

User Manual FFT DataService

V. 2.0.0-release

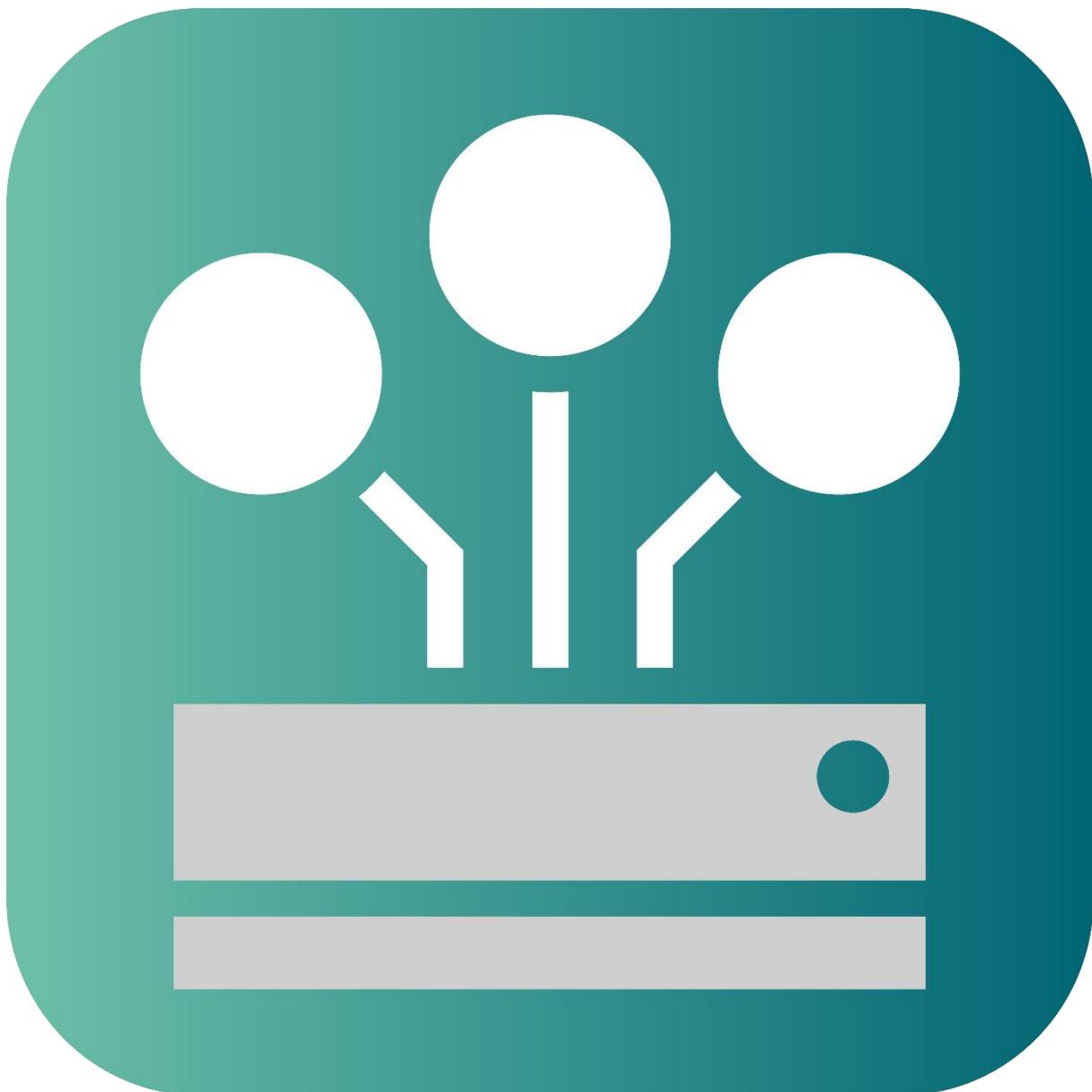


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Disclaimer of liability

This document serves as a user guide for the use of the FFT DataService. It does not replace Siemens' official product and IIH documentation.

Scope / Versions: The content reflects the features available at the time of writing for the FFT DataService and the IIH Essentials OpenAPI ($\geq 2.2.0$). Interfaces, menus, and screenshots may vary depending on IEM, firmware, and app versions. Subject to change without notice.

Responsibility: Installation, configuration, operation, and network security (in particular access rights, port exposure, certificates) are the responsibility of the operator. Ensure compliance with all regulatory, data protection, and IT security requirements (e.g., GDPR) and maintain appropriate backups.

Third-Party Dependencies: Examples include "Industrial Information Hub (IIH)" and "Snowflake," which are trademarks and/or products of their respective owners. References to external products are solely for integration purposes and do not constitute an endorsement.



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Learn more about FFT:



1. Preface

1.1. Introduction

FFT DataService enables manufacturing teams to securely, scalably, and efficiently access production and process data from the Industrial Information Hub (IIH).

Targeted at automation engineers, data engineers, and IT administrators, it removes common hurdles like brittle point-to-point integrations, inconsistent data access, and high effort for historical reads.

Its primary focus is to power the FFT DataBridge. The DataService provides a single, consistent interface tailored for the DataBridge and returns IIH data in a predictable structure. This keeps the DataBridge lean and streamlines transfer to Snowflake.

1.2. Target Audience

This guide is intended for technical professionals with prior experience in Industrial Information Hub (IIH). The intended audience includes:

- Automation engineers
- Data engineers
- Edge/Cloud integration specialists

Familiarity with the following is expected:

- IIH components (e.g., Databus, IIH, Common Configurator),
- Edge device deployment and configuration using Industrial Edge Management (IEM)

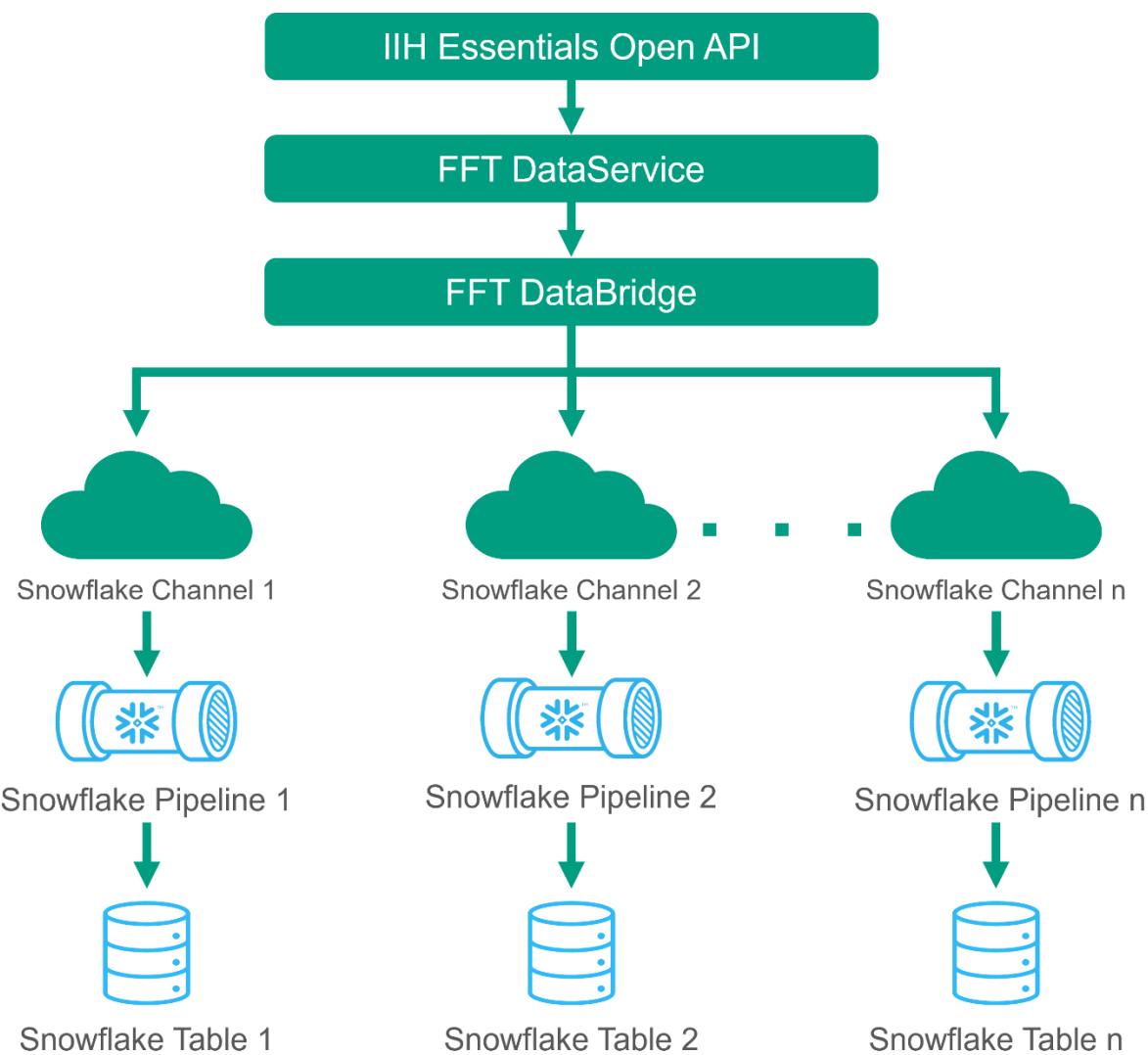
This guide does **not** provide introductory explanations for IIH. It assumes a working knowledge of these systems, focusing instead on the configuration and deployment of the FFT DataService in a production-grade environment.

2. Overview

The FFT DataService works in combination with the FFT-developed FFT DataBridge and is freely available in the Marketplace.

In this setup, the FFT DataBridge initiates the request for data. These requests are sent to the FFT DataService, which then communicates with the IIH Essentials API to fetch the required information. The DataService formats the data and returns it to the DataBridge. Finally, the DataBridge transfers the received data to Snowflake and loads it into the predefined Snowflake tables.

For compatibility, the IIH Essentials must be version 2.2.0 or higher.



3. Installing the APP

3.1. Software Requirements

- IIH Essentials
- Databus
- Common Configurator with Configured Connector (e.g. Simatic S7, S7+)
- IIH Semantics

3.2. Hardware Requirements

- A running Industrial Edge Management (IEM) instance is required. Tested with IEM ISO 1.11.7 and later; other versions may be compatible.
- An Industrial Edge Device that is compatible with Industrial Edge Management
 - IED Model e.g. Simatic IPC 427 E, IPC227G
 - Hard disk at least 2 GB
 - RAM: 2 GB RAM available

3.3. Install the App itself

[How to install an Industrial Edge App? - ID: 109824882 - Industry Support Siemens](#)

4. Configuring

Configuration of the FFT DataService is divided into two parts:

1. Setting up the Siemens Industrial Information Hub (IIH).
2. Configuring the FFT DataService itself.

4.1. Setting up IIH

Follow the official Siemens documentation:

[Industrial Information Hub • Reader • Industrial Operations X Documentation](#)

Once the IIH environment is deployed and the data model is defined, proceed to the next step.

Notes:

- The FFT DataService prefers the **DisplayName** of assets and variables. If no **DisplayName** is set, the **name** property is used instead.
- Only variables whose **source type is not "Static"** are included.

4.2. Configuring DataService

The FFT DataService can be installed and used without providing a configuration file. In this default mode, it connects to the local IIH instance and reads the entire data structure. After startup, every existing variable can be requested.

Optionally, you can provide a configuration file to customize logging behavior and specify entry points for the data structure. The configuration file must be named **config.toml** and placed in the application directory.

Example config.toml:

```
[[iih.instances]]
plc_name = "PLC"
root_asset_id = "9b252fb1-b984-f677-ce9f-9562bbaaff455"
dataservice_host_address = "[::]:53051"

[logging]
console_log = true
level = "INFO"
```

Configuring

```
file_path = "/app/logs/app.log"
file_max_size_bytes = 10485760
file_backup_count = 3
```

Structure of the configuration file

The file consists of two main sections:

- **[logging]**
 - Controls log output.
 - Available parameters:

Attribute name	Default value	Description
console_log	true	Enables/disables console logging.
level	"INFO"	Defines log level (INFO, WARNING, ERROR).
file_path	"/app/logs/app.log"	Path to the log file. Must remain the default for logs to be mounted.
file_max_size_bytes	10485760	Maximum size of a single log file (in bytes).
file_backup_count	3	Number of rotated log files to keep.

[[iih.instances]]

- Defines the entry point for data requests.
- Useful if you want to restrict access to a specific part of the data structure.

Attribute name	Default value	Description
plc_name	""	Asset name of the root node.
root_asset_id	""	Asset ID of the root node.
dataservice_host_address	"[::]:53051"	Host address and port for the gRPC server. By default, it listens to all container IPs at port 53051. The port is only hosted in

		the container and not on device level.
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Note: Providing a configuration file is recommended only for advanced users. Non-IIH experts should operate the FFT DataService without a configuration file.

5. Working with FFT DataService

After startup, the FFT DataService scans the IIH data model and makes all requestable assets and variables available via its internal service interface.

The FFT DataService is designed to be consumed automatically by the FFT DataBridge. No manual preparation, export, or modification of variable lists is required.

5.1. Data Model Exposure

The FFT DataService exposes the IIH data model in a structured form that can be queried by other applications.

The exposed model includes:

- Asset paths
- Variables assigned to each asset

Only variables whose source type is not "Static" are exposed and can be requested.

The provided data model represents the **state of the IIH configuration at application start**.

If the IIH data structure is changed, the FFT DataService **must be restarted** in order to rebuild and expose the updated data model.

5.2. Connecting DataBridge to DataService (local only)

The FFT DataService is available only inside the Edge device network.

To connect the FFT DataBridge to the FFT DataService, use the following address:

`fft_dataservice:53051`

Connection parameters:

- Service name: `fft_dataservice`
- Port: 53051 (default)

If a different port is configured in config.toml (dataservice_host_address), the configured port must be used.

The FFT DataBridge automatically retrieves the available structure and variables after establishing the connection.

5.3. Asset Path Definition

Each variable exposed by the FFT DataService is identified by an asset path and a variable name.

The asset path is built as follows:

- The hierarchy of assets is represented as a dot-separated string
- For each asset level, the DisplayName is used
- If DisplayName is not defined, the name property is used instead

Example:

Line1.Station3.Press

5.4. Variable Identification

Within an asset, variables are addressed by their variable name.

Only variables that meet the following condition are exposed:

- Source type is not "Static"

This ensures that only dynamic and process-relevant data is made available to consuming applications.

5.5. Application Volumes (reference)

The FFT DataService provides the following application volumes:

- cfg-data/
 - Contains configuration files, including:
 - config.toml – optional configuration of the FFT DataService

- fftdataservice_alllog/

Contains runtime logs:

 - app.log
 - Rotated log files
- publish/

Provides exported or diagnostic artifacts. No manual interaction is required for normal operation.

5.6. Operational Scope

The FFT DataService operates as a local service and is intended to be accessed only by applications running on the same Edge device, such as the FFT DataBridge.

The data model is created during service startup and remains static during runtime. Changes to the IIH data structure require a restart of the FFT DataService to take effect.

All required structural information is provided via the service interface. No file-based configuration exchange is necessary.

6. Logging

The Logs are divided in two files. These files are available in the Docker volume view in the edge device.

The app.log file contains application logs generated during the runtime of the application and can be accessed in the app view inside the Edge Device.

Application Volumes	
Name	
/var/run/devicemodel/edgedevice	i
certsips.json	
cfg-data	i
config.toml	
fftdataservicenu_allLog	i
_data	
app.log	
app.log.1	

These files are stored using a ring-buffer mechanism, which can be adjusted in the advanced setup settings. Logs can also be downloaded via the Industrial Edge Device UI. They are separated into two files:
 fft_dataservice.log contains general startup logs and external logs.
 fft_dataservice-error.log contains error logs that occur while the application is running.

7. Limitations

7.1. Variables and Data frequency

The FFT DataService was tested with a total of 5000 individual variables.

Data was processed at a frequency ranging from 500 ms to 1 second.

For optimal performance, we recommend using an edge device with 16 GB RAM and a CPU with at least 8 cores.

8. Change history

Revision	Date	Name	Comment
0.0.1	10.09.2025	A.Hennemann	creation
0.0.2	15.01.2026	A.Hennemann	Adjustment for Dataservice version 2.0.0