

# The retrieval modes

What comes back from a query is not the data. It is a retrieval mode applied to whatever survived compression — and a consumer who does not know which mode they asked for is being confidently misled.

**RECORD** Four modes, what each is honest for, and where each one lies

| MODE                 | WHAT IT RETURNS                                          | HONEST FOR                                    | LIES WHEN                                                                        |
|----------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------|
| Raw / actual         | The stored points, as kept.                              | Investigations, model training, audit.        | You forget that compression already thinned it.                                  |
| Interpolated         | Values computed on a regular grid between stored points. | Aligning tags for calculation and export.     | The signal was stepped, or the gap was an outage, not a quiet period.            |
| Aggregate            | Average, minimum, maximum or count per window.           | Dashboards, KPIs, long-window trends.         | The consumer mistakes the average for the excursion; min and max were discarded. |
| Stepped / last-known | The value held until the next stored point.              | Discrete states and report-by-exception data. | Applied to a genuinely continuous signal.                                        |

**ASK** Three consumer rules, and two fields the tag has to carry

- **Steps as steps.**  
Report-by-exception and discrete data are step functions and must be retrieved stepped. Interpolating them invents transitions that never happened.
- **Gaps as gaps.**  
An outage interpolated into a smooth line is the chain’s most dangerous lie. Quality codes and gap markers let retrieval say “unknown here” — the consumer has to ask for them.
- **Investigate on raw — knowing even raw is post-compression.**  
Trends may live on aggregates for speed; investigations, models and arguments with money go back to the stored points.
- **What is this tag’s compression setting?**  
Lossless encoding or a configured deviation, recorded in the point’s metadata — or it is a rumour.
- **Was the deviation derived, and when was it last examined?**  
From measured noise and named decision sensitivity, per tag class, re-examined when the tag’s duty changes. The tag that fed a monthly report tolerates a deviation the same tag feeding a model cannot.

## THE BOUNDARY THIS CARD CARRIES

Lossy compression settings are measurement decisions made in advance, not storage decisions — excursions inside the deviation vanish, and the lost detail is unrecoverable. This card names no deviation, ratio or product default, because a setting derived from another plant’s noise is not evidence about yours. Historian configuration changes belong to the system owner under site change control.