

Horus Quick Start Guide

Revision 1.2



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IMPORTANT SAFETY AND INSTALLATION INSTRUCTION

SAVE THESE INSTRUCTIONS

INSTRUCTIONS PERTAINING TO RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

WARNING – when using electric products, basic precautions should be followed, including the following:

1. Read all of the safety and installations instructions and explanation of graphic symbols before using the product.
2. The product must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance or electric current to reduce the risk of electric shock. This product is equipped with a power supply cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet which is properly installed and grounded in accordance with all local codes and ordinances.

DANGER – Improper connection of the equipment-grounding can result in a risk of electric shock. Do not modify the plug provided with the product – if it will not fit the outlet have a proper outlet installed by a qualified electrician. Do not use an adapter that defeats the function of the equipment-grounding conductor. If you are in doubt as to whether the product is properly grounded, check with a qualified serviceman or electrician.

3. Do not use this product near water – for example, near a bathtub, washbowl, kitchen sink, in a wet basement, or near a swimming pool, or the like.
4. This product should only be used with a stand or cart that is recommended by the manufacture.
5. This product, either alone or in combination with an amplifier and speakers or headphones, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.
6. The product should be located so that its location or position does not interfere with its proper ventilation.
7. The product should be located away from heat sources such as radiators, heat registers, or other products that produce heat.
8. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.
9. The power-supply cord of the product should be unplugged from the outlet when left unused for a long period of time. When unplugging the power supply, do not pull on the cord, but grasp it by the plug.
10. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
11. The product should be serviced by qualified service personnel when: A. The power supply cord or

plug has been damaged. Objects have fallen, or liquid has spilled into the product, or C. The product has been exposed to rain, or D. The product does not appear to be operating normally or exhibits a marked change in performance, or E. The product has been dropped, or the enclosure damaged.

12. Do not attempt to service the product beyond that described in the user maintenance instructions. All other servicing should be referred to qualified service personnel.

13. **WARNING** - Do not place objects on the power supply cord, or place the product in a position where anyone could trip over, walk on, or roll anything over cords of any type. Do not allow the product to rest on or be installed over cords of any type. Improper installations of this type create the possibility of a fire hazard and/or personal injury.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

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IMPORTANT NOTICE:

Please read the following information very carefully before attempting any installation. Failure to comply with the precise instructions may result in damage to your Merging hardware. Please read this entire section of the manual carefully before installation.

STATIC DANGER NOTICE:

Please note that the Horus contains delicate electronic components that can be damaged or even destroyed when exposed to static electricity. Take all necessary precautions not to discharge static electricity when touching any of the Horus connectors.

Product Regulatory Compliance

The Merging Horus Network Converter is designed and tested to meet the standards and regulations listed in the following sections.

Product Safety Compliance

Horus complies with the following safety requirements:

- UL 1950 – CSA 950 (US/Canada).
- EN 60 950 (European Union).
- IEC 60 950 (International).
- CE – Low Voltage Directive (73/23/EEC) (European Limits).
- EMKO-TSE (74-SEC) 207/94 (Nordics).

Product EMC Compliance

The system has been tested and verified to comply with the following EMC regulations:

- FCC (Class A Verification) – Radiated and Conducted Emissions (USA).
- CISPR 22, 3rd Edition (Class A) – Radiated and Conducted Emissions (International).
- EN45022 (Class A) – Radiated and Conducted Emissions (European Union).
- EN45024 (Immunity) (European Union).
- EN6100-3-2 & -3 (Power Harmonics and Fluctuation and Flicker).
- CE – EMC Directive (89/33/EEC) (European Union).

Electromagnetic Compatibility Notices

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2), this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

Only peripherals (computer input/output devices, Ethernet switches, terminals, printers, etc.) that comply with FCC Class B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.

All cables used to connect to peripherals must be shielded and grounded. Operation with cables, connected to peripherals that are not shielded and grounded, may result in interference to radio and TV reception.

Environmental Limits

System Office Environment

Parameter Limits

Operating Temperature: +5 degrees C to +45 degrees C with the maximum rate of change not to exceed 10 degrees C per hour.

Non-Operating Temperature: -40 degrees C to +70 degrees C

Non-Operating Humidity: 95%, non-condensing @ 30 degrees C

Acoustic noise less than 20 dBA (Cooling Mode set to Low, internal Temperature 45 degrees C, as typical with 3 x Analog modules fitted) with an ambient Temperature (18-25 degrees C)

Operating Shock: No errors with a half sine wave shock of 2G (with 11-millisecond duration).

Package Shock Operational after a free fall, 18 – 24 inch depending on the weight.

ESD 15kV per Merging Environmental Test Specification



Declaration of Conformity

According to

EMC Directive 2004/108/EC

Product	Horus
Manufacturer	Merging Technologies SA Le Verney 4 CH-1070 Puidoux Switzerland
Electrical Rating	90-260 VAC, 50/60 Hz, 0.2 A (at 230V)
Standards	EN 55103-1:2009, EN 55103-2:2009, EN 61000-3-2 :2006+A1+A2, EN 61000-3-3 :2008

Detailed specifications of the tested and certified product are shown in the following Test Report:

Test report Ref No: 16'835 Issued Date: June 2012 by Montena EMC SA

The CE label is affixed on the rear of left side of the Horus unit as per below :



Date 12 June 2012



**Claude Cellier
President
Merging Technologies S.A.**

Horus Warranty Information

This product is warranted to be free of defects in materials and workmanship for a period of one year from the date of purchase. Merging Technologies, Inc. extends this Limited Warranty to the original purchaser.

In the event of a defect or failure to conform to this Limited warranty, Merging Technologies, Inc. will repair or replace the product without charge within sixty (60) days. In order to make a claim under this limited warranty, the purchaser must notify Merging Technologies, Inc. or their representative in writing, of the product failure. In this limited warranty the customer must upon Merging Technologies, Inc. request, return the product to the place of purchase, or other local designation, for the necessary repairs to be performed. If the consumer is not satisfied with the repair, Merging Technologies, Inc. will have the option to either attempt a further repair, or refund the purchase price.

This warranty does not cover: (1) Products which have been subject to misuse, abuse, accident, physical damage, neglect, exposure to fire, water or excessive changes in the climate or temperature, or operation outside maximum rating. (2) Products on which warranty stickers or product serial numbers have been removed, altered or rendered illegible. (3) The cost of installations, removal or reinstallation. (4) Damages caused to any other products.

Contacting Merging

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For all documentation inquiries or suggestions for improvement:
www.merging.com

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Product features and specifications are subject to change without notice.

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INTRODUCTION TO HORUS

Modular by Design

Horus was designed to give its users an amazing amount of Audio I/O channels, over all the most commonly deployed formats, while offering an unprecedented level of quality in such a small form factor.

Providing as standard 64 channels of MADI and 24 channel of AES- EBU I/O, you may choose to add up to 6 Analog I/O optional modules and one additional MADI extension module to bring the total MADI capacity to 128 channels and thereby create the ultimate audio interface for your studio, whatever the size. Once the Horus is fully loaded with option cards, it is capable of achieving an astonishing 176 inputs and 178 outputs @ 1FS There are indeed 2 more output channels than input channels, including the Stereo Headphone Monitoring.

Route Signal Anywhere

Horus has been designed so that any input can be routed to any number of outputs as required... simultaneously. With comprehensive routing pages accessible both locally on the touchscreen and by remote access using a standard web browser, Horus is the answer to signal flow management in your studio.

Green Built

For environmentally-conscious users, Horus has been meticulously designed in order to keep power consumption at an incredible minimum. A fully loaded Horus running all channels of phantom power will only draw about 60W, making it more affordable to run than your kitchen lights.

HORUS Key Features

- Up to 176 inputs and 178 outputs @ 1FS
- Works from 44.1 kHz to 192 kHz (Premium up to DXD/DSD256)
- Signal routing from any input to any combination of outputs
- Works as MADI/AES AD/DA for "standard" operation... AND
- Works in Ravenna mode to deliver all I/O via the network
- Front panel touch screen for local access
- Front panel Stereo Headphone monitoring
- Browser-based remote access using any web enabled device
- Dual redundant power supply option
- Modular design for analog and additional Digital I/O
- Near-zero latency from in to out (<1ms)

Ravenna

The Horus has been designed so that the MADI, AES and Analog modules can all feed into or take their sources from the network over Ravenna streams, providing up to 176 channels of I/O @ 1FS over a single CAT5e or CAT6 cable to any other Ravenna devices on the network.

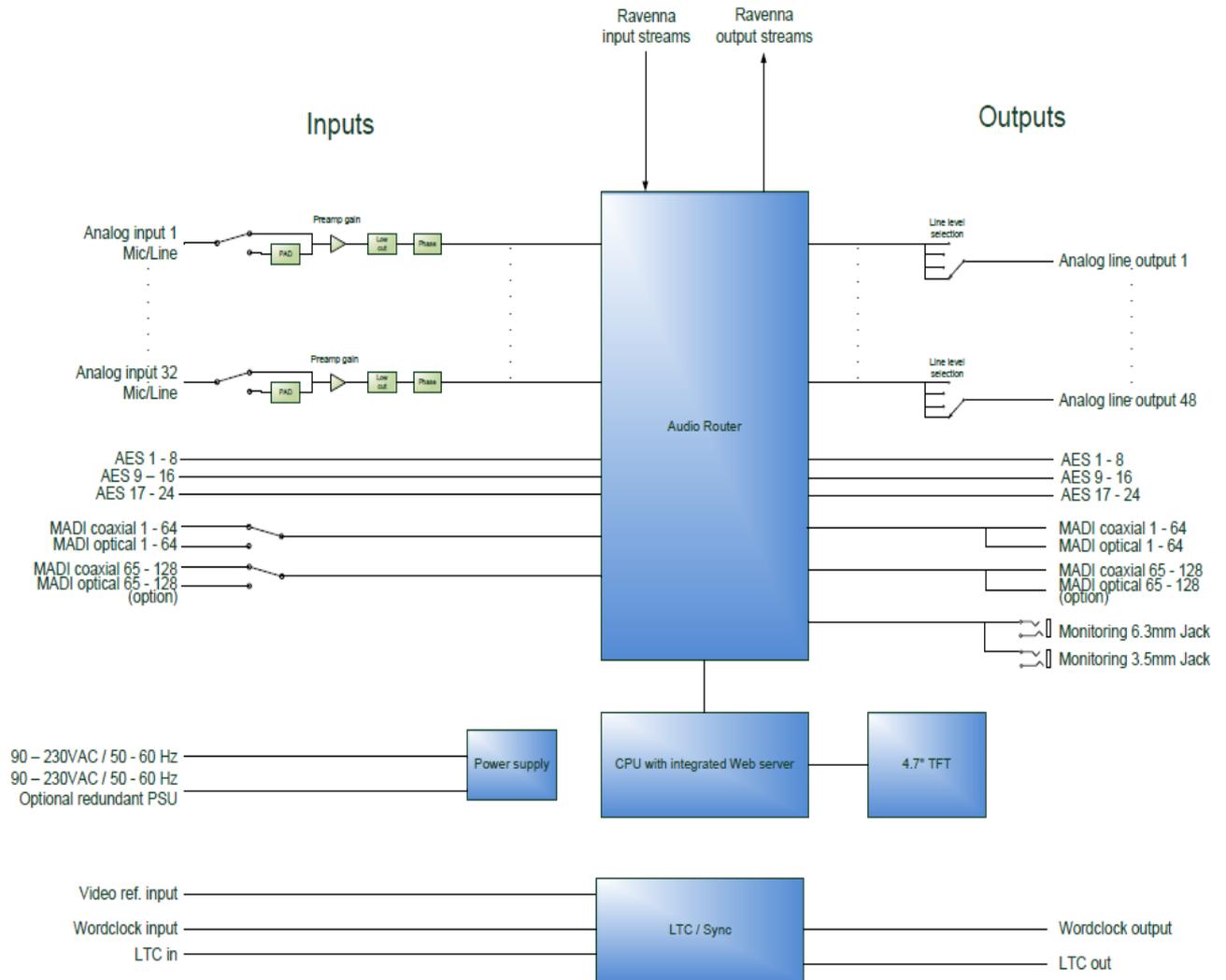
The Ravenna connection on the Horus allows for not only audio, but also control and sync information to flow through as well. Send Timecodes, Wordclock and even GPIO directly to the Horus unit over the same network as your audio. The Ravenna port even provides for remote control access to the configuration and entire routing of the unit itself! Support for: RS-422/LTC/MIDI/GPIO/Video Ref/WCK

Ravenna is a layer 3 IP based protocol. In environments where existing networks are already in place, Ravenna subnets can slip right into place with no additional outlay. In laymen's terms, this means that you can connect your Horus to a properly configured network exactly as you would your PC or Mac, with no additional technology required.

Ravenna is a "mission critical" protocol, meaning that it has been designed to ensure immensely low jitter rates and latencies (sub-millisecond) and ensures that every single sample gets to where it needs to go without fail. Horus also provides a secondary, redundant Ravenna connection allowing for uninterrupted use, even when a network connection fails.

Refer to the *Ravenna User Guide* and the *MassCore-Ravenna Configuration Guide* for more details

HORUS BLOCK DIAGRAM



HORUS HARDWARE

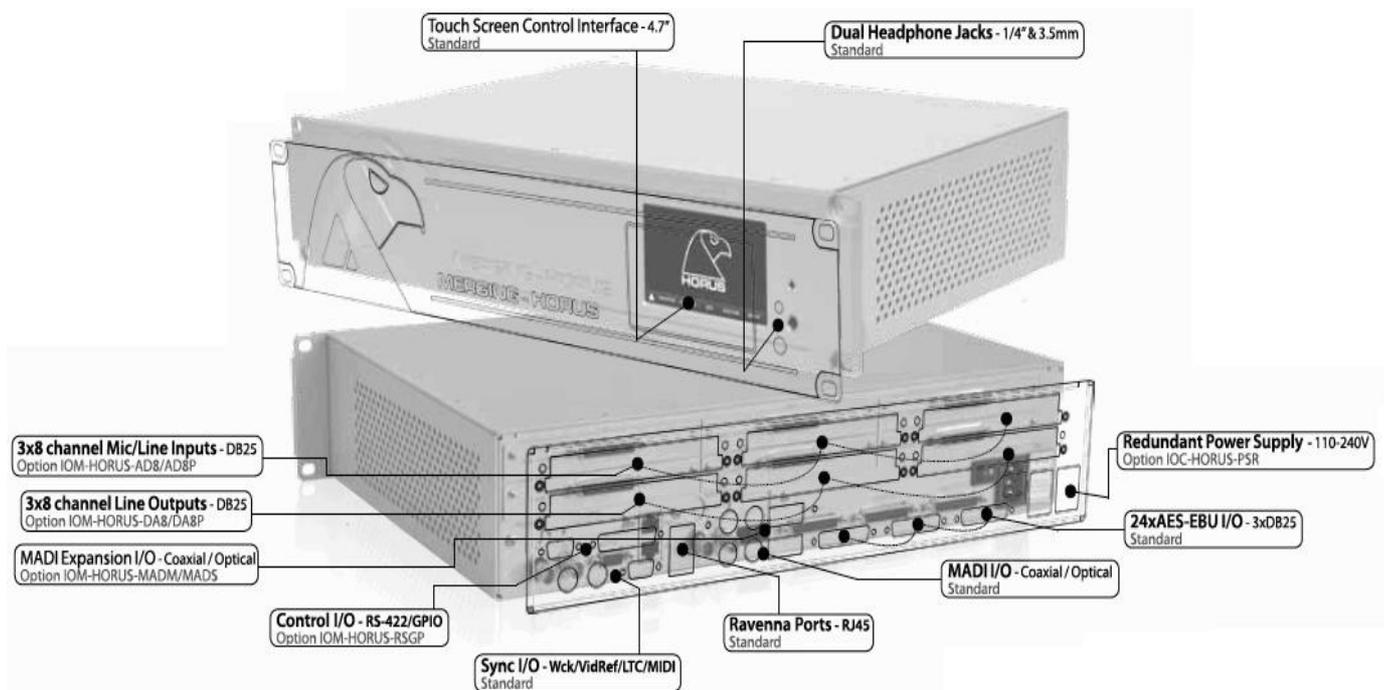
FRONT PANEL



BACK PANEL



HORUS UNIT DESCRIPTION



Installing the Merging PCIe Ethernet Controller Card

Detailed steps on how to install the NET-MSC-GBEX1 PCIe card in your PC.



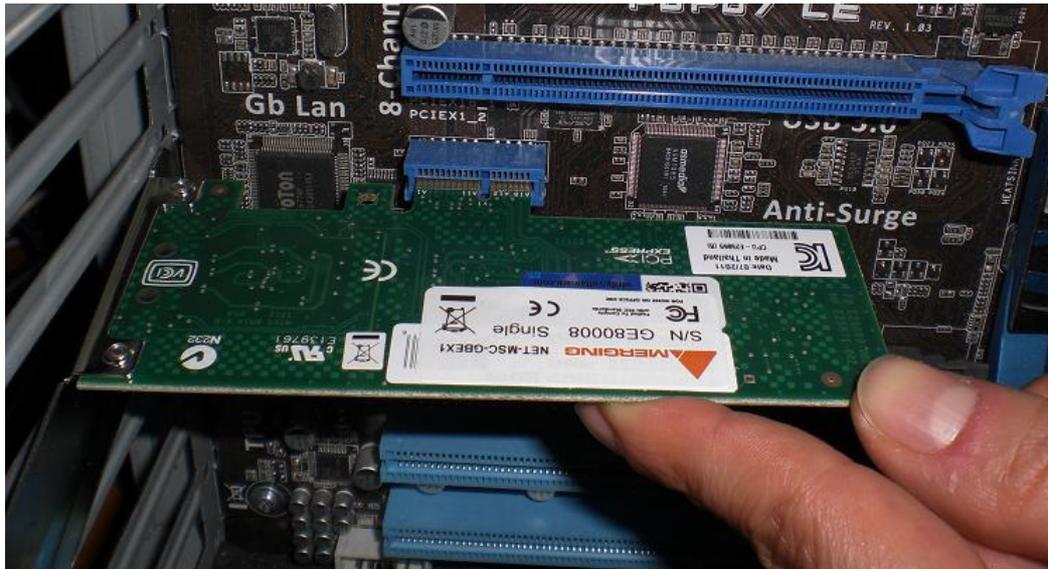
1. Power down your PC and switch it off at the wall. Remove the screws holding the top or side of the case on and carefully slide off the panel.



2. Wearing an anti-static wristband is desirable whenever working with sensitive electrical equipment. Keeping one hand on a metal part of the case will have the same effect, though you may need both hands when installing certain items of hardware.

3. Locate an empty PCIe slot and remove the metal backing plate by removing the screw holding it in place and carefully sliding it up and out. In some cases, there are no backing plates and you will need to remove a length of metal instead. Do this using a flat-blade screwdriver and/or pliers, taking care to avoid any sharp edges left behind.

4. Next, remove the NET-MSC-GBEX1 card from its envelope bag and line it up with the vacant PCIe slot as shown below.



5. Push down gently at first, ensuring you have the pins lined up correctly with the slot, and then apply more force to slot the card home fully.

6. Use the screw which held the backing plate in place to secure the card and check that the card sits properly. Finally, replace the case cover(s) and plug your machine back in.

6. At "First Power Up" Windows will discover the Merging Ethernet PCIe card

Note: Refer to the Merging Ravenna Configuration Guide for more details on the Pyramix MassCore-Ravenna setup

HORUS recommended placement in Rack

Due to confined space in a Rack furniture, adequate spacing (and ordering) between multiple Horus units will play a significant role on the units temperature. Although Merging has spent considerable time in optimizing the Horus power consumption in every aspect possible, the units are still drawing an average of 35W to 45W each. The dissipation of the related heat produced by this consumption is therefore highly dependent on the airflow and natural air convection around those units.

With highly loaded Horus units (more than 3 I/O Analog modules per unit), Merging recommends a free space of 2U above and below each unit to ensure adequate cooling of the devices.

HORUS POWER ON

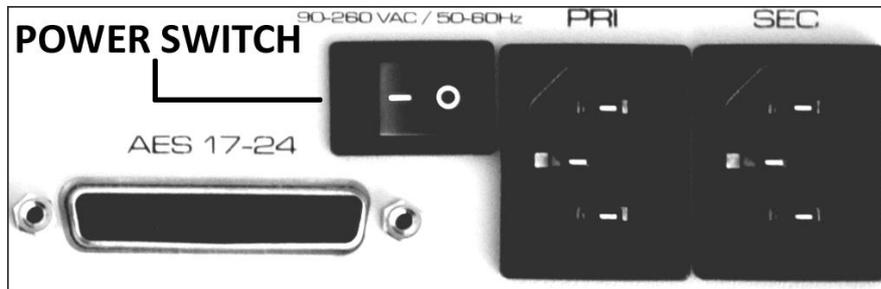
Connecting the Power Cable

The Horus unit runs on 85-240V, 50-60 Hz AC voltage. Excessive voltages can seriously damage the Horus unit, so make sure that your AC power matches the voltage of your Horus unit. When you connect the power, use the cable you received with your Horus unit and plug it into a grounded outlet.

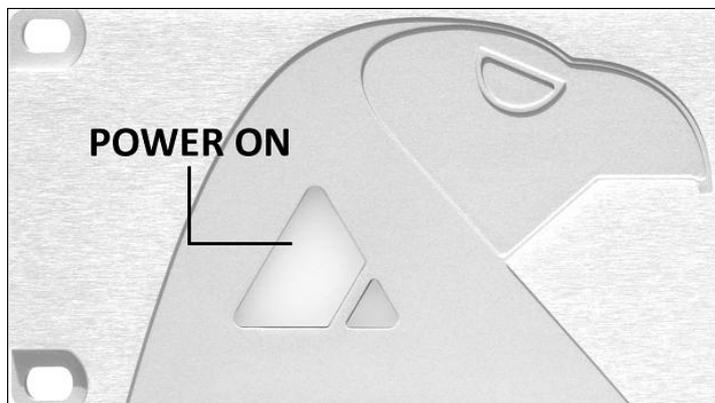
For safety and EMC reasons, and to prevent audio hum, the system must be properly grounded. If your power source does not have a standard three-prong socket, the system must be grounded in another appropriate manner.

If your Horus unit is equipped with the Redundant Power Supply option, make sure you connect both mains cables (one to PRI and one to SEC mains plugs on the Horus).

1. Ignite the Horus Back Panel Power Switch



2. Press the Horus Front Panel Power Button



3. The Horus front panel button will turn blue. If the panel button light isn't steady but appears to flicker, this may indicate a fault condition and requires immediate shut down.

4. Wait until the Horus is fully started and displaying the Main Home screen.

HORUS TOUCH SCREEN CONTROL INTERFACE

Horus Menu Hierarchy

HORUS MENU HIERARCHY



Main Home Screen

This is the screen which you will see after the Horus completes its boot sequence. From here you can navigate to all the other menus for the setup and use of Horus. If at any time you want to return to the Main Screen, you can press the Merging Logo in the bottom left-hand corner to return to the Main Screen. The screen also has access to the 5 main sections of the Horus menu: **Monitor, Meters, IO & Sync, PreAmp** and **Setup**.



HORUS WEB CONTROL ACCESS

Installing and accessing the Horus Control interface remotely

To control and view your Horus remotely with a web browser make sure that you are using one of the Internet browsers below: Google Chrome (Highly Recommended), Mozilla Firefox, Opera, Apple Safari. * Microsoft Internet Explorer is not supported *

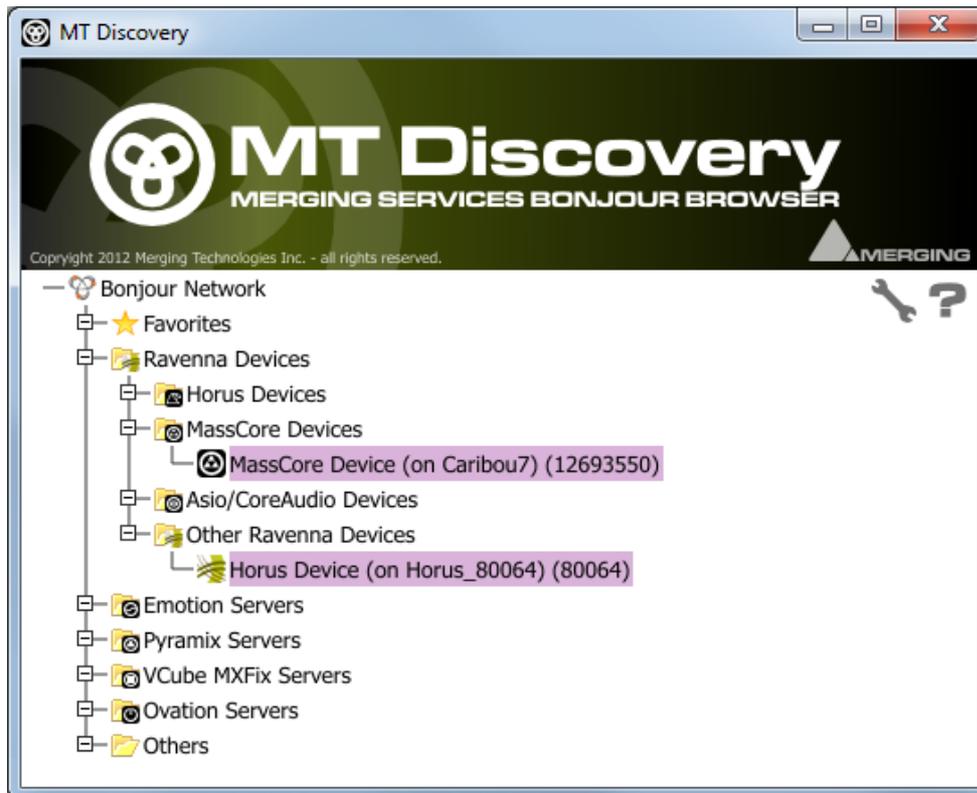
Then take the following steps:

- 1) If you did not install Pyramix v8 proceed from step 2 to 3. If you have already installed a Pyramix v8 go directly to step 4)
- 2) Download the MTDDiscovery.exe application to your system (PC or MAC installers are available) <http://www.merging.com/horus/download>
- 3) Make sure your Horus is connected to the same network as your system, and is configured with the correct IP settings (See "Setting up the Horus IP Address")
- 4) Launch the MT Discovery tool (MTDiscovery.exe)

Any Horus devices on the network will be discovered by the MT Discovery tool and will appear in the folder tree under "Ravenna Devices>Horus Devices"

- A mouse double-click on the Horus Device entry will open the Horus Web Interface in your default web browser
- Only Devices on the same network (same color in display) can have their I/O interconnected
 - * Microsoft Internet Explorer is not recommended for this*

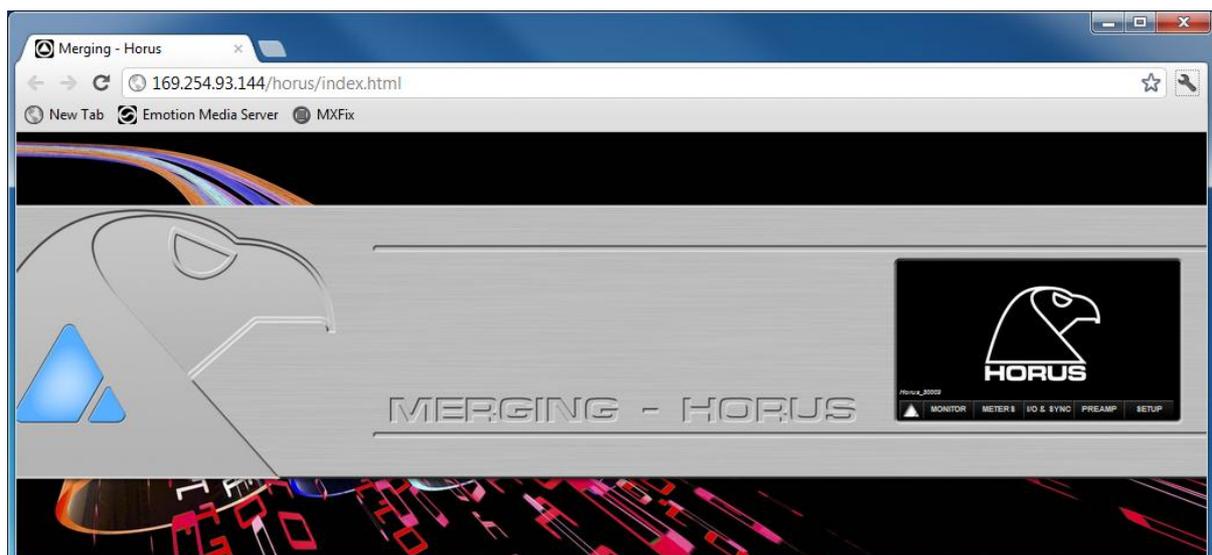
Figure 1 MT Discovery Window



Using the Webpage, you can browse the Menus and change parameters in exactly the same manner as on the front panel TFT of the Horus unit in question.

Warning: It is mandatory that you connect the Horus to a Gigabit Ethernet Port or Switch for remote access.

Figure 2 Horus Web Access

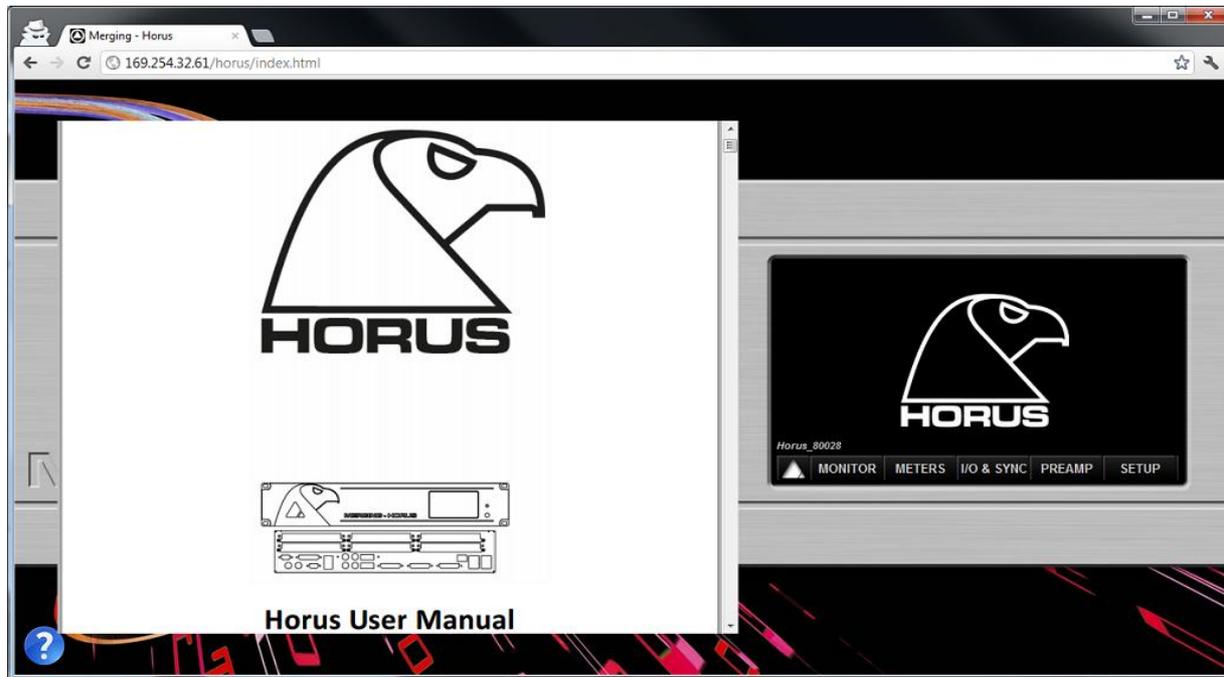


All of the Web access menu pages will be similar to those on the Horus TFT display except for the PREAMP and Network menus.

The Horus embedded User Manual

The Horus embedded User Manual can be opened by clicking on the question mark  sign at the bottom left of your browser. This will overlay the Horus User Manual on your Web control access page.

Figure5 Horus Embedded User Manual



HORUS TROUBLESHOOTING

How to provide Merging Support with a Horus debug dump file

Dump procedure:

1. Connect the Horus to your system via Ethernet
2. Open a web browser (e.g. Google Chrome) and make sure that you type in your Horus Ip address
3. This should open the Main Horus Page (alternatively open the Horus Web page from the MT Discovery tool)
4. Follow the Horus Name entry <Horus name>.local/. with the /debug/syslog
Example: *horus_80028.Local./debug/syslog*
Right-click and export the Horus syslog.txt file
5. Perform the same but this time export the config file as example below.
Example: *horus_80028.Local./debug/config*
Right-click and export the Horus config.txt file
6. Send both file to support@merging.com

Cannot access Horus remotely in Maintenance mode for Firmware update

Procedure:

1. First launch MTDDiscovery and open the Horus Maintenance Mode entry
2. If such entry does not show up, reboot your system and retry
3. If it still does not work, make sure that your Network card is set to Automatic IP addressing (see page 58 above)
4. In case none of the above works, make sure that the Horus is well connected to your system via Ethernet. It is mandatory that the Ethernet port or Switch is a Gigabit one.
5. Make sure that the Ethernet cable is Cat 5E or 6
6. On the Horus Maintenance TFT screen take note of the written IP Address
7. Type this address in your Chrome browser followed by :8080
Example: 169.254.182.31:**8080**

You should now have access to the Horus remote Maintenance page and be able to update your Horus firmware.

Firewall and Antivirus

Windows Firewall:

The Windows Firewall can block communication between MassCore and Horus. We recommend users to disable the Public Network Firewall

Procedure:

1. Go in Windows Control Panel > Windows Firewall.
2. Click on "Turn Windows Firewall on or off"
3. Go to the Public Network section and select "Turn Off Windows Firewall"

Disable Antivirus:

Merging also recommends users to disable their Antivirus, some Antivirus as Avast have been known to block the Horus discovery and Ravenna I/O Connections

Symptom: Horus does not start up or will after a few minutes

Please refer to the technical Horus document to solve the issue of the Hours is not restarting.

To make sure that this is the problem you encounter. Please look through the Horus right side panel air flow holes, you should see a green light that is blinking light rather than steady. If the light is blinking this means that you should contact Merging support or your local dealer in order to get the technical document on the voltage adjustment procedure.

Note: it is also possible that you hear a small regular tick, tick sound noise coming from the Horus under such circumstances.

