

<b>ZXLN 002</b>	<b>Start Auto-teaching: _ZXLN002_StartAutoTeach</b>	
<b>Basic function</b>	Starts the automatic teaching.	
<b>Symbol</b>		
<b>File name</b>	Lib\FBL\omronlib\LaserSensor\ZXLN\_ZXLN002_StartAutoTeach10.cxf	
<b>Applicable models</b>	Smart Sensor	ZX-LDA-N
CPU Unit	CS1*-CPU**H Unit version 3.0 or higher CJ1*-CPU**H Unit version 3.0 or higher CJ1M-CPU** Unit version 3.0 or higher CP1H CP1L (except 10 points CPU)	
Serial Communications Units/Boards	CS1W-SCU21-V1, CJ1W-SCU21-V1, CJ1W-SCU41-V1 Unit Version 1.2 or higher CS1W-SCB21-V1 and CS1W-SCB41-V1 Unit Version 1.2 or higher	
CX-Programmer	Version 5.0 or higher	
<b>Conditions for usage</b>	<ul style="list-style-type: none"> <li>■ External Connections                             <ul style="list-style-type: none"> <li>• Can be used for 1:N connections in controller configuration of the sensor side.</li> <li>• Communications must be within one network and cannot cross to another network.</li> </ul> </li> <li>■ Communication Settings                             <p>The communication settings of the serial port (Serial Gateway) must be the same as those of the Smart Sensor.</p> <ul style="list-style-type: none"> <li>• The communications settings of the specified serial port can be set to the default Smart Sensor settings (the factory shipment value) using the <i>Set Communications Port</i> (_ZXL600_SetComm) function block, and the other Smart Sensor settings using the <i>Set Serial Gateway Mode</i> (_SCx604_SetPortGATEWAY) function block.</li> </ul> </li> <li>■ CPU Unit Settings                             <p>PC System Setup: <i>Shared Settings for Communications Instructions in FBs.</i></p> <ul style="list-style-type: none"> <li>• Communications Instruction Response Timeout Time (default: 2 s), 5 s or more is recommended.</li> <li>• Number of retries (default: 0)</li> </ul> </li> <li>■ Shared Resources                             <ul style="list-style-type: none"> <li>• Communications ports (Internal logical ports)</li> </ul> </li> </ul>	
<b>Function description</b>	When the <i>Start Trigger</i> turns ON, the automatic teaching starts for the Smart Sensor connected to the Serial Port specified by the <i>Connection unit</i> , <i>Serial port No</i> and <i>Sensor CH No.</i> Use this FB together with the <i>Stop Auto-teaching</i> FB (_ZXLN003_StopAutoTeach) The highest value achieved between starting and stopping teaching is set as the high threshold and the lowest value is set as the low threshold. Execute the <i>Stop Auto-teaching</i> FB (_ZXLN003_StopAutoTeach) after the Normal End flag for this FB turns ON. An execution error will occur if the display value is not being held or if the resulting high threshold is lower than the low threshold.	
<b>FB precautions</b>	<ul style="list-style-type: none"> <li>• This FB is processed over multiple cycles. The BUSY output variable can be used to check whether the FB is being processed.</li> <li>• OK or NG will be turned ON only for one cycle after processing is completed. Use these flags to detect the end of the FB processing.</li> </ul> <p><b>Time Chart</b></p>	
<b>EN input condition</b>	Connect EN to an OR between an upwardly differentiated condition for the <i>Start Trigger</i> and the BUSY output from the FB as above.	
<b>Restrictions Input variables</b>	<ul style="list-style-type: none"> <li>• Always use an upwardly differentiated condition for EN.</li> <li>• If the input variables are out of range, the ENO Flag will turn OFF and the FB will not be processed.</li> </ul>	

<b>Output variables</b>	<ul style="list-style-type: none"> <li>• This FB requires multiple cycles to process. Always connect an OR including the BUSY output variable to the EN input variable to ensure that the FB is processed to a completion (see <i>Symbol</i>).</li> <li>• Do not turn the BUSY output variable ON or OFF outside the FB.</li> </ul>
<b>Other</b>	<ul style="list-style-type: none"> <li>• 3 seconds or more may be required for this FB to be completed (i.e., from EN turning ON until the OK or NG Flag turns ON).</li> </ul>
<b>Application example</b>	<p>Smart Sensor is connected 1:N to the Serial Port 1 on the Serial Communications Board (SCB). When bit A turns ON, automatic teaching is started.</p> <p>The diagram illustrates the hardware and logic for starting automatic teaching. The PLC rack contains an SCB (Serial Communications Board), CPU, and SCU (Serial Communications Unit). A Smart Sensor CH1 is connected to Serial Port No. 1 on the SCB through a 1:N connection. The logic shows two conditions: Bit A (normally open) and Bit B (normally closed) trigger the <code>_ZXLN002_StartAutoTeach</code> function block. Bit E (normally open) and Bit F (normally closed) trigger the <code>_ZXLN003_StoptAutoTeach</code> function block. Both function blocks require the Selection Unit #BBBB, Serial Port No. &amp;1, and Sensor CH No. &amp;1. The outputs of these blocks are Busy Flag, Normal End, Error End, and NG.</p>
<b>Related manuals</b>	<p>ZX-L-N Series Smart Sensor Laser Type User's Manual (SCHE-703)          ZX Series Smart Sensor Operation Manual (SCEA-801)</p>
<b>Related FBs</b>	<p>Stop Auto-teaching (<code>_ZXLN003_StopAutoTeach</code>)</p>

■ Variable Tables

Input Variables

Name	Variable name	Data type	Default	Range	Description												
EN	EN	BOOL			1 (ON): FB started. 0 (OFF): FB not started.												
Unit selection Serial Port No.	UnitSelect PortNo	INT INT	&0 &1	As right &1 to &2	Specify the Unit and the serial port. Only serial port 2 of CP1H/CP1L M-type CPU unit is possible to use this FB. <ul style="list-style-type: none"> <li>■ Connected to CPU Unit                             <table style="margin-left: 20px; border: none;"> <tr> <td>Unit selection</td> <td>#FFFF</td> </tr> <tr> <td>Serial port No.</td> <td>Not accessed. (CP1H/CP1L-M: Serial Port2 CP1L-L14/20: Serial Port1)</td> </tr> </table> </li> <li>■ Connected to Serial Communication Board(SCB)                             <table style="margin-left: 20px; border: none;"> <tr> <td>Unit selection</td> <td>#BBBB</td> </tr> <tr> <td>Serial port No.</td> <td>&amp;1: Serial Port 1 &amp;2: Serial Port 2</td> </tr> </table> </li> <li>■ Connected to Serial Communication Unit(SCU)                             <table style="margin-left: 20px; border: none;"> <tr> <td>Unit selection</td> <td>SCU Unit No. (&amp;0 to &amp;15)</td> </tr> <tr> <td>Serial port No.</td> <td>&amp;1: Serial Port 1 &amp;2: Serial Port 2</td> </tr> </table> </li> </ul>	Unit selection	#FFFF	Serial port No.	Not accessed. (CP1H/CP1L-M: Serial Port2 CP1L-L14/20: Serial Port1)	Unit selection	#BBBB	Serial port No.	&1: Serial Port 1 &2: Serial Port 2	Unit selection	SCU Unit No. (&0 to &15)	Serial port No.	&1: Serial Port 1 &2: Serial Port 2
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Unit selection	SCU Unit No. (&0 to &15)																
Serial port No.	&1: Serial Port 1 &2: Serial Port 2																
Sensor CH No.	SensorChNo	INT	&1	&1 to &5	Specify the CH No. of the connecting sensor. e.g.: &2 in the case of CH2.												

Output Variables

Name	Variable name	Data type	Range	Description
ENO (May be omitted.)	ENO	BOOL		1 (ON): FB processed normally. 0 (OFF): FB not processed or ended in an error.
Busy Flag	BUSY	BOOL		Automatically turns OFF when processing is completed.
Normal end	OK	BOOL		Turns ON for one cycle when processing ends normally.
Error end	NG	BOOL		Turns ON for one cycle when processing ends in an error.

Internal Variables

Internal variables are not output from the FB.

If the NG Flag from the FB turns ON, the following internal variables can be monitored to obtain information on the error.

Name	Variable name	Data type	Range	Description
Error code	ErrorCode	WORD		The results information from the Smart Sensor is output to the Error Code.

Error Code Details

Code	Contents	Meaning
#0000	Normal end	
#2203	Operation error	The setting is incorrect. Refer to the <i>ZX Series Smart Sensor Operation Manual</i> for the setting error conditions of teaching or the zero reset function.
#2204	Operation error	The sensor's operation mode is not in the RUN mode.
#2205	Operation error	The unregulated operation is being performed.

Version History

Version	Date	Contents
1.00	2005.12.	Original production

Note

This manual is a reference that explains the function block functions.

It does not explain the operational limitations of Units, components, or combinations of Units and components. Always read and understand the Operation Manuals for the system's Units and other components before using them.