# Model A-2410MD
# Monitoring Downconverter

# Manual



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# INFORMATION TO USERS IN EUROPE

## NOTE

### CISPR 22 CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the European Union EMC directive. 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.

# INFORMATION TO USERS IN THE U.S.A.

## NOTE

### FCC CLASS A DIGITAL DEVICE OR PERIPHERAL

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.

## WARNING

Changes or Modifications not expressly approved by Evertz Microsystems Ltd. could void the user's authority to operate the equipment.

Use of unshielded plugs or cables may cause radiation interference. Properly shielded interface cables with the shield connected to the chassis ground of the device must be used.

# REVISION HISTORY

| REVISION | DESCRIPTION | DATE |
|---|---|---|
| 0.1 | Preliminary Version | Jan 02 |
| 1.0 | First Release, Updated Installation Instructions | May 02 |
| 1.0.1 | Typographical changes in User Control section. | Jul 02 |
| 1.1 | DIP switch function changes, 720P now supports center crop | Nov 02 |

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## Tables

# 1. OVERVIEW

The A-2410MD is an essential tool for your Panasonic AJ-HDC20A or AJ-HDC27V DVCPRO HD Camera. The A-2410MD uses the HDSDI output from the camera to provide full image downconverted composite analog and SDI outputs for local and remote monitoring. The A-2410MD supports all of the HD video formats from the DVCPRO-HD cameras to allow viewing the signal on standard NTSC or PAL monitors.

The A-2410MD has colour space conversion from ITU rec. 709 to ITU rec. 601, and provides three down converted formats: letterbox, 4:3 side crop and anamorphic squeeze.

The rugged, lightweight A-2410MD attaches directly to the rear of the DVCPRO HD camera and has an integrated battery mount for easy installation and use.

The A-2410MD provides downconverted outputs in SDI and NTSC/PAL.

**Features:**

- Mounts on the rear of the Panasonic AJ-HDC20A or AJ-HDC27V camera
- Powered from battery connector or Ext. DC In connector, power is passed on to the camera
- 2 NTSC or PAL outputs.
- 2 SDI outputs
- Letterbox, 4:3 side crop and anamorphic squeeze down conversion formats
- Auto video standard detection
- ITU rec. 709 to ITU rec. 601 colour space conversion

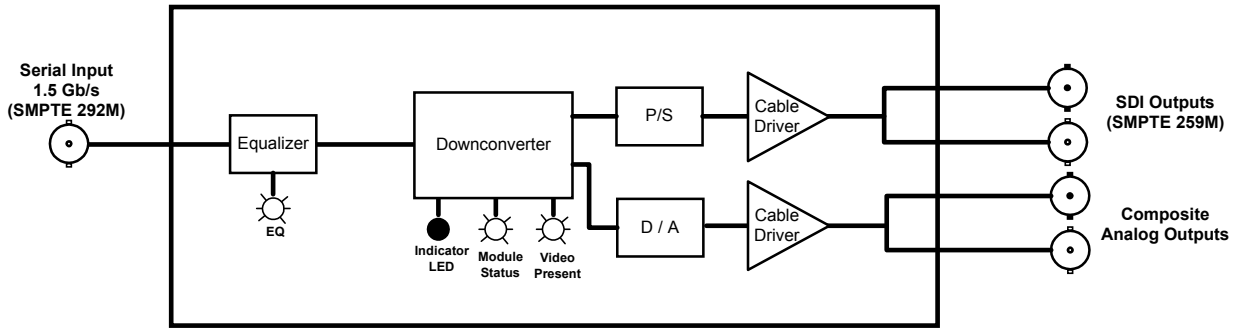


**Figure 1: A-2410MD Block Diagram**

# 2. INSTALLATION

## 2.1. REMOVING THE CAMERA BAUER BATTERY MOUNT

The A-2410MD is designed to mount on the rear of the Panasonic AJ-HDC20A or AJ-HDC27V Camera. It may be ordered with an Anton Bauer, IDX or PAG battery adapter plate.

The camera comes fitted from the factory with a bracket for an Anton Bauer battery pack. This adapter must be removed revealing power connectors on the rear of the camera body. Remove the four screws that hold the battery mount to the rear of the camera body.

**Figure 2: Rear of Camera with Battery Mount Removed**

## 2.2. ATTACHING THE A-2410MD TO THE CAMERA

Remove the U shaped cover plate from the A-2410MD as shown. Feed the camera power connector through the hole in the cover plate, and fasten the cover to the rear of the camera with the screws supplied as shown in Figure 3.

**Figure 3: Mounting Adapter Bracket on the Rear of the Camera**

Attach the AJ2410MD power connector to the connector on the camera and then slide the A-2410MD adapter into the U-shaped cover plate and fasten with four screws as shown in Figure 4.

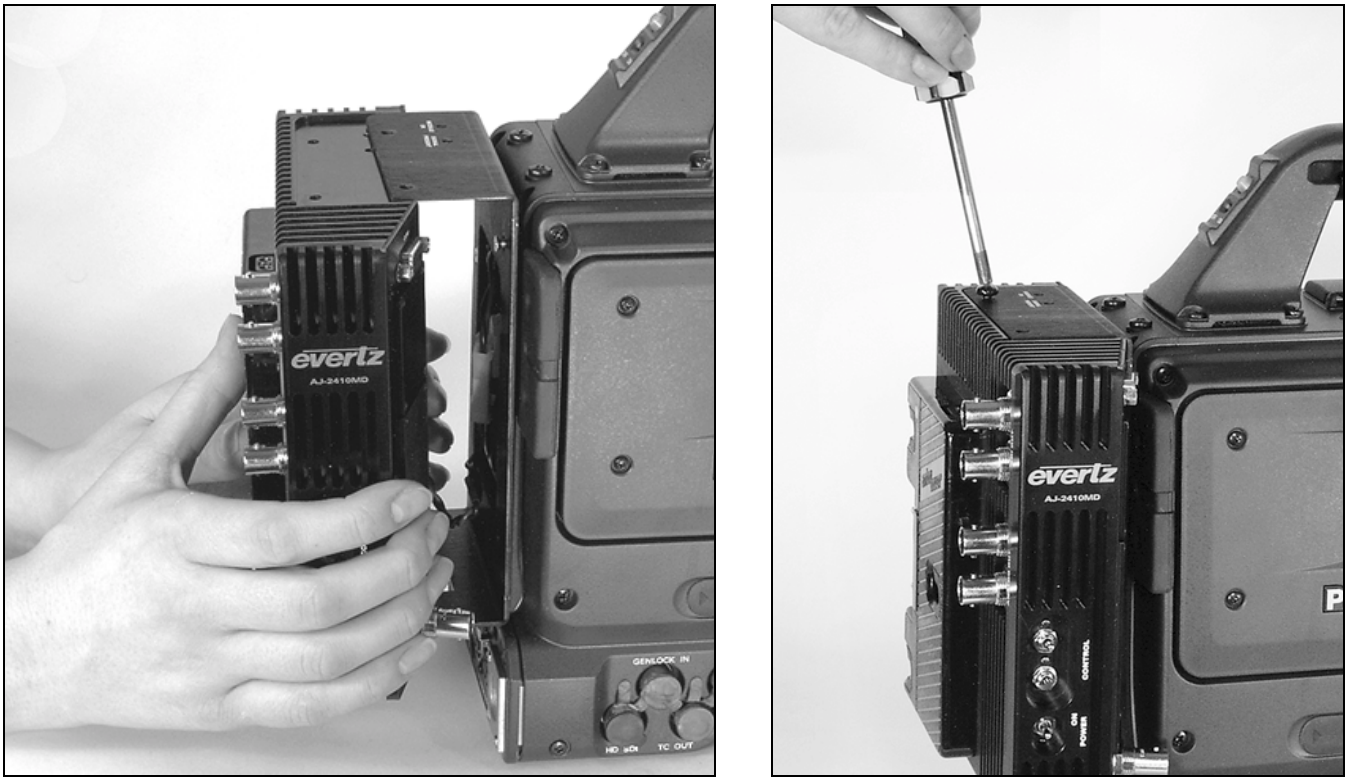


**Figure 4: Fastening Adapter to Mounting Bracket**

When you are done, the adapter should be mounted to the rear of the camera as shown in Figure 5.


**Figure 5: A-2410MD Mounted on Rear of the Camera with Battery**

### 2.3. VIDEO INPUT CONNECTION

Connect the **HD INPUT** BNC connector on the A-2410MD adapter to the HDSDI Video output from the camera. The A-2410MD adapter supports the video formats shown in Table 2.

### 2.4. VIDEO OUTPUT CONNECTIONS

The A-2410MD provides downconverted outputs in serial digital and analog formats. Table 2 shows the downconverter output formats for each video format.

The two **SDI OUTPUT** BNC connectors are used to output the downconverted video as serial component video, compatible with the SMPTE 259M standard.

The two **ANALOG OUTPUT** BNC connectors are used to output the downconverted video from the camera as NTSC/PAL analog composite video.

### 2.5. POWER CONNECTIONS

Power is provided to the A-2410MD from the camera battery or through the 4 pin male XLR EXT DC connector. Apply +12VDC to pin 4 and ground to pin 1 of the XLR.

There is a power switch on the front panel. Press this switch to the ON position to provide power to the unit. Power supplied from the battery or through the EXT DC connector is also passed through to the camera regardless of when the power switch in the On position.

## 3. SPECIFICATIONS

### 3.1. VIDEO INPUT

**Standard:** 1.485 Gb/s SMPTE 292M – autodetect
All standards supported in AJ-HDC20A and AJ-HDC27V cameras (See Table 2). Video standard is auto detected
**Connector:** 1 BNC per IEC 169-8

### 3.2. SDI SERIAL VIDEO OUTPUTS

**Standards:** Serial Component 270 Mb/s (SMPTE 259M-C)
**Connectors:** 2 BNC per IEC 169-8
**Signal Level:** 800mV nominal
**DC Offset:** 0V ±0.5V
**Rise and Fall Time:** 470ps nominal
**Overshoot:** <10% of amplitude
**Return Loss:** > 15 dB
**Wide Band Jitter:** < 0.2 UI

### 3.3. ANALOG VIDEO OUTPUTS

**Number of Outputs:** 2
**Standards:** NTSC or PAL (See Table 2)
**Connectors:** 2 BNC per IEC 169-8
**Signal Level:** 1 V p-p nominal
**DC Offset:** 0V ±0.1V
**Return Loss:** > 45 dB up to 6 MHz
**Frequency Response:** 0.8dB to 4 MHz
**Differential Phase:** <0.9° (<0.6° typical)
**Differential Gain:** <0.9% (<0.5 % typical)
**SNR:** >56dB to 5 MHz (shallow ramp)
**Impedance:** 75 ohm

### 3.4. INPUT TO OUTPUT VIDEO PROCESSING DELAY

The delay between the input HD video's line 1 and the downconverted output video's line 1 is 50 lines of the SD video.

### 3.5. ELECTRICAL

**Voltage:** + 12VDC
**Connector:** 4 pin male XLR or powered from battery Pack adapter
**Power:** 10 watts
**EMI/RFI:** Complies with FCC regulations for class A devices.
Complies with EU EMC directive.

### 3.6. PHYSICAL

**Dimensions:** 6 " H x 6 " W x 2.25 " D
(150 mm H x 150 mm W x 60 mm D)
**Weight:** approx. 1.5 lbs. (0.7 Kg)

## 4. STATUS LED'S

**MODULE OK** This Green LED will be On when the module powered up.

**SIGNAL PRESENT:** This Green LED will be On when there is a supported video signal present at the module input.

## 5. USER CONTROLS

The A-2410MD is equipped with a 4 position DIP switch, located on the bottom of the unit, to allow the user to select various down converted output formats. There is also a toggle switch and pushbutton which are not used at this time.

Table1 gives an overview of the DIP switch functions. Sections 5.2 and 5.2 give details of each of the DIP switch functions. The On position is closest to the camera body.

| DIP Switch | Function |
|---|---|
| 1 | Output Video Standard |
| 2 | Downconverter Format |
| 3 | |
| 4 | Pedestal On/Off |

**Table 1: DIP Switch Functions**

## 5.1. SELECTING THE OUTPUT VIDEO STANDARD

DIP switch 1 is used to set the downconverted output video standard. Refer to the following table to set the output format. The A-2410MD will insert extra fields of some frames to create a 3:2 or 24:25 pulldown on the output video when 23.98 sF or 24 sF video is input. The relationship of the pulldown sequence to the input video will be random. For other input formats, the A-2410MD will insert or remove fields of some frames to create the correct number of output frames.

| Input | DIP 1 ON | DIP 1 OFF |
|---|---|---|
| 1080i/60 | 625i/50 (PAL) | 525i/60 |
| 1080i/59.94 | INVALID OUTPUT | 525i/59.94 (NTSC) |
| 1080i/50 | 625i/50 (PAL) | 525i/60 |
| 1080p/25sF | 625i/50 (PAL) | 525i/60 |
| 1080p/24sF | 625i/50 (PAL) | 525i/60 |
| 1080p/23.98sF | INVALID OUTPUT | 525i/59.94 (NTSC) |
| 720p/60 | 625i/50 (PAL) | 525i/60 |
| 720p/59.94 | INVALID OUTPUT | 525i/59.94 (NTSC) |

**Table 2: Output Video Standard Switch Settings**

## 5.2. SELECTING THE DOWNCONVERTER ASPECT RATIO

DIP switches 2 and 3 are used to select one of three aspect ratio down conversion formats.

| DIP 2 | DIP 3 | Down converted Aspect Ratio Format |
|---|---|---|
| Off | Off | Letter Box |
| Off | On | Letter box |
| On | Off | 4: 3 Center crop |
| On | On | 4:3 Anamorphic Squeeze |

**Table 3: Output Aspect Ratio Selection**

### 5.3. SETTING THE NTSC SETUP PEDESTAL ON THE ANALOG OUTPUT

DIP switch 4 is used to select the whether the NTSC Setup Pedestal will be applied on the Analog Output. The NTSC setup pedestal should not be present when operating in Japan.

| DIP 4 | Output Pedestal |
|---|---|
| Off | Pedestal inserted |
| On | No pedestal |

**Table 4: Analog Output Video NTSC Pedestal Settings**

## 6. UPDATING THE FIRMWARE IN THE A-2410MD

The A-2410MD uses a FLASH memory to hold its firmware. It can be easily updated in the field by connecting a PC to its Firmware Update Port.

#### 6.1.1. Requirements

You will need the following equipment in order to update the A-2410MD Firmware

- PC with available communications port. The communication speed is 57600 baud, therefore a 486 PC or better with a 16550 UART based communications port is recommended.
- "Straight-thru" serial extension cable (DB9 female to DB9 male)
- Terminal program that is capable of Xmodem file transfer protocol. (such as HyperTerminal)
- New firmware supplied by Evertz.

#### 6.1.2. Configuring the A-2410MD for Firmware Upgrades

1. Connect the 9 pin male connector on the straight through serial extension cable to the female 9 Pin D connector on the side of the A-2410MD. Connect the 9 pin female connector on the straight through serial extension cable to the PCs' RS-232 communications port.

#### 6.1.3. Terminal Program Setup

2. Start the terminal program.

3. Configure the port settings of the terminal program as follows:

| | |
|---|---|
| Baud | **57600** |
| Parity | **no** |
| Data bits | **8** |
| Stop bits | **2** |
| Flow Control | **None** |

4. Apply power to the A-2410MD. After the unit powers up, a banner with the boot code version information should appear in the terminal window. The cursor to the right of the word "BOOT>" should be spinning for about 5 seconds then the unit will continue to boot.

For example:

```
EVERTZ 7700PB MONITOR 1.0
COPYRIGHT 1997, 1998, 1999 EVERTZ MICROSYSTEMS LTD.
COLD BOOT |
```

5. The following is a list of possible reasons for failed communications:

   - Defective A-2410MD Serial Upgrade cable.
   - Wrong communications port selected in the terminal program.
   - Improper port settings in the terminal program. (Refer to step 3 for settings).

6. While the cursor is spinning press the <CTRL> and <X> keys on your computer keyboard at the same time, this should stop the cursor from spinning. The spinning prompt will only remain for about 5 seconds. You must press <CTRL-X> during this 5 second delay. If the A-2410MD continues to boot-up, simply cycle the power and repeat this step.

7. Hit the <ENTER> key on your computer once.

8. Type the word “upgrade”, without quotes, and hit the <ENTER> key once.

9. The boot code will ask for confirmation. Type "y", without quotes.

10. You should now see a prompt asking you to upload the file.

### 6.1.4. Uploading The New Firmware

11. Upload the “*.bin” file supplied using the X-Modem transfer protocol of your terminal program. If you do not start the upload within 10 minutes the A-2410MD Boot code will time out. You can restart the upgrade process by removing and reconnecting power to the A-2410MD.

12. The boot code will indicate whether the operation was successful upon completion of the upload.

    For Example:

```
UPLOAD OKAY
7700PB COLD BOOT> |
```

13. The following is a list of possible reasons for a failed upload:

    - If you get the message "transfer cancelled by remote" you must restart the terminal program and load the bin file, then remove and install the module again.
    - The supplied “*.bin” file is corrupt.
    - Wrong file specified to be uploaded.
    - The PCs’ RS-232 communications port can’t handle a port speed of 57600.
    - Noise induced into the A-2410MD Serial Upgrade cable.

### 6.1.5. Completing the Upgrade

14. Type the word “boot”, without quotes, and hit the <ENTER> key once or power cycle the unit. The unit should now reboot.

15. You can now close the terminal program and disconnect the RS-232 serial cable.

16. Replace the side cover plate on the A-2410MD.

The update procedure is now completed.

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