

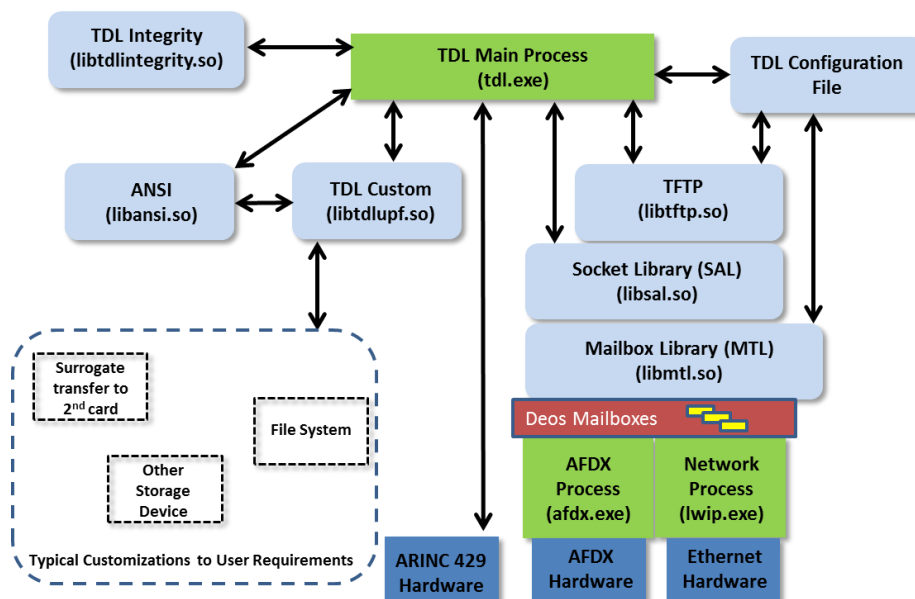
ARINC 615A Data Loading

Avionics systems require the ability to transfer software to the hardware as well as update this software in the field. The ability to transfer this software or data with an avionics device running Deos™ may be carried out through the optional Deos ARINC 615A Data Loading suite of components. These components are ARINC 615A and ARINC 665 compliant for on-board data loading; and includes a license for a single copy of a COTS ARINC 615A lab/field Dataloader for integration and testing purposes. The lab/field Dataloader is configurable and provides both an interactive graphical user interface as well as a terminal based command-line interface and scripting capability to support automated testing of your loadable target.

The ARINC 615A protocol is referred to as the Data Load Protocol (DLP) and it specifies the communications between an ARINC 615A Data Loader, which can be any computer with a network interface such as Ethernet/AFDX/ARINC 664 and the avionics target device (in this case an avionics device running Deos and the TDL software package).

Trivial File Transfer Protocol (TFTP), UDP and IP are used by ARINC 615A to provide network and file transfer services on the target to the Ethernet/AFDX/ARINC 664 interface. Or, if the interface to the device is the ARINC 429 interface, the Deos TDL has a ARINC 615-3 data loader capability that supports upload protocol for 429 interfaces. The Deos TDL supports transfer of data that complies with the ARINC 665 media format (i.e. LUH header files) ARINC 665-2 and ARINC 665-3 versions of the specification are supported.

The diagram below shows the components provided by DDC-I to enable ARINC 615A Target Data Loader (TDL) operations on DDC-I's Deos™ RTOS.



Key Feature Overview

- Supports Ethernet, ARINC 664/AFDX, ARINC 429
- DO-178 DAL A Integrity Library
- Customizable to Specific User Requirements
- Portability via XML Configuration File
- Supports ARM, PowerPC and x86

Key Components Include:

- **ARINC 615-A and ARINC 665 Compliant Lab/Field Dataloader (license for a single copy of a COTS Dataloader for testing and integration purposes)**
 - Windows 7/8/10 and Linux Support (command line only).
 - Modern, intuitive graphical user interface (Windows platforms).
 - Python scripting capability.
 - Supports loading Ethernet targets over standard Ethernet bus.
 - Supports loading ARINC 664 targets over standard Ethernet bus with NO additional ARINC 664 interface hardware needed.
 - Highly configurable, including the ability to inject errors for testing purposes.
 - Logging and network traffic capture capability to assist with troubleshooting your loadable target.
- **TDL Main Process**
 - This multithreaded software is the main target data loader executable and contains the implementation of the ARINC 615 data loading protocol.
 - TDL in its most basic form loads a new Deos executable for system upgrade. Additional requirements may be satisfied through the TDL custom library.
- **TDL Integrity Library**
 - This is a shared object used by the TDL Driver to check and confirm the CRC's present in the ARINC 615 protocol. If desired, this shared object can be used by user applications to crosscheck CRC's as well.
 - This library is optionally available with Verification Evidence to DO-178 Design Assurance Level A (DAL A) to verify the integrity of the transferred data for system safety.
- **Custom Library**
 - This is a shared object to provide extensions to the ARINC 615 protocol for platform specific operations required by the data loader.
 - The custom library is where extensions to the TDL are added for custom requirements such as: using this device to set up surrogate transfers to other cards in the system, using other storage media, interfacing to a user filesystem, etc.
- **Configuration File**
 - This file contains information that configures the TDL for specific platform requirements.
 - For example, the TDL can be configured to establish communication with either an AFDX Driver, a network process (TCP/IP) or a 429 bus to perform data operations. This file also configures various file parameters, reboot permitted, password for mode changes, etc.

Other components provide support functions to the TDL:

- **ANSI Library**
 - This software supports standard ansi functions (eg, memcpy) as well as a 32-bit CRC function.
- **TFTP**
 - This software implements the Trivial FTP protocol.
- **Socket API Library (SAL) & Mailbox Transport Library (MTL)**
 - This software supports a sockets style API between the TDL and the AFDX and Network Drivers.