MT64 Standard Installation procedure.

This document describes how to install the MT64 Standard on a Windows based computer (XP to WIN10, 32 bits or 64 bits).

Table of Content:

General Information:

Overview:
MT64 Standard is a 32 bits application for Windows PC Compatible Computer (XP to WIN10) designed with a touch screen compatible graphic user interface dedicated to live and operational situations.

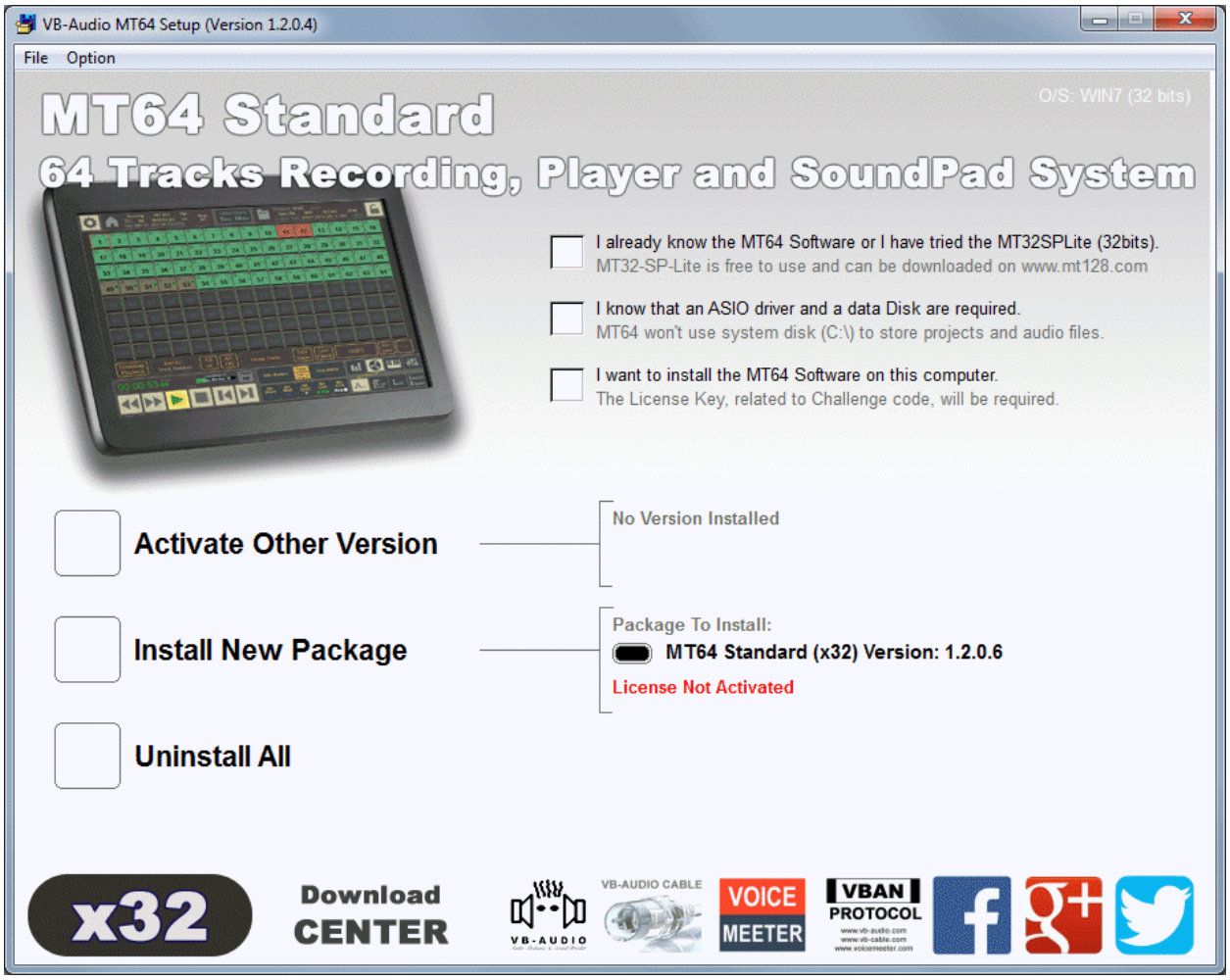
Requirements:
- MT64 Installer requires a license code for installation (if you do not have a license code, you will be prompted to purchase one).
- MT64 software application will be installed on the C: Driver System Disk in the « C:\MT64 » directory.
- MT64 does not store projects or record audio files on System Disk. You may use a secondary (physical or logical) or external or USB thumb drive to store the project and recorded audio files.
- MT64 must be installed by the MT64Standard_Setup.exe program file.
- MT64 must run at Administrator level.

Hardware Minimal Configuration:
- Windows Based PC (WINXP 32bits / WIN10 64bits).
- CPU: Intel Celeron Duo Core (1.8Ghz min).
- 2 GB RAM 800Mhz (4GB preferred).
- One or more additional hard drive.
- VIDEO: 1024 x 768 min (4:3 and Touch Screen Recommended).
- Second Display can be used for SoundPad Module (1024 x 768 min, Full HD 1920 x 1080 recommended).
- ASIO Driver to manage Digital Audio Interface.

Before purchase:
To test your configuration, operating system, ASIO board and all MT64 Functions, you may try the MT32-SPLITE, free to download at www.mt128.com

MT64 Standard Installation:

RUN: **MT64Standard_Setup.exe** in administrator mode and this screen will appear.



Initial Installation:
Check the 3 boxes to agree that you know the MT64 application, you have an ASIO driver and that you want to install the program on this computer

If you don't know the MT128 / MT64 application, it's highly recommended to first test the MT32 SPLITE version, free to use and free to download at www.mt128.com

Activate License:

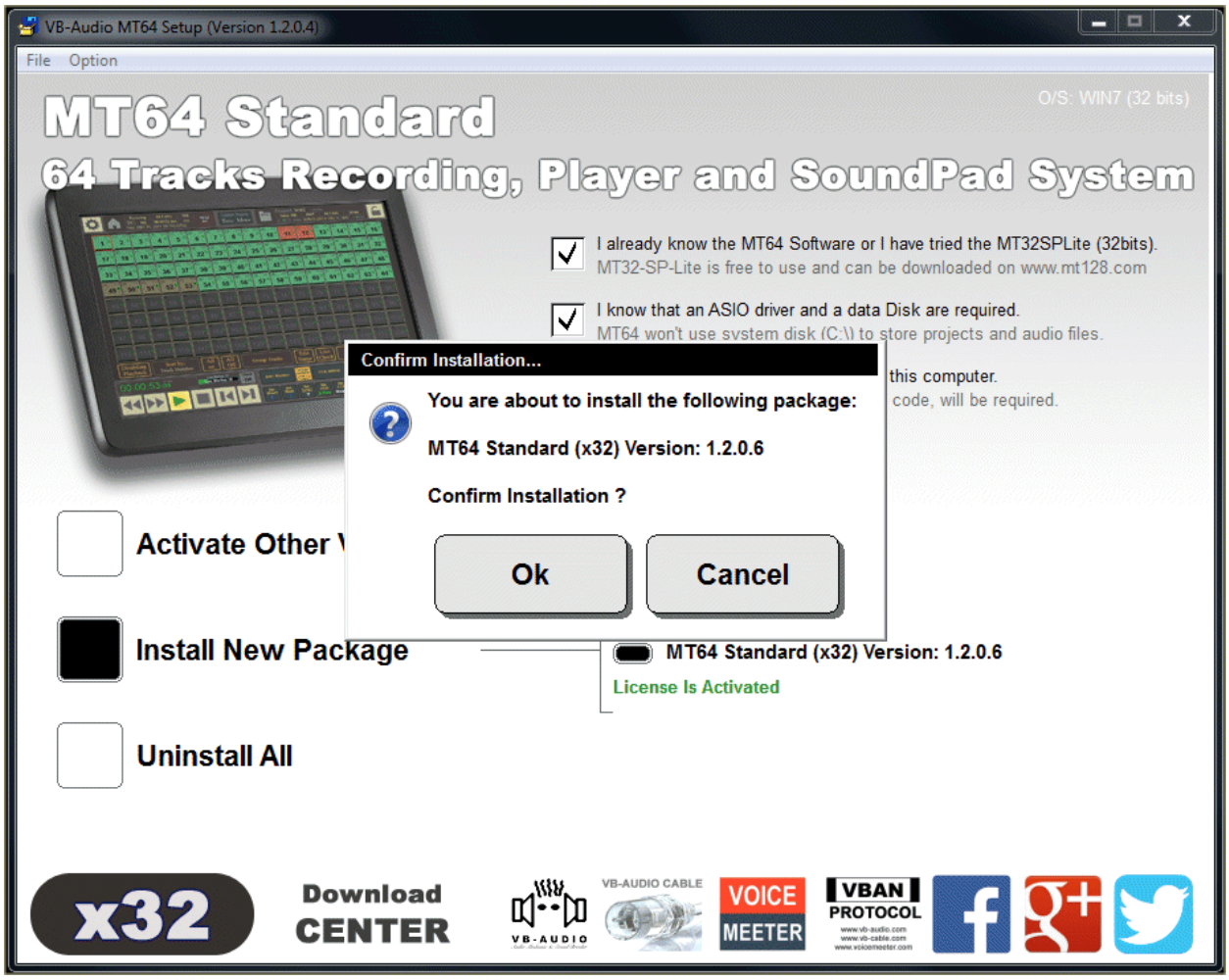
To install the MT64, a License will have to be activated to run the installation process. Click on BUY ONLINE will provide the challenge code to the WebShop that will e-mail you the response code after purchase.

Click on INSTALL NEW PACKAGE will open the License Information dialog box, to let you enter your Response Code. The license code is attached to your computer and e-mail address.

Once you receive your response code, enter it into the “Response Code” field (with your registered e-mail address) and click on ACTIVATE button to activate your License.

Install New Package:

When license is activated, click again on INSTALL NEW PACKAGE and confirm the installation process:



For security / reliability reasons, Installation procedure keeps previous version on system disk (up to 16). Theses previous versions are fully independent and can be activated from the MT64 Setup Program or through the MT64 **Administration Pages**. New package (update) can also be installed by these **Administration Pages**.

The last installed version is automatically set as the activated one. It will be automatically launched on next computer startup (if the Startup Option is set).

Create Shortcut or Run on Startup:

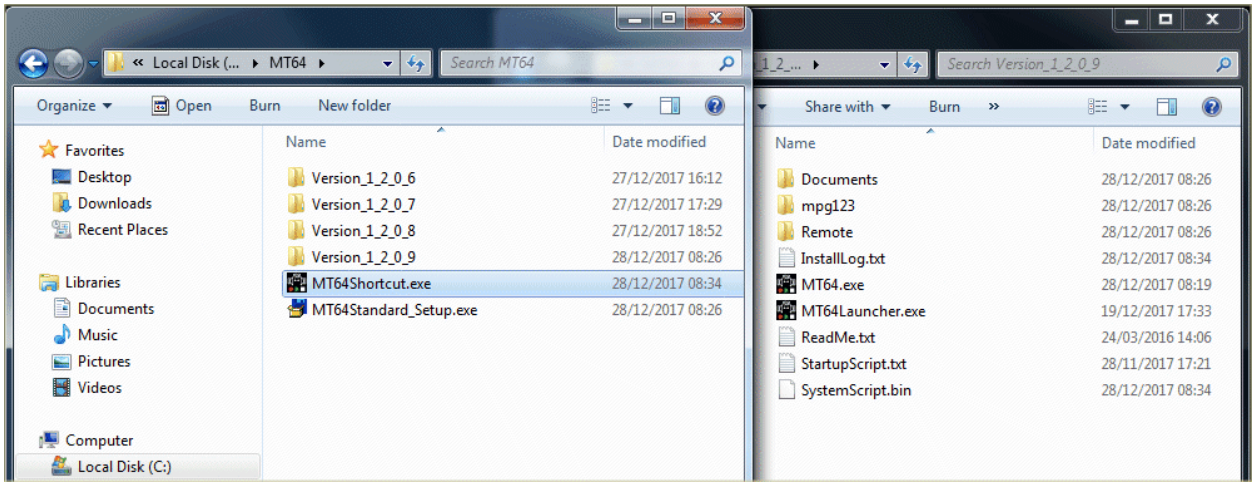
When the installation is complete, the current version is displayed in the “Activate Other Version” section. “Option” menu will allow creating shortcut on Desktop and / or run the MT64 on Windows Startup.

Section “Activate Other Version” is used to activate a previous version in case of problem with an update. For security/reliability reason, the MT64 installation system keeps 16 previous installed versions on your computer, ready to run.

The button “Uninstall All” will de-install all MT64Standard versions.

Run the MT64-Standard Program:
The MT64 program is installed on C:\MT64 folder (not in C:\Program Files\VB).

You may use the MT64Shortcut.exe program file to run the current activated MT64 version. MT64 Setup program, “Option” Menu provide the function to add or remove this shortcut on desktop.



It is also possible to run a specific version by the MT64Launcher in the related version_x_x_x directory.

MT64 Startup:

When starting your computer (or running the **MT128Launcher.exe**), the following screen appears:.

The launcher can wait some seconds before launching the MT64 program.

MT64 Shortcut:

Installation process installs a very tiny executable file called **MT64Shortcue.exe** on C:\MT64 directory. This program can be used to create shortcut on desktop or menu, to launch the activated MT64 version (Activated version is also the one launched on Windows Startup).

MT64 Startup page:

The MT64/MT128 Startup Screen is showing 2 columns: The left column displays your created projects. The right column displays your created templates. In this startup page you can chose to create new project, by using a template or not, or load an old project.

In the middle column, the Emergency button will allow to launch a Recording Session in a single click (once you will have selected ASIO device). And The Administration button allows entering in administration pages. **The default login / password is 'admin' / 'admin'**.

On a first run, both lists are empty, and you can only create new project. It's NOT recommended to push the EMERGENCY RECORD without having made a first project for testing/validating, at least to configure and check your ASIO driver parameters.

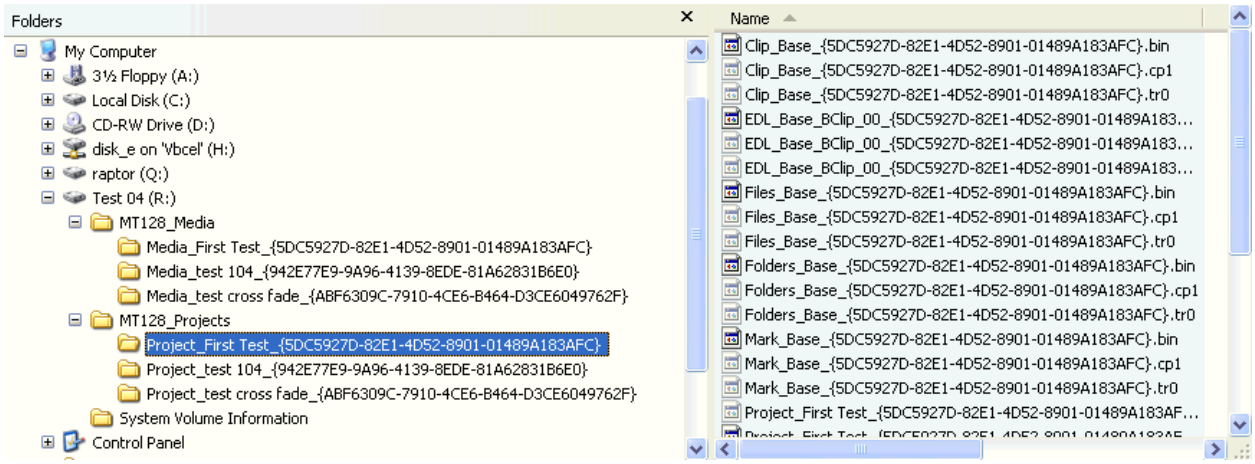
So, on the first MT64 RUN, you have to create a new project by clicking the NEW PROJECT button (yellow button). You will then be able to select the ASIO device.

MT64 and MT128 Project are in the same data base and are fully compatible (MT64 will ignore tracks 65 to 128).

Create your first project:

To create a project you will have to enter a project name in the “name” field and also select at least one disk in the “Preferred disk” field, to store your project and your recorded audio files. You can also check some other parameters, such as Sample Rate or file type…

When clicking on **CREATE PROJECT,** the MT64 is building a database in the selected preferred disk(s). All your projects are stored in **MT128_Projects** folder. All your recorded audio files will be stored in **MT128_Media** folder.



Select ASIO Driver.

By the “page selector” (on bottom right of the screen), go in the ASIO sub page to select an ASIO driver. The goal here is get a running audio driver with the smallest latency (buffer size). 256 samples is an acceptable buffer size for a good compromise CPU power / real time ability. But for punch in/out recording or MTC synchronization, we recommend 128 samples buffer size if running stable enough. 512 samples buffer size is recommended if using Voicemeeter Virtual ASIO Driver.

The configuration dialog box of your ASIO driver appears when clicking on OPEN ASIO CONTROL PANEL.

Current Sampling Rate BUTTON allows defining preferred sampling rate, but the device can refuse if locked on other sampling rate. This is pending on hardware infra structure and synchronization configuration.

Check ASIO Driver Stability.

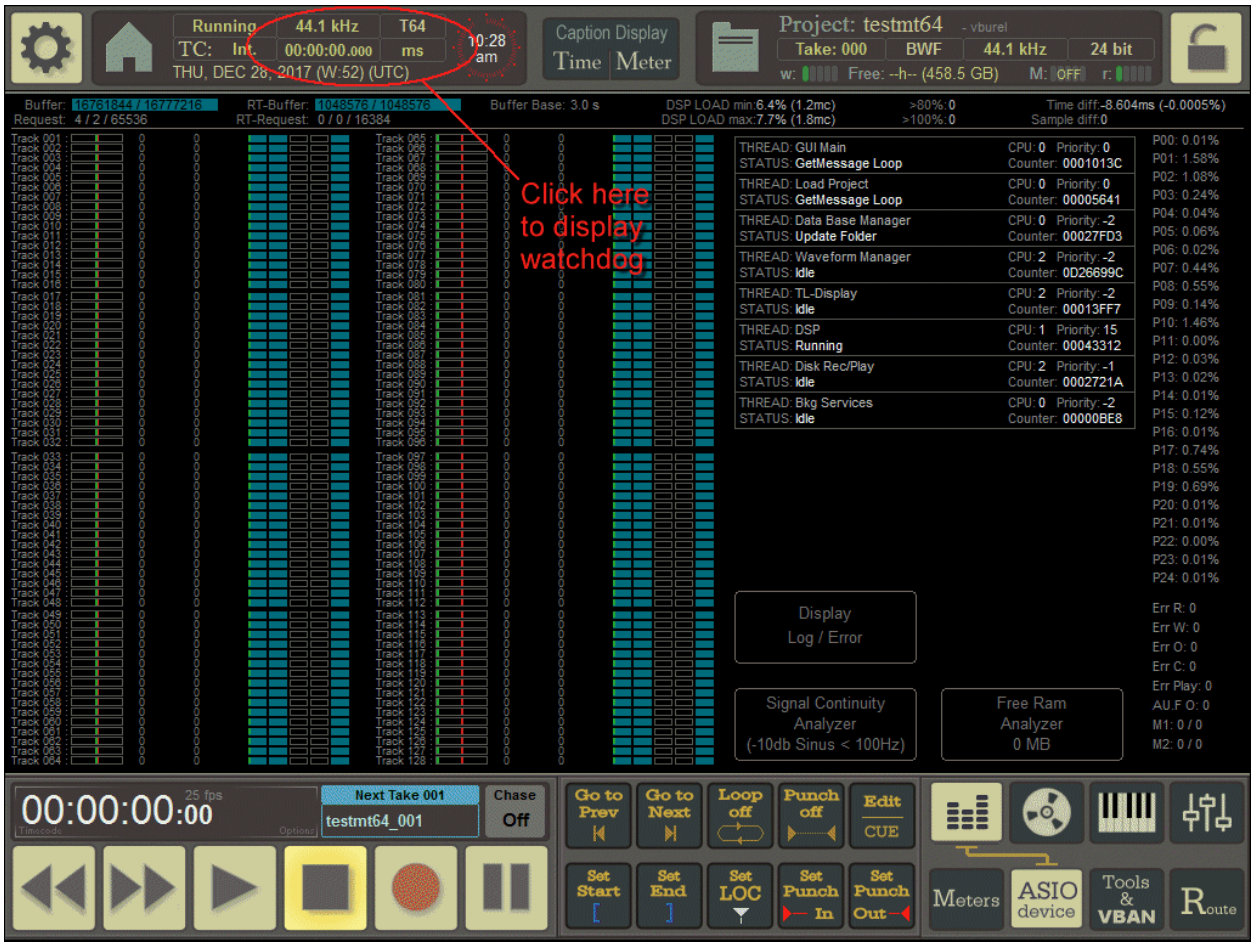
While running, ASIO driver stability and DSP load is measured in real time to show the two graphic below.

On the top, the DSP load must be as stable as possible. Below this, the Callback Timing error is giving the stability of the driver in the time. You may check these two measures in case of audio problem (cut in the sound, crackling sound…).

Device information section will show you the current buffer size, global latency (time between physical input and physical output) and the measured SR (measured sample rate). Measuring sample rate allows detecting hardware synchronization problems and to simply check that the hardware is running on the right speed.

The **DSP Load max** should stay below 80%. A time measure is done on every processed buffer. If a buffer is processed in more than 80% of the real time, a counter is incremented. If a buffer is processed in more than 100% of the real time, a second counter is incremented. **Both counters must stay at ZERO all the time to certify that the ASIO driver is working properly and that the PC configuration is supporting the DSP load.**

Watchdog Dialog Box (for experts / integrators only):
Clicking in the caption system section will open the watchdog/debug dialog box for more information on the different process, buffering process while recording/playback and additional testing functions.



The first measure to survey is the DSP load (same as shown in ASIO page) and time diff.

Time Diff shows the difference between real time (given by a precision PC time counter) and the ASIO time given by the number of sample processed by the driver. After some seconds or one minute, the value must tend to +-0.00xx % (or better again +-0.000x %). Otherwise it means that the driver does not run at the right speed. It's also a way to detect audio interface configuration problems (e.g: wrong Wordclock), or sometime hardware compatibility problem (between mother board / CPU and audio board).

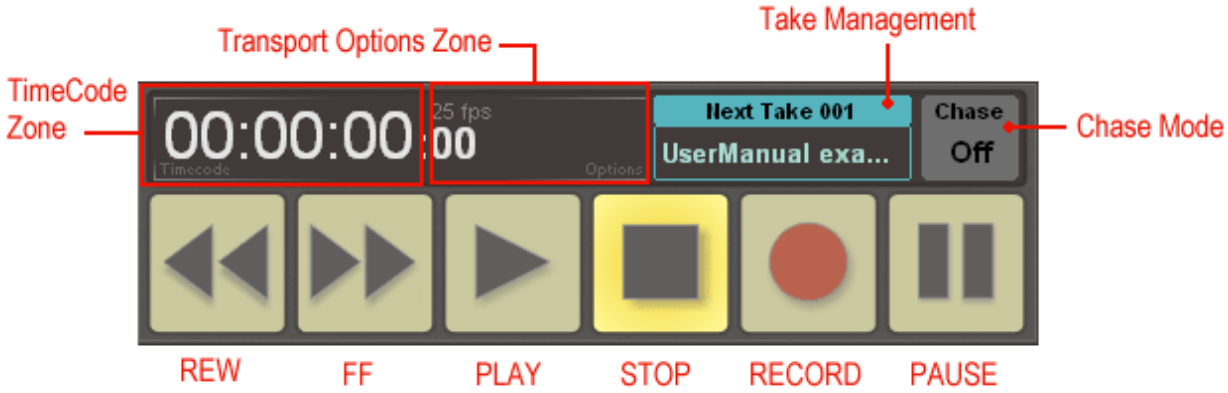
REM: This "time Diff" measure is representative between 2 and 10 minutes after having started ASIO device.

Validating the Recording process:

As first test, it's recommended to make a significant recording with all possible track armed.

Per default, all tracks are routed 1 to 1 with all your possible I/O.

Then Click RECORD

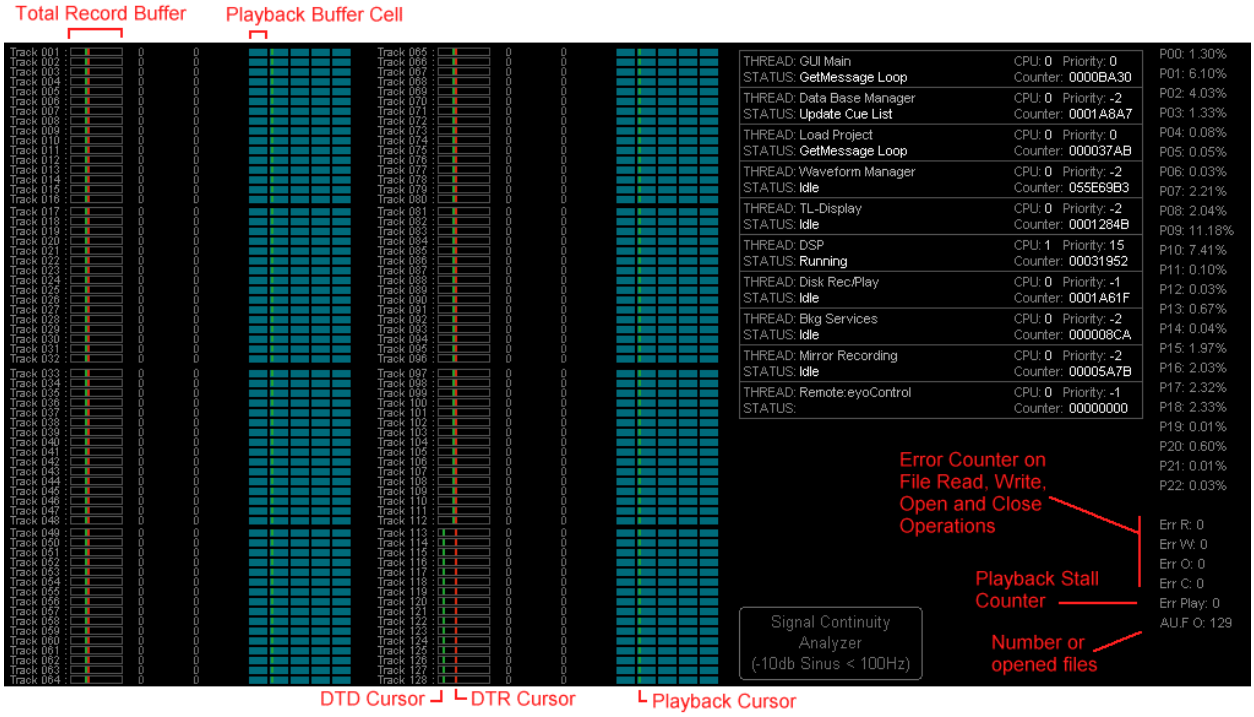


See Recording in Time Line.

It's recommended to record during some hours, a 100 Hz sinus signal. And then check the continuity and stability of the recorded signal in the generated audio file. With such 100 Hz signal it's easy to detect cut in the sound or other kind of problems.

Check the Recording Process

Again we may re-open the watchdog dialog box to see precisely what's happening during recording. This screen shows Record and Playback buffering for the possible 128 tracks.



The MT128 is permanently recording incoming audio signal in RAM (in a total buffer of 5 x 3 seconds), this is what the red cursor shows (DTR cursor). While recording truly on disk, the audio signal stored in RAM is transferred to the DISK, this is what the green cursor shows (DTD cursor). This process speed depends on the disk capabilities and performances (especially access time).

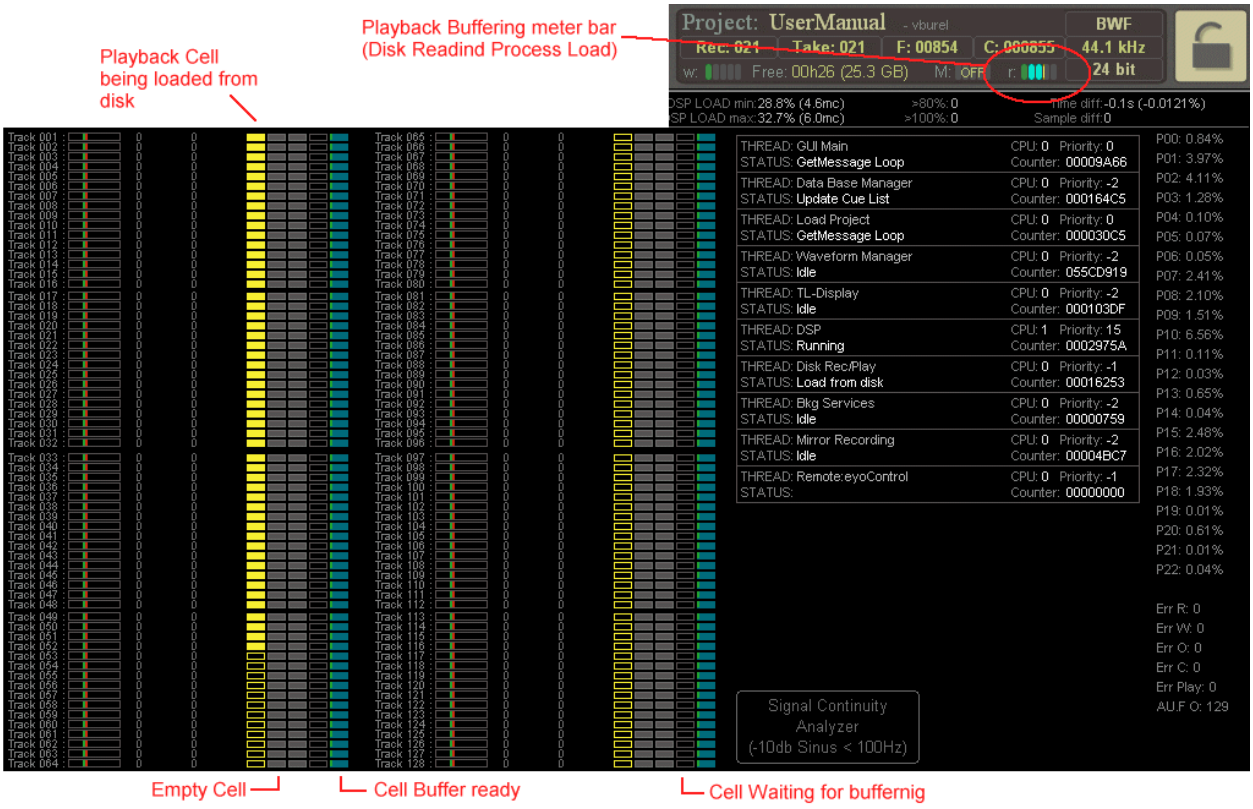
Recording on disk stays a quick process (compared to playback) and 128 tracks can be easily recorded on a regular SATA disk (even with 10 ms access time). For playback the process is usually slower (because there are more error correction algorithms). Playback 128 tracks will ask for faster disk.

REM: Disk Access Time is staying the crucial point for Playback, that's why we recommend using SSD for intensive playback or complicated timeline. For 64 tracks playback, regular SATA disk usually work ok in all cases.

Signal Continuity Analyzer Button allows to follow a Low Frequency Sinus (< 100 Hz -10 db) on every tracks , the first column of zero is used to count discontinuity issues (variation > 1% between 2 samples). This Analyzer is also perfect to evaluate ASIO Driver integrity and your possible Audio Network Infrastructure reliability. We usually perform this test on 5 days duration with a laboratory 50Hz LF Generator.

STRESS Disk process and DSP's

After having recorded several tracks, we can playback them and use FF and REW function to stress the audio motor and see what maximum DSP load we get.

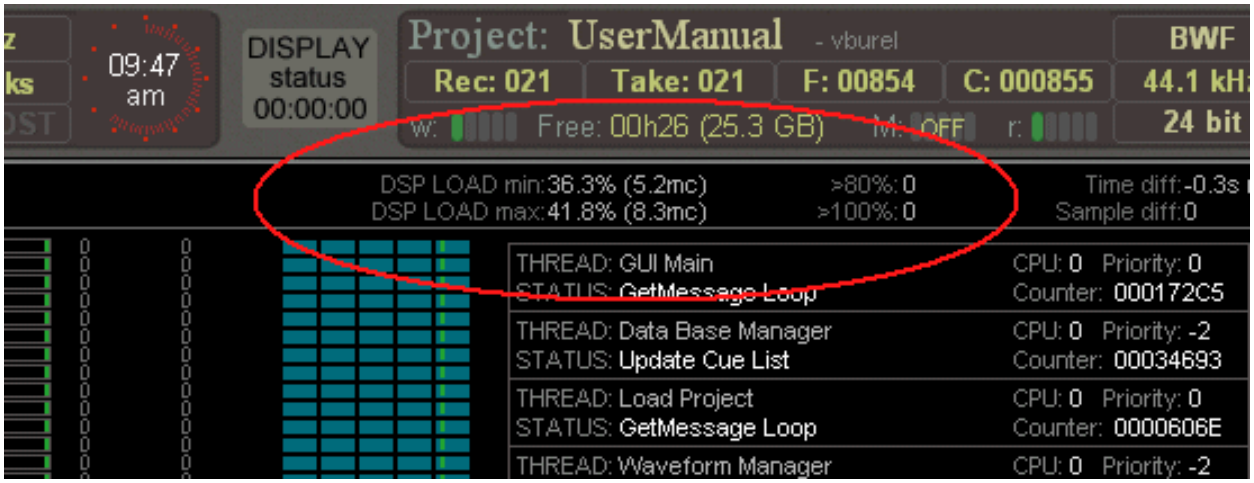


When moving cursor on timeline, MT128 is automatically preparing playback buffers. The MT128 is ready for playback when 2 cells (2 x 3s) have been prepared per track. If disks are slow you will see the process running on the watchdog dialog box.

The DSP load and DISK performances are completely independent. The DSP is running in very high priority (assigned in the core number #2) when the Disk is a low priority process (assigned in the core number #3 or #1). That's why a dual or quad core is recommended to let the maximum power to the disk process without being disturbed by real time DSP process.

The maximum DSP load is reached when playback at x2.5 speed. This can be done by clicking on FF or REW button 3 times (with default FF/REW settings). This is stressing as well the Disk process because it has to fulfill buffer 2.5x times faster than usual.

MAX DSP LOAD:
The max DSP load is reached when playback at 2.5x speed (using FF button). The DSP load must stay below 80% to certify that the system is working properly.



DISK CAPABILITIES
For testing disk capabilities, theoretically speaking, the maximum load is reached by Playback and Record 128 tracks, in the same time. It means to make a Record of some minutes from a point, stop it, and make a Record again from the same point.

In the reality, the playback process load, is pending on the number of clip (and clip overlap) present in a same buffer (time interval). If a cell (3 seconds) is located on the timeline, on a point where there is one or more cross-fade (clip overlap), then the buffering process can become heavy and can finally break the continuity of the playback (the recording process is priority to playback).

However, if you passed all tests described in this document successfully, you can consider having a fully working system (or at least for 99% of job you could do with the MT128).

Activate other versions:

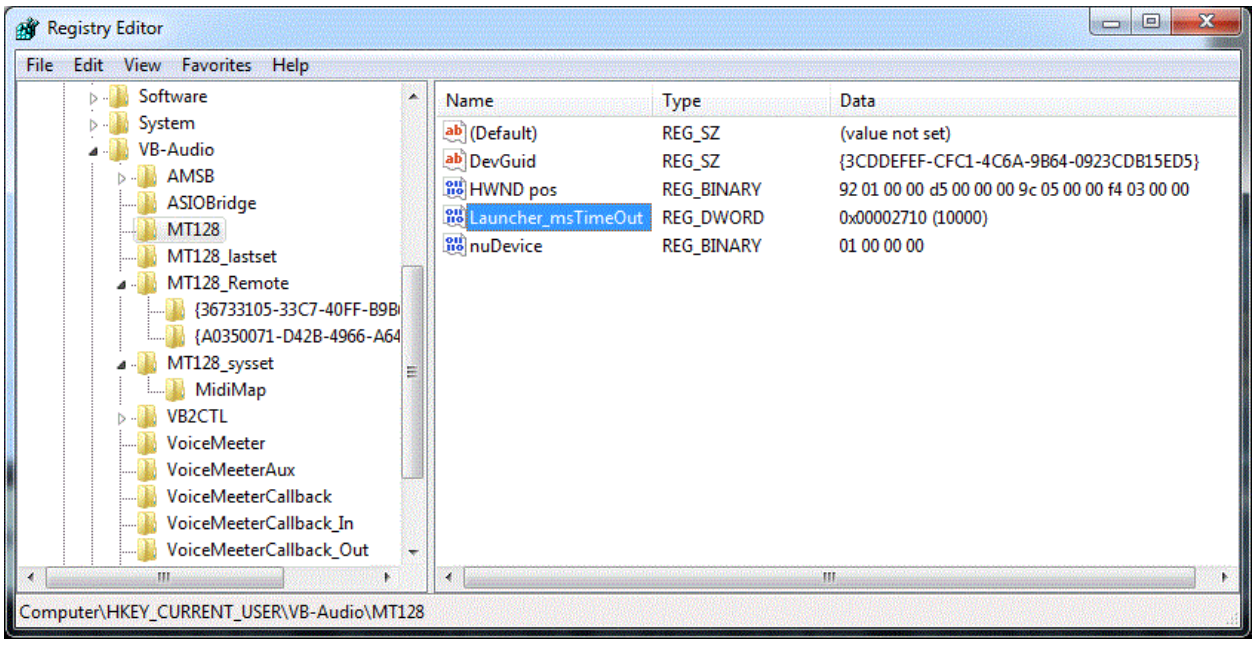
In the System Disk / MT64 Folder (C:\MT64), you will find the installation program, to activate another version or uninstall all.

Remark: There is a difference between Installing MT128 new version by Setup Program or by administration page: MT128 Administration page keeps StartupScript when installing new MT128 version (Update). This StartupScript is copied from the current version to the new installed one. Setup Program installs the default Startup Script.

About MT64 Launcher:

The MT64 Launcher, originally made to check the computer is ready, can wait for several seconds before starting the MT64 program. This is made to let the time to the system to activate different required services on windows startup (USB devices, including possible protection key, drivers, network connections…).

This TimeOut value is given in ms in the CURRENT_USER registry:
Launcher_msTimeOut gives the time to wait in ms (1000 to 120000)



ANNEXES

ANNEXES:

Transfer Rate according sampling rate

Sample rate = 44100 Hz, resolution = 24bit.

nb Track	Sample / s	Bit / s	MBit / s	Byte / s	Mbyte / s
1	44100	1058400	1.01	132300	0.13
2	88200	2116800	2.02	264600	0.25
4	176400	4233600	4.04	529200	0.50
8	352800	8467200	8.07	1058400	1.01
16	705600	16934400	16.15	2116800	2.02
32	1411200	33868800	32.30	4233600	4.04
64	2822400	67737600	64.60	8467200	8.07
128	5644800	135475200	129.20	16934400	16.15

Sample rate = 48000 Hz, resolution = 24bit.

nb Track	Sample / s	Bit / s	MBit / s	Byte / s	Mbyte / s
1	48000	1152000	1.10	144000	0.14
2	96000	2304000	2.20	288000	0.27
4	192000	4608000	4.39	576000	0.55
8	384000	9216000	8.79	1152000	1.10
16	768000	18432000	17.58	2304000	2.20
32	1536000	36864000	35.16	4608000	4.39
64	3072000	73728000	70.31	9216000	8.79
128	6144000	147456000	140.63	18432000	17.58

Sample rate = 88200 Hz, resolution = 24bit.

nb Track	Sample / s	Bit / s	MBit / s	Byte / s	Mbyte / s
1	88200	2116800	2.02	264600	0.25
2	176400	4233600	4.04	529200	0.50
4	352800	8467200	8.07	1058400	1.01
8	705600	16934400	16.15	2116800	2.02
16	1411200	33868800	32.30	4233600	4.04
32	2822400	67737600	64.60	8467200	8.07
64	5644800	135475200	129.20	16934400	16.15
128	11289600	270950400	258.40	33868800	32.30

Sample rate = 96000 Hz, resolution = 24bit.

nb Track	Sample / s	Bit / s	MBit / s	Byte / s	Mbyte / s
1	96000	2304000	2.20	288000	0.27
2	192000	4608000	4.39	576000	0.55
4	384000	9216000	8.79	1152000	1.10
8	768000	18432000	17.58	2304000	2.20
16	1536000	36864000	35.16	4608000	4.39
32	3072000	73728000	70.31	9216000	8.79
64	6144000	147456000	140.63	18432000	17.58
128	12288000	294912000	281.25	36864000	35.16

VALIDATION / QUALIFICATION:

After having setup a PC configuration, or after having updated the MT128 Software with a new version, it's recommended to make a test in situation; by doing exactly what your client is intended to do. A good validation test is to launch a record until the end of the disk and check that the recorded sound is OK (usually with a Sinus 100Hz signal).

PC Setup and O/S Installation:

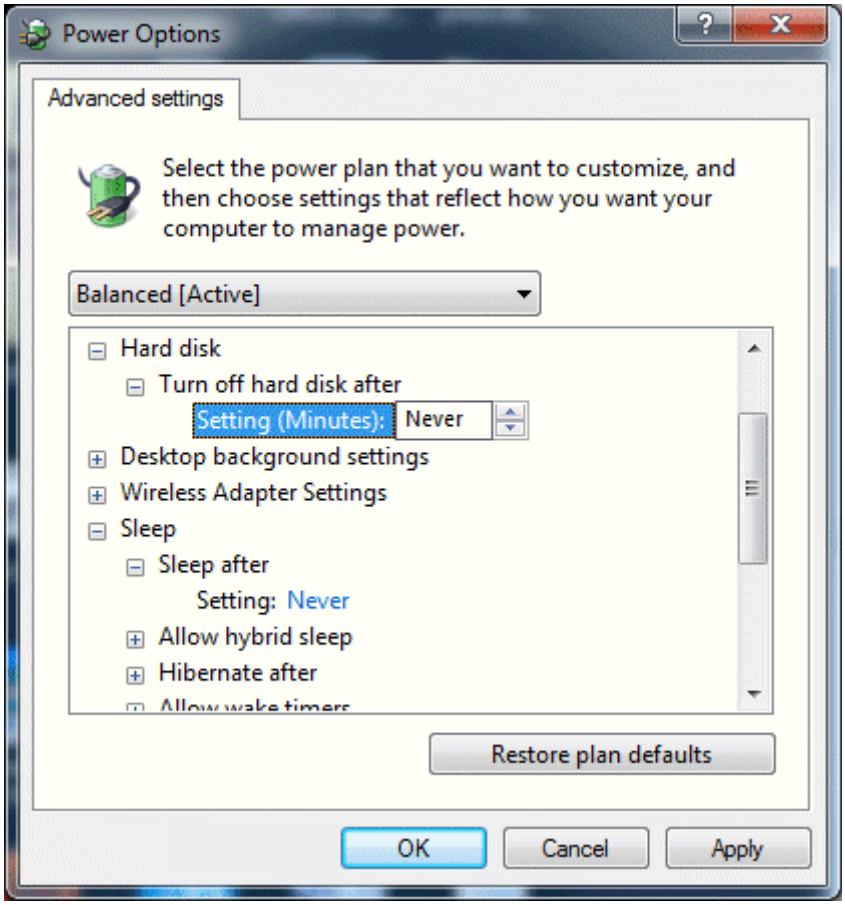
To build your PC and install O/S, we recommend the following steps:

1- Setup your PC without audio interface.
2- Install Windows Operating System
3- Install System Driver (MotherBoard, Ethernet, video, audio onboard if any).
4- Perform critical system/driver update on internet.
5- Install Audio Interface, and related drivers (latest one).
6- Install HASP Drivers (Safenet / Gemalto Software Protection System)

O/S tweaking:

The operating system might be configured for best performances and some options might be switched off to guarantee the stability of the system.

1- ON WIN7 USER ACOUNT CONTROL MUST BE DISABLED.
(see in Control Pane / user account)
2- You might disable Visual Effects (except font smoothing).
(This option is located in advanced system settings -Control Panel / System).
3- Power Plan must be set for maximum performances. And check that your system will not turn off Disk, USB device or Computer.



4- Screen Saver, and any Stand By functions might be deactivated.
5- You might disable useless services (Indexing / Windows Search / Windows Update)…located in Control Panel / Administrative Tools / Services.
6- You can disable AUTOPLAY
7- You can disable “Low Disk Space” Notification.
8- You can disable Windows Update services.
9- You must disable Windows Defender (and all virus scanning services).

Note about RME Audio board Installation:

After having installed RME driver, it’s recommended to reduce the number of WDM driver to 2 for example (see DSP Settings Dialog Box).

If you install different RME board together, check carefully their configuration (especially synchronization options).