



Integrator's Guide



Tahoe-Veo™ Video Distribution System

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Introduction

Congratulations on your purchase of the NeoPro Tahoe-Veo video distribution system. Whether you are working on a sports bar, restaurant, or other large-scale video project, you will find working with the Tahoe-Veo easy and rewarding.

The Tahoe features:

- 24 Component (YPbPr) inputs
- 7 slots for field expansion of up to 112 outputs
- Dual hot-swappable power supplies
- Serial control via RS232 or USB ports
- IR control via front panel sensor or “wired” (back panel)
- 16 memory locations to store switch presets
- IR discrete code for each input and output for easy macro programming
- Component video (YPbPr) section bandwidth is 140 MHz for 1080p



Important Safety Instructions

To minimize the risk of injury or property damage, the following safety requirements must be followed when installing and operating the Neothings "Tahoe" video matrix. Failure to comply with these requirements may also void the warranty. Read these instructions and keep them for future reference.

Servicing

There are no user/operator serviceable components inside the Tahoe chassis. Do not attempt to access components inside the chassis. All repairs and testing inside the chassis must be done by qualified Neothings dealers or technical support representatives.

Please contact Neothings, Inc. for qualified technical support.

Environmental Requirements

This unit is intended for indoor use only.

Do not use this apparatus near water, including "misting" devices, splashed areas, wet cloths, or overspray from liquid cleaners.

Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. The ambient air

temperature for the installation location should not exceed 40 deg. C. (104 deg. F.).

Do not block any ventilation openings. The unit has fans for cooling the system. To ensure maximum cooling efficiency, the installation must have a minimum of 2 inches free air circulation space on each side of the unit.

Unplug this unit during lightning storms or extended periods when it is not in use.

AC Power Connections

The unit is provided with AC Supply Cord(s) that are essential to safe operation of this equipment. Do not substitute other cords, as this may compromise safety and void the warranty. Contact Neothings Tech Support for replacement cords.

Do not defeat the safety purpose of the grounding type plug, which has two blades and a third grounding prong. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

The AC voltage, current, and frequency requirements are listed on the rear of the chassis, near the AC connectors. Connect the unit to an easily accessible AC outlet(s). If the unit is malfunctioning, such as emitting any smoke or odor, disconnect the power cord(s) immediately.

Protect the power cord from being pinched, crimped, cut, or otherwise subjected to abnormal mechanical stress and wear.

Even if the unit has been turned off, it is not disconnected from the mains. To make routine connections and changes of Input/Output (I/O) cables, disconnect the AC supply cord(s) from the back of the unit. After all I/O cables have been connected, restore the AC power input connections.

Peripheral Devices

Only use attachments, cables, and other accessories as provided or specified by Neothings, Inc.

Make sure all I/O cables are not stretched, crushed, crimped, or pulled tightly against sharp edges.

FCC Compliance Notice

This equipment has been tested and found to comply with the limits for a Class B 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 receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer for help.

هامة سلامة ت عد يمات

بم تطل بات الال التزام أن ي جب الامم ت لكات، في الأضرار أو الإصابة خطر ل تقو ل
"Taho" "تاهو" نيوث نجز ف يديو و جهاز وت شغل ت ركيب عند ال تالية ال سلامة
ال ت عد يمات هذ ه إقرأ ال ك فالة ي بطل قد ال ت عد يمات لهذ ه الام ت ثال عدم Neothings.
المس ت ق بل في ال يه ل لرجوع بها واد ت فظ

ال ص يانة

لا. "تاهو" جهاز هيكل داخل المس تخدم ق بل من ل ل ت صل ي ح قاب لة مكو نات ت و جد لا
الهيكل داخل والاخ ت بار الإ صلاح عمل بات جم يع ت تم أن ي جب ال الوحدة هيكل ت ف ت ح
ال تقني الدعم ق سم طري ق عن أو المؤهل ين Neothings وكلاء ق بل من

مؤهل في ني دعم على ل ل حصول Neothings ب شركة الات صال ي رجي

ال ي د ي ن ية الم تطل بات

ف قط الأ ب ن ية داخل ل ل عمل مصمم الجهاز هذ

أو ال غرف، ت بخير أجهزة ذلك في ب ما الم ياه، من ب ال قرب الجهاز هذ ت س تخدم لا
ال سائ لة المنظ فات من الرذاذ أو الرطوبة، الملابس أو الم ب لة، الامناطق

الرديو وت ورات، م ثل ل لحرارة مصادر أي من ب ال قرب زالجها ب ت ت ب ي ت ق م لا
ال صوت مك برات م ثل الأجهزة، من غ ير ه أو والموافد،
(فهنهايت ١٠٤) مؤية درجة ٤٠ = مديطة حرارة درجة أعلى

الأقل على (ب و صة ٢) سم ٥ ت رك ي جب ال جهاز في مراوح أو ف ت حات أي ت حجب لا
ال هواء ران دو حرية ل ل ضمان الوحدة من جان ب كل على

لا عندما أو ال شديدة ال كهربائ ية العواصف أث ناء الوحدة هذ ه عن ال تيار ب فصل ق م
طوية ل ل ف ترات ال س تعمال ق ي د ت كون

(AC) الم تردد ال تيار ت و ص يلات

لأنه ب آخر ال سلك هذ ت س ت بل لا ال م تردد ل ل تيار كهرباء سلك مع الوحدة هذ ه زودت
ل شركة ال فني الدعم مع ات صل .أماناً أقل حدة الو ي جعل أو ال ك فالة ي بطل قد

الأ سلاك لا س ت ب دال Neothing
ب مأخذ الوحدة صل ال الوحدة هيكل خلف مسجلة وال تردد وال تيار ال جهد ف رق م تطل بات
سلك أن م ت أكد، وال تردد ال جهد م تطل بات ومطابق إ ل يه ال وصول سهل AC ل ل تيار
ب سهولة ف صل ه ي مكن ال كهرباء

أو لإجهاد ت عري ضه أو ال قطع أو ال تجعيد أو ال قرض من الطاقة سلك ب حماية ق م
ط ب يعي غ ير إ د تكاك

أي لإجراء مطفأة الوحدة تكون عندما حتى الكهربي انه ي بال تيار موصول الجهاز
سلك اف صل، (I / O) الإخراج أو الإدخال كابلات في تغيرات أورتو يذية توصيلات
إعادة يمكن الكابلات، كافة توصيل يتم أن بعد لوحدة الدخل في الجزء من التيار
ب الطاقة الوحدة توصيل

الطرفية الأجهزة

وكما المنصوص النحو على الملحقات من و غيرها والكابلات المرصقات استخدم
Neothings شركة من زودت
تالفة أو مشدودة غيد التوصيلات من أيأ أن من تأكد

Consignes de Sécurité Importantes

Pour minimiser le risque de blessures ou de dommages à la propriété, les exigences de sécurité suivantes doivent être respectées lors de l'installation et l'exploitation de la matrice vidéo Neothings "Tahoe". Défaut de se conformer à ces exigences peut également annuler la garantie. Lisez ces instructions et les conserver pour référence future.

Entretien

Il n'y a aucun composant réparable utilisateur / opérateur à l'intérieur du châssis Tahoe. Ne pas tenter d'accéder aux composants à l'intérieur du châssis. Toutes les réparations et les tests à l'intérieur du châssis doivent être effectués par des revendeurs qualifiés Neothings ou représentants du support technique.

S'il vous plaît contacter Neothings, Inc. pour le support technique qualifié.

Exigences environnementales

Cet appareil est destiné à une utilisation en intérieur.

Ne pas utiliser cet appareil près de l'eau, y compris les dispositifs "de brumisation", des zones éclaboussées, des linges humides, ou la pulvérisation de produits nettoyeurs liquides.

Ne pas installer près de sources de chaleur telles que des radiateurs, registres de chaleur, poêles ou autres appareils (incluant les amplificateurs) qui produisent de la chaleur. La température de l'air ambiant pour l'emplacement d'installation ne doit pas dépasser 40 degrés. C. (104 deg. F.).

Ne pas bloquer les ouvertures de ventilation. L'unité dispose de ventilateurs de refroidissement du système. Pour assurer l'efficacité maximale de

refroidissement, l'installation doit avoir un minimum de 2 pouces d'espace libre circulation de l'air de chaque côté de l'unité.

Débranchez l'appareil pendant les orages ou de longues périodes quand il est pas en usage.

Connexions électriques

L'appareil est fourni avec cordon d'alimentation secteur (s) qui sont essentiels à l'exploitation sûre de cet équipement. Ne pas remplacer d'autres cordes, car cela pourrait compromettre la sécurité et annuler la garantie. Contactez Neothings Tech Support pour les cordons de remplacement.

Ne pas contourner le dispositif de sécurité de la fiche de mise à la terre, qui possède deux lames et une troisième broche de mise à la terre. Si la fiche fournie ne rentre pas dans votre prise, consultez un électricien pour le remplacement de la prise obsolète.

La tension alternative, et les exigences actuelles, la fréquence sont inscrites à l'arrière du châssis, près des connecteurs AC. Branchez l'appareil à une prise secteur facilement accessible (s). Si l'appareil fonctionne mal, comme toute émission de fumée ou d'odeur, débranchez le cordon (s) d'alimentation immédiatement.

Protéger le cordon d'alimentation d'être pincé, serti, coupe, ou autrement soumis à une contrainte mécanique anormale et l'usure.

Même si l'appareil a été éteint, il est pas déconnecté du secteur. Pour établir des connexions et des changements de routine d'entrée / sortie (I / O) des câbles, débranchez le cordon d'alimentation secteur (s) de l'arrière de l'appareil. Après tous les O / I câbles ont été connectés, restaurer les connexions d'entrée d'alimentation AC.

Périphériques

Utilisez uniquement des fixations, des câbles et autres accessoires fournis ou spécifiés par Neothings, Inc.

Assurez-vous que tous les câbles d'E / S ne sont pas étirés, écrasés, serties, ou tirés étroitement contre des arêtes vives.

System Installation

Rack Mounting

CAUTION: TO AVOID DROPPING UNSECURED POWER SUPPLY UNITS ON THE FLOOR, REMOVE THEM FROM THE SYSTEM PRIOR TO LIFTING THE UNIT INTO THE RACK.

Your Tahoe system ships with the rack mounting ears attached to the chassis. Installing the unit into the rack will usually require two persons; one to hold the unit in place and another to install the rack rail screws (not included).

The Tahoe system should not be mounted on sliding rack rails or drawer slides. It should instead be mounted directly to the vertical rack rails.

Although the actual unit weight will depend on the configuration, the person holding the unit should be capable of lifting 25 lbs.

Power Supplies

Each power supply in your system requires its own AC power cord to be plugged in.

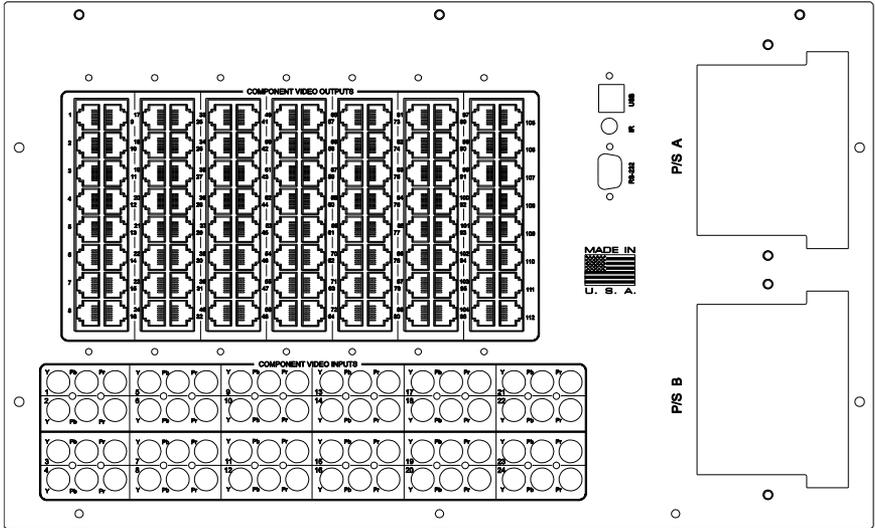
LED Functions

- **RED** – Power is applied. If the LED remains red for more than four seconds, remove the power supply from the system and reinsert. If the power supply still will not enable (green), it may be defective. Contact technical support for further instructions.
- **GREEN** - The Tahoe-Veo system senses that it is operating normally.

If your system was equipped with one power supply from the factory, and you are now ready to install a second power supply, you will need to:

- Remove the blank cover and install the second power supply
- Use the system setup menu to enable faults from the new power supply. Refer to page 13, “System Setup Menu”.

Inputs and Outputs



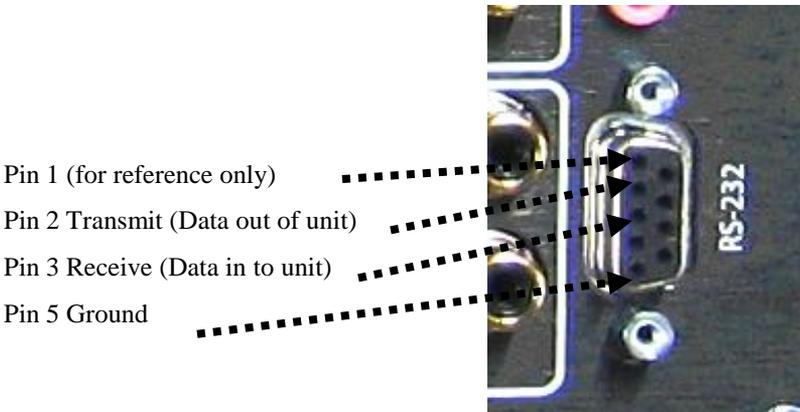
All signal and control connectors are on the rear panel. All signals are low voltage, but we still recommend removing AC power from the matrix when making the connections (connect AC power last).

Connector Labels	Signal type(s)
Y, Pb, Pr	High definition component video inputs
1 - 112	High definition component video outputs over Cat5
IR	Input for unmodulated IR control signal via 3.5mm 2 conductor plug (tip = signal)*
RS232	Serial port for control (bidirectional)
USB	USB port for control. Software is provided to setup USB as a virtual serial port. See the Serial Protocol and USB Driver Installation section of this manual
AC 90-240VAC	AC power inputs (50-60Hz) via IEC320 appliance inlet. Connect last, after all I/O cables

*Some IR repeater systems are designed to work only with their own IR blasters, and a common “workaround” is to cut these blaster cables and add a 3.5mm plug on the end. In some cases, repeater systems will have noise that prevents signals from being decoded.

RS-232 Connection Details

The serial port is wired as a DCE device, and should be connected to a computer’s RS-232 port with a straight through cable. Connection to most control systems should be with a straight through type serial cable, such as the cable provided with the matrix switch. For the command protocols, see the Serial Protocols section of this guide.



Cat5 Cables and Receivers

HD Video Quality & Cable Length

The Tahoe-Veo system supports several types of NeoPro Cat5 receivers for different applications.

Active Receivers

Falcon – can be used from 1 foot to 1,000 feet cable lengths. The Falcon has an auto equalizer that detects the cable length and adjusts the built in line equalizer for optimum picture quality.

Passive Receivers

Raptor – can be used from 1 foot to 125 feet. No cable loss equalization is performed, but produces a high quality image for a lower cost.

System Design Note

Your Tahoe-Veo system supplies the power to the active ‘Falcon’ receiver, however it is not designed to power 112 active receivers on all ports simultaneously. In most cases the number of active receivers used will be much less than the passive receivers, and this will not be an issue.

If your system has only one power supply – You can use up to 40 active receivers. There is no limit on the number of passive receivers.

If your system has two power supplies – You can use up to 80 active receivers. There is no limit to the number of passive receivers. Hot swapping is supported and the system will stay running on the single supply until a replacement is available, however we do not recommend long term use with a single supply when using the maximum number of active receivers.

TIP: ONLY USE NEOPRO CAT5 RECEIVERS WITH THIS SYSTEM. USING THIRD PARTY CAT5 RECEIVERS OR BALUNS CAN CAUSE DAMAGE TO THE SYSTEM AND IS NOT COVERED UNDER THE WARRANTY.

CATx cable types

Output cables can be Cat5, Cat5e, or Cat6. When using passive receivers (Raptor), the best performance will come with Cat6. When using active receivers, best performance will come with Cat5e. The performance difference between the cable types is difficult to perceive on the display, so for most purposes any cable from Cat5 to Cat6 will do.

Cable Termination & Installation

TIP: WHEN CONNECTING VIDEO CABLES OR CAT5 CABLES, REMOVE THE AC POWER TO BOTH POWER SUPPLIES. POWER UP THE UNIT WHEN ALL THE CABLING HAS BEEN COMPLETED.

Before connecting CAT5 cables, make sure the wire pairs are terminated as shown in Figure 1 and Table 1 below. The common standards known as 568A and 568B are electrically equivalent and can both be used so long as both ends are terminated the same way.

Pin	Video Signal Pairs
1	+Y
2	-Y
3	+Pb
4	24 Vdc
5	24 Vdc return
6	-Pb
7	+Pr
8	-Pr

Table 1 - RJ45 connector signal names

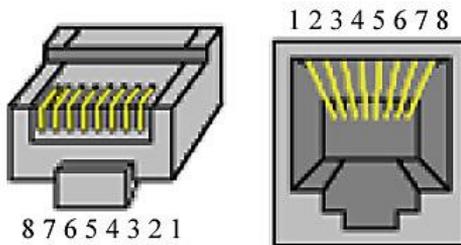


Figure 1 - Identifying pin 1 on the RJ45 connector

The center pair of the RJ45 connector carries 24VDC to the active Cat5 receiver units, and is required. However if using the passive Cat5 receiver units, the center pair can be utilized for other signals such as IR. When doing this, make sure that both ends of the cable have the center pair removed before connecting to the switch system and the Cat5 receiver.

The matrix system is designed to drive only one Cat5 receiver per output port. Do not split the Cat5 signal to additional Cat5 receivers.

Grounding

In most structures, modern three wire outlets will power all the equipment and provide a safety ground. However as systems are upgraded over time, and add-

on work might not be completed to the National Electric Code (NEC), the ground system can become compromised. For your A/V system, this may not only affect performance, but may also leave the equipment susceptible to surge damage.

Your Cat5 receivers have basic surge suppression circuits built in, so for best performance and protection, either the display or the Cat5 receiver should be grounded. A display with a three wire AC plug meets this requirement, but if the display has a two wire plug, you should ground the Cat5 receiver directly to the AC Outlet.

We highly recommend checking the AC ground at each display outlet and rack location to ensure proper wiring and compliance with the NEC.

When using external Cat5 surge suppressors to further protect your system, the ground connection is absolutely required as the surge suppressor only works when properly connected to ground.

Testing Cables Prior To Use

When using Cat5 cable testers/certifiers, the cable should map each pin straight across (i.e. 1 to 1, 2 to 2, through 8 to 8).

Operation

Overview

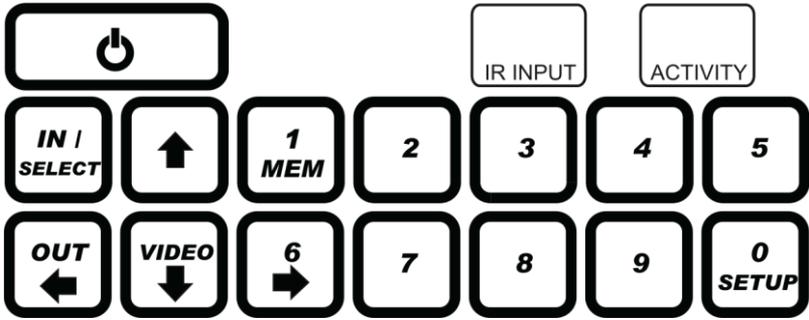
Generally there are three ways to control the matrix switch:

- 1) Front panel buttons
- 2) IR remote
- 3) Serial commands (RS232 or USB)

This section of the user guide deals with the front panel and IR remote methods. Serial commands are discussed in the section titled “Serial Protocol” further down in this document.

Front Panel Control

The front panel uses NeoTouch™ technology, which senses a human finger touching the panel without any moving parts. The buttons also have LED indicators which will help you understand what mode the system or menu is in at any time. The front panel is shown below.



IR Remote

The factory IR remote (optional) is shown below. Although the button locations are not exactly the same as the front panel, they serve the same purpose. The system recognizes a button press the same regardless if it came from the front panel or the IR remote (unless either is disabled, which will be discussed later).



IR Inputs

Located on the front panel is a small box labeled “IR Input” where IR codes can be received. If your system makes use of IR emitters from a control system, this is the correct location to attach the emitter.

On the rear panel of the system is a pink colored 3.5mm jack labeled “IR”. If your control system supports it, you may alternately connect directly to the matrix system. Note that this IR jack is for unmodulated IR codes, not simply IR emitters converted to 3.5mm plugs. If your system is unable to remove the IR modulation carrier, then attach the emitter to the front panel only.

Discrete IR Codes

The number of button presses required to route video can sometimes be too long when automating the IR button presses in a complex macro program. To solve this, a unique, or *discrete* IR code has been assigned to each input and each output. Using this method, any switching function can be triggered by using only two short IR codes.

For further information on programming of remotes and control systems, you may download the discrete IR codes (HEX format) from our website:

<http://www.neoprintegrator.com/toolbox.php>

Power

Via Front Panel



A single touch of the power button turns the unit on. To prevent an accidental power down, two button presses are required to shut down the matrix. The power function disables all of the video outputs, however does not completely power down the matrix system.

Via IR Remote

There are three power buttons on the IR remote.

Power Toggle – Changes power state from current state

Power On – Always turns on, regardless of current state

Power Off – Always goes to standby, regardless of current state

Standby Mode

When in Standby Mode, all outputs are virtually disconnected. In this state, the switch can still execute commands from the serial port, just in case your control system or remote did not turn it on first.

In Standby, any command received will not be saved. Thus, when the switch is powered back on, the most recent switch state before the unit was powered off will be reloaded.

Front Panel Text Display



The menu system will be displayed on the front text display as shown above. The screen shown here is called the ‘home’ screen. If you navigate away from this screen either for setup, or checking status, or are in the process of entering a switch routing command, eventually you will end up back at the home screen when you are done or because no buttons were pressed for 30 seconds.

If your system has any faults, they will only be viewable when you are at the home screen.

Switching Using the Front Panel or IR

When powered on, the IN button will start a switching command. The text on the display will guide you through the correct buttons, and should look like this:



Follow the prompts on the display to complete the switching command.

The basic routing sequence is shown below, where XX represents the two digit input number and YYY represents the three digit output number.

Routing Function	Key Sequence
Switch video and audio from input x to output y	IN, X, X, OUT, Y, Y, Y
Switch input X X to all outputs	IN, X, X, OUT, 0, 0, 0
Disable output Y Y Y	IN, 0, 0, OUT, Y, Y, Y

Matrix Routing Status



Starting from the home screen, you may view the connection status of the matrix inputs and outputs by using the ◀ and ▶ arrows. The front panel display steps through the outputs, and will display what input source is currently routed to each output.

If you have the preview monitor option, the preview monitor will automatically switch to the output number currently displayed on the text display. In this mode, the preview monitor follows the output port.

Use the Power or Exit Button to exit and return to the home screen. The output status display will close automatically after a 30 second period when no buttons have been pressed.

System Setup Menu



From the home screen, pressing the Setup button will take you into a series of setup options as listed below.

Setup Menu Navigation

Setup Menu Navigation	Key
Enter the setup menu	SETUP
Navigate through the setup menu items by pressing left and right arrows. Going to the next item auto-saves and immediately applies any changes made to the item.	◀ and ▶
Modify the setup item with the up and down arrows.	▲ and ▼
Closes the setup menu without saving changes (of the current item)	POWER or EXIT
Save changes to the setup item and exit	SELECT

Setup Menu Options

Setup Item	Description
SET: Panel LED	Controls the front panel button LEDs. Default is ON .
SET: Disp Lamp	Sets the display brightness to 1 of 4 levels. Default is 100% (full brightness).

Setup Item	Description
SET: AC PowerUp	<p>Controls what the matrix does when AC power is first applied, and how it recovers from a power outage.</p> <p>ON (default) forces the unit to turn on, and the previous switch state will be restored.</p> <p>STANDBY causes the unit to enter Standby mode when AC power is applied.</p>
SET: Touchpanel	<p>Enables or disables the front panel buttons. Default is ON (enabled).</p>
SET: Touchsense	<p>Controls the sensitivity of the front panel buttons. Default is HIGH for fastest front panel response. A lower setting reduces the risk for accidental button pushes or false triggers by outside interference.</p>
SET: Front IR	<p>Enables or disables the front panel IR sensor. Set to OFF to prevent spurious IR signals from controlling the matrix. Default is ON (enabled).</p>
SET: Verbosity	<p>Default is ON, where the matrix echoes responses to any command (via serial, IR, or front panel). When set to OFF, the matrix only echoes responses to serial commands.</p> <p>Note: Memory commands and mute commands will always echo serial responses, regardless of this setting</p>
SET:PM AutoOFF	<p>Turn off preview monitor after 1-60 minutes. Default is 5 minutes. Timer is refreshed whenever the preview monitor changes input.</p>
SET: PS in A/B	<p>This must be set to match the configuration of your power supplies. PS A is the top unit, PS B is the bottom unit. Set to either A, B, or Both depending on your system. Normally this will be preset from the factory.</p>
SET: FaultMode	<p>If a power supply or fan fault occurs but later goes away, the STICKY setting allows the home screen to continue to alert the users. SELF-CLEAR (default) will stop the alert automatically, however you may not be aware of intermittent faults this way.</p>

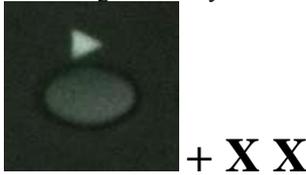
Setup Item	Description
SET: DebugMode	<p>This setting is an information menu where you can look at the parameters that are monitored by the system. There are no changeable settings in this section.</p> <p>SYSCODE – This is a hexadecimal value that will only have meaning to NeoPro technical support.</p> <p>P/S A – displays current voltages from top power supply A</p> <p>P/S B – displays current voltages from bottom power supply B</p> <p>FAN A – displays RPM from top power supply A fan</p> <p>FAN B – displays RPM from bottom power supply B fan</p>

Memory Features

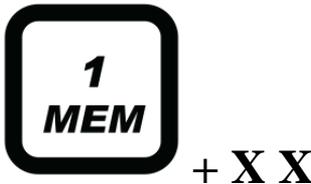
Memory RECALL
Slot 1st Digit

The system memory can have 16 preset ‘scenes’ that can be recalled from the front panel or IR remote. To ensure the system does not get reprogrammed by untrained and unauthorized personnel, the memory functions cannot be changed from the front panel buttons, however they can be stored using the IR remote.

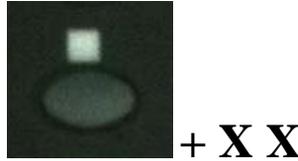
To recall from a memory location from the IR remote, simply press the ‘Recall/Play’ button and the two digit memory slot number.



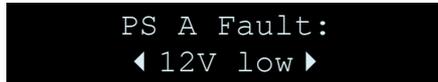
To recall from a memory location using the front panel, simply press “MEM” and the memory slot number:



To store to a memory location from the IR remote, press the ‘Store/Stop’ button and the two digit memory slot number. The system will then store the current switch routing to memory.



Fault Messages



If there are any faults with power or cooling, the user will be alerted via the front panel and the serial port. The details of the serial port messages are detailed in the section titled “Serial Protocol”.

When a fault occurs, the user will see:

- Flashing power (blue) LED and activity (red) LED.
- Message on the front panel with a description of the fault

Sticky Faults

If there is an intermittent fault, and the actual fault later goes away, the LEDs will continue to flash and the fault message will remain on the display. Using the left and right arrow keys will allow you to display multiple fault messages, and finally access the option to clear the fault messages.

Self-Clearing Faults

This is the default operating mode for the system. In this mode, any fault messages will automatically clear themselves if the actual fault is resolved. Although this may reduce questions from the users of the system, it may also cause the users to miss an opportunity to take preventative measures before a fault becomes more severe. An example of this is a fault caused by fan RPM being too low, but only once in a while. Then after some weeks, the fan stops turning all together, and a cooling failure results. Having the sticky faults on may create an opportunity to inspect the fan and remove dust or possibly replace the power supply.

What Actions To Take For Faults

PS A or B 12V High – Abnormal condition, power supply may be defective. Replace immediately.

PS A or B 12V low – System may be overloaded (if only one power supply) or may indicate power supply failure.

PS A or B 24V High – Abnormal condition, power supply may be defective. Replace immediately.

PS A or B 24V low – System may be overloaded with active receivers. If using more than 20 active receivers with a single supply, add a second power supply. If using more than 40 receivers with dual power supplies, reduce the load of active receivers. If the system does not have too many loads, this may indicate a defective Cat5 output cable (could be either the active or passive receivers). Troubleshoot by unplugging one receiver at a time and see if the fault clears. During this type of testing it may be helpful to change to Self-clearing fault mode.

Fan A or B RPM Low or OFF – May indicate the fan is clogged with dust. Remove the power supply units and clean with compressed air. May also indicate a mechanical failure of the fan. Replace the power supply unit or contact the factory for repair options.

Restoring Factory Defaults

This sequence initializes the matrix switch, sets everything to default and clears the memory. **All stored information will be lost—use with caution!**

- Using the power button, place the matrix in the Standby mode.
- Carefully enter the sequence **0 0 7**.

The display will say “Initializing...” and automatically power on.

Adding Output Cards

Overview

These instructions are intended for Neothings authorized service personnel, and not the end users of the system

Adding more outputs to the system can be done by adding one or more Cat5 16 output cards. The following instructions will take you step by step through the process.



TIP: AN ESD (ELECTRO STATIC DISCHARGE) WRIST STRAP WILL BE INCLUDED WITH ANY OUTPUT CARDS THAT ARE SHIPPED SEPARATE. WEAR IT TO PREVENT DAMAGE TO THE CIRCUIT CARDS. (SEE FIG 3)

Opening the System

- 1) Remove all AC power from the system, and disconnect all signal cables.
- 2) Remove the system from the rack.
- 3) Remove the 7 screws from the rear flange of the top cover.
- 4) Remove the 4 side screws from the top cover (2 on each side).
- 5) Slide the top cover back, and then off of the system chassis.
- 6) Remove 2 screws and slot blank cover from the rear panel. Save the screws for later. The blank cover can be discarded.

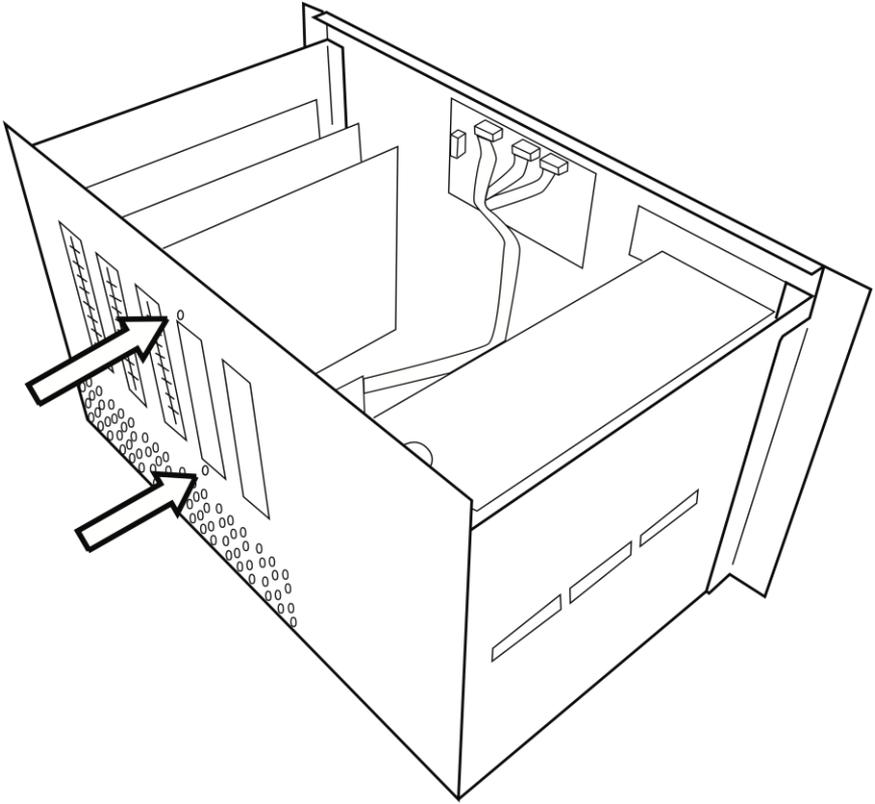


Figure 2 - Save these two screws for attaching add-in card.

Installing the Cards

- 1) Put the ESD wrist strap on your wrist and attach the clip end to the system chassis.
- 2) Remove 16 output card from its ESD safe bag.
- 3) Install into the lowest numbered slot in the backplane board. Insert edge connector in a straight down motion not angled. Push firmly to ensure it is seated all the way.
- 4) Install 2 screws through the rear panel and into mounting brackets on the 16 output card.
- 5) Replace the top cover, the 4 side screws, and the 5 rear flange screws.

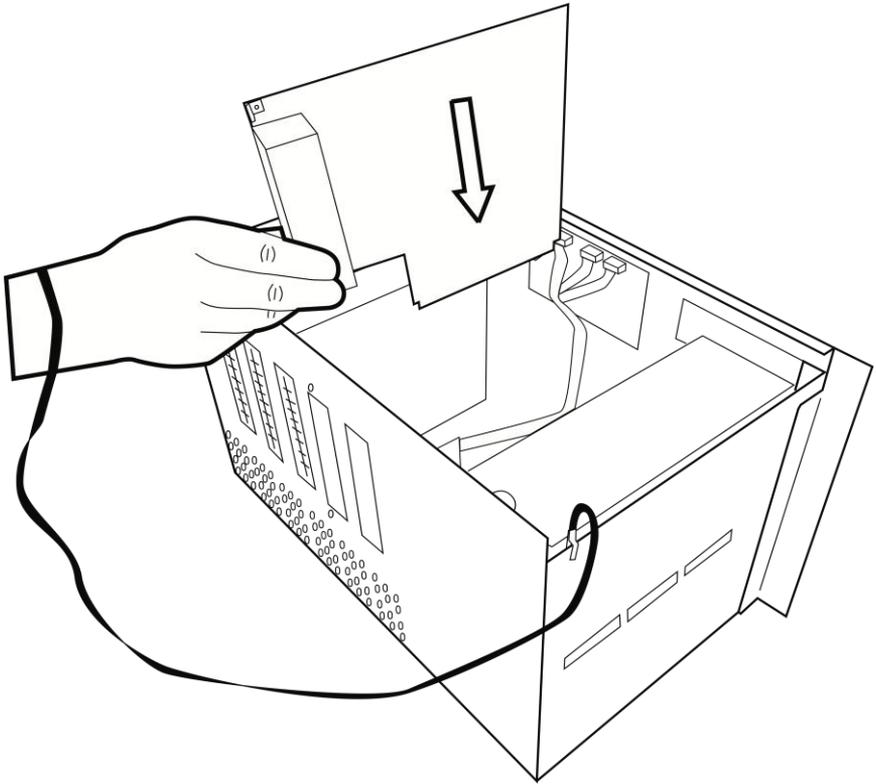


Figure 3 - Always wear ESD strap while handling the boards

Returning to Service

- 1) Reinstall the system into the rack.
- 2) Reinstall all signal cables.
- 3) Reinstall AC power cords and power up the system.

At this point the physical installation is complete. There are no setup menus to change to make the system aware of the new cards. They will automatically be recognized and utilized.

Adding and Hot Swapping Power Supplies

Overview

Removing and replacing power supplies is designed to be quick and easy on this system, so the instructions are brief. However if your system originally only had one supply and you are adding the second one, there are a couple of setting changes. After adding a second power supply, you will need to make the system aware of the second power supply so that it will include any faults from the new power supply. See the section titled “System Setup Menu” to change the PS A/B options to “Both”.

When hot swapping the power supplies, the system will indicate faults while a power supply is not present. This is normal, and can be cleared after the power supply is inserted and powered up.

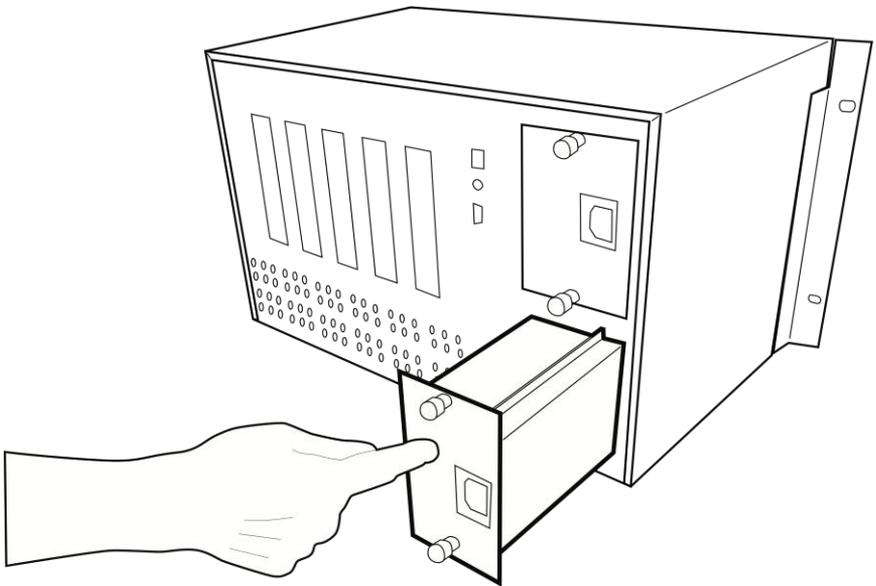


Figure 4 - Installing additional power supply

Serial Protocol

Serial Port Settings

The serial port operates at 115.2k baud, no parity, 8 data, 1 stop. No hardware flow control is used.

Conventions In This Manual

In the examples given in this section of the manual, the serial strings to send are highlighted like this:

```
[TV, 01, 80] .
```

Some examples may require you to ‘fill in the variables’ before they actually work. In these examples we will italicize the text like this:

```
[TV, XX, YY]
```

Commands Overview

Commands are structured so that a control program has two-way communication with the matrix. The control system can confirm and store the state of the matrix switch. These commands are also human readable ASCII text, which will help in troubleshooting and testing.

The matrix may also be controlled with one way serial communications.

Common Structures and Syntax

Commands are not case sensitive. Upper and lower case characters are used in this manual, but have the same effect.

Numbers are 1 to 3 digits, (leading zeroes are optional).

Spaces are not permitted within the square braces—they will generate an error.

A command is always wrapped in square braces:

```
[command]
```

It is not necessary to follow the command by any carriage returns or other special characters. The closing brace will trigger the switch to process the command.

The switch will only attempt to process a command between matching [] braces, so any characters before and after the braces is discarded. If there are

invalid characters/values/command between the braces, they will be processed, and the switch will echo the bad command and return an error **[E]**.

Within a command or response, there will be one or more fields, separated by commas:

```
[TV,1,2]
```

Group Commands

A group command is always wrapped in curly brackets:

```
{ [command1] [command2] [command3] }
```

Group commands are used if the user wants to see one response per command mode inside the group brackets. So if there are two commands in one group bracket, there will only be one response string.

Group commands are also used for memory edit function, this will be discussed later.

One-way Commands

One-way commands, (where there is no programming that depends on feedback) can be sent to the matrix at any time, regardless of the state of the matrix (e.g. on Standby mode).

Response to Commands

The serial port does not echo characters or ASCII codes sent, so the only characters sent back are the response to commands. When a valid command is received and executed, code indicating the status of the entire matrix is returned.

The response will be in curly brackets { }, like in a group command, and can be used as a command back to the matrix or be used as an input to memory edit function.

Errors

Any command with invalid parameters or a syntax error will result in a response of:

```
[E]
```

Switching Protocol

Switching commands use this structure:

```
[TV, ii, oo]
```

ii is the one or two digit source input number. If this number is 0, then the selected output will be disabled.

oo is the one or two digit output number. If the number is 0, then the selected input is routed to all outputs.

Serial Control Examples

Here are a few examples of serial control code:

```
[TV, 1, 2]
```

Routes input 1 to output 2

```
[TV, 0, 12]
```

Disables output 12

```
{ [TV, 1, 0] [TV, 3, 6] [TV, 12, 80] }
```

Group command that first routes input 1 to all, then routes input 3 to output 6, then routes input 12 to output 80.

Setup Protocol

Setup commands have 3 parameters:

```
[S, x, n]
```

S invokes the Setup function

The table below lists values for *x* and *n*:

<i>x</i>	<i>n</i>	Setup function
L	0	Led OFF
L	1	Led ON
R	0	IR OFF
R	1	IR ON
B	0	Front Panel Buttons OFF
B	1	Front Panel Buttons ON
V	0	Verbosity OFF
V	1	Verbosity ON
D	25	Display Brightness 25%
D	50	Display Brightness 50%
D	75	Display Brightness 75%
D	100	Display Brightness 100%

x	n	Setup function
S	L	Front Panel Sensitivity LOW
S	M	Front Panel Sensitivity MEDIUM
S	H	Front Panel Sensitivity HIGH
A	0	On Power Up – STANDBY
A	1	On Power Up – ON
K	1	Fault mode sticky
K	0	Fault mode self-clearing
T	1-60	Turn off preview monitor after this amount of time in minutes.
P	A	Only PS A present (masks errors from PS B)
P	B	Only PS B present (masks errors from PS A)
P	C	Both PS A & B are present

Power Control

The power ON command is:

[P, 1]

The power OFF command is:

[P, 0]

Preview Monitor Control

The Preview Monitor can be control in two ways. One is mentioned in the previous section “*Matrix Routing Status*” above. Using that method, the preview monitor will follow the OUTPUT being selected from the front panel. The second method is via serial control, which is detailed here. Using this method, the preview monitor is commanded to display an INPUT.

The Preview Monitor can be switched via serial/USB command as follows :

[PM, ii]

Where *ii* is the two digit input number 01 through 24.

Example of displaying input 1 on the preview monitor:

[PM, 01]

Query Commands

x is the first letter of model name. Responses are in { } brackets.

Command	Result
---------	--------

[?V]	Firmware version
[?P]	Power status
[?S]	Setup values
[?S,C]	Returns fault codes
[?TV]	Switching matrix state. Responses can be re-used as input back to the matrix switch.

Memory Protocol

Memory functions enable the user to store, recall, view, and edit switch configurations. There are 16 memory locations available, designated 1-16.

The Memory Command structure begins with **M**:

[M,x,n]

x	n (memory location)	Memory Function
S	1-16	Store current state to memory location <i>n</i>
R	1-16	Recall memory location <i>n</i>
V	1-16	View memory location <i>n</i> via serial
C	1-16	Clear memory location <i>n</i>
E	1-16	Edit memory location <i>n</i>

Memory function stores all input-output combinations in the matrix switch.

Memory Edit

Memory edit allows the user to modify the contents of a memory slot. To do this, send the memory edit command then send a group command:

[M,E,n]

{ [command1] [command2] [command3] [command4] }

n is the memory slot to edit

For this code format, note:

- These commands will be stored in the memory location, but will not be executed.
- The memory edit function only accepts switch commands, including volume & tone commands.
- The commands can contain a time parameter, as used for audio transitions.

- While memory edit command is active invalid code inside a group bracket { } will be ignored.
- Commands after the closing bracket will be treated as normal commands.
- If no opening bracket is detected right after invoking the memory edit command, the program will exit the memory edit function without saving anything to the designated memory location.

Fault Message Protocol

On the serial ports, when a fault occurs the fault message will be autonomously transmitted to the control system. At any time the control system can query for the current faults by sending,

[?S,C]

The fault message contains a fault code number as shown below. This number must be processed by the control system software to determine what faults are present. Here is an example:

[S,C,12345]

Once the actual fault has been resolved, the system will then transmit the following:

[S,C,0]

To convert the code into useful information, do the following:

- 1) Convert the ASCII string of numbers to a 16 bit integer value.
- 2) Lookup each bit position in the following table to determine what fault or faults are present:

Bit #	15	14	13	12	11	10	9	8
Name	PS A 12V Off	PS A 12V Low	PS A 12V High	PS A 24V Off	PS A 24V Low	PS A 24V High	FAN A Off	FAN A Low

Bit #	7	6	5	4	3	2	1	0
Name	PS B 12V Off	PS B 12V Low	PS B 12V High	PS B 24V Off	PS B 24V Low	PS B 24V High	FAN B Off	FAN B Low

TIP - A SIMPLE WAY TO PROGRAM FOR FAULTS IS TO QUERY "[?S,C]" AND LOOK FOR THE RESPONSE STRING "[S,C,O]". IF THE CODE IS NOT ZERO, THERE IS A FAULT PRESENT.

The verbosity setting [S,V,x] also has an affect on fault messaging through the serial ports. In the default state of verbosity ON (1), the system will transmit faults as they occur and clear themselves. With verbosity turned OFF (0), the system will only send a fault message as a response to a fault query [?S,C].

USB Driver Installation

When using the USB port, the matrix switch will be installed as a virtual COM port. This means that any control program capable of controlling a device through a normal serial port should be able to control the matrix through a USB port.

This driver set is for all versions of MS Windows. Linux and Mac drivers can be made available upon request.

The following steps are for Windows XP, but other versions of Windows are similar.

Step 1 – Connect the USB cable to the matrix and controlling computer.

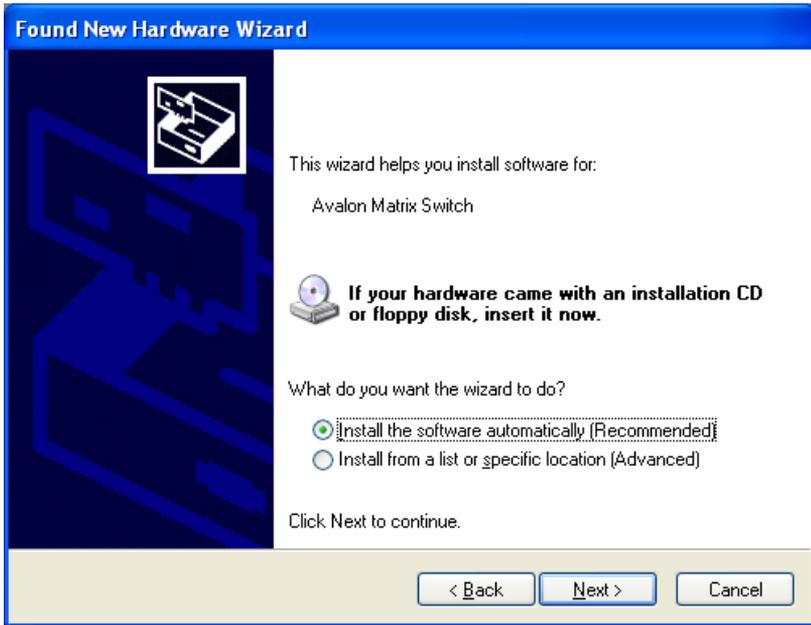
Windows will detect the new hardware, and launch the plug and play wizard.

Step 2 – Found New Hardware Wizard



The first window will attempt to use the internet to find the driver, Select “**No, not at this time**”, and click **Next**.

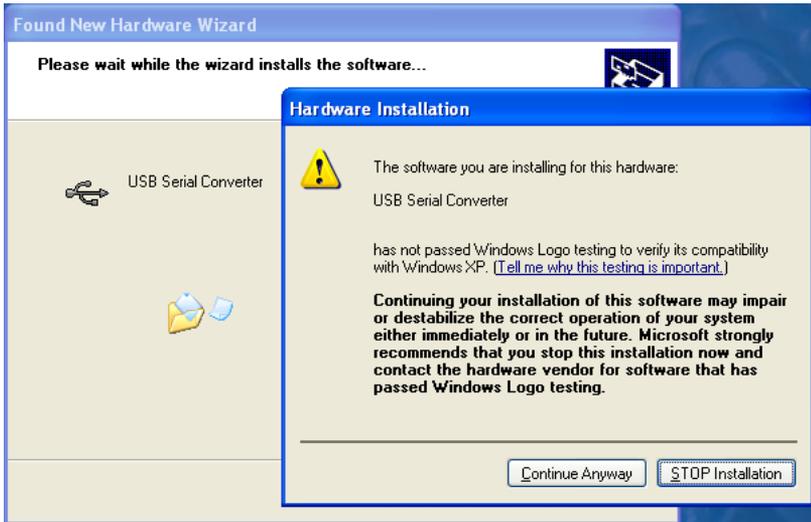
Step 3 – Driver location



The next window attempts to find the driver disc. Insert the driver CD disc in the CD-ROM drive if you haven't already.

Leave the button labeled "Install the software automatically (recommended)" selected, and click Next.

Step 4 – Continue Anyway



Windows will prompt on logo testing. Click “**Continue Anyway**”

Step 5 – Completion of first half



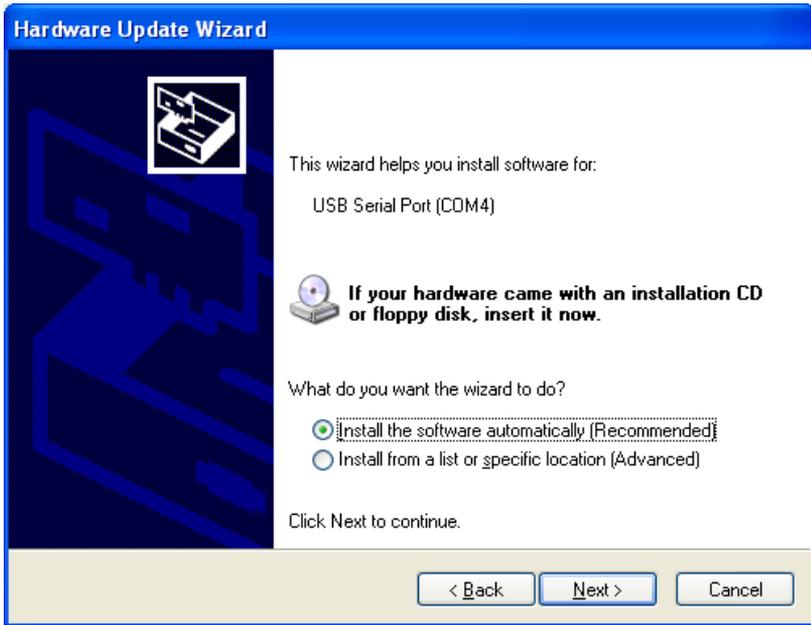
Click “**Finish**”.

Step 6 – Installing virtual COM port driver



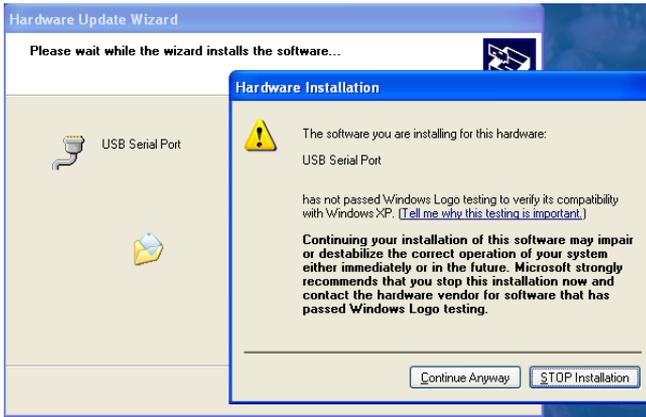
Windows will again start the new hardware wizard to install the virtual COM port driver. Click “**No, not this time**”, then click **Next**.

Step 7 – Finding the driver



Leave the button labeled “Install the software automatically (recommended)” selected, and click Next.

Step 8 – Continue Anyway



Windows will prompt on logo testing. Click “**Continue Anyway**”

Step 9 – Completing the Hardware Update Wizard

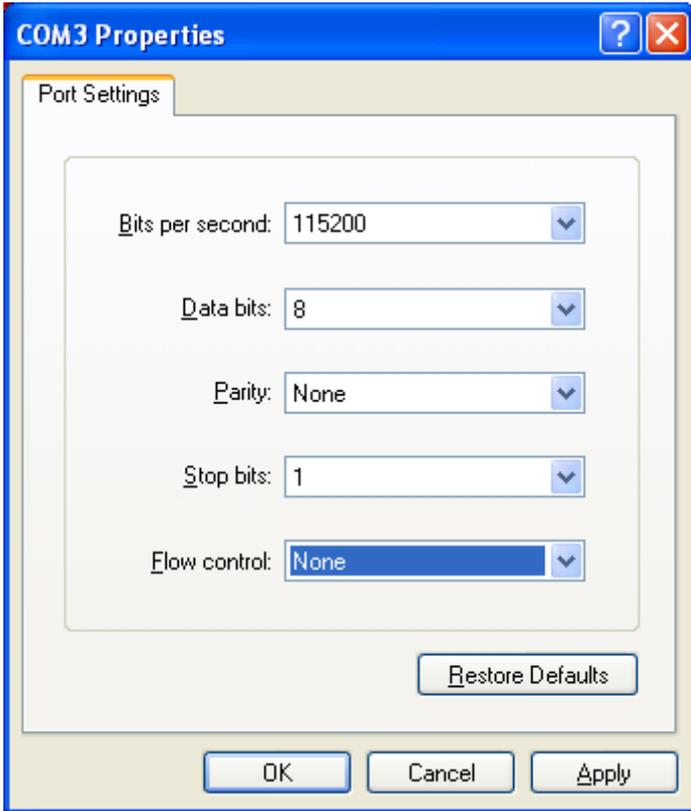


This is the final step, click **Finish**

At this point, the drivers are installed properly.

USB COM Port Settings

Whether using a Windows terminal program such as Hyperterminal, a control application, or a dedicated control system, the baud rate settings are the same: 115.2K baud (change using Bits per second dropdown), 8 data, no parity, 1 stop, no flow control. The COM port shown in the following example may change depending on your system.



Uninstalling the USB drivers

There is typically no harm in leaving the drivers installed in Windows. It is usually best to keep them installed, so that when the device is plugged back in, it will be recognized automatically and is assigned the same COM port number.

However, if you need to uninstall the drivers for any reason, use the Windows Control panel to do so.

To Uninstall:

Click the **Start** Menu

Select Settings, then Control Panel

Click Add or Remove Programs

Find Matrix Switch USB Drivers

Click Change /Remove

Follow the on screen instructions.

Care and Maintenance

The NeoPro matrix switch does not require any regular maintenance besides keeping it clean.

For optimum performance and product life, periodically inspect and clean the ventilation openings in the chassis side panels.

Never use harsh cleaners or solvents on the front panel. There are several dusting products for electronics, and standard glass cleaner may be used.

Spray any liquids onto a towel first, then wipe the front panel with the moist towel.

Should the NeoPro matrix switch fail to operate as expected, please contact NeoPro for service advice.

Specifications

Performance

Component Video

Input coupling	AC
Input impedance/termination	75 ohms
Output coupling	DC
Output impedance	75 ohms source terminated
Output video bandwidth (-3dB)	140 MHz
Crosstalk	Below -80dB
Video modes	480i, 480p, 540i, 540p, 576i, 576p, 720p, 1080i, 1080p
Video vertical rates	24, 25, 29.97, 30, 50, 59.97, 60

Power

Input Voltage	90-240V AC 50-60Hz autosensing
Input Power	275W (fully loaded)
Input Current	2.3A max (at 120VAC)

Physical

Dimensions without rack ears	17"W x 10.4"H x 10.675"D
Weight	25.6 lbs max (fully loaded) (shipping wt. approx. 32 lbs. max)

Notes:

2 Year Warranty

NeoPro warrants this product against defects in material and workmanship for a period of 2 years. This warranty applies to the original end-user purchaser and installation service provider. NeoPro will, solely at its option, repair or replace this product with a functionally equivalent new or factory-reconditioned product during the warranty period. The consumer should contact the installation service provider that resold the product who will in turn deliver the product to NeoPro. All transportation risks and costs in connection with this warranty service are the responsibility of the consumer.

In order to keep this warranty in effect, the product must have been handled and used as prescribed in the instructions accompanying this warranty. This warranty does not cover any damage due to accident, misuse, abuse, or negligence. Repair or replacement, as provided under this warranty, is your exclusive remedy. NeoPro shall not be liable for any incidental or consequential damages. Implied warranties of merchantability and fitness for a particular purpose on this product are limited to the duration of this warranty.

Some states/countries do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. Some states/countries do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state and country to country.



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