User Manual for "Handpad Emulation App v1.0"
(for windows)

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Introduction

The TTS Handpad Emulation App is a small windows application that emulates the Handpad functionality onto the PC screen. This gives access to the full functionality of the Handpad for remote control allowing complete remote imaging or EAA from a connected PC.
The Application emulates the standard Handpad, so please refer to the Mount user manual for guidance on the general use of the mount.

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How does it work

The TTS mounts has an internal microcontroller running the firmware that controls the mount. The handpad has its microcontroller and sends commands to the mount head but has nothing to do with the actual control of the mount. Therefore, the handpad can be unplugged and the mount will continue to operate including receiving commands over Ascom and the ST4 guide interface.
The Handpad emulation software in the same way communicates with the mount head but does not take the actual control. It is therefore possible to unplug the handpad and plug in the handpad emulation app while the mount is up and running. It also means that if you need to stop the app for any reason you can always restart and connect to the mount again without losing alignment.

Needed equipment

The App will run on Windows versions 8, 10, and 11. The App uses the Microsoft.NET framework, and this must be available in version 4.7 or never. Many PC's will have this installed already.

The mount is connected to a USB2 or USB3 port on the PC with a special cable. Please contact Track The Stars to purchase this cable together with a software license.
Available at www.trackthestars.com/shop

Installation of the App.

1. Download the app from the link provided when you purchase the cable. One exe file and one CSV file for user objects are downloaded.
2. Save the files where you want them on your PC.
3. The App is ready immediately. Just double-click on the file to start the app.

If the app will not start properly, please check the .NET framework is available.

Install the driver for USB-serial cable

The cable for the connection to the Mount contains a USB to Serial converter. A driver is needed to use the converter. Often this driver is already available on the PC and will install automatically when the cable is inserted.
Please visit the following link to download the driver and see how to install it if needed.
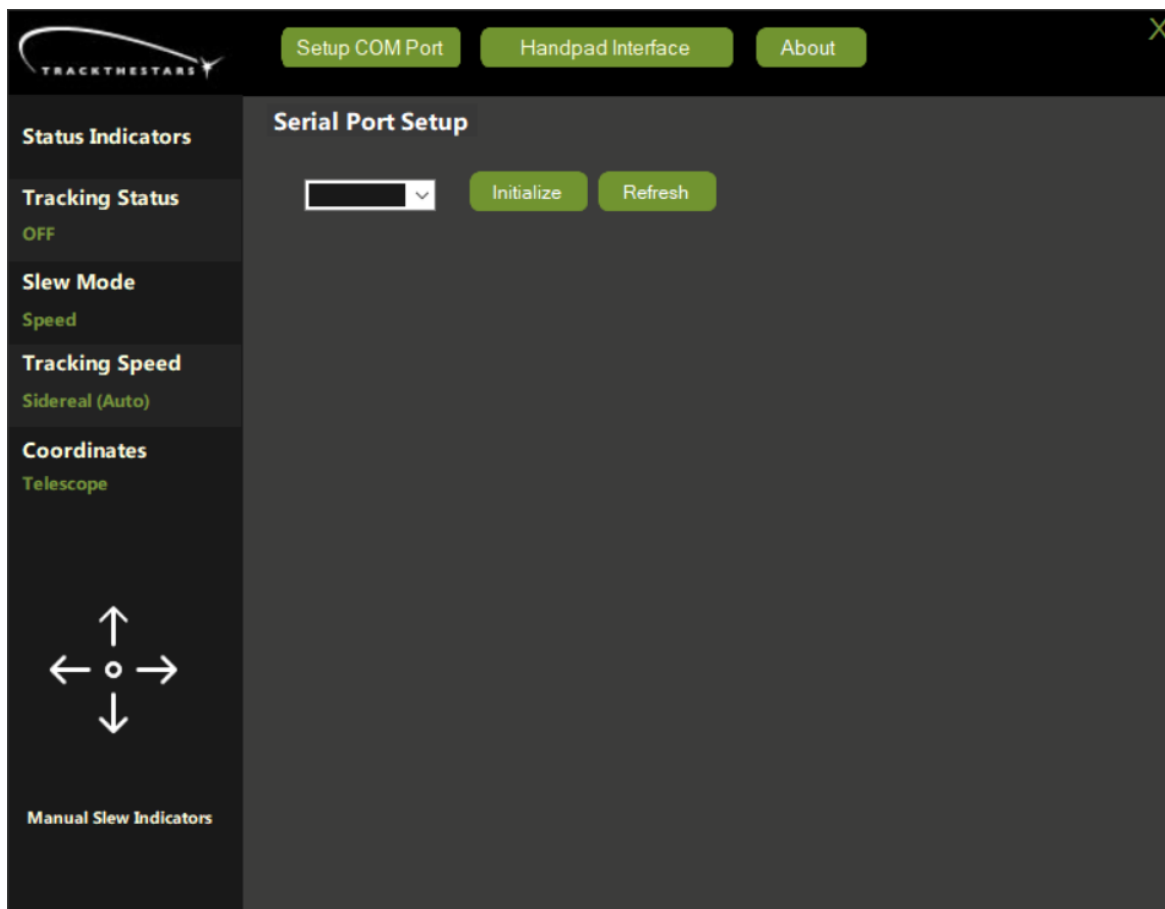https://www.usb-drivers.org/cp2102-usb-to-uart-bridge-driver.html

Connect the PC to the Mount head

1. Remove the handpad cable from the "HP" connector on the Mount head.
2. Insert the cable into a USB2 or USB3 port on the PC and the "HP" port on the Mount head.
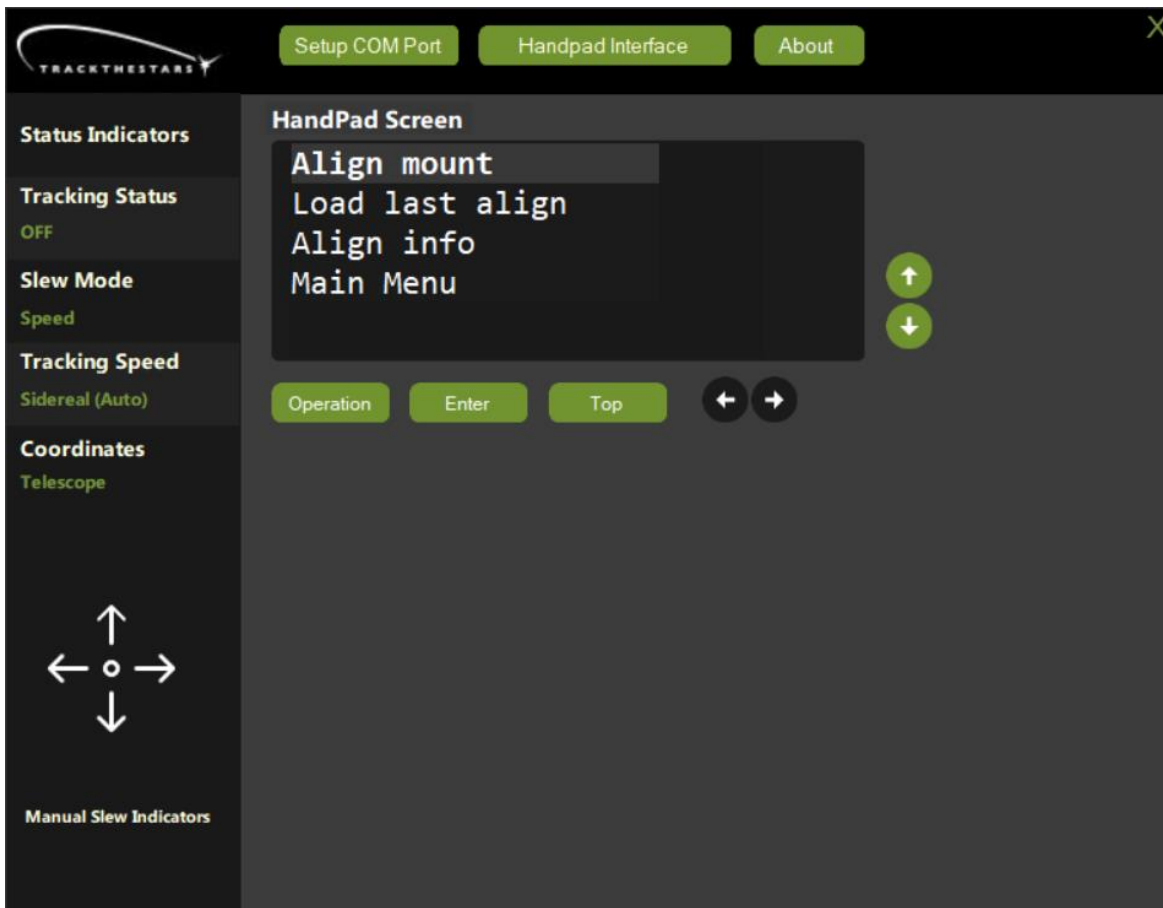
Using the App

Start the App by double-clicking on the Exe file.

1. Select Port no. from the drop-down list. Click refresh if needed.
2. Click Initialize

This will open the Serial port.

Now select the tab "Handpad Interface". If the communication is running the *Handpad Screen* will be active with data (click the *Operation* button to activate if needed).

Explanation of the user interface:

- The Dark area below the text "Handpad Screen" emulates the Handpad screen (max 4 lines).

- The green vertical arrows emulate the rotation of the Handpad knobs on the sides of the handpad. The dark horizontal arrows emulate the rotation of the Handpad knob on the front of the handpad. One mouse click on an arrow works as one rotational click on the Handpad knob.

  The arrow keys on the keyboard can also be used.

- The three buttons below the screen emulate pushing either of the three Handpad knobs. The buttons can be activated by mouse click or by using the keyboard keys Q W E.

- The manual slew indicator arrows indicate if the mount is slewing. The arrow in the slewing direction turns green.
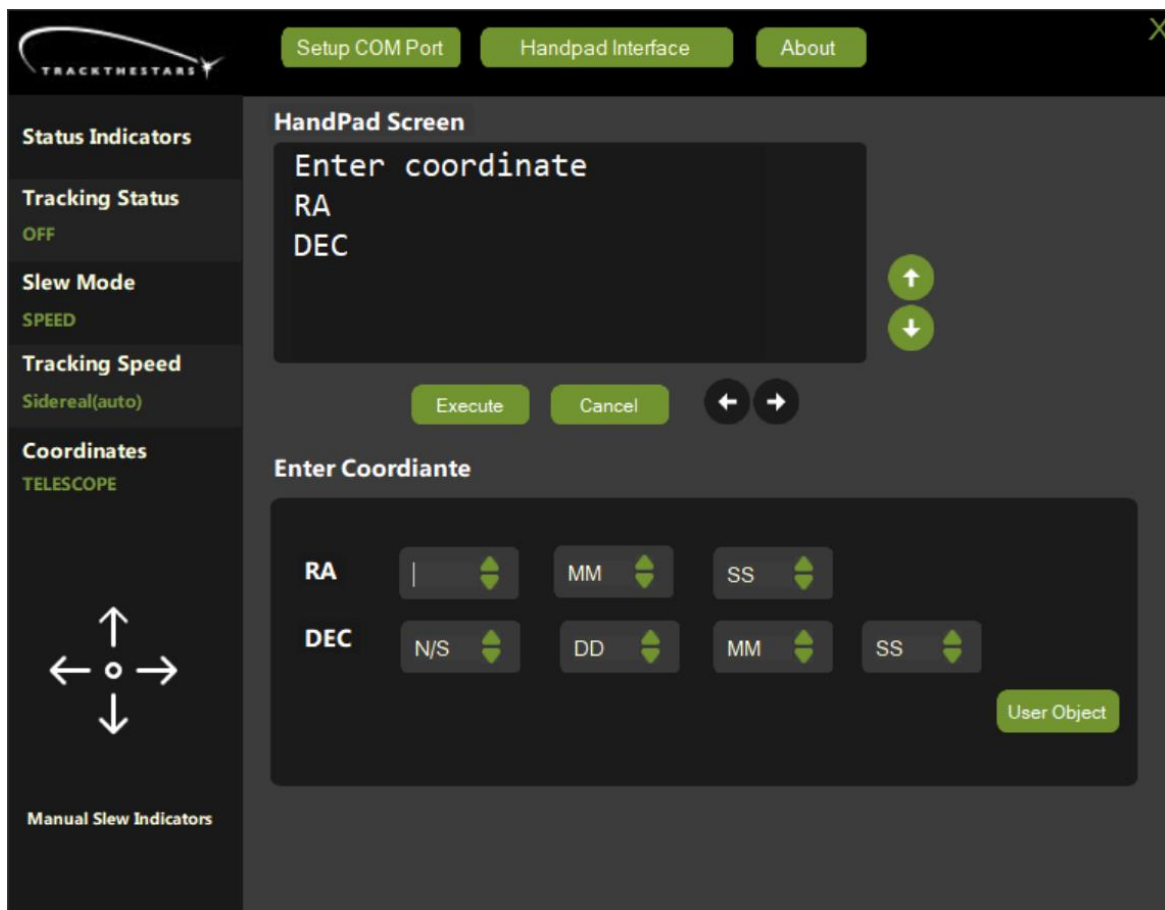
- The status indicators show:

- Tracking status – **on** or **off**
- Slew mode – indicates if the mount is in **speed** mode or **step** mode.
- Tracking speed – **Sidereal, Lunar, Solar** (manually selected or **automatic** by goto target)
- Displayed Coordinates – **Telescope** (mount), **Alt-Az**, **EQ**, **Field Rotation**
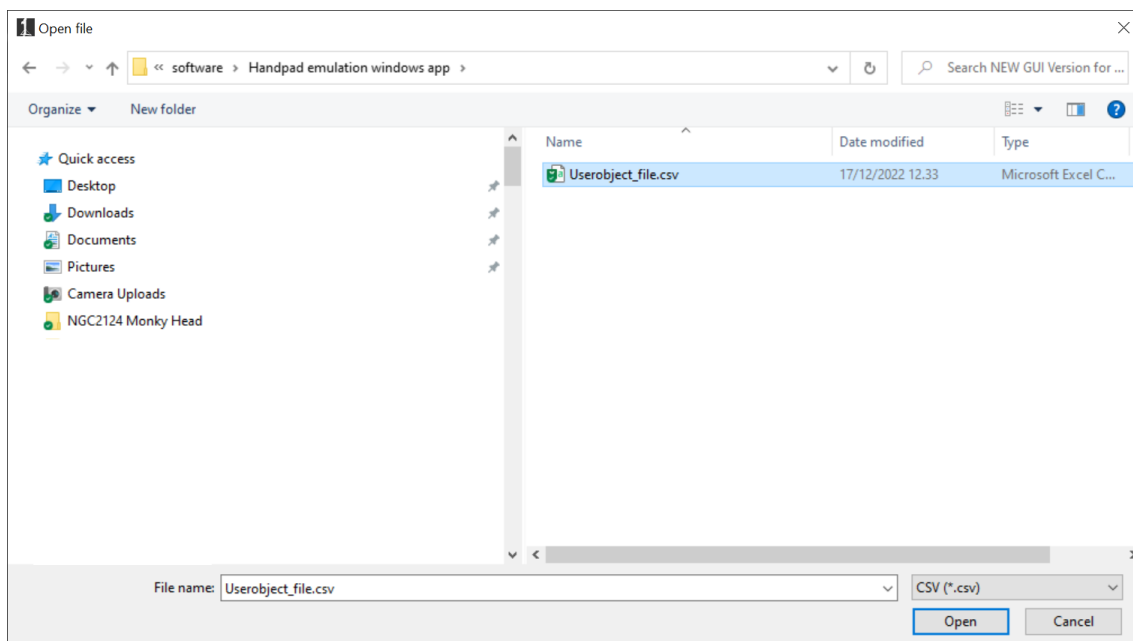

User object function

It is possible to make a list of your favourite objects and have the mount slew to them. This is a function that is only available in the handpad app.
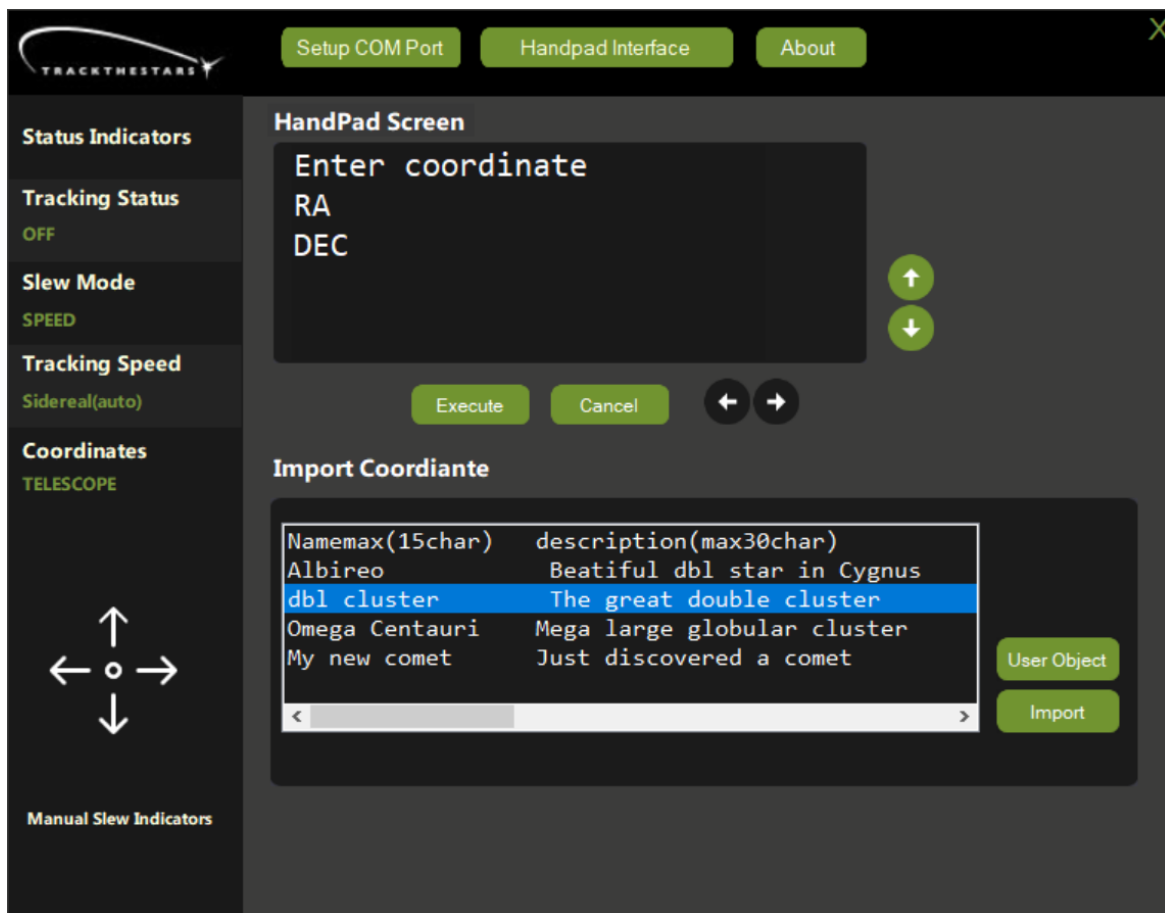
To use the User Object function, select the "Goto – Coordinates" command. It will display this screen.
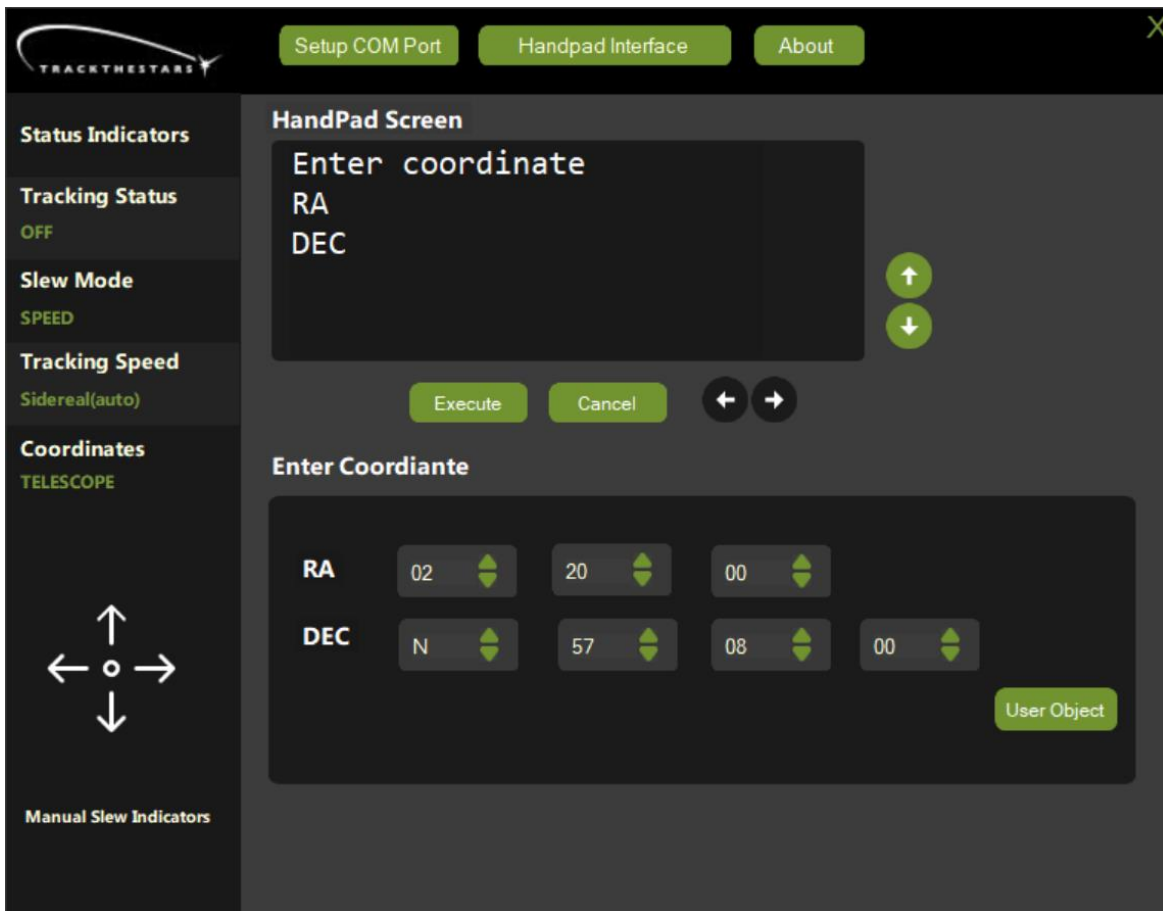
Click on *user objects* to open a file with user objects.

Select an object from the displayed lines.

Click *Import* to import coordinates of the object (RA, DEC).

Click *Execute* to start a Goto the object.

User object files format

The object list is stored in a comma-separated file (CSV). This file can be edited by the user and more files with different names can be made.

The format of the file is like this:

There is one object per line with this information:

Object_name,Object_description,RA_coordinates,DEC_coordinates

Each line must have this format (4 fields separated by commas)

Max 15 characters name,

Max 30 characters description,

RA coordinates in the format: HHMMSS,

DEC coordinates in the format: +DDMMSS

Here is an example of a file with 3 objects:

M27,Dumbbell Nebula,195935,+224316

M51,Whirlpool Galaxy,132953,+471143

Comet1,My first comet,023411,-353421

It is easy to edit the user object file using "Notepad" or for more possibilities Excel or another editor.

Remember to share your object in the User Group.

Troubleshooting

If the app will not start, please check that you have Microsoft.net version 4.7 or higher.

If the app will not connect to the mount check the following:

- Is the com port installed correctly?
  Check in the Window Device Manager and see if the device shows up/disappears when plugged in/out of the USB port. Note the com port number.

- Is it the correct com port number?
  Many connected astronomy devices create com ports, so it can be difficult to find the right one. Notice that if you plug the USB adapter into another USB port the com port number will most likely change.

- Is the mount ready to use?
  Try to connect the physical Handpad and see that the mount works as expected. Now swap the cables in the PH connector to the USB cable.

If you have any questions, please email support@trackthestars.com