models (V1/V2 CPU models) or devices like the iPad/iPhone.

When the Host:Port edition box of the configuration window is empty, the session initiator functionality is deactivated. The corresponding endpoint is then acting as a session listener only, and it will wait to be invited by a session initiator (from another KissBox product or from the computer driver, as explained in the next section)

If you want to activate the Session Initiator functionality for a given endpoint, enter the IP address and the control port number of the RTP-MIDI device you want to invite automatically.

These two parameters shall be entered in the form XX.XX.XX.XX:PPPP, where XX represents the IP address and PPPP the control port number.

For example, to invite a RTP-MIDI device located at 192.168.0.6 using control port 5004, enter the following data in Host:Port : 192.168.0.6:5004, as you can see in the following screenshot.



If you do not enter a port number, the KissBox Editor will use 5004 by default.

Note that you can use the Session Initiator functionality on one endpoint, and keep the second one as a Session Listener only. You can also activate the Session Initiator on the two endpoints.

4.5.2 - Monitoring the MIDI streams

The MIDI streams between the OEM module and the main processor can be monitored remotely. This functionality is extremely useful to detect if a MIDI communication exists on these connectors.

Simply select the RTP-MIDI endpoint you want to monitor in the navigator on the left pane of the KissBox Editor. Click then on the "Monitor" button. The following window will then appear.



Each LED on this window will light when MIDI messages are transmitted/received by the OEM module

Note that it is not possible to modify the operating parameters of a OEM module when it is monitored. You must first close the monitoring window. If you try to edit the operating parameters while the monitoring function is active, the KissBox Editor will then display an error message.

5 - Using RTP-MIDI module with Windows or Mac computers

5.1 - RTP-MIDI driver installation on Mac OS X computers

Installing the RTP-MIDI driver on Mac computer is extremely easy... since there is no driver to install!

All OS X computers support RTP-MIDI natively since version 10.4 (older versions of OS X do not support RTP-MIDI)

5.2 - rtpMIDI driver installation for Windows computers

The rtpMIDI driver is needed on Windows platform if you want to use the CM-MIDI as a standard MIDI interfaces in your MIDI applications. This driver is not needed for applications or plugins like the VSTizer series which are implementing RTP-MIDI communication stack in themselves.

The driver works for all versions of Windows, from XP to Win8, both for 32 bits and 64 bits versions. It can be found on KissBox download page and on Tobias Erichsen's webpage <http://www.tobias-erichsen.de/software/rtpmidi.html>

Note that the KissBox version of the driver is free, even for commercial applications, but it is restricted to the use with KissBox RTP-MIDI products. The driver on Tobias Erichsen webpage can be used to connect computers together, but you have to contact Tobias for any commercial applications in that case (the driver is free however).

The driver installation is very simple and direct. Just start the installer and follow the instructions.

If you get a warning in XP about the installation of a non-signed driver, you can safely ignore it. Just click on "Continue" button if the window appears.

We recommend you also to install the Bonjour client on your PC (available from Apple website), in order to get the "Bonjour Plug&Play" support on Windows.

The Bonjour package is available at this address: http://support.apple.com/kb/DL999?viewlocale=en_US

If you have any problem with the rtpMIDI driver installation, we recommend you to take a look to the great tutorial made by Tobias Erichsen on his webpage <http://www.tobias-erichsen.de/software/rtpmidi/rtpmidi-tutorial.html>

Once everything is configured, you can start to use your RTP-MIDI setup now. Note that the network configuration is normally done one time. The RTP-MIDI configuration can be changed whenever you want, since it allows dynamic management of your devices. You can then change the MIDI streams between devices without needing to disconnect/reconnect any cable, which is extremely powerful (this is called "Dynamic Patch Bay")

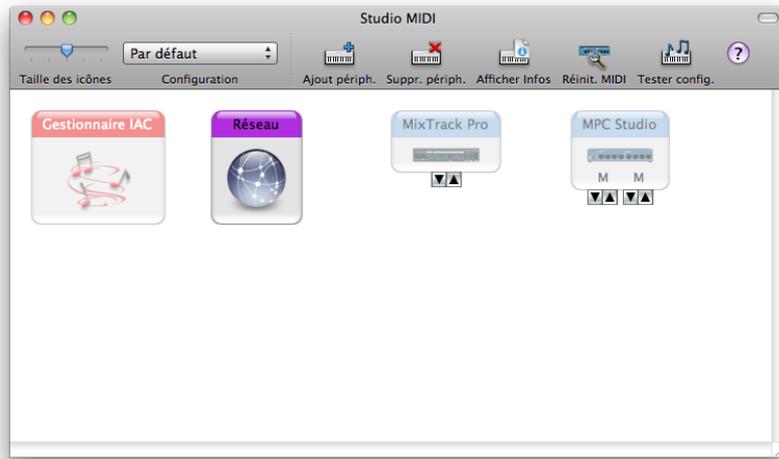
5.3 - Step 1 : open the RTP-MIDI control panel

The RTP-MIDI session configuration procedure is exactly the same on Windows and Mac OS. The only difference comes from the way to access the driver's configuration panel.

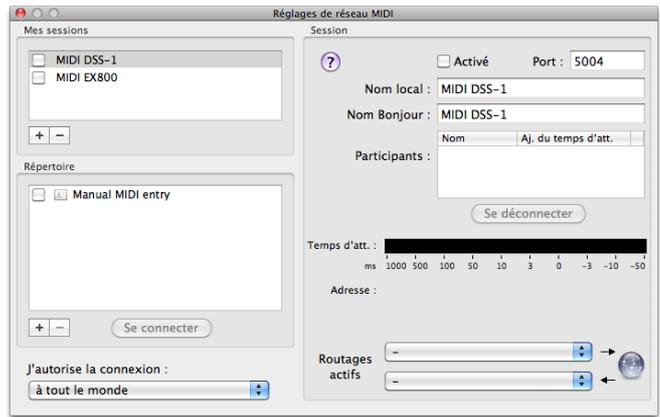
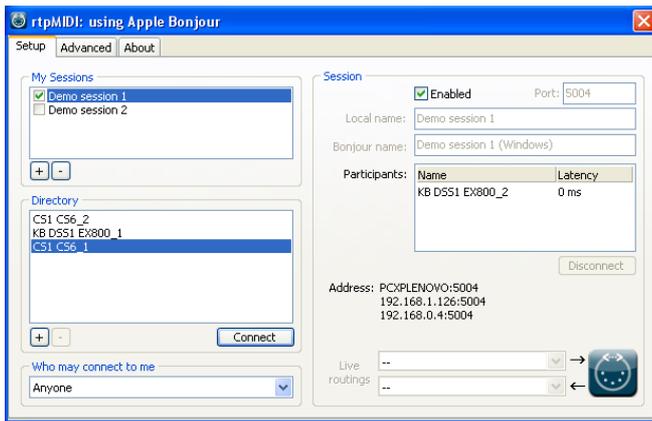
On Windows, you have to double-click on the icon on your desktop. You can also use the entry in the Start menu.



On Mac OS, you have to go in Applications/Utilities/Audio and MIDI Configuration. Click on "Window" menu and choose "Show MIDI window".

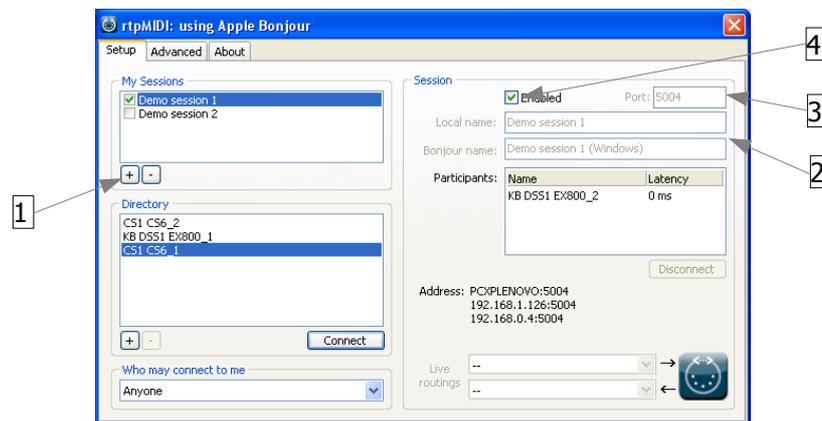


Double-click on "Network" icon to open the driver configuration panel. As you can see, the configuration panel on Mac OS is very similar to the one on Windows.



5.4 - Step 2: create a session

A session is simply how the RTP-MIDI ports will appear in your MIDI application (in other terms, their names). Each time you create a session, you add a new pair of MIDI ports (one MIDI IN and one MIDI OUT) in your system, which becomes available to all your MIDI applications running in your computer.



1. Click on the "+" sign under the "My sessions" list. A new session with your computer name by default is added in the list
2. Enter the name you want for the session in "Local name". By default, the Bonjour name will be the same as the local name, but you can use two different names if you want. On the screenshot, you can see that we named this session "Demo session 1"
3. Enter a UDP port number for the session (see below). The control panel assigns automatically a UDP port number to any new session, but **each session must use a different UDP port number (two sessions can not use the same port numbers). Moreover, a single RTP-MIDI session uses two consecutive ports.** So you will need to count ports 2 by 2 for each new session (for example, session 1 will use ports 5004 and 5005, session 2 will use 5006 and 5007, etc...)
4. Now click on Enable button (or click in the checkbox in the list, just beside the session name we have created). You will notice that the edition boxes will become grayed. You need to uncheck "Enabled" if you want to change anything in the session parameters.
5. CONGRATULATIONS! You have created your first RTP-MIDI session (and your computer now has a new MIDI Interface available). If you open any MIDI application on your computer, you will notice that your session name appears as a MIDI interface.

Who said that RTP-MIDI was difficult to use?



You have seen that we speak here of "UDP ports". UDP is simply a protocol used by RTP-MIDI (UDP in fact "transports" the data across the network). The ports are nothing else than a sub-

entity in the IP communication stack, which allows to create different receivers and transmitters within the same IP address.

If we go back to the city model we use at the beginning of this guide, you can say that UDP ports are like apartment numbers within a given building (the building address being given by the IP address).

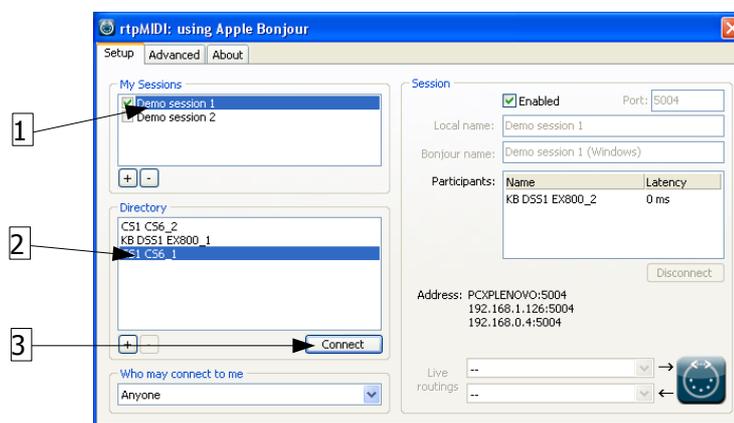
There are 65536 port numbers available in each computer, 5004 is the standard one recommended for a first RTP session.

5.5 - Step 3 : connecting to remote RTP-MIDI devices with Bonjour

When you have opened the RTP-MIDI control panel for the first time, you may have seen than names appeared automatically in the Directory list. Normally, you will see here the names you have given to the sessions in the CM-MIDI.

The magic behind this is called "Bonjour". This protocol has been developed by Apple to simplify network configuration of devices like printers. When a RTP-MIDI device supporting Bonjour is connected to a network, it sends automatically a message to all other devices to say "Hello (Bonjour means "Hello" in French), I am a RTP-MIDI device, I am located at this IP address, and I am using these UDP ports"

These devices will then appear automatically in the list of available devices for your sessions. You do not have to tell your computer what is their configuration, Bonjour did it for you. You can see in the following screenshot that three remote RTP-MIDI devices have been detected automatically.



An important thing to understand is that devices being listed in the directory are **not connected** to your local session. When they are visible, it means that they are **available** for a session.

To open a session between your computer and remote RTP-MIDI device:

1. Select the local session you want to use on your computer (this will be the Session Initiator). In the previous screenshot, you see that we selected Demo Session 1
2. Click on the remote device you want to connect to (this will be the Session Invitee) in the Directory list
3. Click on the "Connect" button under the Directory list

You will notice then that the remote device disappears from the Directory list and its name appear now in the Participants list.

If everything goes well, you will see a value appearing under the Latency header in the Participants list. In that case, it means that the remote device accepted the invitation, and you can now exchange MIDI data over the network between the computer and the device.

If you see "???" symbol in place of a latency value, it means that the remote device does not answer to the invitation or does not accept it. In such a case, you will probably get an error message after a few seconds.

This situation is very seldom with devices using Bonjour, since all network parameters are transmitted automatically. This indicates that the remote device does not answer correctly to invitation. This can happen in the following cases:

- the remote device been disconnected from the network without being switched off properly (and it

did not send the specific message used by Bonjour to indicate that it leaves the network)

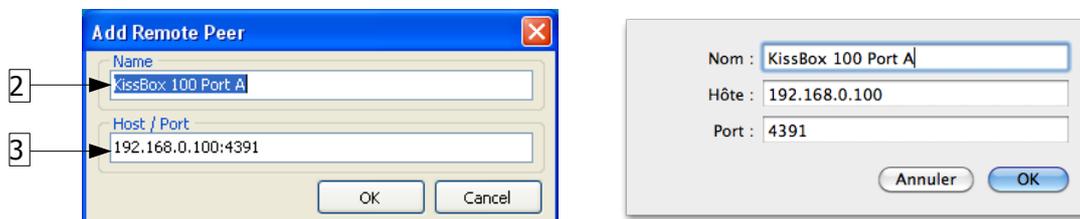
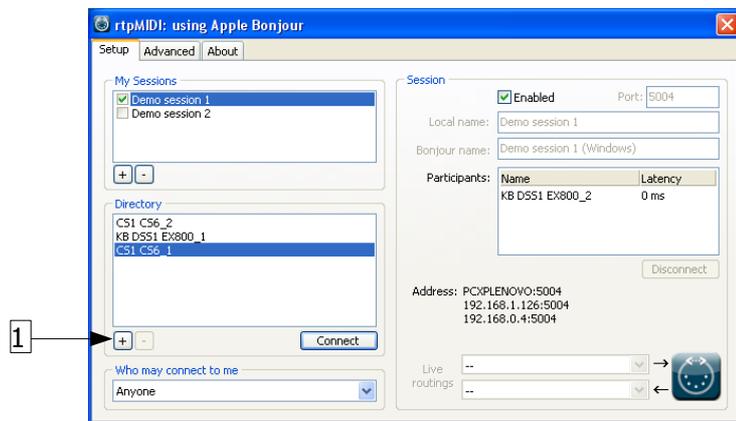
- the remote device is crashed and need to be rebooted
- there are too many sessions already being opened with the remote device and the device does not have enough resources to respond (however, RTP-MIDI devices should answer with a specific message to refuse the invitation in that case)

5.6 - And if I want to use the module without Bonjour?

Bonjour protocol is not a part of RTP-MIDI and is purely optional. It is a native part of Mac OS-X, but if you use a PC with rtpMIDI driver, you will need to install Bonjour in Windows.

You can then find some PC on which Bonjour is not installed/running. You may also find some situations (typically in very complex setups) where Bonjour service is not allowed or is blocked by network routers.

You can perfectly use the CM-MIID with your computer in such cases, but you will need to add them manually (since Bonjour will not transmit their network parameters automatically)

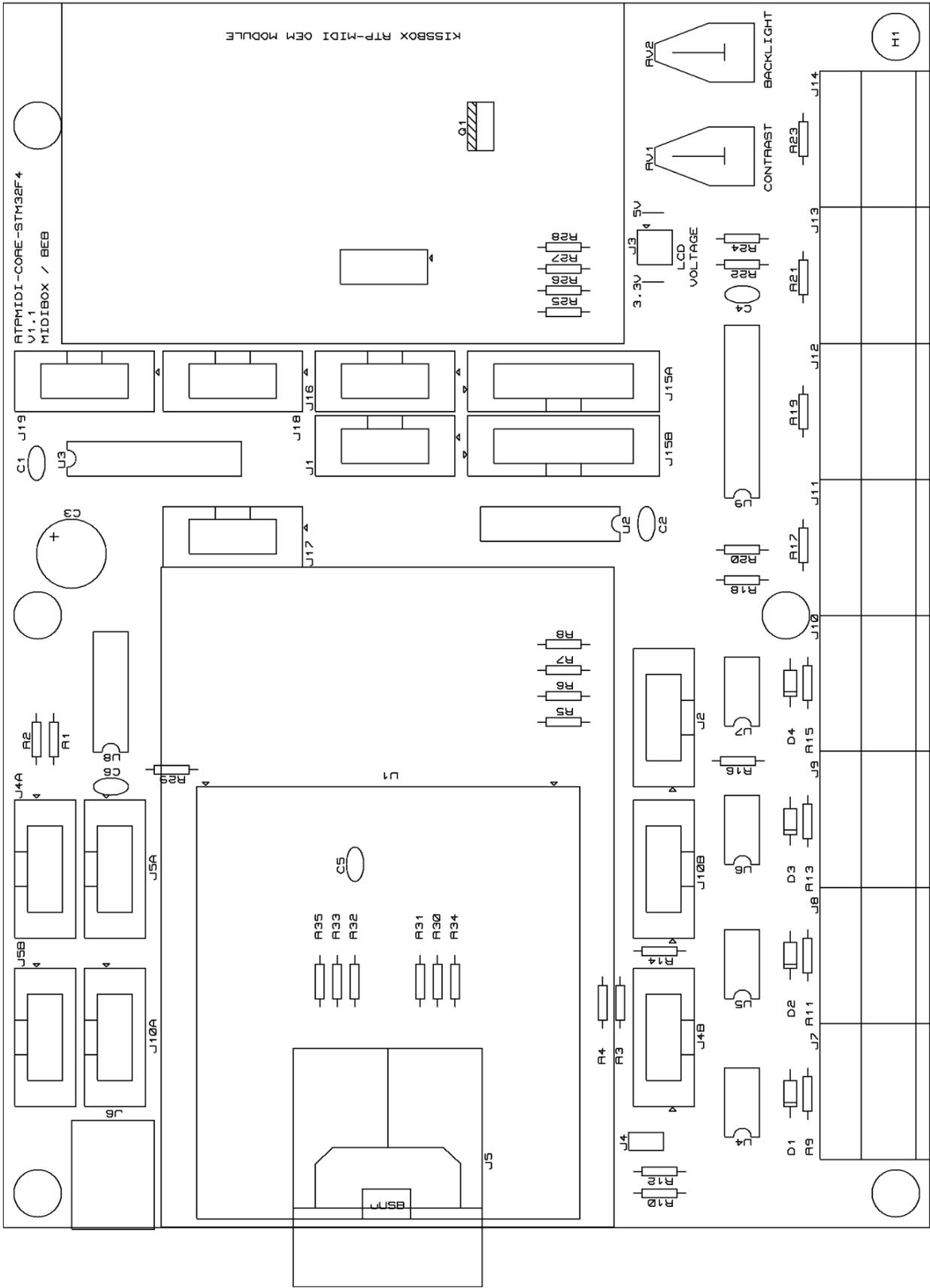


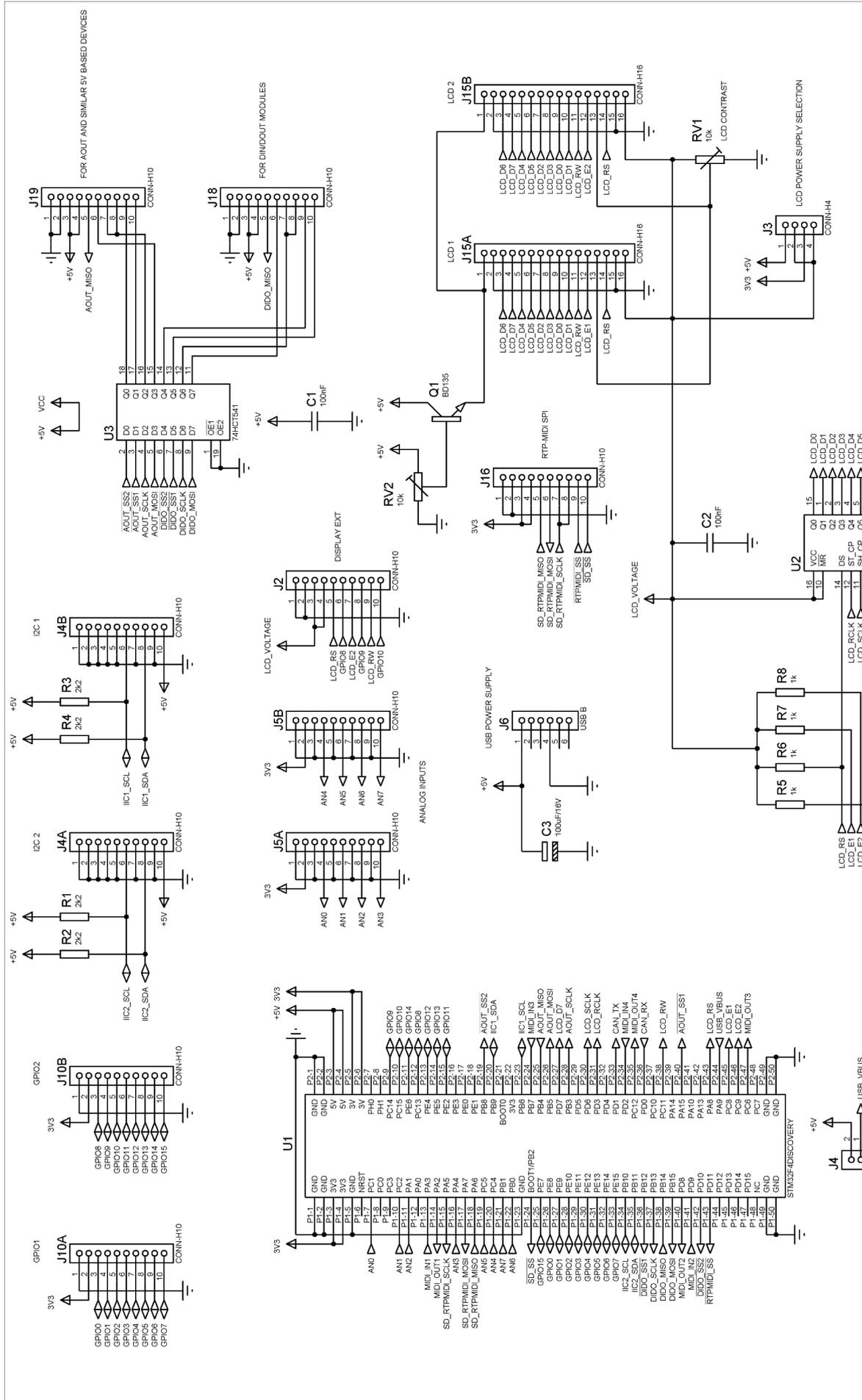
NEW SCREENSHOTS WITH CORRECT PORT NUMBERS FOR CM-MIDI!!!!

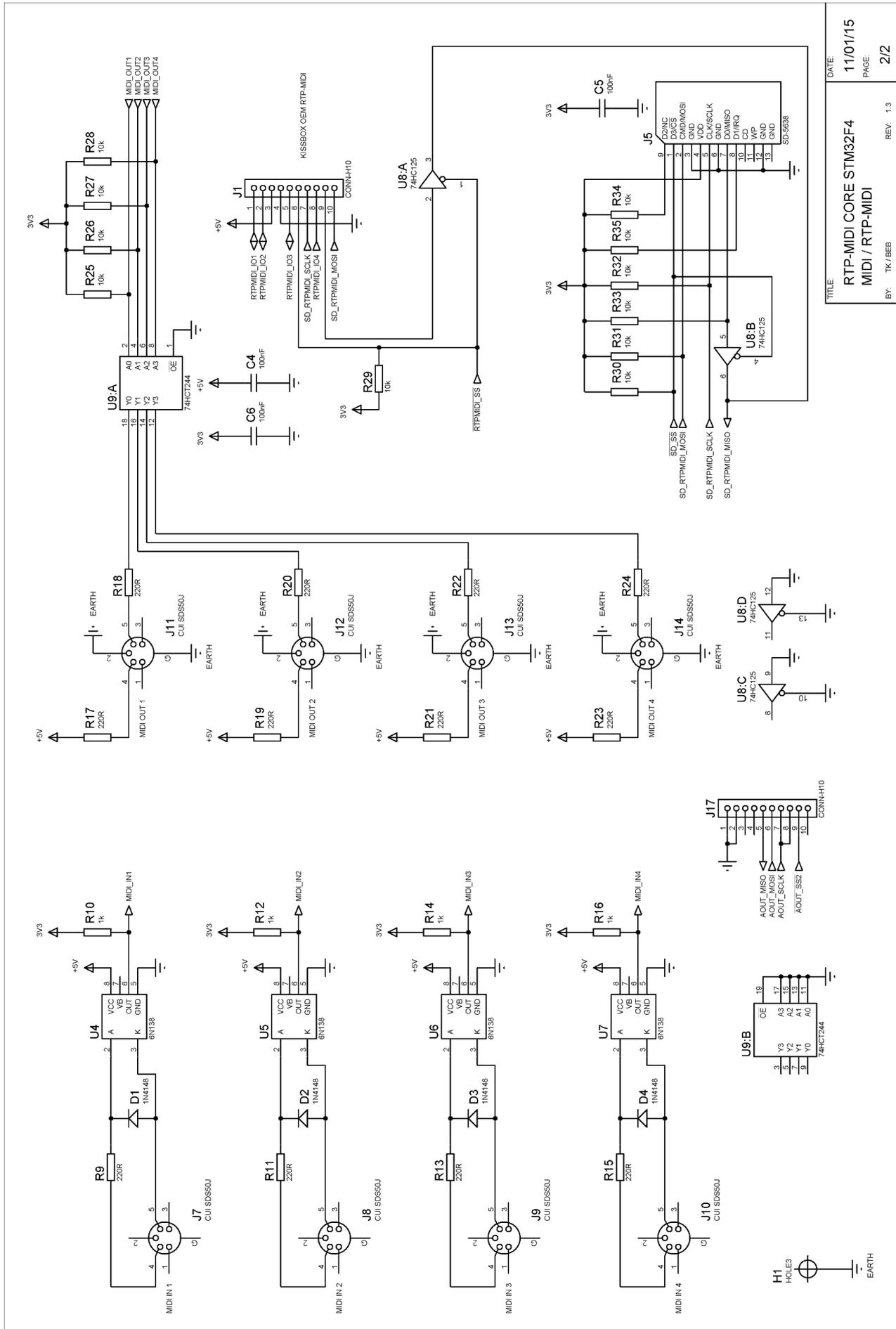
Here are the steps to follow to add manually a device to your directory list:

1. Click on "+" button under the Directory list to open the "Add remote peer" window
2. In the "Add remote peer" pop-up, enter a name for the remote device
3. If you use rtpMIDI driver on Windows, enter the IP address and the RTP-MIDI control port number in the Host/Port (see below for details on how to get the control port number for KissBox devices), using the following format: xx.xx.xx.xx:yyyy, where xx.xx.xx.xx is the IP address and yyyy is the Control Port number. On the screenshot, you see that we want to connect to device located at 192.168.0.100 using port 4391.
4. If you use the Mac OS driver, you have to enter the IP address and the control port on two separate line
5. Once the device is entered in the Directory list, follow instructions from previous paragraph to open a session with this device.

6 - APPENDIX A : SCHEMATIC DIAGRAM







7 - APPENDIX B : Upgrading firmware

KissBox is continuously enhancing the firmware running in their products, especially to add new functionalities. You can easily upgrade the firmware running on the OEM module to keep your interface “up-to-date”, using the KissBox Editor.

VERY IMPORTANT: Never try to load into the RTP-MIDI OEM a firmware written for another KissBox product model (DMX1TR, TC2TR, MIDI2TR, etc...), including other MIDI products! The application interface for these products differs from this kit at hardware level, so loading a wrong firmware can make the OEM board totally unresponsive, and it can also seriously damage or destroy the electronic board.

Firmware files for the RTP-MIDI OEM are available on KissBox website. We recommend you to check regularly for updates on the website, since we always enhance the functionalities of our products. Latest firmware versions also correct bugs found in previous versions.

A computer running the KissBox Editor is also required to upgrade the CM-MIDI firmware. The CM-MIDI takes a default address of 192.168.0.253 (subnet mask 255.255.255.0) on the network when it goes into firmware upgrade mode, so make sure that the network card of your computer is correctly configured. **Before starting, make sure that there is no other device on your network using this IP address.**

- Disconnect the power supply for now. Wait until the KissBox Editor Wizard tells you to connect it back
- Connect the OEM board to the network (still with power supply not connected!)
- Start the KissBox Editor
- Click on “Upload firmware” menu (Windows version) or “Tools / Firmware uploader” (Mac version)

The Upload Wizard window will then open.



Simply follow the instructions given in the Wizard to upload a new firmware in the RTP-MIDI module:

- Push **and hold** the small pushbutton located on the RTP-MIDI board
- While the push-button is being hold, connect the power supply to the main board
- Wait until the blue LED blinks fast. This indicates that the board is now in bootloader mode and ready for firmware upgrade. You can now release the push-button
- Click “Next” button on the Upload Wizard. The instructions given in the various pages are the same as given here before
- When the file browsing window opens, locate the firmware file that you have previously downloaded from the website (it's a “.kb3” file)
- Click on “OK” and waits while the firmware is being uploaded
- When the file transfer is completed, the RTP-MIDI OEM will restart with the new firmware. You can now

close the KissBox Editor if you do not need to perform further configuration.

8 - Document revisions

Date	Author	Version	Description
20/07/2014	B.Bouchez	1.0	First document release
13/08/2014	B.Bouchez	1.1	Error corrected in BOM : optocouplers must be 6N138. 6N136 are not allowed Exact reference of SD card connector added
16/08/2014	B.Bouchez	1.2	R5 to R8 replaced by 1k in BOM and schematics. Removed BD675 as option (voltage drop is too high, insufficient backlight range)
11/01/2015	B.Bouchez	1.3	Updated document with new option from T.Klose in bootloader V1.018 Updated schematics with correct values (V1.3) Added comment about optional components to enhance 6N138 speed.
10/05/2016	B.Bouchez	1.4	Correction in section 2.2 : the 3.3V must be measured on U8, not U2.