Every Instrument, Every Document, One Query

How GILT gives instrumentation engineers instant access to their full data estate

The Instrumentation Data Challenge

Instrumentation engineers manage some of the most documentation-intensive assets in any operating facility. Every transmitter, control valve, analyser, safety device, thermocouple and flow element has a datasheet, a specification sheet, a loop drawing, a cable schedule, a junction box assignment, a calibration record and a maintenance history. Multiply that by thousands of instruments across a facility — often spanning 20+ years of accumulated revisions — and the volume of documentation is enormous.

Finding the right document for the right instrument at the right revision is a daily friction point. Is the valve datasheet in the EDMS? Which revision? Is the calibration record in the CMMS? Is the latest specification in the vendor correspondence folder? Does the loop drawing match the as-built configuration? The data exists — it's just buried across disconnected systems in inconsistent formats.

This fragmentation means that simple questions — "What is the Cv of FV-4201?" or "When was LT-3102 last calibrated?" — can take 30 minutes or more to answer with confidence. Multiply that across hundreds of queries per week and the productivity impact is substantial.

How GILT Assists Instrumentation Engineers

- **Instrument-centric queries** — Ask "Show me everything for FV-4201" and get the complete instrument profile in a single response: datasheet (Cv, pressure class, material spec, actuator type, fail position, SIL rating), P&ID location, loop drawing, C&E references, calibration history, spare parts list, maintenance records and procurement details. Every item is linked to its source document with page number and revision. The query takes seconds; the manual alternative takes 30+ minutes.
- **Datasheet intelligence** — GILT extracts and structures every field from instrument datasheets with header-row detection, merged-cell handling and unit normalisation. This enables population-wide queries that are impossible with manual search: "Which control valves have a SIL rating of 2 or higher?" or "List all transmitters rated for Class 300 or above" or "Which instruments have a design temperature above 400°C?" Results are returned with source references to the specific datasheet and revision.
- **Calibration and maintenance tracking** — Calibration records and PM schedules from your CMMS are linked to individual instruments. Identify overdue calibrations across the facility. Track calibration drift trends over time to predict instrument failure before it occurs. Ensure compliance with your facility's maintenance philosophy and regulatory requirements. Query: "Which instruments in Area 300 have overdue calibrations?" and get an actionable list with last calibration date, due date and responsible party.
- **Spare parts and procurement** — Know immediately whether a spare exists in the warehouse, which bay it's located in, and its current stock level. If a spare is not available, GILT provides the vendor part number, supplier contact, estimated cost and procurement lead time from the last purchase order. Coupled with fault diagnosis, this closes the loop from problem identification to rectification planning.
- **Cable and junction box management** — Query cable schedules, junction box assignments and marshalling layouts. Trace the complete signal path from field instrument through junction boxes, marshalling cabinets and I/O cards to the DCS/PLC input channel. Ask: "What is the cable route for LT-3102 from field to DCS?" and get the full path with cable numbers, junction box IDs and I/O card addresses.
- **Specification compliance** — Compare installed instrument specifications against design requirements and current process conditions. Identify instruments operating outside their rated envelope. Flag instruments where the installed specification no longer matches the current process duty — enabling proactive replacement before failure.

Impact for Instrumentation Teams

- Time to answer instrument-specific questions reduced from 30+ minutes to seconds with full source traceability
- Population-wide queries across thousands of instruments enable systematic analysis previously impossible with manual methods
- Overdue calibrations identified and tracked automatically with full compliance audit trail against facility maintenance philosophy
- Spare parts availability and procurement information available at point of diagnosis — closing the loop from fault identification to rectification
- Signal path tracing from field instrument to DCS I/O card completed in seconds rather than hours of manual cable schedule review
- Instrument specification compliance monitored proactively — instruments operating outside rated envelopes are flagged before failure
- MOC support — when process conditions change, GILT identifies all instruments whose rated envelope may be affected

How It Works — Instrument-Level Knowledge Graph

GILT's knowledge architecture links every instrument tag to a node in a multi-layer graph. That node connects to every document, record and data point associated with that instrument — across all source systems simultaneously. When you query an instrument, the system traverses this graph to assemble complete context in milliseconds. Domain-adapted embedding models ensure that instrumentation-specific terminology (Cv, PFDavg, HART, FOUNDATION Fieldbus, SIL, smart positioner) is interpreted with engineering precision. Every response includes full provenance — document name, page number, revision — so answers can be verified against the original source. The knowledge base is evergreen: as new calibration records, maintenance work orders or revised datasheets arrive, the graph updates incrementally without requiring a full rebuild.

Supported Data Sources

GILT ingests instrumentation data from the systems you already use. Datasheets and specification sheets from EDMS platforms (Documentum, Meridian, Aconex, SharePoint). Calibration records and maintenance history from CMMS (SAP PM, IBM Maximo, Infor EAM). Loop drawings, cable schedules and junction box layouts from CAD systems (AutoCAD, MicroStation) and structured exports. P&ID data from intelligent drawing systems or scanned legacy drawings using fine-tuned vision models. Spare parts inventories from warehouse management systems. Vendor documentation from email archives and file servers. All formats are supported — PDF, DWG, DXF, scanned TIFFs, Excel, CSV, XML and proprietary exports. Data is linked at the instrument tag level, creating a single point of truth regardless of how many source systems are involved.

Security

Instrument data — including SIS documentation, SIL-rated device records and safety system configurations — is handled with the highest sensitivity classification. GILT's architecture is informed by IEC 62443 and ISO 27001. All data is encrypted in transit (TLS 1.3) and at rest (AES-256) with per-client key management. Access is role-based with multi-factor authentication and full audit logging. Processing environments are logically isolated per client with no cross-client access. GILT does not retain client data or IP beyond the engagement period — all data, embeddings and knowledge graph contents are securely deleted post-engagement with cryptographic verification. For Australian clients, all processing occurs on Australian-hosted infrastructure.