



## Communication Utilities

Use this utility to enable your controller to receive data from external devices, such as bar-code readers, via an RS232 port. Since there is no Ladder element for this function; you perform it by storing values into SIs.

Note that the communication settings stored into these SIs only take effect at power-up.

SI	Parameter	Value to Store	Notes
141	STX ( <a href="#">Start of Text</a> )	Select one of the 3 STX option by storing its value into SI 141: <ul style="list-style-type: none"> <li>• <a href="#">0-255(ASCII)</a></li> <li>• -1: No Start of Text (not recommended)</li> <li>• -2: No Start of Text (Enables access by Unitronics PC applications)</li> </ul>	The STX parameter indicates where the <a href="#">data block</a> begins. <ul style="list-style-type: none"> <li>• -1: Note that the ASCII character '/' (backslash) cannot be used to indicate the start of the data block.</li> <li>• -2: enables applications such as U90 Ladder and Remote Access to access a networked PLC. Note that these applications use the 'backslash' character ( / ) (ASCII character 47) as the Start of Text (STX) character.</li> </ul>
142	ETX ( <a href="#">End of Text</a> )	Select one of the 3 ETX option by storing its value into SI 142: <ul style="list-style-type: none"> <li>• <a href="#">0-255(ASCII)</a></li> <li>• -1: ETX marked by Length</li> <li>• -2: ETX marked by 'Silence'</li> </ul>	The ETX parameter indicates where the data block ends. When the ETX is registered by the function, SB 60 turns ON. <ul style="list-style-type: none"> <li>• If you use an ASCII character (0-255), note that if this character occurs <b>after</b> the Length parameter defined in SI 143, SB 60 turns ON.</li> <li>• Selecting -1 causes the function to use the <b>length</b> of a data block alone to determine its end.</li> <li>• Selecting -2 causes the function to use the <b>duration</b> of silent time following the STX to determine the end of a data block.</li> </ul>
143	ETX Length or Silent	<ul style="list-style-type: none"> <li>• Length: up to 128 (relevant if you store -1, Length, into SI 142 to provide ETX)</li> <li>• Silent: up to 24000</li> </ul>	<ul style="list-style-type: none"> <li>• This defines both the length of text, or silence, that signals the end of text.</li> <li>• Note that the duration of a silent 'counter' unit is approximately 2.509 mS. The 'silent' value should be lower than the <a href="#">TimeOut value</a>.</li> <li>• When defined as length, SI 143 cannot exceed SI 144.</li> </ul>
144	Maximum Length	Up to 128	<ul style="list-style-type: none"> <li>• This is the maximum legal length for received text.</li> <li>• When the maximum length is exceeded, the Receive Buffer is automatically cleared, and SB 60 is turned OFF, enabling new data to be received.</li> <li>• This can be used to detect buffer overflow.</li> </ul>
145	Start Address: Receive Buffer	MI Address	This MI contains the start address for the vector of registers that serves as the Receive Buffer.
60	Number of Bytes currently in Receive Buffer	Read only	SI 60 indicates how many bytes of data are currently in the Receive Buffer.
61	Number of Bytes in Receive Buffer when SB 60=1	Read only	SI 61 indicates how many bytes of data are in the Receive Buffer when SB 60 turns ON.
146	Copy Data: Format	<ul style="list-style-type: none"> <li>• 0: copy each received byte</li> <li>• 1: copy in groups of 4 received bytes.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>0</b> causes each separate byte to be copied to a separate register including STX and ETX. For example, if the PLC receives an STX character, 4 data bytes, and an ETX character, the data will be copied into a vector of 6 MIs: the first containing the STX, 4 MIs for the data bytes; the last MI will contain the ETX.</li> <li>• <b>1</b> causes every <b>4</b> bytes to be copied to a single register, without the STX and ETX. This is used when the received data is in numeric format. For example 12345 would be copied to 2 consecutive MIs. The first MI would contain 1234, the second would contain 5.</li> </ul>
140	Start receiving	300	In your application, use this to call the function after you have entered all of the other parameters. Note that when you run Test (Debug) Mode, the current value in SI 140 will <b>not</b> be displayed.

SB	Description	Notes
60	Data Successfully Received	Read only. Turns ON when the ETX condition is registered by the system.
61	Copy Data in Receive Buffer to MI Vector	Write only. <ul style="list-style-type: none"> <li>Turning this SB ON causes the buffer contents to be copied to the MI vector defined in SI 145. The data will be copied according to the format defined in SI 146.</li> <li>If SI 146 is set to 0, this SB can be set at any time.</li> <li>If SI 146 is set to 1, this SB can be set after SB 60 turns ON.</li> </ul>
62	Clear Receive Buffer, Clear SI 60, Clear SI 61, Reset SB 60	<ul style="list-style-type: none"> <li>This SB must be turned ON to enable a new message, or data block, to be received.</li> <li>Turn this SB ON to enable data to be received <b>before</b> the maximum length, defined in SI 144, is exceeded.</li> </ul>

Note that if no data is received for a period exceeding the TimeOut, you will lose the data in the buffer.

To see how to use the Communications Utility, check the sample application **Read Card - Display Number Value.U90**. This may be found by accessing Sample U90 Projects from the Help menu.

This application demonstrates how to read a magnetic card number using an "IDTECH" card reader, then display that number on the PLC's screen. The card reader transmits the number in ASCII characters in this format:

**< %?[CR];xxxxx?[CR] >** where **xxxxx** is the card number.

The ASCII character used to mark the Start Of Text (STX) is **< ; >** (semicolon). End Of Text (ETX) is marked with the character **< ? >**.

Since the card number is 5 digits long, the card number is copied to 2 separate MIs. The MIs are linked to 2 variables that are shown on the PLC's screen in 2 separate Displays.

The parameters must be written into their respective operands using one scan condition. For this purpose, it is recommended to use SB 2 Power-up bit, as shown in the sample application.

#### **Related Topics**

[ASCII character reference table](#)