Tommy's Pi Display Module User Manual

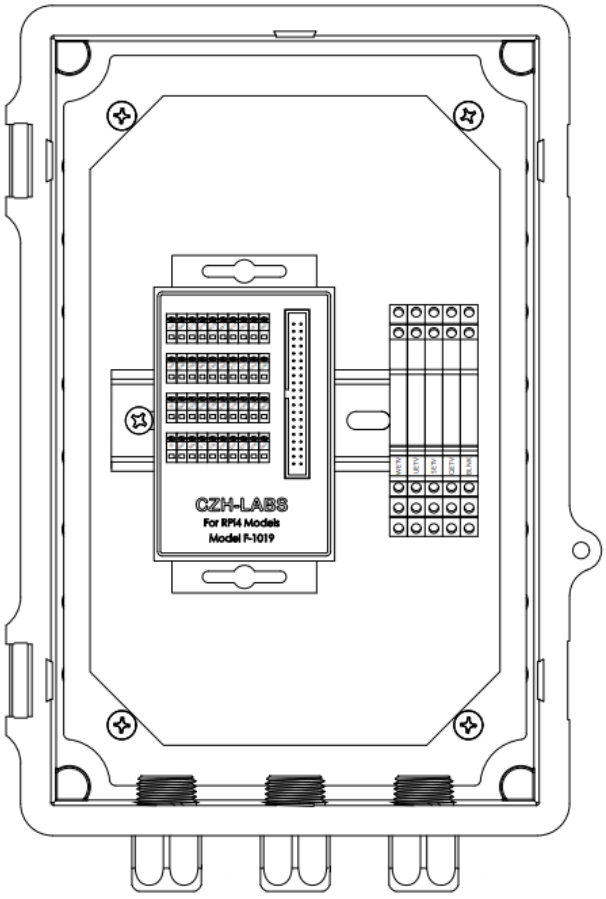


Table of Contents

General Information

In the following pages you will see coverage on how the pi works, how to find what version of pi you are utilizing, what kits and part numbers are available, and how to set up the pi and how to wire it up.

Some systems use a 110 VAC voltage to control the slides. If you have a 110VAC system you will need to make sure the relays used to wire to the TPDM stay 110V. All kits listed below list 24V relays. These will need to be substituted for 110V relays.

The Tommy's Pi Display Module, how does it work?

The Tommy's Pi Display Module (TPDM) is a raspberry pi running Raspbian (a Linux based operating system) that has an IO case around the pi itself that has a special program preloaded to it. This program interprets the signals from the Guardian Wash Command and fires the slides needed.

The TPDM can connect to the internet for franchise sites and retrieve updated images from an online database so that the images do not have to be manually changed. If it cannot connect to the internet, it will display images that are preloaded as a fall back.

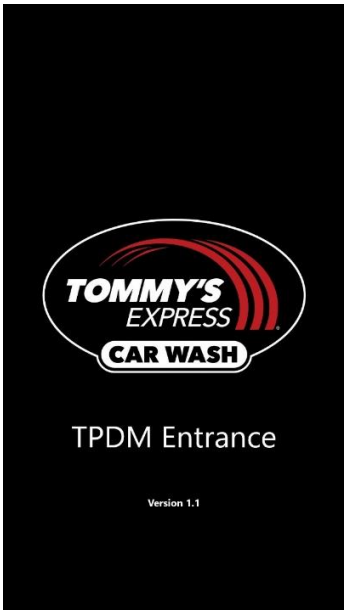
The TPDM can also be remoted by utilizing TeamViewer.

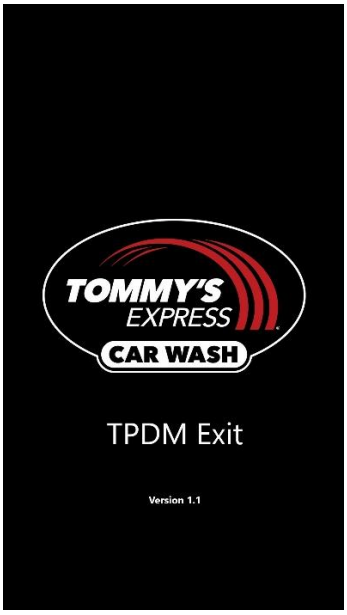
What Version is my TPDM?

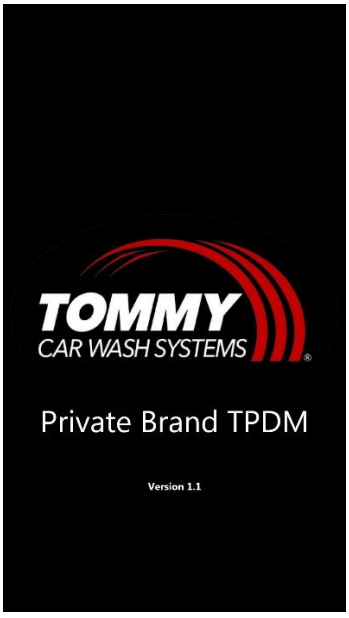
Finding out what version of TPDM you are utilizing is as easy as viewing the desktop. Once the Pi is booted up the unit will display a label that clarifies if it is an entrance, Exit, or private brand unit and what version of software it is currently running.

To view this, you simply hook up a keyboard and hit the escape key, so you exit the program and are on the desktop. If you do not see a desktop like the one below and it does not have a Tommy's logo this means you are running on version 1.0.

The next three images will display what to expect on the Entrance, Exit, and Private Brand desktop in that order.







Pi Kits and Part Numbers

Below you will find the pi kits with a description and parts included and a list of all part numbers for the Tommy's Pi Display Module (TPDM). After the kits are provided replacement parts will be listed.

Entrance Pi Kit for Franchises – TX-EM-PC-A

The TX-EM-PC-A or Pi Entrance TV Display Controller For Franchises ONLY is a complete replacement kit that takes place of the old mini PC display controllers for franchise sites. This kit includes the following parts to be a direct plug and play:

TX-EM-P-ELE-2053-A	Programmed Tommy's Express PI Entrance Memory Card
P-E2019-A	Pi TV Display Base Assembly for Entrance and Exit PC's
P-ELE-2052	Micro HDMI to HDMI Cable 6 Feet, Raspberry Pi 4
P-ELE-2054	CanaKit 3.5A Raspberry Pi 4 Power Supply (USB-C)
P-ELE-2056	HDMI Adapter Nylon Braided Male to Female Cable Supports Ethernet 1080P

Exit Pi Retrofit Kit for Franchises – CCS-TX-PI-EX-RETRO-A

The CCS-TX-PI-EX-RETRO-A or TX Pi Exit TV Display Controller Retrofit Assembly is a complete kit to replace the old mini-PC display controllers for the exit PC for franchise sites. This kit includes relays and an enclosure. This kit includes the following parts and is pre-assembled in the enclosure:

CCS-2966171	Phoenix Contact PLC Output Relay - 24v DC 6a
CCS-NBB-10243	Voice Commander Enclosure Box
CCS-NBX-10985-PL	Voice Commander Enclosure Circuit Board Mounting Panel
CCS-0801733-X-2M	DIn Rail, Per Inch
P-SS-1300	Cord Grip, 1/2" NPT, w/ Liquid Tight Sealing Ring & Nut
P-ELE-2055	20 Gauge Hookup Wires kit Stranded Tinned Copper Wire
TX-EX-PC-A	Pi Exit TV Display Controller For Franchises ONLY

Exit Pi Kit for Franchises – TX-EX-PC-A

The TX-EX-PC-A or Pi Exit TV Display Controller For Franchises ONLY is a complete replacement kit for sites that have already been retrofitted with CCS-TX-PI-EX-RETRO-A. This kit should not be sent out to a site who does not have an enclosure and relays to isolate the exit Pi and should only be used as an assembly in the aforementioned kit. This kit includes the following parts:

TX-EX-P-ELE-2053-A	Programmed Tommy's Express PI Exit Memory Card
P-E2019-A	Pi TV Display Base Assembly for Entrance and Exit PC's
P-ELE-2052	Micro HDMI to HDMI Cable 6 Feet, Raspberry Pi 4
P-ELE-2054	CanaKit 3.5A Raspberry Pi 4 Power Supply (USB-C)
P-ELE-2056	HDMI Adapter Nylon Braided Male to Female Cable Supports Ethernet 1080P

Private Brand Pi Kit – EM-PC-A

The EM-PC-A or Pi TV Display Controller For Non-Franchises ONLY is a complete replacement kit that takes place of the old mini PC display controllers for private brand sites. This kit includes the following parts to be a direct plug and play:

P-ELE-2053-A	Programmed Non-Franchise PI Memory Card
P-E2019-A	Pi TV Display Base Assembly for Entrance and Exit PC's
P-ELE-2052	Micro HDMI to HDMI Cable 6 Feet, Raspberry Pi 4
P-ELE-2054	CanaKit 3.5A Raspberry Pi 4 Power Supply (USB-C)
P-ELE-2056	HDMI Adapter Nylon Braided Male to Female Cable Supports Ethernet 1080P

Pi Hardware Base Assembly – P-E2019-A

The P-E2019-A or Pi TV Display Base Assembly for Entrance and Exit PC's is a base assembly used in assembling the other kits. This Assembly should only be sent out if the hardware on the pi itself has failed. This kit is more like an individual part and will also be listed in the replacement parts section:

P-ELE-2049	RPi Screw Terminal Block Breakout Module
P-ELE-2051	Raspberry Pi 4 Model B (8gb)
P-ELE-2057	Raspberry Pi 4b Heatsink
LABOR-CCS	CanaKit 3.5A Raspberry Pi 4 Power Supply (USB-C)

Pi Replacement Parts

Below you will find a list of parts that may need to be replaced on a malfunctioning TPDM setup.

Part Number	Readable Name
TX-EM-P-ELE-2053-A	Programmed Tommy's Express PI Entrance Memory Card
TX-EX-P-ELE-2053-A	Programmed Tommy's Express PI Exit Memory Card
P-ELE-2053-A	Programmed Non-Franchise PI Memory Card
P-E2019-A	Pi Hardware Base Assembly
P-ELE-2054	CanaKit 3.5A Raspberry Pi 4 Power Supply (USB-C)
P-ELE-2056	Micro HDMI to HDMI braded Adapter
P-ELE-2052	Micro HDMI to HDMI Cable 6 Feet, Raspberry Pi 4
CCS-2966171	Phoenix Contact PLC Output Relay - 24v DC 6a

Setting Up the Pi

Below you will find typical installation instructions for installing the Tommy's Pi Display Module (TPDM). These instructions will not be an exact match for the Exit Pi Retrofit kit as that comes mounted in an enclosure but will need to be wired up in a similar order.

1. Determine how you will be connecting the TPDM to the TV. Most sites already have a length of HDMI cable and will be utilizing the braded adapter over the 6-foot ethernet cable. Confirm which cable you will need and where would be best to set up your unit.

2. Check and confirm that the SD card is seated in the TPDM. If the SD card is not located in the slot shown below be sure to insert the SD card at this time.

3. Hook up the adapter cable or HDMI to the TPDM and TV in the first micro-HDMI slot. Since most sites will likely have a cable in place from their previous module, they will likely use the braded adapter shown below.

4. Hook up the power to the TPDM and confirm that the pi is displaying correctly on the TV. Once power is hooked up the device will boot straight into the program and display the logo screen. The power supply used needs to be the one provided to prevent issues with underpowering the unit.

5. Unhook power and wire the TPDM according to the wiring diagrams available in the “Wiring Diagrams” section. Be sure to reference the correct diagram when wiring your device up.

6. Hook power back up to the Pi and test the unit. You can manually fire slides as needed for testing from the package slides section of the GWC HMI controller. If the slides display in the wrong order re-wire as needed to get the correct outputs firing.
    a. If you are working on the Entrance Module the slides can be fired manually by going to the Setup Menu and the Package lights page.

    b. The Exit module slides can be fired manually by going into the Output Control and locating the Exit Module Slide functions.

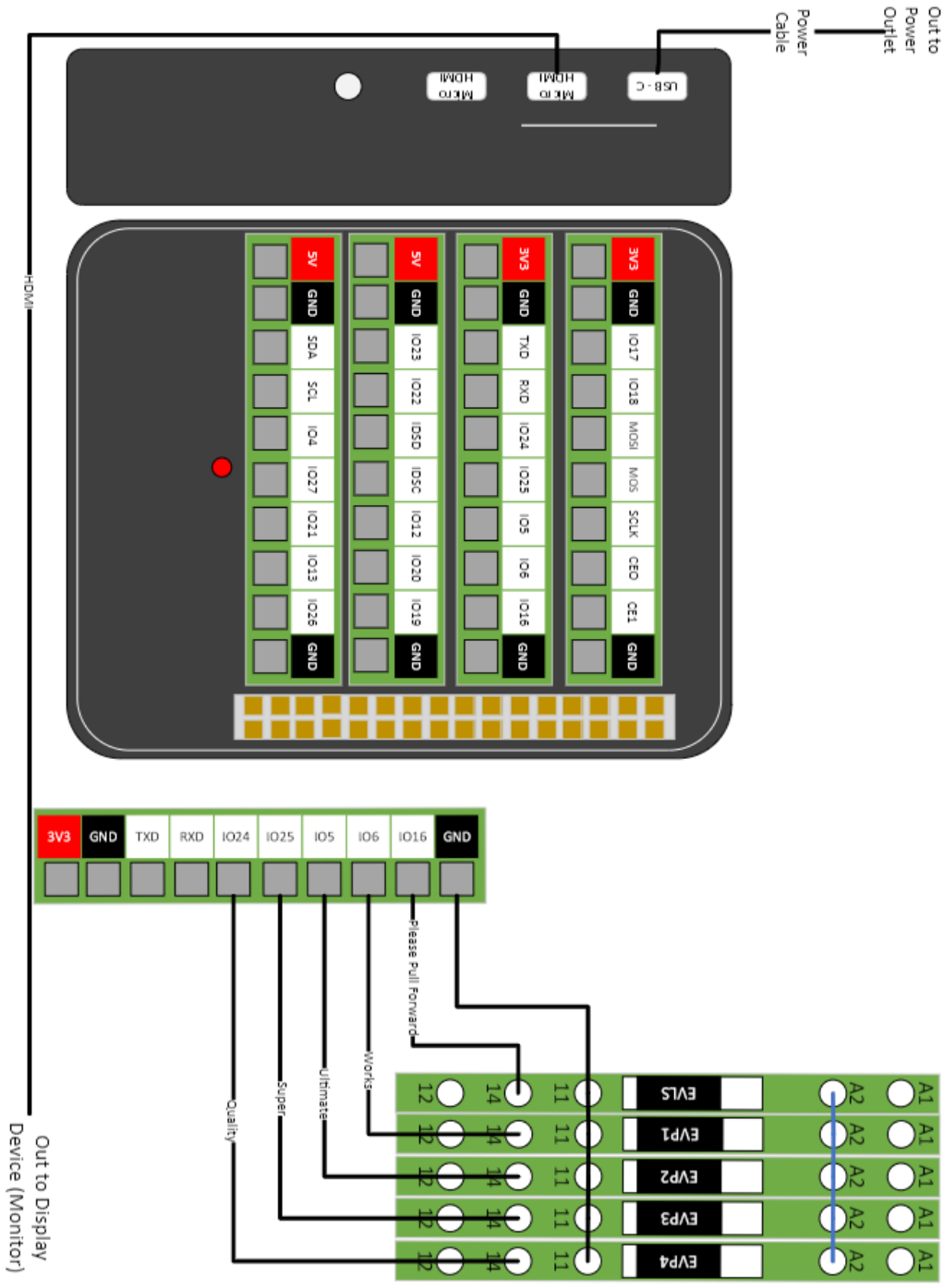
Wiring Diagrams

In the following pages you will find the wiring diagrams that show how to wire up the Tommy's Pi Display Module (TPDM). There are three variations for this, the Entrance Pi, Exit Pi, and Private Brand Pi wiring setups.

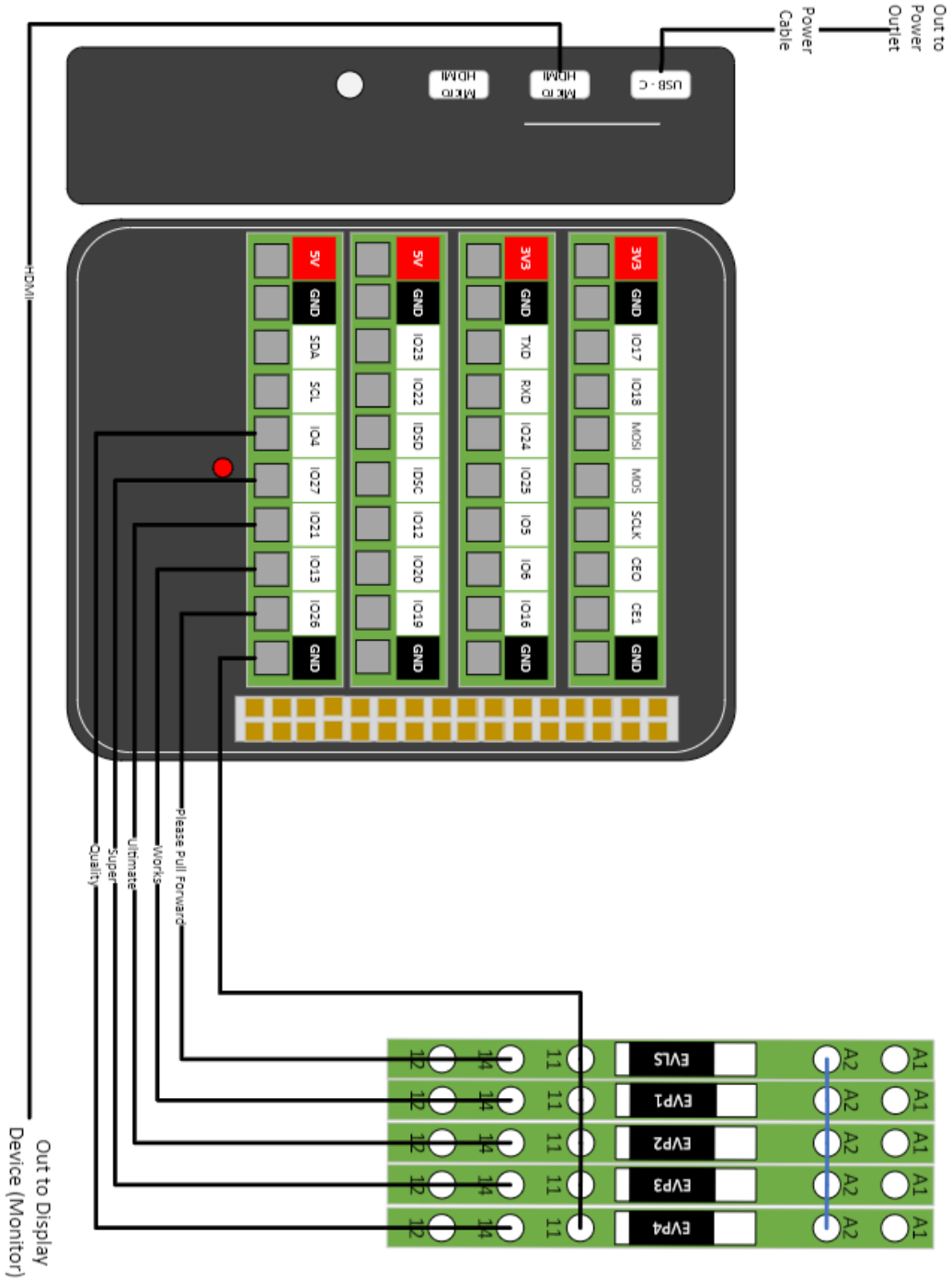
Entrance Pi Wiring Diagrams

The next three pages will display the wiring diagrams for the TPDM Entrance Module for version 1.1 and Earlier, Versions 1.2 through 1.4, and version 1.5. Be sure to utilize the correct drawing corresponding to the version of TPDM you have.

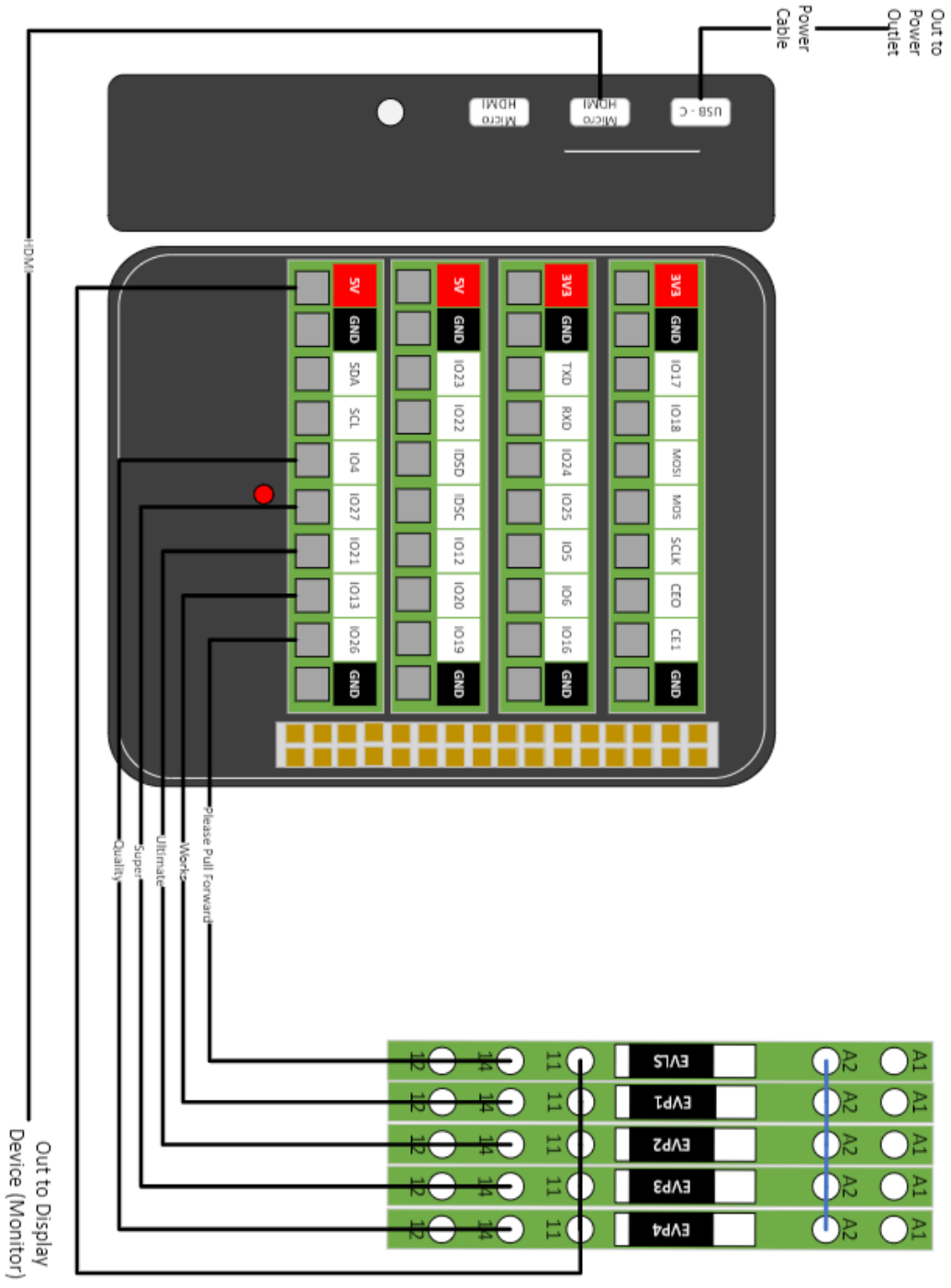
Version 1.1 and Earlier



Version 1.2 through 1.4



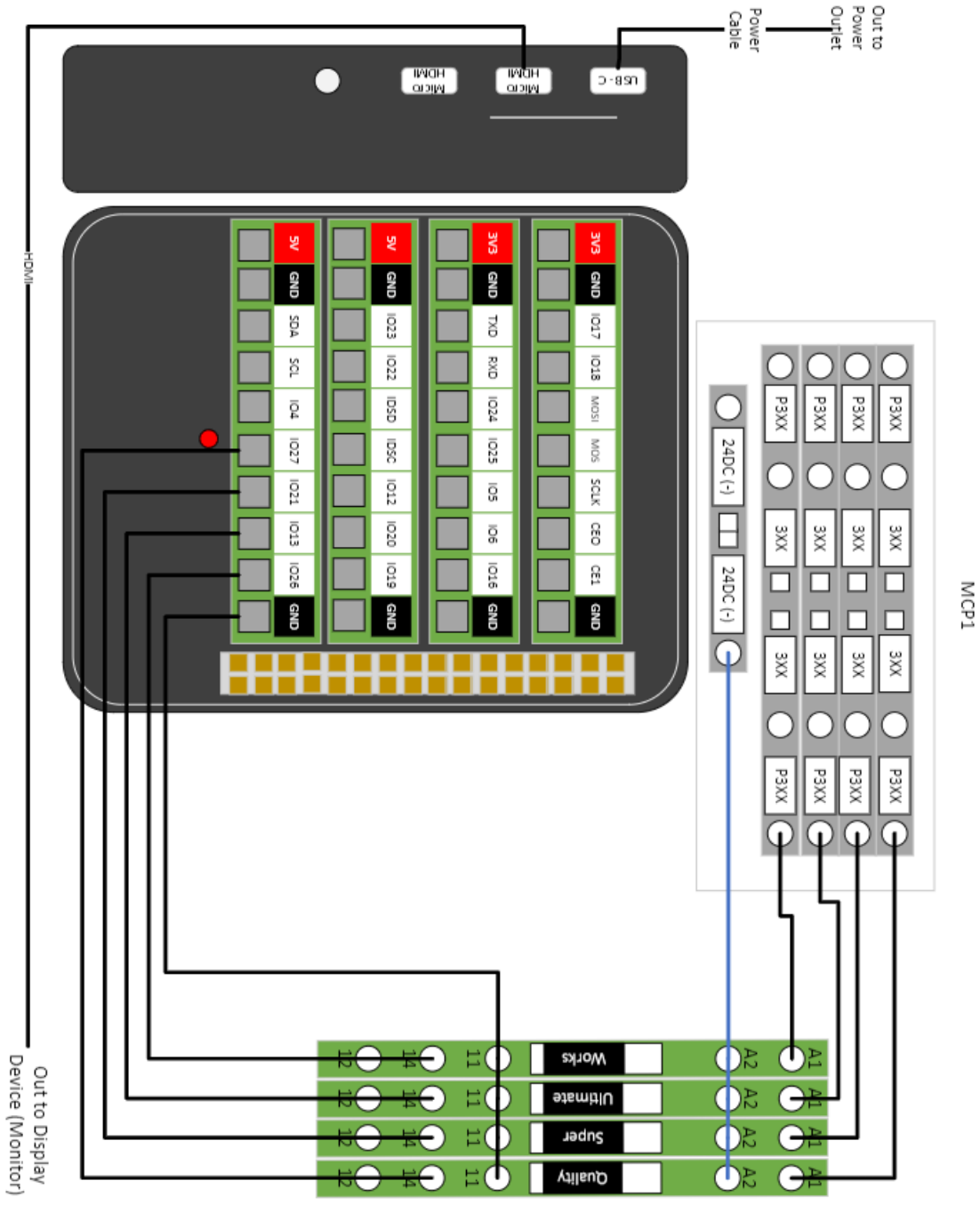
Version 1.5


Power Cable
Out to Power Outlet
Micro HDMI
Micro HDMI
USB - C
HDMI
5V
GND
SDA
SCL
IO4
IO27
IO21
IO13
IO26
5V
GND
IO23
IO22
IDSD
IDSC
IO12
IO20
IO19
3V3
GND
TXD
RXD
IO24
IO25
IO5
IO6
IO16
3V3
GND
IO17
IO18
MOSI
MOS
SCLK
CE0
CE1
Please Pull Forward
Ultimate
Super
Quality
EVLS
EVP1
EVP2
EVP3
EVP4
Out to Display Device (Monitor)

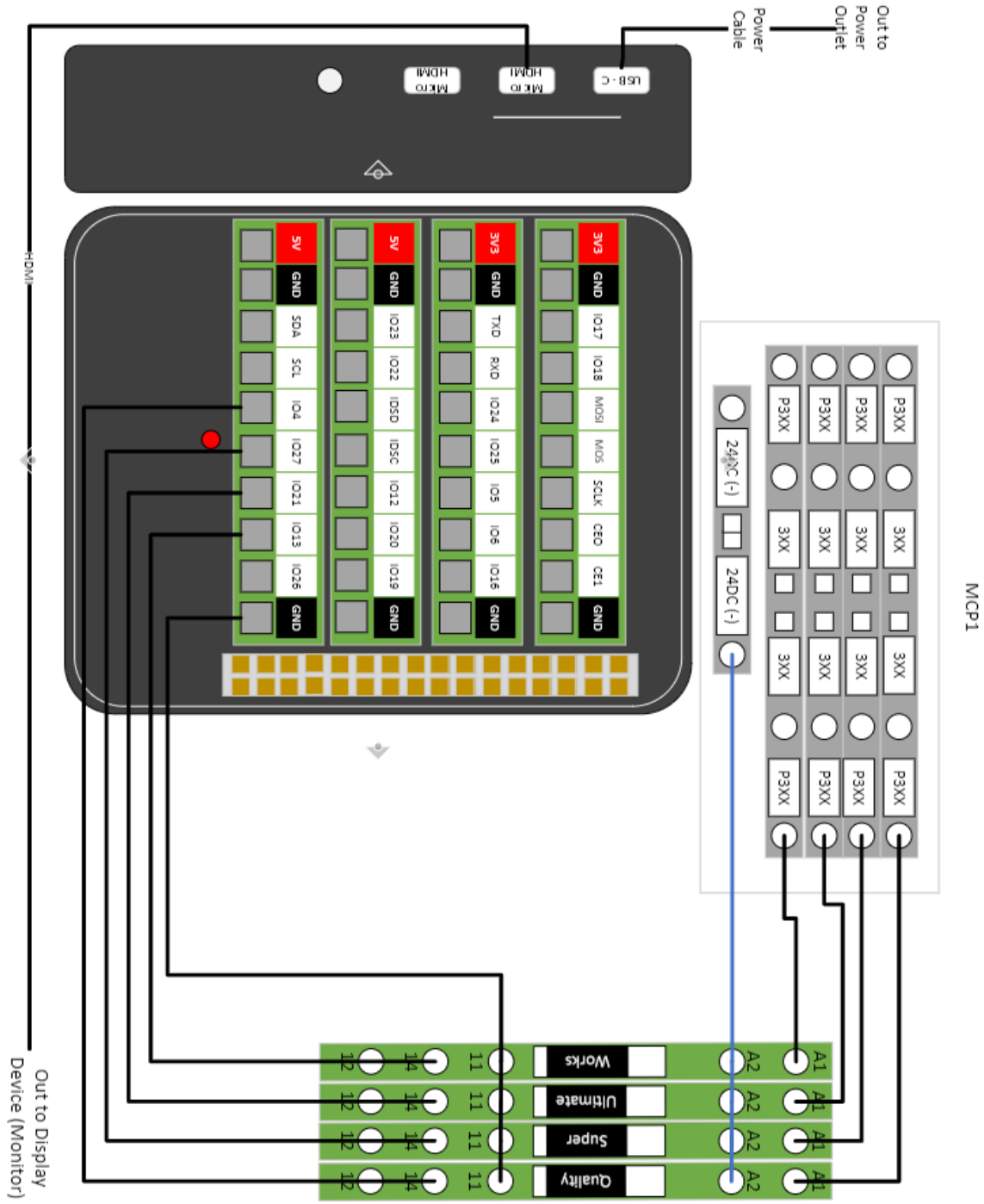
Exit Pi Wiring Diagrams

The next three pages will display the wiring diagrams for the TPDM Exit Module for version 1.1 and Earlier, Versions 1.2 through 1.4, and version 1.5. Be sure to utilize the correct drawing corresponding to the version of TPDM you have.

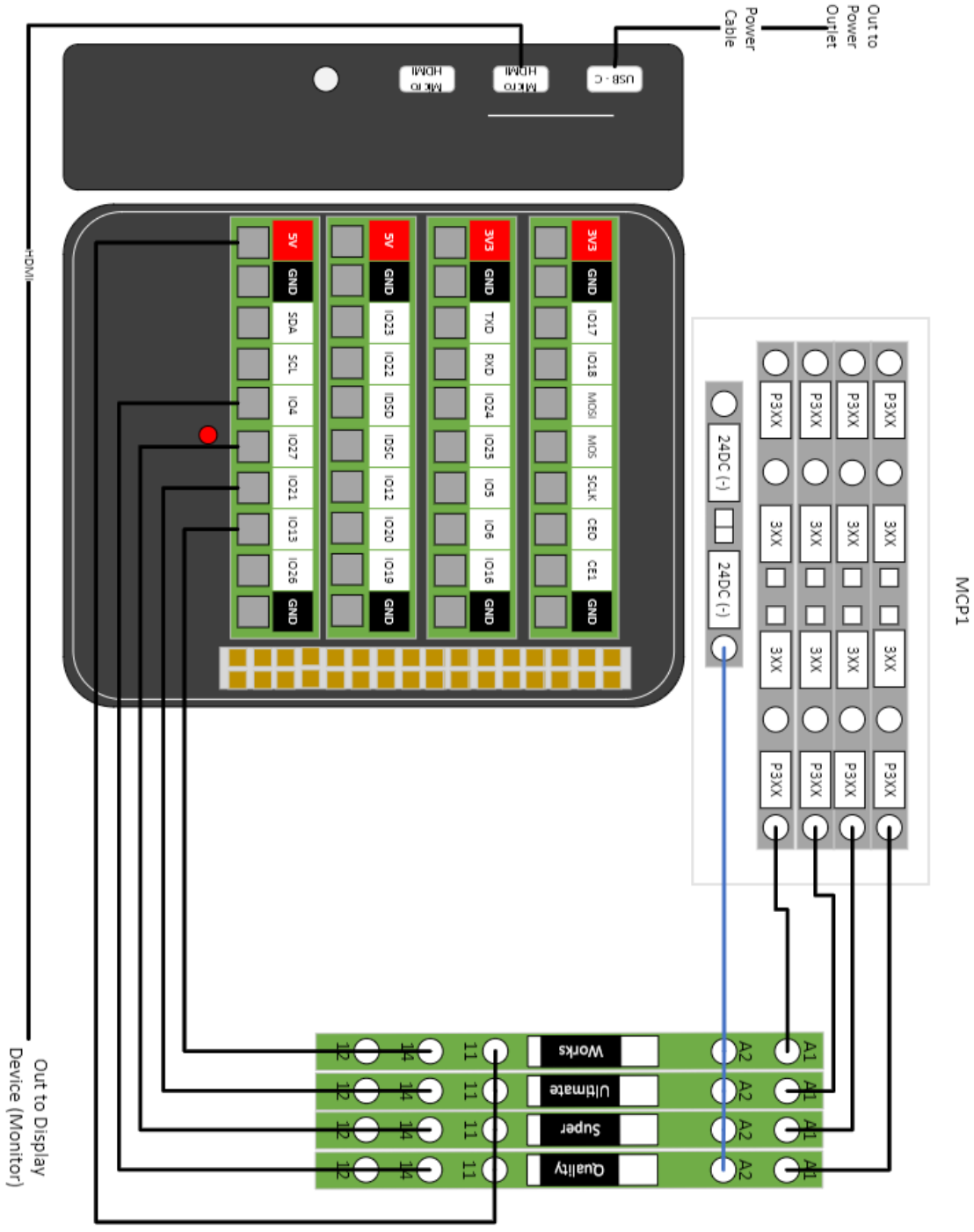
Version 1.1 and Earlier



Version 1.2 through 1.4



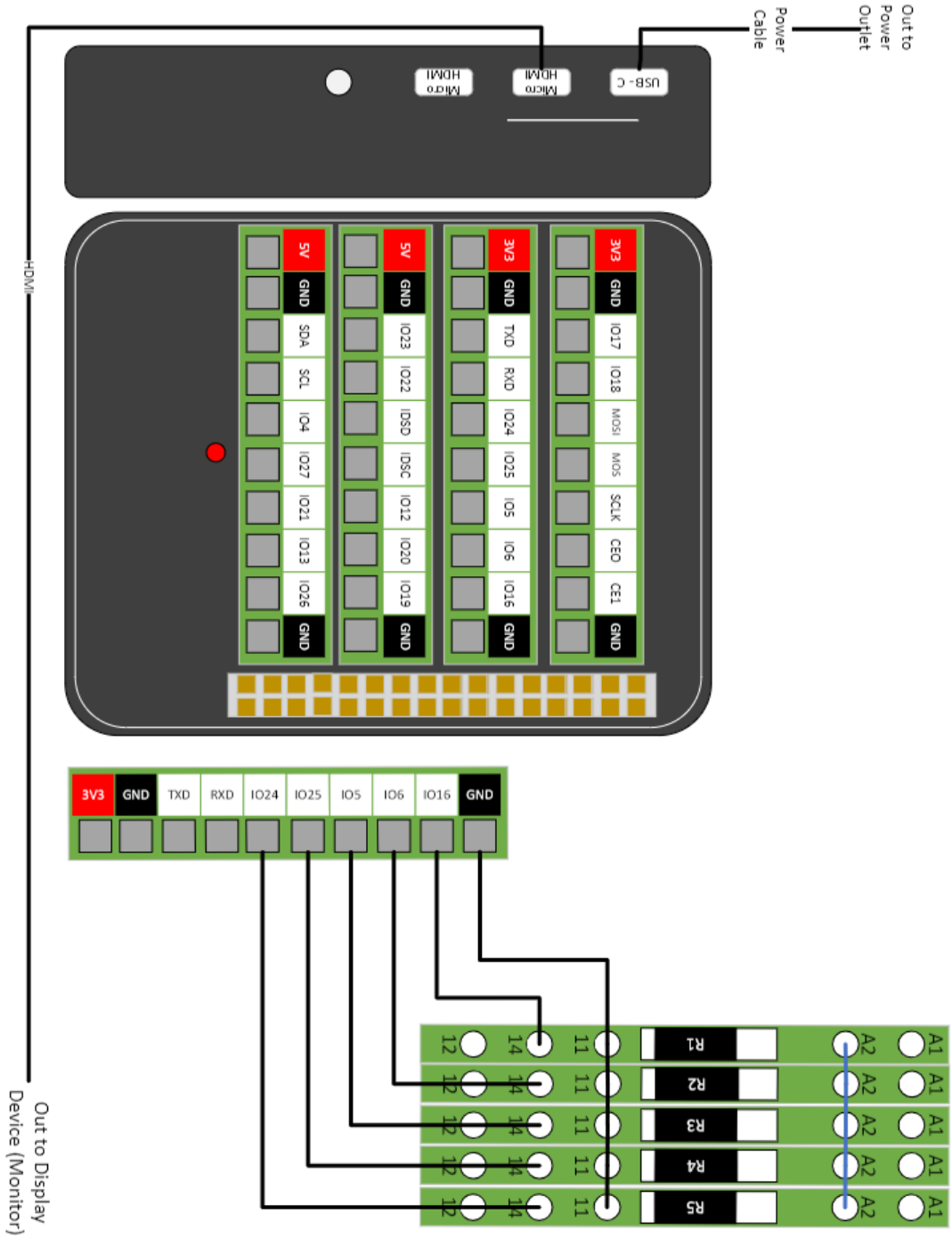
Version 1.5


Power Cable
Out to Power Outlet
USB - C
Micro HDMI
Micro HDMI
HDMI
5V
GND
SDA
SCL
IO4
IO27
IO21
IO13
IO26
5V
GND
IO23
IO22
IO5D
IO5C
IO12
IO20
IO19
3V3
GND
TXD
RXD
IO24
IO25
IO5
IO6
IO16
3V3
GND
IO17
IO18
MOSI
MOS
SCLK
CE0
CE1
24DC (-)
24DC (-)
P3XX
3XX
MCP1
Works
Ultimate
Super
Quality
A1
A2
11
12
14
Out to Display Device (Monitor)

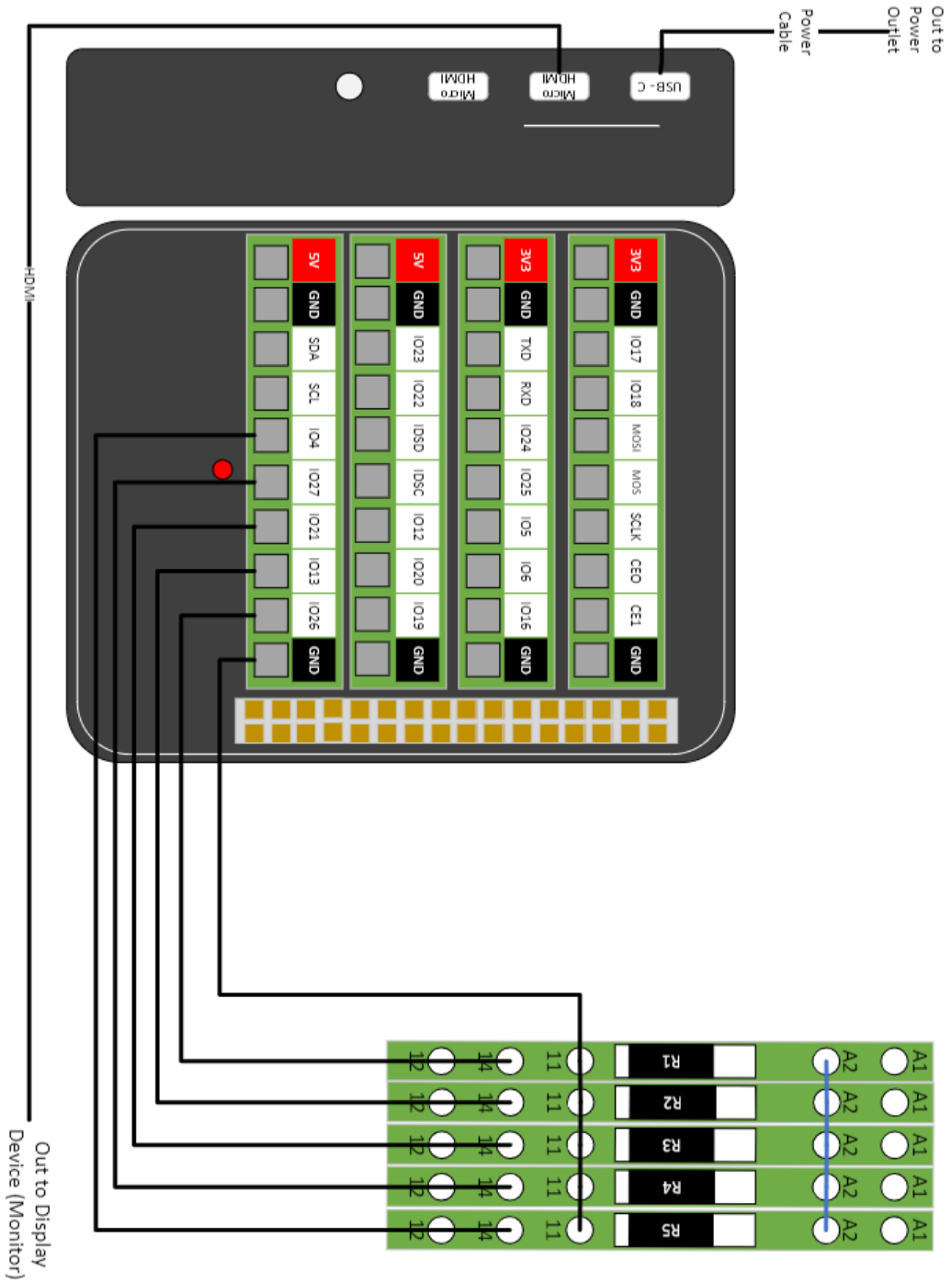
Private Brand Pi Wiring Diagrams

The next three pages will display the wiring diagrams for the TPDM Private Brand Module for version 1.1 and Earlier, Versions 1.2 through 1.4, and version 1.5. Be sure to utilize the correct drawing corresponding to the version of TPDM you have.

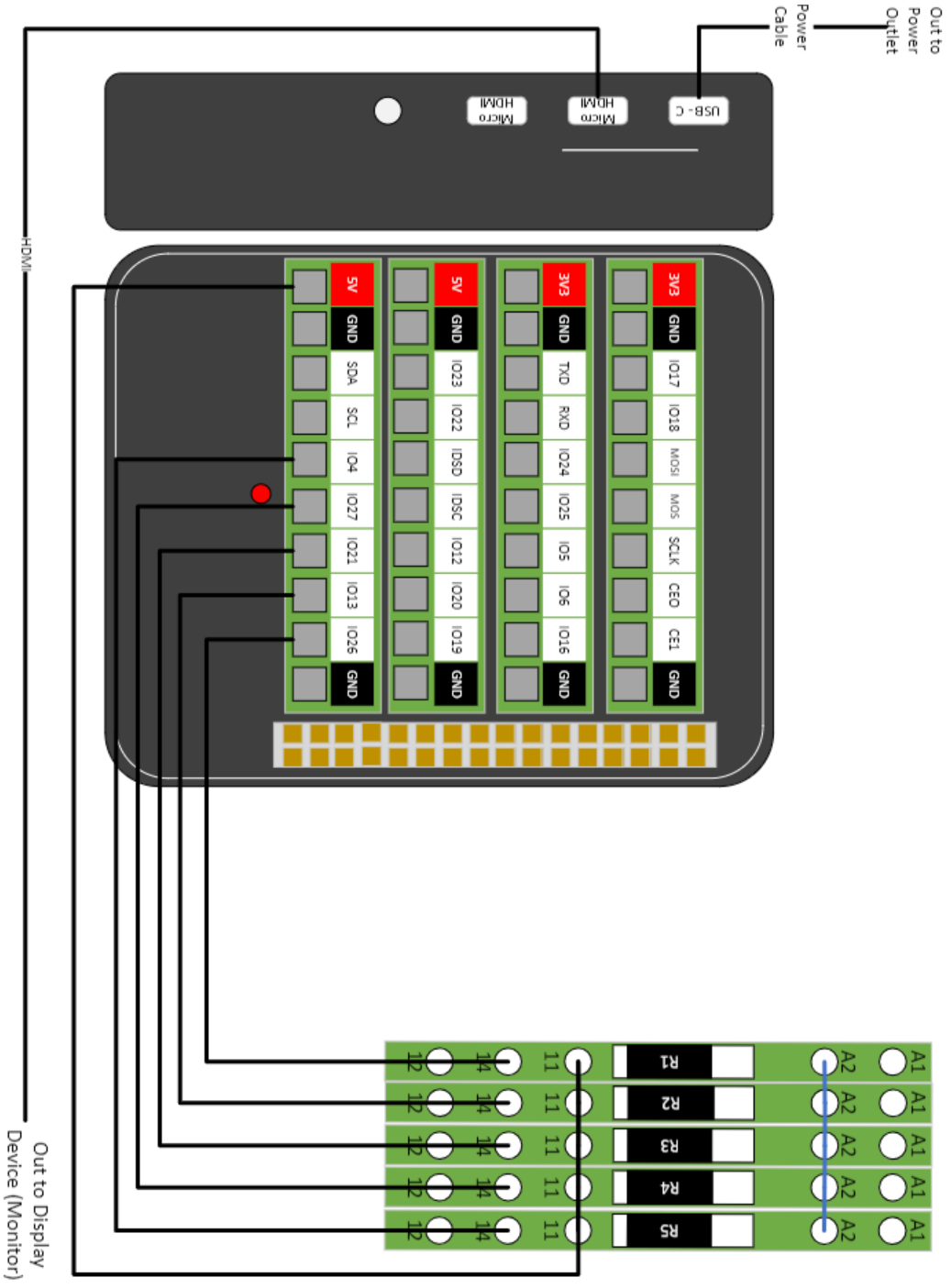
Version 1.1 and Earlier



Version 1.2 through 1.4



Version 1.5


Out to Power Outlet
Power Cable
USB-C
Micro HDMI
Micro HDMI
HDMI
5V
GND
SDA
SCL
IO4
IO27
IO21
IO13
IO26
GND
5V
GND
IO23
IO22
IDSD
IDSC
IO12
IO20
IO19
GND
3V3
GND
TXD
RXD
IO24
IO25
IO5
IO6
IO16
GND
3V3
GND
IO17
IO18
MOSI
MOS
SCLK
CEO
CE1
GND
R1
R2
R3
R4
R5
A1
A2
11
12
14
Out to Display Device (Monitor)

How To

In the following section you will find three how to write ups pertaining to the TPDM, How to Access the Pi Using TeamViewer, How to Open the TPDM Program, and How to Load Private Brand Slides.

How to Access the Pi Using TeamViewer

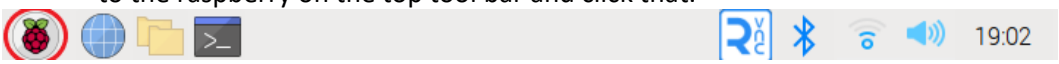
1. Connect a keyboard and mouse to the TPDM using the USB ports on the bottom of the device. Once connected, confirm the mouse is working properly.

2. Confirm the TPDM is properly connected to Wi-Fi. If this device is an entrance or exit module it will need to be connected to the GWCControlNet. If it is a private brand TPDM it can be connected to whatever network is available. Without internet you will be unable to connect to the device remotely.

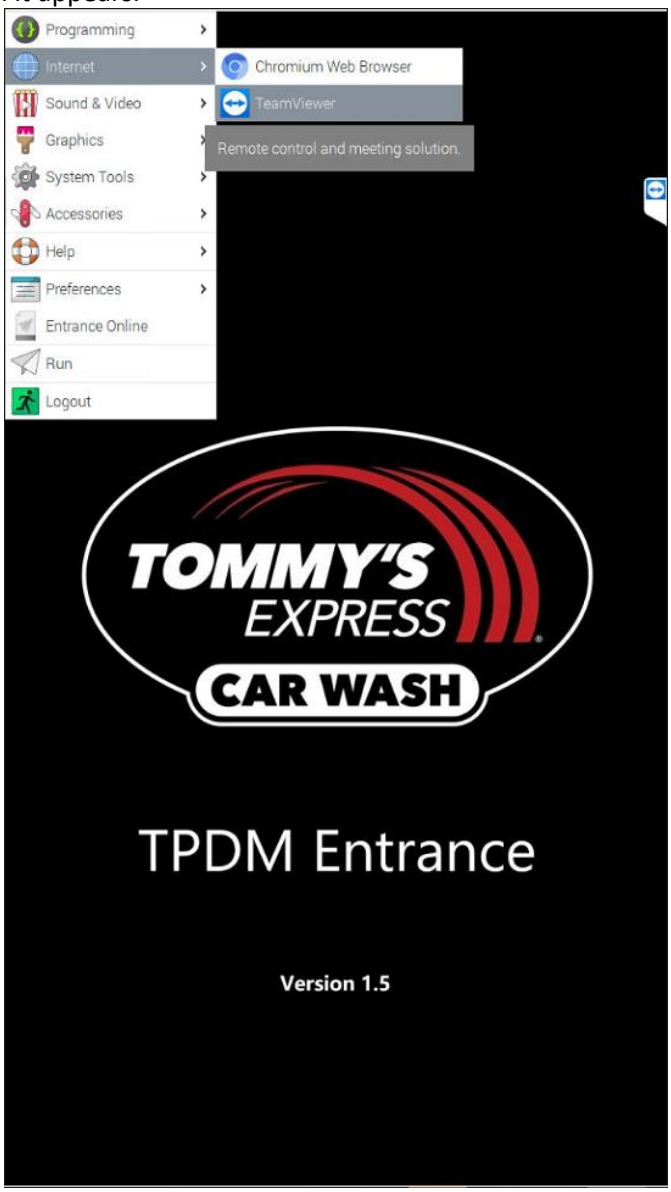
    a. You can confirm the device has internet by moving the mouse to the top right-hand side of the screen. Once there a Wi-Fi symbol should appear to the left of the Bluetooth symbol.

    b. If you do not see the Wi-Fi Symbol like above and instead see two arrows with red x's on them this means the device is not connected to the internet.

3. Once Wi-Fi is confirmed to be connected to the TPDM you will need to navigate to the raspberry on the top tool bar and click that.



4. By clicking on the raspberry icon, a drop-down menu will appear. In the dropdown menu you will want to click internet and select the TeamViewer option when it appears.



5. Once open TeamViewer will display a window with an ID and Password. From here all you will have to do is type in the information on the PC you wish to log into the Pi from.

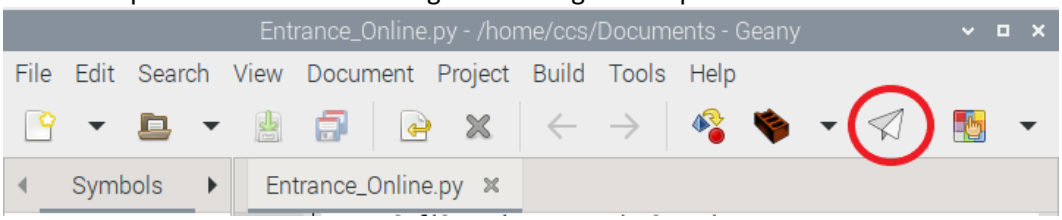
How to Open the TPDM Program

The TPDM Program is the heart of what makes this Linux based device function as we need and fire slides. The quickest way to boot up this program is to power cycle the device as it will open on bootup. If you are on desktop and do not wish to power cycle the device the way this program can be opened and executed depends on your Pi version.

Version 1.3 and Earlier

1. On the desktop locate and open the .py script for the program. This will be titled "Entrance_Online.py", "Exit_Online.py" or "PB.py" depending on the type of TPDM you have.

2. Once opened the script will open in an editor. At the top you will find a paper airplane. Click on that to begin executing the script.



Version 1.4 and Later

1. Click and open the executable on the desktop. It will be titled either "Entrance Online", "Exit Online" or "Private Brand TPDM"

How to Load Private Brand Slides

The Private Brand TPDM is set up so custom slides can be uploaded to display when triggered. Each function can display up to two slides, with there being 5 functions in total. The Logo setup can also swap between two slides as well. These slides must be saved as .jpg images to be uploaded to the TPDM.

1. Identify what slides you wish to use for what functionality. One example of this is if you would like to have a please pull forward slide constantly displayed or if you would like this to fire after a logo slide when a car enters the stack for the wash.

2. If not yet done, wire the TPDM as previously instructed and hook it up. If you do not know how to set up the TPDM please refer to the section “How to Set Up the Pi” under “General Information”.

3. Power up the TPDM by plugging in the USB-C power cable if not yet done. Confirm the device fully boots into the program and displays before continuing.

4. Upload the slides you wish to use to a USB stick. Images should be 1080 by 1920 (portrait) for best results. Any TPDM past version 1.3 will automatically resize.

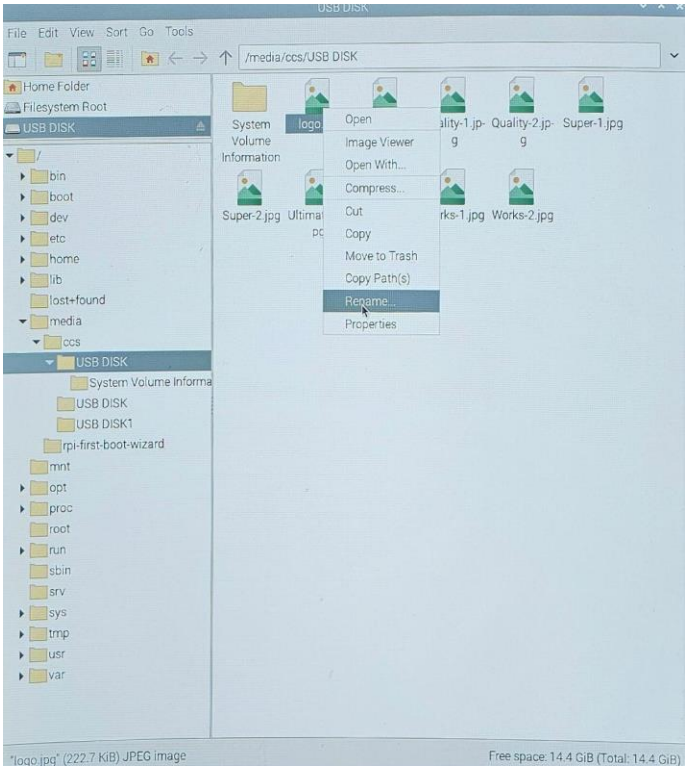
5. Hook up a keyboard and mouse to the pi as well. Once the keyboard and mouse are connected press the escape key on the keyboard and it should exit the autorun script and take you to the desktop.

6. Insert the USB stick previously mentioned into the TPDM using a free USB slot located on the bottom of the device. This will cause a pop up to display on the device.

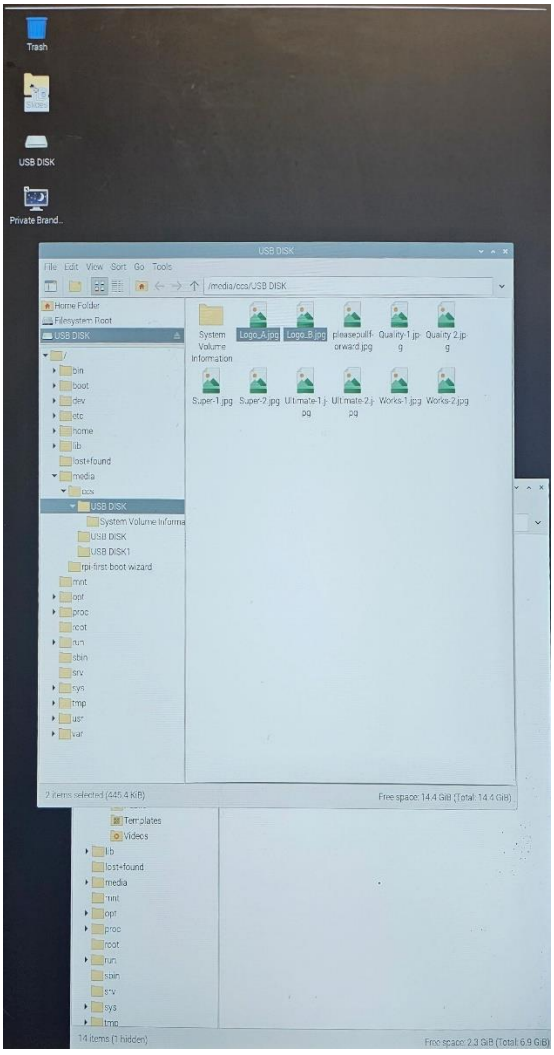
7. On the desktop a pop-up for a removable medium has popped up, click OK and that will open the device instead. If this does not appear, click the USB DISK logo on the desktop instead.

8. Once open, locate the picture(s) on your thumb drive and what slide you would like to be your “Logo” slide. Right click on the slide and click rename. You will want to rename the slide “Logo_A.jpg” and your second one “Logo_B.jpg”.

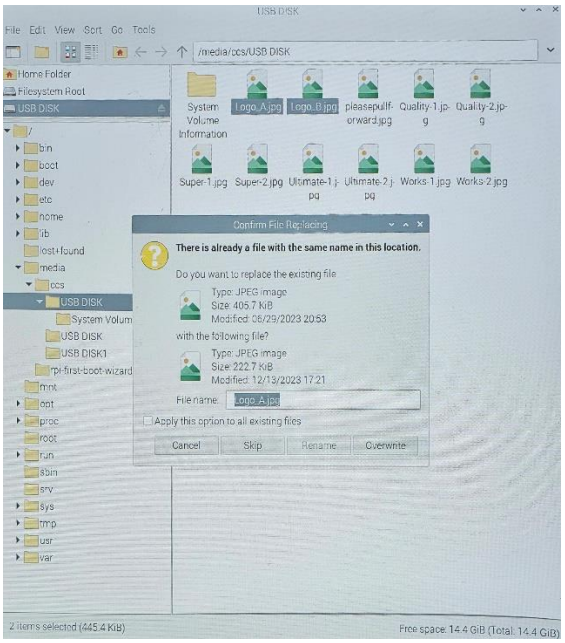
    - If at any point you do not have two images for a single function, you can create a copy of a single image to use as a swap between. To do this you will just need to select the image before transferring to the slides folder on the desktop, copy the image, and paste in the USB folder. You can then rename the original image and the image you copied to fill both images for that function.



9. After the file has been renamed, drag, and drop the renamed “Logo_A.jpg” and “Logo_B.jpg” to the slides folder on the desktop.



10. Once dropped in a pop-up will show up stating “There is already a file with the same name in this location”. On this pop up you will want to press the “Overwrite” button for both images. If overwrite does not appear make sure to confirm that the images are named correctly, and all capitalizations are properly in place.



11. This same process will be repeated for the number of functions you have that the TPDM needs to fire. If you do not have a total of five, only copy over the ones you have and leave all images in the slides folder. Do not delete any images in the slides folder on the desktop. Each one will need to be renamed as follows:

    a. “Image_1A.jpg” and “Image_1B.jpg” for function 1.
    b. “Image_2A.jpg” and “Image_2B.jpg” for function 2.
    c. “Image_3A.jpg” and “Image_3B.jpg” for function 3.
    d. “Image_4A.jpg” and “Image_4B.jpg” for function 4.
    e. “Image_5A.jpg” and “Image_5B.jpg” for function 5.

12. Once done copying the slides over, close out of both file windows. On the desktop click the icon labelled “Private Brand TPDM”. This will cause the program to open and execute. From here you can test and confirm proper operation.
    - In addition, you can also execute the program by simply power cycling the device by unplugging and re-plugging in the USB-C power supply.

Troubleshooting

Listed below are basic troubleshooting steps to perform if your TPDM is not operating optimally. Please locate the section that best describes your issue and follow the troubleshooting. If you are unable to troubleshoot and find the fix utilizing the troubleshooting steps below reach out to Equipment Support.

TPDM Is Not Powering on:

1. Confirm the power supply being used is the correct power supply that is included in the TPDM kits. If it is not, order and utilize the correct power supply which is listed in the Pi Kits and Part Numbers Section above.

2. Check the outlet the power supply is plugged into. If the outlet is a GFCI outlet, confirm it is not tripped and is producing 120 Volts AC. You can also confirm by using a different outlet to see if the TPDM powers up.

3. When the voltage has been confirmed test the unit by plugging it into a USB-C charger and base. This can be used temporarily to confirm the unit is working correctly. If it does receive power replace the Power supply. If it does you will need to order a new TPDM module.

The Keyboard and Mouse Do Not Work on Hookup:

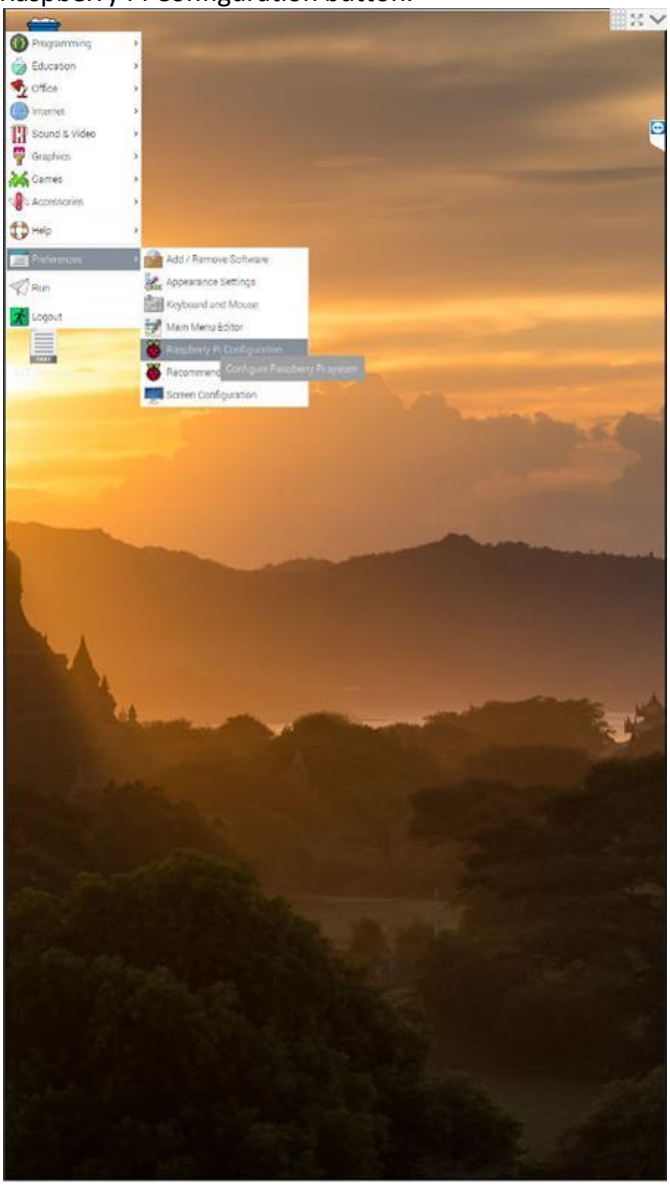
1. If the keyboard and mouse are wireless be sure to check the batteries at this point and confirm the devices have proper power. If the devices are wired be sure to confirm the devices work on another device.

2. Once the keyboard and mouse are confirmed to be working, power cycle the TPDM by removing the power cable.

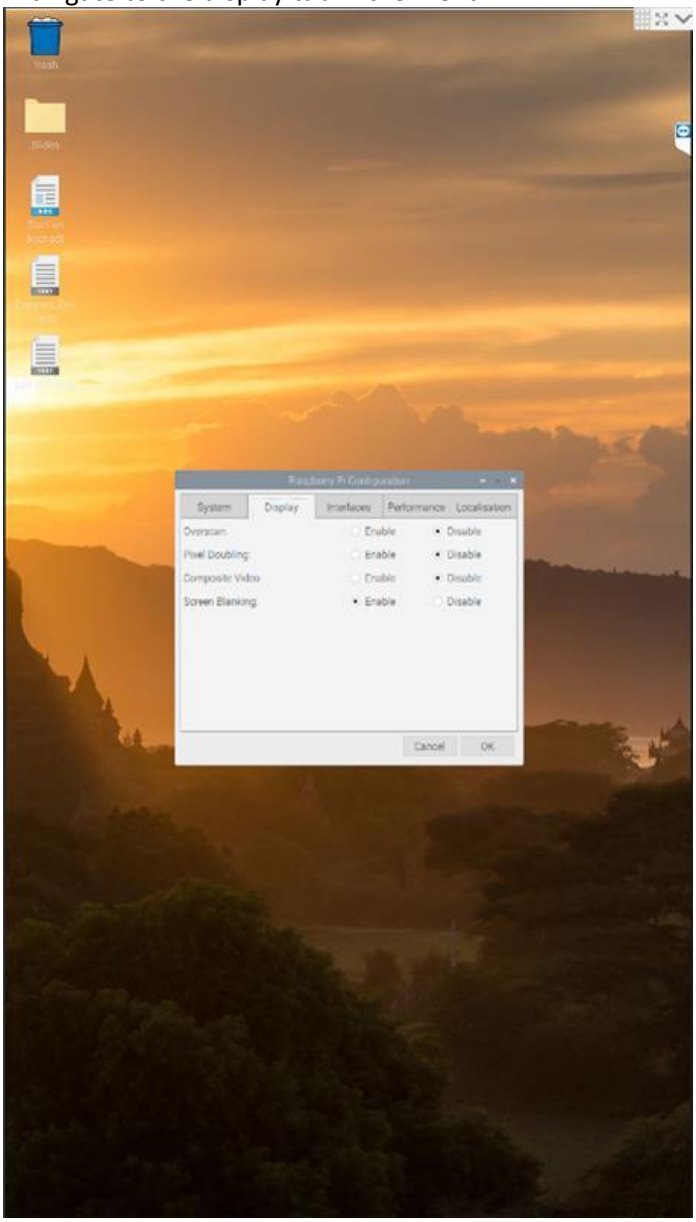
3. At this point if the keyboard and mouse do not work attempt to use the other USB ports on the device. If you are still unable to connect and utilize the keyboard and mouse replace the TPDM hardware.

TPDM Screen Sleeps or Flickers:

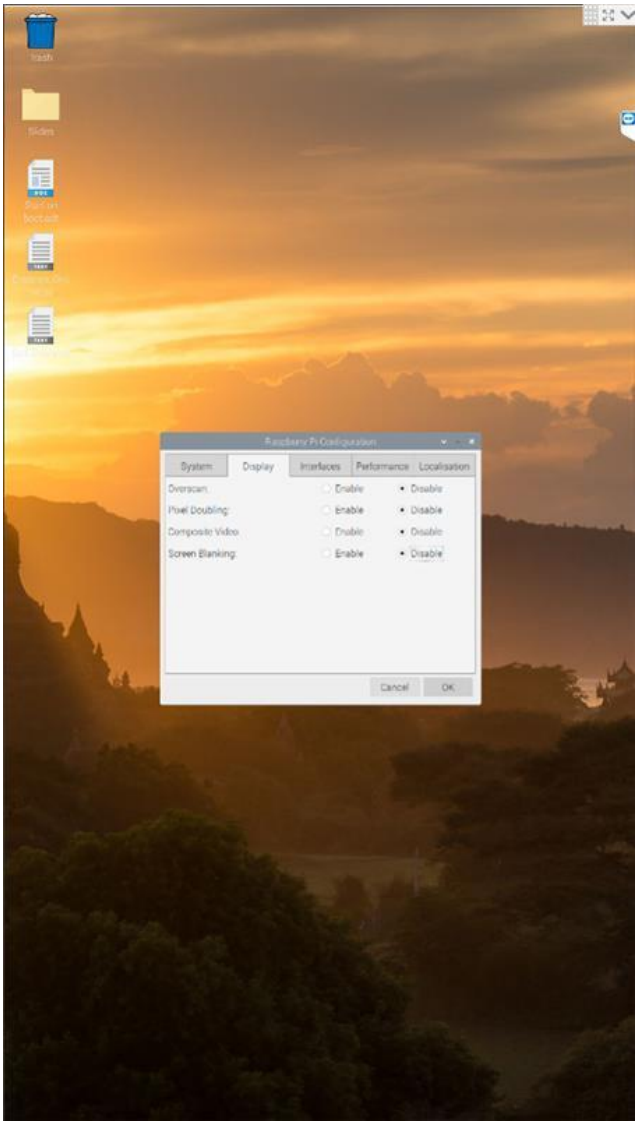
1. Confirm the Pi does not have Screen Blanking turned on in the Raspberry Pi Configuration.
    a. Navigate to the taskbar dropdown, click the Raspberry icon, and then click the preferences tab. Once preferences is selected, click the Raspberry Pi Configuration button.



b. Navigate to the display tab in the menu.



c. Locate the screen blanking section on the menu and click “Disable” if it is enabled. Once this has been set to disable, click “OK” at the bottom of the menu.



2. If Screen Blanking was not enabled or the issue persists, check, and reseat all HDMI and HDMI extender cables at this time.
    a. If the cable length is over 50 feet and the issue continues to persist a set of HDMI extenders may need to be installed as HDMI signal degrades over 50 feet.

TPDM Does Not Display:

1. Reboot the device. The device does not swap automatically for displays and needs to be rebooted if the display goes out for any period.

2. Plug the TPDM into a different monitor with the same cables and reboot the device. If the TPDM does display, continue to troubleshoot the monitor the device plugs into.

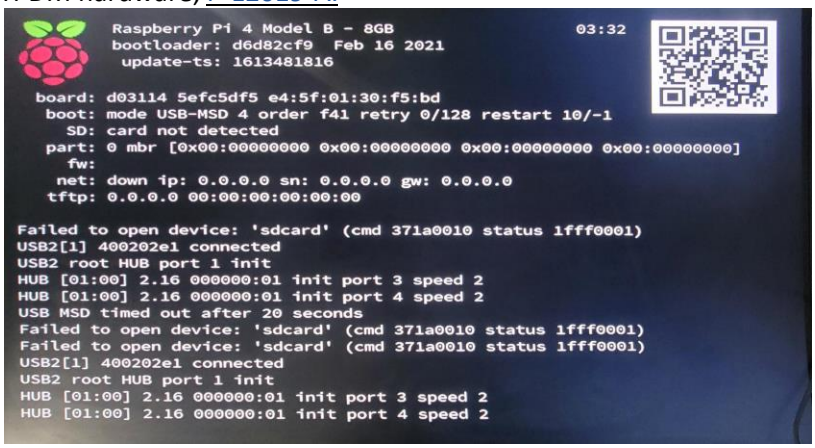
3. If the unit does not display on a different monitor Remove/Replace the HDMIs for testing and reboot the device.

4. If issues persist after swapping out HDMI cables and a micro-HDMI to HDMI adapter is installed, swap the micro-HDMI converter with another, and reboot the device.

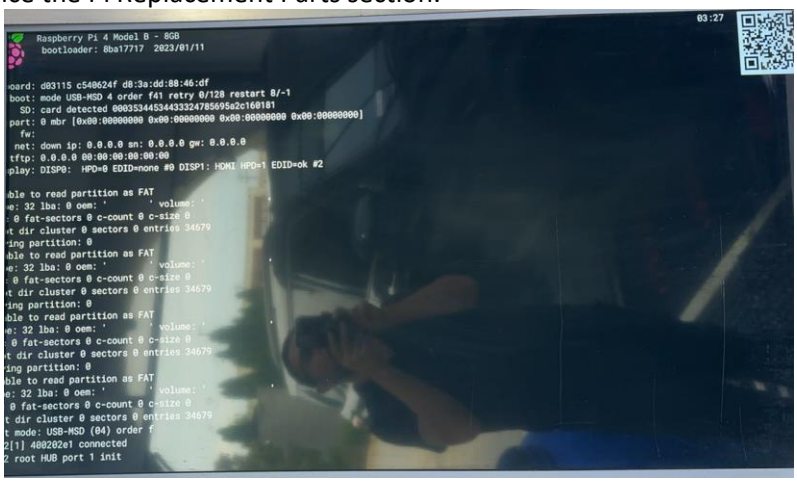
5. Swap to the second micro-HDMI display port on the TPDM and reboot the device. Repeat steps 2 through 4 on this port to test. If issues persist replace the unit.

TPDM Displays BIOS or Terminal Output:

1. Check and take a picture of the output. If the text displayed matches the text below and lists any reference to SD being not detected card confirm that the micro-SD card is seated properly. If reseating does not correct the issue replace the TPDM hardware, P-E2019-A.



2. If the unit mentions the SD card is detected and it is unable to read partition or enters a different error screen than that shown above reseat the SD Card. If issues persist replace the micro-SD card as the programed card is corrupted and will need to be reformatted/replaced. This will be based off the purpose of your TPDM. Please reference the Pi Replacement Parts section.



TPDM Displays Incorrect Slides:

1. If the system displays the incorrect slides when a slide is fired track what slides are improperly displaying and write them down.

2. Once you have tracked the slides and what fires what swap the wiring for the slide wires so the correct slides fire (these wires should be plugged into the white labelled ports).

TPDM Constantly Fires a Wash Package:

1. If the system is stuck constantly displaying a wash package mark the input wiring to the Pi and unhook the wire responsible for firing that wash package. If the wash package continues to fire when the wire is unhooked the hardware has likely failed and the site will need to replace the TPDM Hardware.

2. If the wiring is unhooked and the wash package stops firing confirm the controller for the wash you are using is not sending a constant signal to the TPDM. In a Tommy's Guardian wash command controller this can be checked by navigating to Setup and then Package Lighting.

3. If the issue is still present only when wiring is hooked up and the controller is known to NOT be sending an input investigate the wiring from your controller to the Pi at this time.

TPDM Displays "Error: Multiple Inputs Detected" Slides:

1. If the system is stuck displays slides that state "Error: Multiple Inputs Detected" at the bottom the TPDM believes the wash controller is sending it multiple signals when it should not. Label and unhook all input wires to see if the slides stop displaying. If it does not stop displaying replace the TPDM hardware.

2. If the wiring is unhooked and the slides stops firing confirm the controller for the wash you are using is not sending a constant signal to the TPDM. In a Tommy's Guardian wash command controller this can be checked by navigating to Setup and then Package Lighting.

3. If the issue is still present only when wiring is hooked up and the controller is known to NOT be sending an input investigate the wiring from your controller to the Pi at this time.

TPDM Displays “Error: VPS Timeout Error” Slides:

1. If the system is stuck displays slides that state “Error: VPS Timeout Error” at the bottom the TPDM believes the wash controller is sending it a constant input for Please Pull Forward and never receiving the signal to change to a wash package. This error will only come up if the Please pull forward input from the wash controller has been stuck on for more then 10 minutes. Begin troubleshooting by making sure your VPS eyes have power to both sides.

2. If the VPS eyes have power on both sides confirm that they are aligned and at a signal strength of 3 on the back of the receiver. If you need help at or after this point as the issue is not resolved contact Tommy’s Equipment Support.

TPDM Does Not Display a Slide:

1. Confirm the slide is being fired from the controller properly. In a Tommy’s controller this can be confirmed by checking the package lighting page.

2. Confirm that the relay for the slide is getting 24 volts (or 110 if your system uses it) of power to A1 and A2. If it is not, investigate the wiring before the relay and TPDM.

3. Use a Jumper wire to touch together the terminal screw of the slide you are trying to fire and the terminal screw that connects to 11 on your relay. If it is still not firing at this point replace the TPDM Hardware. If it does fire investigate the relay and replace as needed.

TPDM Display is Sideways:

1. Check the version of the TPDM you have. If the version is 1.4 or earlier make sure your micro-HDMI cable is plugged into the first slot closest to the USB-C power supply.

2. If the issue persists, confirm the TV is set to landscape mode in the settings and not portrait mode.

TPDM Display is Upside-Down:

1. Check the version of the TPDM you have. If the version is 1.4 or earlier make sure your micro-HDMI cable is plugged into the first slot closest to the USB-C power supply.

2. If you are plugged into the correct slot and it is upside-down still your TV was mounted in the entrance module the wrong way. To fix this open the terminal app on the pi. The terminal app is located on the task bar at the top of the screen and is the 4th icon from the left.

3. Type in the following command based on the type of TPDM you have:
   - ***a.*** Entrance: “sudo nano /etc/xdg/autostart/Entrance.desktop”
   - ***b.*** Exit: “sudo nano /etc/xdg/autostart/Exit.desktop”
   - ***c.*** Private Brand: “sudo nano /etc/xdg/autostart/PB.desktop”

4. Once the text file opens look for where the code says “--rotate left” and change it so the code now reads “--rotate right”. Do **NOT** delete any other bits of code in this file.