Topic updated on September 21, 2023

Defining, viewing, and controlling data mappings

Overview

Data mappings can be defined, deleted, viewed, and have their state controlled.

The **Data Mapping** feature provides the function to:

- Read a source device variable at a defined frequency
- If the device variable has changed since the last read, write it to a destination device variable
- Optionally, include transformation from one data type at the source device variable to a different data type for the destination device variable.

Data mappings are defined on the node where the source device driver and destination device driver are installed and where the device specific communication to the physical devices will take place. Physical devices types include: PLCs, controllers, sensors, and bar code readers.

In the case of logical devices, the device is defined on the node where the memory representation of the device and its variables will take place. There is no physical device to connect to and no communication protocol to support. Logical device types include: global variable device, aliases device, and property file reader device.

Once a data mapping is defined and **Started**, the runtime handles the reading of the source device variable, processing, and the writing of the destination device variable. There is no need for a separate trigger to be defined to do this device variable access (for example using the **Set** action).

The Data Mapping feature can be used to compliment, and be a part of, the M2M solution application logic that users define in triggers.

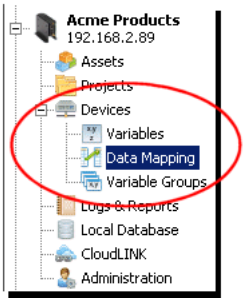
Defining data mappings

Data mappings are defined after the devices referenced for the source device variable and destination device variable are defined and **Started**.
Follow these steps to add a data mapping definition to a node:

1. From the left pane, expand the node that you want to add a data mapping definition to.
2. Select the **Devices** icon.

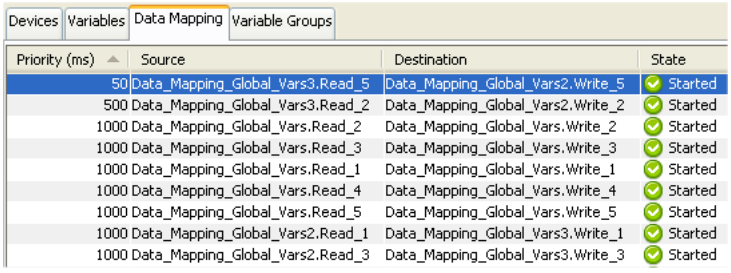
   Then select the **Data Mapping** tab

   Or, alternatively, select the **Data Mapping** sub icon.



   The **Data Mapping** window appears as the right pane.

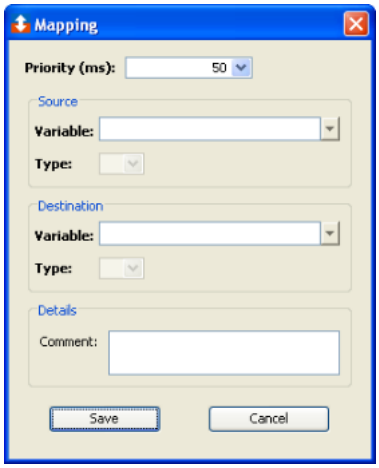
   For this example, the Data Mapping window has previously defined data mappings.



Priority (ms)	Source	Destination	State
50	Data_Mapping_Global_Vars3.Read_5	Data_Mapping_Global_Vars2.Write_5	Started
500	Data_Mapping_Global_Vars3.Read_2	Data_Mapping_Global_Vars2.Write_2	Started
1000	Data_Mapping_Global_Vars.Read_2	Data_Mapping_Global_Vars.Write_2	Started
1000	Data_Mapping_Global_Vars.Read_3	Data_Mapping_Global_Vars.Write_3	Started
1000	Data_Mapping_Global_Vars.Read_1	Data_Mapping_Global_Vars.Write_1	Started
1000	Data_Mapping_Global_Vars.Read_4	Data_Mapping_Global_Vars.Write_4	Started
1000	Data_Mapping_Global_Vars.Read_5	Data_Mapping_Global_Vars.Write_5	Started
1000	Data_Mapping_Global_Vars2.Read_1	Data_Mapping_Global_Vars3.Write_1	Started
1000	Data_Mapping_Global_Vars2.Read_3	Data_Mapping_Global_Vars3.Write_3	Started

3. From the bottom of the **Data Mapping** tab, select **New**.

   A new Data Mapping window appears.



4. Select a value for the **Priority (ms)** parameter.
   This is the frequency that the runtime Device Publisher feature will read the source device variable.
   The units are in milliseconds (ms).
5. Select a Source Variable.
   The list of devices are the Started devices on this node.
   Expand the desired device and its internal structure until you can select the individual source device variable.
6. Select a Destination Variable.
   The list of devices are the Started devices on this node.
   Expand the desired device and its internal structure until you can select the individual destination device variable.
7. If the drivers support data transformation, the data type fields will become active and can be changed to a data type different than the variables' data type.
8. If the source device variable and the destination device variables are arrays, enter the Count of variables to transfer.
9. Use the **Save** button to save the definition of the data mapping.
   The data mapping will appear in the list of data mappings for the node, in a **Stopped** state.

Viewing data mappings

The **Data Mapping** tab provides a list of data mappings defined on the node.

To use the **Data Mapping** tab, follow these steps:

1. From Workbench left pane, expand the node whose data mapping you want to view.
2. Select the **Devices** icon.
   Then select the **Data Mapping** tab
   Or, alternatively, select the **Data Mapping** sub icon.
3. The **Data Mapping** tab provides a table format that lists the data mappings defined on the node.
   The top section of the **Data mapping** tab provides these columns:

Column	Description
Priority	The priority of the data mapping, specified in the millisecond frequency that the runtime Device Publisher will read the source device variable.
Source	The source device variable.
Destination	The destination device variable.
State	The data mapping state, which can be: **Started** - the data mapping is active. The runtime Device Publisher is reading the source device variable at the priority frequency.

Column	Description
	Stopped - the data mapping is not active. **Disabled** - indicating there is a problem communicating with the source device.
Last Executed	Date and time when the data mapping was last executed, including the write to the destination device variable.
Successes	The number of successful data mappings from the source device variable to the destination device variable.
Failures	The number of failed data mapping. This is usually caused by the destination device not being in a **Started** state.
Overflow	The number of times the runtime Device Publisher cannot process the data mapping in a timely manner. The entire node's definitions of data triggers, variable groups and data mappings defines the load on the runtime Device Publisher. Each of the Priority parameter values defines the list of device variables that need to read and processed that the Priority's millisecond frequency. You might want to change the value set in the Priority parameter.

Data Mapping status information

The bottom portion of the **Data Mapping** pane provide information concerning the performance of the selected data mapping as follows:

Parameter	Description
Source Device Name	The source device name.
Source Name	The source variable name.
Source Type	The data type of the source device variable.
Source Count	When the source and destination device variables are an arrays, the number of source device variables from the source array to transfer to the destination device variable array.
Source Length/Bit	For String data types, the length of the source device variable. For BOOL data types, the number of bits being mapped.
Priority	The priority frequency in milliseconds that the source device variable is read by the runtime Device Publisher.
Status	A pair of status values. The left side value is the last result code for the read of the source variable or the write of the destination variable. This is normally zero. The right side value is an internal data mapping status, which is different from the data mapping's **State** (**Started**, **Stopped**, or **Disabled**).
Successes	The number of successful data mappings from the source device variable to the destination device variable.
Failures	The number of failed data mapping. This is usually caused by the destination device not being in a **Started** state.
Successes/Minute	The number of successful data mappings per minute. This is an approximation over the recent time period.
Comment	The comment that was defined with the data mapping.
Destination Device Name	The destination device name.
Destination Name	The destination variable name.
Destination Type	The data type of the destination device variable. This can be different from the source device variable type
Destination Count	When the source and destination device variables are an arrays, the number of source device variables from the source array to transfer to the destination device variable array.
Destination Length/Bit	For Bit data types, the number of destination device variable bits being mapped.
State	The data mapping state, which can be: **Started** - the data mapping is active. The runtime Device Publisher is reading the source device variable at the priority frequency. **Stopped** - the data mapping is not active. **Disabled** - indicating there is a problem communicating with the source device.
Last State Change	The date and time of the last state change of the data mapping
Last Fired	Date and time when the data mapping was last executed, including the write to the destination device variable.
Overflow	The number of times the runtime Device Publisher cannot process the data mapping in a timely manner. The entire node's definitions of data triggers, variable groups and data mappings defines the load on the runtime Device Publisher. Each of the Priority parameter values defines the list of device variables that need to read and processed that the Priority's millisecond frequency. You might want to change the value set in the Priority parameter.
User	The log in id of the user who started the data mapping. This user's security credentials are used to determine the access rights to the source and destination variables.

Controlling data mappings

When a data mapping row is selected in the table, the buttons at the bottom of the **Data Mapping** tab become enabled or disabled. This is based on the current state of the data mapping and the function of the button.

A single data mapping row or multiple data mapping rows can be selected and then the function buttons used, but the state of each data mapping will determine if the function can be performed.

Button	Description
New	Define a new data mapping.
Edit	Edit the data mapping definition. This can be used when the data mapping is in the **Stopped** state. This is only available for a single data mapping row selection.
Start	Available when the data mapping is in a **Stopped** state. Change the data mapping to the **Started** state.
Stop	Available when the data mapping is in the **Started** or **Disabled** state. Change the data mapping to the **Stopped** state.
Delete	Available when the data mapping is in the **Stopped** state. Delete the data mapping definition from the node.
Refresh	Refresh the information displayed in the **Data Mapping** tab. The Workbench will periodically refresh the information on its own without the Refresh button being used.

A data mapping row's pop-up menu can be displayed, and the available options selected.