

Solution Brief

Critical features

Measurable benefits

Use cases

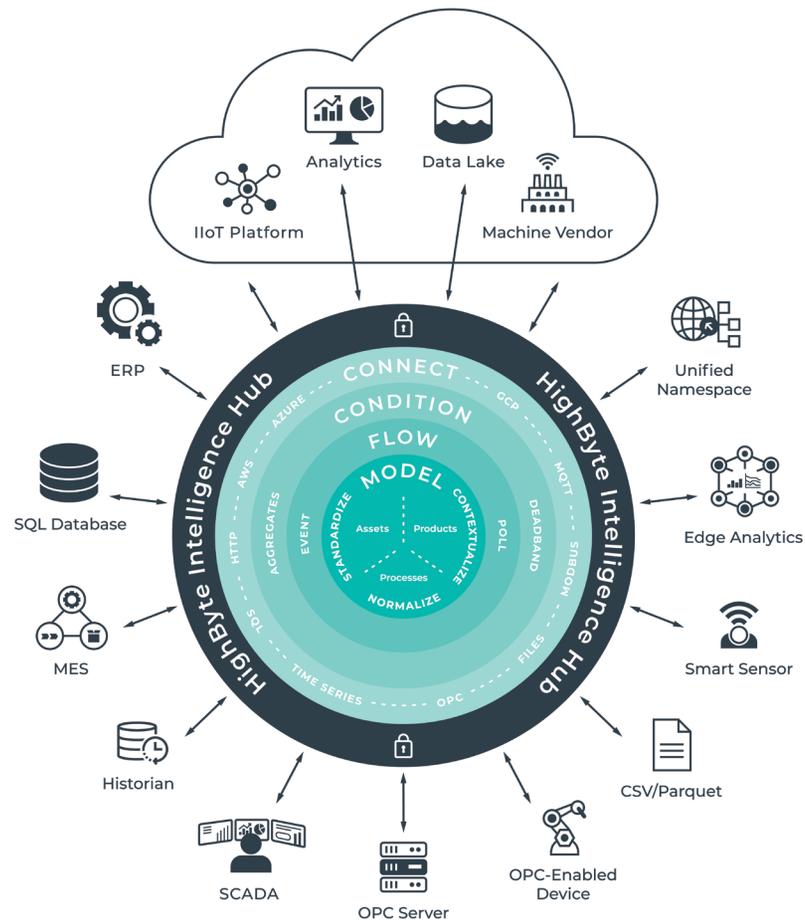
Technical specifications

Make Your Industrial Data Useful

HighByte Intelligence Hub is an Industrial DataOps software solution designed specifically for industrial data modeling, delivery, and governance.

DataOps (data operations) is the orchestration of people, processes, and technology to securely deliver trusted, ready-to-use data to all who require it. HighByte Intelligence Hub provides industrial companies with an off-the-shelf DataOps solution to accelerate and scale the use of operational data throughout the enterprise by contextualizing, standardizing, and securing this valuable information.

Run the software at the Edge to merge and model real-time, transactional, and time-series data into a single payload and deliver contextualized, correlated information to all the applications that require it. Together, we can make your industrial data more useful for whatever digital transformation project comes your way.



Critical Features for Industrial DataOps

DATA MODELING

Represent machines, products, processes, and systems with intelligent data models suited to your needs. Contextualize thousands of industrial data points by merging them with information from other systems, adding meta data, standardizing data attribute names and lists, and normalizing units of measure. Model hundreds of common assets in minutes with templated inputs and instances.

DATA CONDITIONING

Collect raw input data, condition the data, and pass conditioned data to instances or flows. Filter data through a deadband condition to reduce the jitter in a source sensor or measurement. Filter the data through an aggregate to buffer higher resolution data and provide statistical calculations using average, min, max, count, and delta at a slower rate to characterize the specified time period. Manipulate and transform raw input data into a usable format. Alarm on bad quality or stale data.

DATA TRANSFORMATIONS

Use the built-in transformation engine based on JavaScript notation to standardize and normalize data for comparison and application mismatches. The transformation engine enables you to perform calculations, execute logic to define new “virtual property” values, and decompose complex strings at the Edge to improve data usability and reduce transmission volume. Define global JavaScript functions or load third-party JavaScript or Node packages, then use them in any expression within the Intelligence Hub.

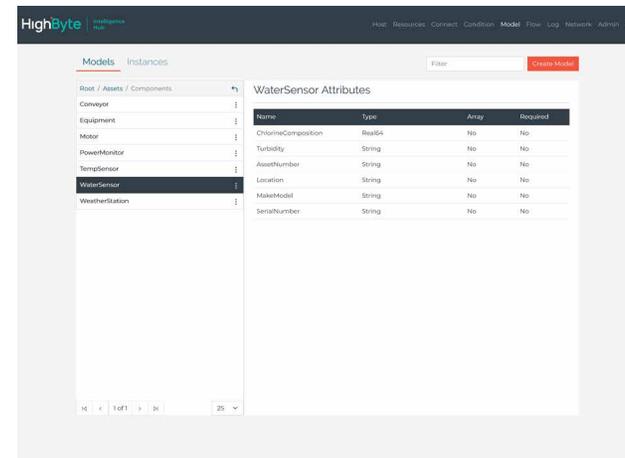


Figure 1: Data Modeling

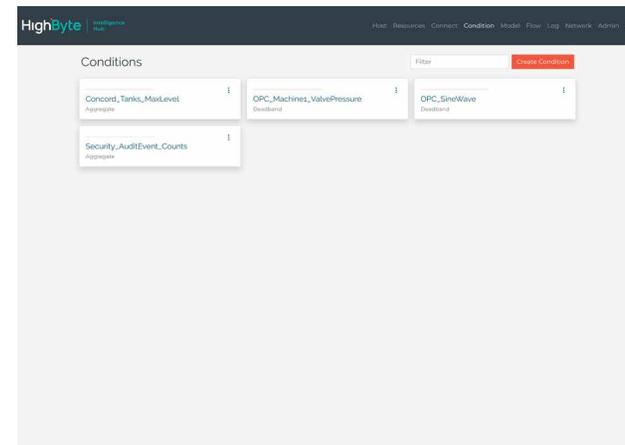


Figure 2: Data Conditioning

Critical Features for Industrial DataOps

CONNECTION FLOWS

Create data flows for raw data, modeled information, or files between connections at any frequency or event. Enable store and forward to buffer data to disk if target connection is lost. Manage data flows within HighByte Intelligence Hub, monitoring flow state and key metrics. See and be alerted to connection and flow failures through the Intelligence Hub and easily monitor the Intelligence Hub at scale using third-party system-monitoring applications.

CODELESS INTEGRATION

Collect and publish data over open standards and native connections—eliminating the need for custom-coded integrations. Easily configure and manage multiple connections and their respective inputs and outputs within the script-free interface. Collect data from SQL and REST source systems using dynamic requests leveraging inputs from other systems. Quickly integrate data from specialty systems and devices. Merge data from multiple systems into a complex modeled payload.

EDGE NATIVE

Run HighByte Intelligence Hub on your choice of light weight hardware platforms including single board computers, industrial switches, IoT gateways, and industrial data servers at the Edge. Deploy as an individual software installation or Docker image, which allows you to rapidly deploy and upgrade system software components.

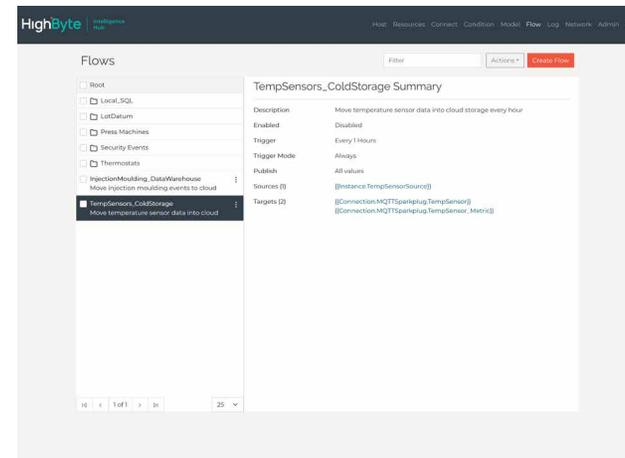


Figure 3: Connection Flows

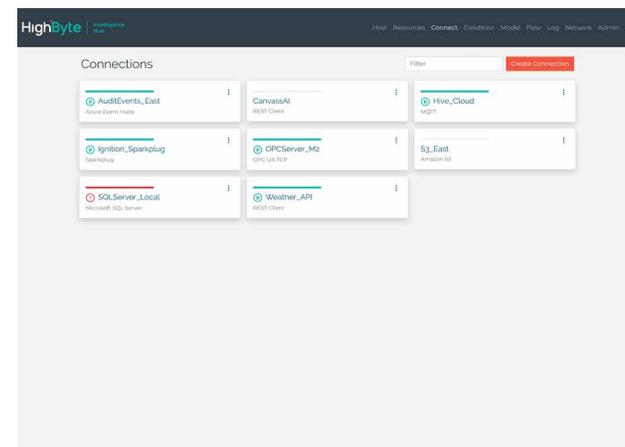


Figure 4: Codeless Integration

Critical Features for Industrial DataOps

SECURITY

Exchange data using the built-in security of connection protocols. By identifying outputs by connection, administrators can implement higher-level management and security than typical pub/sub broker architectures and open, unmanaged API access. Authenticate users and their roles through third-party identity providers with Security Assertion Markup Language (SAML).

MULTI-HUB CONFIGURATION

Connect multiple hubs to a single host that acts as the central hub. Once connected, administrators can log in to the central hub and easily switch between hubs to configure and monitor individual hub activity and compare configurations for differences. Administrators can also synchronize models, connections, or complete projects between hubs.

HIGH AVAILABILITY

Deploy redundant Intelligence Hubs for critical data and pair the hubs as a primary and secondary. A secondary hub will be ready in a warm state ready to enable flows when it detects the primary is no longer responding.

ADMINISTRATION

Create unique user names and passwords for each user. Assign a user to a role with a pre-defined set of permission claims or assign a user their own unique permission claims. Use Active Directory to manage authentication, authorization of users, and application settings. Create and maintain certificates in the hub configuration to authenticate and secure data transfer with other systems.

AUDITING

Enable audit logging to allow all configuration creations, modifications, or deletions to be logged to the event log as AUDIT type events. View all log events through the configuration and filter by type, source, or message text. Automatically back up the runtime's configuration file to a backup directory at a specified frequency and maintain a specified maximum number of these files. These backups will enable you to roll back the configuration if an incorrect change was made that caused problems with the configuration.

Measurable Benefits for Operational Technology (OT), IT, and Line of Business

Accelerate analytics and other Industry 4.0 use cases with a digital infrastructure solution built for scale.

- Reduce system integration time from months to hours
- Empower operators with insights from the Cloud
- Improve data curation and preparation time for AI and ML applications
- Improve system-wide security and data governance
- Scale operations metrics and analytics across the enterprise
- Meet system integrity and regulatory traceability requirements
- Reduce information wait time for business functions
- Reduce Cloud ingest, processing, and storage costs
- Eliminate time spent troubleshooting broken integrations
- Automate and maintain data pipelines

Use Cases

HighByte Intelligence Hub is an Industrial DataOps solution capable of meeting the requirements of several data preparation and integration use cases for discrete, batch, and process manufacturers.

SYSTEMS INTEGRATION

Accelerate and maintain integrations between on-premises industrial systems and business systems.

EDGE-TO-CLOUD

Prepare, contextualize, and deliver plant floor data for data lakes, dashboards, analytics, and machine learning (ML) applications in the Cloud.

CLOUD-TO-EDGE

Deliver setpoint changes or alerts from ML applications and modeled data from third-party sensors back into SCADA systems, HMIs, historians, and OPC servers on the factory floor.

UNIFIED NAMESPACE

Prepare and publish industrial data to a unified namespace (UNS) or subscribe to a UNS and distribute data to enterprise systems.

CROSS-PLANT ANALYSIS

Achieve cross-plant data aggregation, visibility, and production analysis in an enterprise Cloud with a data modeling abstraction layer.

HIGH RESOLUTION DATA ANALYTICS

Collect high resolution, sub-50ms sensor data in batches, contextualize, and publish to analytics applications or the Cloud.

Technical Specifications

CONNECTIVITY

Connector	Inbound	Outbound
AWS		
Amazon Kinesis Data Firehose		✓
Amazon Kinesis Data Streams		✓
Amazon Redshift	✓	✓
Amazon S3		✓
AWS IoT SiteWise		✓
Azure		
Azure Blob Storage		✓
Azure Event Hubs	✓	✓
Azure IoT Edge	✓	✓
Azure IoT Hub	✓	✓
Files		
Apache Parquet	✓	✓
CSV	✓	✓
File	✓	✓
Google Cloud Platform		
Google Cloud Pub/Sub		✓
HTTP		
REST Client	✓	✓
Webhook	✓	
MODBUS		
Modbus TCP	✓	
MQTT		
MQTT JSON	✓	✓
Sparkplug	✓	✓

Technical Specifications

CONNECTIVITY

Connector	Inbound	Outbound
OPC		
OPC UA TCP	✓	✓
SQL		
JDBC Driver	✓	✓
Microsoft SQL Server	✓	✓
MySQL	✓	✓
Oracle Database	✓	✓
PostgreSQL	✓	✓
Time Series		
InfluxDB	✓	✓
PI System	✓	✓



HighByte Intelligence Hub can also connect bi-directionally to AWS IoT Core and AWS IoT Greengrass through the MQTT connector.

SUPPORTING OPERATING SYSTEMS

- Windows Server 2012/2016/2019
- Windows 8/10
- Linux [any Linux distribution capable of running a JVM; tested with Ubuntu]
- macOS

SOFTWARE DELIVERY

HighByte Intelligence Hub is an on-premises application configured remotely through a web browser or a REST-based API. The software is available as an annual subscription. Please visit highbyte.com/pricing to view licensing options.

SYSTEM REQUIREMENTS

- Java SE 11 or OpenJDK 14 [or newer]
- HTTP server [for hosting frontend]
- 1.4 GHz processor
- 1 GB RAM
- 1 GB available disk space
- Network capable [TCP]

These are minimal system requirements. Actual requirements will vary based on product configuration.

Next Steps

Interested in learning more? Please contact sales@highbyte.com to request additional information, schedule a demo, or join our free trial program.

About HighByte

HighByte is an industrial software company in Portland, Maine USA building solutions that address the data architecture and integration challenges created by Industry 4.0. HighByte Intelligence Hub, the company's award-winning Industrial DataOps software, provides modeled, ready-to-use data to the Cloud using a codeless interface to speed integration time and accelerate analytics. Learn more at www.highbyte.com.

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