Connecting PLC Data to Status Device Cloud

Using Programmable Logic Controllers with Status Device Cloud

This whitepaper details the process of using PLC data in your Status Device Cloud deployment.
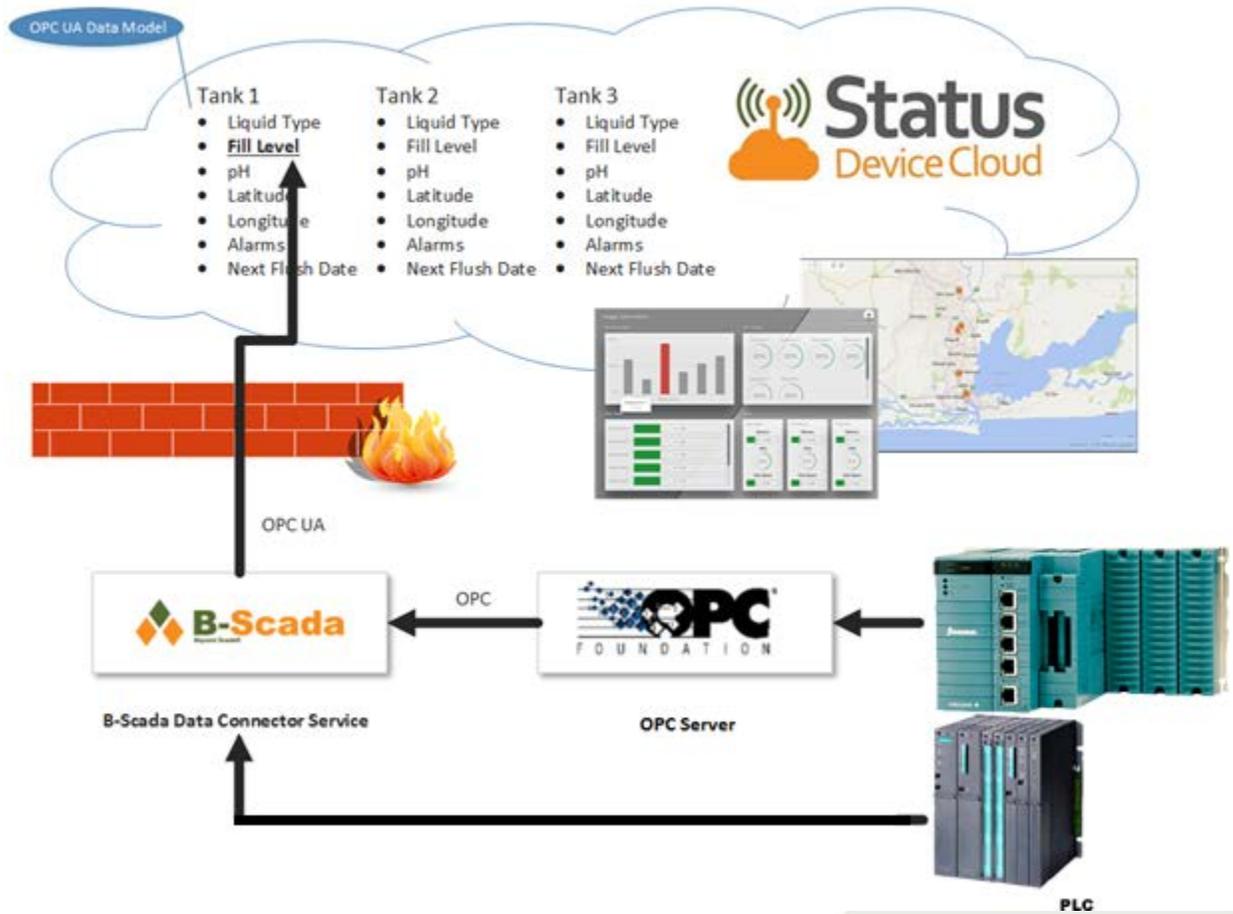
Contents

Overview

Figure 1 - This diagram provides a visual overview of the process of connecting your PLC to your Status Device Cloud Data Model

Status Device Cloud is built on OPC UA (Unified Architecture), and is intended to communicate with thousands of potential devices, including programmable logic controllers (PLCs). Status Device Cloud includes drivers for many of today's most popular PLCs, and can communicate with many others through an appropriate OPC server.

To determine how to include your PLC data in your Status Device Cloud data model, you must determine whether it is supported by one of the drivers provided in the Status Data Connector or – if not – whether you can find an OPC server for your particular model of PLC.

Using Device Drivers Included in the Data Connector

Status Device Cloud has several included data providers for different types of devices. Data connectivity for Status Device Cloud includes: OPC UA, OPC DA, SNMP, MQTT, Domoticz, Empress, SQL and ODBC data sources, Excel workbooks, Allen Bradley, BACnet, Modbus and Siemens S7 devices, as well as Monnit, Libelium, Advantech Wzzard, and B-Scada sensors.

In short, if you are using an Allen Bradley, Siemens S7, or any controller that communicate via the BACnet or Modbus protocols, your device is likely supported without the need for an OPC server.

In most of these cases you will want to install a local version of the Data Connector service behind your firewall to pass this data to your data model in the cloud. The exception is for Modbus communication, which can be done through your hosted Data Connector if you would prefer.
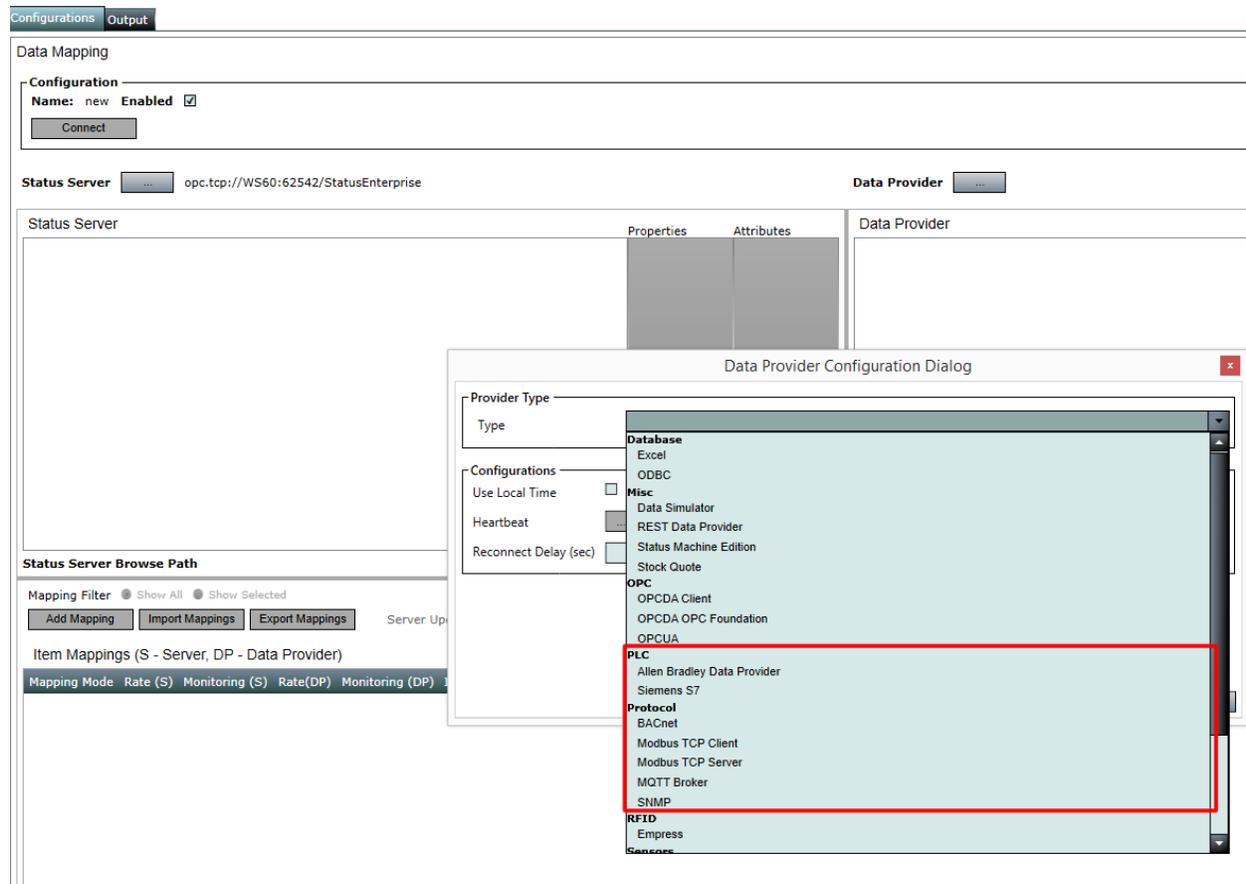

Figure 2 - Several included data providers may allow you to connect your PLC without the need for an OPC server

Using an OPC Server

If your device is not supported by one of the data providers included in the Status Data Connector, you will likely be able to find an OPC server that supports your device.

OPC servers are software programs that convert hardware communication protocol used by a PLC into the OPC protocol. They are frequently used in SCADA (Supervisory Control and Data Acquisition) and HMI (Human Machine Interface) application. Status Device Cloud supports both OPC UA and the classic OPC DA protocols.

A list of OPC servers for many PLCs can be found on B-Scada's website at: http://scada.com/software/opcservers/.
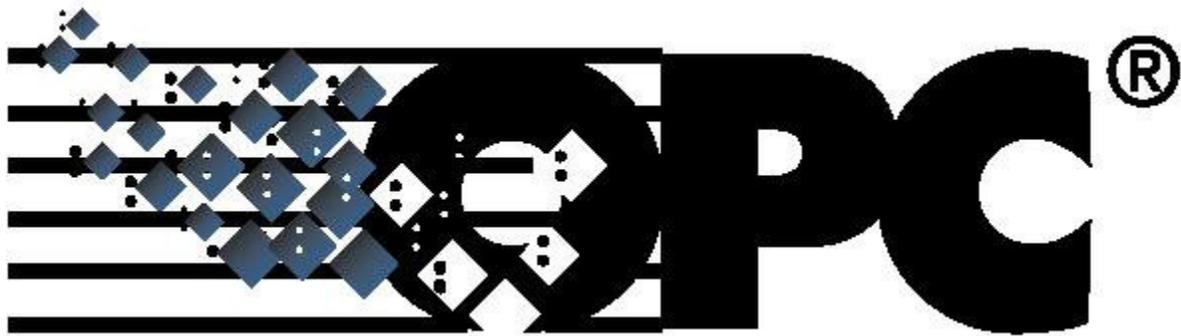
OPC DA

The OPC Data Access protocol is fully supported by Status Device Cloud, and will require users to install the free OPC Core Components that are provided to Status Device Cloud users. OPC DA connections will also require that the Status Data Connector service be installed locally as OPC DA is not web-friendly. To get your OPC DA data to your data model in the cloud, the Data Connector will convert it to OPC UA.

The process for using OPC DA data in your Status deployment is covered in the paper "*Using OPC DA Data in Status Device Cloud*". This current paper will assume you are using either a direct device driver or an OPC UA server.

OPC UA

The OPC Unified Architecture protocol is a modern, open, platform-independent protocol on which Status Device Cloud is built. OPC UA connections are fast, reliable, and web-friendly. If using OPC UA, you will be able to connect to your hosted Status Data Connector service if you wish, in which case you would not need to install the Data Connector locally.
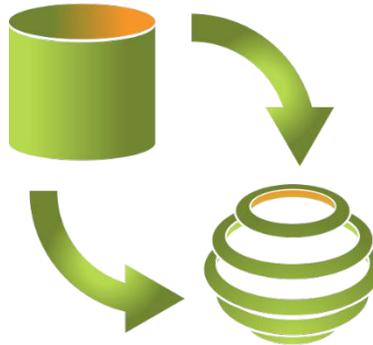
Using the Data Connector

Figure 3 - Data Connector Icon

When your Status Device Cloud account was created, you were provided with a URL for a cloud-based Data Connector you could use to map your device data to your Status Device Cloud data model. This works fine for web-friendly data sources, including OPC UA, but if you are using one of the included data providers like Allen Bradley or Siemens S7, and you will have to install the Data Connector service locally behind your firewall to send your data to the cloud in a web-friendly format.

Referring to Figure 1 above, you can see that your assets are connected by OPC server to a local instance of the Data Connector Service. The Data Connector service then communicates your data via OPC UA to your data model in the cloud.

Assuming you have already installed the Data Connector on a local machine, you can access the application by selecting the 'Advanced' checkbox on the Status Device Cloud Application Launcher:
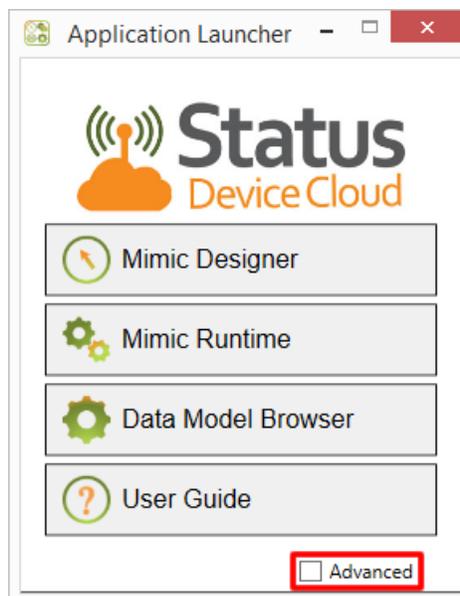

Figure 4 - Show additional applications by selecting the 'Advanced' checkbox in the application launcher

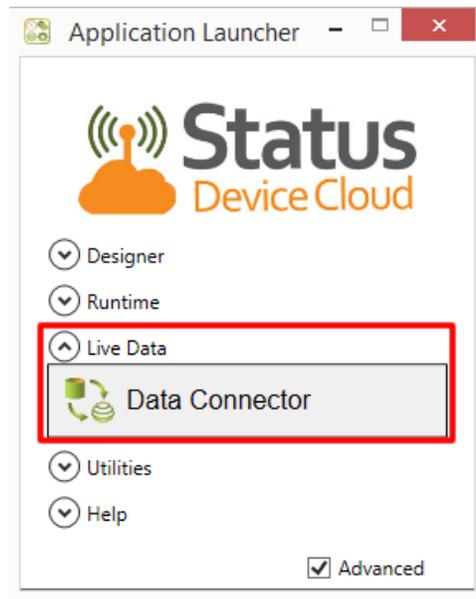The Data Connector Application can be found by expanding the 'Live Data' tab.

Figure 5 - The Data Connector application is listed under 'Live Data'

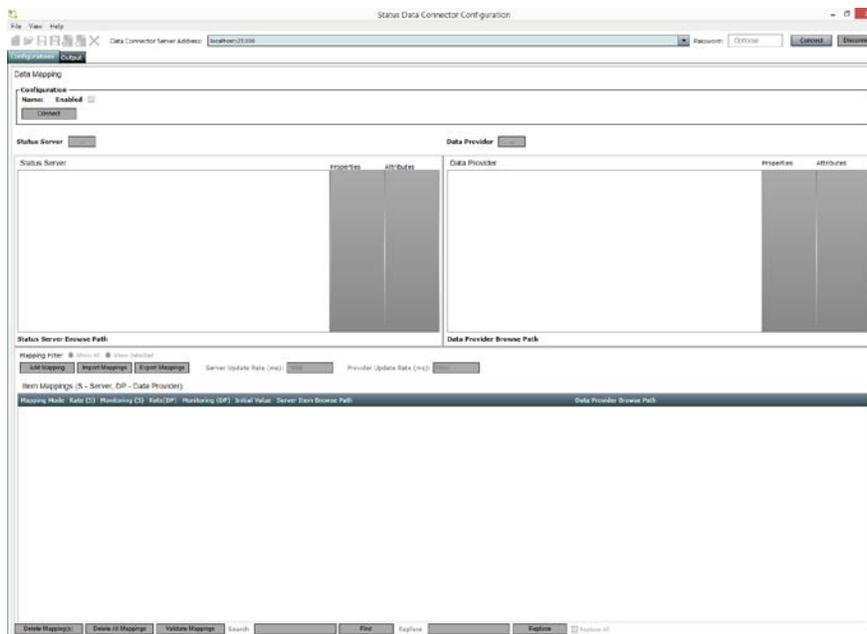Clicking on the Data Connector button will launch the application.

Figure 6 - The Status Data Connector GUI

Mapping Your Device Data to Your Data Model

Data mapping is covered in much greater detail in Part 12 of the Status Enterprise User Guide, as well as in the 'Working with Live Data' section of training videos at www.scadauniversity.com. For this paper, we'll show enough of the process to get you ready to map the addresses in your PLC to the properties in your data model and start bringing in live data.

Step 1 – Connect to the Data Connector Server

Enter the correct server address in the bar at the top of the Data Connector GUI. This is the location of the PC where the Data Connector Service in installed. If you are using the same PC that will be running the service, the default value of '*localhost:21000*' will usually work.

After entering or confirming the address, click 'Connect'

Step 2 – Create a New Mapping Configuration

Select the 'Add New' icon to create a new Mapping Configuration. Give the Mapping Configuration a name in the dialog window that appears.
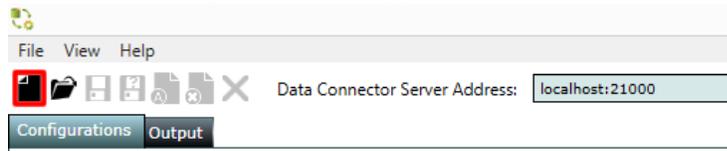

Step 3 – Select Your Data Provider Type

Select the appropriate data provider in the 'Data Provider Configuration Dialog' window that appears. You will find the OPC UA provider under the OPC heading, and other relevant providers under the PLC and Protocol headings.

8
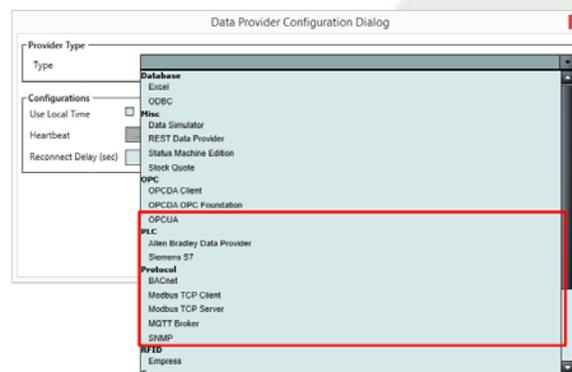
Step 4 – Configure Your Data Provider

Enter the appropriate configuration settings for your selected data provider type. Required settings will vary depending on your data source. Detailed information on the different data providers can be found in Status Enterprise User Guide Part 12 – Data Connector Service
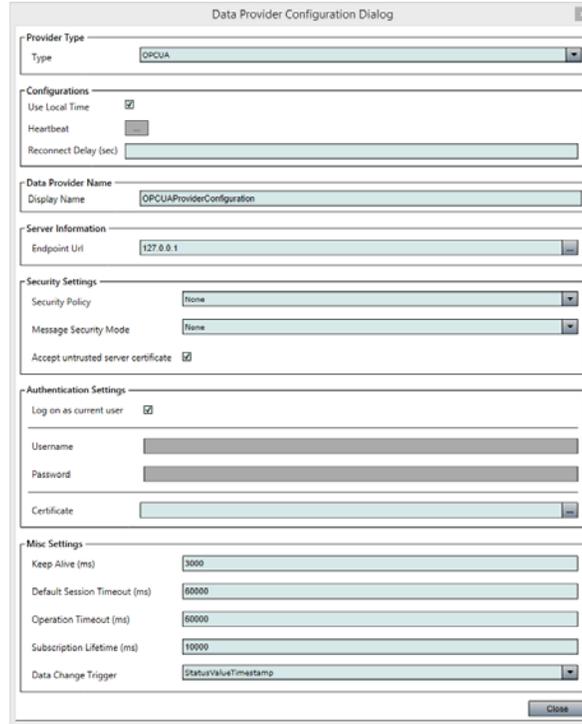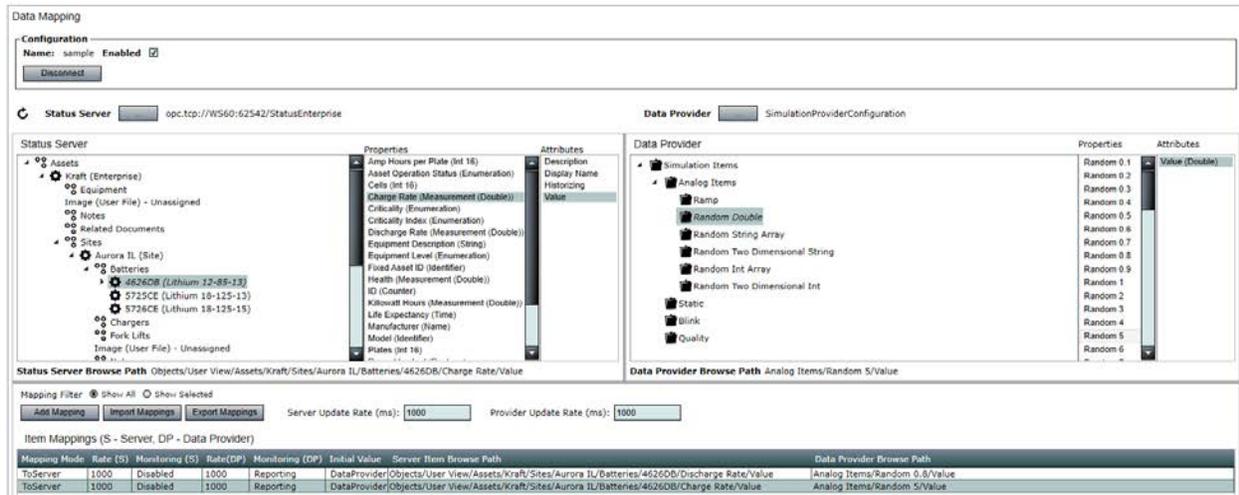

Step 5 – Confirm and Connect

Click 'Connect' after confirming all settings are correct. The 'Data Provider' listed should be the provider you just selected and configured. The 'Status Server' should be pointed to the address of your hosted Status Server – which was provided at the time your Status Device Cloud account was created.

9

Step 6 – Create Your Data Mappings

Map the addresses or tags from your data source to properties in your data model. For your data model to receive real-time value updates, you must define which properties in your model are associated with which memory addresses in your controller (Example below shows simulated data from the Data Simulator provider).

Note: To create data mappings, you must have both a valid data source and an existing data model with assets and properties to which data points can be mapped.

More detailed information on the specifics of data mapping can be found in [Status Enterprise User Guide Part 12 – Data Connector Service](). Data mapping is also discussed in the training videos at [www.scadauniversity.com]() under the section '_Working with Live Data_'.

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Additional Information

More information – including training videos, product documentation, case studies, and more – can be found at www.scadauniversity.com.

Learn more about the Data Connector in Status Enterprise User Guide Part 12 – Data Connector Service.

Learn more about creating your data model in Status Enterprise User Guide Part 2 – Data Model Designer.

B-Scada provides software and hardware solutions for the monitoring and analysis of real time data in the SCADA (Supervisory Control and Data Acquisition), IoT (Internet of Things) and smart city domains. B-Scada systems are sold worldwide in various verticals including: building automation, transportation, smart grid, manufacturing, agriculture and commerce. B-Scada solutions are deployed onsite and as cloud-hosted solutions in a SaaS (Software as a Service) model. Learn more at http://scada.com.

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