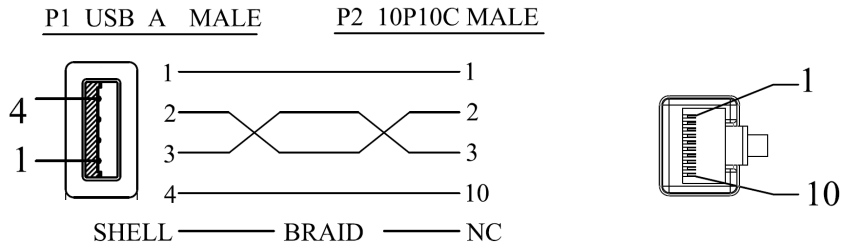
Barcode Scanners Communication To AutomationDirect PLCs via RS232

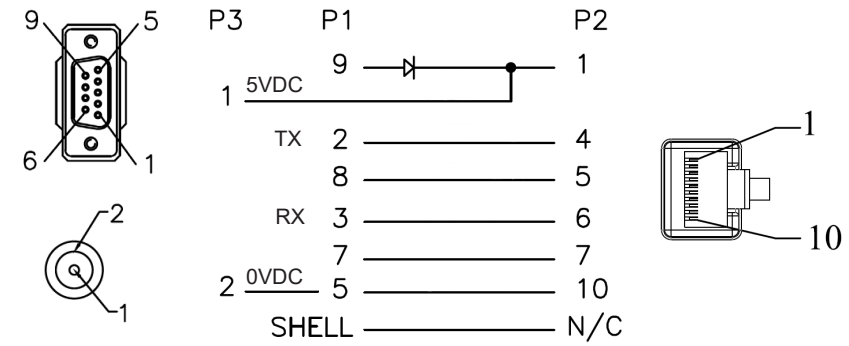
To allow the Code barcode readers to communicate to the AutomationDirect PLCs, you must first set up the scanner. With the scanner powered up, scan the column of code that correlates with the reader's part number.

User will need to select the baud rate, number of data bits, parity, and stop bits and set up RS232 connection through the selected PLC software.

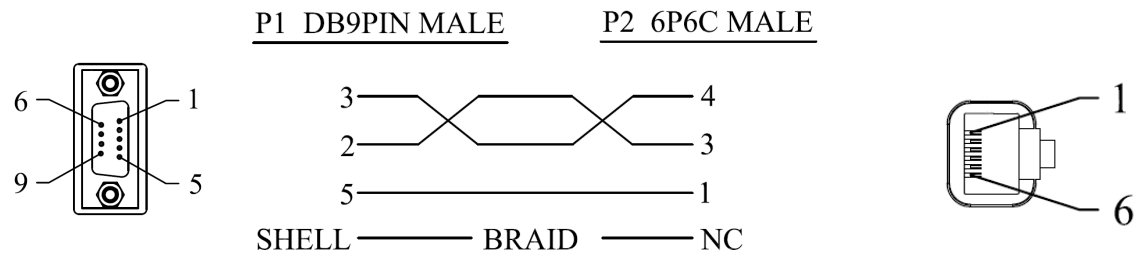
USB Connections (CRA-500-C298, CRA-C508-C298, CRA-C34-C298)



RS232 Connections (CRA-501-C298, CRA-C502-C298, CRA-C503-C298)



DB9 to RJ12 (CRA-519-C298)



CR950/CR1100/CR1500/CR5210 Configuration Codes

Configuration changes will take effect immediately and be saved to memory

Reset and Reboot

Note: When a Factory Reset is performed, a Reboot will be necessary.

1A Factory Reset

M20111_01

1B Reset to RS232 Factory Defaults

M20112_01

1C Reboot Reader

M20345_01

1D Enable RS232 Serial Mode (Default)

M20251_01

Baud Rate

2A RS232 Interface 1200 Baud Rate

M20160_01

2B RS232 Interface 2400 Baud Rate

M20161_01

2C RS232 Interface 4800 Baud Rate

M20162_01

2D RS232 Interface 9600 Baud Rate

M20163_01

3A RS232 Interface 19200 Baud Rate

M20164_01

3B RS232 Interface 38400 Baud Rate

M20165_01

3C RS232 Interface 57600 Baud Rate

M20166_01

3D RS232 Interface 115200 Baud Rate (Default)

M20167_01

Additional configuration codes can be found in the configuration guides as follows:	
CR950	https://www.automationdirect.com/pn/doc/manual/CR950-K301-C298
CR1100	https://www.automationdirect.com/pn/doc/manual/CR1100-K201-C298
CR1500	https://www.automationdirect.com/pn/doc/manual/CR1500-K202-C298
CR5210	https://www.automationdirect.com/pn/doc/manual/CR5210-C502-C298

CR950/CR1100/CR1500/CR5210 Configuration Codes

Configuration changes will take effect immediately and be saved to memory

Data Bits

4A RS232 Interface 7 Data Bits

M20168_01

4B RS232 Interface 8 Data Bits (Default)

M20169_01

Stop Bit

4C RS232 Interface 1 Stop Bit (Default)

M20170_01

4D RS232 Interface 2 Stop Bit

M20171_01

Parity

5A RS232 Interface Even Parity

M20172_01

5B RS232 Interface No Parity

M20173_01

5C RS232 Interface Odd Parity

M20174_01

Suffix

6A Suffix Carriage Return (RS232 Mode Only)

M20212_01

6B Suffix Carriage Return Line Feed (RS232 Mode Only) (Default)

M20213_01

6C Suffix Line Feed (RS232 Mode Only)

M20214_01

6C Erase Suffix Data

M20208_01

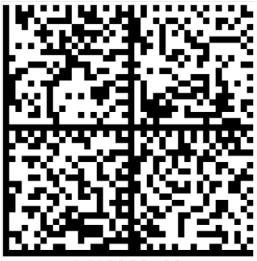
Additional configuration codes can be found in the configuration guides as follows:	
CR950	https://www.automationdirect.com/pn/doc/manual/CR950-K301-C298
CR1100	https://www.automationdirect.com/pn/doc/manual/CR1100-K201-C298
CR1500	https://www.automationdirect.com/pn/doc/manual/CR1500-K202-C298
CR5210	https://www.automationdirect.com/pn/doc/manual/CR5210-C502-C298

CR6022 Series Configuration Codes

Configuration changes will take effect immediately and be saved to memory

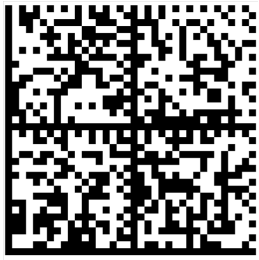
Reset and Reboot

7A Reset to RS232 Factory Defaults



M10389_03

7B Reset to USB Factory Defaults



M10002_02

7C Reboot Reader

M10296_01

Note: When a Factory Reset is performed, a Reboot will be necessary.

Baud Rate

8A RS232 Interface 1200 Baud Rate

M10392_01

8B RS232 Interface 2400 Baud Rate

M10393_01

8C RS232 Interface 4800 Baud Rate

M10394_01

8D RS232 Interface 9600 Baud Rate

M10395_01

9A RS232 Interface 19200 Baud Rate

M10396_01

9B RS232 Interface 38400 Baud Rate

M10397_01

9C RS232 Interface 57600 Baud Rate

M10398_01

9D RS232 Interface 115200 Baud Rate (Default)

M10399_01

Additional configuration codes can be found in the configuration guide as follows:	
CR6022	**https://www.automationdirect.com/pn/doc/manual/CR6022-C500-C298**

CR6022 Series Configuration Codes (continued)

Configuration changes will take effect immediately and be saved to memory

Data Bits

10A RS232 Interface 7 Data Bits

M10390_01

10B RS232 Interface 8 Data Bits (Default)

M10391_01

Stop Bit

10C RS232 Interface Stop Bit 1 (Default)

M10406_01

10D RS232 Interface Stop Bit 2

M10407_01

Parity

11A RS232 Interface Even Parity

M10400_01

11B RS232 Interface Odd Parity

M10401_01

11C RS232 Interface No Parity (Default)

M10402_01

Suffix

12A Suffix Carriage Return (RS232 Mode Only)

M10320_01

12B Suffix Carriage Return Line Feed (RS232 Mode Only)

M10322_01

12C Suffix Line Feed (RS232 Mode Only)

M10321_01

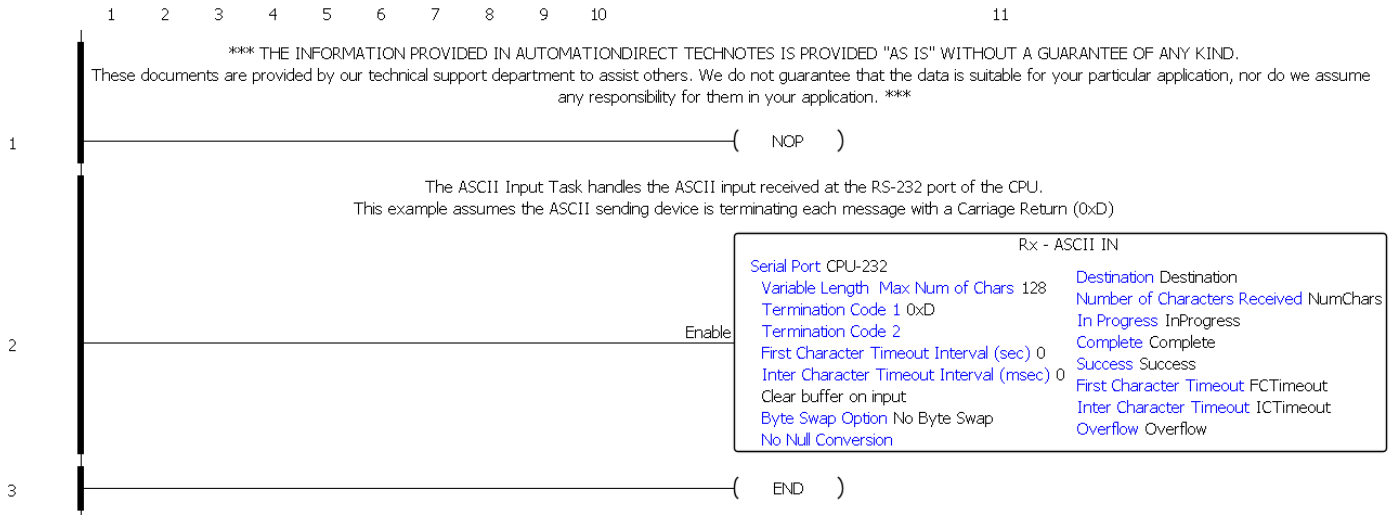
12D Erase Suffix Data (Default)

M10130_01

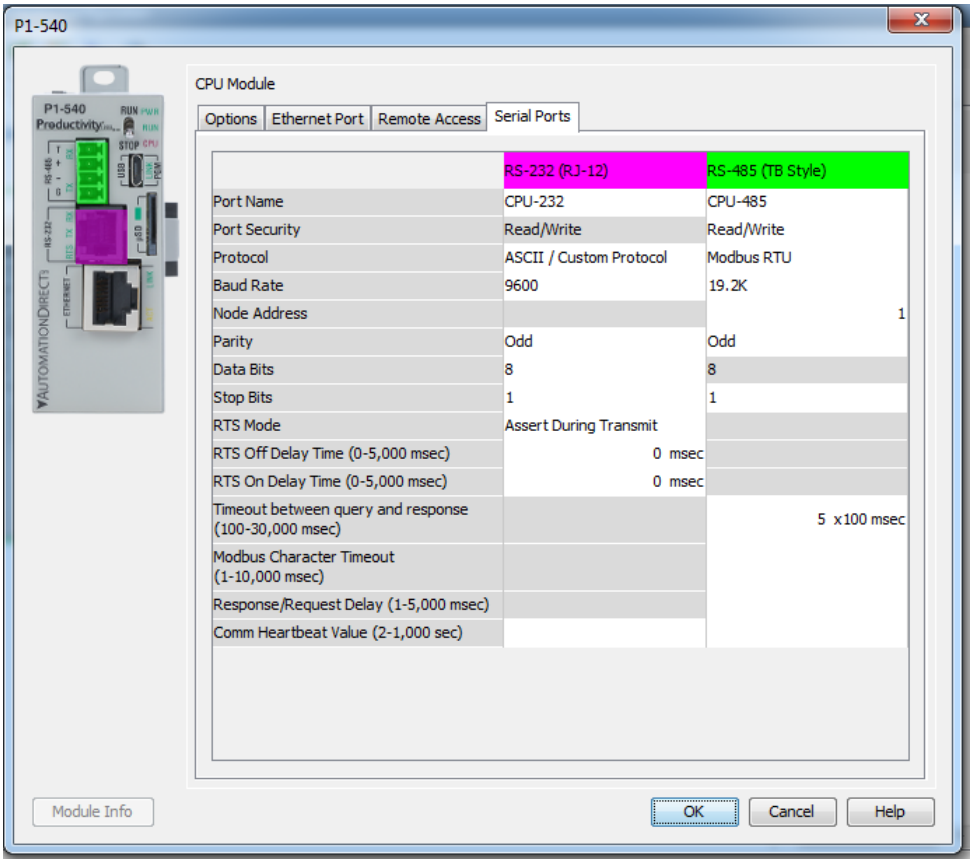
Additional configuration codes can be found in the configuration guide as follows:	
CR6022	https://www.automationdirect.com/pn/doc/manual/CR6022-C500-C298

Productivity PLC Example

The Productivity PLC ASCII Input Task handles the ASCII input received at the RS-232 port of the CPU. This example assumes the ASCII sending device is terminating each message with a carriage return (0xD)



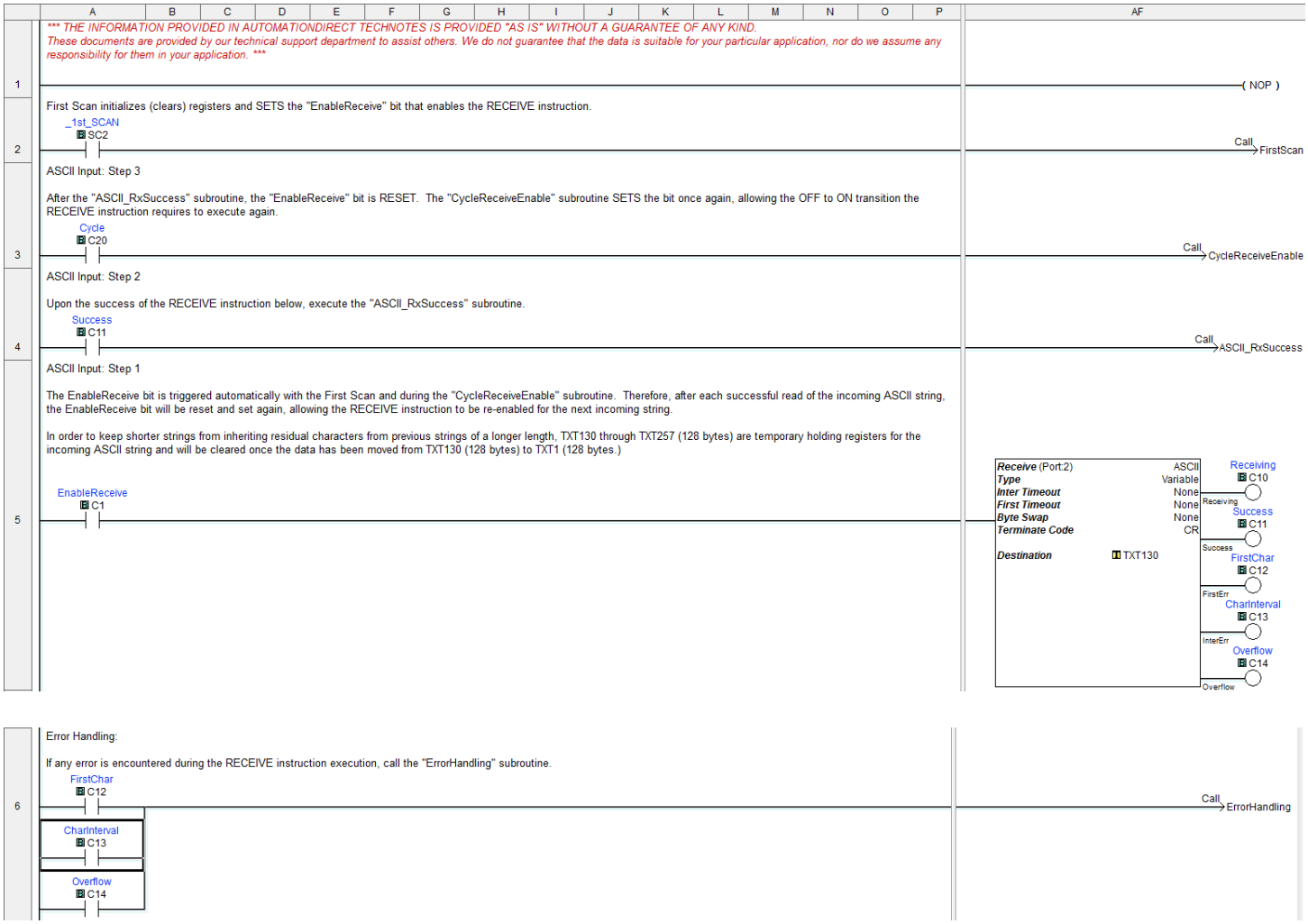
The Serial Port needs to be set up. This example assumes Baud Rate = 9600, Parity = Odd, Data Bits = 8, and Stop Bits = 1, but any configuration can work.



CLICK Example

The CLICK programming example is a three-step process that (1) receives the data from the scanner and (2) places that data in holding register before (3) moving it to the final register.

Main Program



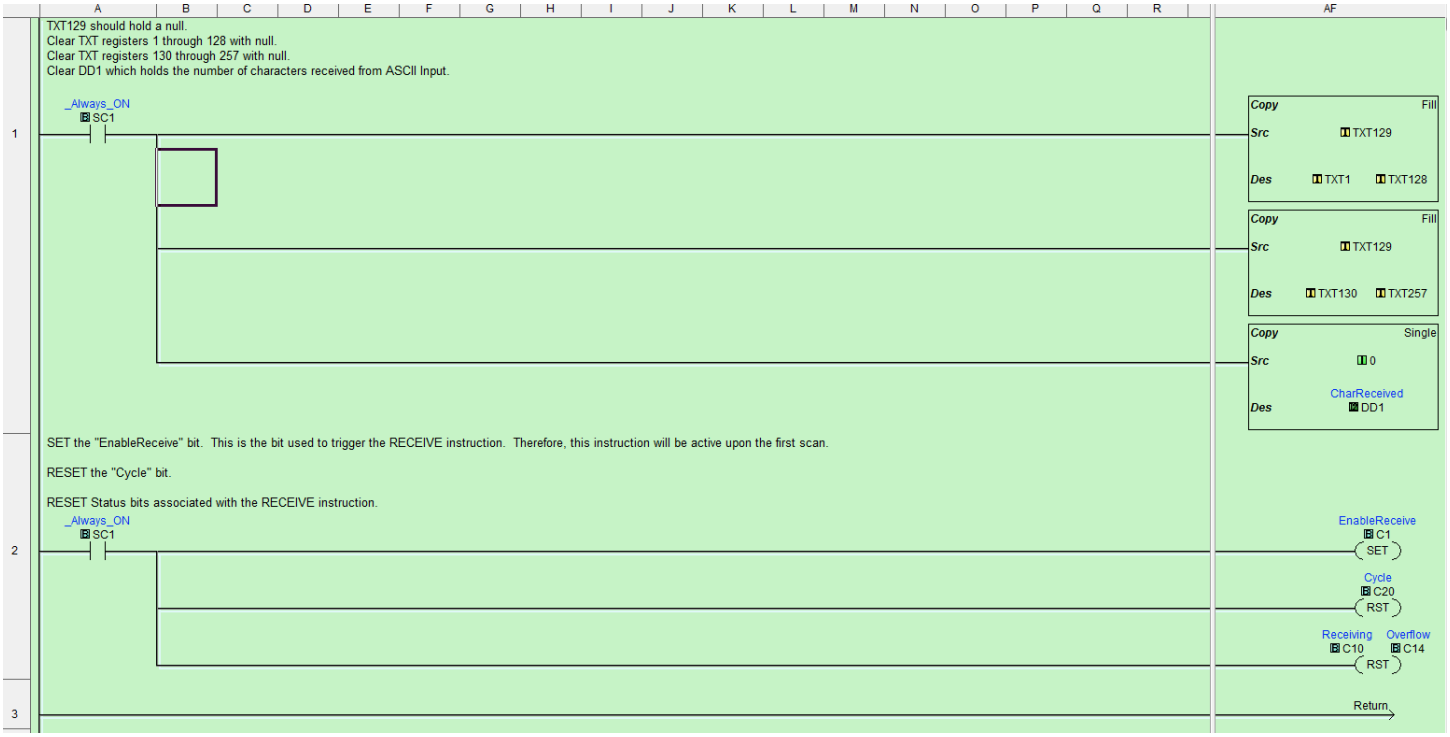
The EnableReceive bit is triggered automatically with the First Scan and during the "CycleReceiveEnable" subroutine. Therefore, after each successful read of the incoming ASCII string, the EnableReceive bit will be reset and set again, allowing the RECEIVE instruction to be re-enabled for the next incoming string.

In order to keep shorter strings from inheriting residual characters from previous strings of a longer length, TXT130 through TXT257 (128 bytes) are temporary holding registers for the incoming ASCII string and will be cleared once the data has been moved from TXT130 (128 bytes) to TXT1 (128 bytes.)

CLICK Example (continued)

Subroutine Programs

"FirstScan" – This subroutine is called upon first scan (SC2). It initializes (clears) registers and SETS the “EnableReceive” bit that enables the RECEIVE instruction. The RECEIVE instruction is located in the main program.

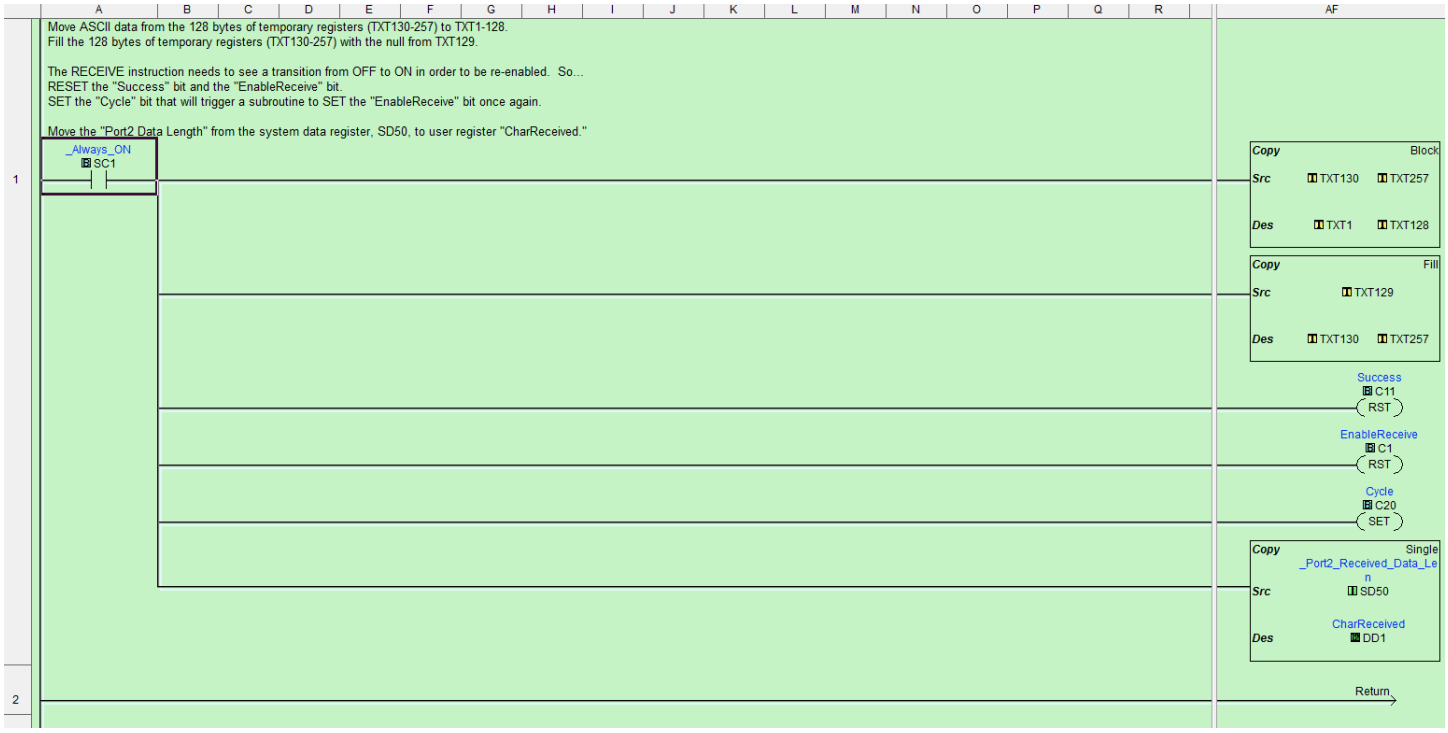


CLICK Example (continued)

"ASCII_RxSuccess" – This subroutine is called after success of the RECEIVE instruction below.
Move ASCII data from the 128 bytes of temporary registers (TXT130-257) to TXT1-128.
Fill the 128 bytes of temporary registers (TXT130-257) with the null from TXT129.

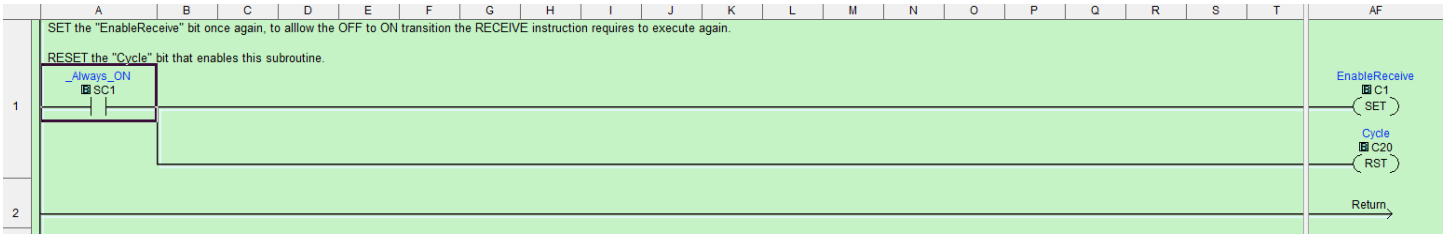
The RECEIVE instruction needs to see a transition from OFF to ON in order to be re-enabled. So RESET the "Success" bit and the "EnableReceive" bit, and SET the "Cycle" bit that will trigger a subroutine to SET the "EnableReceive" bit once again.

Move the "Port2 Data Length" from the system data register, SD50, to user register "CharReceived."

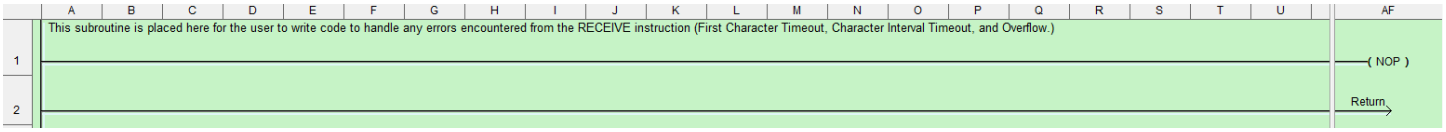


CLICK Example (continued)

"CycleReceiveEnable" – After the "ASCII_RxSuccess" subroutine, the "EnableReceive" bit is RESET. The "CycleReceiveEnable" subroutine SETS the bit once again, allowing the OFF to ON transition the RECEIVE instruction requires to execute again.



"ErrorHandling" – This subroutine is placed here for the user to write code to handle any errors encountered from the RECEIVE instruction (First Character Timeout, Character Interval Timeout, and Overflow.)



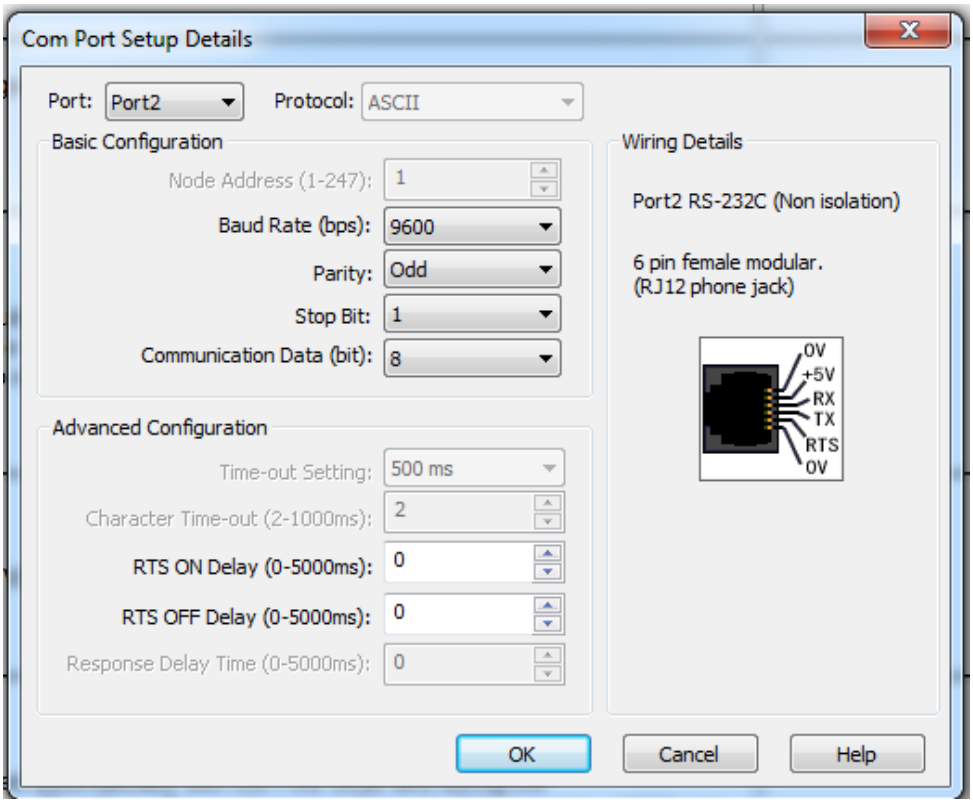
Below are the bits that are used in the code shown above:

Address	Data Type	Nickname
C1	BIT	EnableReceive
C10	BIT	Receiving
C11	BIT	Success
C12	BIT	FirstChar
C13	BIT	CharInterval
C14	BIT	Overflow
C20	BIT	Cycle
SC1	BIT	_Always_ON
SC2	BIT	_1st_SCAN
DD1	INT2	CharReceived
SD50	INT	_Port2_Received...
SD60	INT	_Port3_Received...

Address	Data Type	Nickname
TXT1	TEXT	
TXT2	TEXT	
TXT3	TEXT	
TXT4	TEXT	
TXT5	TEXT	
TXT6	TEXT	
TXT251	TEXT	
TXT252	TEXT	
TXT253	TEXT	
TXT254	TEXT	
TXT255	TEXT	
TXT256	TEXT	
TXT257	TEXT	

CLICK Example (continued)

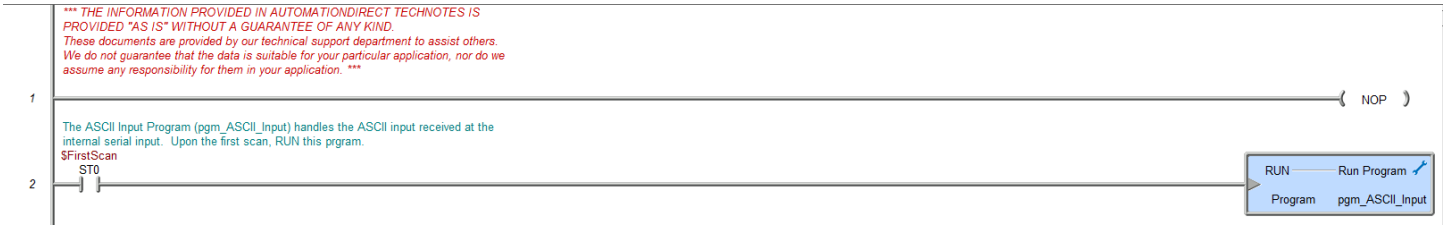
The Com Port needs to be set up. This example assumes Baud Rate = 9600, Parity = Odd, Data Bits = 8, and Stop Bits = 1, but any configuration can work.



BRX Example

Main Program

The ASCII Input program (Pgm_ASCII_Input) handles the internal serial input. On first scan RUN this program.



Pgm_ ASCII_Input

Upon initially running the program, CLEAR the internal serial port. This will delete any data in the Input Queue data storage, as well as reset the .InQueue value.

IF the character count at the internal Serial buffer (IntSerial.InQueue) is greater than zero, THEN execute the STREAMIN Instruction and populate SL0 (sInputString) element

This stage serves two purposes:

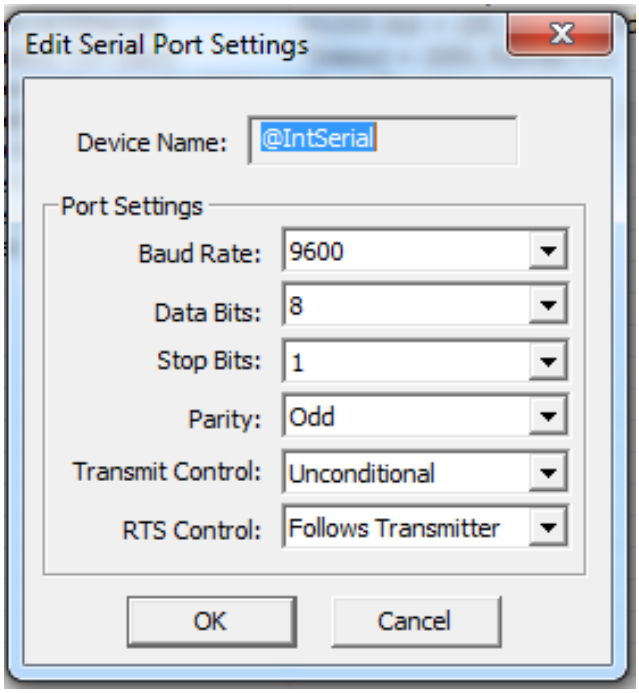
1) It allows the user to write any code required for parsing the input string and placing the parsed content to other memory elements
2) Once the stage is complete, a jump is executed back to stage 1, allowing for a new evaluation of the IntSerial.InQueue value.

Continued...

BRX Example (continued)

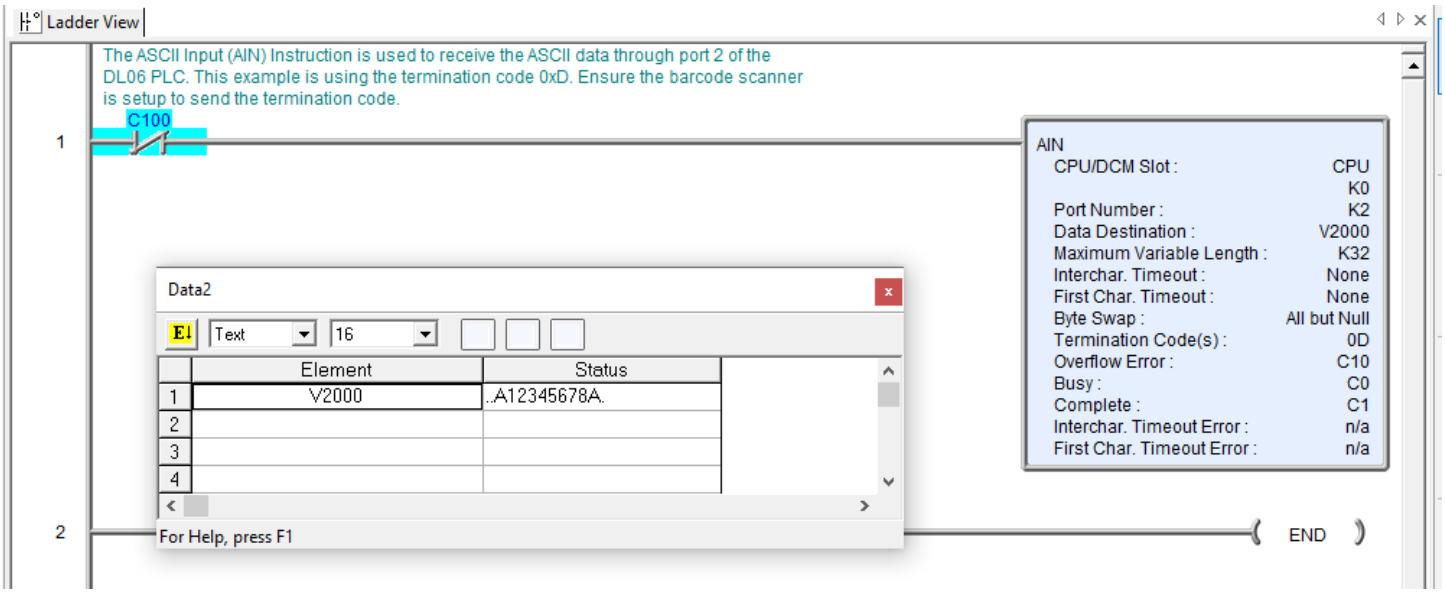
This stage is placed here for the user to write any required code for handling any errors encountered during the execution of this program.

The Serial Port needs to be set up. This example assumes Baud Rate = 9600, Parity = Odd, Data Bits = 8, and Stop Bits = 1, but any configuration can work.

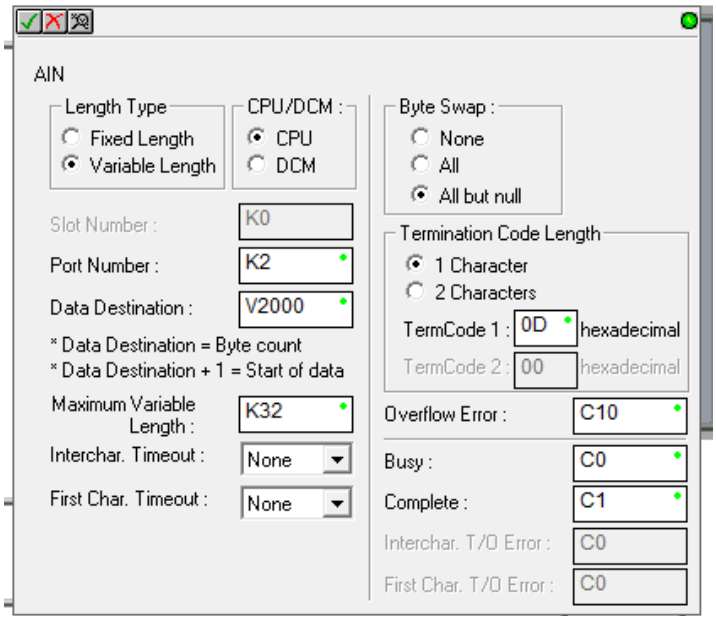


DirectLogic Example

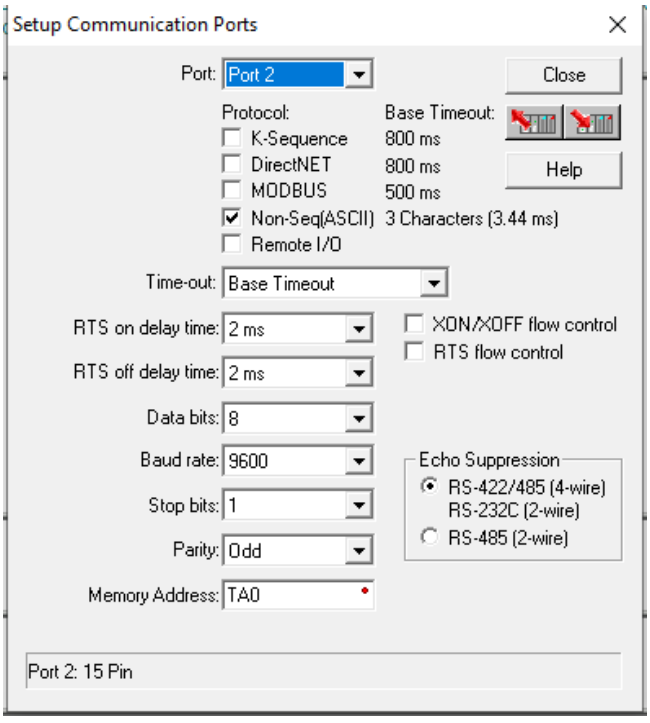
The ASCII input (AIN) instruction is used to receive the ASCII data through port 2 of the DL06 PLC. This example is using the termination code 0xD. Ensure that the barcode scanner is set up to send the termination code.



AIN instruction setup



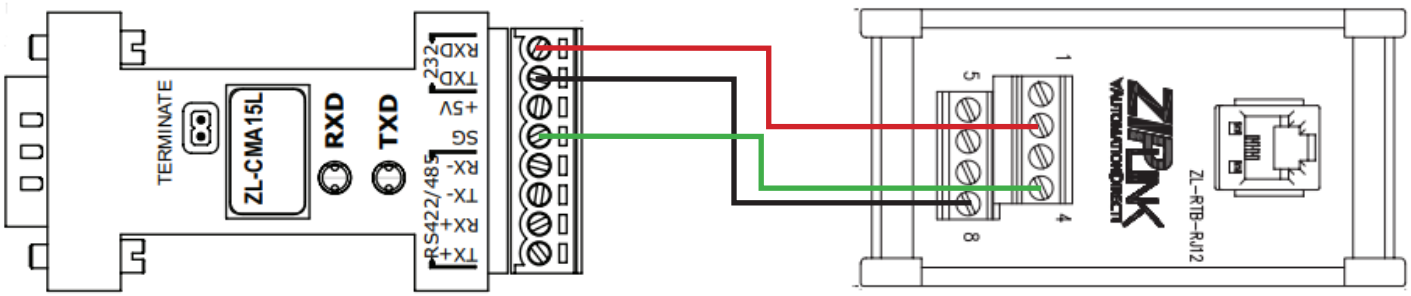
Secondary COM port setup



DirectLogic Example (continued)

Components used:

- PLC: D0-06AR (using serial port 2)
- ZL-CMA15L (connected to port 2 of the D0-06AR)
- ZL-RTB-RJ12 (the RJ12 cable from the barcode reader connects here and is then wired to the ZL-CMA15L)



C-more HMI Examples for Code Readers

Compatibility			
Scanner	***C-more EA7****	***C-more EA9***	***C-more CM5***
CR950-K301-C298	Yes	Yes with powered USB hub	Yes
CR1100-K201-C298	Yes	Yes with powered USB hub	Yes
CR1500-K201-C298	Yes	Yes with powered USB hub	Yes
CR5210-CC500-C298	Yes	Yes with powered USB hub	Yes
CR2701-200-C298	Yes**	Yes**	Yes**
CR2702-200-C298	Yes**	Yes**	Yes**

**** Please note that the C-more EA7 is no longer in active production.***

***** Please note that although the CR270x will work with the HMI, the HMI will not provide enough current to charge the scanner. However, the scanner battery can always be charged using an external charger such as the CRA-A274-P1-C298 quad bay battery charger.***

There are two ways to get the Code Reader to communicate with the C-more HMI

1. Enable Alternate Operating System (EA9 and CM5 only)

Alternate Operating System ON.

M20305_01

Alternate Operating system OFF.

M20306_01

2. Declare Enumeration (all C-more HMIs)

Declare Enumeration when addressed.

CC004640_01

In all of the above examples, depending on the application, it may become necessary to add an Enter to the suffix by scanning the following:

Suffix Enter (USB keyboard only)

M20219_02

Erase Suffix Data

M20208_01

Additional configuration codes can be found in the configuration guides as follows:	
CR950	https://www.automationdirect.com/pn/doc/manual/CR950-K301-C298
CR1100	https://www.automationdirect.com/pn/doc/manual/CR1100-K201-C298
CR1500	https://www.automationdirect.com/pn/doc/manual/CR1500-K201-C298
CR5210	https://www.automationdirect.com/pn/doc/manual/CR5210-C500-C298

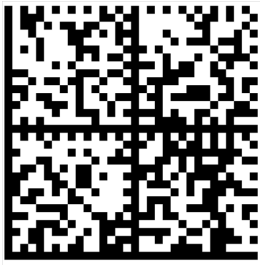
C-more HMI Examples for CR6022 Series

Compatibility		
Scanner	***C-more EA7****	***C-more EA9***
CR6022-C500-C298	Yes	No

* Please note that the C-more EA7 is no longer in active production.

There are three ways to get the CR6022 to communicate with the EA7 HMI

1. Alternate Operating System ON.

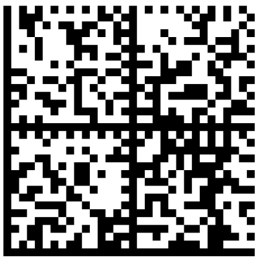


M10123_02

Alternate Operating System OFF.

M10122_02

2. Declare Enumeration after the Get Report descriptor.



M10123_02

3. Declare Enumeration after Set Configuration.

CC003973_01

In all of the above examples, depending on the application, it may become necessary to add an Enter to the suffix by scanning the following:

Suffix Enter (USB keyboard only)

M10134_01

Erase Suffix Data (Default)

M10130_01

Additional configuration codes can be found in the configuration guide as follows:	
CR6022	**https://www.automationdirect.com/pn/doc/manual/CR6022-C500-C298**