



THE "V" IS FOR
VERSATILITY

MANUAL PART NUMBER: 400-0167-001

VM2210BE

V- MATRIX™ BASIC ENCLOSURE

USER'S GUIDE

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This manual covers:

VM2210BE - Basic Enclosure

PRECAUTIONS / SAFETY WARNINGS 1

Please read this manual carefully before using your **VM2210BE** Versatile Matrix™ System. Keep this manual handy for future reference. These safety instructions are to ensure the long life of your **VM2210BE** Versatile Matrix™ System and to prevent fire and shock hazard. Please read them carefully and heed all warnings.

1.1 GENERAL

- Qualified ALTINEX service personnel, or their authorized representatives must perform all service.

1.2 INSTALLATION

- To prevent fire or shock, do not expose this unit to rain or moisture. Do not place the **VM2210BE** in direct sunlight, near heaters or heat radiating appliances, or near any liquid. Exposure to direct sunlight, smoke, or steam can harm internal components.
- Handle your **VM2210BE** carefully. Dropping or jarring can damage the unit. If the **VM2210BE** is not used for an extended period, disconnect the power cord from the power outlet or turn off the main connection.

1.3 RACK-MOUNT INSTALLATION

- Use only ALTINEX supplied **MB1001** rack-mount ears for mounting the **VM2210BE** into a rack.
- The maximum operating ambient temperature is 45 degrees Centigrade.
- When installing the **VM2210BE** into a rack, distribute individual units evenly, otherwise hazardous conditions may be created by an uneven weight distribution. This will reduce heat build up and will prolong the life of the **VM2210BE**. Make sure that the rack is properly grounded.

1.4 CLEANING

- Unplug the **VM2210BE** power cord before cleaning.
- Clean surfaces with a dry cloth. Never use strong detergents or solvents such as, alcohol or thinner. Do not use a wet cloth or water to clean the unit.

1.5 FCC NOTICE

- 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 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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- Any changes or modifications to the unit not expressly approved by ALTINEX, Inc. could void the user's authority to operate the equipment.

ABOUT YOUR VM2210BE 2

Introducing the **VM2210BE**...the world's first Versatile Matrix System by ALTINEX. While almost all matrix switchers claim to offer some level of modularity, the **V-Matrix** is based on a new, unique design concept that provides complete modularity from the inside out.

The core of the **V-Matrix** is a patent-pending component called the Matrix Engine™. Using a special three-dimensional board layout, the Matrix Engine (VM2128ME) handles all of the routing of signals internally. To build a matrix configuration, the Engine is plugged into a Basic Enclosure (VM2210BE), which is then populated with input and output cards.

The cards can be designed to handle a wide array of signal formats and connector types. Also, a single Basic Enclosure can be populated with mixed format cards. The **V-Matrix** System includes both 8-input/output high-resolution video cards and 8-input/output balanced audio cards. Used together with the Matrix Engine and Basic Enclosure, these elements alone enable you to design a huge number of configurations, with sizes ranging from 8 x 8 to 128 x 128 (in increments of 8) and signal formats that include RGBHV, RGBS, RGsB, Component Video, S-Video, Composite Video, Stereo Audio and Mono Audio.

All input and output cards are "hot-swappable" with finger adjustable lock-down screws and secure, positive engagement card-edge connections. The modularity of the **V-Matrix** concept makes it quick and easy to upgrade or repair. The Basic Enclosure can be virtually stripped down to its bare metal essentials and re-built with user-friendly "pluggable" pieces without removing it from the rack.

In fact, for mission critical applications, it is quite feasible to keep a spare Matrix Engine available that can be swapped out through the front panel without ever removing the basic enclosure from the rack or unplugging any of the cables connected to the back panel. Even the dual AC power supply is completely removable and swappable.

The **V-Matrix** Basic Enclosure makes use of an innovative cooling system with a chimney-like design that maximizes even airflow through the Matrix Engine and input/output cards. This ensures that the system does not overheat, even in rigorous environments.

Control of the system is made primarily via RS-232, though the back panel also provides a 10 Base-T connection for future network control capabilities. Protocol for input/output selection is both powerful and simple, involving basic, easy-to-understand ASCII commands.

TECHNICAL SPECIFICATIONS 3

| FEATURES/ DESCRIPTION | VM2210BE – 10U Basic Enclosure |
|----------------------------|-----------------------------------|
| Width (enclosure) | 16.3in (414mm) |
| Width (w/rack mount sides) | 19.0in (483mm) |
| Height | 17.3 in 439 mm |
| Depth | 17.6 in 447 mm |
| Depth (w/front handles) | 19.9 in (505 mm) |
| Weight | 89 lb. (40 kg) |
| Material | Al 0.1" and Steel |
| Finish | Black |
| Front/Back Panels | Al 0.1"/Steel 0.047" |
| T° Operating | 10°C-40°C |
| T° Maximum | 50°C |
| Humidity | 0-45% non-condensed |
| MTBF (calc.) | 40,000 hrs (min.) |
| Input Card Slots | 16 |
| Output Card Slots | 16 |
| RS-232 Inputs | (2) 9-pin D Female |
| 10 Base-T Network Input | |
| Power | 90-265V AC |
| Power Consumption | 300 watts max. |
| Convenience AC Outlets | 3 (Edison Connectors) |
| Convenience AC Power | 10Amp max |

Table 1.

DESCRIPTION OF VM2210BE

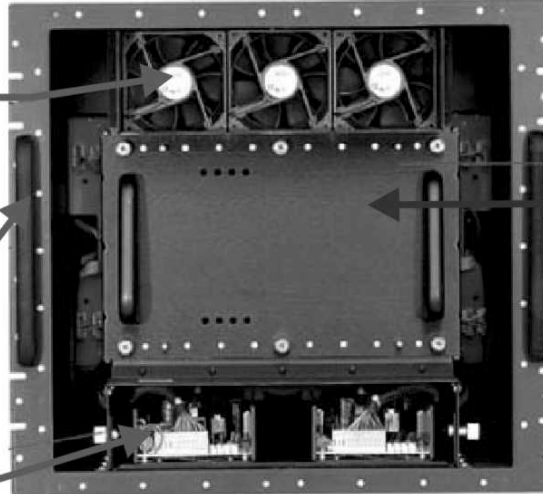
4

FRONT PANEL (SHOWN WITH COVER REMOVED)

Triple internal fans pull even airflow over all components through chimney-like design

10 U High Basic Enclosure

Dual power supply is easily replaceable (covered by filter when front panel is in place).



The Matrix Engine handles routing of all signals internally. Can be removed by unfastening lock-down screws and pulling on inside handles.

BACK PANEL

16 hot-swappable input card slots. Accepts either video or audio in any slot. Unused slots covered with blank panels.

RS-232 connection for remote control
10 Base-T connection for network control

Triple back panel fans work together with internal fans for maximum cooling power

Power input connection (90-265V AC)

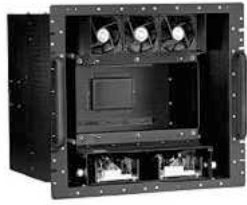
Three AC power outlets provided for convenience



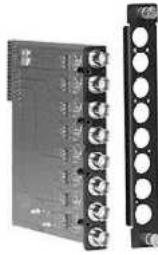
16 hot-swappable output card slots. Accepts either video or audio in any slot. Unused slots covered with blank panels.

4

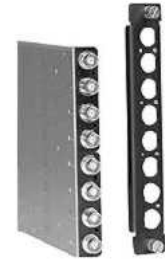
How to Build a V-Matrix Configuration



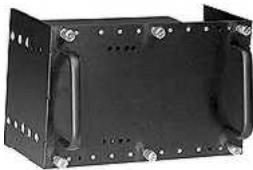
VM2210BE & VM2218PS
Basic Enclosure & Power Supply



VM2143VS
8-in Video Input Card



VM2144VS
8-out Video Output Card



VM2228ME
Matrix Engine



VM2141AU
8-in Audio Input Card



VM2142AU
8-out Audio Output Card

| Example A | | Example B | | Example C | |
|---|----------|--|----------|--|----------|
| 128 x 128 Composite Video Matrix Switcher | | 128 x 128 RGBHV + Stereo Audio Matrix Switcher | | 64 x 64 RGB + Mono Audio Matrix Switcher | |
| Parts Required | | Parts Required | | Parts Required | |
| Qty. | Part # | Qty. | Part # | Qty. | Part # |
| 1 | VM2210BE | 7 | VM2210BE | 2 | VM2210BE |
| 1 | VM2128ME | 7 | VM2128ME | 2 | VM2128ME |
| 1 | VM2218PS | 7 | VM2218PS | 2 | VM2218PS |
| 16 | VM2143VS | 80 | VM2143VS | 24 | VM2143VS |
| 16 | VM2144VS | 80 | VM2144VS | 24 | VM2144VS |
| | | 32 | VM2141AU | 8 | VM2141AU |
| | | 32 | VM2142AU | 8 | VM2142AU |

INSTALLING YOUR VM2210BE 5

Step 1. Connect the power entry connector of the **VM2210BE** to the power outlet with the provided power cord. The power supply is universal and will work throughout the world with voltages from 100V to 240 VAC.

Step 2. Turn on the power switch of the **VM2210BE**. The power LED on the front panel will turn red indicating that the unit is on. A green status LED indicates that the system is operating properly.

OPERATION 6**6.1 RS-232 CONTROL**

Control of the **VM2210BE** is made primarily via RS-232, though the back panel also provides a 10 Base-T connection for future network control capabilities.

6.1.1 RS-232 PROTOCOL

The RS-232 protocol for input/output selection is both powerful and simple, involving basic, easy-to-understand ASCII commands. Protocol for the **VM2210BE** uses a simple ASCII character format.

1. Square brackets “[]” are part of the command.
2. Use uppercase letters for all commands.

6.2 RS-232 COMMANDS

Each command can have suffix **F** for feedback. [lxxxOnnn] would connect input to output. [lxxxOnnxF] would also provide feedback in the form of [OK]. If error is occurred during command processing an [ERR] will be sent out. All commands can be capital, small or mixed letters.

[rset] = [RSET]

△ **Commands marked with this symbol write into non-volatile memory. These commands should not be used as a part of a control program to operate the switcher. Since these commands write into the non-volatile memory, limited amount executions is available before the memory need to be replaced. Most of these commands can be safely issued about 5,000 times.**

1. [SETUPr,x,y,n,m,k,l(F)]

Configure matrix switcher for proper partitioning. Optional F at the end of the command provides feedback [OK]. The 128x128 matrix can be configured to have up to 9 smaller matrices inside. The simple example would be to build 16x16 RGBHV and Video switcher from a single 128x128

switcher. You must save this information using [SAVESETUP] command. Without saving it the information will be lost when power is disconnected.

- r** – matrix number 1-9
- x** – input offset for matrix 0-9999 (factory default 0)
- y** – output offset for matrix 0-9999 (factory default 0)
- n** – number of inputs 1-128 (factory default 128)
- m** – number of outputs 1-128 (factory default 128)
- k** – channel width 1-32 (factory default 1)
- l** – channel Spacing 0-31 (factory default 0)

2. [STARTCODEn(F)]

Command Start Code. Start and End code must be different.

n - < ,./?*&^%\$#@!~[]{}()\|”

3. [ENDCODEk(F)]

Command Start Code. Start and End code must be different.

k - < ,./?*&^%\$#@!~[]{}()\|”

4. [BAUDRATEn,m(F)]

Baud Rate.

- n** – Port number (1 or 2 only)
- m** - 300, 600, 1200, 4800, 9600, 19200

5. [SETIDn(F)]

Each matrix switcher can have different ID. Each (ID) identification can be identified as numbers or any combination of numbers or letters up to 10 characters long. If you have Red, Green, Blue signals to switch and you want to switch them individually then you would set id as Red for Green and for Blue. Then you can switch these channels individually. If level id is set to 0 then this level will always switch regardless of the unit ID command issued. [SETIDRed], [setID28], [SetIDblue],[setidAll23] all are legal commands.

- n** – Unit Id. Any 10 alphanumeric characters. Case sensitive.

6. [SAVESETUP(F)] Δ

Save information changed by commands above.

7. [RECALLn,k(P)(F)]

This switcher contains 99 memories. Memory 1 is used during power up sequence. If you want the switcher to come up with specific connections made as default, save these connections into memory 1. Each memory has complete status of all switches and all matrixes. (P) suffixes allows to execute recall without doing any switching. The [SWITCH] command must be used to execute all connections. Example: [recall1,1], [RECALL01,0f], [recaLL98,1F], [recall99pf]

n - memory to recall 1-99

k – defines what to do with inputs that are not connected. 1= force all current connections to be exactly how they are in the stored memory. 0= do not change connections that have no connection in the stored memory.

8. [SAVEn(F)] Δ

This switcher contains 99 memories. Each memory can save complete status of all switches. These memories can be saved using RS-232 commands.

n - memory to save 1-99

9. [SELECTIDn,k,m,...(F)]

Enable selected units. By specifying the ID the selected units will be enabled in addition the already enabled units. Up to 20 unit Ids can be entered at in one command. By default during power up unit is enable and will respond to all commands.

Example:

Add unit 23,45,120, 1,r,g,b to the control group
 [SELECTID23,45,120,1,r,g,b] Same but provide
 feedback [selectid23,45,120,1,r,g,bf]
 [SELECTID0,TEST,Red,Green,Blue] – disable
 all units and enable units with specified ID's
 [SELEctid1] – enable all units

n – Id names

10. [CONNECTm,i,o,i,o,i,o,i...(P)(F)]

Connect input to output and execute command immediately. Up to 32 pairs of inputs and outputs can be switched at the same time. (P) suffix is used to load connections but not to switch them until [SWITCH] command is issued.

m - matrix number 1 to 9

i - input number 1 to 128 (if input number 0 is used that input is disconnected from the selected output)

o - output number 1 to 128

11. [SWITCH(F)]

Switch command immediately connects inputs and outputs together. Usually this command is issued after Path command is used.

12. [MATRIXn(F)]

This command provides feedback on the matrix configuration.

m - matrix number 1 to 9

13. [STATUS(F)]

This command provides feedback on the switcher settings.

6.3 WINDOWS BASED CONTROL SOFTWARE

This Windows 95/98/NT based control software is available from the ALTINEX website at www.altinex.com in the Download section.

TROUBLESHOOTING GUIDE

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We have carefully tested and have found no problems in the supplied **VM2210BE**; however, we would like to offer suggestions for the following:

- Make sure that power is connected to the enclosure and also check to see if the cards are pushed in all the way.
- Make sure that cables are connected properly and fit snugly. Please immediately replace any defective or damaged cables.
- Make sure that video cards connected to the **VM2210BE** have video sources connected to compatible displays.
- Make sure that audio cards connected the **VM2210BE** have audio sources connected to compatible audio equipment.
- If there is problem with the **VM2210BE** please call ALTINEX at (714) 990-2300.

ALTINEX POLICY**8****8.1 LIMITED WARRANTY**

ALTINEX warrants that its products and cables are free from defects in materials under normal use and service. This warranty is limited to repairing at company's factory any part or parts of the product, which upon company's examination shall disclose to be, thus defective. Products considered defective should be returned to company with transportation charges pre-paid within 2 years (90 days for cables) from date of shipment to the purchaser. The warranty is expressly instead of all other warranties expressed or implied. ALTINEX neither assumes nor authorizes any other person to assume for it any other liability in connection with the sale of the products. This warranty shall not apply to any product that shall have been repaired or altered outside of company's factory in any way so as, in its judgment, to affect its stability or reliability, or that has been subject to misuse, negligence, or accident.

8.2 RETURN POLICY

It is very important to ALTINEX that you receive the products that you have ordered and that this product meets your expectations. In the unlikely event, that an ALTINEX product needs to be returned please follow the policy below:

ALTINEX will accept product returns for a period of 30 days from authorized ALTINEX dealers. Products must be returned in an unopened package.

If a product has been opened, the restocking fees will apply. For the restocking fee amount, please contact an ALTINEX Sales Representative.

If the product is in your possession for more than 30 days, the restocking fees will apply.

ALTINEX will not accept any returns on cables or custom products.

If your product is in warranty and needs service, contact the ALTINEX Sales Department for an RMA (Return Material Authorization). Products

returned without an RMA number may experience a delay in service.

If your product is out of warranty and needs service, contact the ALTINEX Sales Department for an RMA (Return Material Authorization). Products returned without an RMA number may experience a delay in service. The service charges will be quoted to you before the actual repairs are done.

8.3 CONTACT INFORMATION**ALTINEX, INC.**

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Brea, CA 92821 USA

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