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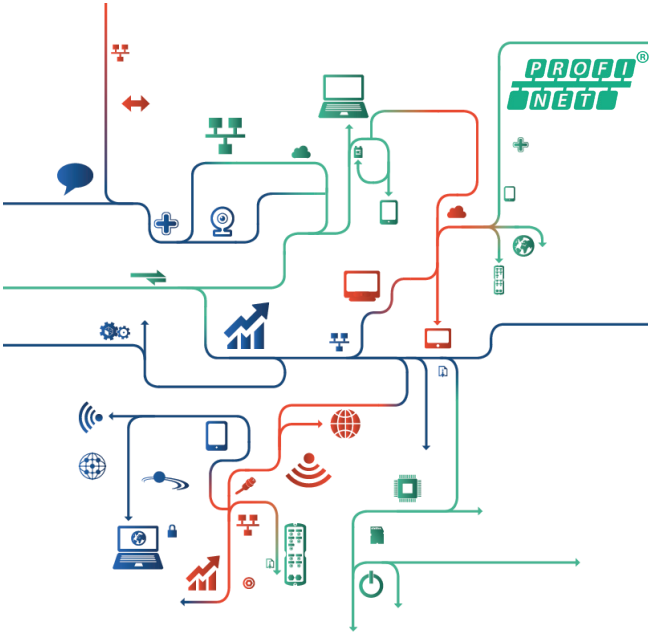
Initial Startup of the TIA V13 Function Block

for the BLN Barcode Line Scanner



Project Engineering Instructions

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1. Notes for the User

These instructions describe incorporation of the BLN Barcode Line Scanner into an existing PROFINET network.

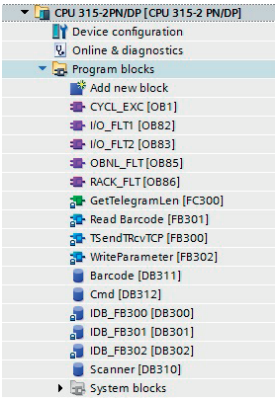
2. Safety Precautions

- Read the operating instructions carefully before using the utilized products.
- Installation, initial start-up and maintenance of the described products may only be carried out by qualified personnel.
- The described products are not suitable for safety applications.
- The operating company must comply with local safety regulations.

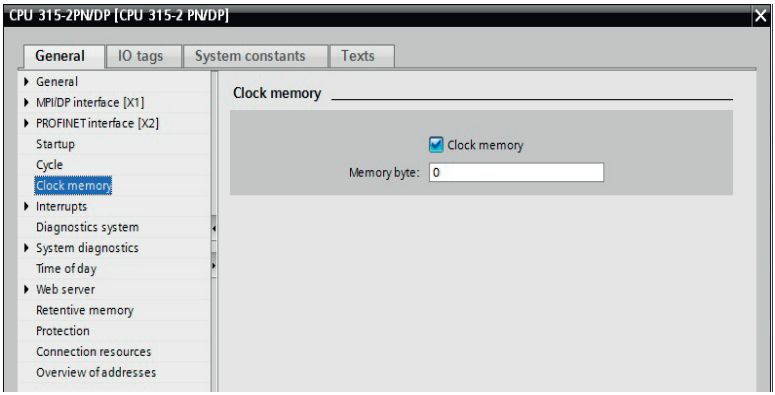
3. General Note

This document is intended to explain the incorporation of a Barcode Line Scanner with Ethernet interface into a PROFINET controller as an example. This description has been prepared on the basis of a Siemens Simatic S7 controller. wenglor sensoric GmbH does not offer any guarantee that the contents of this description are correct and/or complete. Device-specific adaptation of other wenglor products or products from other manufacturers is not dealt with in this version.

4. General Information on Scanner Functions

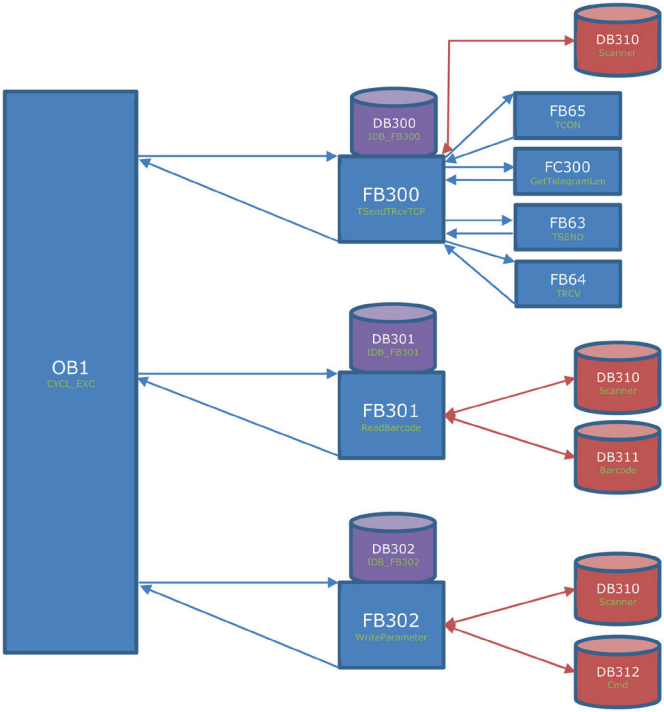


This is an overview of all of the blocks which are required for the use of scanner functions.
In order to assure that the variables set up in OB1 can be assigned to the corresponding inputs and outputs of the respective function block, the symbol table must first be copied from the sample project. It must also be noted that the utilized flags and timers are only programming suggestions which do not necessarily have to be complied with.



In der Hardwarekonfiguration kann über einen Doppelklick auf die CPU ein Menüfenster geöffnet werden. In diesem Fenster können unter anderem Einstellungen wie das Festlegen des Taktmerkerbytes oder die An- und Abwahl der Taktmerker realisiert werden.

5. Call Structure of the Scanner Blocks



6. OB1 – Network1

Netzwerk 1:

Kommentar

```
      L     16#01                                    16#01
      L     #OB1_SCAN_1
      ==I
      O(
      L     16#02                                    16#02
      ==I
      )
      O(
      TAK
      L     16#04                                    16#04
      ==I
      )
      S     "InitCom"                                %M1.2
```

Checking is conducted to determine whether or not the CPU has been started in network 1 of OB1. The “InitCom” variable is set each time the CPU is restarted. This variable initializes a connection for each participant. After OB1 has been run, this variable is reset. Alternatively, this initialization signal can also be set and reset in the respective startup OB.

7. OB1 – Network2

7.1. Overview

Netzwerk 2: establish connection to scanner

DeviceID:...

```
      CALL  "TSendTRcvTCP", "IDB_FB300"                %FB300, %DB300
         InitCom     :="InitCom"                       %M1.2
         Clock25Hz   :="Clk04"                         %M0.2
         ConID       :=16#0001                         16#0001
         InterfaceId :="Local~PROFINET-Schnittstelle_1" 64
         IPAdr1      :=10                              10
         IPAdr2      :=0                               0
         IPAdr3      :=3                               3
         IPAdr4      :=243                             243
         PRcvData    :="Scanner".Rcv                   P#DB310.DBX0.0
         PSendData   :="Scanner".Send                  P#DB310.DBX300.0
         Connected   :="Connected"                     %M8.0
```

7.2. Call

```
      CALL  "TSendTRcvTCP", "IDB_FB300"                %FB300, %DB300
```

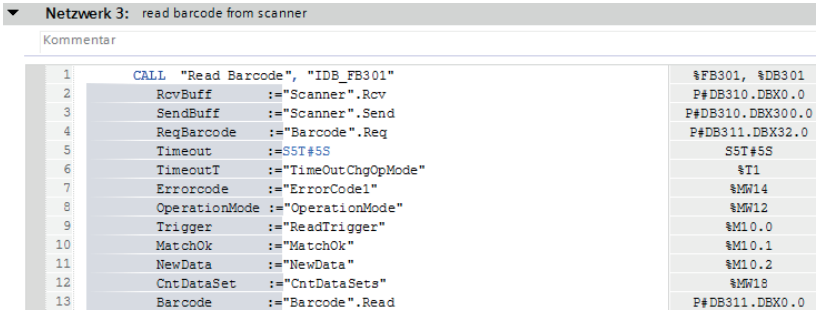
The “TSendTRcvTCP” (FB300) function block with associated “IDB_FB300” (DB300) instance data block is called from the user program. This function block (FB300) establishes a TCP/IP connection which permits outgoing data transmission from the wenglor scanner. The Siemens “TSEND”, “TRCV” and “TCON” blocks are used. (Blocks provided by Siemens and which comply with DIN EN 61131-3 are designated Siemens blocks. They cannot be changed by the user.)

7.3. Parameter Descriptions

Name	Declaration	Type	Value Range	Description
InitCom	INPUT	BOOL	FALSE (0) TRUE (1)	Initializes the connection Has to be set when the CPU is started and then reset in OB1
Clock25Hz	INPUT	BOOL	FALSE (0) TRUE (1)	Frequency of 2.5 Hz
ConID	INPUT	WORD	W#16#0001 W#16#0FFF	A memory variable which assigns an identification number to each participant (a separate ID must be generated for each participant)
DevID	INPUT	BYTE	B#16#0 B#16#1 B#16#2 B#16#3 B#16#5	Controls the hardware configuration and selects the type of communication **B#16#0:** communication via CP 443-1 **B#16#01:** communication via the IE interface in interface slot 1 (IF1) with WinAC RTX (TCP only) **B#16#02:** communication via the integrated IE interface with the 315-2 PN/DP and 317-2 PN/DP CPUs **B#16#03:** communication via the integrated IE interface with the 319-3 PN/DP CPU **B#16#05:** communication via the integrated IE interface with 414-3 PN/DP, 416-3 PN/DP, 416-3F PN/DP and 41x-5H PN/DP CPUs (rack 0)
IPAdr1	INPUT	INT	192	Includes numbers 1 to 3 of the IP address.
IPAdr2	INPUT	INT	168	Includes numbers 4 to 6 of the IP address.
IPAdr3	INPUT	INT	100	Includes numbers 7 to 9 of the IP address.
IPAdr4	INPUT	INT	10	Includes numbers 10 to 12 of the IP address.
PRcvData	INPUT	ANY	—	Pointer to memory area of the received data
PSendData	INPUT	ANY	—	Pointer to memory area of the transmitted data
Connected	IN_OUT	BOOL	FALSE (0) TRUE (1)	A condition variable which indicates whether or not it was possible to establish a connection

8. OB1 – Network3

8.1. Overview



8.2. Call

The “Read Barcode” (FB301) function block with associated “IDB_FB301” (DB301) instance data block is called from the user program. This function block (FB301) is required in order to read out the barcode data from the wenglor scanner.

Four different modes can be selected to this end (see page 7 „8.3. Parameter Descriptions“):

1st mode: no trigger / no match
2nd mode: trigger / no match
3rd mode: no trigger / match
4th mode: trigger / match

8.3. Parameter Descriptions

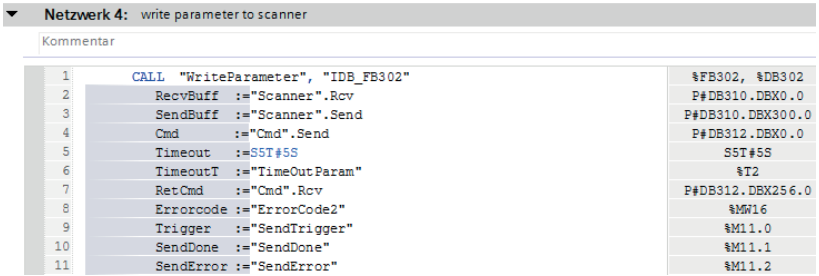
Name	Declaration	Type	Value Range	Description
RcvBuff	INPUT	ANY	—	Pointer to memory area of the received data
SendBuff	INPUT	ANY	—	Pointer to memory area of the transmitted data
ReqBarcode	INPUT	STRING	—	Match string for scanner barcode (important in modes 3 and 4)
Timeout	INPUT	S5TIME	S5T#0H_0M_0S_10MS; (10 ms) bis S5T#2H_46M_30S_0MS; (9990 s) und S5T#0H_0M_0S_0MS	A variable which specifies a maximum timespan within which the mode must be changed while scanning (here declared at 5 s)

TimeoutT	INPUT	TIMER	-T#24D_20H_31M_23S_648MS bis T#24D_20H_31M_23S_647MS	Timer variable with memory area in the PLC (T1)
Errorcode	OUTPUT	WORD		Provides feedback indicating which error has occurred
			W#16#0000	**W#16#0000:** no errors have occurred
			W#16#80A1	**W#16#80A1:** DB number greater than allowed for this PLC
			W#16#80B1	**W#16#80B1:** DB does not exist
			W#16#8xyy	**W#16#8xyy:** use SFC24 help information (TEST_DB)
			W#16#8051	**W#16#8051:** none of the possible modes has been selected
			W#16#8052	**W#16#8052:** operation mode not allowed (values 1 - 4)
			W#16#8053	**W#16#8053:** length of the queried barcodes is 0
			W#16#8054	**W#16#8054:** length of the queried barcodes is longer than allowed
			W#16#8055	**W#16#8055:** maximum time for selecting a mode has elapsed

OperationMode	IN_OUT	INT	1 – 4	Controls which function mode will be used **OperationMode 1:** No trigger / no match Data are read out continuously from the scanner; no comparison with the match string **OperationMode 2:** Trigger / no match Data are read out of the scanner after the trigger is activated; no comparison with the match string (trigger = 1) **OperationMode 3:** No trigger / match Data are read out continuously from the scanner; comparison with the match string (MatchOk = 1) **OperationMode 4:** Trigger / match Data are read out of the scanner after the trigger is activated; comparison with the match string (MatchOk = 1; trigger = 1)
Trigger	IN_OUT	BOOL	FALSE (0) TRUE (1)	A condition variable which makes it possible to read out the data (important in modes 2 and 4)
MatchOk	IN_OUT	BOOL	FALSE (0) TRUE (1)	A condition variable which determines whether or not the required data values coincide with the barcode values (important in modes 3 and 4)
NewData	IN_OUT	BOOL	FALSE (0) TRUE (1)	A condition variable which indicates whether or not new data are available
CntDataSet	IN_OUT	WORD	W#16#0001 W#16#0FFF	A counter variable for the number of received barcode data
Barcode	IN_OUT	ANY	—	Pointer to the memory area of the barcode data

9. OB1 – Network4

9.1. Overview



9.2. Call

```
1   CALL "WriteParameter", "IDB_FB302"                %FB302, %DB302
```

The “WriteParameter” (FB302) function block with associated “IDB_FB302” (DB302) instance data block is called from the user program. This function block (FB302) transmits various commands to the wenglor scanner. Feedback is received from the scanner for all commands (except for the trigger pulse), which indicates whether or not data recording was successful.

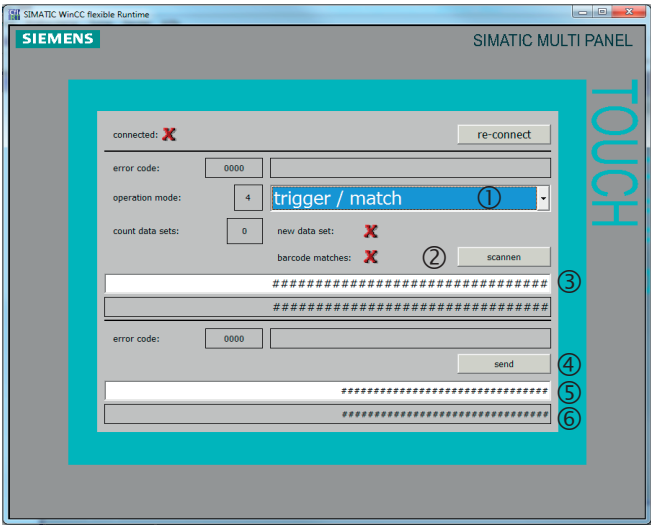
9.3. Parameter Descriptions

Name	Declaration	Type	Value Range	Description
RcvBuff	INPUT	ANY	—	Pointer to memory area of the received data.
SendBuff	INPUT	ANY	—	Pointer to memory area of the transmitted data.
Cmd	INPUT	STRING	—	A memory variable which contains the barcode's data
Timeout	INPUT	S5TIME	S5T#0H_0M_0S_10MS; (10 ms) bis S5T#2H_46M_30S_0MS; (9990 s) und S5T#0H_0M_0S_0MS	A variable which specifies a maximum timespan within which the data must be transmitted (here declared at 5 s)
TimeoutT	INPUT	TIMER	-T#24D_20H_31M_23S_648MS bis T#24D_20H_31M_23S_647MS	Timer variable with memory area in the PLC (T2)
Errorcode	OUTPUT	WORD	W#16#0000 W#16#80A1 W#16#80B1 W#16#8xyy W#16#8051	Provides feedback indicating which error has occurred. **W#16#0000:** no errors have occurred **W#16#80A1:** DB number greater than allowed for this PLC **W#16#80B1:** DB does not exist **W#16#8xyy:** use SFC24 help information (TEST_DB) **W#16#8051:** send memory not long enough; memory must have the same length as the "Cmd" string variable.
Trigger	IN_OUT	BOOL	FALSE (0) TRUE (1)	A condition variable which makes it possible to write/send data
SendDone	IN_OUT	BOOL	FALSE (0) TRUE (1)	A condition variable which determines whether or not sending has been completed
SendError	IN_OUT	BOOL	FALSE (0) TRUE (1)	A condition variable which indicates whether or not an error has occurred at the sensor or Tmax has been exceeded
RetCmd	IN_OUT	STRING	W#16#0001 W#16#0FFF	Comparison variable between the selected mode and the recorded barcode values

10. Visualization and Scanner Modes

The wenglor scanner offers a total of 4 different modes.
1st mode: no trigger / no match
2nd mode: trigger / no match
3rd mode: no trigger / match
4th mode: trigger / match

The trigger function can be used to control the point in time at which a barcode is evaluated (start signal). The match function compares the recorded barcode value with a comparison value (a comparison value can be specified). The match condition is fulfilled as soon as the two values coincide.



① Selection of the desired mode

② Selection of the scanning function when a mode with “trigger” has been selected

③ Initialization of a barcode match value if a mode with “match” has been selected.
Furthermore, an error code can be evaluated and the scanner can be reconnected.

④ A LIMA command can be sent to the scanner with the help of the send button.

⑤ A LIMA command can be specified here. An overview of commands is included in the product’s interface protocol.
www.wenglor.com ➔ Product World ➔ Product search (enter the product number) ➔ Download ➔ Interface protocol

⑥ Return value, LIMA command