HDMIPi Assembly

What is in the box?

Depending on the variant or kit purchased, the assembly of the HDMIPi unit is the same, thus a majority of the contents are the same; So inside you should find:

1 x LCD Panel

1 x HDMIPi Driver Board

1 x Short HDMI Connector

1 x Short USB to Micro USB Cable

1 x Set of Acrylic Buttons

5 x Layers of Acrylic (Colours may vary)

6 x Short M3 Bolts

6 x M3 Hexagonal Spacers

2 x M2.5 Bolts

4 x M2.5 Nuts

1 x Set of Raspberry Pi Nuts and Bolts (depends on variant)

Why are some layers funny colours?

When you receive the HDMIPi kit, the layers of acrylic still have their protective coverings. Each layer will have a covering on both sides, including the clear layers.

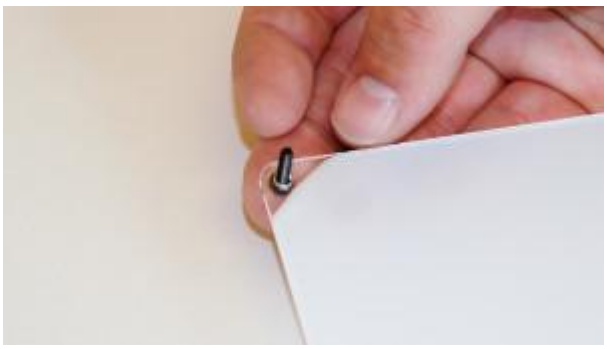
These peel off really easily, all that it needs is a thumbnail or a plastic blade to pick at the corners making it easy to rip off the covering. Don’t use anything metal as this will easily scratch the acrylic.

Layer 1 – The front protector

The very first layer on the HDMIPi unit is the clear protective layer, this is easily identifiable as it is the thinnest plastic layer with only 6 holes for the bolt.

Start by picking away the protective layer from one side, thumbnails are best for this as using anything metal like a blade or bolt driver will result in scratching the clear layer, and as this is the very first thing seen, will be very obvious. Completely remove the protective layer from one side only.

On the reverse side pick away just enough of the protective layer to leave 2 corners clear. With these 2 corners exposed, push through M3 bolts, this will act as a guide for the next set of layers to keep them neat and organised.

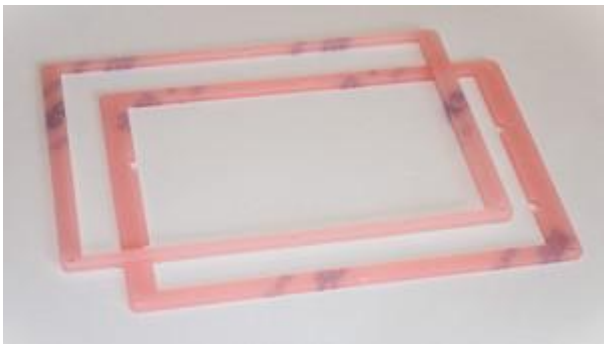


HDMIPi logo layer

Although purely optional, it hides the metal sides of the LCD panel and gives the finished unit a better look and feel. This just slips straight on to the screws already placed.

Layer 2 – LCD panel holder

The layer responsible for holding the LCD panel in place is next, this is easily identifiable by having the thinnest sides.



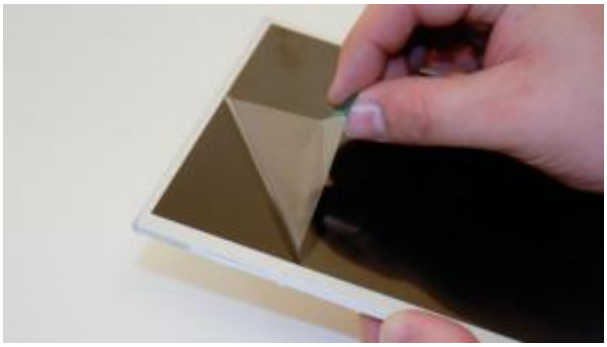
As you will also see, one of the sides is thicker than the other. The reason for this is on the LCD panel itself, one side of the metal is thicker, so the design is to overcome this and also keep the screen central to the unit.

Remove both sides of the protective plastic, this is then placed on top with the thicker side to the **right**, feeding the screws through the holes.

LCD Panel

The LCD panel should already have the ribbon cable inserted. If it doesn’t, or needs reseating jump to the section about the ribbon cable.

Remove the protective cover from the LCD panel, again using a thumbnail to avoid scratching the glass, use the green tab or pick at the corner to remove. Lay the LCD panel face down on to the unit, the PCB on the LCD panel should be at the bottom of the unit.



The LCD panel should fit snugly within layer 2. Carefully pick up the unit to double check everything is placed the right way around. You shouldn't see the metal of the LCD panel (providing the black HDMIPi layer is used).

Layer 3 – LCD gripper layer

To keep the LCD panel in place and allow some room for the cable, screws and PCB on the LCD panel, an extra layer is needed. Whilst similar to layer 2, layer 3 has thicker sides to hold the LCD panel in place.

Remove the protective layer from both sides of the plastic.

Add the layer 3 on top of the unit, pay attention to the notches in sides, these are there to give some room for the driver board screws so no damage is done to the back of the LCD panel.

Layer 4 – Driver board and Pi

Remove the driver board from the antistatic packaging, and take some time to familiarise yourself with the layout.

One side of the board features the power in with both a micro USB port and a 1.7mm barrel jack port for 12v input. On the same side is HDMI 2 and audio out from the HDMI input currently in use.

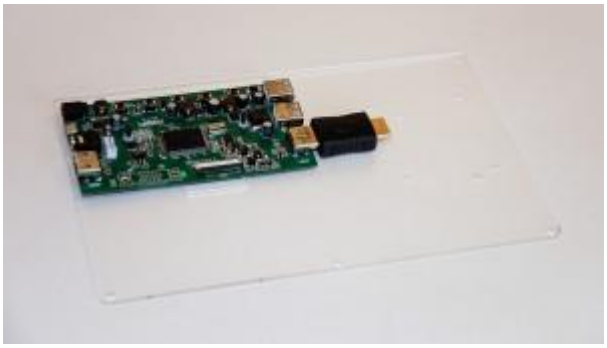
On the other side of the board features HDMI 1 which will be used for the Raspberry Pi video and USB Power which powers the Pi.

Using the thinnest bolts (M2.5 thickness), push a bolt through the hole near the rectangle cut out as pictured followed by a M2.5 nut;

Do the same again for the other hole, followed by another M2.5 nut. Push the driver board on to the screws, with the LCD connector next to the cutout. Screw the remaining 2x M2.5 nuts on top of the driver board to secure it in place. If it is too fiddly to grip use a pair of pliers to grip the nut whilst screwing it in place.

Be careful not to catch any components whilst using any tools to secure the driver board in place.

Plug in the HDMI connector to the driver board.



As the driver board can handle both designs, each requires a slightly different approach, scroll down to find your Raspberry Pi model.

Raspberry Pi Model A or B

In this variation you will have a USB cable with right angled connectors.

Plug the large USB connector in to the driver boards' PI POWER port.

Next step is to add the Raspberry Pi, firstly plug the micro USB connector in to the Pi, followed by pushing the Raspberry Pi to plug in to the other side of the HDMI connector.

Using the M3 bolts to secure the Pi in place (the first revision of Raspberry Pi's do not have mounting holes, if you are using one of these skip this step). Push the bolts through the driver board and then through the Raspberry Pi's mounting holes. Sometimes this can be a bit tight. Follow up by adding the nuts to secure the Pi to the driver layer.

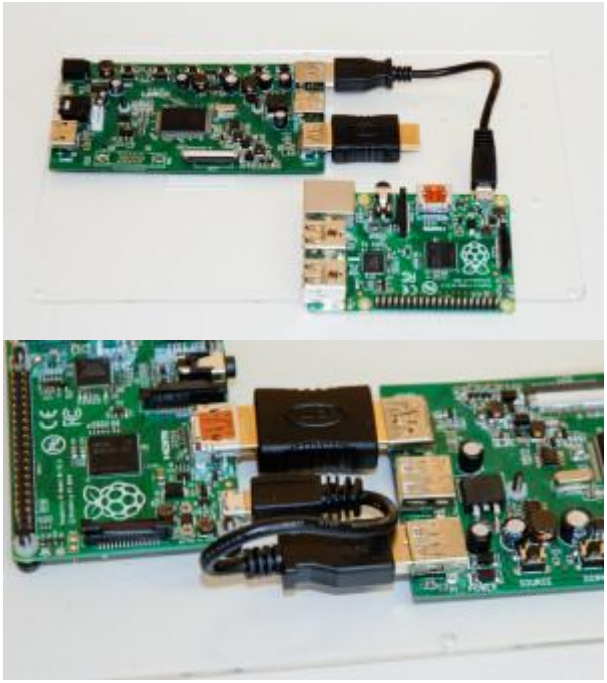
Raspberry Pi Model B+ or Pi 2

In this variation you will have a straight USB cable. This cable will bend to form an S shape. Ensure the micro SD card is in the Raspberry Pi as it can be difficult to insert once assembled.

Plug the large USB connector in to the driver boards' PI POWER port.

Next step is to add the Raspberry Pi, firstly plug the micro USB connector in to the Pi, followed by pushing the Raspberry Pi to plug in to the other side of the HDMI

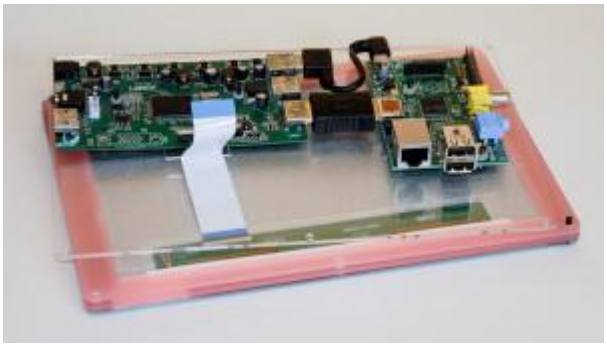
connector. This might need a bit of force as the USB cable will need to form an S shape to fit in the small gap between the Pi and driver board. It is OK to try a few times to get it fit in snuggley.



Using the M3 bolts to secure the Pi in place, push the bolts through the driver board and then through the Raspberry Pi's mounting holes. Sometimes this can be a bit tight. Follow up by adding the nuts to secure the Pi to the driver layer.

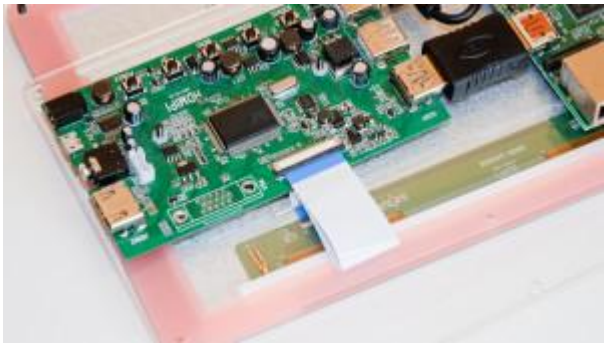
Connecting the ribbon cable

With the driver board and Raspberry Pi in place on the driver plate, bring it to the unit, and push the ribbon from the LCD panel through the cut out. Lay the driver layer down on top, insert the end of the ribbon cable in to the connector.

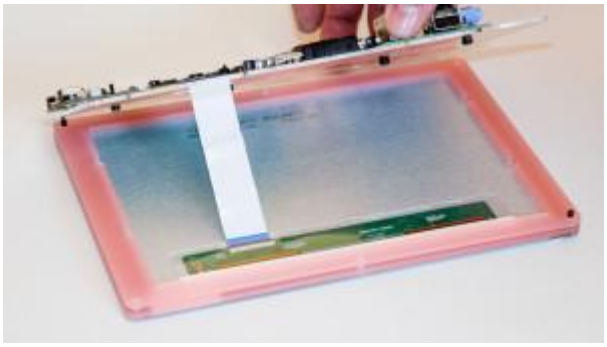


The connector works by gripping on to the ribbon cable with the black tab to hold it in place, in much the same way as the Raspberry Pis' camera connector does. Using thumbnails, carefully push the connector away from the driver board;

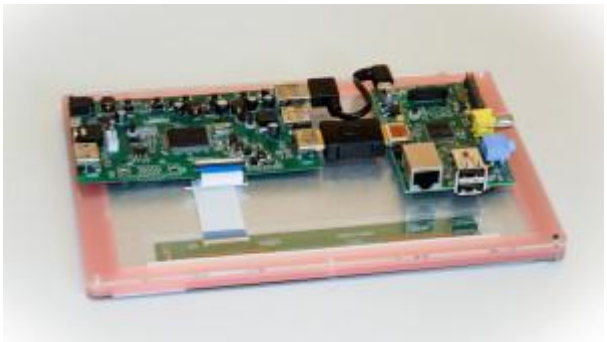
Insert the ribbon cable in to the connector, and push the tab back in place to grip on to the ribbon cable. The ribbon should be straight, and the tab firmly in place.



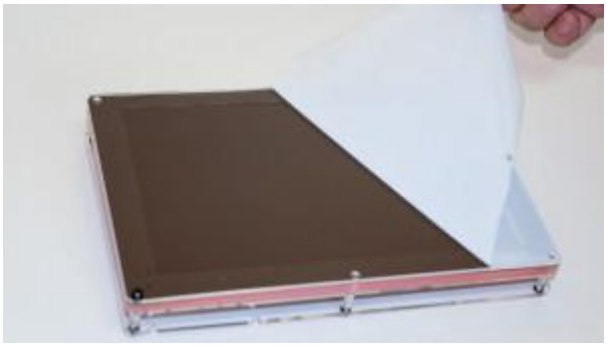
Carefully lift up the driver layer to pull the slack of the ribbon cable through the cut out, and place it back down on top of the unit, making sure the screws feed through the holes in the driver layer.



Fix everything together by screwing on the hex spacers on to the 2 bolts, don’t use any mechanical tools to tighten the spacer, as this could lead to damage with the acrylic layers and LCD panel.



Now you can turn over the unit to add the remaining bolts and hexagonal spacers. Peel around the edge of the first layer to uncover the remaining screw holes – Or remove the protective layer completely if you are feeling confident!



Add the remaining 4 bolts, bear in mind pushing a bolt through the 4 layers will be a bit tight. Add the hex spacer to the back using finger tightness, do not use any mechanical tool to tighten the spacer as it could lead to cracking of the layers and potentially damage the LCD panel.

Optional – Power up test

Sometimes it is handy to check everything is working before completely finishing up, as a problem in the end can lead to disappointment and undoing all the hard work you have put in. At this stage all the electronic parts are in place and connected, connect the HDMIPi unit to a 5.2V power supply capable of 2 Amps, or a 12V power supply with 1.7mm barrel connector capable of 1 Amp – Both of these are available from the Cyntech Shop.

With power added, the screen should power up, hopefully to the Raspberry Pi booting up sequence. If the screen is blue, stating that no signal is found on HDMI 2 or VGA, press the Source button until it reads HDMI 1.

If there is nothing on the screen with HDMI 1 selected, remove the power and double check all the connections between the driver board and Raspberry Pi, and that the Raspberry Pi has an SD card firmly in place. If there is still nothing see the Troubleshooting section below.

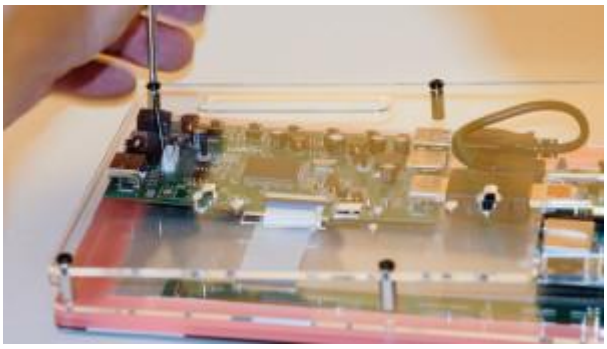
If everything is working perfectly, remove the power and continue.

Layer 5 – Back cover

Turn the unit over to look at the back again, depending on the variant of HDMIPi, you will have received either a A/B variant featuring cut outs for the yellow composite and blue/black audio connectors. If you received the B+/Pi 2 variant there will be a longer cut out for the larger GPIO connector and cut outs for the extra USB ports.

Both are attached exactly the same to fit, but pictures of both variants are shown below.

Place the back plate on to the unit, ensuring that the Raspberry Pi connectors fit through the holes



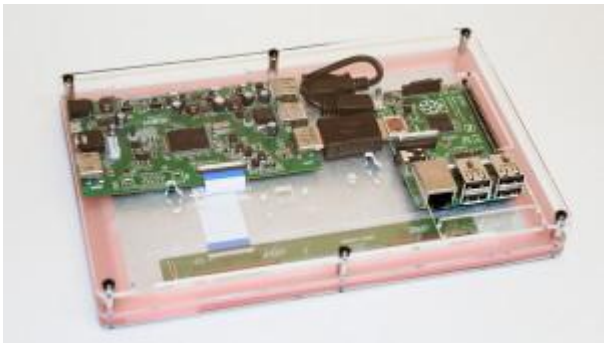
All that is needed to finish is stick on the acrylic buttons. Each button has peel-able backing so the button can be stuck straight on to the tactile buttons of the driver board if you wish.

A/B Variant

Here is what the A/B back plate looks like completed;

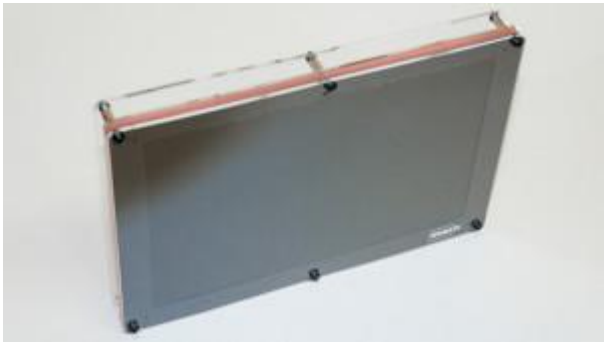
B+/Pi 2 Variant

Here is what the B+/Pi 2 back plate looks like completed;



Just add power

You should have in your hands now is a completed HDMIPi unit!



If you haven't already tried the LCD screen in the test above, all that is needed now is to rip the front protection layer off – If you haven't done already – Add a mouse and keyboard, and a 5.2V or 12V power supply.

Troubleshooting

Black border around the screen

The overscan feature is designed to make the screen slightly smaller for older TVs to prevent the picture disappearing off the edges, by default the config.txt file on a standard Raspberry Pi image has a small amount of overscan as a 'just in case' feature.

The HDMIPi unit can display without the need for any overscan. To turn the feature off, open the config.txt file on the SD card to find the line

#disable_overscan=1

Ensure it says =1 at the end, and remove the # from the beginning, and reboot.

A detailed guide on using the config.txt file will be available soon.

Text is too small to read

The native resolution for the LCD panel is 1280×800, although is capable of handling up to 1920×1080 – Unless instructed to within the config.txt file, the Raspberry Pi will default to this resolution.

To lower the resolution on a Raspberry Pi, open the config.txt file located on the SD card, or in the folder */boot/config.txt* if you are using the Pi at the time of writing.

At the bottom of the file, add the following lines;

hdmi_group=2 # HDMIPi for 1280 x 800
hdmi_drive=2 # for alternative modes get sound
hdmi_mode=28 # 1280 x 800 @ 60 Hz Specifcations
hdmi_ignore_edid=0xa5000080

Save the file, and boot – or reboot if your editing the file on the Pi being used. Instantly the text should be readable.

If you are unsure on editing the config.txt file, a detailed guide will be available shortly.

Ribbon Cable

The ribbon cable is responsible for providing the LCD panel with both power and data, it is also very delicate and prone to damage when not handled correctly.

Normally the LCD panel is shipped with the ribbon cable already attached, but if for any reason the cable requires replacing, or reseating, this can be done without any special tools.

From the LCD panel

The grip on the LCD panel flips up 90 degrees when unlocked, and clamps down on to the cable when locked in place.

To unlock the connector, using both thumbnails, under each edge of the connector, apply a gentle force upwards until you feel a slight click. The ribbon cable can then be easily removed.

To reseat the cable, place the cable in to the connector, ensuring it is inserted straight with the contact facing down and blue tape facing up. Simply close the connector grip on to the ribbon cable until it clicks in to place and holds the cable.

From the driver board

The grip on the driver board slides out towards the edge of the board.

To unlock the grip on the ribbon cable, use your thumbnails to prise out the grip at each end gently until it slides out and releases the ribbon cable.

To insert a new or reseat a ribbon cable, slide the ribbon cable in to the connector, ensuring the grip is pushed out, firmly insert the cable with the contacts facing down and blue tape upwards. Push the grip back in to the connector to lock the cable in place.

Resolution Out of Bounds

This very serious red screen isn’t as bad as it looks, all it is telling you that the Raspberry Pi or other input has been set to a resolution that the HDMIPi chipset can’t handle.

If the resolution was set in the *config.txt* file of the Raspberry Pi, check back at the configuration to ensure that the numbers are in correct and isn’t conflicted with another driver mode setting.