

CP1L-L14 High Speed Counter to NS5.

PURPOSE:

This document will show how to configure the CP1L-L14 to use the high speed counter 0 to measure the length of material passing by a sensor. The total length is then displayed on the NS5 operator interface.

REQUIRED EQUIPMENT:

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|----|-------------|-------------------------------|
| 1. | CP1L-L14DRA | Omron CP1L PLC. |
| 2. | CP1WCIF01 | RS232 Port of CP1L |
| 3. | S8VM-03024 | Power Supply. |
| 4. | E6B2-CWZ6C | Rotary Encoder. |
| 5. | NS5-MQ01BV2 | Omron NS5 Operator Interface. |

REQUIRED SOFTWARE:

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|----|------------------|--|
| 1. | CX-PROG V7.2 | Omron PLC Programming Software. |
| 2. | CX-DESIGNER V2.1 | Omron Operator Interface Programming Software. |

REQUIRED CABLES:

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|----|-------------|----------------------------|
| 1. | | USB PLC Programming Cable. |
| 2. | C200H-CN229 | NS5 Programming Cable. |
| 3. | C200H-CN320 | NS – PLC Com Cable |

FILES:

CP1L High Speed Counter NS5.doc	The file you are reading.
CP1L High Speed Counter NS5.xp	CP1L Program.
CP1L_HighSpeedCounter_NS5.ipp	NS5 Program.
CP1L_HighSpeedCounter_NS5 folder	NS5 Program support files.

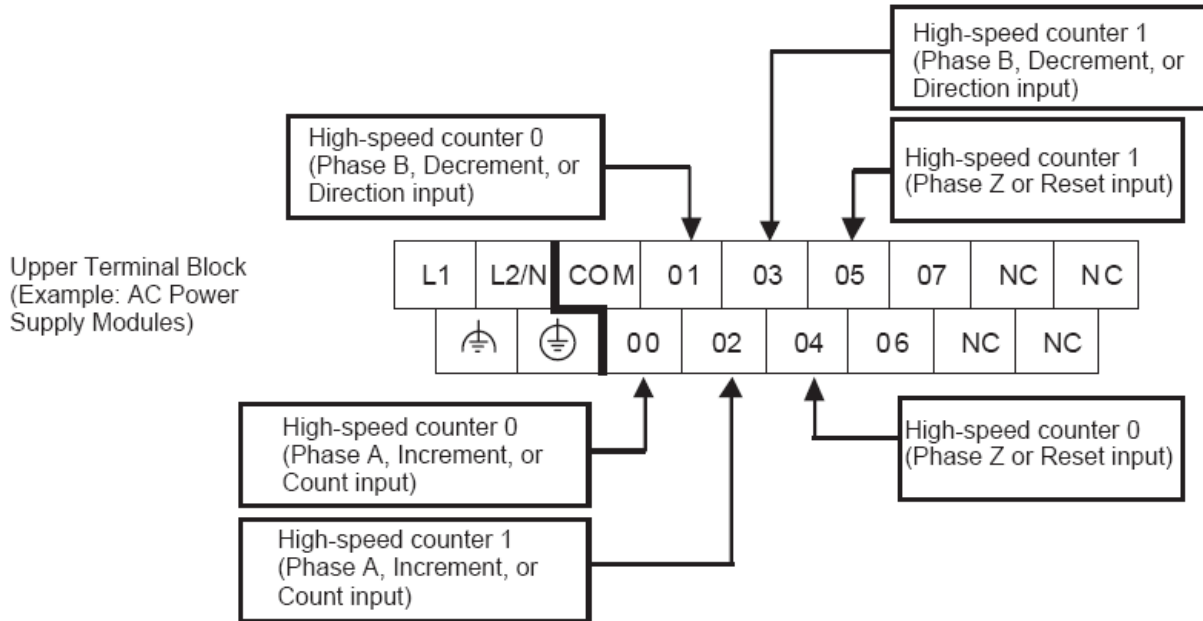
HELPFUL MANUALS:

W451 CP1H/CP1L Programming Manual
W462 CP1L Operation Manual

INSTRUCTIONS:

1. Wire the encoder to the PLC using the diagram below of CP1L terminals as a guide.

Input Terminal Arrangement for CPU Units with 14 I/O Points



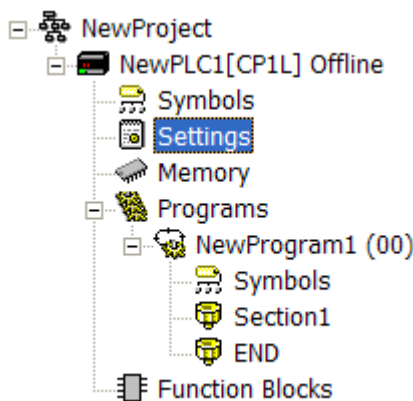
- You also need to use something called a gate. The gate signal tells the high speed counter to either count or ignore the pulses being received. In our example we only want to count when there is material passing by a sensor. We wired the sensor to Input 7. Below there is a description from the manual on the Gate bit. For High Speed Counter 0 the bit is A531.08

Purpose	Function used	Description
Measure a workpiece's length or position. (Start counting when a certain condition is established or pause counting when a certain condition is established.)	High-speed Counter Gate Bit	The high-speed counter can be started or stopped (PV held) from the Unit's program by turning ON/OFF the High-speed Counter Gate Bit when the desired condition is met.

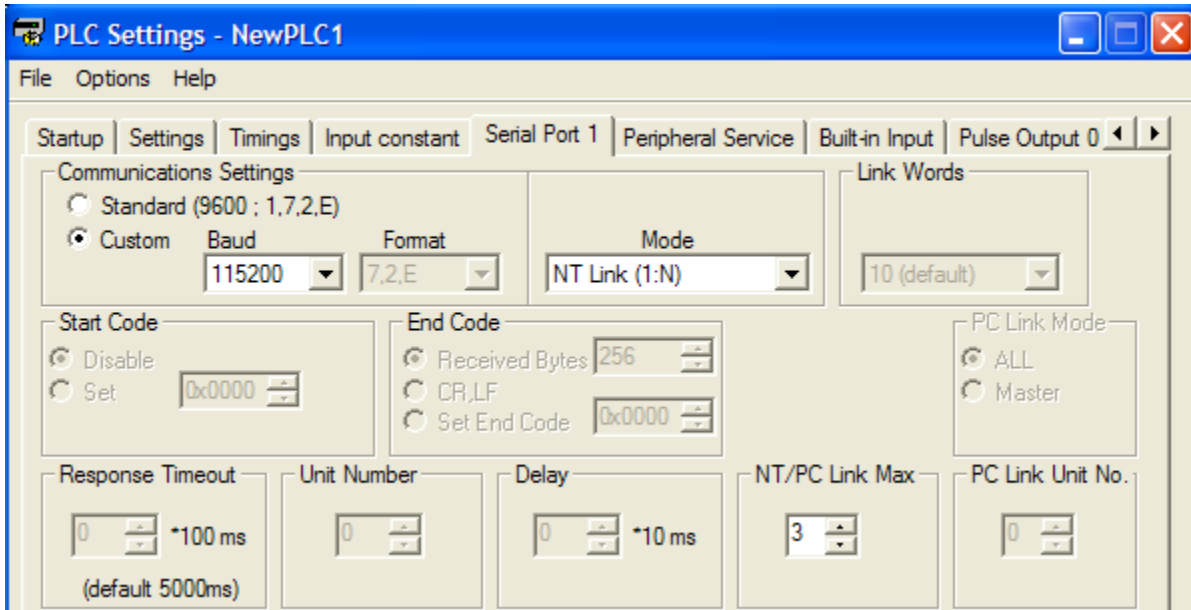
If the High-speed Counter Gate Bit is turned ON, the corresponding high-speed counter will not count even if pulse inputs are received and the counter PV will be maintained at its current value. Bits A53108 to A53111 are the High-speed Counter Gate Bits for high-speed counters 0 to 3.

When the High-speed Counter Gate Bit is turned OFF again, the high-speed counter will resume counting and the counter PV will be refreshed.

- Turn the power on to the PLC and connect to it using CX Programmer. Make sure the PLC is in the Program / Stop Mode.
- Double click on Settings in the Project Workspace.



5. This will open the PLC Settings window. Click on the Serial Port 1 Tab. Here you can change the settings for the CP1W-CIF01 module that should be plugged into the PLC. To communicate from the PLC to the screen we are going to use this module and the C200H-CN320 cable. Change the setting in the tab to reflect what is shown below.

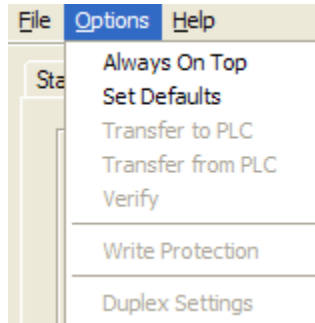


- Click on the Built-in Input Tab. This is where we setup how the High Speed Counter is going to function. In our case we are only going to use high speed counter 0 in a linear mode. We are going to reset the counter using the PLC program and the count is coming in as a differential input.

The screenshot shows the 'Built-in Input' configuration window with the following settings:

- High Speed Counter 0:**
 - Use high speed counter 0
 - Counting mode: Linear mode Circular mode
 - Circular Max. Count: 0
 - Reset: Software reset
 - Input Setting: Differential phase input
- High Speed Counter 1:**
 - Use high speed counter 1
 - Counting mode: Linear mode Circular mode
 - Circular Max. Count: 0
 - Reset: Z phase, software reset
 - Input Setting: Differential phase input
- High Speed Counter 2:**
 - Use high speed counter 2
 - Counting mode: Linear mode Circular mode
 - Circular Max. Count: 0
 - Reset: Z phase, software reset
 - Input Setting: [Empty]
- High Speed Counter 3:**
 - Use high speed counter 3
 - Counting mode: Linear mode Circular mode
 - Circular Max. Count: 0
 - Reset: Z phase, software reset
 - Input Setting: [Empty]
- Interrupt Input:**
 - IN0: Normal
 - IN1: Normal
 - IN2: Normal
 - IN3: Normal
 - IN4: Normal
 - IN5: Normal

7. Once you have made the settings changes you will need to transfer them to the PLC. Click on the Options Menu and select Transfer to PLC.



8. Next download the demo program to the PLC.
9. Power down the PLC. Wait 10 seconds and power it back up. Reconnect using CX Programmer and put the PLC in the Run mode.
10. The next thing we need to do is to make sure that the counter is counting. The count values can be found at the following addresses. Experiment with the gate signal by turning it on and off and notice what happens to the counts.

High-speed counter 0: A271 (leftmost 4 digits) and A270 (rightmost 4 digits)

High-speed counter 1: A273 (leftmost 4 digits) and A272 (rightmost 4 digits)

11. If you look at the program you will also notice that we have converted the counts into inches.
12. Download to the NS screen and test.