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Connectivity Guide

Connecting to Allen-Bradley PLC-5
using ControlLogix Gateway

February 2021
Ref. 1.002

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1. Overview

The purpose of this document is to provide a real-life example of how to connect Allen-Bradley PLC-5 devices using ControlLogix Gateway. In this instance, their infrastructure had been in place for 5 years. They had an RSLinx connected to the Gateway, but they wanted to replace it with KEPServerEX®.

1.1 Hardware Infrastructure

1. **PLC5 Controllers**. This is a very old controller by Allen-Bradley, discontinued a long time ago. They used to communicate with a serial connector with a protocol called DH+ (Data Highway Plus). Each PLC5 has physical switches to provide a DH+ identification number (unique in the network).

    ◆ *Consult: http://ab.rockwellautomation.com/programmable-controllers/plc-5-controllers*

2. **Data Highway Plus (DH+)**. It is an old serial protocol, based on RS-485, developed and owned by Allen-Bradley. With this serial connection, you could exchange messages between devices in the line, and connect PCs to get real time data (for HMI and SCADAS for example) and even to program the PLC. (This driver was deprecated in KEPServerEX 6.10.623.)

    ◆ *Consult: https://www.rtaautomation.com/blog/data-highway-plus-dh/*

3. **ControlLogix Gateway**. This is basically the converter between Ethernet Allen-Bradley CIP protocol to the serial DH+ protocol. This ControlLogix does not need any CPU, but will need the appropriate modules according to what protocols you want to convert from and to. In my case, the ControlLogix Gateway consisted of the following elements:

    ◆ *Consult:*
    http://literature.rockwellautomation.com/idc/groups/literature/documents/um/1756-um513_-en-p.pdf

    a. **1756-DHRIO**. ControlLogix DHRIO Communication Module. It can be configured to communicate using RIO or DH+ protocols. It has 2 serial interfaces, to create up to 2 DH+ networks (A and B). In my case, the customer was only using Interface A.

        ◆ *Consult:*
        http://literature.rockwellautomation.com/idc/groups/literature/documents/um/1756-um514_-en-p.pdf

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b. **1756-ENET**. ControlLogix Ethernet Communication Module. This is the module that KEPServerEX will connect to. You can define the IP via rotary switches or with a software configuration tool. We will use ControlLogix Ethernet driver to connect KEPServerEX to this module.
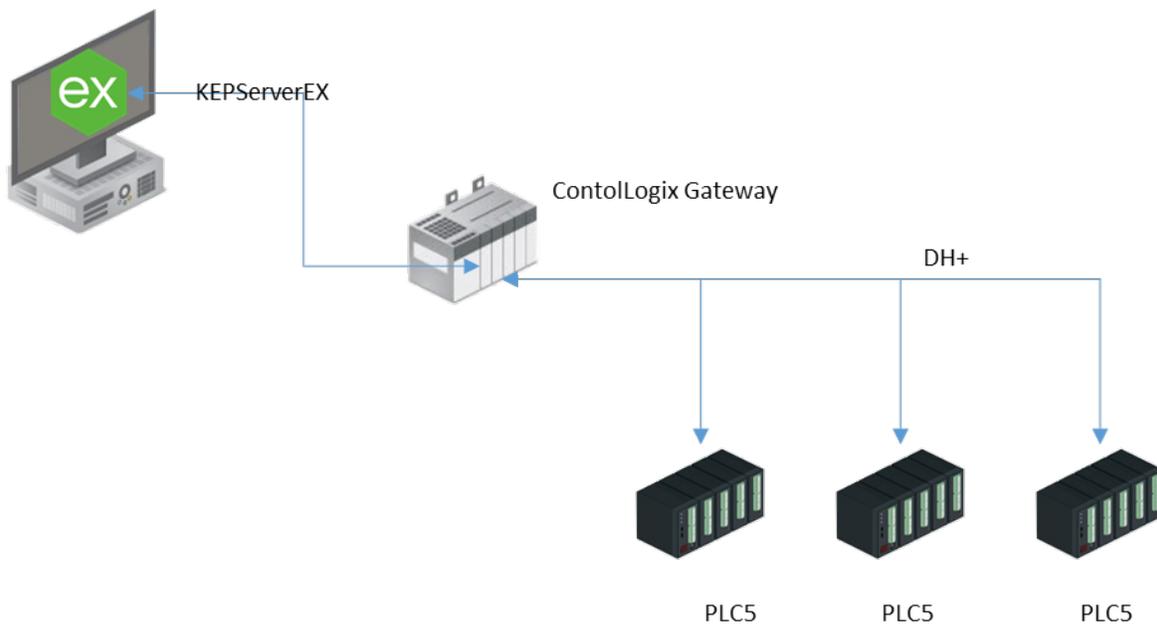
◆ *Consult:*
*http://literature.rockwellautomation.com/idc/groups/literature/documents/um/1756-um051_-en-p.pdf*

c. **1756-A4**. ControlLogix chassis. This is the backplane where the modules are plugged in. It is also known as backplane.
d. **1756-PA72**. Power supply. Also plugged to the chassis.

1.2 Architecture

1.3 Identify Each Device in the Network

A user already using RSLinx Classic can run the RSWho command from RSLinx (Communications →
RSWho) and wait a few seconds for the program to find all the Allen Bradley elements accessible
from the PC. Below is an example of what might be received:
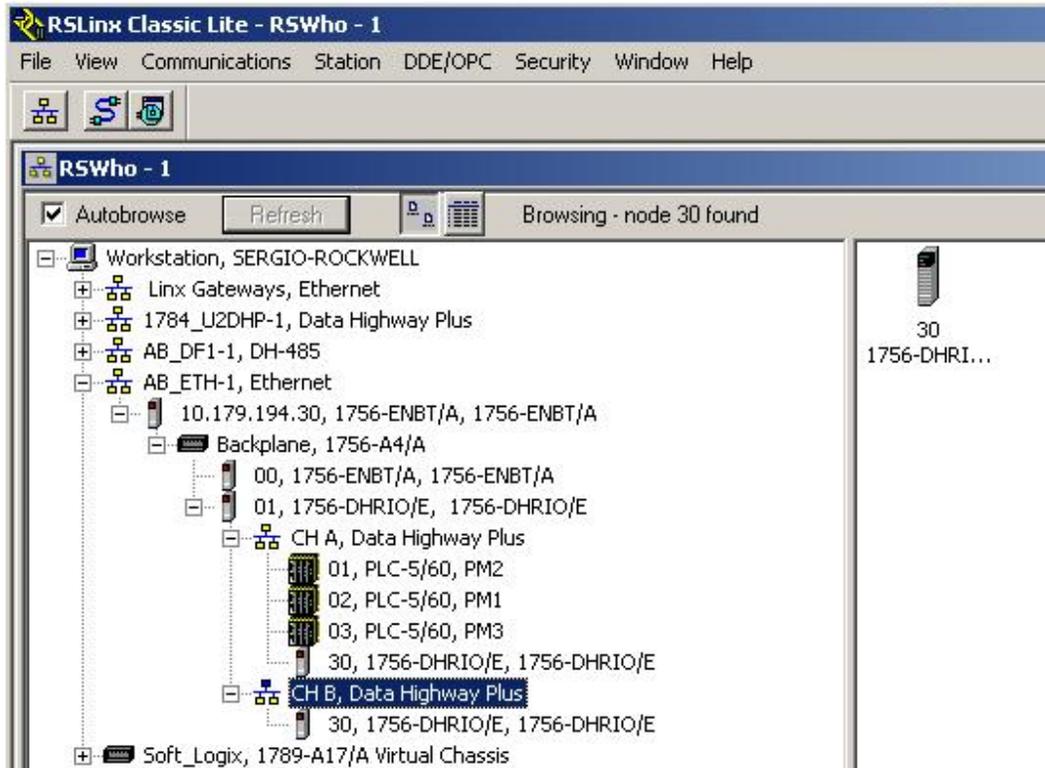
🌸 **Tip**:   RSLinx Lite is a free version of RSLinx that can be used to browse for devices.

Knowns:

- The Ethernet module has the following IP address: 10.179.194.30
- The DH+ module is in slot 01 of the backplane, and the Ethernet module is in slot 00.
- In the DH+ network there are 3 devices, PLC5/60, all of them in the first interface of the DH+
  module (Interface A) with the identifiers 1, 2 and 3.

⚪ **Note**:   The DH+ interface must have a DH+ address. The PLC programmer gave the address 30
                octal (24 decimal).

1.4 Configure KEPServerEX

1. Create a new channel for Allen-Bradley ControlLogix Ethernet.

Property Groups	Identification	
General	Name	PM1
Ethernet Communications	Description	
Write Optimizations	Driver	Allen-Bradley ControlLogix Ethernet
Advanced	**Diagnostics**	
	Diagnostics Capture	Disable

2. Create a new device and configure it with DH+ Gateway: PLC5 as the model.

3. In the ID field, enter the following: <10.179.194.30>,1,1.A.2.

Property Groups	Identification	
General	Name	PM1
Scan Mode	Description	
Timing	Driver	Allen-Bradley ControlLogix Ethernet
Auto-Demotion	Model	DH+ Gateway: PLC-5
Tag Generation	Channel Assignment	PM1
Logix Comm. Parameters	ID	<10.179.194.30>,1,1.A.2
Logix Options	**Operating Mode**	
Logix Database Settings	Data Collection	Enable
ENI DF1/DH+/CN Gtwy Co...	Simulated	No
Redundancy		

ID
Specify the device's driver-specific station or node.

[Defaults] [OK] [Cancel] [Apply] [Help]

4. This allows access to the device ID 2 in DH+ interface A in slot 1 of the backplane (always #1) in the gateway whose IP address is 10.179.194.30.

5. DH+ devices do not accept ATG, so create the tags manually according to the PLC5 syntax, as shown in the screenshot below.

Property Groups	Identification	
General	Name	STATE
Scaling	Description	Status of the machine. 1 running/2 Stop
	Data Properties	
	Address	N7:30
	Data Type	Word
	Client Access	Read/Write
	Scan Rate (ms)	100

Description
Provide a brief summary of this object or its use.

| Defaults | OK | Cancel | Apply | Help |

6. Verify communication is successful and providing data.