

Open-Source Tools for MIL-STD-1553 and IRIG 106

Chapter 10 Data

Libraries

- **IRIG 106 Library (i106lib)** – An open-source C library for reading, writing, and parsing IRIG 106 Chapter 10 data files (the standard flight test recording format) ¹. It supports decoding various packet types (e.g. MIL-STD-1553 bus messages) and runs on Windows (DLL) and Linux (static library). License: **BSD-3-Clause** ². Source: GitHub – *bbaggerman/irig106lib*.
- **libirig106 (ATAC)** – A maintained fork of i106lib, providing a cross-platform C library for IRIG 106 Chapter 10/11 file and stream parsing/generation ³. It supports all major OS and includes decoders for many data types (1553, ARINC-429, PCM, Video, etc.). A Python wrapper is available for this library. License: **BSD-3-Clause** ². Source: GitHub – *atac/libirig106*.
- **PyChapter10** – A pure Python library for working with IRIG 106 Chapter 10 (now Chapter 11) files ⁴. It provides a high-level Pythonic API to read and write Chapter 10 files, allowing iteration over packets and messages (for example, iterating over all 0x19 MIL-STD-1553 message packets in a file) ⁵. Useful for scripting and data analysis without C code. License: **BSD-3-Clause** ⁶. Source: GitHub – *atac/pychapter10*.

Command-Line Utilities and Analysis Tools

- **IRIG 106 Utilities (i106utils)** – A suite of open-source command-line tools (distributed with i106lib) for inspecting and manipulating Chapter 10 files ⁷. Key tools include: `i106stat` (summarize data channels and message types in a file), `i106trim` (trim or time-slice a data file), and decoders like `idmp1553` to extract and display MIL-STD-1553 bus messages in human-readable form ⁸ (with filtering by channel or RT address). These utilities facilitate quick analysis and conversion of IRIG 106 data. License: **BSD-3-Clause** (same as i106lib). Source: GitHub – *bbaggerman/irig106utils*.
- **Wireshark IRIG-106 Ch10 Dissector** – A Wireshark plugin (Lua script) for decoding IRIG 106 Chapter 10 telemetry packets ⁹. This plugin allows Chapter 10 data streams (including encapsulated 1553 bus traffic) to be opened in Wireshark for packet-level analysis. It interprets Chapter 10 headers and data formats in real-time. License: **GPL-2.0** ¹⁰. Source: GitHub – *diarmuidcwc/LuaDissectors* (see `ch10.lua` module).
- **IRIG 106 Synthetic Data Generator** – A set of tools for generating **synthetic** IRIG 106 Chapter 10 files from simulated flight and sensor data ¹¹. Developed by ATAC, this toolkit orchestrates external models (e.g. a flight dynamics simulator and video generator) and uses custom utilities to create Chapter 10 recordings with realistic content. It can produce time packets, video streams, **1553 bus messages** (e.g. navigation data on a 1553 bus) and more, all synchronized in a Chapter 10 file ¹².

¹³ . This is useful when real flight test data is unavailable. License: **Open-source (OSI approved)** – the custom code is open (leveraging libraries like ffmpeg, SQLite, and irig106lib) – likely BSD-3-Clause. *Source:* GitHub – *atac/SyntheticData*.

Simulators and Hardware Tools

- **MIL-STD-1553 Bus Simulator (Software)** – A software simulation of the MIL-STD-1553B bus protocol for development and testing purposes ¹⁴ . This simulator provides a Bus Controller and multiple Remote Terminal implementations in code, allowing users to emulate a 1553 network. It can be used to create or test space/avionics applications by importing the simulator module, without physical 1553 hardware. License: **GPL-2.0** ¹⁵ . *Source:* GitHub – *ShubhankarKulkarni/MIL-STD-1553-Simulator*.
- **Open1553 (FPGA/IP Core)** – An open-source hardware project with HDL (VHDL/Verilog) cores and reference designs to implement MIL-STD-1553 interfaces on FPGAs ¹⁶ . It includes IP cores for a Bus Controller and Remote Terminal, along with example projects for various Xilinx boards (Arty, ZedBoard, ZCU102, etc.) using a custom PMOD 1553 transceiver. Simulation support is provided for verification. *License:* **Various open-source licenses** (multiple components) ¹⁶ . *Source:* GitHub – *johnathan-convertino-afri/open1553*.
- **Flex1553 (Teensy 4.x Library)** – A lightweight C++ library for the Teensy 4.0/4.1 microcontroller that implements a MIL-STD-1553 bus interface using the on-chip **FlexIO** peripheral ¹⁷ . It provides a basic Remote Terminal (RT) implementation and a rudimentary Bus Controller, allowing a Teensy to communicate over a 1553 bus (primarily for lab testing or interfacing with 1553 devices) ¹⁸ . License: **MIT** ¹⁹ . *Source:* GitHub – *bsundahl1/Flex1553*.

¹ GitHub - bbaggerman/irig106lib

<https://github.com/bbaggerman/irig106lib>

² libirig106/LICENSE.txt at master · atac/libirig106 · GitHub

<https://github.com/atac/libirig106/blob/master/LICENSE.txt>

³ GitHub - atac/libirig106: Chapter 10/11 file/stream parsing and generation

<https://github.com/atac/libirig106>

⁴ ⁵ ⁶ pychapter10 · PyPI

<https://pypi.org/project/pychapter10/>

⁷ ⁸ IRIG 106

<https://www.irig106.org/>

⁹ LuaDissectors/ch10.lua at master · diarmuidcwc/LuaDissectors · GitHub

<https://github.com/diarmuidcwc/LuaDissectors/blob/master/ch10.lua>

¹⁰ GitHub - diarmuidcwc/LuaDissectors: A bunch of lua dissectors for Wireshark that support iNet-X and IENA packet formats

<https://github.com/diarmuidcwc/LuaDissectors/tree/master>

¹¹ ¹² ¹³ GitHub - atac/SyntheticData

<https://github.com/atac/SyntheticData>

14 15 GitHub - ShubhankarKulkarni/MIL-STD-1553-Simulator: MIL-STD-1553 is a serial communication protocol that is used in spacecrafts. This repository contains a simulation for this protocol. It can be used to create any space applications by importing the simulator into your code.

<https://github.com/ShubhankarKulkarni/MIL-STD-1553-Simulator>

16 GitHub - johnathan-convertino-afri/open1553: Projects for building MIL-STD-1553 communications devices

<https://github.com/johnathan-convertino-afri/open1553>

17 18 19 GitHub - bsundahl1/Flex1553: MIL-STD-1553 for Teensy 4

<https://github.com/bsundahl1/Flex1553>