

TREK COMMAND TUTORIAL



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1 Welcome

The Telescience Resource Kit (TReK) is a suite of software applications and libraries that can be used to monitor and control assets in space or on the ground. The TReK Command application provides the capability to update, send, and track commands. Includes support for various types of command destinations.

This tutorial provides step-by-step instructions describing how to perform common application functions.

This tutorial uses screen dumps taken on a Windows computer. However, the steps are the same regardless of whether you are running on Windows or Linux.

2 Technical Support

If you are having trouble installing the TReK software or using any of the TReK software, please contact us for technical assistance:

E-Mail: trek.help@nasa.gov

Messages sent to this address are automatically forwarded to the TReK team.

3 Introduction

The TReK Command application provides the capability to update, send, and track commands. The destinations available to the application vary based on the installed version.

4 Overview of the User Interface

4.1 Main Window

The main window contains several areas as shown in Figure 1. The Command Track and Message Area are dock windows that you can float or dock. To float a dock window, use your left mouse button to click and hold the title area while dragging the window to another area of the screen. To dock, use the title bar to drag the dock window over the main window and drop.

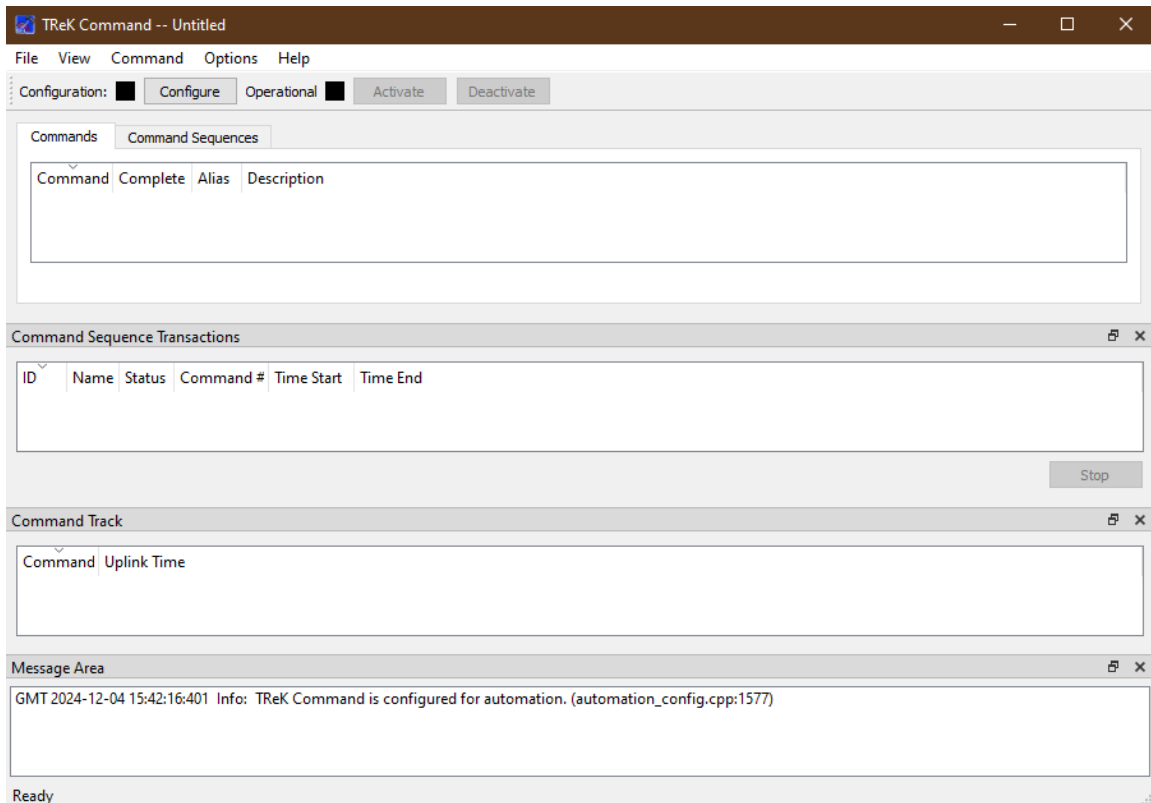


Figure 1 Main Window

Toolbar

The toolbar at the top of the window provides quick access to configure the application and activate and deactivate the command service.

Command

The Command area will display a list of commands and command sequences when the command service is activated. It will also display convenience buttons to perform functions such as updating a command, sending a command, or starting a command sequence.

Command Sequence Transactions

The Command Sequence Transactions area displays instances of command sequences as they are executed and potentially allows a user to stop a long running sequence if necessary.

Command Track

The Command Track area displays the history of commands sent.

Message Area

The Message Area displays important status and error messages. The message area can be cleared using the View menu.

4.2 Toolbar

The toolbar provides visual information about the state of the application and provides access to common application functions.

Configuration Status

When the Configuration status is black, this indicates the application has not been configured. When the Configuration status is green, this indicates the application has been configured and the command service can be activated.

Use the Configure button to access the Configure dialog to configure the application.

Operational Status

When the Operational status is black, this indicates the command service is inactive. When the Operational status is green, this indicates the command service is active and tasks such as sending a command or starting a command sequence can occur. The application must be properly configured before the Activate button will be available. The command service must be active before the Deactivate button will be available.

Use the Activate button to activate the command service. This will initiate all internal activities needed to support commanding tasks. When you activate the command service, you will see activation status messages in the main window message area. If you need to reconfigure the command application, deactivate the command service, and then push the Configure button to reconfigure.

4.3 Menus

The Command application menus are: File, View, Command, Options, and Help. Each of these menus is described in more detail below.

File Menu

The File menu provides the capability to manage configurations and exit the application.

View Menu

The View menu provides the capability to clear the main window message area and show and hide different areas in the main window.

Command Menu

The Command menu provides the capability to configure the application, activate and deactivate the command service. It also provides access to functions such as updating a command, sending a command, viewing command communication messages, viewing command track information, and clearing the Command Sequence Transactions. The Command menu is context and version sensitive and items displayed may vary by version and Command Destination Type.

As shown in Figure 2, additional menu items are displayed when the Command Destination Type is a POIC destination.

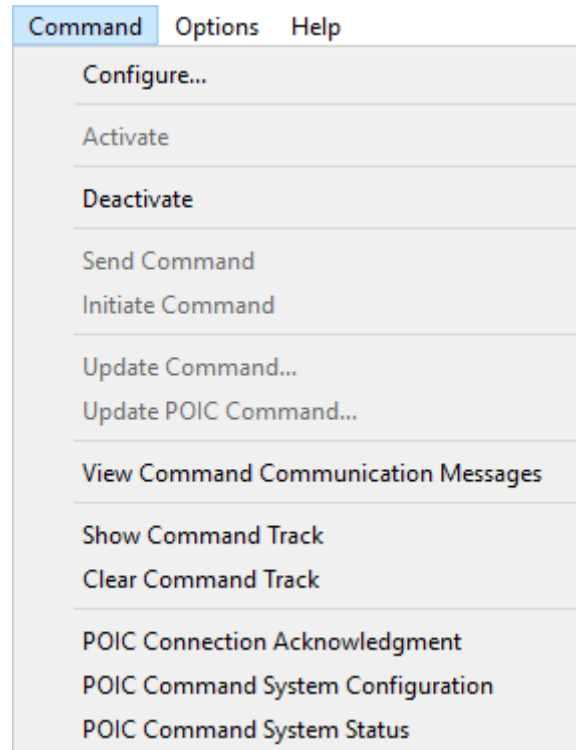


Figure 2 Command Menu

Options Menu

The Options menu provides access to the Messages dialog, the Command Preferences dialog, and the Advanced Settings dialog. The Messages dialog displays application messages. The Command Preferences dialog provides the capability to configure preferences such as the Command Confirmation Prompt. The Advanced Settings dialog provides access to advanced settings.

Help Menu

The Help menu provides access to on-line help and application version information.

5 TReK Command Tour

Sometimes it's easier to learn how to use an application by example. This tutorial describes how to configure the Command service, activate the Command service, update a command, and then send a command.

This section was written assuming you have read the Introduction section and the Main Window section. If you have not read these sections, please go back and read them. They contain important information that is not repeated in this section.

If at any time you need to exit the application so you can resume working through the Tutorial at a later time, File Save will allow you to save all the data you entered.

Please go through the tour in order. Some sections depend on data from previous sections.

Step-By-Step

1. If you haven't started the Command Application, use the operating system's menu to start the application. You should see the Command main window shown in Figure 3.

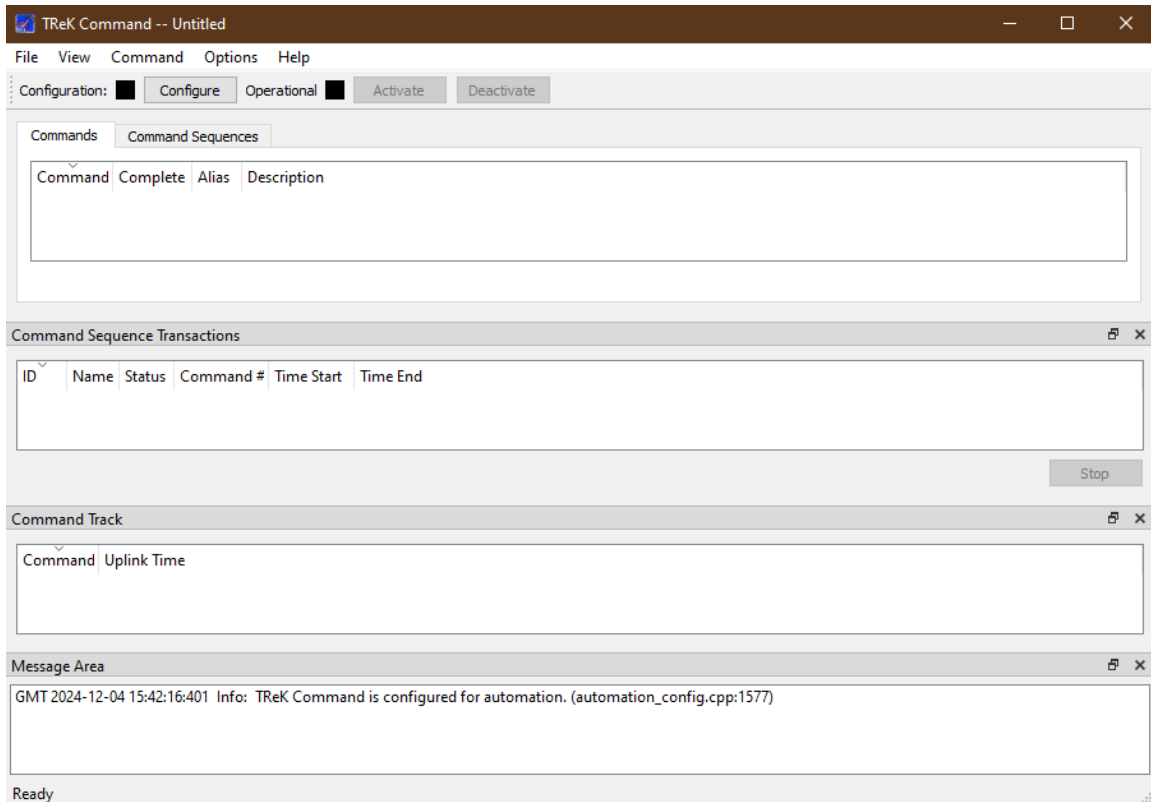


Figure 3 TReK Command Main Window

2. Push the Configure button in the Main Window Toolbar. You should see the Command Configuration dialog shown in Figure 4. Note: the default state of the dialog may vary based on version.

The screenshot shows a 'Command Configuration' dialog box with a dark brown title bar. It has five tabs: 'General' (selected), 'Commands', 'Command Sequences', 'History', and 'Bridge'. In the 'General' tab, there are three input fields: 'Destination Name' (empty), 'Destination Type' (set to 'UFO'), and 'Communication Type' (set to 'UDP'). Below these is a sub-dialog box with two tabs: 'General' and 'Firewall (NAT)'. The 'General' sub-tab contains two sections: 'Local Information' with 'Local IP Address' (10.232.81.236) and 'Local Port' (8500), and 'Destination Information' with radio buttons for 'Host Name' and 'IP Address' (selected), and a 'Port' field (5150). A 'Browse...' button is next to the 'Local IP Address' field. At the bottom right of the main dialog are 'OK' and 'Cancel' buttons.

Figure 4 Command Configuration Dialog (General Tab)

3. On the General Tab change the Destination Type to UFO, if not already the default. The dialog should look like the one shown in Figure 5.

Command Configuration

General | Commands | Command Sequences | History | Bridge

Destination Name:

Destination Type: **UFO**

Communication Type: **UDP**

General | Firewall (NAT)

Local Information

Local IP Address:

Local Port:

Destination Information

☐ Host Name:

☒ IP Address:

Port:

Figure 5 Command Configuration with UFO Destination Type Selected

4. On the General tab enter the following information:

Destination Name:	UFO
Destination Type:	UFO
Local IP Address:	Enter your local IP address.
Local Port:	8500
Destination IP Address:	Enter your local IP address
Destination Port:	8888

Your dialog should now look like the one shown in Figure 6.

The screenshot shows a 'Command Configuration' dialog box with a dark brown title bar. It has five tabs: 'General', 'Commands', 'Command Sequences', 'History', and 'Bridge'. The 'General' tab is selected and contains the following fields:

- 'Destination Name:' with a text box containing 'UFO'.
- 'Destination Type:' with a dropdown menu showing 'UFO'.
- 'Communication Type:' with a dropdown menu showing 'UDP'.

Below these fields is a sub-dialog box with two tabs: 'General' and 'Firewall (NAT)'. The 'General' sub-tab is selected and contains:

- 'Local Information' section with:
 - 'Local IP Address:' text box containing '10.232.81.236' and a 'Browse...' button.
 - 'Local Port:' text box containing '8500'.
- 'Destination Information' section with:
 - 'Host Name:' radio button (unselected) and text box.
 - 'IP Address:' radio button (selected) and text box containing '10.232.81.236'.
 - 'Port:' text box containing '8888'.

At the bottom right of the main dialog are 'OK' and 'Cancel' buttons.

Figure 6 Command Configuration with General Tab Populated

5. In the Command Configuration dialog, select the Command tab. Your dialog should look like the one shown in Figure 7.

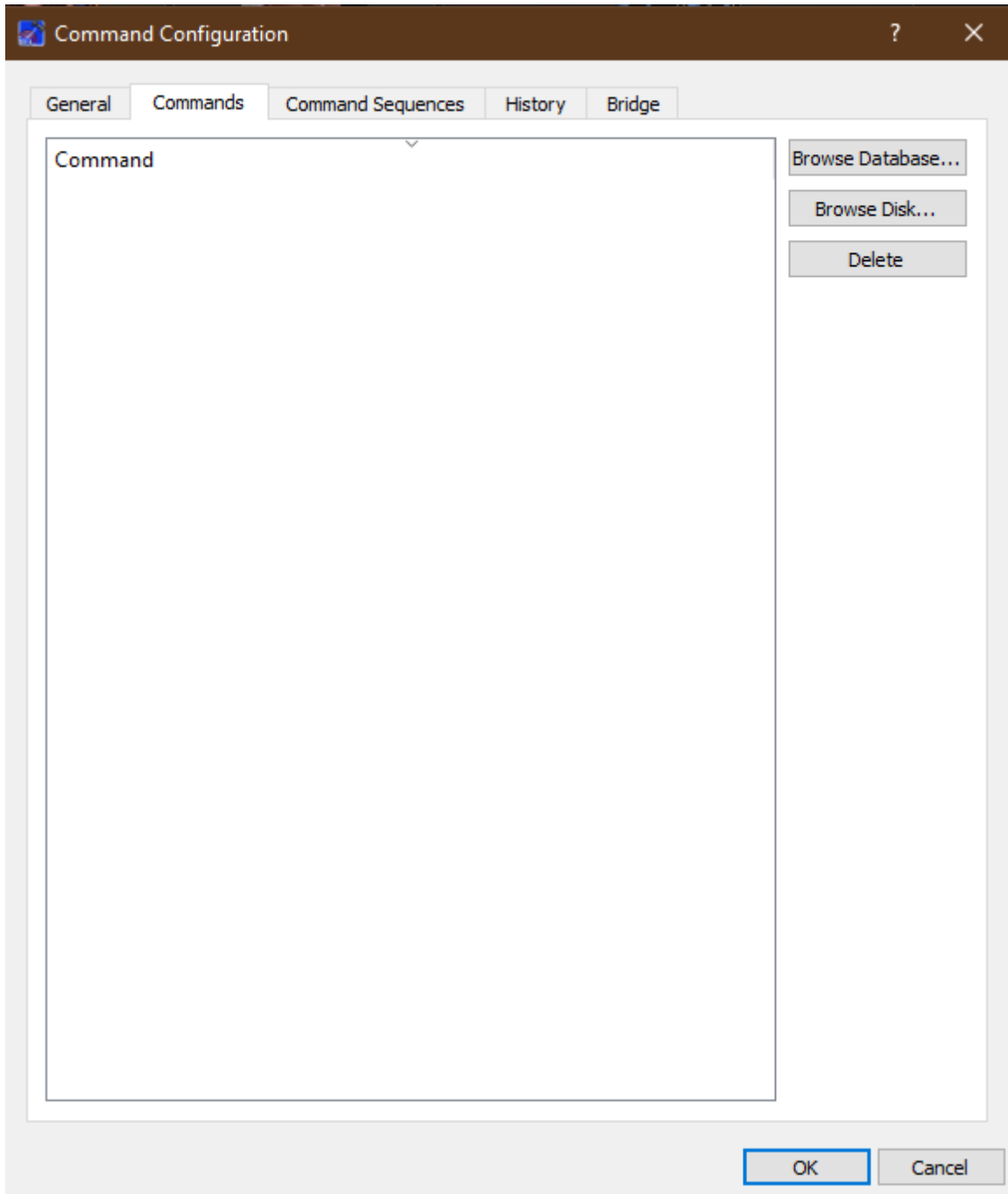


Figure 7 Command Configuration Dialog (Command Tab)

6. Push the Browse Disk button. The open dialog will default to the `trek_workspace/metadata/command_packet` directory as shown in Figure 8.

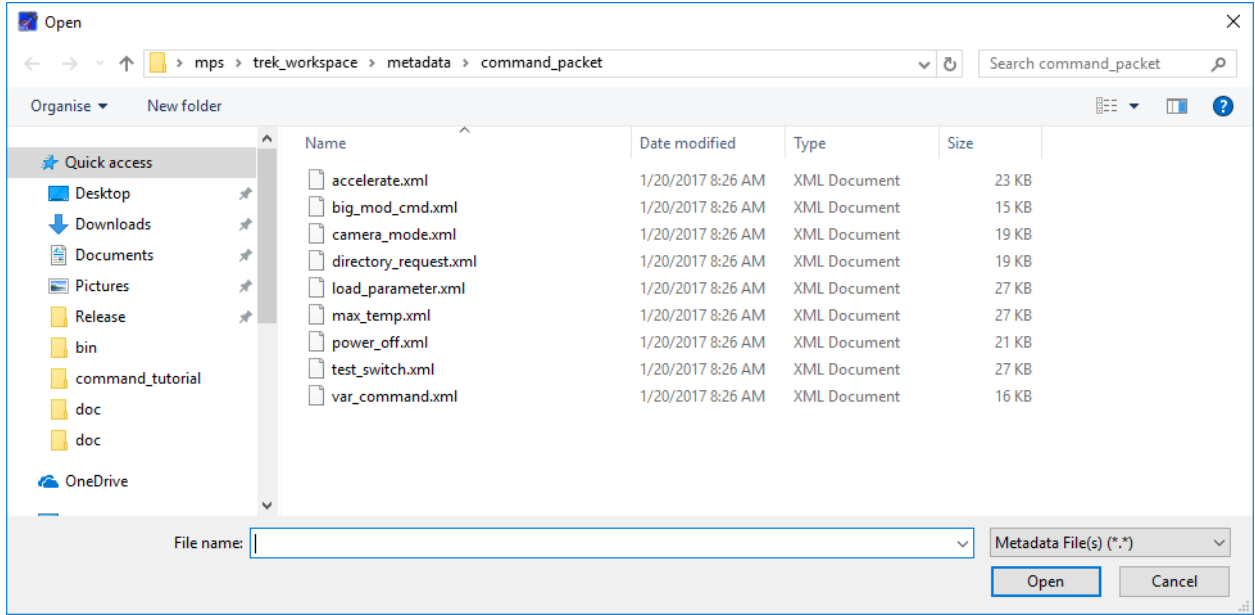


Figure 8 Command Metadata Files

7. Select the file named **test_switch.xml** and push the Open button. The command will be added to the Command list as shown in Figure 9.

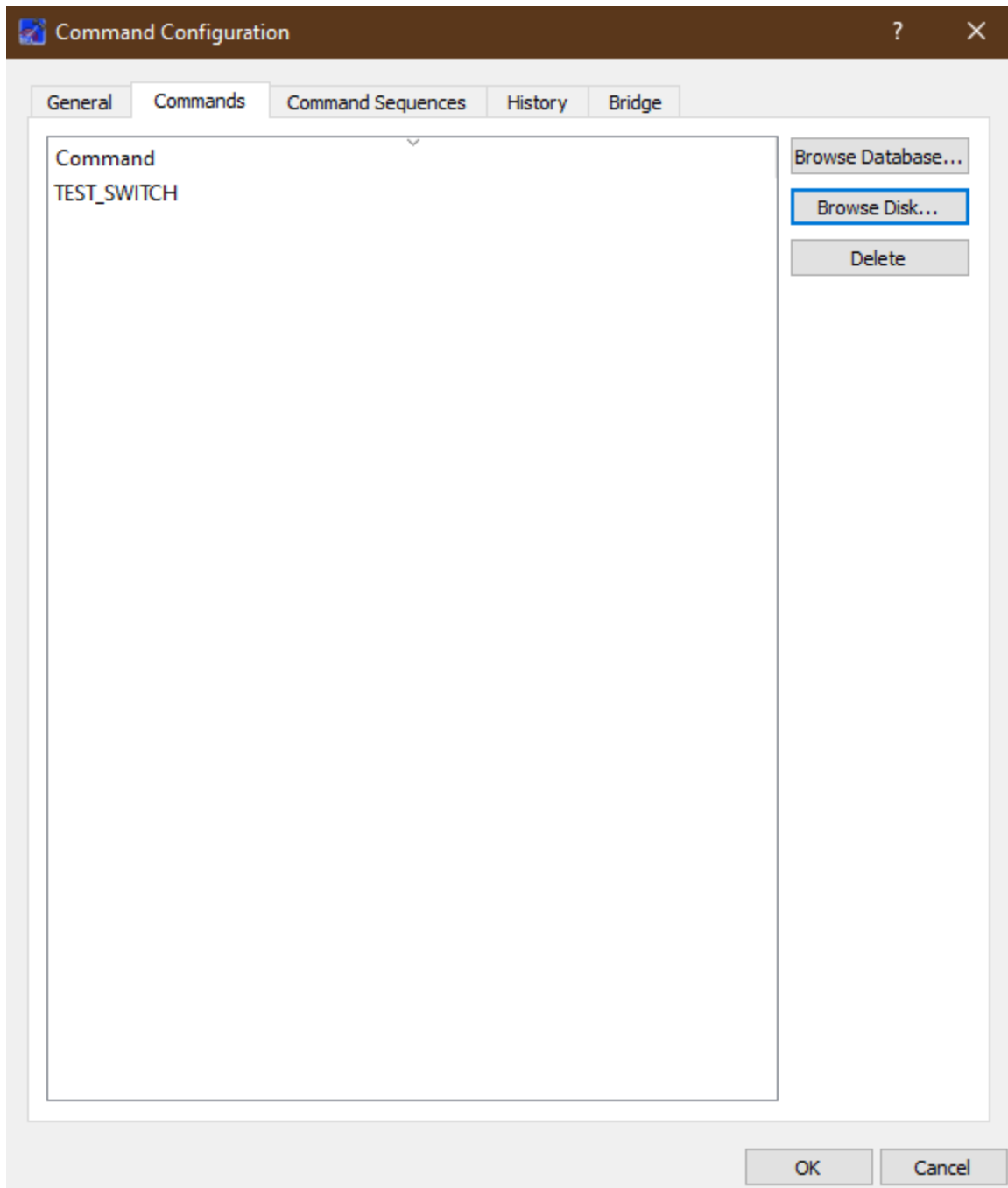


Figure 9 Command Configuration Command List with TEST_SWITCH Command

8. Push the OK button to complete the configuration. You should see the Configuration status has turned green as shown in Figure 10.

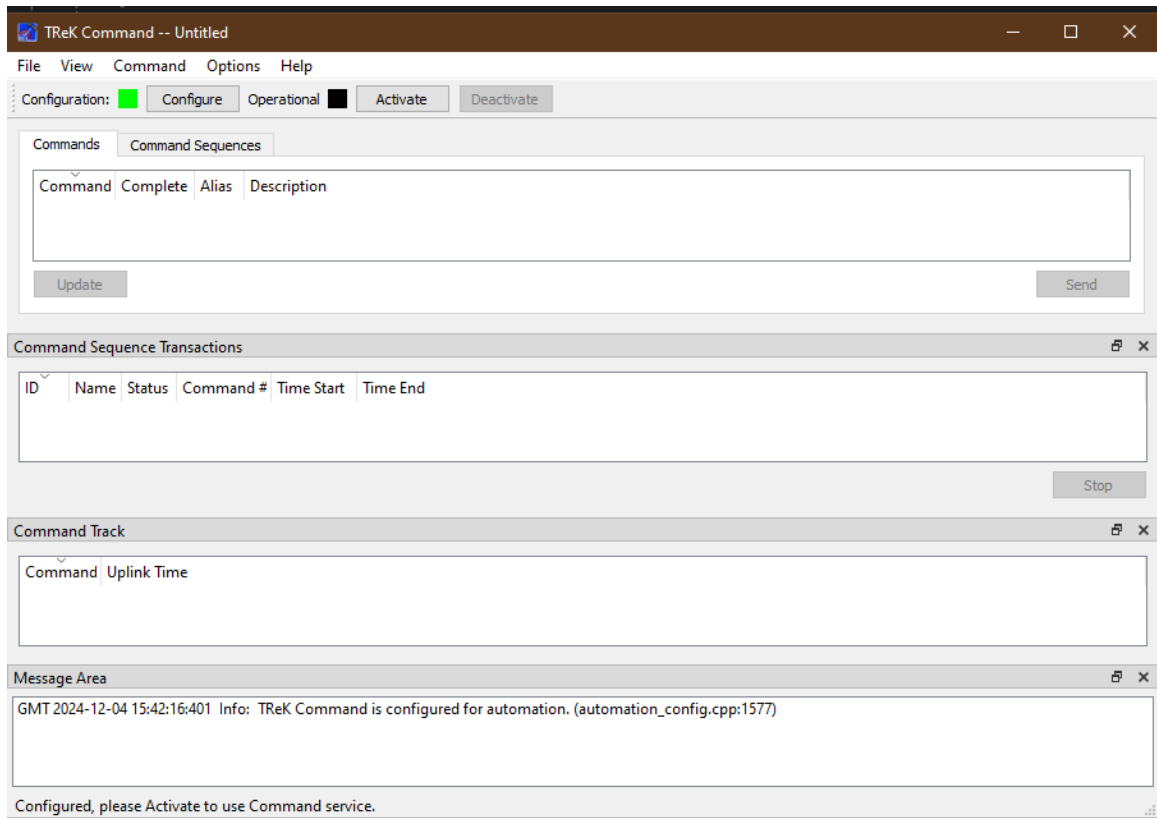


Figure 10 Main Window showing Configuration Status Green

9. Push the Activate button in the Main Window toolbar to activate the Command service. Once the service is active you should see the Operational status turn green as shown in Figure 11.

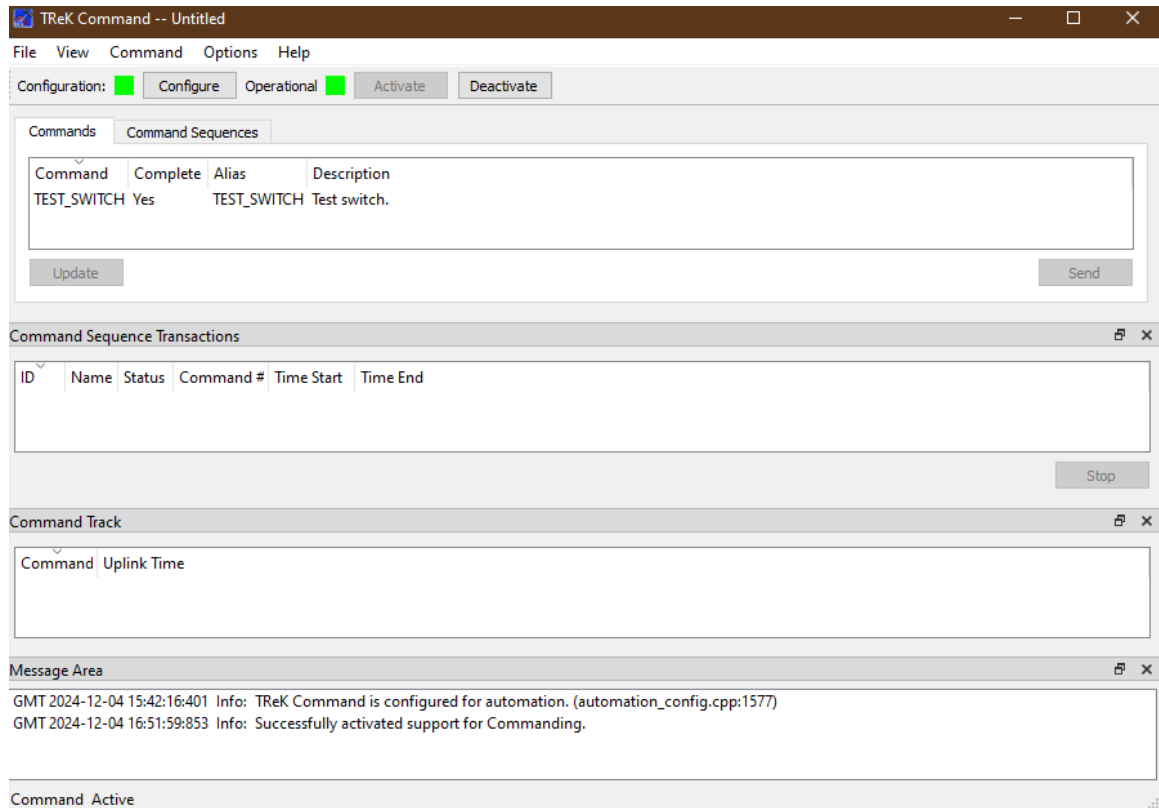


Figure 11 Active Command Service

Now that the Command service is activated, the Command list has been populated with the command you entered in the Command Configuration. You can also see whether the command is complete (all the command fields have values). There are buttons available to update and send the command. These buttons will not be active until you select a command in the list.

10. In the Main Window Command tab, in the Command list select the TEST_SWITCH command. The Update and Send buttons should now be enabled.

11. Push the Update button to display the Update Command dialog shown in Figure 12.

Name: TEST_SWITCH

Name	Start Bit	Data Type	Data Format	Length	Modifiable	Value
CcsdsVersion	0	Unsigned Integer	Decimal	3	false	0
CcsdsType	3	Unsigned Integer	Decimal	1	false	1
CcsdsSecHdrFlag	4	Unsigned Integer	Decimal	1	false	1
APID	5	Unsigned Integer	Decimal	11	false	3
CcsdsSeqFlags	16	Unsigned Integer	Decimal	2	false	3
CcsdsSeqCnt	18	Unsigned Integer	Decimal	14	true	0
CcsdsLength	32	Unsigned Integer	Decimal	16	true	0
CcsdsTimeStamp	48	ISS Time	DateTime	40	true	1970-01-01 00:00:00
CcsdsTimeId	88	Unsigned Integer	Decimal	2	false	0
CcsdsCheckwordIndicator	90	Unsigned Integer	Decimal	1	false	1
CcsdsZoe	91	Unsigned Integer	Decimal	1	false	0

OK Cancel

Figure 12 Update Command Dialog for TEST_SWITCH

12. In the Update dialog, scroll down until you see the command field named WORD05 as shown in Figure 13. Change the value from 0 to 13. It should look like Figure 14.

WORD05	64	Twos Complement	Decimal	16	true	0.000000
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Figure 13 WORD05 Command Field

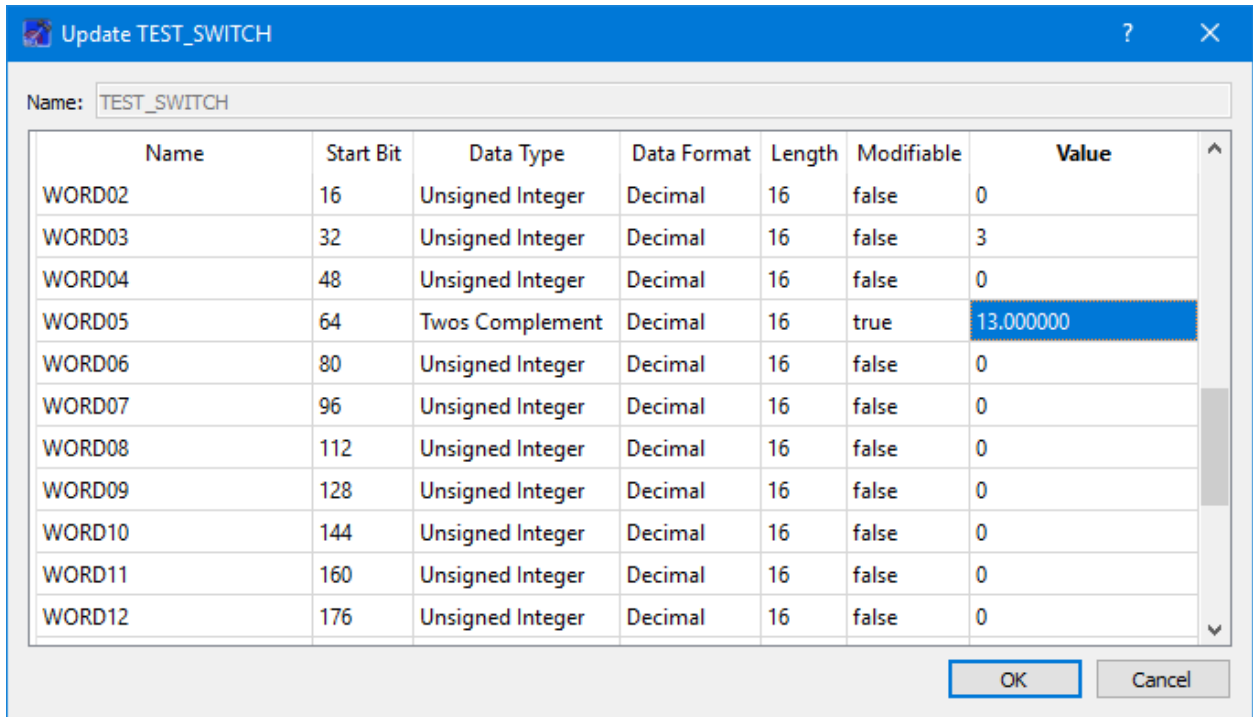


Figure 14 Command Field WORD05 Value Set to 13

13. Push the OK button to close the Update dialog.

Note: The updates you make will only be available while the Command service is active. Once you deactivate the command service any updates you made will be gone.

14. Now that you have updated the contents of the TEST_SWITCH command, it's time to send the command. Select the TEST_SWITCH command in the Main Window Command list and then push the Send button. If the Command Confirmation Prompt setting is enabled a message dialog will prompt you to confirm you want to continue.

You should see the TEST_SWITCH command in the Main Window Command Track area as shown in Figure 15.

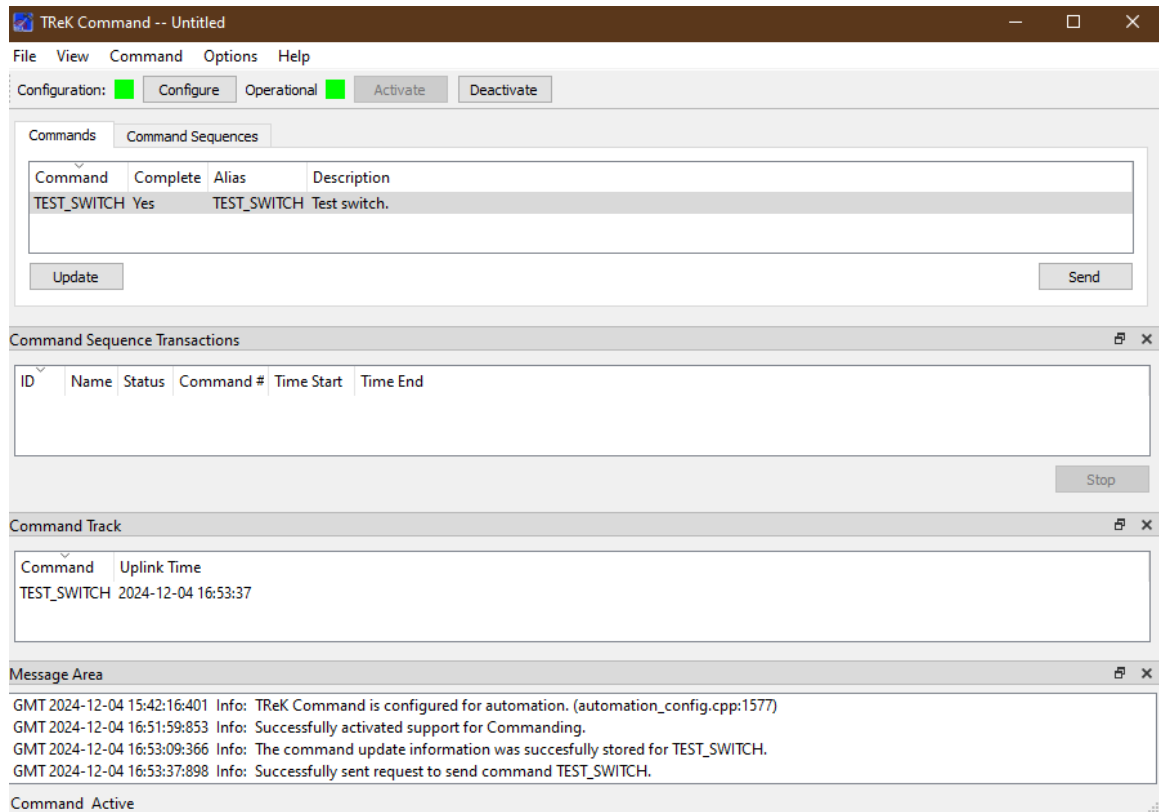


Figure 15 Command Track showing TEST_SWITCH Command

That's it! Now you know how to configure the Command service, activate the command service, update a command, and send a command. For information about defining command packets, please reference the TReK Concepts Tutorial, the TReK Metadata Tutorial, and the TReK Metadata User Guide. For more information about the TReK Command application please see the TReK Command User Guide.