ITTIA DB IoT™

## Edge Data Processing and Management Software for IoT Devices

ITTIA DB IoT Delivers:

- ➢ Fast, Safe, Scalable Database Software
- ➢ Modern Database for IoT Stream Processing
- ➢ Effective APIs to Filter and Aggregate Data
- ➢ Deep Real – Time Insights into Edge Data
- ➢ Multi-Precision Continuous Real-Time Queries
- ➢ Security – Safeguard Embedded IoT Data
- ➢ Small Footprint – Best Performance
- ➢ Cross Platform Embedded Database Library

ITTIA provides time series database and IoT stream pipeline processing software for edge embedded devices. ITTIA DB IoT silently embeds and provides powerful data management and reliable data processing for microcontroller devices to securely collect, process, and act on fresh real time data.

Manufacturers benefit from ITTIA DB IoT for streaming and ingesting high volume of data, such as metrics, traces, logs, and events, from sensors at a high rate. The processing engine enables devices to monitor, filter and understand real time data, while the data management engine offers long-term data storage.

ITTIA DB IoT empowers devices to ingest, monitor, query, and store timestamped values. Each device can write tens of thousands of values per second or more, whether data arrives from a single data source or hundreds of dynamically added data sources.
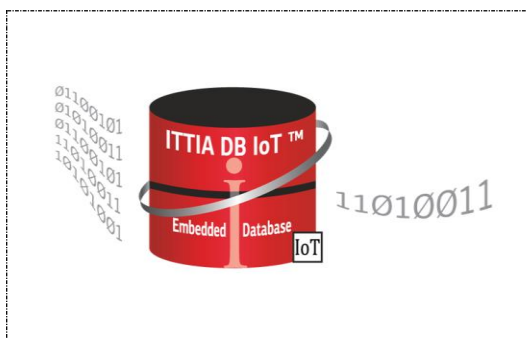
"Servomex's selection of ITTIA database for use within our next generation solutions is based on a combination of ITTIA characteristics including technical capability/performance, breadth and ease of OS and middleware integration, value, commercial clarity and flexibility, and, most importantly, a demonstrable commitment to maintaining a long term mutually beneficial working relationship. ITTIA have consistently delivered on their promises."
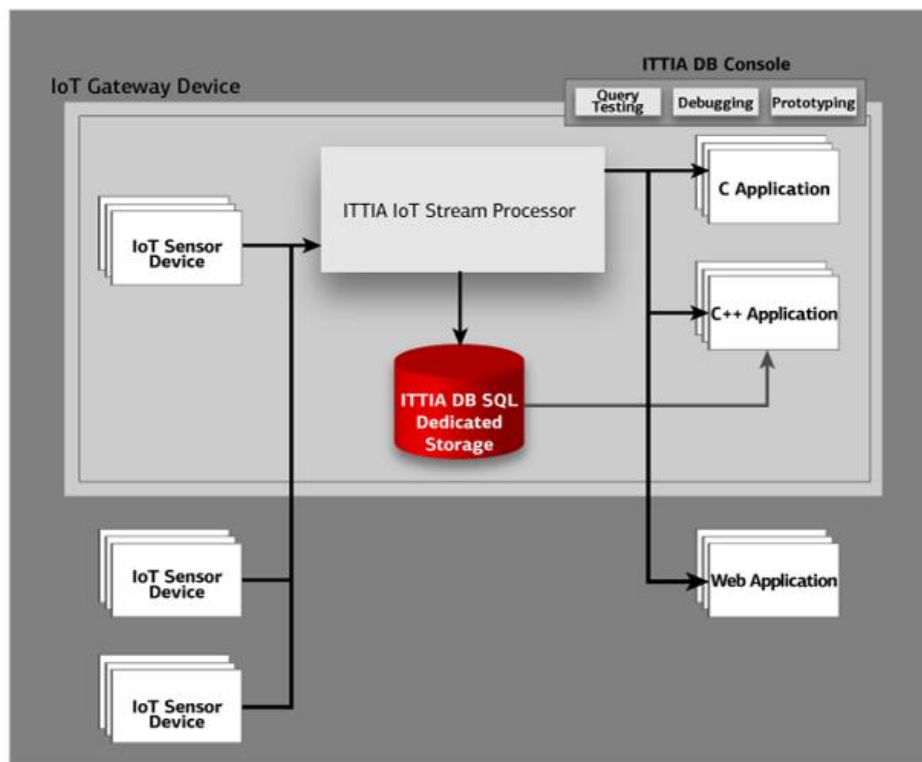
CTO, Servomex, the world leader in gas analysis

Edge Device Data Management and Processing Software

SDK for Real-time View into MCU Devices and Embedded System Data

Capture Metrics, Events, Traces, and Act on Autonomous IoT Device Information

IoT Edge Network

In order to bring our proven FlexCtrl solution to the next level and make it fit for the Industrial IoT, we needed a much more 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 helping us achieve this. ITTIA database provided all the core features we needed right in their standard product and was therefore a natural choice."
CEO, BitCtrl, IIoT Automation System
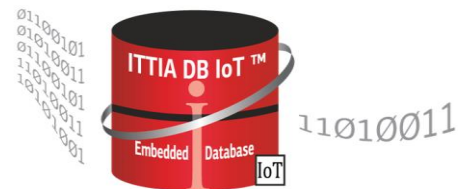
Case Study - Unlock the power of real time data by monitoring and capturing a variety of time series sensor data from the equipment onto edge devices. Build efficient embedded systems to increase productivity, improve quality and device predictability.

Challenge	Solution
➤ **UNEXPECTED POWER LOSS** - Power loss causes data corruption and data loss on flash media.	➤ ITTIA DB IoT offers fail safe storage format to prevent corruption and data loss.
➤ **INACCESSIBLE DEPLOYMENT** – Autonomous MCU devices must operate with large volume of data for long period, with limited accessibility.	➤ ITTIA DB IoT scalable and reliable algorithms organize and manage data on devices that become self-maintaining.
➤ **SLOW DATA EXPORT** – Devices must rapidly export large volume of data ordered by time stamp.	➤ ITTIA DB IoT APIs empower manufacturers to optimize time series data retrieval and export.
➤ **INADEQUATE CAPABILITY** – Inability to monitor, collect and analyze data, at different time, from different sensors.	➤ ITTIA DB IoT combines data from multiple sources supplied individually by the application to optimize real time queries.
➤ **VARYING LAG** – Inability to orchestrate acceptance and management of out of order time series data.	➤ ITTIA DB IoT compensates for lag and out of order delivery of sensor data to capture accurate information from intermittent protocols.
➤ **INFLEXIBLITY PREVENTS UPDATE** – Rules on how to respond to events are hard coded & cannot change without replacement of the entire firmware.	➤ ITTIA DB IoT data processing engine offers dynamically creation of continuous queries to combine, aggregate, and downsample IoT data.
➤ **RACE CONDITIONS** – RTOS tasks need to read to stored data while another task writes new data.	➤ ITTIA DB IoT provides thread safe access to a database from concurrent tasks.

Do you need assistance with MCU edge device data processing and management? ITTIA offers a JUMP START with complementary consultation.

Data Management Features

DATABASE FOR AUTONOMOUS SYSTEMS

Developers embed ITTIA DB IoT to ensure high availability, reliability, and security in device applications, with no need for a database administrator. With support for a variety of real time operating systems and hardware architectures, ITTIA DB IoT offers developers to build real-time applications that leverage stream processing for microcontroller application development.

HIGHLIGHTS

- IoT and Industrial IoT
- Time series data modeling
- No DBA
- Single- or multithread
- High performance
- Small footprint

KEY FEATURES

- Cross-platform support
- Platform independent formats
- In-memory, on-disk, hybrid
- Concurrent read and write
- Multithreading/multitasking
- Multiple process support
- Full storage encryption

Achieve fast queries, rely on existing database fundamental knowledge, and scale to thousands of data points per second. Build powerful IoT devices to monitor stream of data, store important time series information, and optimize both data processing and data management.

EXTENDED IOT CAPABILITIES

- Performance
- Low Latency
- Time Series Optimizations
- High Throughput
- Web Services Protocol
- Raw Binary Data Format

ITTIA DB IoT offers fast inserts to ingest time series values with high-cardinality loads and real time optimization of queries keyed by timestamp. High performance read and write captures valuable insight with minimum latency.

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

DATA INTEGRITY

- ACID transactions
- Isolation levels
- Rollback
- Savepoints
- Automatic crash recovery
- Multiple concurrency models
- CRC data verification
- CRC transaction log verification

SCALABILITY

ITTIA DB IoT is specifically designed to bring the robust capabilities of enterprise RDBMS to embedded developers working with C and C++.

SECURITY FEATURES

- AES-128
- AES-256
- Custom storage encryption algorithms

Data Processing Features

IOT EDGE DATA PROCESSING DATABASE

When data produced by IoT devices can be processed directly on the IoT edge network, devices take action quickly and efficiently. ITTIA DB IoT 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 high update frequencies.

HIGHLIGHTS

- ➢ Push and pull IoT Streams
- ➢ Materialized views
- ➢ Continuous queries
- ➢ Filter expressions
- ➢ Time windows
- ➢ Aggregate functions
- ➢ Group, downsample, and join

DATABASE FOR TIME SERIES IOT DATA

To capture IoT data on flash media, the ITTIA DB IoT writes materialized views directly into an integrated relational edge database. Device applications pull captured data with on-demand queries to efficiently filter over any time range or indexed attribute.

MANAGING MASSIVE FLOW OF EDGE DATA

Continuous SQL queries enable edge applications to filter, group, and aggregate IoT sensor readings. Developers submit expressive continuous SQL statements to ITTIA DB IoT so that each application only receives the information it needs to take action and update business-critical summary reports.

Flexibility Matters

CROSS PLATFORM COMPATIBILITY

Supported Operating Systems:
RTOS, Linux, Windows

Development:
C/C++
Python, PHP, Ruby, Lua

SUPPORTED PROCESSORS

- ➢ NXP
- ➢ Texas Instruments
- ➢ Xilinx
- ➢ Altera
- ➢ STMicroelectronics
- ➢ Renesas
- ➢ Arm, Power Architecture, and more

MAXIMIZE PERFORMANCE

ITTIA DB IoT is designed for high-performance data management by minimizing overhead and effectively utilizing scarce resources. Whether an application needs great overall performance for high-throughput or low latency, ITTIA DB IoT is the best choice.

www.ittia.com

Disclaimer