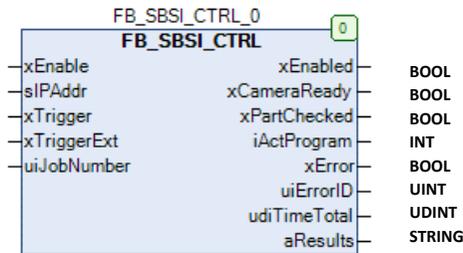


## Basic description for the use of SBSI Function block

The fb support to establish TCP/IP connection, change active job no., send a trigger signal and receive result string from SBS-vision sensors. Independent from the model. Based on firmware 1.23.

Set TRUE to Enable the function block. Connection to camera will be established **BOOL**  
 IP of the Camera **BOOL**  
 Triggers the Camera to take a picture, Software Trigger **BOOL**  
 TRUE: External Trigger from Camera can be used; FALSE: Software Trigger only **BOOL**  
 Job number **UINT**



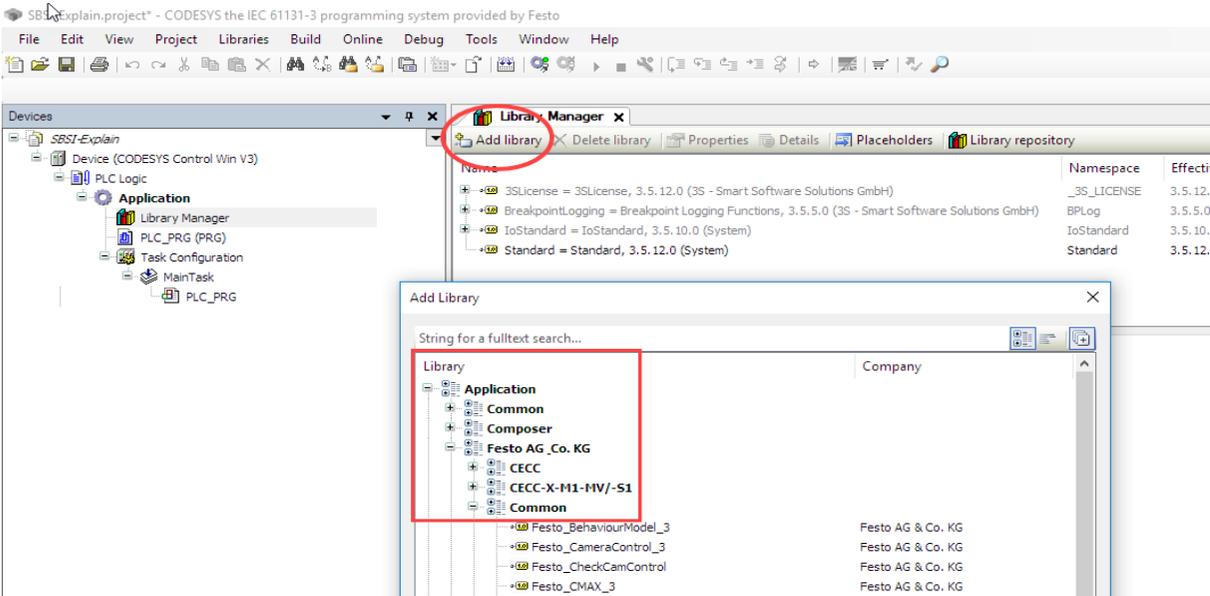
active Job number

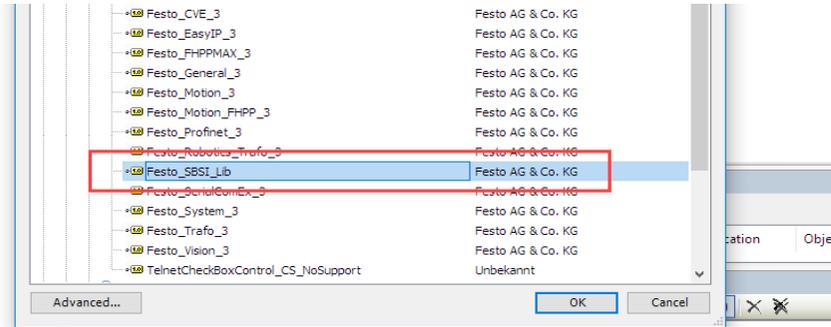
See SBSI Error list in library documentation Codesys project

aResults: Every trigger to the Sensor create new results at the FB output array, due to configured payload!

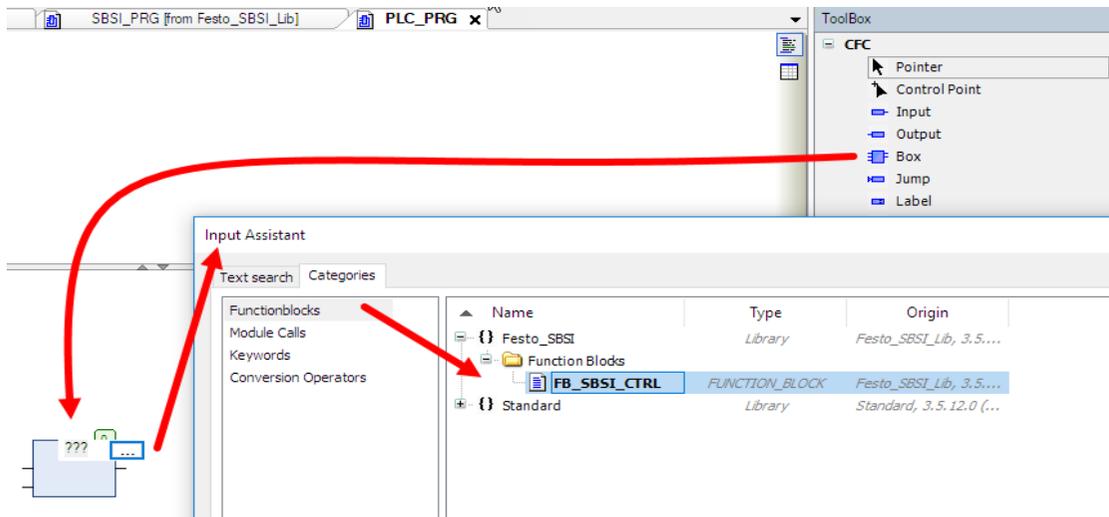
## Add the Library:

First you have to install the library to the repository of your Codesys. Then add the library to your project.

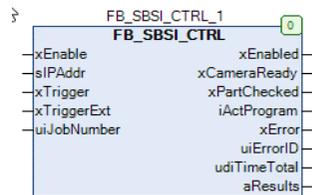




Then you can use the FB as a usual FB in Codesys  
 Place a new Box, use the Input Assistant with the Auto Declaration and instance no.



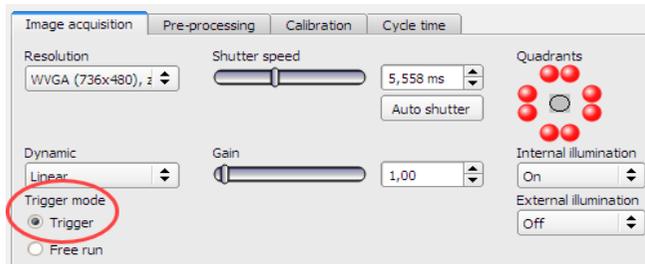
Now the FB is inserted:



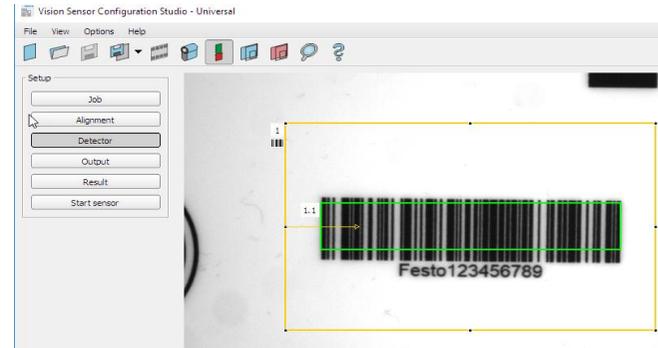
### Prepare the Vision Sensor for communication

Configure the vision sensor with Vision Sensor Configuration Studio. The following description is not intended to show all possibilities of the sensor. It shows the most important settings.

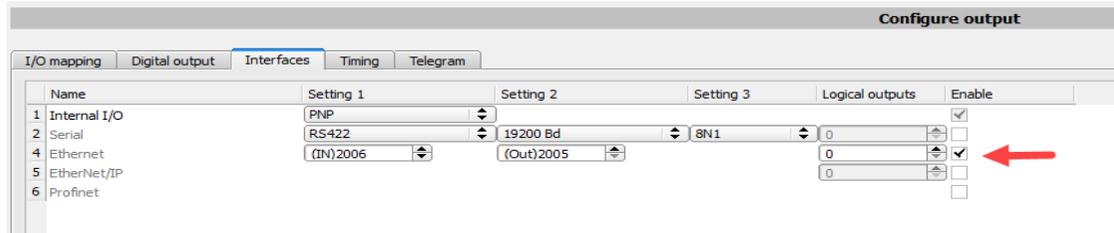
Set the sensor to Trigger mode!



Set up a detector e.g Bar Code



Activate the ETH interface in the Vision Sensor Configuration Studio.



### Configure the payload for the data.

The FB is build for max. 100 result string. In this demo we transfer 4 values. Position of the Bar code x, y, angle and the string of a barcode. Important is to insert the semicolon as a separator sign. By clicking the + it is possible to add more entry in the payload list.



The screenshot displays the Vision Sensor Configuration Studio interface. On the left, a control panel includes buttons for Alignment, Detector, Output (circled in red), Result, and Start sensor. Below this is a Trigger/Image update section with a Trigger button and Single/Continuous options, and a Connection mode section with Online and Offline radio buttons. The main area shows a camera view of a barcode with a yellow bounding box and a green detection box. The barcode text is "Festo123456789". On the right, a "Decoded results" table shows the detected string and its length.

Decoded string	Truncated	String length	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
1.1 Festo123456789	<input type="checkbox"/>	14	n/a								

Below the main interface is the "Configure output" window, with the "Telegram" tab selected. It shows I/O mapping settings (ASCII, Start, Trailer, Separator (circled in red), End of Telegram) and a "Payload" table. The Separator is set to ";". The Payload table lists detected data points:

Active	Detector	Value	Min. length	No. of results
<input checked="" type="checkbox"/>	Detector 1	Barcode-1: Position X	0	
<input checked="" type="checkbox"/>	Detector 1	Barcode-1: Position Y	0	
<input checked="" type="checkbox"/>	Detector 1	Barcode-1: Angle	0	
<input checked="" type="checkbox"/>	Detector 1	Barcode-1: String	0	

At the bottom, the status bar shows Mode: Config, Name: Festo, Active job: 1, Job1, Cycle time: (n/a), Flash: 0.6 kB / 40.5 MB, X:0 Y:0 I:0, DOUT, and a row of indicator lights (12, 09, 05, 06, 07, 08).

To store and activate the setting in the sensor you have to "START sensor"  
 Communication will only start when the sensor is in run mode! Every time when sensor is stopped by Config software, the connection has to be established anew.

This screenshot shows the "Vision Sensor Configuration Studio - Universal" application window. The menu bar includes File, View, Options, and Help. The toolbar contains icons for file operations and sensor control. The "Setup" panel on the left has buttons for Job, Alignment, and Detector. The main area shows a partial view of the camera feed with a yellow bounding box.



After a trigger to the Sensor the following result will be calculated:

Vision Sensor Configuration Studio - Universal

File View Options Help

FESTO

Setup

- Job
- Alignment
- Detector
- Output
- Result
- Stop sensor

Trigger/Image update

Trigger

Connection mode

Online  Offline

100%

Results/statistics

Results

Detector	Score	Time	Detector type
1 Detector 1	100.0	12ms	Barcode

Decoded results

	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Position X	Position Y	Angle
1.1	n/a	354.0	207.5	0.0															

Statistics

Count: 5

Pass: 5

Fail: 0

Minimum execution time:

Maximum execution time:

Mode: Run Name: Festo Active job: 1, Job 1

Average execution time: 36ms

Cycle time: 36 ms Flash: 0.6 KB / 40.5 MB X:0 Y:0 I:0 DOUT: 12 09 05 06 07 08

### Control of the FB

Force the ip address of the sensor and then force "True" to the xEnable input. Then the connection will be established, and if all is o.k, the FB set the output xEnabled and XCameraReady. If not then the Error output occur. Error Id could be checked in the library dokumentation in Codesys.

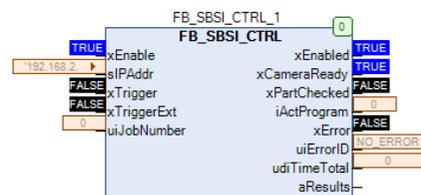
SBSI-Explain.project\* - CODESYS the IEC 61131-3 programming system provided by Festo

File Edit View Project CFC Build Online Debug Tools Window Help

LibraryVersion [from Festo\_SBSI\_Lib] Library Manager SBSI\_PRG [from Festo\_SBSI\_Lib] PLC\_PRG x Device

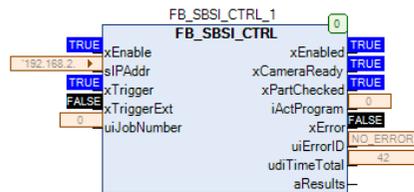
Device.Application.PLC\_PRG

Expression	Type	Value	Prepared value
FB_SBSI_CTRL_1	FB_SBSI_CTRL		
xEnable	BOOL	TRUE	
sIPAddr	STRING	'192.168.2.100'	
xTrigger	BOOL	FALSE	
xTriggerExt	BOOL	FALSE	
uiJobNumber	INT	0	
xEnabled	BOOL	TRUE	
xCameraReady	BOOL	TRUE	
xPartChecked	BOOL	FALSE	
iActProgram	INT	0	
xError	BOOL	FALSE	
uiErrorID	SBSI_ERRORS	NO_ERROR	
udiTimeTotal	UDINT	0	
aResults	ARRAY [0..100] OF ...		
iSTEP	INT	30	



Now the FB is ready for trigger input.

Expression	Type	Value	Prepared value	A...	Comment
FB_SBSI_CTRL_0	FB_SBSI_CTRL				
FB_SBSI_CTRL_1	FB_SBSI_CTRL				
xEnable	BOOL	TRUE			TRUE = Enable Function Block
sIPAddr	STRING	'192.168.2.100'			IP address of the SBSI Vision Sensor
xTrigger	BOOL	TRUE			Rising Edge: Trigger SBSI
xTriggerExt	BOOL	FALSE			
uiJobNumber	INT	0			Set SBSI active Job 1 - 255
xEnabled	BOOL	TRUE			TRUE = Camera connected
xCameraReady	BOOL	TRUE			TRUE = Camera waiting for Command
xPartChecked	BOOL	TRUE			TRUE = Trigger executed ...cessfully and aResults c.
iActProgram	INT	0			Active Camera Program.
xError	BOOL	FALSE			TRUE = Error is present
uiErrorID	SBSI_ERRORS	NO_ERROR			See SBSI_Errors
udiTimeTotal	UDINT	42			Camera Execution time + ...IP communication time .
aResults	ARRAY [0..100] OF ...				Array of results configure... the Output Tab of Visio.
aResults[0]	STRING	'382000'			
aResults[1]	STRING	'233502'			
aResults[2]	STRING	'-8142'			
aResults[3]	STRING	'Festo123456789'			
aResults[4]	STRING				
aResults[5]	STRING				



All result value x 1000 !!

354000 = 354,0  
207500 = 207,5  
-8142 = -8,1

Detector	Score	Time	Detector type	Decoded results													Position X	Position Y	Angle	Co	
1	100,0	14ms	Barcode	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	382.0	233.5	-8.1	

The sensor transmitt the results multiplied by 1000! So for further processing in Codesys the values have to be divided!

If result is not possible or calculated. The String is empty and the value is 0.

File View Options Help

Setup

- Job
- Alignment
- Detector
- Output
- Result
- Stop sensor

Trigger/Image update

Trigger

Connection mode

Online  Offline

100%

Results/statistics

Results

Detector	Score	Time	Detector type
1 Detector 1	0.0	48ms	Barcode

Decoded results

Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Position X	Position Y	Angle	Com
9																		

LibraryVersion [from Festo\_SBSI\_Lib] Library Manager SBSI\_PRG [from Festo\_SBSI\_Lib] PLC\_PRG x Device

Device.Application.PLC\_PRG

Expression	Type	Value	Prepa
FB_SBSI_CTRL_0	FB_SBSI_CTRL		
FB_SBSI_CTRL_1	FB_SBSI_CTRL		
xEnable	BOOL	TRUE	
sIPAddr	STRING	'192.168.2.100'	
xTrigger	BOOL	TRUE	
xTriggerExt	BOOL	FALSE	
uiJobNumber	INT	0	
xEnabled	BOOL	TRUE	
xCameraReady	BOOL	TRUE	
xPartChecked	BOOL	TRUE	
iActProgram	INT	0	

xError	BOOL	FALSE
uiErrorID	SBSI_ERRORS	NO_ERROR
udiTimeTotal	UDINT	60
aResults	ARRAY [0..100] OF ...	
aResults[0]	STRING	'0'
aResults[1]	STRING	'0'
aResults[2]	STRING	'0'
aResults[3]	STRING	"
aResults[4]	STRING	"
aResults[5]	STRING	"

To get also a string for a "no read" it is possible to give an own text.

Detector name	Detector type	Alignment
1 Detector 1	Barcode	<input checked="" type="checkbox"/>

Code	Ref. string	Quality	Lines	Structure
Bar code type		Decoded string length		
Code128 / EAN128		512		
Min. number of codes		<input type="checkbox"/> Min. max. characters		
1		10 20		
Max. number of codes		<input checked="" type="checkbox"/> No-read string		
1		FAIL		
Polarity		Dark on light		

result in Codesys:

ARRAY [0..100] OF ...	
STRING	'0'
STRING	'0'
STRING	'0'
STRING	'FAIL'
STRING	"
STRING	"

End of document