Set Up Data Source Using Siemens S7 protocol

In this Appendix...

G

This manual covers the StrideLinx platform available from 2017 through 2021.

For details covering the StrideLinx Cloud 2.0 platform available after April 2021, please click here to link to that manual.

The StrideLinx Cloud 2.0 manual includes details describing the Activation Code model of Data Logging, Cloud Notify and other add-on features.

For information on the migration wizard from the original platform to StrideLinx Cloud 2.0, click here.

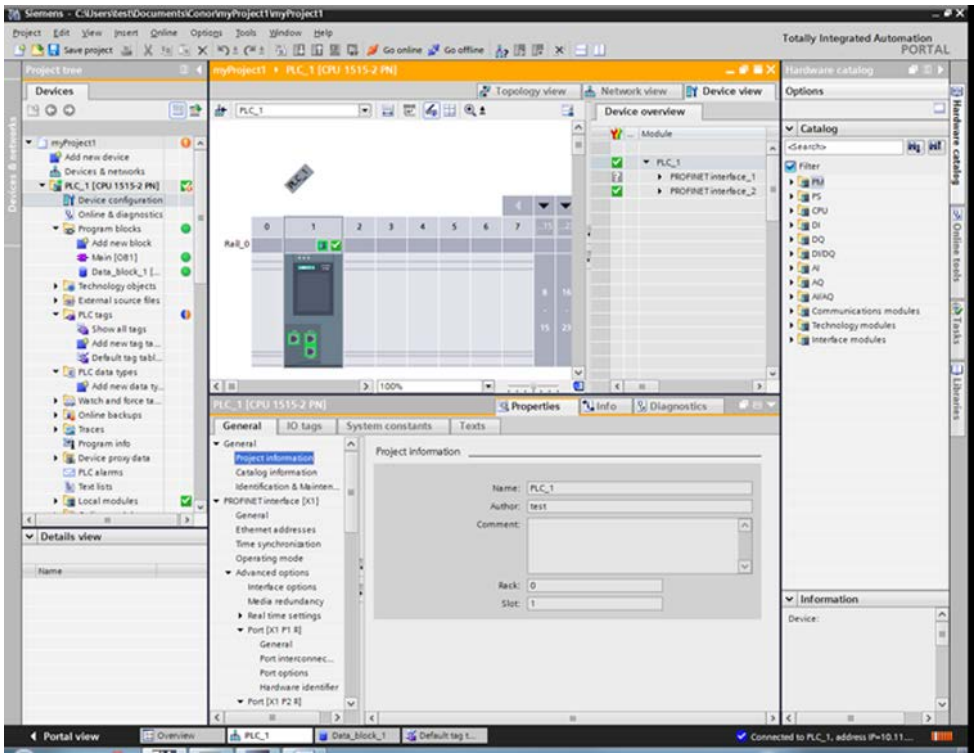
Set up data source for a device using Siemens S7 protocol

In order to use the cloud data logging or cloud notification functionality with a Siemens S7 PLC, the communication between the StrideLinx router and the PLC must be configured first. We will use Siemens TIA Portal software to collect information on the PLC and set required configuration options, then use the StrideLinx platform to set up data logging.

Prepare the Siemens PLC for remote data logging or notifications

Find the rack and slot numbers

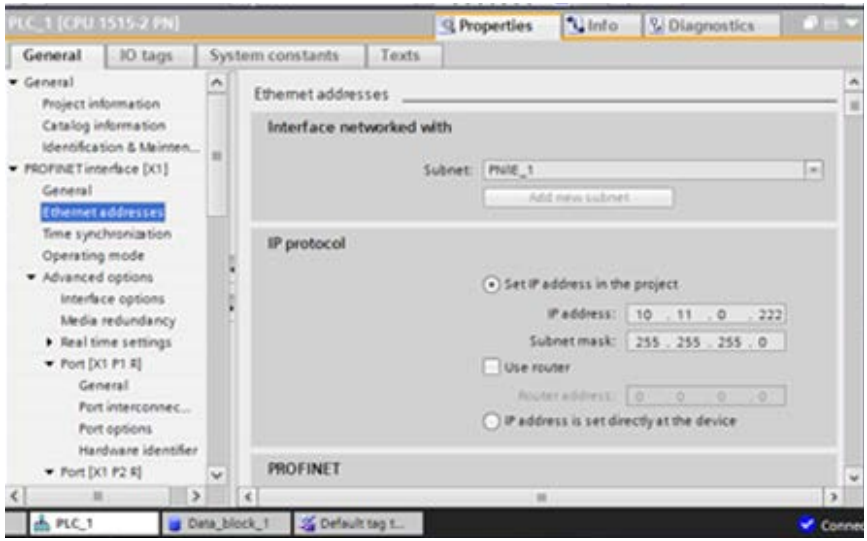
In TIA Portal, click on the CPU and select “Project Information” in the center panel. Make note of the rack number and slot number to enter into the StrideLinx platform later.



Find the static IP address

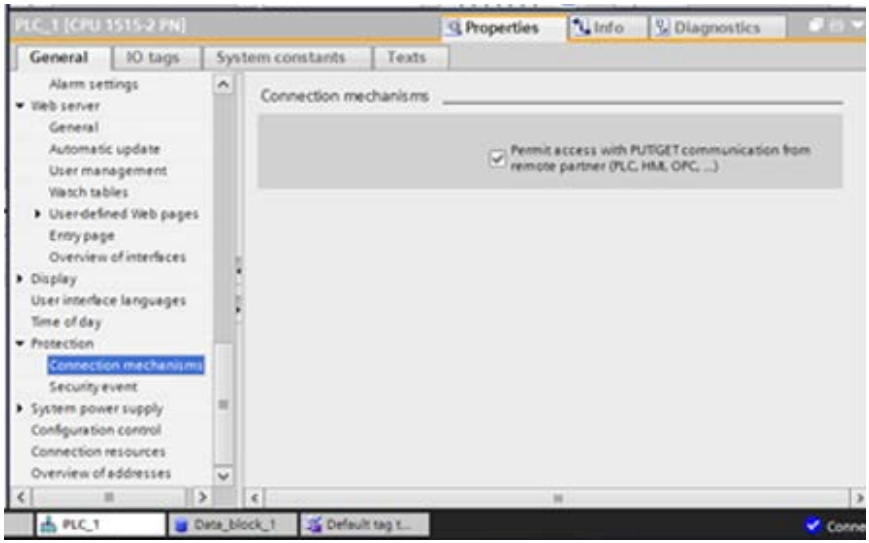
The PLC must have a static IP address in order to be accessed throught the VPN. To find or set the IP address, select “Ethernet addresses” in the center panel. Make note of the IP address

and subnet mask. Be sure the subnet mask shown matches the subnet mask of the VPN router.



Enable external access

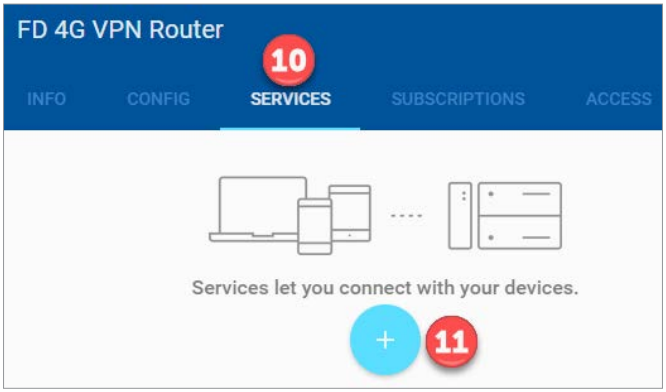
In the PLC, make sure you enable the "Permit access with PUT/GET communication from remote partner (PLC, HMI, OPC, ...)" option.



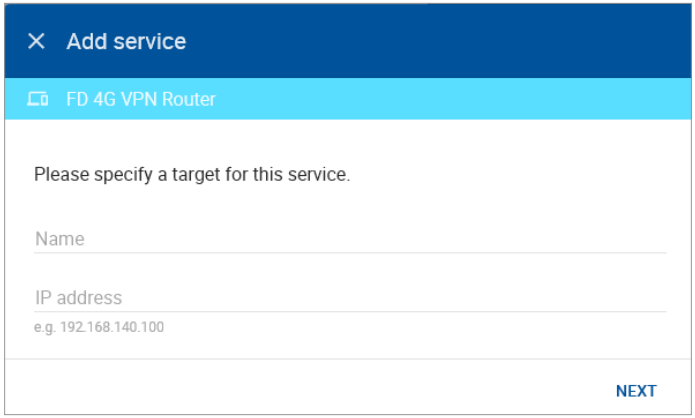
The Siemens S7 PLC is now ready to set up data logging or notifications on the StrideLinx platform.

Configure the address and protocol for the PLC from which data will be read

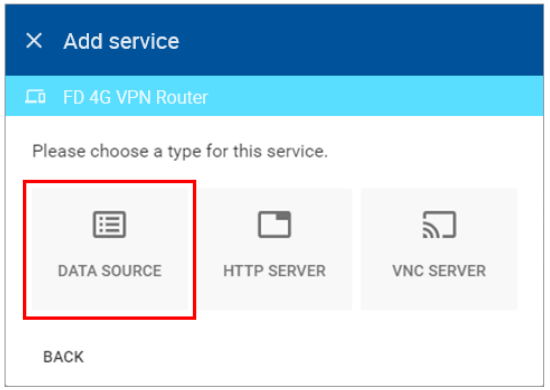
On the StrideLinx platform, click on the SERVICES tab (10). Click the +(Add) button (11).



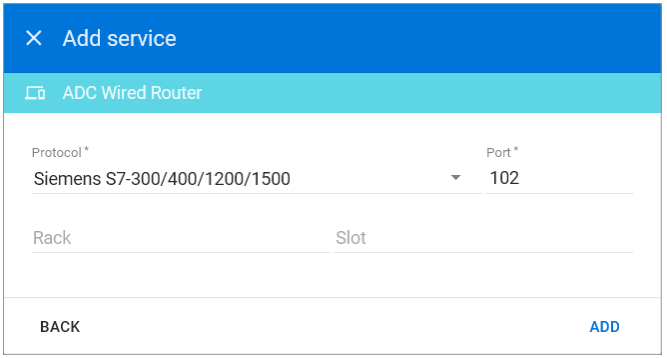
Add a Name and the IP Address of the PLC where the data resides. Click NEXT.



Select DATA SOURCE.

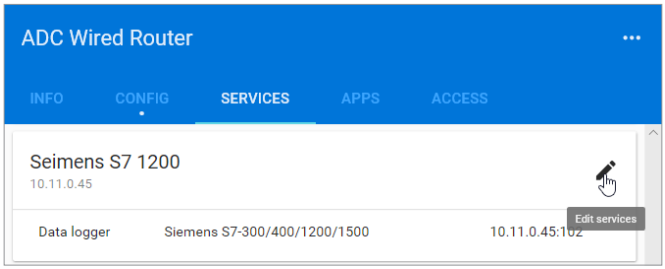


Select the Siemens S7 protocol. Fill in the rack and slot that were previously recorded for the PLC. Then click ADD to continue.

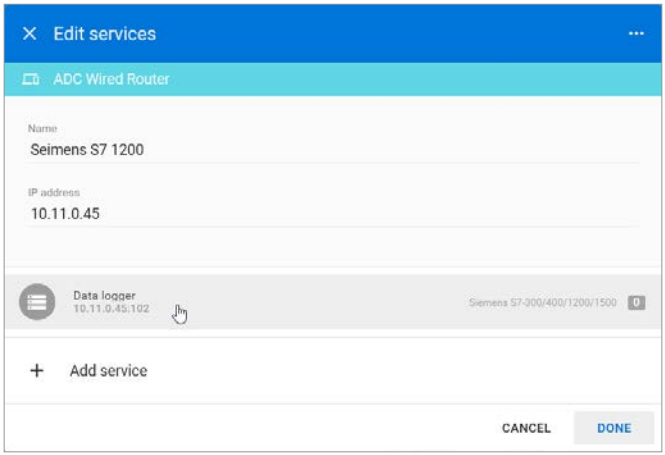


Configure the data tags

To add a data tag, go to the SERVICES tab for the router and click the Edit services (pencil) icon next to the device for which you want to add the data tag.

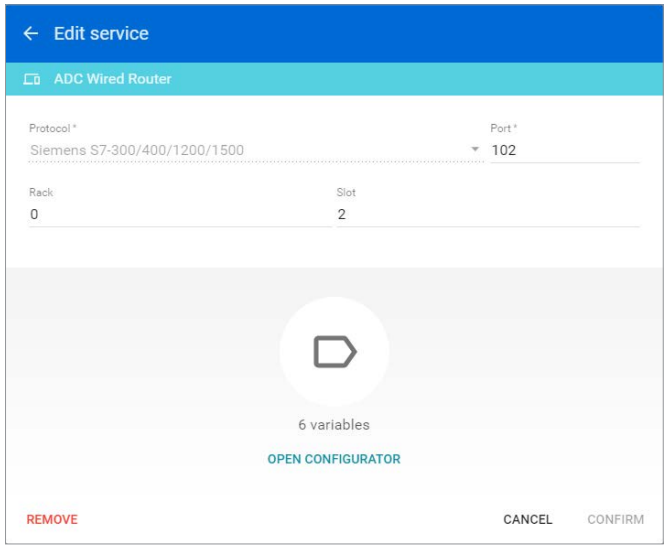


This opens the Edit services dialog. Click the name of the existing device for which you would like to add a data tag.



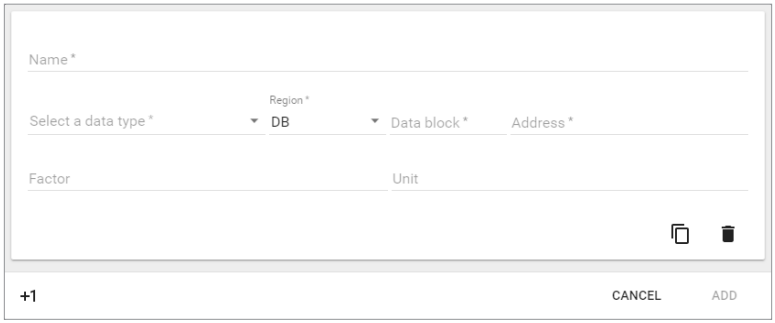
NOTE: *It is advisable to enter data tags in small batches, and test the variables periodically to verify the entries. The entries can be tested by clicking "RUN TEST" in the Configurator, or from the Cloud Logging Web App as described in the Data Logger Test Utility section. Please refresh your browser if the information on screen appears to not be updated properly at any time.*

The resulting "Edit service" screen displays the parameters for the data source, plus a count of existing data tags. Click OPEN CONFIGURATOR to add or edit tags.



Data tags can be entered interactively, or a set of tags can be imported from a previously-exported CSV file. Export of sets of data tags is discussed later in the "Export Data Tags" subsection. For this example, select "Add new variable" to manually enter tags.

A data entry screen opens, with one new data tag ready to be entered. Set the relevant parameters for the new data tag. The data tag input fields and supported data types are described in the next two tables, respectively. Subsequent figures illustrate the correct syntax for entering Siemens S7 addresses. Additional data tags can be entered in this round by clicking "+1" in the lower left corner of the screen. When all the desired tags have been entered click ADD.

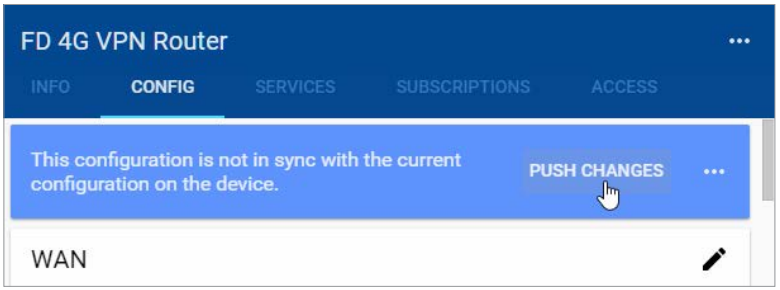


Data Tag Input Fields	
Field	***Description***
Name	Give the data tag a logical name.
Select a data type	See next table for the available data types.
Region	Select the type of value that needs to be logged. Values are Output Byte (AB), Input Byte (EB), Data Block (DB) and Markers (MB)
Data Block	Define in which data block the data tag is located.
Address	Define at which address in the data block the tag is located.
Unit (optional)	Here you can assign a value to a unit, for example, gallons or psi.
Factor (optional)	This allows you to multiply by a value. For example, factor 0.01 divides the data value by 100.

Data Types Supported		
StrideLinx	***Siemens S7 Elementary Types***	***Siemens S7 Memory Types***
Bool	BOOL	I/Q/M/DBX
Float32	REAL	ID/QD/MD/DBD
Float64		
Int8	BYTE	IB/QB/WB/DBB
Int16	INT	IW/QW/MW/DBW
Int32	DINT	ID/QD/MD/DBD
Int64		
String	CHAR	DBB String/DBB Char
Uint8		
Uint16	WORD	IW/QW/MW/DBW
Uint32	DWORD	ID/QD/MD/DBD
Uint64		

The following subsection, "Siemens S7 address notation and lookup," presents the recommended method to determine the correct address and syntax for your data tag. After all data is entered, click ADD to continue.

Once you have added all the data tags you want to log, you will be prompted to push the configuration to the router.



The data tag entries should now be verified using the procedure described in the "Test Utility" subsections of Chapter 4 and Chapter 5.

NOTE: *Additional data tag parameters related specifically to data logging (i.e., sampling interval, data retention policy, and logging only when changed) can be set from the Cloud Logging web app discussed in Chapter 4.*

The Cloud Logging web app can now be used to set up data dashboards and to adjust additional data tag parameters related specifically to data logging, and the Cloud Notify web app can be used to set up alarm notifications.

Export data tags

Data tag configurations can be exported in CSV format. The CSV file is downloaded to your local PC, and can later be imported to set up another StrideLinx router.

Select data tags to be exported by clicking the icon for each data tag, or select all data tags at once from the More Options (•••) menu in the upper right corner of the screen. The selected data tags can then be deleted, duplicated, or exported from the pop up menu at the bottom of the screen.

Siemens S7 address notation and lookup

The following data within Siemens S7 PLC is addressable for remote access.

Siemens S7 Memory Addressing					
Memory Type		**Range**	**Description**	**Read/Write**	**Data Type**
I	I *	0.00–65535.7	Input Memory	R/W	Bit
	IB *	0–65535			Byte
	IW *	0–65535			Word
	ID *	0–65535			Double Word
Q	Q *	0.00–65535.7	Output Memory	R/W	Bit
	QB *	0–65535			Byte
	QW *	0–65535			Word
	QD *	0–65535			Double Word
M	M *	0.00–65535.7	Internal Memory	R/W	Bit
	MB *	0–65535			Byte
	MW *	0–65535			Word
	MD *	0–65535			Double Word
DB	DBX *	1.0–65535.65535	Data Block Memory	R/W	Bit
	DBB *				Byte
	DBW *				Word
	DBD *				Double Word

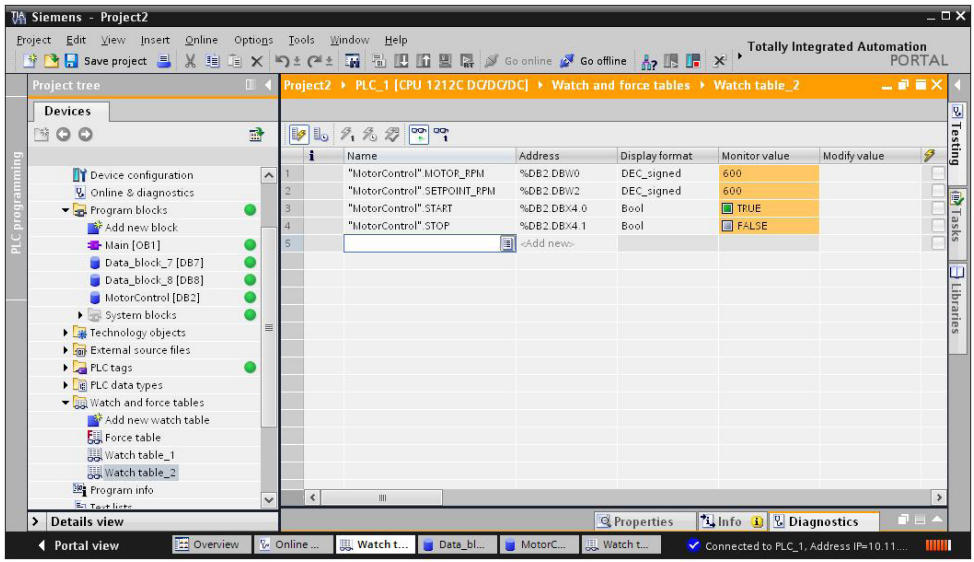
**** Does not need to be entered. Only displayed.***

NOTE: *Timers and Counters are System Blocks that are not addressable.*

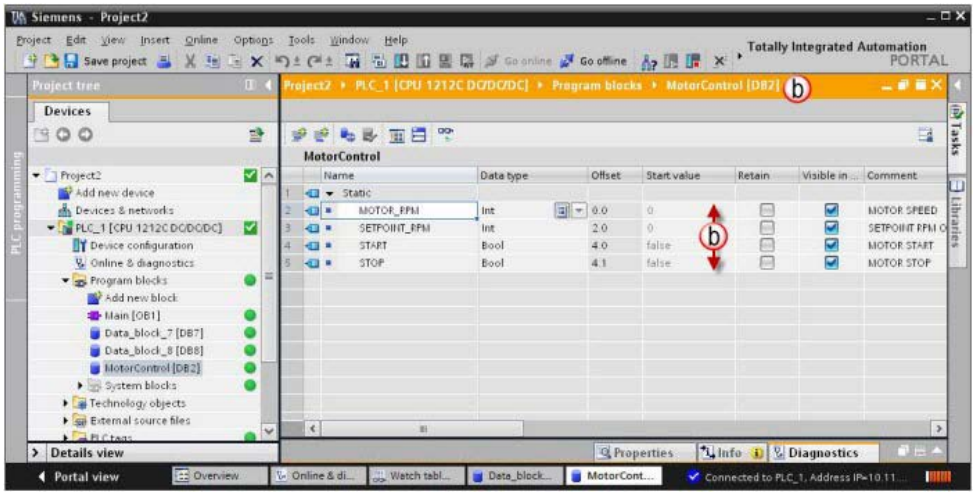
NOTE: *Data Blocks must have "Optimized Block Access" DISABLED in SIMATIC STEP 7 software in order to be accessed remotely.*

Use the Offset column of the Data Block as the byte address for StrideLinx. Even though the DB is defined as “Int” the offset is still byte not word.

To view the status of the variables in the PLC, connect to the PLC within SIMATIC STEP 7 and add or open an existing Watch Table from the Devices Tree as shown below.



Data Block Addressing syntax differs some between what is seen in SIMATIC STEP 7 and in StrideLinx. To view the Data Block, double click on the specific Data Block you wish to view. When a specific Data Block is selected, a window like the one shown below will open.



The previous image shows DB2. Inside DB2, there are four variables:

- MOTOR_RPM is addressed at byte0 and is a 16-bit Integer.
- SETPOINT_RPM is addressed at byte2 and is also a 16-bit Integer.
- START is addressed at byte 4, bit 0 and is a Boolean.
- STOP is addressed at byte 4, bit 1 and is a Boolean.

If the "Offset" column is not displayed, right-click any column header to Show / Hide Columns.

These four variables would be addressed as follows in StrideLinx:

- MOTOR_RPM: Type = Int16, Region = DB, Data block = 2, Address = 0
- SETPOINT_RPM: Type = Int16, Region = DB, Data block = 2, Address = 2
- START: Type = Boolean, Region = DB, Data block = 2, Address = 4, Bit = 0
- STOP: Type = Boolean, Region = DB, Data block = 2, Address = 4, Bit = 1