

## DATA SHEET

video processing unit with  
HDMI output for all -XS products



### introduction:

Enable Inc., has developed this module to be used with any of the minnieCam™ -XS or minnieScope® -XS products and offer real-time preview on an HDMI monitor with up to 1Mpixel output resolution.

This is a DVI 1080p - 60fps progressive output Video Processing Unit (VPU) with an HDMI output port (VPU-HDMI-XS) that should be used by those that only intend to display the output of the -XS products onto a monitor. A version of this VPU that outputs in both USB3.0 and HDMI is also available (ENA-10011-AS).

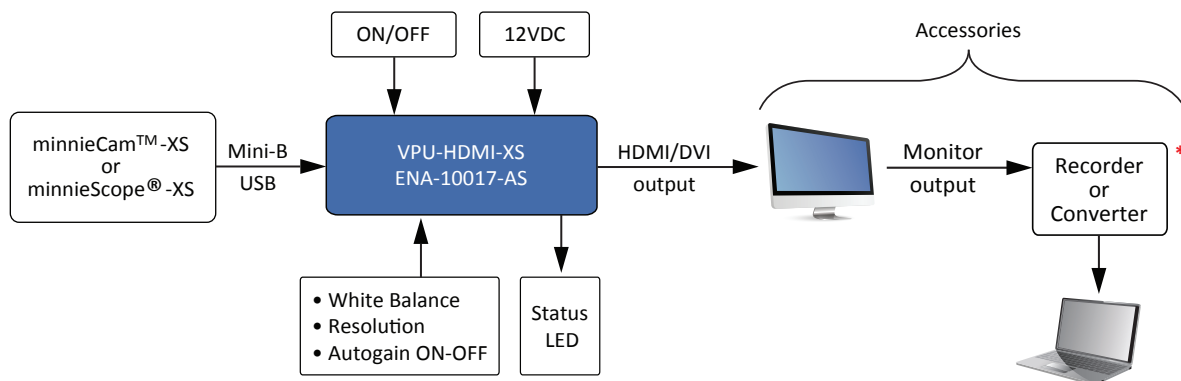
The hardware is compatible with HDMI or DVI monitors. Appropriate adopter (HDMI to DVI) is necessary for DVI monitors (not provided). A universal 12VDC wall plug transformer and HDMI cable are provided with the module.

Enable Inc. also offers additional accessories for recording and storing video or images.

### product features:

- interface for minnieCam™ -XS or minnieScope® -XS products.
- real-time video output support for HDMI/DVI.
- output format HD 1080p at 60fps.
- simple manual White Balance operation.
- interpolation algorithms produce higher resolution video outputs.
- Resolution button toggles among several video output formats; higher in resolution than the native 400x400.
- max of 1Mpixel output available.
- autogain function and autoexposure control built in.
- Autogain ON/OFF capability also available.

### block diagram:



\* See "recording accessories" section for more details

### product specifications: ENA-10017-AS

#### electrical characteristics:

video output	DVI 1080p 60fps progressive
input voltage <sup>1</sup> (2.1mmx5.5mm receptacle): male center positive	DC 12V typ. 7.5V min / 12V typ. / 18V max
current consumption @ 12V	200mA typical 155mA min/290mA max

#### input/output:

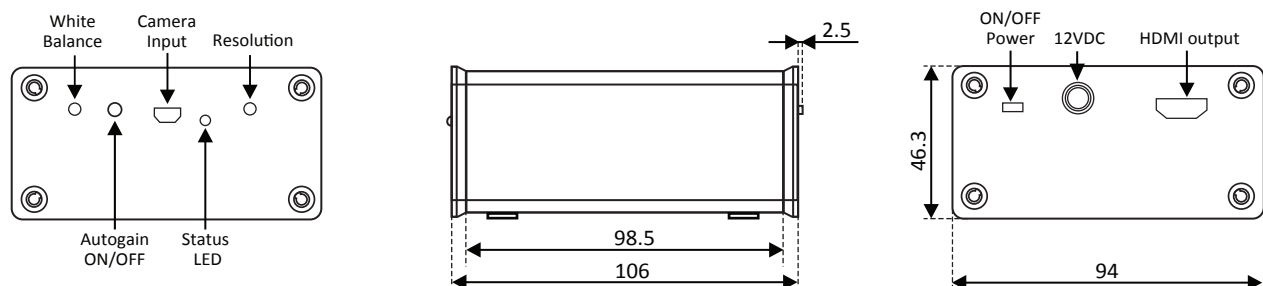
output video port <sup>2</sup>	HDMI (type A)
camera input port <sup>3</sup>	Mini-B USB 5pin
status LED <sup>4</sup>	indicates different functions
keyboard (2 buttons)	White Balance (WB) Resolution <sup>5</sup> (400x400) to (1000x1000) Autogain ON/OFF <sup>6</sup>

- 1 A 12VDC wall-plug transformer is also shipped with this module.
- 2 Compatible with HDMI or DVI ready monitors. When connecting to a DVI monitor, the proper HDMI to **DVI-D single-link** adapter must be used.
- 3 Connect to minnieCam™ -XS or minnieScope® -XS products with corresponding connector. Note that this VPU-HDM-XS model **IS NOT COMPATIBLE** with -L camera sensors. Damage may occur to both the -L sensor and this VPU-HDMI-XS module.
- 4 See the operating instructions section for more details about the function of the status LED.
- 5 The "Resolution" button changes the output resolution between the native 400x400 pixel output to 1,000x1,000 pixels in 3 steps.
- 6 Toggles autogain function ON/OFF. When autogain is turned OFF, gain is set to the middle of the range.

### disclosures:

- NOTE:** We do not guarantee that the VPU-HDMI-XS is compatible with all monitors, TVs, or recorders with an HDMI input port. The HDMI video output of this device is compatible only with displays and recorders that comply with the video specification of the VPU-HDMI-XS.
- NOTE:** Several TV's may not be able to display video from this VPU (unless they comply with all the specifications of our hardware).
- NOTE:** We have successfully tested compatibility of the VPU-HDMI-XS with many different commercially available computer monitors (especially those with a DVI input port) for as long as they comply with the video output specifications of this device.

### mechanical dimensions (all dimensions in mm):



### operating instructions:

1. Apply power to the “12VDC” input of the module using the wall plug AC/DC transformer provided with the module. Turn the “ON/OFF” switch to the ON position.
2. Connect a minnieCam™ -XS or minnieScope® -XS assembly to the mini-B USB (5pin) connector labeled “Camera Input” on the side of the module. The “Status LED” should be continuous ON under normal operating conditions.
3. If the camera sensor is not plugged in, or is defective, or if there is a discontinuity in the electrical cable, the monitor will appear blank. The “Status LED” will be flashing at 1Hz, indicating video input failure.
4. Connect the provided HDMI cable between the “HDMI Output” port of the module and an HDMI ready monitor. Live streaming video should be displayed on the monitor. If the monitor has a DVI input then the proper HDMI to DVI adapter (**not provided**) should be used.
5. The system firmware uses linear interpolation algorithms to generate higher resolution images than the native format of 400x400 pixels. Use the “Resolution” button to switch among the different formats. The default output is 800x800 pixels. The sequence of video outputs is as follows: 800 > 1000 > 800 > 600 > 400 > 600 > .... and so forth with every press of the “Resolution” button. When enhanced resolution is engaged, some image fidelity (sharpness) may be lost, but in return a larger image is offered with no pixelation.  
**NOTE:** After power down, the last video output size is saved in memory and will be used next time the unit is powered back on.
6. Use the “White Balance” button to perform an instant color correction under changing lighting conditions; operation described below in more detail.
7. This version of the VPU-HDMI-XS supports hot plug-in of the camera sensor. Camera sensor may be unplugged and plugged back in without the need to power cycle the unit to restore operation.  
**NOTE:** If the camera’s electrical connector (5 pin mini-B USB) is connected to the “Camera Input” and power to the module is cycled (OFF and back ON), and there is no image displayed on the monitor (but noise), unplug and plug back in the mini-B USB connector to restore the image (while power is ON). If the problem persists, refer to the data sheet for the minnieCam™ -XS or minnieScope™ -XS assembly; the section that describes adjusting the potentiometer inside the mini-B USB connector shell.
8. Use the “Autogain ON/OFF” button to turn the autogain OFF and then back ON. When autogain is disabled, the gain is set to the middle of the available range.  
**NOTE:** Depending on lighting conditions, when autogain is disabled the gain on the sensor may be at the wrong level. The user will have to adjust the gain via the software on the computer.

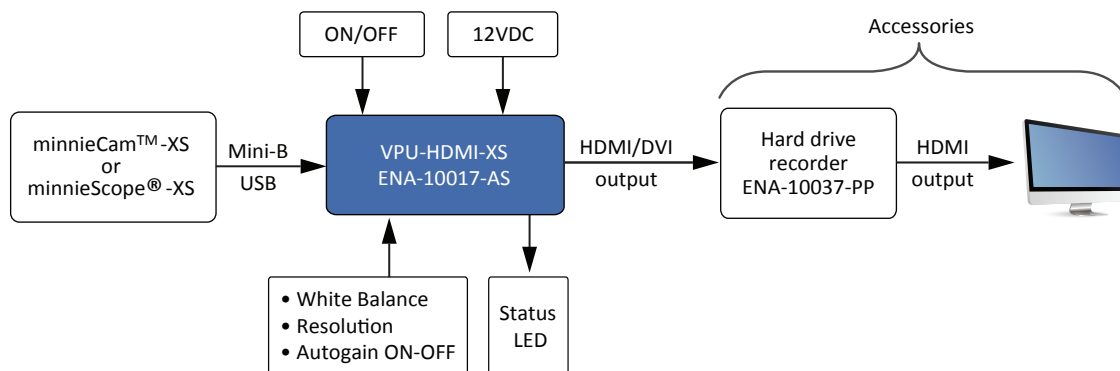
### white balance correction procedure:

1. Under the specific lighting conditions of your setup, point minnieScope™ -XS or minnieCam™ -XS onto a white piece of paper or other white surface. Make sure pixels are not saturated.
2. Press the “White Balance” button on the side of the module for a second and release it. The camera will automatically perform an automatic color correction (AWB) for the specific lighting conditions. During the AWB calibration process the “Status LED” will be blinking fast, and will stop blinking ONLY after the AWB process is completed. While the “Status LED” is blinking, keep the camera sensor aiming towards a white surface.  
**NOTE:** The time it takes to complete an AWB calibration process may vary depending on lighting conditions.  
**NOTE:** The white balance settings are saved even after a power down cycle.
3. If the lighting conditions change (even for the same sensor), repeat steps 1 and 2.  
**NOTE:** The white balance function may need to be repeated for every sensor that is plugged into the unit.

## recording accessories:

Although the HDMI output of the ENA-10017-AS is designed for those who wish to only display live video from a minnieCam™ -XS or minnieScope® -XS module onto a HDMI/DVI ready monitor, Enable Inc., offers two different options of accessories for recording video or images from the HDMI signal output of the ENA-10017-AS:

**Option 1. ENA-10037-PP:** Record directly onto a hard drive or USB Flash drive (no extra software or computer required). Hard drive or USB Flash drive are not provided.



Enable Inc., is a qualified reseller of recording hardware made by AverMedia. ENA-10037-PP is their award winning model “EZRecorder 530”; A PC-free High Definition HDMI recorder. You can capture, record and take snapshots directly onto a hard drive or USB flash drive without the use of a computer.

- Record HD footage in 1080p from an HDMI output
- No PC required
- Single button recording
- Pause and resume recording
- Take snapshots while recording
- H.264 hardware compression
- Zero delay for pass-through video
- Built-in 2.5” HDD slot

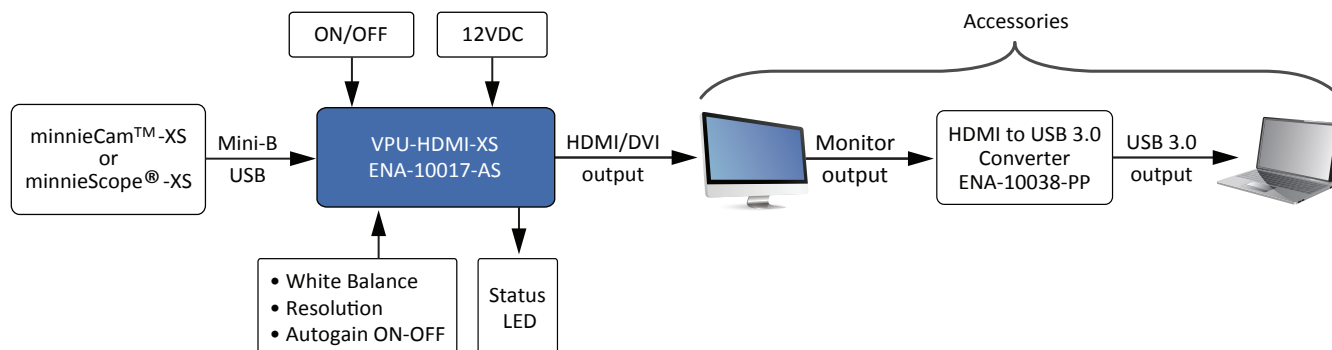
ENA-10037-PP, a PC-free recorder, only needs to be powered up and connected to a video source via an HDMI or component input to activate recording. Moreover, one can preserve the most important moments as static photos by snapshotting while recording, and save them to an external USB or internal 2.5” HDD. The H.264 hardware compression ensures sharp video quality, allowing files to be rendered in high resolution. ENA-10037-PP is a straightforward, versatile solution for recording.

Data sheet for ENA-10037-PP can be found at:  
[https://s3-us-west-2.amazonaws.com/avermedia/web\\_release\\_www/CR530/CR530\\_datasheet\\_en.pdf](https://s3-us-west-2.amazonaws.com/avermedia/web_release_www/CR530/CR530_datasheet_en.pdf)

User manual for ENA-10037-PP can be found at:  
[https://s3-us-west-2.amazonaws.com/avermedia/web\\_release\\_www/CR530/UM\\_CR530\\_ww\\_150429.pdf](https://s3-us-west-2.amazonaws.com/avermedia/web_release_www/CR530/UM_CR530_ww_150429.pdf)

**NOTE:** Enable does not provide support or warranty for this hardware. The user must consult the AverMedia website and technical support for more information about this hardware.

**Option 2. ENA-10038-PP:** Record and display onto a computer by providing an HDMI to USB3 converted and corresponding software to install onto a computer.



Enable Inc., is a qualified reseller of recording hardware made by AverMedia. ENA-10038-PP is their award winning “DarkCrystal 750”; A High Definition HDMI to USB3 converter. Viewing software (Capture Studio) and SDK are included and are available for download from AverMedia’s website.

- Bundled with exclusive capture SDK kit
- Supports popular video editing software
- Enables HDMI and/or component input
- 3rd party plug-ins, Adobe Premiere Pro CS6, Sony Vegas Pro and ImageJ
- Compatible with DirectShow-compliant software, including: XSplit, OBS, Windows Media Encoder 9, VLC media player, Potplayer, Graph Edit and Adobe Flash Media Live Encoder

A powerful USB 3.0 capture box, ENA-10038-PP is packaged with an exclusive capture SDK that is capable of supporting a range of programming languages and editing features. The ENA-10038-PP represents a complete package for simplifying the process of recording and streaming full HD videos.

Windows drivers (select operating system) for ENA-10038-PP can be downloaded from:  
[http://www.avermedia.com/professional/download/cd750#ans\\_part](http://www.avermedia.com/professional/download/cd750#ans_part)

Data sheet for ENA-10038-PP can be found at:  
[https://s3-us-west-2.amazonaws.com/avermedia/web\\_release\\_www/CD750/DS\\_CD750\\_EN\\_20160704.pdf](https://s3-us-west-2.amazonaws.com/avermedia/web_release_www/CD750/DS_CD750_EN_20160704.pdf)

“Capture studio”; the video viewing and capture software for ENA-10038-PP can be downloaded from:  
[http://www.avermedia.com/professional/download/sdk#ans\\_part](http://www.avermedia.com/professional/download/sdk#ans_part)

The SDK basic package can be downloaded from:  
[http://www.avermedia.com/professional/download/sdk#ans\\_part](http://www.avermedia.com/professional/download/sdk#ans_part)

**NOTE:** Enable does not provide support or warranty for this hardware. The user must consult the AverMedia website and technical support for more information about this hardware.

## part number and ordering information:

**ENA-10017-AS:** VPU-HDMI-XS module

**ENA-10020-AS:** HDMI-XS electronic assembly.  
The VPU-HDMI-XS without the chassis.

**ENA-10037-PP:** Hard drive recorder

**ENA-10038-PP:** HDMI to USB3 converter

**ENA-10057-PP:** 12VDC, 2.0 A, AC to DC  
Wall transformer

**ENA-10058-PP:** HDMI cable, type A male-male