Tournament Manager on the Raspberry Pi

The Raspberry Pi is a series of small, inexpensive, single-board computers featuring multiple USB ports, an Ethernet network connection, and HDMI video output. The Tournament Manager display and field control software can be run on certain Raspberry Pi models, enabling low-cost displays and simplifying competition cabling.

Installing and configuring Tournament Manager on a Raspberry Pi is an advanced topic. Please ensure you are comfortable with the concepts described below before attempting to use this feature at a tournament.

Raspberry Pi Tournament Manager Quick Start

Requirements

> **Tip -** The Raspberry Pi product is just a bare circuit board. However, most vendors sell bundles that include a case, power supply, microSD card, and HDMI cable. It is recommended that you purchase one of these kits for convenience. Popular kit brands that have been used are *CanaKit*, *Vilros*, and *LoveRPi*. All of these are available on `Amazon.com` at the time of this writing (search for *"Raspberry Pi 3 kit"*). Some kits contain more equipment than others - make sure your kit contains everything below or you purchase the additional parts separately.

- A Raspberry Pi 2 or 3 model B with case and 2.5A power supply (Raspberry Pi 1, Zero, model A, etc. are not supported)
- A microSD card of at least 2GB in size (note: the SD card will be **completely erased** so ensure there is nothing on it that you wish to save)
- A display device (TV, computer monitor, or projector) which will be connected to the Raspberry Pi. The device must include an HDMI input and must support 1080P (1920x1080) resolution.
- A copy of the Tournament Manager Raspberry Pi software image which can be downloaded from the Tournament Manager website at `https://vextm.dwabtech.com`
- A computer and associated software necessary to copy a disk image to the Raspberry Pi SD card (see `https://www.raspberrypi.org/documentation/installation/installing-images/` for guides for Windows, macOS, and Linux)
- The most recent version of Tournament Manager running on a PC
- An Ethernet network connected to the Raspberry Pi and Tournament Manager PC that includes a DHCP server
- (Optional) VEXnet Field Control equipment

Step 1 - Install Tournament Manager on SD card

> **Important Note!**
> Installing Tournament Manager for the Raspberry Pi on will completely erase everything else on your microSD card! Make sure you are using the correct card and that you have saved anything important from the card first. It is recommended that you use a separate SD card specifically for Tournament Manager if you are sharing Raspberry Pis with other users.

After you finish downloading the Tournament Manager Raspberry Pi software image, you'll need to copy the software onto your microSD card to be used in the Raspberry Pi. This cannot be done using normal file copy operations on your PC. Instead, follow the instructions at
`https://www.raspberrypi.org/documentation/installation/installing-images/`to install the software to the SD card.

> **Note -** The Tournament Manager Raspberry Pi software image will be used instead of the operating system listed on the web page referenced above. Please skip the steps on that page which refer to downloading an official Raspberry Pi image and use the Tournament Manager image instead.

Please be aware that the software images for the Raspberry Pi are large. The image file you download will be a ZIP file of approximately 300 MB. You will need to unzip that file to get the .img file inside. When unzipped, the .img file is approximately 900 MB, so be sure you have enough free hard drive space on your PC before attempting this step.

Step 2 - Connect cables and power on

Insert the SD card that you prepared in Step 1 into the Raspberry Pi. Connect the Raspberry Pi to the Ethernet network and the display device using the HDMI cable. If you intend to use this Raspberry Pi as a field queue display, you can also connect the VEXnet Field Control Board to one of the USB ports on the Raspberry Pi if desired. Finally, connect the power supply. As soon as power is connected the Raspberry Pi will begin booting up.

When the Raspberry Pi is first powered on, you should briefly see a multicolored square filling most of the display (this may not be observed if your display device takes a moment to wake up from sleep mode). The screen will then go black for a few seconds, and then you will see the Tournament Manager icon in the middle of the screen. The Tournament Manager icon indicates that the Raspberry Pi is in the process of starting the Tournament Manager software.

Once the Raspberry Pi finishes booting up, you will see a screen showing the VEX Robotics logo and the IP address of the Raspberry Pi. At this point you can continue with Step 3 to configure the Tournament Manager software on the Raspberry Pi.
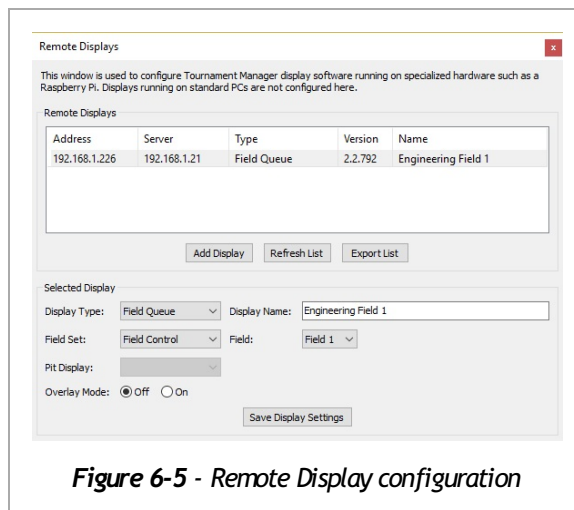
> **Note -** When the Raspberry Pi first starts up, you may see "<unknown>" on the display for a short time. This is normal as the Raspberry Pi attempts to obtain an IP address.

Step 3 - Configuring Tournament Manager

Once the Raspberry Pi is running and displaying an IP address, you can configure it from within Tournament Manager. Start Tournament Manager on your PC and select *Displays ⇒ Configure Remote Displays* in the menu bar. Your Raspberry Pi should be detected automatically and shown in the list. The `Refresh List` button can be used to re-scan for Raspberry Pis if yours was not detected right away. Alternately, click `Add Display` and type in the IP address shown on your Raspberry Pi to manually add it to the list.

Select your Raspberry Pi in the Remote Displays list. At the bottom of the window, select the type of display that you would like shown on the Raspberry Pi and choose the Field or Pit Display to be shown as appropriate. The Display Name field can be filled in to help you remember what each display is being used for. Finally, Overlay Mode determines whether this display will use a green-screen output meant for superimposing over live video. Select Off for this setting if you are not sure.

Figure 6-5 - Remote Display configuration

Once the settings are complete, click `Save Display Settings`. This will configure the Raspberry Pi and then a few moments later the Tournament Manager display will start. You can change the Raspberry Pi settings at any time and click `Save Display Settings` to restart the display.

> **Note -** If you have trouble with the Raspberry Pi during an event, simply disconnect power for a moment and then plug it back in. The Raspberry Pi will take a minute or so to reboot and once it does, it will automatically reconnect to the Tournament Server. There is no need to reconfigure the Raspberry Pi if your Tournament Server has not changed.

> **Note -** If you are running multiple tournaments at the same time on the same Ethernet network, you must configure each Raspberry Pi from the instance of Tournament Manager that you wish it to connect to. The Remote Displays list will show all Raspberry Pis even if they are not connected to the same tournament server.