TCF-S Commander Help

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The **TCF-S Commander** program has been designed for use with the Optec TCF-S series Temperature Compensating Focusers including the TCF-S, TCF-Si, TCF-S3, and TCF-S3i models.

This help document provides instructions for installing and using the **TCF-S Commander** and **ASCOM Local Server** software. TCF-S Commander acts as a client to the Local Server with both components included in one installer package. Any ASCOM focuser client may connect with and control the TCF-S focuser through a single serial connection. Other ASCOM clients include programs such as Maxim D/L, ACP, Sequence Generator Pro, FocusMax, and many others.

For Mac users of the TCF-S, Software Bisque has developed an X2 native driver for TheSky X Pro. Equinox Pro developed by Microprojects also has a built in TCF-S driver. Refer to the software package documentation for assistance configuring or using either of these excellent Mac software package.

Drivers for Linux based software have been developed and are available from the INDI website. INDI stands for Instrument-Neutral-Distributed-Interface and has been developed by Linux enthusiasts with good support and tutorials. The INDI Library v1.0.0 is now available for download. Visit the INDI page and check under Device Support for more information.

This Help document is organized into the following chapters:

▶ Determining COM Port

◆ Additional Resources

◆ Revisions to this Help document

  📄 Rev. 6.00 - 2015/07/15 Updated help document for **TCF-S Commander** and **ASCOM Local Server driver**.

*Optec, Inc. makes no warranties either expressed or implied about **TCF-S Control** software.*

Please note: These help files are updated occasionally. The latest version can always be found online at:
http://www.optecinc.com/astronomy/software/docs/tcf-s_help/index.htm

![Optec logo]

Chapter 1: Installation

About

![Optec logo]

Thank you for choosing the **TCF-S Commander and ASCOM Local Server** focuser control program. **TCF-S Commander** includes an ASCOM Local Server and is designed for testing, configuring, and operating the Optec TCF-S line of Temperature Compensating Focusers.   The ASCOM Initiative is a loosely-knit group of astronomy software developers and device manufacturers devoted to vendor-independent plug-and-play control. ASCOM is a Windows-only platform and is backward compatible with at least Windows XP. **TCF-S Commander** has been fully tested with the latest ASCOM Platform and Windows operating systems and functions as a 32-bit application. The software will run on either 32-bit or 64-bit systems without issue.

ASCOM Platform 6.1SP1 or higher is required to install and use this software. Visit the ASCOM Website to obtain the latest platform.

Version 6.0 of this program will communicate with and control all revisions of the following focuser models:

- ➢ **TCF-S**
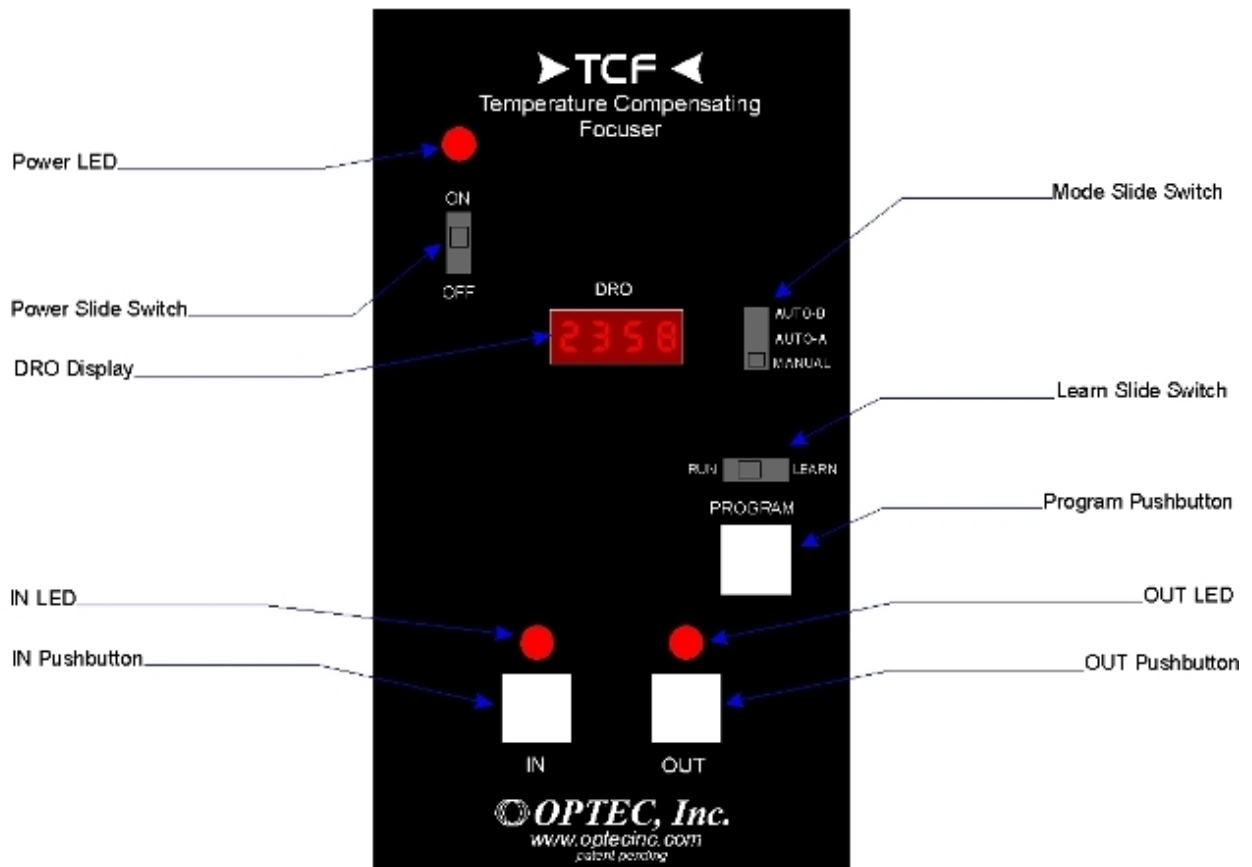
- ➢ **TCF-Si**

- ➢ **TCF-S3**

- ➢ **TCF-S3i**

Original Optec TCF-S focuser with external control box.

You can learn more about the TCF-S focusers by visiting the Optec web page located at: http://www.optecinc.com/astronomy/catalog/tcf/index.htm

A pdf copy of this help file can be found by visiting the Optec website. Click here to download the current pdf version for this help file.

License

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Requirements

- **TCF-S Commander and Local Server Requirements:**

    - Microsoft Windows XP or above, 32-bit or 64-bit operating system,

    - ASCOM Platform version 6.1SP1 or higher,

    - Microsoft .NET Framework version 4.5 or higher,

    - TCF-S, TCF-Si, TCF-S3, or TCF-S3i focuser.

    - Available serial port or open USB port when using Optec USB/Serial cable.

Note, installing the **TCF-S Commander** program will also install the **ASCOM Local Server** which requires the ASCOM Platform. **TCF-S Commander** will act as an ASCOM client and creates the instance of the Local Server when opened. Other clients may connect and disconnect to the Local Server with immediate updates to the **TCF-S Commander** client interface. Additionally, other client

programs will create the initial instance of the Local Server object if **TCF-S Commander** is not running. The program uses very little of the system resources and should not interfere with any other operating programs. Neither printer nor graphic functions are used by **TCF-S Commander**. It is necessary that the computer have an available COM port for communication with the TCF-S focuser. If the computer has no native COM ports, a USB-to-Serial port converter adapter may be used. Optec offers our USB/ Serial cable in various lengths, or stock no. 17690, a USB-to-Serial converter known to work well with Optec devices. Any FTDI based converter should work equally well.

The connection from the TCF-S, TCF-Si, TCF-S3, or TCF-S3i Temperature Compensating Focuser to the PC requires a modular 6-wire cable with the appropriate 9-pin DB9 (serial port) and 6-pin RJ-12 connectors. Optec can supply this cable in any length along with stock no. 17695, our modular to DB9 converter for the modular Reverse cables. Users wishing to fabricate their own cables are referred to Appendix A of the TCF-S Technical Manual.

The program automatically sets the communications port settings to operate at 19.2K baud. At this data rate, the cable length should to be 100-ft (30m) or less and of good quality. Erratic operation may be due to communication errors when the serial connections are not secure.

Of course, an Optec TCF-S focuser is also required. The TCF-S focuser should be turned on with the temperature probe connected when attempting to "Connect" to the device within **TCF-S Focuser** software. Note that use of the Remote IN/OUT Keypad is not compatible with serial communications and the software will disconnect when using this device. Disconnecting the IN/OUT Keypad will allow the software to connect once again.

▶ **ASCOM Platform and Local Server Requirements:**

- ▶ Microsoft Windows XP or above, 32-bit or 64-bit operating systems,

- ▶ Microsoft .NET Framework version 4.5 or higher.

Installing

▶ **Installing the Software**

The latest installer package can be found on the TCF Downloads page on the Optec website. The software is provided in a single zipped file. Most modern operating systems can open the zipped file natively. With Windows XP, a separate program to unzip the compressed file may be required.

NOTE: The ASCOM Local Server is a 32-bit only application. **TCF-S Commander** is also 32-bit only, but will operate on either 32-bit or 64-bit operating systems.

After downloading the current zip file, save it to your Download folder or your desktop. Double-click to extract the files. The unzipped folder will contain two files- **OptecTCF-S_Installer(x.x.x).msi** and **setup.exe**. Double-click **Setup.exe** to begin the installation.

▶ **Location of Files**

The default location for the program files is in the **Program Files** folder for 32-bit systems, or **Program Files (x86)** for 64-bit systems. The installer will create subfolders **\Optec\TCF-S** by default. Alternatively, the user can specify any other location for the files during the installation.
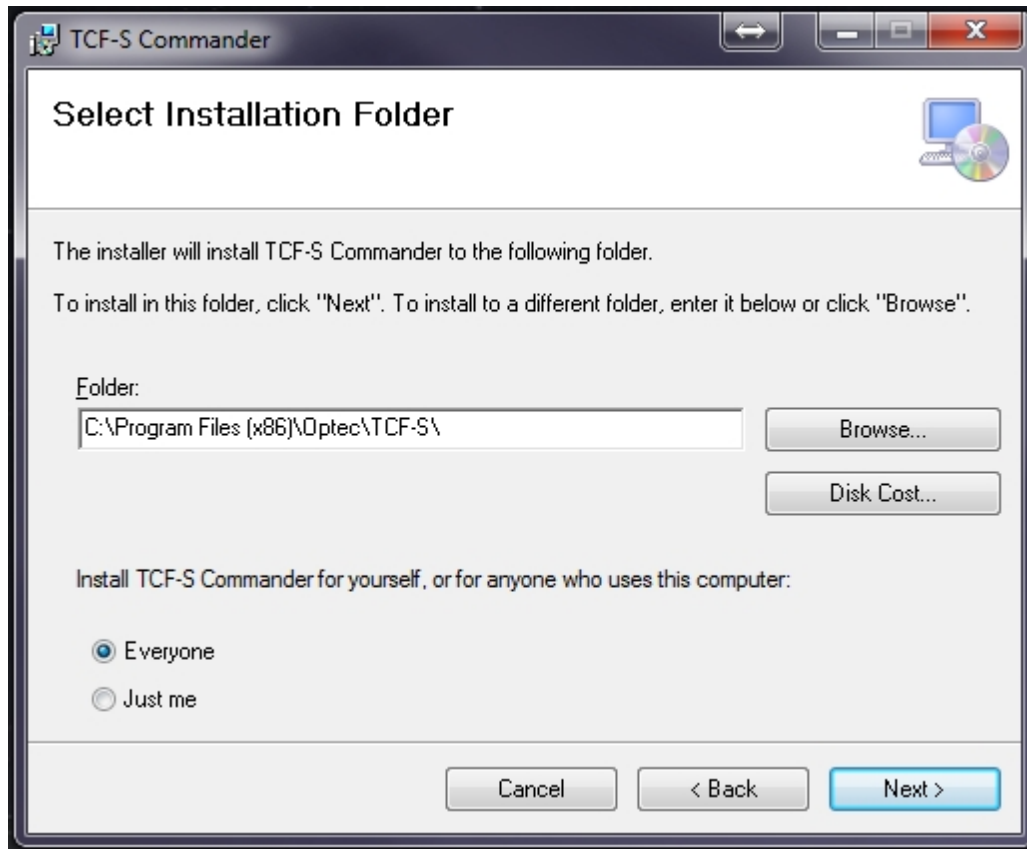
- ▶ **Windows XP / Windows 7 Start Menu**

  Be default, the installer package will place the **TCF-S Commander** shortcut in the Windows Start menu for Windows 7 and earlier:

  Start -> All Programs -> Optec -> TCF-S
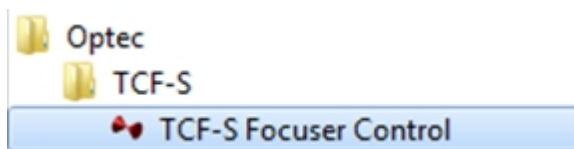
  Right-click the shortcut and select Delete to remove it from your Start menu.

- ▶ **Windows 8 Start Screen**

  For Windows 8 and above, a new tile will be added to the Start Screen. Swipe or scroll to the right to locate the TCF-S Commander tile. Alternatively, you may type "TCF-S" in to the Search box to locate the tile.

- ▶ **Desktop Icon**

  The installer will place a shortcut for the **Optec TCF-S Focuser** control program on the desktop, by default. If the shortcut does not appear, navigate the Start menu and right-click on the Optec TCF-S Focuser program. Select "Send to" - "Desktop (create shortcut)" to place a new shortcut on the User's Desktop. Double-click this shortcut to start the program.

▶ **Program File Locations**

By default, the program files for TCF-S Commander and the ASCOM Local Server components are located in the following folders:

    C:\Program Files\Optec\TCF-S   for Windows 32-bit systems,

    C:\Program Files (x86)\Optec\TCF-S   for Windows 64-bit systems

Deleting or removing any of the files in this folder or any of its sub-folders could cause the application to cease to function properly. Additionally, ASCOM parameters are placed in the system registry.

Logged events will appear in the Event Logger uner **Optec TCF-S Log**. To view the log, open *Computer Management* and navigate to *Systems Tools, Event Viewer, Applications and Services Logs, Optec TCF-S Log*.

Starting


▶ **Starting Optec TCF-S Focuser Control**

    ▶ To start **TCF-S Commander**, navigate through the Start menu or Start Screen to **All Programs - Optec - TCF-S.** Click **Optec TCF-S Focuser** or double-click on the desktop icon.
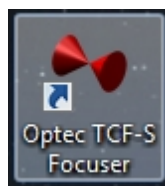
    ▶ To establish a connection to the TCF-S focuser you the main **TCF-S Commander** window, click the first menu option - **Device** - **Connect.** The

>Auto Connect

Upon opening the TCF-S Focuser Control application the program will automatically attempt to connect to your TCF-S via the last selected COM port. If this is the first time running the program, it will use COM1. If a focuser is not connected to the last selected port, the status bar at the bottom of the program will display 'No TCF-S Found'. See the Operation section of this help file for information regarding how to select a COM port.
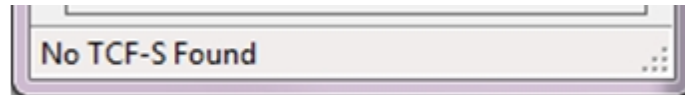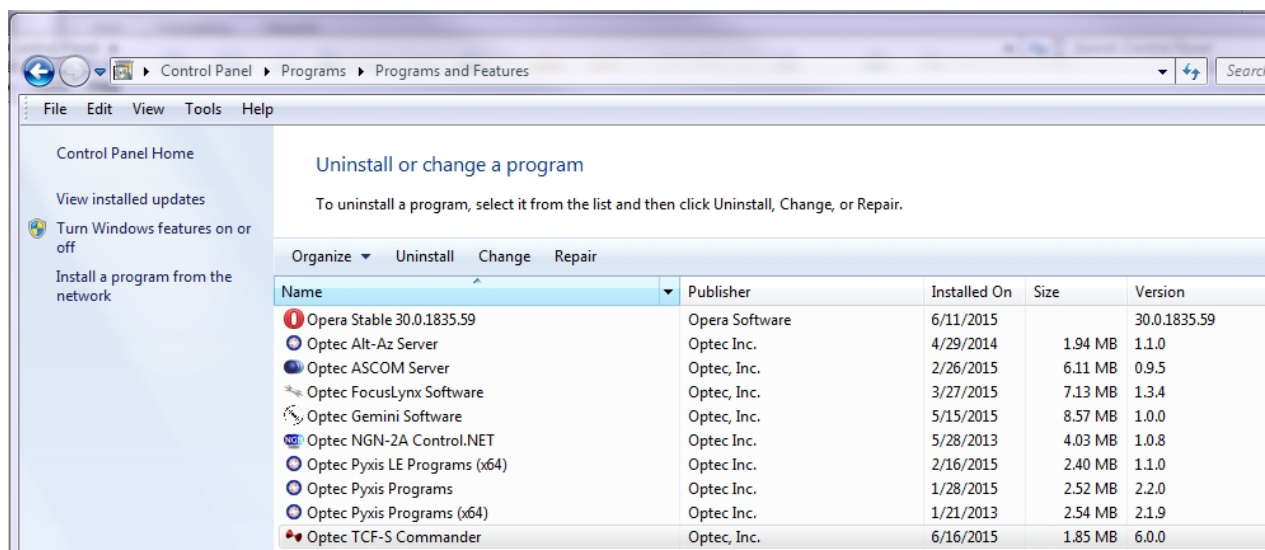

Uninstalling

▶ **Uninstalling Optec TCF-S Commander**

  ▶ To remove TCF-S Commander and the ASCOM Local Server driver from your computer, go to **Control Panel - Uninstall a Program**. Locate the **Optec TCF-S Commander** in the list and click Uninstall.

Chapter 2: Operation

Selecting COM Port

▶ **Selecting a COM Port**

In order to connect to a focuser you must first select the proper COM port name so that the program knows where to look for the device. To change the selected COM port name, click Settings on the top menu bar and select Change COM Port. All available port names will be displayed to the right as shown in the image below. Click the name of the port you wish to use. If you do not see the desired port name listed, check if another program is currently using the port.

The COM port name can be selected via the ASCOM Driver Setup Dialog form or the TCF-S Focuser Control Program. Since these two programs share the same settings storage file any changes made in one program will be reflected in the other.
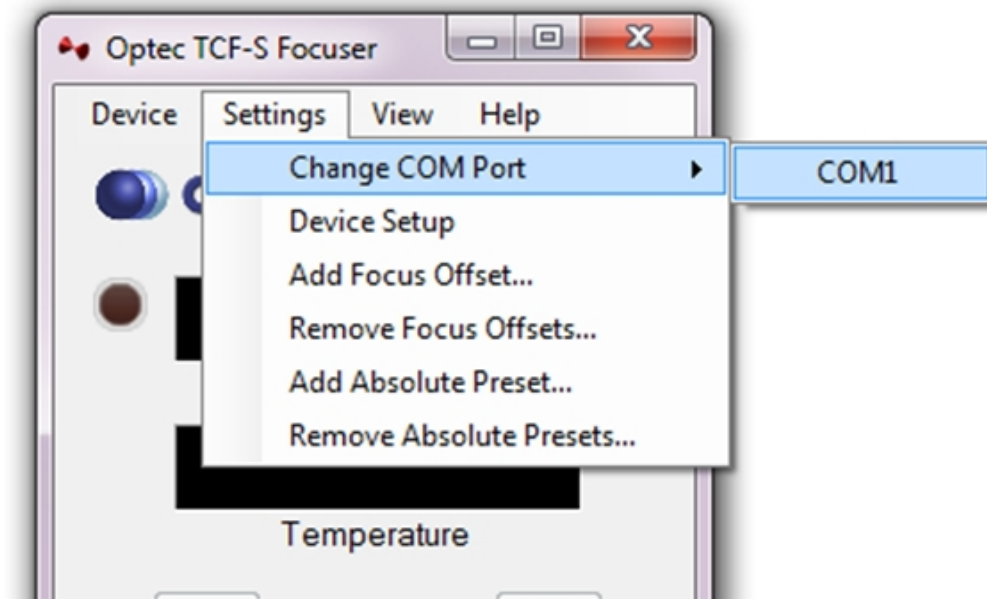
Device Setup

- ▶ **Accessing Configuration Settings**

   Configuration of the device and program settings can be achieved via the TCF-S Focuser Control program or the ASCOM Driver Setup Dialog. Any change made in one will be reflected in the other program. To access the settings form in the TCF-S Focuser Control program click Settings on the main menu bar and select Device Setup. To access the settings from the TCF-S ASCOM Driver simply open the setup dialog from whichever client application you are using. The property grid shown below allows the user to view and edit all device settings.

Setup Optec TCF-S - ASCOM

Device   Help

Optec   ASCOM

COM Port Name   COM4

Application Configuration	
Serial Port Name	COM4
Device Configuration	
Backlash Compensation Enabled	**True**
Device Type	**TCF_S**
Disable Temp. Probe	**False**
LED Brightness	**MEDIUM**
Mode A Temp. Coefficient	**86**
Mode A Temp. Intercept	**5000**
Mode B Temp. Coefficient	**86**
Mode B Temp. Intercept	**5000**
Temp Mode A Delay	**1**
Temp Mode B Delay	**1**
Temp. Comp. At Start	**True**
Temp. Comp. Mode	**A**
Temperature Offset(°C)	**0**
Device Status	
Backlash Comp. Available	False
Current Pos. for Display	------
Current Position	0
Current Temp (°-C)	0
Current Temp. for Display	------

Backlash Comp. Available
Indicates whether the device is capable of backlash compensation.

Close

Device is Not Connected

▶ **Serial Port Name (Read Only)**

The *Serial Port Name* property displays the currently selected COM port. See *Selecting COM Port* for information regarding how to change the selected port.

▶ **Backlash Compensation Enabled**

This property is used to enable and disable the built-in backlash compensation of the focuser device. Not all versions of firmware include this feature. TCF-S focusers with firmware versions below 4.10 and TCF-Si focusers with firmware versions below 3.10 do not have backlash compensation available. TCF-S focusers with version 4.10 do not have the ability to disable the backlash compensation feature. Likewise, TCF-Si focusers with firmware versions below 3.10 do not have backlash compensation available. TCF-S version 4.11 and TCF-Si version 3.11 focusers do have the ability to disable the backlash compensation feature. This may be required for certain older programs where a timeout occurs when moving the focuser OUT.

▶ **Device Type**

The *Device Type* property displays which type of focuser the program is configured to work with. The latest firmware versions of the TCF-S focusers are able to report their device type to the application and

thus the user would not have to set this property manually. However, older firmware versions did not have this feature. If the displayed Device Type is not the same as the actual type of focuser connected, click the property value and select the correct device type from the drop down menu. NOTE: You should always reboot a focuser after changing the device type property.

▶ **Disable Temp. Probe**

Not everyone chooses to use the temperature compensation feature of the TCF-S focuser. In such a case, the user can set the *Disable Temp. Probe* property to True. If the temperature probe is enabled and the probe is unexpectedly removed from the focuser, the application will automatically set the *Disable Temp. Probe* property to True. If you re-insert the probe back into the focuser you must manually set the *Disable Temp. Probe* property to *False* in order to begin reading temperatures again. Obviously, if you plan to use the temperature compensation feature of the focuser the probe must be inserted and the *Disable Temp. Probe* property must be set to *False*.

▶ **LED Brightness**

On the newer firmware versions of the TCF-S focusers the user has the ability to adjust the brightness of the LED's and DRO (Digital Read Out) on the focuser hand control box. To set the brightness, click the *LED Brightness* property value and select the desired value. The program must be Connected to the focuser and the focuser must not be in Temperature Compensation or Sleep mode when changing the *LED Brightness.*

TCF-Si focusers do not have a hand control box and thus do not have a DRO. For that reason, the brightness of the LED on the focuser body can only be set to either ON of OFF.

▶ **Mode A/B Temp. Coefficient**

These properties display the temperature coefficients programmed into the focuser for temperature compensation modes A and B. The value displayed represents the number of steps the focusers stepper motor will move for each degree of change in temperature. The default value is set to 86 which is a typical coefficient for an f/10 Schmidt Cassegrain telescope as found in the Optec observatory. For historical reason the Optec Temp. Coefficient (TC) is the negative of the slope. The program must be Connected to the focuser and the focuser must not be in Temperature Compensation or Sleep mode when changing this property. The new wizard will find a better coefficient then it did in the past versions.

▶ **Mode A/B Temp. Intercept.**

The "Mode (A/B) Temp Intercept" is a new feature that has been added to TCF-S Commander. By knowing both the Slope (the coefficient) and the Intercept (the new parameter) you will rarely, if ever, need to refocus. The coefficient has historically been found by the Wizard and the intercept is simply the position in steps when the focuser is at 0 Celsius. The updated Temp Comp Learn Wizard program will automatically set the intercept value after a successful calibration. Because temperature compensation works and follows a linear model these two values allow TCF-S commander to know the proper focus of the system for any given temperature. See Temp Comp. At Start for more details.

▶ **Temp Comp. At Start**

When Temp Comp at Start is engaged and the coefficient and intercept are set correctly the focuser will automatically move itself (on connect to any ASCOM client) to the correct focus position and will resume temperature compensating. This will compensate for any temperature changes that your system has gone through while the focuser was off. Assuming that your optical system is unchanged (no new gadgets in the path) and that you always start on the same filter on connect (TCF-S will bring the system into focus for the filter that was used for calibration) this should always bring the system into focus. For most well calibrated systems this will completely eliminate the need to focus the telescope.

▶ **Temp Comp. Mode**

Use this property to set which coefficient, A or B, is to be used when temperature compensation is activated either by an ASCOM client application or the TCF-S Focuser Control application.

▶ **Temp Mode A/B Delay**

The *Temp Mode A/B Delay* property can be used to adjust the time delay between temperature compensation adjustments. The default and minimum value allowed is 1 which represents a delay of approximately 500 ms. Each increment to this property adds an additional 5ms to the delay time. Note that if the actual focus is far from the target position (this could result from a large temperature change occurring over a short time) the focuser will disregard the delay value and move to the target position at a much faster rate. The program must be Connected to the focuser and the focuser must not be in Temperature Compensation or Sleep mode when changing this property.

▶ **Temperature Offset**

The temperature probes used in the TCF-S probe are not accurately calibrated, however they are precise. This means that they can report a change in temperature with great certainty while the absolute temperature reading may not exactly reflect the current conditions as measured by a different thermometer. This does not in any way affect the performance of the focusers ability to temperature compensate because only differential temperature measurements (changes in temperature) are needed. That being said, if the user wishes to apply an offset to the Temperature reading to adjust the TCF-S reported temperature to match the true ambient temperature, they can do so via the *Temperature Offset* property. Changing this property will in NO WAY affect the functionality of the focuser. It will change the temperature displayed on the application's main form and the temperature returned by the ASCOM driver to client applications. The units of this property are in degrees Celsius.

▶ **Display Position Units** (TCF-S Focuser Control program ONLY)

This property allows the user to set the units of position as displayed on the programs main form. The users has the option of stepper motor steps or microns. Changing this property have no affect on the functionality of the focuser or the ASCOM Driver. This property can also be changed by left-clicking on the position read-out on the main form.

▶ **Display Temperature Units** (TCF-S Focuser Control program ONLY)

This property allows the user to set the units of temperature as displayed on the programs main form. The users has the option of degrees Celsius, degrees Fahrenheit, or Kelvin. Changing this property have no affect on the functionality of the focuser or the ASCOM Driver. This property can also be changed by left-clicking on the temperature read-out on the main form.

▶ **Backlash Comp. Available**

Displays the current status of the backlash compensation feature (enabled or disabled). TCF-S focusers with firmware versions below 4.10 and TCF-Si focusers with firmware versions below 3.10 do not have backlash compensation available.

▶ **Current Position**

Displays the current position, in steps, for the connected focuser.

▶ **Current Position for Display** (TCF-S Focuser Control program ONLY)

Represents the current position of the focuser in the units selected in the *Display Position Units* property.

▶ **Current Temperature**

Displays the current temperature, in degrees Celsius, for the connected focuser as read by the temperature probe and offset by the value of the *Temperature Offset* property.

▶ **Current Temp. for Display** (TCF-S Focuser Control program ONLY)

Represents the current temperature of the focuser in the units selected in the *Display Temp. Units* property and offset by the value of *Temperature Offset* property.

▶ **Firmware Version**

Displays the firmware version of the connected focuser. This value is determined by the software at the time the device is connected. If the TCF-S focuser contains an old firmware version it may not be capable of reporting its version number to the control software. If that is the case, the program will report "V.old" for the firmware version. Optec always recommends using the latest firmware revision in all of our products.

▶ **Maximum Step**

This property represent the maximum position that the focuser can travel to, in units of stepper motor steps. This value is determined based on the selected device type. Three inch focuser models have a maximum travel of 10,000 steps; two inch focusers have a maximum travel of 7000 steps.

▶ **Step Size**

This property represent the linear distance of focusers draw tube will travel per step of the stepper motor. This value is determined based on the selected device type. Three inch focuser models have a step size of 2.5 microns; two inch focusers have a maximum travel of 2 microns per step.

Main Form

> **Main Form**

The main form of the Optec TCF-S Focuser Control program, shown on the right, gives you complete control over your focuser device.

> **View Menu**

The view menu allows the user to specify which controls appear on the main form. All controls are displayed by default. Click view and uncheck a control to remove if from the main form.

The *Always On Top* setting, when checked, will force the main TCF-S Focuser Control window to remain on top of all other program windows.

> **Device Menu**

The device menu allows the user to connect and disconnect from the focuser, enter and exit Temperature Compensation mode, enter and exit Sleep Mode and close the TCF-S Focuser Control program.

> **Logos**

The logos at the top of the screen provide hyperlinks to the Optec Inc. website and official ASCOM website. Clicking either logo will open a new internet browser window.

> **Connection Indicator Light**

The connection indicator light, located to the left of the Position readout, gives the user a visual indication of whether the focuser is connected or not. The user can click the Connection Indicator Light to connect or disconnect from the focuser at any time (assuming the focuser is physically connected to the computer and the correct COM port has been selected).

> **Position Readout**

When a focuser is connected the Position Readout gives the user an indication of the current position of the focuser. Clicking the Position Readout causes the display to change units.

> **Temperature Readout**

When a focuser is connected, the Temperature Readout gives the user an indication of the current temperature as measured by the temperature probe. If the temperature probe is not inserted or is disabled the Temperature Readout will display "DISABLED". Left-click the Temperature Readout to change the displayed units for the temperature. Right-click the Temperature Readout to enable or disable the probe.

> **Relative Move Controls**

The relative move controls allow the user to manually change the focus by pressing the *IN* and *OUT* buttons. Use the *Increment* box to set how many steps the focuser will travel for every button press.

> **Temperature Compensation**
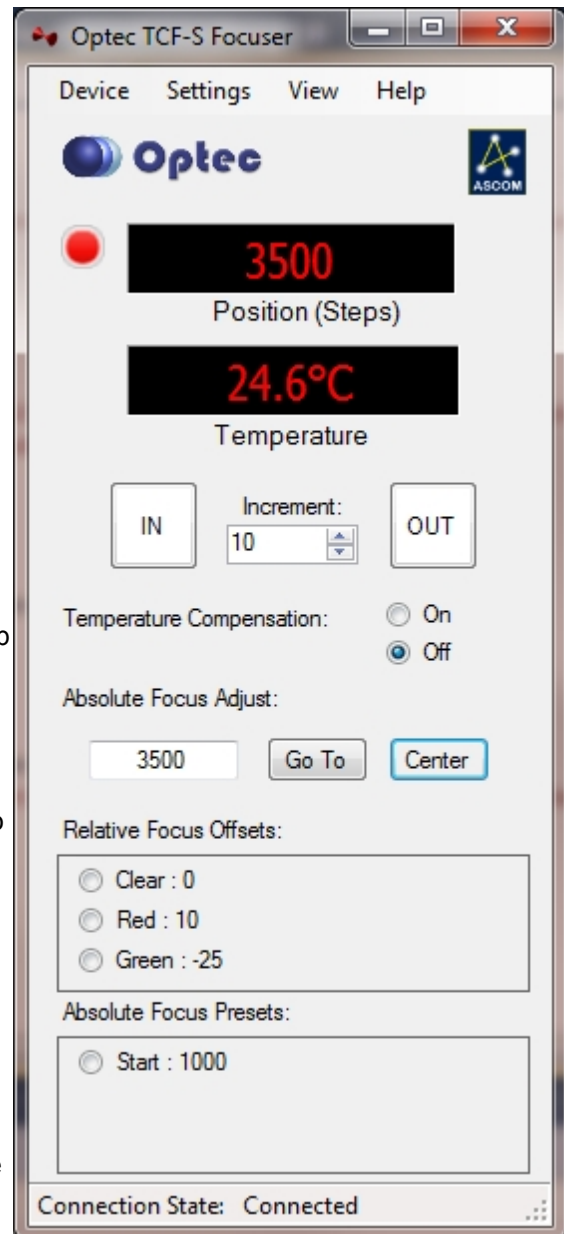
The Temperature Compensation controls allow the user to turn temperature compensation on or off. This functionality is only available when the device is connected.

▶ **Absolute Focus Adjust**

The Absolute Focus Adjust controls allow the user to send the focuser to a specific absolute position. Enter a position in the box and press the *Go To* button to change focus to a new position. Press the *Center* button to move the focuser to the center of its possible travel.

▶ **Relative Focus Offsets**

See *Focus Offsets*.

▶ **Absolute Focus Presets**

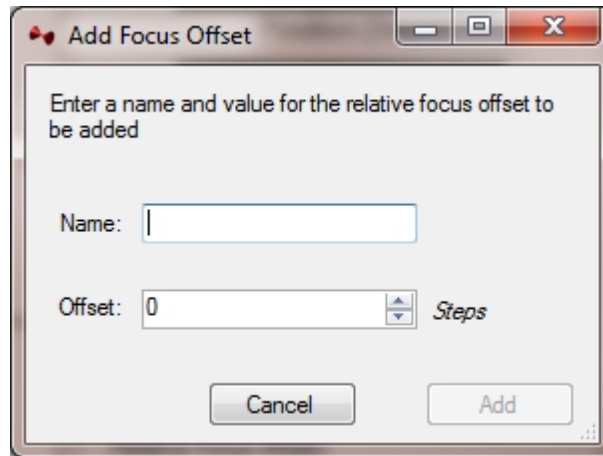See *Focus Presets*.

Focus Offsets

▶ **Why are Focus Offsets Needed?**

The TCF-S Focuser Control program gives you the ability to create and store relative focus offsets. The intention is that these offsets would be used by customers who are using the program in conjunction with a filter wheel. When changing from one filter to another, a focus change is often required because the optical system does not always focus all wavelengths at the same focal plane. A small offset can be entered for each filter used.

▶ **How to add a Focus Offset**

First of all, if the *Relative Focus Offsets* panel is not visible on the main form, select *View* from the main tool bar and click the *Relative Focus Offsets* item. To add a focus offset right-click in the *Relative Focus Offsets* pane and select *Add Offset* from the context menu. This will open up the *Add Focus Offset* form as shown below. On the form, type in a name for the new offset (e.g. LUMINANCE, Clear, BLUE, or H-Alpha), then enter the number of steps to offset from the default filter. A good idea is to set the offset for your default filter to 0. All other filter offsets will be *Relative* to this focuser postion. Click *Add* to add the offset. Repeat this process for additional offsets.

▶ How to remove a Focus Offset

To remove focus offsets right-click in the *Relative Focus Offset* pane and select Remove Offsets from the context menu. This will open up the *Remove Focus Offsets* form as shown below. Check the boxes next to the offsets that you wish to remove and click the *Remove* button. This will remove the selected offsets. Click *Close* when you are finished removing offsets.
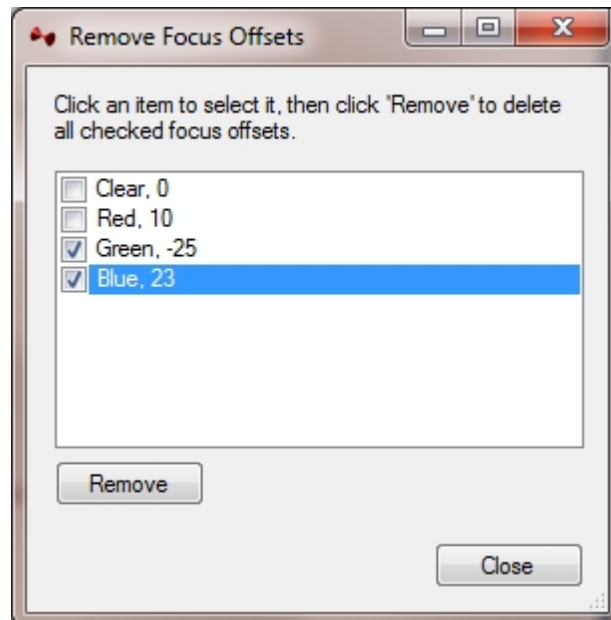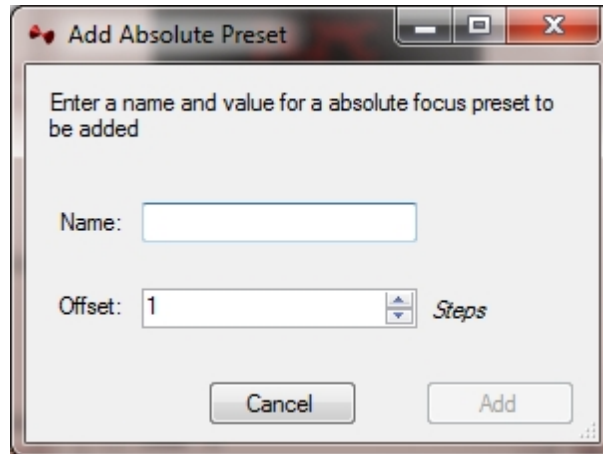

Focus Presets

▶ Why are Focus Presets Needed?

The TCF-S Focuser Control program gives you the ability to create and store absolute focus Presets. The intention of Presets is to provide the user the ability to quickly change focus to a specific stored position. For example, if you know that your optical system focuses somewhere near 1000 steps, you

may want to create an absolute focus preset at 1000. This way before running a focus routine you could quickly move close to your focus point and shorten the time of the focusing routine.

▶ **How to add an Absolute Focus Preset**

First of all, if the Absolute *Focus Presets* Panel is not visible on the main form, select *View* from the main tool bar and click the *Absolute Focus Presets* item. To add a focus Preset right-click in the *Absolute Focus Presets* Panel and select *Add Preset* from the context menu. This will open up the *Add Absolute Preset* form as shown below. On the form, type in a name for the new Preset (at least one character), then enter the number of steps for the preset position. Click *Add* to add the Preset. Repeat this process for additional Presets.

▶ **How to remove a Focus Preset**

To remove Absolute Focus Presets right-click in the *Absolute Focus Preset* Panel and select *Remove Absolute Presets* from the context menu. This will open up the *Remove Absolute Presets* form as shown below. Check the boxes next to the Presets that you wish to remove and click the *Remove* button. Click *Close* when you are finished removing Presets.
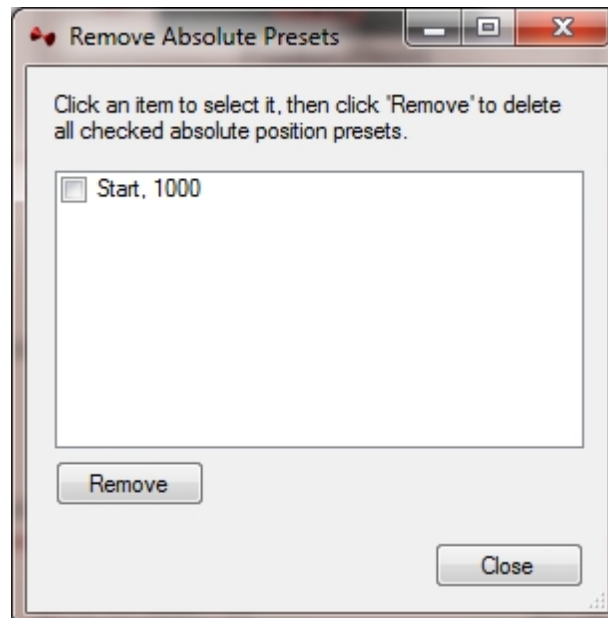
Chapter 3: FAQ & Troubleshooting

- ▶ Connect Errors - Most commons solutions to connection errors.

- ▶ Determining COM Port - Checking the Device Manager for assigned COM port.

- ▶ Error Codes - Focuser generated error codes.

- ▶ Page cannot be displayed - Windows Help engine error.

Connect Errors

Connect Errors - the most common connection errors occur due to faulty or intemittent connections. If you receive a "**Error connecting to TCF**" error, check the following possible problem sources.

- ▶ Check the COM port assignment of your USB-to-Serial converter as described under **Determining COM Port**.

- ▶ Check that the PC Serial Port converter is wired correctly.

- ▶ Check the flat Reverse cable. You easily check that each end of the RJ12 connectors are wired straight through. That is, Pin 1 on one connector should be connected to Pin 1 on the opposite connector. When looking at the Reverse cable connector ends, the wire colors should appear identical as shown below.
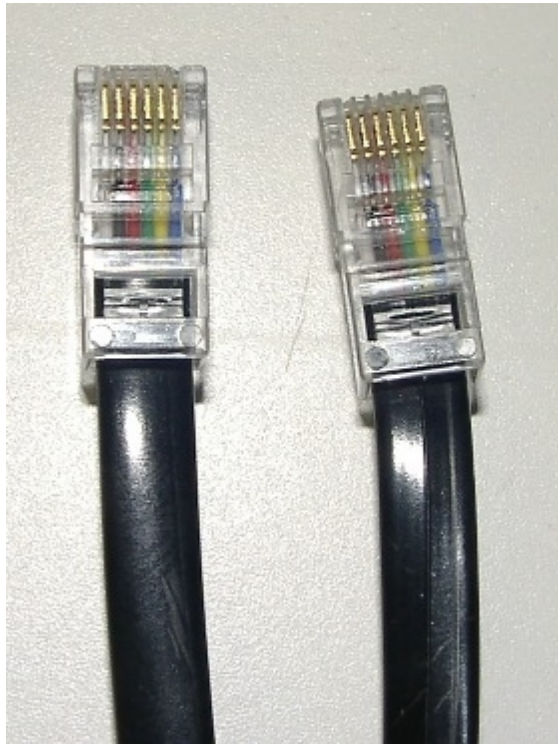
- Check that the RJ12 connectors are properly inserted into the TCF-S focuser control box and the PC Serial Port Converter.

- If using the original type **TCF-S** or **TCF-S3** with external hand controllers, be certain the hand control **Mode** slide switch is set to the PC/Manual position. If either AUTO-A or AUTO-B is selected, a serial connection cannot be made. The **Learn** slide switch must also be set to **RUN** for proper operation. (See About for a view of the hand controller.)

Determining COM Port

One of the first problems encountered when using the USB-to-Serial port converters is trying to determine which COM port is assigned.

- **COM Port Assignments**

The instructions below provide the easiest way to set up the USB-to-Serial port converter. To display the Device Manager in Windows, click Control Panel, or right-click on the My Computer icon and select Manage. Select Device Manager under System Tools.

Follow the instructions at right below.
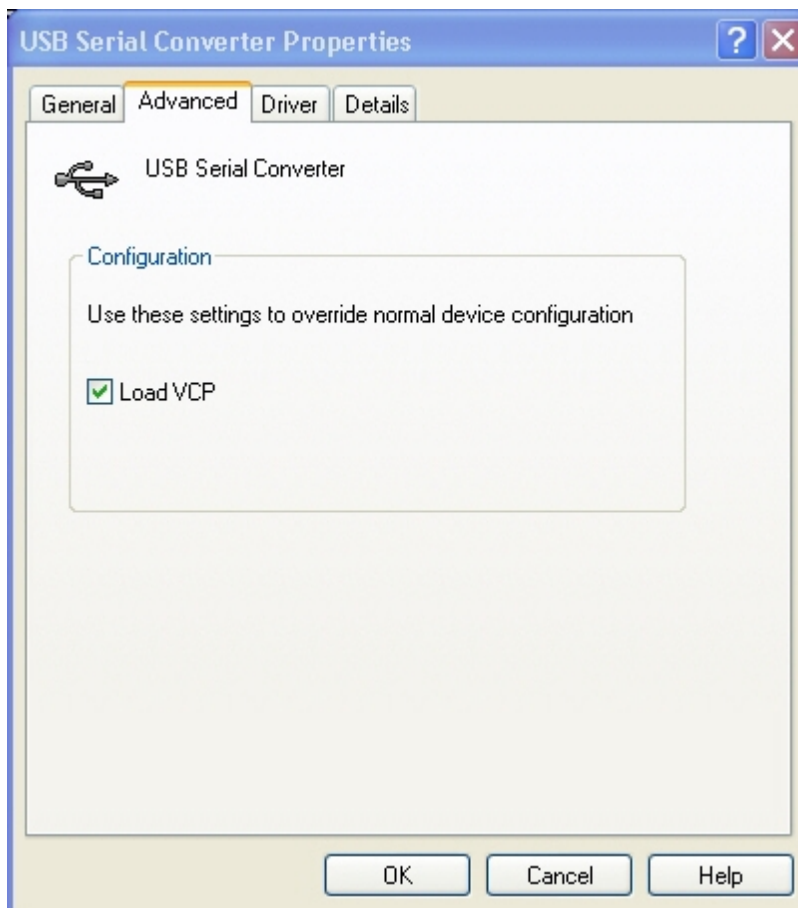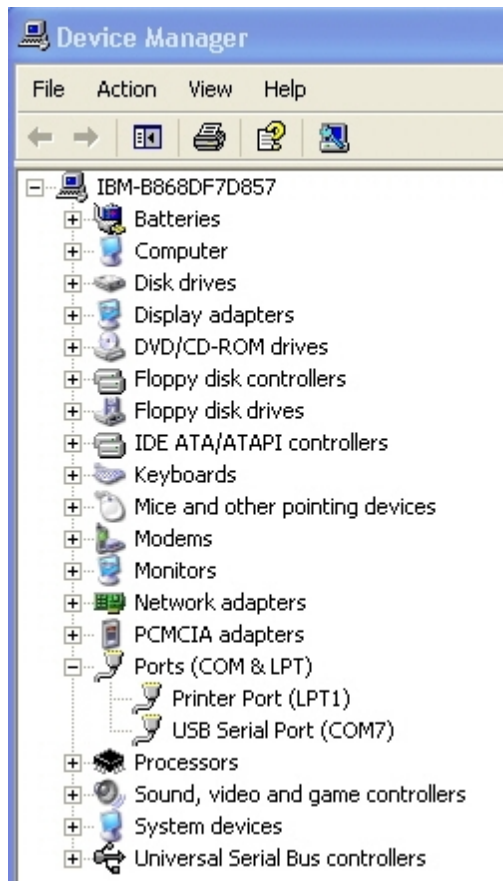
1. Before plugging your new converter into your computer, make sure that any existing old drivers for the FTDI chips set have been removed. Do this by going to the Add/Remove Programs in the Control Panel and find any listing of "FTDI drivers" and remove it. If you have any older USB-to-Serial Converters using the FTDI chip set, you can remove them now.

2. From the Optec Install disk or from the Optec web site at: http://www.optecinc.com/astronomy/downloads/usb-to-serial.htm, download and run the FTDI driver executable setup program. This setup program is for Windows operating systems: Windows 8, Windows 7, Vista, XP, and Win2000. You will not see any message if the program loads successfully.

3. After running the setup program, you can now plug in one of your FTDI chip set USB-to-Serial converters. To find the COM number that was selected for each USB-to-Serial converter, go to your Device Manager (PATH: My Computer - Control Panel - Systems - Hardware) and check to see the COM port number listed under Ports (COM & LPT). See the diagram on the left which has COM7 selected for the USB-to-Serial Converter. You can then plug your other converters in one at a time to see which COM

	number have been selected for those. 4. **IMPORTANT NEW INFORMATION**: There have been some recent changes with the firmware installed in the USB-to-Serial converters that Optec supplies after July 2007 that may require an additional computer setting to be modified. If you do not see the COM port number in the Device Manger screen as above, but do see messages that indicated that the USB-to-Serial converter is installed and ready, then the VCP (Virtual COM Port) box must be checked. Examine the second image at the left and see that no COM port number has been selected. Open the line item "Universal Serial Bus controllers" and select properties for the"USB Serial Converter" line item. Select the "Advanced" tab as shown in the third image at the left and check the "Load VCP" box. Unplug the USB-to-Serial converter and then plug it back in. You should see the COM port number appear under Ports as described in paragraph 3. This will effect all converters that are connected.

Error Codes

The TCF-S focusers communicate with **TCF-S Control** through an ascii command set as described in the TCF-S Technical Manual. The TCF-S firmware and protocol display error codes for common problems that might occur at the hardware level. **TCF-S Control** will handle most of these errors and display a suitable message, but occasionally you may see one of the error codes below:

▶ **ER=1**   Temperature probe not connected or not working.
This is the most common fault and can usually be traced to a missing temperature probe or faulty wiring. Check the temperature probe connection first. Also check the Control cable connection at the TCF hand control.

Note: If using the Remote IN/OUT Keypad (Optec stock #17680) the software will throw an error. Though the Remote Keypad is "hot-swappable" it is advised that you Disconnect from **TCF-S Control** software before using it.

SPECIAL NOTE: If the PC serial control cable is inadvertently plugged into the RJ-45 connector of the TCF-S hand control box (the left-most connector) pins 1 and 8 may be pushed down and fail to make a proper contact. Pin 1 is the ground pin for the temperature probe. If this connection fails intermittently, an **ER=1** error code will result.   If you are experiencing intermittent connection problems, examine the pins of the RJ-45 connector using a good light and magnifier. Check all the pins are lined up evenly. If not, use a pair of tweezers to bend pins 1 and 8 upward and back in line.

▶ **ER=2**   New calculated position when unit turned on in AUTO-A or AUTO-B exceeds limits.
Try re-centering the focuser and adjusting the telescope's coarse focus. This error should never be passed to the **TCF-S Control** software. If it is displayed, check that the slide switches are in the "Manual/ PC"

▶ **ER=3**   EEPROM failed read/write test on boot up.
Contact Optec if this error condition occurs repeatedly.

Page cannot be displayed
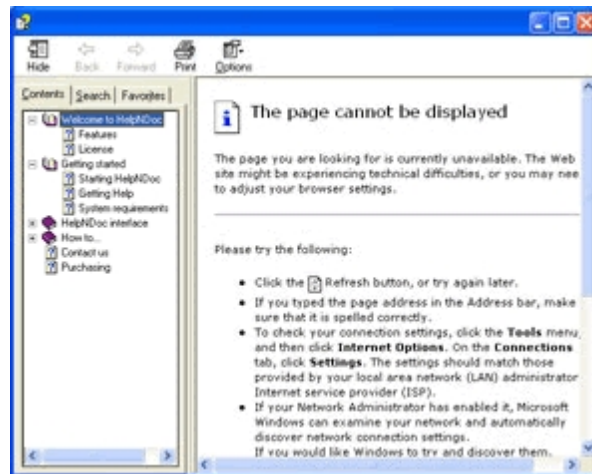
Symptoms

Microsoft's HTML Help Viewer is showing an error page saying either that:

- "The action has been canceled"

- "The page cannot be displayed"

Solutions

- Make sure your help file is not accessed from a network path or via a mapped networked drive. Try to copy the file locally and launch it again;

- Make sure your help file isn't in a path with symbols such as "#" (sharp). Once again, try to copy it locally before launching it;

- In some cases, you can have access to an "unblock" button in the properties page of the help file. Right click on the file then go to its properties and click the "unblock" button. This button is not available in all systems though.

Chapter 4: Additional Resources

There are many resources on the internet to help you use the TCF-S focuser. Visit the Optec website first.

If unable to connect to the internet, or with any other questions at all, please feel free to contact Optec Support by telephone at:

▶ Optec Support: 616-897-9351