PEPPERL+FUCHS
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Using barcode reader with Ethernet/IP

Introduction

The Pepperl+Fuchs handheld barcode reader has RS232, USB or wireless connectivity. This document will describe how to make an RS232 cabled barcode reader work with an RTS Ethernet/IP adapter.

Ethernet/IP

The barcode reader has an RS232 interface. It does not however support Ethernet/IP directly. In order to talk Ethernet/IP use the converter RTS-UP… unit to convert the serial data to Ethernet/IP. The Ethernet/IP data will be placed directly into the PLC memory. No ladder logic programming will be required.

RTS-UP-1 – Converts one serial and one Ethernet device to Ethernet/IP
RTS-UP-4 – Converts four serial and four Ethernet devices to Ethernet/IP

This document will show you how to correctly configure the barcode readers and the RTS adapter.

Barcode hardware requirements

ODT-HH-MAH… - Barcode reader
ODZ-MAH-CAB-R2 – RS232 cable
ODZ-MAH-5V-110V – 5V power supply

Configure the barcode reader

Follow these steps to configure the barcode.

Set barcode reader to RS232 defaults

Configure the barcode reader for RS232 defaults by scanning these barcodes. Make sure the SAVE barcode is scanned at the end as well. This will configure your barcode reader to 57,600, 2 stop bits, 8 data bits, and no parity.

RS232 1-way mode

RS232 defaults

Save

Configure a suffix or a prefix and suffix. This example will use a Carriage return as a suffix only.

Delete prefix and suffix

Carriage return as suffix

Configure RTS-UP-… Ethernet/IP adapter

Load Ethernet/IP firmware

The RTS-UP unit comes with socket server firmware. If you want other firmware for industrial busses like Ethernet/IP, PROFINET, or Modbus/TCP then download this firmware from our web site and send the firmware to the unit using PortVision.

Download and install Portvision Plus

You may have to reboot your PC to see the RTS unit. Click "Scan".
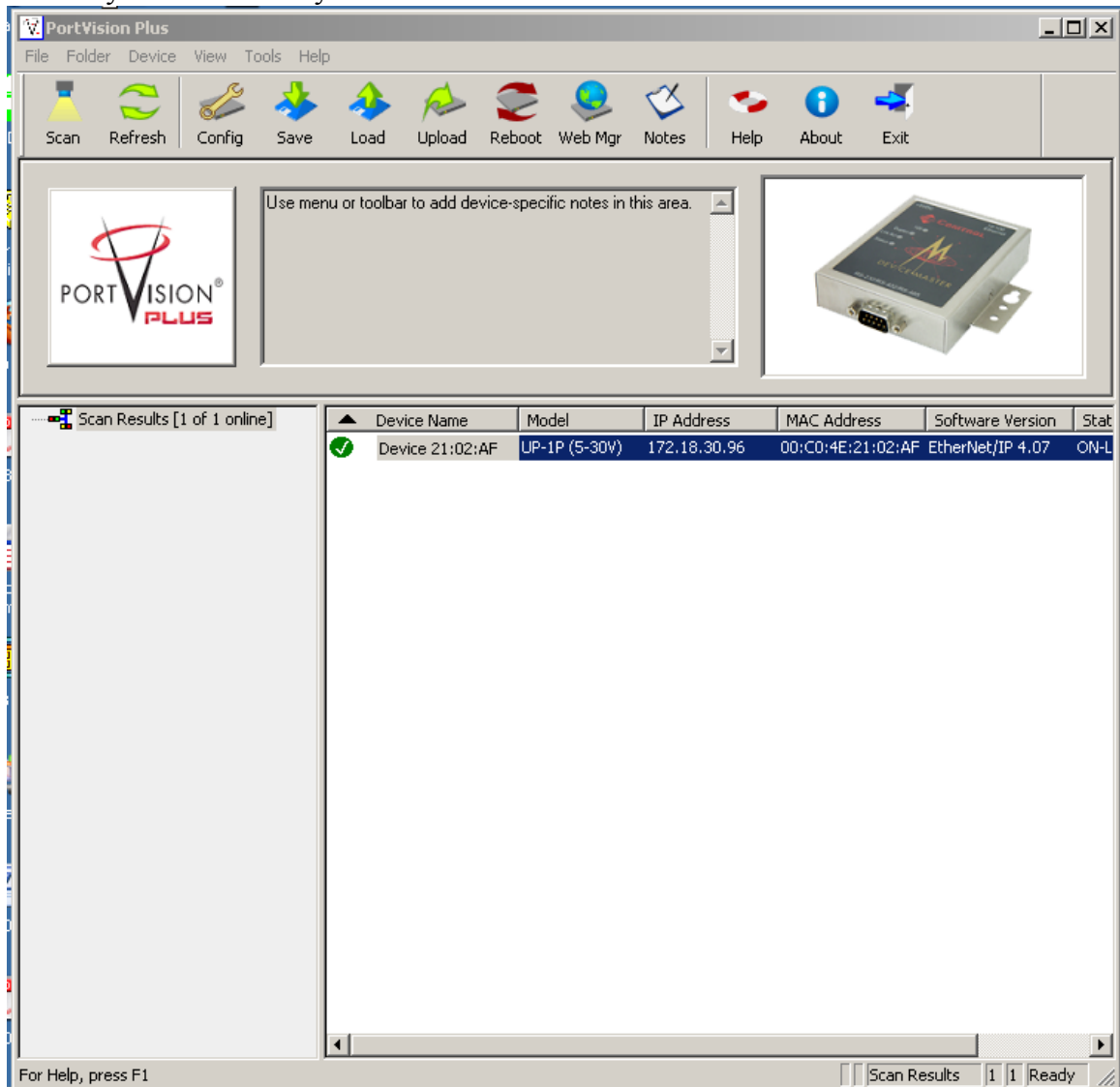

Scanning for RTS-UP… devices

Download the Ethernet/IP firmware

If the Scan Results do not show a device with Ethernet/IP firmware; then highlight the device and go to the menu "Device > Upload Firmware" and update the RTS unit with the right firmware. When you install the Ethernet/IP firmware above the .bin file will be in the folder Comtrol > Ethernet/IP > Ethernetip-x.xx.bin
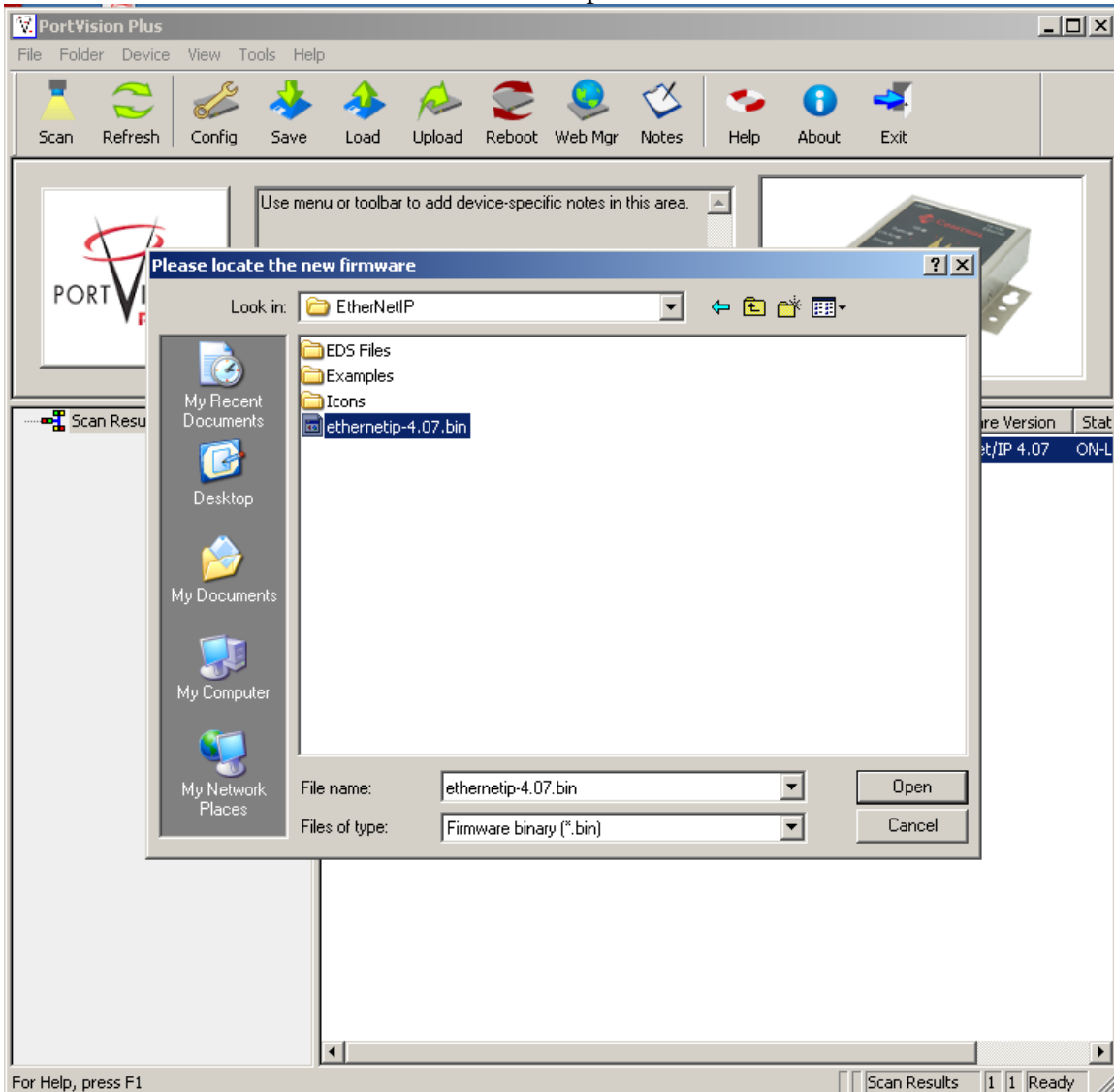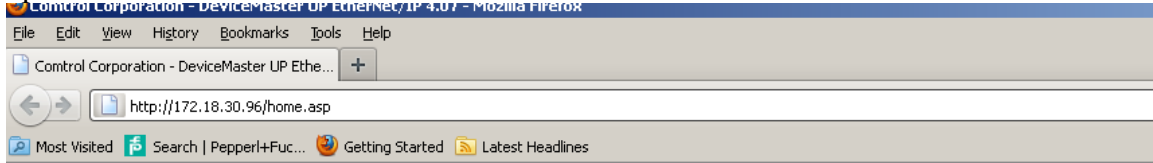

Loading the Ethernet/IP firmware into the RTS-UP…

Using PortVision you can also double click on the scanned unit and configure the IP Address, subnet mask, and gateway.
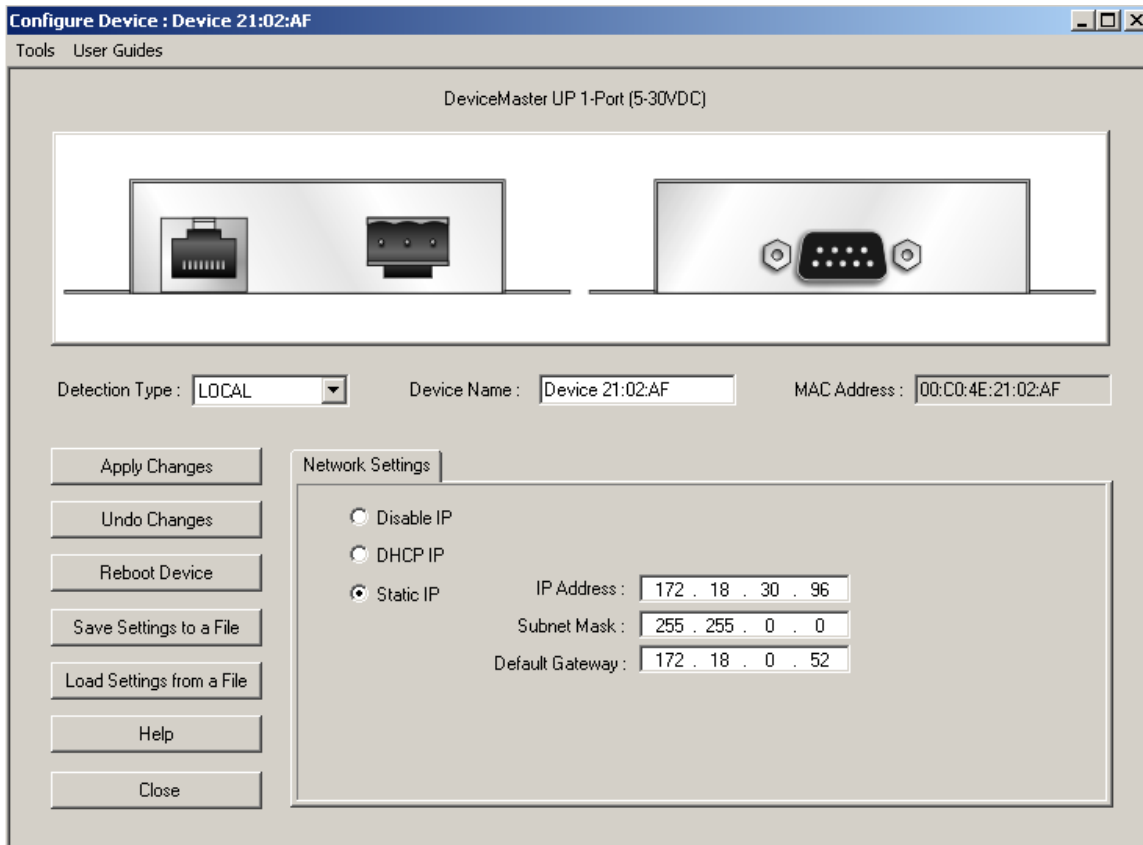
IP address configuration screen for RTS-UP…

Configure the RTS and barcode reader to work together

Put the IP address of the RTS-UP… unit in a web browser. You will configure the rts-up…unit here.

Go to Serial Device Configuration and open up Port 1. Make the configuration changes you see below. Some settings you will have to customize yourself. The items circled in red are the ones that differ from the default.

Serial Device Configuration

Server Configuration Home
Ethernet Device Configuration
Communication Statistics
PLC Interface Diagnostics
Display Serial Logs

	Port 1
Serial Port Settings	
Mode:	RS-232
Baud:	9600
Parity:	none
Data Bits:	8
Stop Bits:	1

Things you will need to know to make these settings:

PLC IP address

PLC controller slot number(Usually 0)

Control tag variable, SINT array, where the read data will be placed. My example has a variable called barcode[50] that is an SINT array.

Edit Serial Port 1 Configuration

Serial Configuration
Mode: `RS-232`
Baud: `57600`
Parity: `none`
Data Bits: `8`
Stop Bits: `2`
Flow: `none`
DTR: `off`
Rx Timeout Between Packets: `200` (msec)

Serial Packet Identification
STX (Start of Transmission) Rx Detect: `none` Byte 1: `___` Byte 2: `___` (dec)
ETX (End of Transmission) Rx Detect: `one byte` Byte 1: `13` Byte 2: `___` (dec)
Discard Rx Packets With Errors: ☑

PLC Specific Settings
STX (Start of Transmission) Tx Append: `none` Byte 1: `___` Byte 2: `___` (dec)
ETX (End of Transmission) Tx Append: `none` Byte 1: `___` Byte 2: `___` (dec)
Strip Rx STX/ETX: ☐

Application Specific Settings
STX (Start of Transmission) Tx Append: `none` Byte 1: `___` Byte 2: `___` (dec)
ETX (End of Transmission) Tx Append: `none` Byte 1: `___` Byte 2: `___` (dec)
Strip Rx STX/ETX: ☐

EtherNet/IP Settings
Rx (To PLC) Ethernet Transfer Method: `Write-to-Tag/File`
PLC IP Address: `172.18.30.9`
PLC Controller Slot Number (ControlLogix Family): `0`
Maximum PLC Update Rate (Write-To-Tag/File): `40` (msec)
Maximum Rx Data Packet Size: `40` (bytes)
Oversized Rx Packet Handling: `Truncate`
Rx (To PLC) Produced Data Tag/File Name: `barcode`

Note: File names for SLC/PLC-5 must begin with a "$" (i.e. $N10:0).
Note: File names for MicroLogix must begin with a "#" (i.e. #N10:0).
Tx Sequence Number Checking: ☐
Disable Non-Filtered To PLC Rx Queue: ☐
(PLC-5/SLC) Rx MS Byte First: ☐
(PLC-5/SLC) Tx MS Byte First: ☐

Port configuration screen for RTS-UP…

Once all settings have been made, choose "Submit" at bottom of page. Wait for unit to reboot.

Make sure your PLC has the same tag as was configured in the web interface. This example uses a tag name "barcode. **It must be of type SINT array**. A length of 50 is appropriate. **The tag must be a controller tag.**

⊞-Local:2:I		{...}		AB:1769_MODUL...
⊞-Local:2:O		{...}		AB:1769_MODUL...
⊞-barcode		{...}	Decimal	SINT[50]

How will you know it is working?

Go back to the web configuration screen of the RTS-UP… unit and now go to the PLC Interface Diagnostics screen. Trigger the barcode reader. Refresh screen and the "Messages/Responses Sent to PLC" will count up on the PLC Interface Diagnostics screen. Also at the bottom you will see "No Error Detected"

PLC Interface Diagnostics

Server Configuration Home
Serial Device Configuration
Ethernet Device Configuration
Communication Statistics
Display Serial Logs

EtherNet/IP Interface Statistics	Reset Statistics
Messages/Responses Received From PLC:	3
Broadcasts Received From PLC:	0
Messages/Responses Sent To PLC:	3
Request Messages From PLC:	0
Bad Responses to Msgs Sent To PLC:	0
Invalid Network Path Errors:	0
No Response From PLC Errors:	0
Pending Request Limit Errors:	0
Unexpected Event Errors:	0
Unsupported CIP Request Instance Errors:	0
Unsupported CIP Request Service Errors:	0
Unsupported CIP Request Class Errors:	0
Unsupported CIP Request Attribute Errors:	0
Improper Configuration Errors:	0
Invalid Message Data Errors:	0
System Resource Errors:	0
Oversized Received Data Packet Errors:	0
Writes To Offline Ethernet Device on Socket1:	0
First Error Description:	No Error Detected

The data will now appear automatically in the PLC. The counter in the first two bytes will increment for each barcode read.

The amount of data will very depending on the length of the barcode read. There will be a four byte header in the PLC that will be used by your PLC program to figure out when new messages arrive. You program should look for the counter to know when a new barcode has been read.

See below what the tag data will look like in the PLC.

⊟ barcode	{...}	Decimal	SINT[50]
⊞ barcode[0]	4	Decimal	SINT
⊞ barcode[1]	0	Decimal	SINT
⊞ barcode[2]	7	Decimal	SINT
⊞ barcode[3]	0	Decimal	SINT
⊞ barcode[4]	'2'	ASCII	SINT
⊞ barcode[5]	'1'	ASCII	SINT
⊞ barcode[6]	'5'	ASCII	SINT
⊞ barcode[7]	'1'	ASCII	SINT
⊞ barcode[8]	'3'	ASCII	SINT
⊞ barcode[9]	'9'	ASCII	SINT
⊞ barcode[10]	13	Decimal	SINT
⊞ barcode[11]	0	Decimal	SINT
⊞ barcode[12]	0	Decimal	SINT
⊞ barcode[13]	0	Decimal	SINT
⊞ barcode[14]	0	Decimal	SINT
⊞ barcode[15]	0	Decimal	SINT
⊞ barcode[16]	0	Decimal	SINT
⊞ barcode[17]	0	Decimal	SINT

Counter

Barcode length

Barcode

Suffix

Barcode data as it looks in Allen Bradley PLC