

Telescience Resource Kit (TReK)



TReK Review Package

February 3, 2021



Information About This Review

- The TReK Beta Software Testing Program:
 - Provides an opportunity for you to test drive the TReK software and provide feedback to improve the product.
 - Feedback is accepted throughout the entire Beta Software Testing time period.
 - You can send input via an e-mail to trek.help@nasa.gov.
 - All input is entered, assigned a number, and tracked to resolution.
 - TReK Development Team will correspond with you on any input received via trek.help@nasa.gov.
 - Provides early access to the TReK software.
 - TReK 0.11.0 Beta Review Period: February 3, 2021 – March 19, 2021.
 - TReK 5.3.0 Target Release Date: April 30, 2021.

Note: Due to export requirements, a HOSC Portal Account with access to the TReK Software Download area is required to participate in the TReK Beta Software Testing Program.



TReK 5.3.0 Software

The TReK 5.3.0 Software Release will contain the following updates:

- Safety Conditional KuIP Services (SCKIPS) – Updates to TReK CFDP Software
 - Hazardous commands are recorded in a file.
 - A hazardous command file is transferred to a payload using CFDP configured to encrypt and decrypt CFDP's Protocol Data Units (PDUs) and includes an encrypted timestamp.
 - Encryption provides confidentiality, authenticity and integrity.
 - An encrypted timestamp provides replay resistant time authentication.
 - The PEP Ethernet interface provides the ability to monitor SCKIPS's health and status information.
 - E-Mail and Text Capabilities
 - Includes an Application Programming Interface (API) that supports programmatically texting a message, e-mailing a message, or e-mailing a file to one or more recipients.
 - Includes a drop box capability that supports texting a message, e-mailing a message, or e-mailing a file to one or more recipients.
 - Includes the capability to configure for application specific alerts via e-mail or text. For example, the HPEG application can be configured to send a text or e-mail if the HPEG connection between TReK and the HOSC is lost.
 - Example Usage Scenario: Payload uses CFDP to send a file to a ground e-mail dropbox which e-mails the file to one or more recipients.
 - Generate GSE Packets
 - This capability can be used to retransmit data processed by TReK.
 - The GSE packet will be formatted as defined in the PGUIDD (SSP-50305).
 - Users can define a GSE packet, export the metadata definition for the GSE packet, and manage the transmission of the GSE packet.
 - Parameter Extraction
 - Extract parameter values from incoming data and write them to a file.
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TReK 5.3.0 Content

Software	Description
CFDP Application	Provides capabilities to perform file transfer functions using the CCSDS File Delivery Protocol (CFDP). This application has a graphical user interface. You can choose to use Native CFDP (CFDP using UDP) or ION CFDP (CFDP over BP). Added support for Safety Conditional KuIP Services (SCKIPS) and E-Mail and Text capability.
CFDP Console Application	Provides capabilities to perform file transfer functions using the CCSDS File Delivery Protocol (CFDP). This application is a console application targeted for use onboard ISS. It was provided to serve two purposes: (1) a CFDP console application for customers to use right out of the box, and (2) an example program showing customers how to use the CFDP Library to perform common CFDP functions. You can choose to use Native CFDP (CFDP using UDP) or ION CFDP (CFDP over BP). Added support for Safety Conditional KuIP Services (SCKIPS).
CFDP Library	Provides an application programming interface to perform file transfer functions using the CCSDS File Delivery Protocol (CFDP). It includes support for CFDP over Bundle Protocol. You can choose to use Native CFDP (CFDP using UDP) or ION CFDP (CFDP over BP). Added support for Safety Conditional KuIP Services (SCKIPS).
Command Application	Provides capabilities to update, send, and track commands. Includes support for various types of command destinations including POIC, Suitcase Simulator, PRCU, RAPTR, and UFO. It includes the command bridge capability. This application has a graphical user interface. Added E-Mail and Text capability.
Command Library	Provides an application programming interface to update, send, and track commands. Core library is C++ with Release 3 compatible wrappers for ANSI-C and .NET.
Crypt Application	Provides the capability to generate cryptography keys for use with cryptography services in TReK applications and libraries.
Data Application	Provides capabilities to receive, process, record, and forward data. This application has a graphical user interface. Added support for GSE Packet Generation, Parameter Extraction, and E-Mail and Text capability.



TReK 5.3.0 Content

Software	Description
Data Library	Provides an application programming interface to create, populate, build, and decompose packets. Includes support for pre-defined and custom headers and packets.
Device Services Library	Provides an application programming interface to perform functions such as creating sockets, sending data, receiving data, etc. Includes support for Bundle Protocol.
E-Mail and Text Library	Provides an ANSI C application programming interface to send texts, email messages and email file attachments to a designated group of one or more recipients by communicating with an Simple Mail Transport Protocol (SMTP) email server. The library also provides the capability to create a dropbox that sends a file as a file attachment or sends the content of the file as a text or email message by moving the file to the dropbox.
EXPRESS Library	Provides support for the following EXPRESS Payload to ISS C&DH System Ethernet interfaces as defined in SSP 52000-IDD-ERP Rev N: Telemetry Generation (including health and status), Command Handling, Ancillary Data, PEP Bundle Request, PEP Procedure Execution Request, and Data Transfer over IP.
HOSC Login Application	Provides the capability to establish a login with the HOSC. The login session can be used across TReK applications (e.g. HPEG, Command).
HPEG Application	Provides access to HOSC Payload Ethernet Gateway (HPEG) services. This application has a graphical user interface. It provides the capability to request HPEG services. This includes selecting a ground node ID (if applicable), starting and stopping services, and enabling and disabling the HPEG Idle Check. Includes support for DTN. Added E-Mail and Text capability.
HPEG Library	Provides an application programming interface to retrieve HPEG configuration and status information.
IONconfig Application	Provides the capability to generate ION configuration files and scripts. The scripts (Windows batch files and Linux shell scripts) can be used to start and stop ION. This application has a graphical user interface.



TReK 5.3.0 Content

Software	Description
IONizer Application	Provides capabilities to start, stop, and monitor ION. This application has a graphical user interface. Added E-Mail and Text capability.
IONizer Library	Provides an application programming interface to start, stop, and monitor ION.
Metadata Application	Provides the capability to define and manage metadata. Support for creating databases and metadata files and translating between different types of metadata formats. This application has a graphical user interface.
PEP Ethernet Library	Provides support for Payload Software Interface Control Document Part 1, International Standard Payload Rack to ISS Document interfaces as defined in SSP 52050 Rev M.
Playback Application	Provides the capability to playback recorded data. This application has a graphical user interface. Added FIPS 140-2 compliant cryptography services.
Record Library	Provides an application programming interface to record data.
Telemetry Library	Provides an application programming interface to retrieve telemetry data. Core library is C++ with Release 3 compatible wrappers for ANSI-C and .NET.
TReK Help Application	Provides integrated help for all TReK applications and libraries. Updates.