RELEASE 8.X

ITTIA DB SQL DATASHEET

Embed ITTIA DB to continuously gather real-time data, and only store what is important!

What Is ITTIA DB SQL?

The ITTIA DB SQL™ hybrid transaction and analytical processing (HTAP) embedded database architecture provides analytical queries on the same database that handles transactions for embedded systems and Internet of Things (IoT) devices. By enabling edge scale without sacrificing speed or consistency in milliseconds, ITTIA DB SQL empowers manufacturers to unleash the full potential of data on their embedded systems. ITTIA DB SQL combines relational tables, streaming, and time series data management engines. ITTIA Software Development Lifecycle (SDL) is conformant to the principles of IEC/ISO 62443 part 4-1.

ITTIA DB SQL BENEFITS

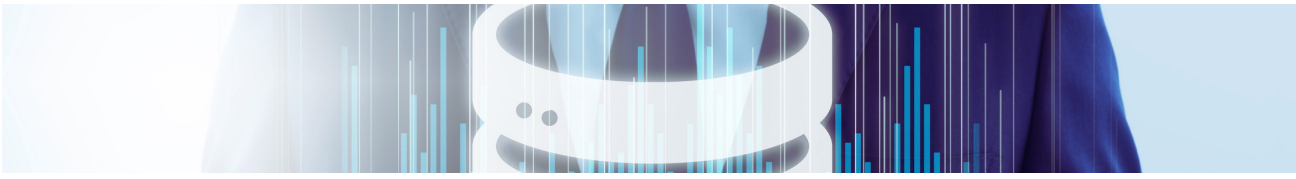
- High performance embedded database
- Aggregate, filter, and process edge data
- Deep real-time insights into edge data
- Secure and safeguard embedded data
- Time series to store timestamped values
- Cross-platform embedded database
- Conformant to principals of IEC/ISO 62443
- Security Expert Agent Library - DB SEAL
- Solution for Windows, Linux, and RTOS

MAXIMIZE PERFORMANCE

ITTIA DB SQL is designed for high-performance data management by minimizing overhead and effectively utilizing scarce resources. It delivers great performance for high-throughput and low latency. ITTIA DB SQL's high velocity data ingestion and query engine empowers the edge to quickly manage data, whether watching neuron behavior in the brain at millisecond resolution, continually monitoring changes to IoT edge infrastructure, or tracking real-time data sources.

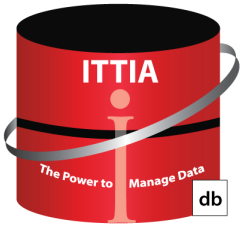
SECURITY AGENT - ITTIA DB SQL Security Expert Agent Library (DB-SEAL™) isolates databases stored on devices, chooses between alternatives to mitigate an attack, and keeps the database contents always available. This proactive monitoring of the data and database by DB-SEAL will allow each device to issue an alert, block access, or shut down when data management metrics fall out of the expected range. DB-SEAL, a virtual agent, monitors database responsibilities, input, and data metrics, in real time, and responds by rejecting unexpected requests.

SECURITY FEATURES - ITTIA DB SQL security capabilities include AES-128, AES-256, custom storage encryption algorithms, SCRAM database authentication, and SSL/TLS plugins for secure remote access and replication.



TIME SERIES - ITTIA DB SQL is a first-class time series database optimized for timestamped data. Applications embedded with ITTIA DB SQL easily capture stream measurements, events, and important metrics that are tracked, monitored, downsampled, and aggregated over time.

- Store aggregated timestamped data for analysis
  - Time series, as a first-class data type
  - Fast insertion, fast retrieval, and fast export
- Store timestamped data points
  - Identify patterns, avg., max., min., etc.
  - Determine inefficiencies
- Measure the performance trends over time
  - Easily detect alarming problems before disaster
  - Plan maintenance and rapidly respond to incidents



STREAMING + ANALYTICS

Real-time IoT device data can be processed directly on the IoT edge network, where embedded systems must take action quickly and efficiently. ITTIA DB SQL processes continuous queries in real time and pushes the results for applications to take immediate action. It delivers low latency response time when capturing data from many IoT devices at a high sample rate.

AGGREGATE & ANALYZE

- Push and pull IoT Streams
- Real-time materialized views
- Continuous SQL queries
- Filter
- Time window
- Aggregate
- Group

TABLE DATA TYPES

- integer, tinyint, smallint, bigint
- float32, float64, currency
- Unicode: UTF-8, UTF-16, UTF-32 date
- time, datetime, timestamp
- interval day to second
- interval year to month
- Boolean
- BLOB, varbinary

TABLE DATA INTEGRITY

- ACID transactions
- Isolation levels
- Rollback
- Savepoints
- Automatic crash recovery
- Multiversion Concurrency Control (MVCC)
- CRC page/log verification
- Replication & data distribution

Database Tools: ITTIA DB Console, ITTIA SQL Utility, and ITTIA DB Server

CROSS PLATFORM COMPALIBILITY

- Supported Operating Systems:
  - Linux, Windows, RTOS
- Development:
  - C/C++
  - SQL, ODBC, JDBC
  - Python, Lua, ...

SUPPORTED PROCESSORS

- Arm architecture
  - Cortex-A
  - Cortex-R
- Intel architecture
  - IA-32
  - x86-64

RELIABILITY

ITTIA DB SQL is a fully **ACID**-compliant transactional embedded database. It protects data by grouping related changes into **atomic** transactions. Transaction logging ensures the database is always **consistent** and protected from corruption and **isolates** active transactions from each other. When an unexpected power failure occurs, **durable** tables are automatically repaired to the last completed transaction.

AVAILABILTY

- High availability
  - Replication
  - Data distribution
- Mirroring
- Automatic failover
- Customized data replication
- Remotely streamed real-time views
- Hot backup

- **Database engines**
  - Time series
  - Data streaming
  - Relational tables
- **Tools**
  - DB Console web cockpit
  - Import/export commands
- **Characteristics**
  - Hard real-time
  - Embeddable
  - Small footprint

- **Safety**
  - Data concurrency
  - ACID compliance
  - Disaster recovery
  - Referential integrity
- **Security**
  - DB SEAL security agent
  - AES encryption
  - Authentication
  - Secure remote access
  - Secure Development Lifecycle

- **Multithreading and multitasking**
  - High availability
  - MVCC
  - Cross-platform
  - Client/server option
- **Structured data**
  - SQL query language
  - Strong data type support
  - Advanced BLOB support
  - Unicode support
  - Dynamic schema

We Don't Earn Trust in a Day. We Earn Trust Day-By-Day!

"In order to bring our proven FlexCtrl solution to the next level and make it fit for the Industrial IoT, we needed a flexible and robust storage solution for the historic data. Our systems collect and manage data for many years, and this is the digital gold that our customers harvest. Data must be handled by a safe, secure, and robust database, and we recognized that we needed a special partner to help us achieve this. ITTIA DB SQL provided all the core features we needed right in their standard product and was therefore a natural choice." CEO, BitCtrl, IIoT Automation System.

https://www.ittia.com/products/ittia-db-sql

ITTIA

Embeddable Edge Data Management