Data Explorer

Browse and inspect your solution data.

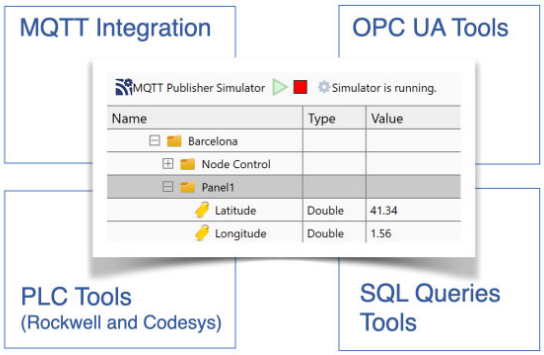
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Introduction to the DataExplorer

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Easily perform data mining and monitoring from various data sources like:

- MQTT Brokers
- OPC-UA
- PLCs
- SQL Databases



Key Concepts and Terms

Connection Target

The connection target configuration sets up the location of the data source to be used. Typically, you can select from three types of locations:

1. **Local:** This option connects automatically to some data connections defined in the solution configuration.
2. **TagProvider:** This option connects with *TagProvider*, which are dynamic data sources created in the solution configuration.
3. **Remote:** This option allows you to connect with a remote source, not necessarily used by the solution.

Connection Status

To browse data, the first step is to connect with the data source. After the connection is established, the Data Browser tree will regularly update with data from the sources.

Note: For SQL queries, the DataGrid results view will only update after you execute a query, but the connection is established automatically.

Data Browser Window

For field devices (MQTT, OPC-UA, PLCs), after the connection is established, a hierarchical tree with the data structure and values is displayed. For SQL queries, the results are shown in a *DataGrid*.

Export Settings to the Solution

When connecting with a remote data source not used by the solution, there are options to incorporate that data source into your application with one click. For SQL queries, you can export your customization of DataGrid columns to be used in operator displays.

Understanding the DataExplorer Tools

Overview

The DataExplorer tools are typically used in the following phases of project development:

1. **Data Discovery:** Whether using MQTT, OPC-UA, ControlLogix PLCs, or SQL Databases, the DataExplorer tools provide a user-friendly and easy way to verify the consistency of the data you intend to work with.

2. **UserTypes and Tags Definition:** UserTypes, local Tag, and TagProviders can be easily created in the project configuration using the data displayed in the Data Browser window.
3. **Testing and Validation:** When used in conjunction with connections already defined in the project configuration, these tools can be used to validate and monitor the results of data acquisition.

Typical Workflow

1. **Start Servers or Simulators:** When using MQTT or OPC, you have the option to use the built-in OPC-UA server, the local MQTT broker, or run data simulators.
2. **Select the Option for Connection Target:** Select the connection, either from the project or remote sources. For *ControlLogix* PLCs, you can also search for devices in the network automatically.
3. **Browse the Data Structure and Values:** View the values in the *TreeView* explorer (for OPC, MQTT, and PLCs) or in the DataGrid (for SQL queries).
4. **Add Connections, UserTypes, or DevicesPoints to the Unified Namespace:** Export server connections, data structures, or specific topics to be used by the application.

Working with the DataExplorer Tools

Each data source has its own procedure to execute data acquisition.

MQTT Tools

With MQTT, the Data Browser will act as a client application to the broker, subscribing to the data visible on the user interface.

Follow the link MQTT Tools Reference for further information.

OPC Tools

With OPC-UA, the Data Browser will act as a client application to the OPC server, reading the data visible on the user interface by polling every second.

Follow the link OPC Tools Reference for further information.

PLC Finder

With PLCs, the Data Browser will send protocol request to the PLC, reading the data visible on the user interface by polling every second.

Follow the link PLC Finder Reference for further information.

SQL Queries

With SQL Databases, the DataGrid is only updated when the Execute Query command is executed.

Follow the link SQL Queries Reference for further information.

WebData Tools

The WebData Tools tab provides a request builder for REST, GraphQL, and MCP HTTP APIs. Use it to test external endpoints and export the connection to a Reports WebData object.

Follow the link WebData Tools Reference for further information.

Performance Considerations

As this is only a DataExplorer interface, the default update cycle is one second. However, this does not reflect the performance you will experience at runtime, which can be much higher depending on your configuration.

For all field protocols (MQTT, OPC-UA, PLC native protocols), you can define parallel requests, subscribe instead of poll (if the protocol allows), and use the AccessType concept to group your data according to its priority, usage in the application, or process requirements. The volume of data and performance the project can manage at runtime is significantly higher than that of the DataExplorer tools.

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