The timestamp audit

A timestamp is three claims wearing one number: which moment it records, which clock produced it, and in what representation it is stored. Most systems answer all three by accident. One row per device family, and one deliberate interruption test at the end.

RECORD

The four audit columns — what each records, and the answer that should worry you; walk them per device family

AUDIT COLUMN	WHAT THE ROW RECORDS	THE ANSWER THAT SHOULD WORRY YOU
Stamped when	Source-stamped by the device, or arrival-stamped by a poller or historian.	Store-and-forward telemetry arrival-stamped. The gap runs to hours.
Which clock	The device's own, a site time server, or a GPS-disciplined source — and how far it might be from true.	A commissioning laptop's clock, five years stale, on a device used to order events.
Which representation	UTC stored, local rendered, zone named in every export leaving the site.	Naked local times — an ambiguous, repeated hour every autumn.
Drift monitored?	Drift alarms on every source, clock state recorded beside the quality codes.	"Time sync is configured." Nobody watches whether it still works.

ASK

Four design rules, and the test that finds forgeries

- **Stamp at source wherever the device can.**
  Where a poller must stamp instead, record *that fact* in the point's metadata, so consumers know the weakness of the claim.
- **Carry both stamps when they differ.**
  Source time and arrival time answer different questions — when did it happen, when did we know — and buffered telemetry needs both.
- **Never let a conversion re-stamp.**
  A gateway that replaces source time with "now" has forged the birth certificate. Test for it at commissioning; it is common and silent.
- **Buffer a source deliberately, then look at what arrives.**
  Interrupt the link, let the buffer fill, restore it — and see whether the drained values carry their observation times or the moment the link returned.
- **Monitor the clocks like the utility they are.**
  A clock that fails quietly corrupts everything it stamps, plausibly. An investigation should be able to ask "was time healthy?"

THE BOUNDARY THIS CARD CARRIES

Timestamps are the one piece of context that cannot be repaired later, which is why this card is an audit rather than a remedy. It prescribes no synchronisation tier and no accuracy figure: the ordering accuracy each data class needs is a site engineering decision, and changing time sources or device settings is change-controlled work.