MURIDEO®

MU-STIX-AF

USER MANUAL

STIX TEST ECOSYSTEM SIGNAL GENERATOR

WITH FEMALE HDMI PORT

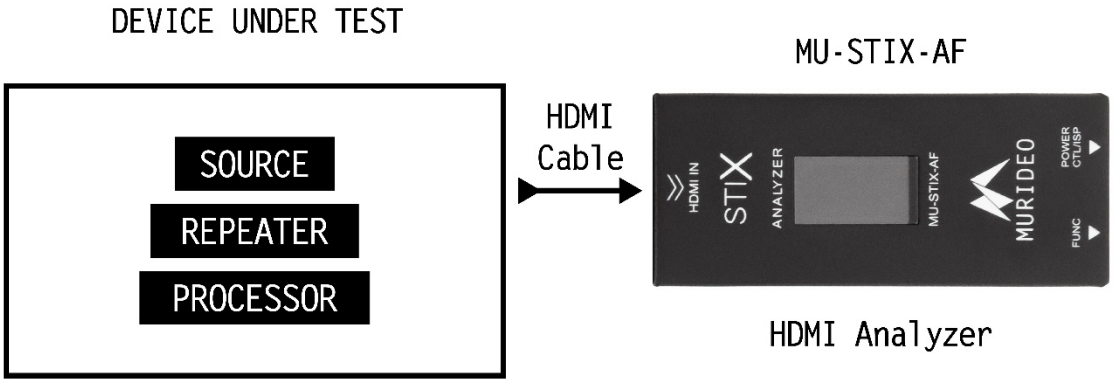
Contents

Introduction

Murideo's MU-STIX-AF is a next-generation, ultra-compact HDMI 2.1 signal analyzer, purpose-built for today's professional AV installers and integrators. With its female HDMI connector and enhanced control interface, the STIX-AF expands the versatility and usability of the STIX platform for a wide range of HDMI signal verification tasks.

The STIX-AF supports both cutting-edge HDMI 2.1 (FRL) signals up to 48 Gbps and legacy HDMI (TMDS), making it ideal for analyzing modern and legacy signal paths. It can analyze video signals up to 8K/60 Hz and 4K/120 Hz. The onboard OLED screen and new level-switch interface offer an intuitive navigation experience, displaying a real-time thumbnail of the source signal, along with detailed video and audio parameters including resolution, timing, color space, audio type, sampling rate, and more.

Designed for maximum flexibility in the field, the MU-STIX-AF features low power consumption and is USB Type-C powered, enabling operation from mobile devices, displays, or AV receivers. Rugged, reliable, and enhanced for usability, the MU-STIX-AF is an essential tool for professional-grade HDMI signal diagnostics.



Features

- Cost-effective HDMI 2.1b, 8K 48 Gbps (FRL) compliant signal analyzer
- Analyze signals up to 8K resolution timings at 8-, 10-, and 12-bit color depths, in RGB 4:2:0, 4:2:2, and 4:4:4 color spaces
- Automatically detects and logs signal changes, sync losses and signal loss time
- OLED color screen with an intuitive navigation menu displays incoming video thumbnail, source timing, FRL or TDMS presence, color space, color depth, and HDCP 1.4/2.X versions
- Displays audio information, including audio type, sampling rate and number of channels
- Low power draw allows device to be powered over USB Type-A (from AVR or display) or via USB Type-C from mobile device.

Box Contents

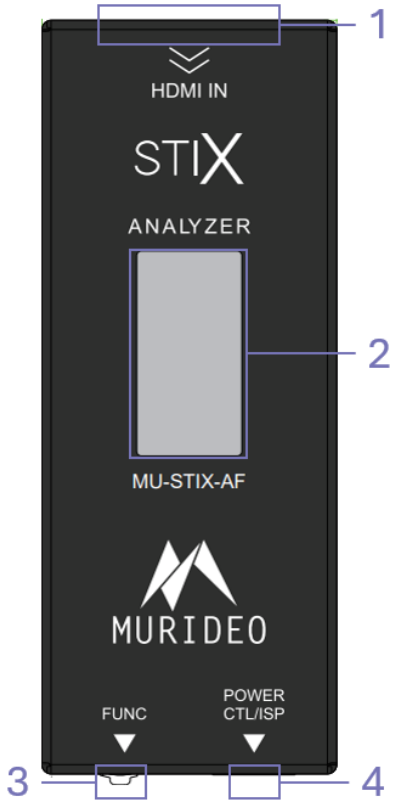
- (1x) Murideo MU-STIX-AF Unit
- (1x) 5' USB Type-C to USB Type-A Cable

Product Overview

Technical Specifications

Video	
HDMI Version	2.1
HDCP Version	1.4 and 2.3
HDCP ON/OFF	No
Maximum Clock Rate	600 mscs (1188 MHz)
Maximum Throughput per Channel	12 Gbps (48 Gbps Total)
Resolution Timings	HDMI VICs up to 8K/30 Hz, DCI up to 4K/60 Hz, VESA DMT, VESA CVT-RB up to 600 MHz
Video Encoding	RGB, YCbCr
Video Sampling Models	RGB 4:4:4, YUV 4:4:4, YUV 4:2:2, YUV 4:2:0
Color Bit Depth	12-, 10-, 8-bit
Audio (Diagnostic Only)	
Audio Type	LPCM
Audio Sampling Rate	32 kHz, 44.1 kHz, 48 kHz, 88 kHz, 96 kHz, 176 kHz, 192 kHz
Audio Channels	Up to 8-Channel
Audio Volume	No
Ports	
HDMI	19-pin Type-A, female
Power/Firmware & Control	USB Type-C
Environmental	
Operating Temperature	23 to 125°F (-5 to 51°C)
Storage Temperature	-4 to 140°F (-20 to 60°C)
Humidity Range	5-90% RH (No Condensation)
Cooling	Passive
Power	
Power	5 V 540 mA
Power Consumption	2.7 W Maximum
Physical / Dimensions	
Dimensions (Unit Length/Width/Height)	mm: 12 x 32 x 82 inches: .47 x 1.26 x 3.22
Dimensions (Packaged Length/Width/Height)	mm: 122 x 91 x 26 inches: 4.80 x 3.58 x 1.02
Weight (Unit)	0.09 lbs. (0.04 kg)
Weight (Packaged)	.34 lbs. (.15 kg)
*Specifications subject to change without notice. Mass & dimensions are approximate	

MU-STIX-AF Overview



MU-STIX-AF
1 – HDMI IN
2 – OLED Screen
3 – Function Switch and Button
4 – USB-C Port Power, Control (CTL), In-system Programming (ISP)

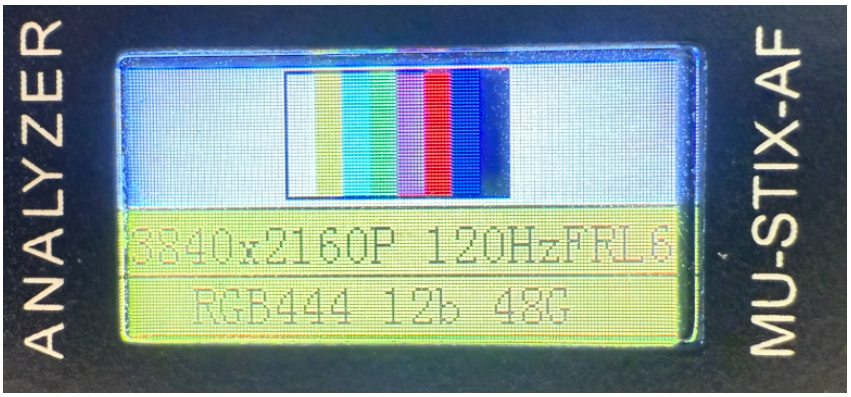
Preparing For Use

The Murideo STIX-AF is powered through the USB Type-C input using any standard USB power supply.

- Connect the STIX-AF to a power supply using the supplied USB cable. Any USB Type-C to C or Type-C to A cable may be connected to the STIX-AF.
- Connect the STIX-AF to the source device to be tested with an HDMI cable.
    - Source devices include set-top boxes, streaming devices, HDMI matrixes, or any HDMI device with an HDMI output.
- Video and Bandwidth information will be displayed on the Home Screen.
    - By default, the EDID stored in the STIX-AF can receive signals up to 8K resolution, at 30 frames per second, with 12-bit Color Depth.

Home Screen

By default, the STIX-AF will power up to the Home Screen shown below:

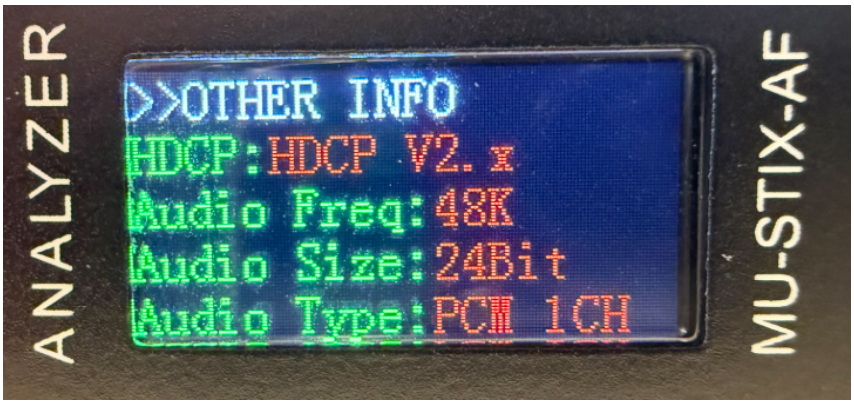


The home screen displays 5 forms of information:

1. Thumbnail
    a. Low resolution video image of source
2. Incoming Resolution, Timing, and Scan Type.
3. HDMI Transmission Method
    a. TMDS or FRL
4. Color Space
    a. RGB 4:4:4, YUV 4:4:4, YUV 4:2:2, YUV 4:2:0
5. Color Depth
    a. Bits per Component

There are three total screens including the Home Screen. To see additional diagnostics information, short press the function button (labeled FUNC). Return to the home screen by cycling through the screen options.

Other Info Screen

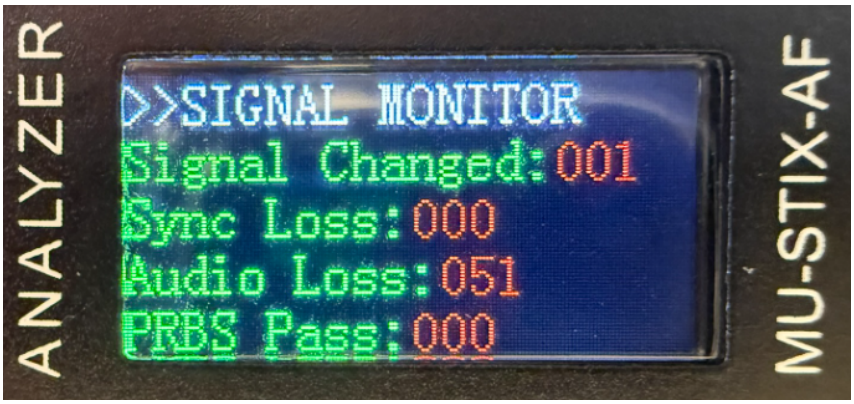


The Other Info screen displays information related to the HDCP encoding and Audio Format of the incoming video and audio signal. These include:

1. HDCP
    a. No HDCP
    b. HDCP 1.4
    c. HDCP 2.X
        i. Shows for both legacy HDCP 2.2 and newer HDCP 2.3 formats.
2. Audio Frequency
    a. Frequency of the incoming audio signal.
3. Audio Size
    a. Bit depth of the incoming audio signal.
4. Audio Type
    a. The number of channels the incoming (L)PCM audio signal contains.
    b. Encoded audio, such as Dolby or DTS, cannot be decoded by the STIX-AF. These signals are presented as NON-PCM and indicate their Audio Size as 16 bit. Lossy audio, Dolby Digital or DTS Digital, will show Audio Frequency up to 192KHz. Lossless audio, Dolby MAT or DTS MA, will show Audio Frequency as HBR.

After 5 seconds of inactivity, the STIX-AF will return to the home screen.

Signal Monitor Screen



The Signal Monitor screen consists of three fields that pertain to the health of the HDMI signal and the device uptime. This is useful for checking changes in video signal or dropped connections, these fields function as follows:

1. Signal Change
    a. When using the signal change function, it is recommended to use a static test pattern. Every second the STIX-AF will check for changes in the video signal such as resolution, color space, refresh rate, and RGB Triplet values. If any of the video frame values have changed, the value will increase by 1.
    b. In the event the HDMI source device disconnects; if the signal remains unchanged, when reconnected, the value will remain unchanged.
    c. The Signal Change field will count to 999, any new signal changes will roll over the count to 001.
2. Sync Loss
    a. The number of times the TMDS/FRL negotiation has been lost or disconnected, counting begins after initial video signal connection.
    b. The Sync Loss field will count to 999, any new signal changes will roll over the count to 001.
    c. Sync Loss can measure up to 65,535 instances when connected directly to the control port via serial.
3. Time
    a. The total uptime of the unit.
    b. The Time field will count to 99h 59m 59s. Additional uptime will roll over the uptime to 00h 00m 01s.
4. Resetting the Signal Monitor screen
    a. While the Signal Monitor screen is open, press and hold the function button for 2 seconds.
    b. Signal Monitor settings are volatile and will reset after a power cycle.

Screen Saver

The blank (black) screen saver will appear after 5 minutes of inactivity. During this state the STIX-AF is operational, and serial data may be sent to and received from the unit. Users may open the Home Screen at any time by pressing the function button. Signal changes or changes in the HDMI sync will cause the Home Screen to open as a response.

Firmware and Control

Updating the firmware
Requirements:

- Windows PC

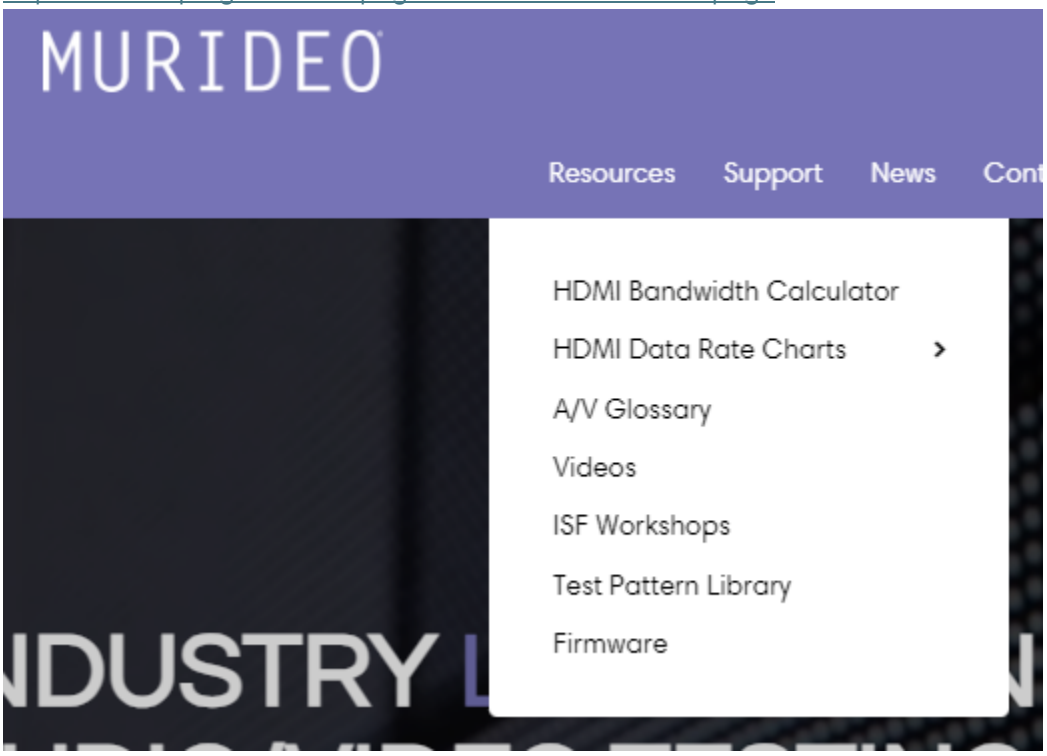
- USB-A or USB-C to USB-C data cable for a direct serial connection

- Firmware FWM file and Uploader

- CH340 USB Serial Driver (available on murideo.com)

Follow the steps below to update the firmware on the STIX-AF:

1. Find the firmware file under the Resources -> Firmware dropdown on https://www.avproglobal.com/pages/murideo-brand-home-page

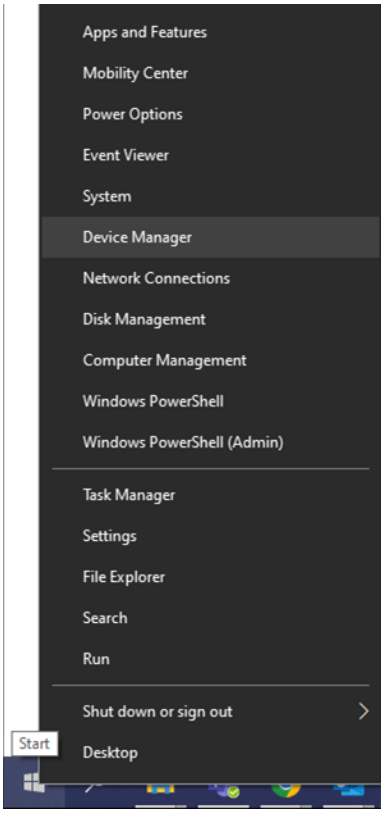


2. Connect PC directly to the USB-C CTL/USP ports on the STIX-AF using a USB -C cable.
3. Download and install the CH340 USB Serial Driver.
    1. Navigate to https://www.avproglobal.com/products/mu-stix-af
    2. Click on the Resources tab.
    3. Click the USB DRIVER link.
    4. Download the CH340 driver to your PC.

Key Features Specs Resources

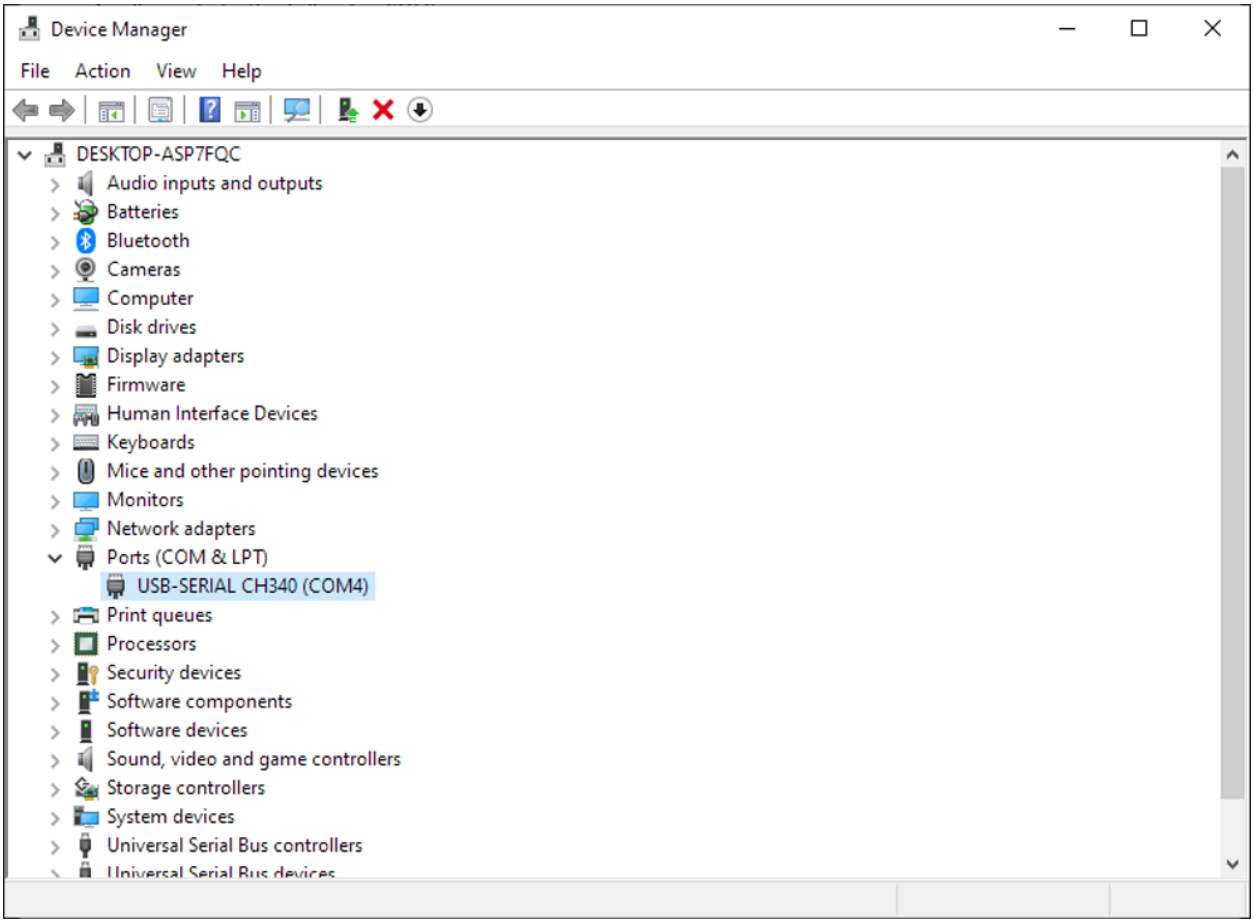
- Data Sheet
- Manual
- Photos
- Diagrams
- USB Driver
- Warranty

4. Right-click on the Windows Start button and select Device Manager.

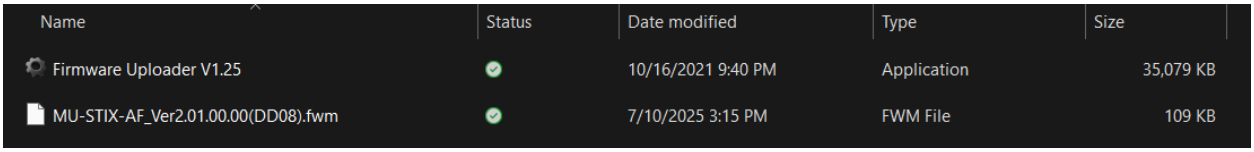


Then select the Ports (COM & LPT) drop-down menu and locate the port labeled USB-SERIAL

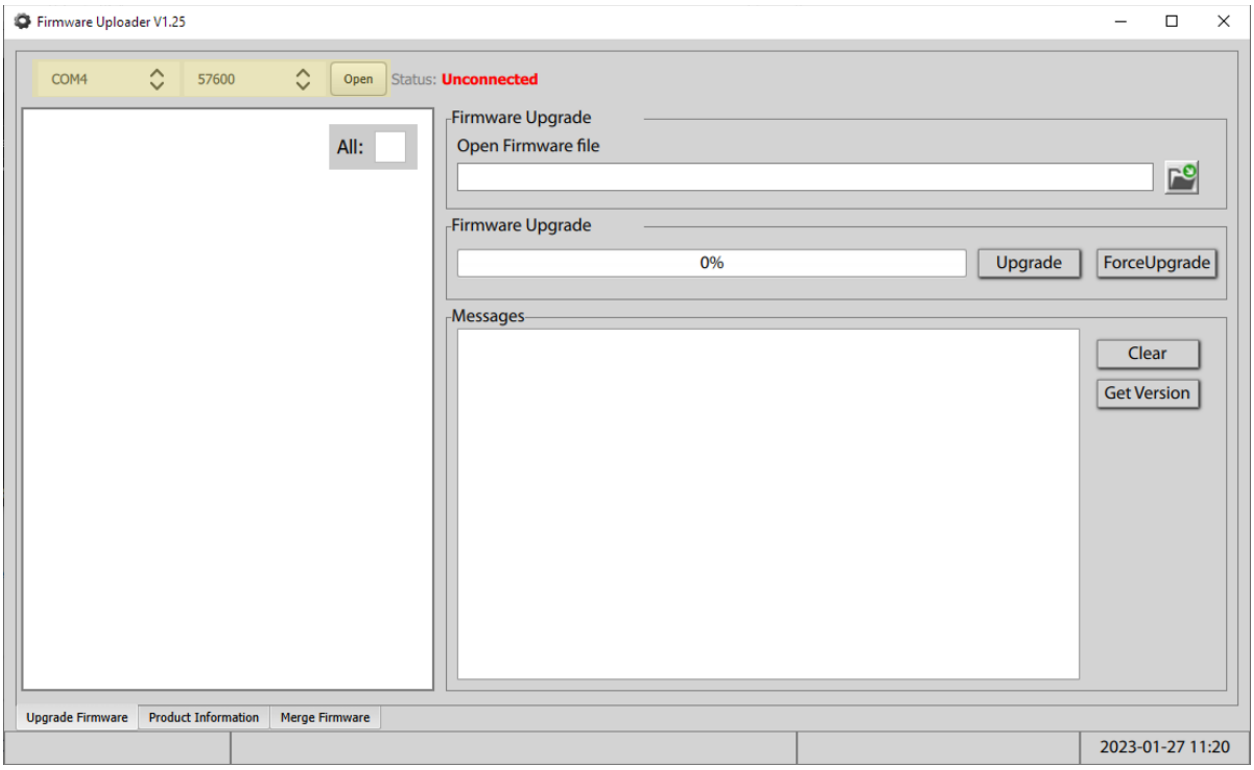
CH340 (COMX) to confirm the STIX-AF is connected to the PC.



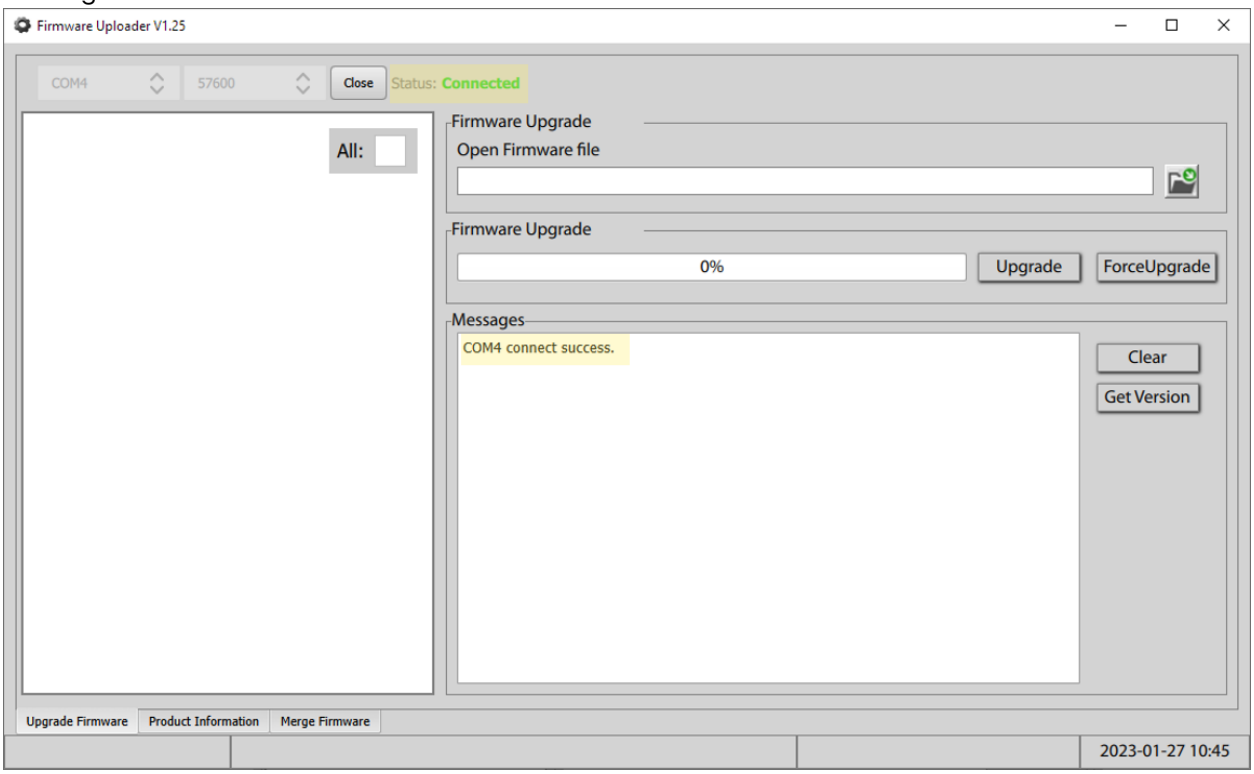
3. Open the Firmware Uploader program



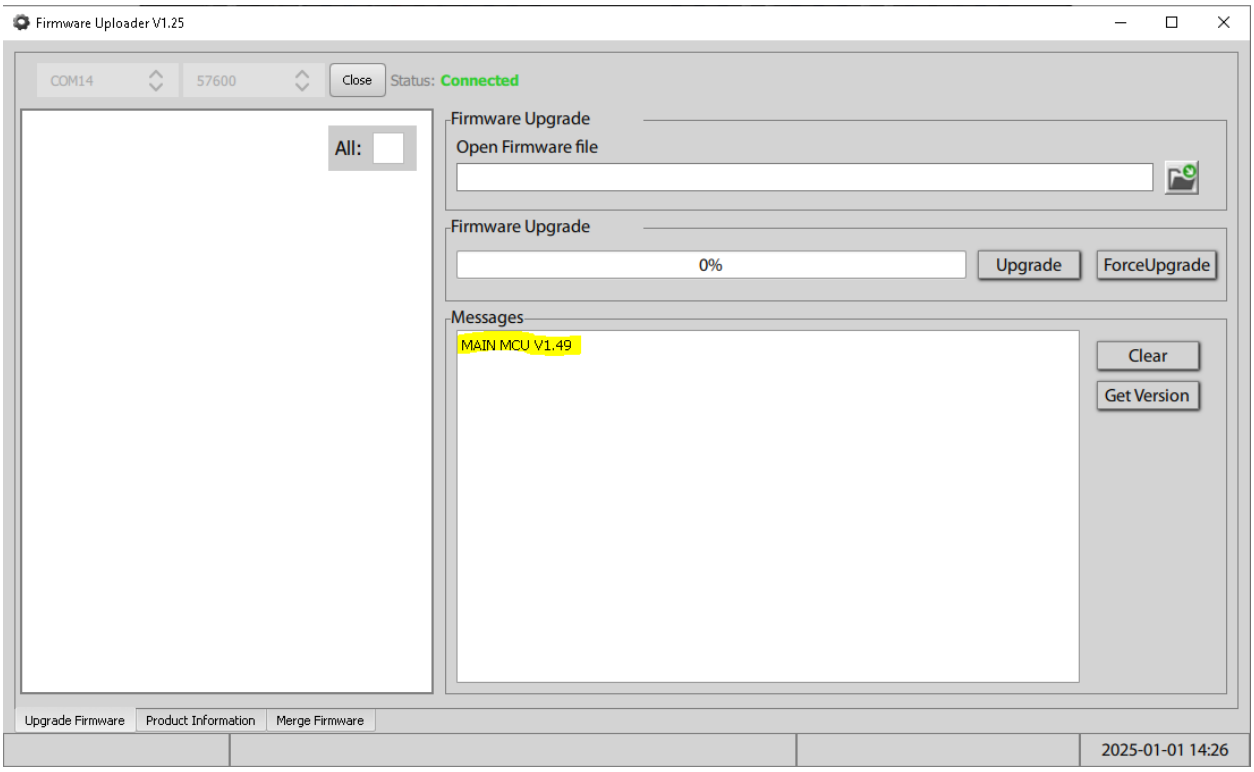
Select the correct COM, Baud: 57600, and select the Open button to open the port.



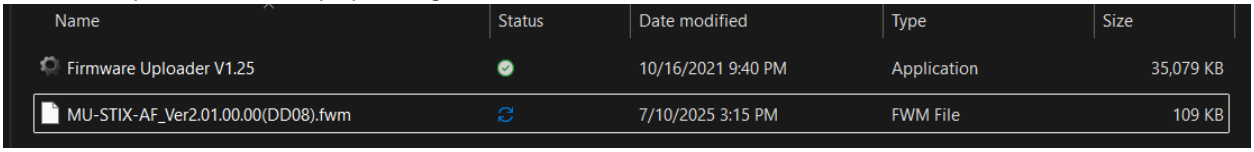
The Status will now show as Connected in green text with COMX connect success under Messages.



4. Select the Get Version button to see the current firmware version on the STIX-AF (note: screenshot below is only an example and may not display the exact version).

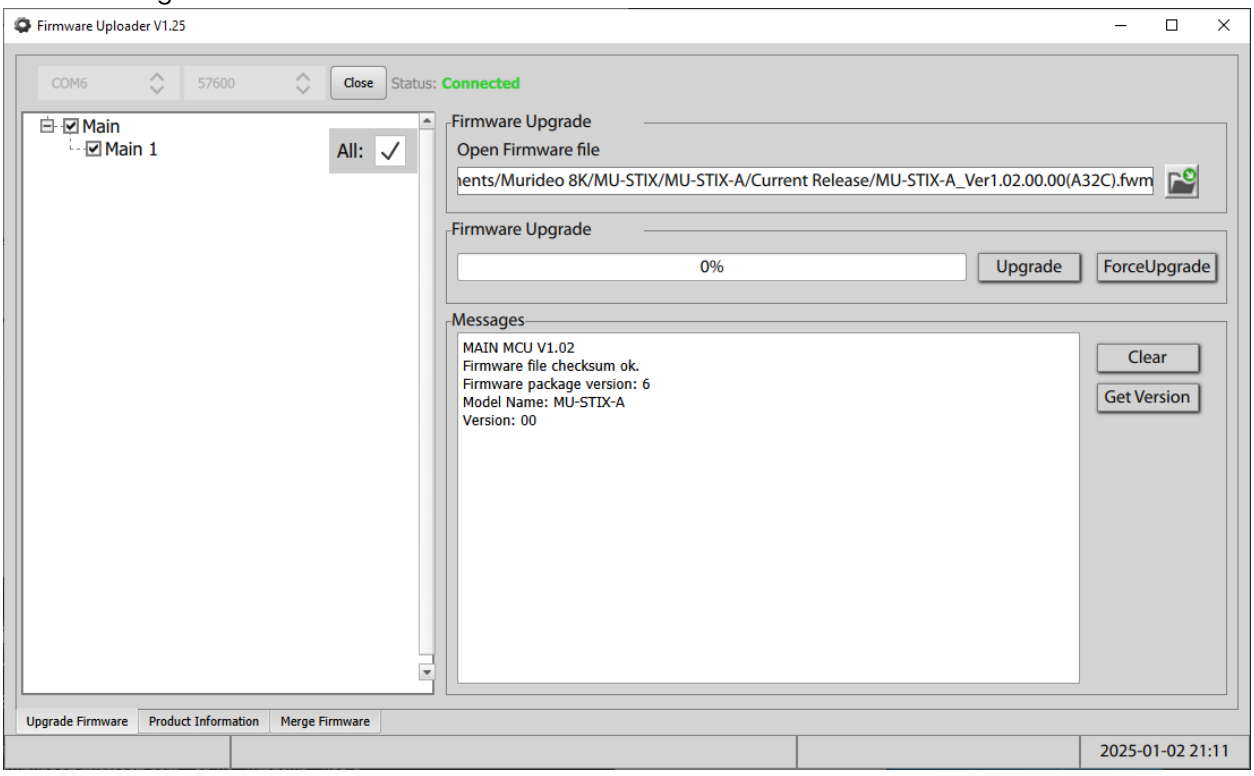


5. Select the file button  to load the firmware file. Make sure to select the correct firmware file for the device you are currently updating.

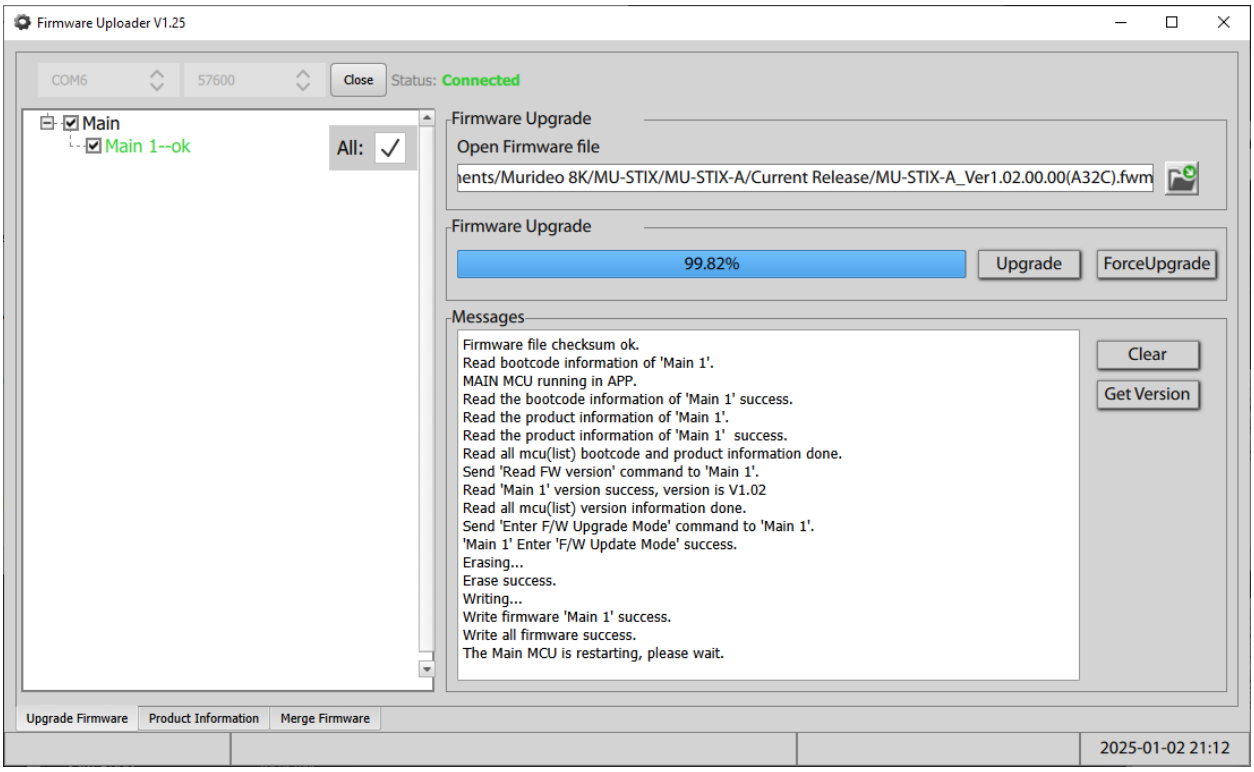


The firmware file will be loaded into the Open Firmware file field with the following information

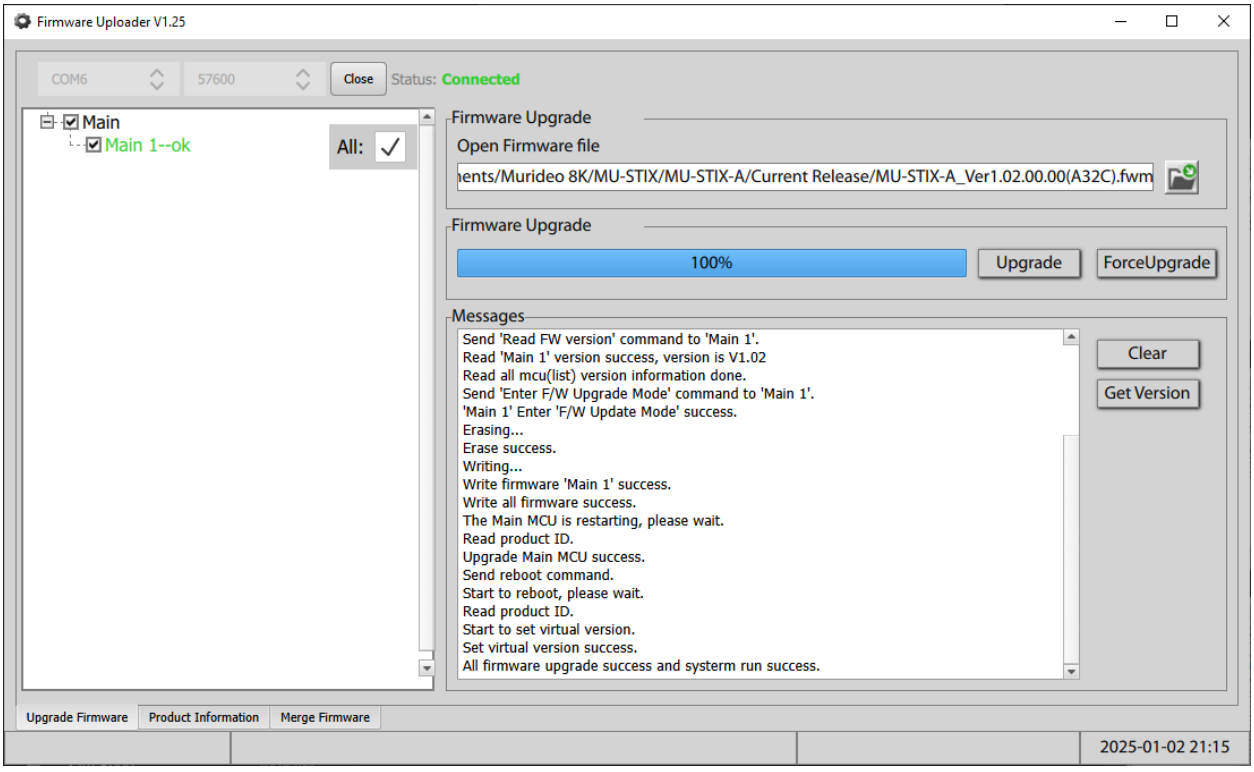
under Messages:

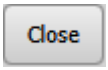


6. Select the Upgrade button to start the firmware update. The loading bar will pause at 99% for a few seconds before automatically rebooting the unit. Do not use the ForceUpgrade button. If the Uploader is not updating firmware for any reason, please contact Murideo Support to assist in troubleshooting your STIX-AF.



7. Once the loading bar reaches 100%, use the Get Version button again to ensure the new firmware version is correct (note: screenshot below is only an example and may not display the exact version).



8. Select the  button to close the port, then select the X at the top-right to exit the Uploader. The STIX-AF is now up to date on its firmware and is safe to disconnect from your PC and power.

Control

The STIX-AF can be controlled through Serial communication from a USB port with serial capabilities (COM) using the internal USB to UART adaptor. Ensure the CH340 Driver has been installed before connecting the device.

STIX-AF Serial Port Properties

Baud Rate	57600
Data Bits	8
Stop Bits	1
Parity	None
Flow Control	None

The STIX-AF features an ASCII API; commands sent to the unit should be followed by the carriage return control character. In the following example we will use <cr>:

USER SENT:	GET ADDR<cr>
ECHO RECEIVED:	ADDR 00<cr>

Command List

Azz	All Commands start with Prefix System Address zz, {zz=[01-99](zz=00,broadcast address)}
H	Help
STA	Show Global System Status
SET RST	Reset to Factory Defaults
SET RBT	System Reboot
SET ADDR xx	Set System Address to xx{xx=[01~99]}
SET INx TMDS ON/OFF	SET INx TMDS ON/OFF{x=[0~1](0=ALL)
GET ADDR	Get System Address
GET TMDS CHECK	Check Whether the TMDS Voltage works Properly
GET CRC VAL	Get CRC VALUE xx
SET INx EDID y	Set Input x EDID=NEW Add{x=[0~1](0=ALL),y=[0~3] (0:1080P_2CH,1:4K60Hz_2CH,2:8K60Hz_2CH,3=User_EDID)}
SET INx EDID Uy DATAz	Write EDID To User y Buffer of Input x{x=[0~1](0=ALL), y=[1],z=[EDID Data]}
GET INx EDID	Get Input x EDID Index{x=[0~1](0=ALL)}
GET INx EDID y DATA	Get Input x EDID y Data{x=[0~1](0=ALL),y=[0~3]}
GET INx VID INF	Get Input x Video Information

Additional Automation

CRC Evaluation

USER SENT:	GET CRC VAL<cr>
ECHO RECEIVED:	CRC Value {integer}<cr>

The CRC Value will calculate the checksum of the video signal, including resolution, color space, refresh rate, and RGB Triplet values. Any change in video signal, including moving video, will cause the CRC Value to change. It is recommended to use a static test pattern when testing for Signal Change.

Sync Loss Testing

EVENT:	TMDS/FRL connection has been lost
ECHO RECEIVED:	SYNC LOSS {32 bit Integer} <cr>

If the HDMI connection is dropped between the HDMI Output and the STIX-AF, the STIX-AF will echo the number of instances the connection has been lost. The Sync Loss counter begins after the first HDMI connection is established and will continue to count until the unit is either reset or power-cycled.

USER SENT:	SET INx TMDS ON/OFF<cr>
ECHO RECEIVED:	INx TMDS ON/OFF<cr>

The HDMI Inputs operating state can be manually toggled using the command above. When an active video signal is present, this allows the user to simulate a Sync Loss.

Audio Loss Testing

EVENT:	Audio format has changed or connection has been lost
ECHO RECEIVED:	AUDIO LOSS {32 bit Integer} <cr>

If the audio format is changed or the connection is dropped between the HDMI Output and the STIX-AF, the STIX-AF will echo the number of instances the connection has been lost. The Audio Loss counter begins after the first HDMI connection is established and will continue to count until the unit is either reset or power-cycled.

PRBS Pass Testing

While an HDMI connection is established with the STIX-GF, the STIX-AF will check the PBRS in intervals. A PASS result indicates that the STIX-AF detected no bit errors during the test cycle, confirming error-free transmission over the measured interval. The PBRS Pass counter begins after the first HDMI connection is established and will continue to count until the unit is either reset or power-cycled.

Video Format Testing

EVENT:	TMDS/FRL connection established	
ECHO RECEIVED:	IN0 SGMT {HActive}*{VActive}{scantype} {refreshrate}Hz IN0 SGMT 1920*1080P 60Hz	HActive: Active Horizontal Resolution VActive: Active Vertical Resolution Scantype: - I: interlaced - P: Progressive Refreshrate: Active Refresh Rate, whole integer.
ECHO RECEIVED:	IN0 CD x	x= Color Depth (8, 10, 12)
ECHO RECEIVED:	IN0 CSC x	x = Color Space 0: RGB4:4:4 1: YUV4:2:2 2. YUV4:4:4 3: YUV 4:2:0
ECHO RECEIVED:	IN0 HDCP x	x = HDCP Version 0: No HDCP 1: HDCP 1.4 2: HDCP 2.X

Upon establishing an HDMI connection with the source device, the STIX-AF will echo information relevant to the video signal including Resolution and Timing, Color Depth, Color Space, and HDCP version. Full video information, including Bandwidth and HDR presence, can be polled anytime using the command below:

USER SENT:	GET IN1 VID INF<cr>
ECHO RECEIVED:	IN1 VID INF <{H}x{V}.{S}.{R}Hz.CSa. VTb.HDCPc.CDd.TBe.HDRf><cr> IN1 VID INF <3840x2160.p.60Hz.CD0.VT1.HDCP0.CD8.TB17.8.HDR0><cr>

H	Horizontal Active Resolution
V	Vertical Active Resolution
S	Scan Type I = Interlaced P = Progressive
R	Refresh Rate
a	Color Space x = Color Space 0: RGB4:4:4 1: YUV4:2:2 2. YUV4:4:4 3: YUV 4:2:0
b	Video Type 0: DVI 1: HDMI
c	x = HDCP Version 0: No HDCP 1: HDCP 1.4 2: HDCP 2.X
d	x= Color Depth (8, 10, 12)
e	Value of the HDMI Bandwidth in Gigabits per second. Bandwidth measures to the nearest tenth decimal.
f	HDR Presence 0: No HDR Metadata Present 1: HDR Metadata Present

Warranty

AVPro Global Holdings (DBA MURIDEO) offers a 2-year international limited warranty for its Murideo products. Any product first sold to you is guaranteed to be free from defects in both components and workmanship under regular use. The warranty period commences on the date the item ships.

Attention:

Your invoice with the date of purchase, model number, and serial number of the product is proof of the date of purchase. The international Limited Warranty is applicable and shall be honored in every country where MURIDEO or its Authorized Service Providers offer warranty service subject to the terms and conditions provided in this international Limited Warranty Statement. Products included in this warranty:

- Murideo SEVEN Series Generators
- Murideo SIX Series Generators
- Murideo SIX Series Analyzers
- Murideo Fox & Hound Series
- Murideo HDMI Test Monitor Series
- Murideo GAX Series
- Murideo STIX Series

During the warranty period, the defective hardware of Murideo products will be either repaired or replaced with new or like-new products at Murideo's discretion. This International Limited Warranty covers the costs of service parts and labor required to restore your product to fully functional condition. MURIDEO will, at its discretion, repair or replace any defective products or parts covered by this International Limited warranty with refurbished parts of the product that are equivalent to new or like new products in both functionality and performance. A product or part repaired or replaced under this International Limited Warranty shall be covered for the remainder of the original warranty period applying to the product or part or for 90 days, whichever expires last. All exchanged parts and products under this International Limited Warranty will become MURIDEO's property.

Obtaining Warranty Service

Warranty service or Returned Merchandise Authorization (RMA) under this International Limited Warranty will be honored only if claims are made within the warranty period. The process for notifications to MURIDEO or products outside the warranty period will be the same, but charges may apply. Contact details may be obtained on the MURIDEO website: https://www.murideo.com/

Customers are requested to perform the following actions before claiming MURIDEO product is defective:

- Owner must notify MURIDEO, during the warranty period, in writing of the alleged defect and allow MURIDEO a reasonable opportunity to inspect the allegedly defective product;
- No Product may be returned without MURIDEO's consent. The MURIDEO RMA# must accompany all returns, and all returns must be delivered to MURIDEO within the warranty period.
- Owner may, then at its own expense, return the allegedly defective Product, freight pre-paid and in the original packaging, accompanied by a brief statement explaining the alleged defect to MURIDEO;
- If MURIDEO determines that any returned Product is not defective, or if MURIDEO determines that the warranty does not cover the defect, MURIDEO will return the Product to the Owner at the Owner's expense, freight collect, and Owner agrees to pay MURIDEO reasonable cost of handling and testing.
- Upon determining that the returned product is defective, the Owner will need to present the invoice showing the original purchase transaction to receive warranty service. If shipping the product, the Owner will need to package it carefully and send it, transportation prepaid by a traceable, insured method, to the MURIDEO Service Center. Package the product using adequate padding material to prevent damage in transit. The original container is ideal for this purpose. Include the RMA #, your name, return shipping address, email address, and telephone number where you may be reached during business hours inside the shipping package with the unit. Any replacement unit will be warranted under these Terms and Conditions for the remainder of the original warranty period or ninety (90) days, whichever is longer. For important Aps on operating and troubleshooting the product, refer to the user manual, which can be downloaded from our website, http://www.murideo.com/.

Disclaimer of Warranty

THIS WARRANTY IS EXPRESSED INSTEAD OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND OF ALL OTHER OBLIGATIONS OR LIABILITIES ON MURIDEO'S PART, AND IT NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PARTY TO ASSUME FOR MURIDEO ANY OTHER LIABILITIES. THE FOREGOING CONSTITUTES THE BUYER'S SOLE AND EXCLUSIVE REMEDY FOR THE FURNISHING OF DEFECTIVE OR NONCONFORMING PRODUCTS AND MURIDEO WILL NOT, IN ANY EVENT, BE LIABLE FOR COST OF SUBSTITUTE OR REPLACEMENT, COST OF FACILITIES OR SERVICE, DOWNTIME COSTS, LOSS OF PROFITS, REVENUES OR GOODWILL, RELIANCE DAMAGES, LOSS OF DATA, LOSS OF USE IF OR DAMAGE TO ANY ASSOCIATED EQUIPMENT, OR ANY OTHER INDIRECT, INCIDENTAL, SPECIAL, OR CONSEQUENTIAL DAMAGES BECAUSE OF THE FACT THAT SUCH PRODUCTS WILL HAVE BEEN DETERMINED TO BE DEFECTIVE OR NONCONFORMING. THE RIGHTS AND OBLIGATIONS OF THE PARTIES UNDER THIS AGREEMENT SHALL NOT BE GOVERNED BY THE PROVISIONS OF THE 1980 U.S. CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS OR THE UNITED NATIONS CONVENTION ON THE LIMITATION PERIOD IN THE INTERNATIONAL SALE OF GOODS, AS AMENDED (COLLECTIVELY, THE"CONVENTIONS"); RATHER, THE RIGHTS AND OBLIGATIONS OF THE PARTIES SHALL BE GOVERNED BY THE LAWS OF THE STATE of SOUTH DAKOTA, INCLUDING ITS PROVISIONS OF THE UNIFORM COMMERCIAL CODE, AS APPLICABLE. FOR THE AVOIDANCE OF DOUBT, THE CONVENTIONS ARE HEREBY EXCLUDED.

This Limited Warranty gives you specific legal rights. You may also have other rights that vary from state to state or country to country. You are advised to consult applicable state or country laws to fully determine your rights. Some jurisdictions do not allow the exclusion or limitation of special, incidental, or consequential damages or limitations on how long a warranty lasts, so the above exclusion and limitation may not apply to everyone.

Support

For service and support, contact your local dealer. To find your dealer or to contact MURIDEO support, go to: https://support.murideo.com or call +1-605-330-8491 for worldwide technical support.

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Thank you for choosing MURIDEO! Please contact us with any questions, we are happily at your service!

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