

## TSC\_DEMO.img.gz – what is it?

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You are reading this because you apparently have received a rather big file called “TSC\_DEMO.img.gz”. This is a demonstrator for the free telescope controller software TSC, written for the Raspberry Pi family of single board computers.

This is an image of a 16GB SD-card holding the minimum libraries and a binary copy of the TSC software. It is a demonstrator because all necessary tools for modifying TSC or building the hardware associated with it were removed for saving space. Without the hardware, TSC is a brain without limbs, and therefore its functionality is very limited.

### Things that can be done:

- Get an idea of the internal functionality of TSC.
- See how TSC integrates into your local network/WLAN.
- Check how it connects to your favourite planetarium program. Denote that a serial connection via USB is only available with the TSC hardware, but connection via WLAN (e. g. via SkySafari or Kstars) is possible. Of course TSC does not move, but if you **Sync** on an object using the internal catalog, you can at least see little crosshairs hopping around.
- Check whether your camera connects to the internal camera interface of TSC for use with the internal guider or (in the near future) internal platesolving, a functionality under development for use with the new Raspberry Pi 4 family of SBCs.

### How to make an SD card:

- Uncompress the TSC\_DEMO.img.gz image. Make sure that you have enough space available on your harddisk, and yes, this takes a while. On Linux, you can simply double-click TSC\_DEMO.img.gz. On other operating systems, the procedure is similar.
- Make a physical copy on a (fast) 16 GB minimum SD card. On Linux (or Raspian), this is done by typing:  
**sudo dd if=<location of input file> of=<device to write to> bs=8M status=progress**  
<device to write to> is the physical location of your SD-card; with an external card reader, this is usually a /dev/sd... device, an internal card reader can often be found at /dev/mmcblk0. You can also use the *Disk Image Writer* that comes for instance with Ubuntu. Writing an SD-card is of course also feasible on other operating systems; for details, check for instance:  
<https://learn.sparkfun.com/tutorials/sd-cards-and-writing-images/all>
- Put the SD card into at least a Raspberry Pi 3B, connect a mouse and a HDMI monitor and boot it.
- Synchronize your clock, either by using SkySafari (see instructions below), or by connecting your Raspberry Pi to an Ethernet cable and wait until a time server signal is received. You can also set date and time manually by closing TSC using the Exit button, opening a terminal by pressing <Ctrl-Alt-T> and typing:  
**sudo date -s "20 DEC 2019 18:00:00"** – of course with the right time and date. Restart TSC with the TSC desktop icon after that.

### What you will see:

- A warning that no drives are connected. This is ok as no drives are connected.
- After confirmation, TSC will come up. It spawns an autonomous network called TSCHotspot; the password is TSCraspi – use these credentials to access the LX200 client client via your planetarium program. The IP address to connect to is **192.168.50.5**, the Port is **49152**. Set your location in the **Location** tab, store it using **Store Data** and make sure that your system clock is correct – the TSC hardware has a buffered real-time clock, you don't have one. On SkySafari, you can synchronize by sending time and location; make sure that the checkbox **Allow time/position from LX200** is checked in the Location tab of TSC.
- Plug in your camera and go to the **CCD** tab. Select your camera vendor, click **Start INDI Server** and **Connect**. In the next tab (called **Guiding**), you can now **Expose** an image and see whether something comes in there.