

VERSE — Test & Calibration Report

Firmware v1.4, build 212d560 · measured 25–28 August 2026

Every figure in this document was measured. Nothing is estimated, extrapolated or taken from a datasheet. Where a limit was not reached, it says so.

Method

Three independent sources of evidence were used, so that no single instrument's opinion could go unchallenged.

Reference instrument	Swisson XMT-120A professional DMX measurement tool
Peer instrument	A second VERSE, inline via its passive thru
File analysis	Every recording checked off the unit, byte by byte, against its own header

The file analysis is the part that matters most. A recorder that reports its own success is not evidence. Each capture was pulled from the card and independently verified — frame count recomputed from file size, refresh rate recomputed from frame count and duration, and every frame compared against the one before it.

1. Recording integrity

Continuous unattended recording of a full 512-slot universe, on mains and on battery, with a dropped-frame counter running throughout.

RUN	DURATION	POWER	FRAMES (UNIT A)	FRAMES (UNIT B)	DROPPED
1	4 h 09 m	mains	597,439	597,971	0
2	10 h 00 m	mains	1,441,292	1,441,302	0
3	4 h 12 m	battery	606,067	606,074	0

Total: 5,290,145 consecutive frames across 36.7 unit-hours and 2.7 GB written. Zero frames dropped.

Sustained write rate was 20.0 KB/s against a card rated at 10 MB/s — a margin of roughly 465×. Throughput is not the constraint; the capture buffer holds 364 ms, so only a stall longer than that can lose a frame, and none occurred.

Every file passed independent verification: header consistent, all frame data present, no trailing data, refresh rate recomputed within 0.01 Hz of the stored value, and the universe demonstrably changing throughout.

What this test could have failed

It did, twice, during development — and both faults were invisible from the unit's own screen. They were found because the files were checked independently rather than trusted. Both are fixed in this build, and the results above are from firmware carrying those fixes.

2. Timing accuracy — transmit

VERSE transmitting, measured **simultaneously** by the Swisson XMT-120A and by a second VERSE inline on the same cable.

MODE	BREAK (VERSE)	BREAK (SWISSON)	MARK (VERSE)	MARK (SWISSON)	RATE (VERSE)	RATE (SWISSON)
Playback	177 μ s	178 μ s	22 μ s	23 μ s	41.9 Hz	42 Hz
Scene	175 μ s	176 μ s	20 μ s	20 μ s	42.0 Hz	42 Hz
Manual	175 μ s	176 μ s	21 μ s	20 μ s	42.0 Hz	42 Hz

Every break agrees within 1 μ s. Every mark agrees within 1 μ s. Every refresh rate agrees within 0.1 Hz. Slot count read 512 on both instruments in all three modes.

Against the DMX512-A (ANSI E1.11) minimums of 88 μ s break and 8 μ s mark-after-break, VERSE transmits at approximately **twice** and **two and a half times** the minimum.

3. Timing accuracy — receive

The same comparison in the other direction, both instruments watching one source.

	VERSE	SWISSON XMT-120A
Break	175 μ s (min/max 175 / 175)	176 μ s
Mark after break	1820–2715 μ s	2259 μ s
Refresh rate	39.9 Hz	40 Hz
Slots	512	512

The source here was a third-party controller with an unusually long mark. Both instruments reported it, and agreed. That is the useful result: VERSE does not flatter a signal, and does not invent a fault that is not there.

4. Unit-to-unit agreement

Two VERSE units reading the same line at the same time, driven by the Swissson as a known-good source.

	UNIT A	UNIT B
Break	140 μ s	139 μ s
Break min/max	139 / 140 μ s	139 / 140 μ s
Mark after break	23 μ s	23 μ s
Mark min/max	22 / 24 μ s	22 / 24 μ s
Refresh rate	34.9 Hz	34.9 Hz
Slots min/max	512 / 512	512 / 512

Two independent units agree to within **1 μ s**.

This also establishes something about the instrument itself. Reading a rock-steady source, VERSE reports 1 μ s of spread on break and 2 μ s on mark — essentially its 0.5 μ s resolution floor. The same unit reading a poorly-behaved source reports a spread of 109–6970 μ s. **The instrument is not adding jitter of its own; it is reporting what is there.**

5. Interrupted recording

A recorder used unattended must survive losing power. Tested on two units, by two methods — a firmware reset and a hardware power cut — with recordings running.

	RESULT
File present after restart	Yes, all four tests
Playback	Complete, on both units
Frame count recovered	From file size, matching the data actually on the card
Frames lost	Only those never written — at most the last few

Verified independently: all four interrupted files were confirmed intact off the card, with frame counts recovered correctly.

6. Fault detection

A budget DMX console was connected deliberately. VERSE logged, unprompted:

```
58634 MAB_SHORT 1 us (minimum 8) x67
62635 MAB_SHORT 0 us (minimum 8) x131
70635 MAB_SHORT 0 us (minimum 8) x256
86635 MAB_SHORT 4 us (minimum 8) x512
```

That console emits a mark-after-break of **0–4 μ s against a required minimum of 8** — frequently none at all. VERSE identified it within seconds and described it in plain words, without being told what to look for.

Summary

Frames recorded without loss	5,290,145
Unattended recording tested to	10 hours continuous
Recording verified on battery	4 h 12 m, ~24% of charge
Break accuracy vs reference	within 1 μs
Mark accuracy vs reference	within 1 μs
Refresh rate accuracy vs reference	within 0.1 Hz
Unit-to-unit agreement	within 1 μs
Timing resolution	0.5 μ s
Transmitted break / mark	~176 μ s / ~20 μ s (spec minimum 88 / 8)

What is not claimed

Stated plainly, because a report that only makes claims is worth less than one that marks its own boundaries.

- **This is not a calibration certificate.** It is a cross-check against one professional reference instrument, on one bench, on one day.
- **No traceable calibration** to a national standard is claimed or implied.
- **VERSE is not certified test equipment** and carries no accuracy specification. The figures above describe measured agreement, not a guarantee.

- **Recording limits were not reached.** Ten hours is the longest run performed, not a maximum. A 32 GB card holds roughly 395 hours of a full universe, a 128 GB card over 1,500. On a FAT32 card a single recording is capped at 4 GB — about 56 hours — by the filesystem; exFAT cards, which is how 64 GB and larger cards ship, have no practical single-file limit.
- **Card performance varies.** Testing used A1-rated cards. A slower or worn card may stall longer than the 364 ms capture buffer. VERSE counts any frame it drops and reports it on screen and in the file, so a lossy recording can always be told from a clean one.