Part Numbering

\[
\text{NHD - x.x - HDMI - x - xxxx - xxx}
\]

<table>
<thead>
<tr>
<th></th>
<th>Manufacturer</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manufacturer</td>
<td>NHD – Newhaven Display</td>
</tr>
<tr>
<td>2</td>
<td>Size (in inches)</td>
<td>10.1 – 10.1” Diagonal</td>
</tr>
<tr>
<td>3</td>
<td>Interface</td>
<td>HDMI – HDMI Interface</td>
</tr>
<tr>
<td>4</td>
<td>Descriptor</td>
<td>A – 1024x600 Resolution, HDMI Audio supported</td>
</tr>
<tr>
<td>5</td>
<td>Type</td>
<td>RSXV – Premium MVA</td>
</tr>
<tr>
<td>6</td>
<td>Touch Panel</td>
<td>[n/a – No Touch, CTU – Capacitive USB-HID [Pre-calibrated, No external drivers needed]]</td>
</tr>
</tbody>
</table>
# Table of Contents

Overview ........................................................................................................................................... 3  
Functions and Features .................................................................................................................... 3  
Model Information .......................................................................................................................... 4  
Electrical Characteristics .............................................................................................................. 4  
HDMI Receiver Information ............................................................................................................ 4  
Audio Amplifier Information .......................................................................................................... 4  
Interface Description ...................................................................................................................... 5  
Connecting with Windows/Windows Embedded .............................................................................. 6  
Connecting with Linux .................................................................................................................... 8  
Audio Support ................................................................................................................................. 9  
Technical Resources ..................................................................................................................... 9  
  2D Drawings .................................................................................................................................. 9  
  3D Models ................................................................................................................................... 9  
Quality Information .......................................................................................................................... 10  
Precautions for Using LCDs/LCMs ............................................................................................... 10  
Warranty Information ..................................................................................................................... 10  
Document Revision History ............................................................................................................ 11
Overview

The HDMI interface has become the most popular video interface standard to date, and HDMI video sources are easier to come by now than ever before. Whether you need an HDMI TFT display for your Raspberry Pi/BeagleBone Black application, a Windows/Windows Embedded PC monitor, or a touch screen HMI for your Linux or other embedded system, the Newhaven Display HDMI TFT product line offers a solution.

Available in 5.0”, 7.0”, and 10.1” size options, our HDMI TFT Modules unite our existing high-quality TFT display panels with a custom PCB engineered in the USA by Newhaven Display. Assembled to the display, our PCB provides the user an all-in-one, plug-and-play HDMI + USB Touch solution for virtually any application.

- Our 10.1” models support 2-Channel Stereo Audio through HDMI.

Functions and Features

- 10.1” HDMI TFT Module w/ USB-HID Capacitive Touch option
- On-board Analog Devices ADV7611 HDMI Receiver
- Plug-and-play USB-HID Touch, no external driver installation required
- 2-Channel Stereo Audio supported through HDMI; speaker terminal outputs
- HDMI (Type-A) Input
- Compatible with PC (Windows/Linux)
- Compatible with Linux based SBCs such as Raspberry Pi, BeagleBone, etc.
- 24-bit True Color, 1024x600 Resolution (WSVGA)
- High Brightness LED backlight with PWM
- 75° Viewing Angles all sides
- 4 x Mounting Holes (#10-32), compatible with Rack Unit (RU) spacing
- Engineered in Elgin, IL (USA)
Model Information

<table>
<thead>
<tr>
<th>HDMI Module P/N</th>
<th>TFT Panel Used</th>
<th>Display Type</th>
<th>Luminance Rating</th>
<th>Optimal Viewing Angle</th>
<th>Touch Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHD-10.1-HDMI-A-RSXV</td>
<td>NHD-10.1-1024600AF-ASXV#</td>
<td>Premium MVA</td>
<td>800 cd/m²</td>
<td>75° all angles</td>
<td>No Touch</td>
</tr>
<tr>
<td>NHD-10.1-HDMI-A-RSXV-CTU</td>
<td>NHD-10.1-1024600AF-ASXV#-CTP</td>
<td>Premium MVA</td>
<td>700 cd/m²</td>
<td>75° all angles</td>
<td>Projected Capacitive (USB-HID)</td>
</tr>
</tbody>
</table>

For detailed information on the TFT Panel used, please view its Product Specification by accessing the product webpage link above.

Electrical Characteristics

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Condition</th>
<th>Min.</th>
<th>Typical</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature Range</td>
<td>TOP</td>
<td>Absolute Max</td>
<td>0</td>
<td>-</td>
<td>+50</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature Range</td>
<td>TST</td>
<td>Absolute Max</td>
<td>-20</td>
<td>-</td>
<td>+60</td>
<td>°C</td>
</tr>
<tr>
<td>Backlight PWM Frequency</td>
<td>fPWM</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>20</td>
<td>kHz</td>
</tr>
<tr>
<td>Backlight PWM Voltage</td>
<td>VPWM</td>
<td>-</td>
<td>2.5</td>
<td>3.3</td>
<td>5.5</td>
<td>kHz</td>
</tr>
<tr>
<td>Module Supply Voltage</td>
<td>VDD</td>
<td>-</td>
<td>5.0</td>
<td>7.5</td>
<td>9.0</td>
<td>V</td>
</tr>
<tr>
<td>Module Supply Current</td>
<td>IDD</td>
<td>VDD = 5V</td>
<td>-</td>
<td>1.8</td>
<td>2.0</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VDD = 9V</td>
<td>-</td>
<td>1.0</td>
<td>1.2</td>
<td>A</td>
</tr>
</tbody>
</table>

HDMI Receiver Information

On-board Analog Devices ADV7611 Low Power HDMI Receiver.
To view the full ADV7611 specification, please download it by accessing the link below:

Audio Amplifier Information

On-board Texas Instruments TAS5717 Digital Audio Power Amplifier.
To view the full TAS5717 specification, please download it by accessing the link below:
## Interface Description

![Image of NHD 10.1" HDMI TFT User Guide](image)

(Capacitive Touch model shown above as reference)

<table>
<thead>
<tr>
<th>Num.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>(CN3) <strong>Micro-USB (Type-B) Connector for Touch</strong> – <strong>Touch Panel model only</strong>&lt;br&gt;This is to connect the Touch Panel of this module to a USB input to act as a USB-HID device.</td>
</tr>
<tr>
<td>2)</td>
<td>(CN2) <strong>HDMI (Type-A) Connector</strong>&lt;br&gt;This is a full-size HDMI connector meant to connect the HDMI source signal (Video &amp; Audio) to this module. The on-board HDMI Receiver does not scale video resolutions. Therefore, the output resolution of the source must be 1024x600 (WSVGA). In most applications, this is automatically detected by the HDMI source.</td>
</tr>
<tr>
<td>3)</td>
<td>(CN1) <strong>DC Jack (Center-Positive), 2.00mm ID, 5.50mm OD</strong>&lt;br&gt;This is used to supply power to the display module. A DC power supply in the range of 5V – 9V must be used. The output current rating of the DC power supply should be at least the maximum Supply Current (I_{dd}) listed in the Electrical Characteristics section on the previous page.</td>
</tr>
<tr>
<td>4)</td>
<td>(LED1) <strong>LED Indicator for Power</strong>&lt;br&gt;This is a Green LED that will illuminate when DC power is supplied to the module.</td>
</tr>
<tr>
<td>5)</td>
<td>(CN4) <strong>Terminal Block w/ Push Buttons (24-18AWG wire size), for Speaker output</strong>&lt;br&gt;This connection is the speaker output for the (Left) channel. An 8Ω speaker up to 10W can be used here.</td>
</tr>
<tr>
<td>6)</td>
<td>(CN5) <strong>Terminal Block w/ Push Buttons (24-18AWG wire size), for Speaker output</strong>&lt;br&gt;This connection is the speaker output for the (Right) channel. An 8Ω speaker up to 10W can be used here.</td>
</tr>
<tr>
<td>7)</td>
<td>(CN6) <strong>Terminal Block w/ Push Buttons (24-18AWG wire size), for Backlight PWM</strong>&lt;br&gt;This connection allows the user to dim the LED backlight through use of a PWM signal. See Electrical Characteristics for details.</td>
</tr>
</tbody>
</table>
Connecting with Windows/Windows Embedded

Connecting our HDMI TFT Modules to a Windows system is fully plug-and-play. Start by plugging in a DC power supply in the range of 5 - 9V, with at least 2A of output current. The green LED near at the top of the PCB will illuminate when the board has power supplied to it. Next, connect the display to your system via HDMI cable. Due to the on-board EDID, the display will be detected automatically and the system’s output resolution will set itself to 1024x600.

For the Capacitive Touch model, once the display is connected to the system via USB, Windows will automatically detect and install the necessary drivers.
Once Windows has finished installing the drivers, the device will show as ‘Ready to use’.

For reference, in Device Manager the USB-HID Touch device will show as below:
Connecting with Linux

Most Linux applications with an HDMI source will also be fully plug-and-play, however when using our HDMI TFT Modules with the Raspberry Pi, the config.txt file on the Pi’s microSD card will need to be slightly modified by the user.

The following highlighted lines need to be added in config.txt for proper display output:

```plaintext
# For more options and information see
# http://rpf.io/configtxt
# Some settings may impact device functionality. See link above for details
# uncomment if you get no picture on HDMI for a default "safe" mode
#hdmi_safe=1
# uncomment this if your display has a black border of unused pixels visible
# and your display can output without overscan
#disable_overscan=1
# uncomment the following to adjust overscan. Use positive numbers if console
goes off screen, and negative if there is too much border
#overscan_left=16
#overscan_right=16
#overscan_top=16
#overscan_bottom=16
# uncomment to force a console size. By default it will be display's size minus
# overscan.
#framebuffer_width=1280
#framebuffer_height=720
# uncomment if hdmi display is not detected and composite is being output
#hdmi_force_hotplug=1
# uncomment to force a specific HDMI mode (this will force VGA)
#hdmi_group=1
#hdmi_mode=1
hdmi_group=2
hdmi_mode=87
hdmi_cvt=1024 600 60 6 0 0 0
# uncomment to force a HDMI mode rather than DVI. This can make audio work in
# DMT (computer monitor) modes
#hdmi_drive=2
# uncomment to increase signal to HDMI, if you have interference, blanking, or
# no display
#config_hdmi_boost=4
# uncomment for composite PAL
#sdtv_mode=2
# uncomment to overclock the arm. 700 MHz is the default.
#arm_freq=800
# Uncomment some or all of these to enable the optional hardware interfaces
#dtparam=12c_arm=on
#dtparam=12s=on
#dtparam=spi=on
# Uncomment this to enable the lirc-rpi module
#dtoverlay=lirc-rpi
# Additional overlays and parameters are documented /boot/overlays/README
# Enable audio (loads snd_bcm2835)
dtparam=audio=on
```

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Audio Support

Most HDMI TFT Modules on the market today do not support audio through HDMI. Our 10.1” HDMI TFT Module stands apart from the norm by utilizing an Analog Devices HDMI Receiver which extracts HDMI audio, and sends the digital signal to the on-board Texas Instruments Audio Amplifier. At the output of the audio amplifier, our module features easy-to-use speaker terminal blocks (24 – 18 AWG wire) which allow our module to be easily connected to (2) standard 8Ω speakers, up to 10W each. Some reference speakers are linked below:

<table>
<thead>
<tr>
<th>Digi-Key</th>
<th>Mouser</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUI Audio, Inc., 8ohm, 10W Speaker</td>
<td>PUI Audio, Inc., 8ohm, 10W Speaker</td>
</tr>
<tr>
<td>CUI Inc., 8ohm, 10W Speaker</td>
<td>CUI Inc., 8ohm, 10W Speaker</td>
</tr>
<tr>
<td>CUI Inc., 8ohm, 3W Speaker</td>
<td>CUI Inc., 8ohm, 3W Speaker</td>
</tr>
</tbody>
</table>

Technical Resources

2D Drawings

- [NHD-10.1-HDMI-A-RSXV](#)
- [NHD-10.1-HDMI-A-RSXV-CTU](#)

3D Models

- [NHD-10.1-HDMI-A-RSXV](#)
- [NHD-10.1-HDMI-A-RSXV-CTU](#)
Quality Information

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Content of Test</th>
<th>Test Condition</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Temperature storage</td>
<td>Endurance test applying the high storage temperature for a long time.</td>
<td>+60°C, 240hrs</td>
<td>2</td>
</tr>
<tr>
<td>Low Temperature storage</td>
<td>Endurance test applying the low storage temperature for a long time.</td>
<td>-20°C, 240hrs</td>
<td>1,2</td>
</tr>
<tr>
<td>High Temperature Operation</td>
<td>Endurance test applying the electric stress (voltage &amp; current) and the high thermal stress for a long time.</td>
<td>+50°C, 120hrs</td>
<td>2</td>
</tr>
<tr>
<td>Low Temperature Operation</td>
<td>Endurance test applying the electric stress (voltage &amp; current) and the low thermal stress for a long time.</td>
<td>0°C, 120hrs</td>
<td>1,2</td>
</tr>
<tr>
<td>High Temperature / Humidity Operation</td>
<td>Endurance test applying the electric stress (voltage &amp; current) and the high thermal with high humidity stress for a long time.</td>
<td>+50°C, 90% RH, 120hrs</td>
<td>1,2</td>
</tr>
<tr>
<td>Thermal Shock resistance</td>
<td>Endurance test applying the electric stress (voltage &amp; current) during a cycle of low and high thermal stress.</td>
<td>0°C, 30min -&gt; 25°C, 5min -&gt; 50°C, 30min = 1 cycle 10 cycles</td>
<td></td>
</tr>
<tr>
<td>Vibration test</td>
<td>Endurance test applying vibration to simulate transportation and use.</td>
<td>10-55Hz, 15mm amplitude. 60 sec in each of 3 directions X,Y,Z For 15 minutes</td>
<td>3</td>
</tr>
<tr>
<td>Static electricity test</td>
<td>Endurance test applying electric static discharge.</td>
<td>Air: Vs=8KV, Contact: Vs=4KV, 10 times</td>
<td></td>
</tr>
</tbody>
</table>

**Note 1:** No condensation to be observed.
**Note 2:** Conducted after 4 hours of storage at 25°C, 0%RH.
**Note 3:** Test performed on product itself, not inside a container.

Precautions for Using LCDs/LCMs

See Precautions at [www.newhavendisplay.com/specs/precautions.pdf](http://www.newhavendisplay.com/specs/precautions.pdf)

Warranty Information

## Document Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>9/6/2018</td>
<td>Initial Release</td>
</tr>
</tbody>
</table>