Compliance sheet — star-crc

Everything a supplier qualification, a legal review or an export check usually asks about star-crc 0.1.0, in one document.

1. Identity

Document	STAR-PKG-STAR-CRC-EN · v2.3 · 2026-11-14
Package	star-crc
Version	0.1.0
Capability	star.telemetry.crc
Maturity	Released & Verified (RELEASED)
Python	>=3.9
Source commit	dc09f61d
Source	https://github.com/Andrea07072000/S.T.A.R.-/tree/main/packages/star_crc

2. Licence and obligations

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3. What it needs at run time

Nothing beyond the Python standard library: it works offline.

4. Integrity

SHA-256 fingerprints of the files published on this website. Check a downloaded file with:

```
python -c "import
hashlib,sys;print(hashlib.sha256(open(sys.argv[1],'rb').read()).hexdigest())" star_crc-0.1.0-
py3-none-any.whl
```

FILE	SHA-256
star_crc-0.1.0-py3-none-any.whl	743b7ca13aa60b40edcc446907f297b7ca5903e219ffca19040db83855b5af4a
star_crc.py	f76adb50d0c6577919db8b739f61e62c7a42ed1ef5c8e9dadb5754c8c999d3d2
star_crc-0.1.0-source.zip	86e0a5ee4c8e635c7e948396cd6c594d35fb7424d5111cb05b1e9884a0a6b425

5. What it does, and its limits

The CRC-16 of CCSDS transfer frames, CRC-16/XMODEM, CRC-32, CRC-32C and any Rocksoft-model CRC of 8 to 64 bits computed through the defining shift register; on 499 messages and nine variants identical to fastcrc (4491 values), to CPython binascii and zlib (1497) and to a polynomial division over GF(2) in SymPy (1611); reproduces the nine catalogue check values.

A CRC detects errors with a known probability; it does not authenticate and does not correct. This module computes check values: it does not frame, randomise or decode telemetry (see `star_telemetry` in this repository). Bit-by-bit processing in Python is slow (about 0.2 s for 65536 bytes): it is a reference and a verifier, not a link-rate implementation. Widths below 8 or above 64 and polynomials without the term 1 are refused, not supported.

- `crc16_ccsds(data)` is the Frame Error Control Field of CCSDS TM, AOS and TC transfer frames (polynomial 0x1021, register preset to all ones); `crc16_xmodem`, `crc32` and `crc32c` are the other three named variants.
- `crc(data, width, poly, init, reflect_in, reflect_out, xor_out)` computes any CRC described by those six parameters, width 8 to 64. The message goes through the shift register one bit at a time: no table.
- Measured on 499 messages of 0 to 300 bytes through nine variants: identical to fastcrc on 4491 values, to CPython `binascii.crc_hqx` and `zlib.crc32` on 1497, and to the remainder of a polynomial division over GF(2) done in SymPy (no CRC code involved) on 1611. No mismatch.
- Every function returns an int in [0, 2^width) or raises `ValueError`: data that is not bytes or bytearray or is longer than 65536 bytes, a width, polynomial, preset or final XOR out of range, an even polynomial, reflection flags that are not bools.

6. Export, use and certification

The package is published and freely available. That usually takes software out of export-control lists, but not every use of it: read the page on space activities and export control before using it in a controlled programme. It is not certified or qualified for flight; the evidence describes what was tested and how.

7. Citation and bill of materials

```
@software{cavazzini_star_crc_0_1_0,
  author  = {Cavazzini, Andrea},
  title   = {{star-crc}: Cyclic redundancy checks, bit by bit},
  version = {0.1.0},
  year    = {2026},
  url     = {https://andrea07072000.github.io/S.T.A.R.-/software/star_crc/},
  note    = {Apache-2.0. Source: https://github.com/Andrea07072000/S.T.A.R.-, commit dc09f61d}
}
```

CITATION.cff · BibTeX · SBOM CycloneDX 1.5 · SBOM SPDX 2.3

8. Warranty and liability

Provided "as is", without warranties or conditions of any kind (Apache License 2.0, sections 7 and 8), to the extent the law allows. This never excludes liability that the law does not allow to exclude.

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