

AG03-1

**RSLogix™ 5000 EtherNet/IP™
Add-On Instruction via
Anybus® Communicator™**

Software Description



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1 General Notes

1.1 Trademarks

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EtherNet/IP™ is a trademark of ODVA, Inc.

1.2 Liability

SIKO GmbH assumes no warranty whatsoever regarding topicality, correctness, completeness or quality of the information or software products provided. All liability claims against SIKO GmbH referring to material or immaterial damages caused by using or not using the information or software provided or by using erroneous or incomplete information or software are always excluded.

1.3 Limitations

The Add-On Instruction and its function were tested on a CompactLogix® 1769-L16ER. The module was programmed using RSLogix™ 5000 version V20.01.00 (CPR 9 SR 5).

The configuration file and its function were tested on an Anybus® Communicator™ AB7007. The file was setup using Anybus® Configuration Manager - Communicator RS232/422/485 version v.4.4.1.3 (Win 2000/XP/Vista/7).

1.4 Requirements

- Basic knowledge of handling and programming Allen-Bradley® systems.
- Familiarity with EtherNet/IP™.
- Basic knowledge of setup and handling Anybus® Communicator™
- Familiarity with Anybus® Configuration Manager

1.5 Versions Overview

This manual is related to

- AG03-1 firmware version ≥ 1.02
- Add-On Instructions "SIKO_AG03-1_RSLV19-01-00_V5-0-1.L5X"
- Add-On Instructions "SIKO_AG03-1_RSLV20-01-00_V5-0-1.L5X"
- Anybus® configuration file "SIKO_EIP_31-SN5_pattern.cfg"
- Anybus® Communicator™ file "005A000C004D0300.EDS"

1.6 List of Abbreviations

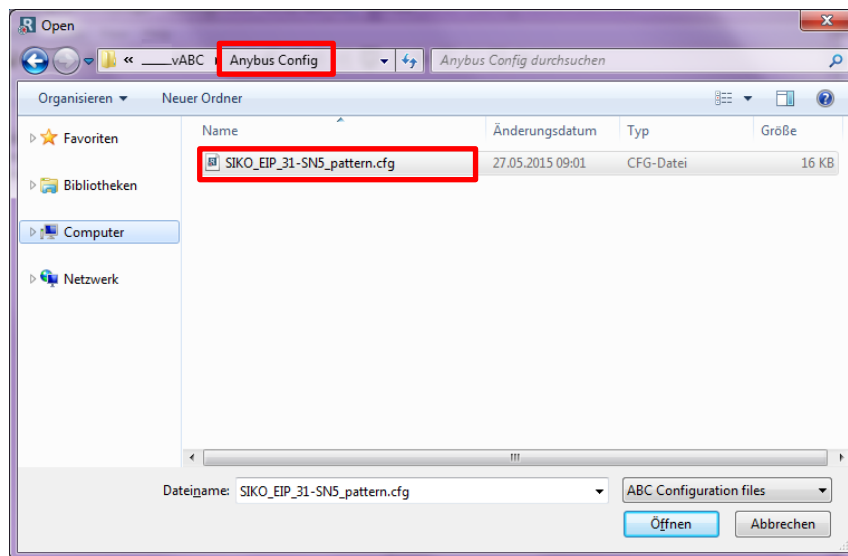
EIP	EtherNet/IP™	ABC	Anybus® Communicator™
SW	Status Word	ACM	Anybus® Configuration Manager
CW	Control Word	AOI	Add-On Instruction

2 Setup of Anybus® Communicator™

Please note, that the Anybus® configuration file is designed for a flexible SIKONETZ-5 participant numbers of minimum 1 to maximum 31. Only the TCP/IP configuration has to be modified according to your network requirements. Please consider an IP Address modification when reading further on.

2.1 ABC Configuration File

Start ACM and select configuration file “SIKO_EIP_31-SN5_pattern.cfg” from the folder “Anybus Config”.

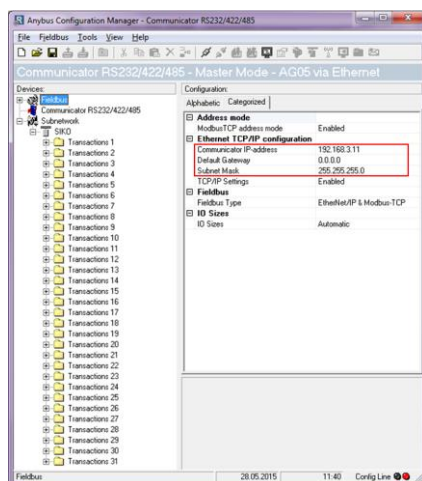


2.2 TCP/IP Configuration

NOTICE

The IP settings in this example can cause serious network problems under certain circumstances. If you are in doubt about the correct IP settings for your network, ask your system administrator for assistance.

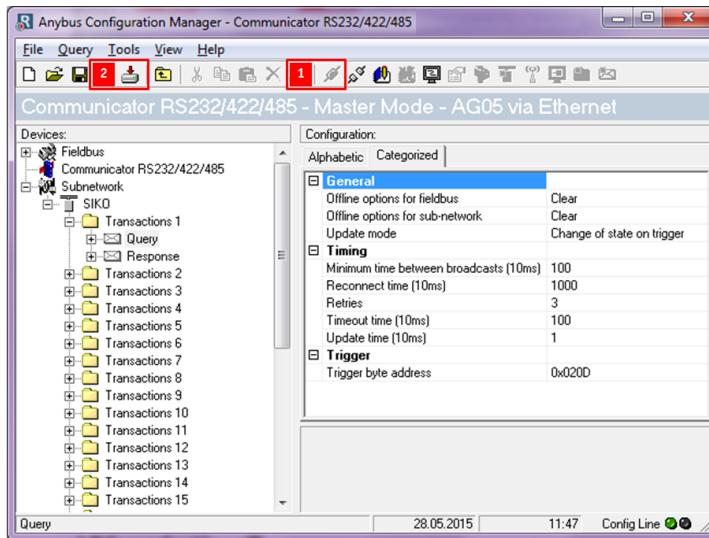
Modify TCP/IP configuration if necessary.



1. Press “Connect” to go online with the ABC.

2. Press “download to the ABC”.

You should have the following view:



2.3 ABC Cycle Time

Each transaction consists of "Query" and "Response". The minimum time for a used transaction is about ≥ 10 ms. Each Subnetwork cycle has an overhead of about ≥ 100 ms.

Since the plc cycle time is asynchronous with ABC cycle time the AOI integrates a trigger instead of checksum to the SIKONETZ-5 structure. When a master telegram is completed by the AOI the trigger will be incremented. The corresponding transaction will be updated by change of state on trigger and exchanges the trigger with checksum byte before the SIKONETZ-5 telegram is send into subnetwork.

The subnetwork reply is checked and checksum byte is exchanged with incremented trigger byte before the telegram is send to plc by ABC. The AOI will wait until a valid slave telegram is responded before sending a new telegram. Due to it the minimum time between update cycle amounts to ≥ 110 ms minimum. Please consider this for time critical applications!

3 I/O Configuration in the Scanner

From software version 20 onwards, EDS files are used for the I/O configuration.

Up to and including software version 19, the I/O configuration is carried out without EDS files.

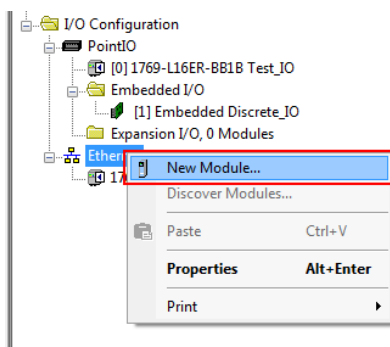
3.1 I/O Configuration with RSLogix™ 5000 Version 19 or Lower

3.1.1 Add New Module to the Hardware Configuration

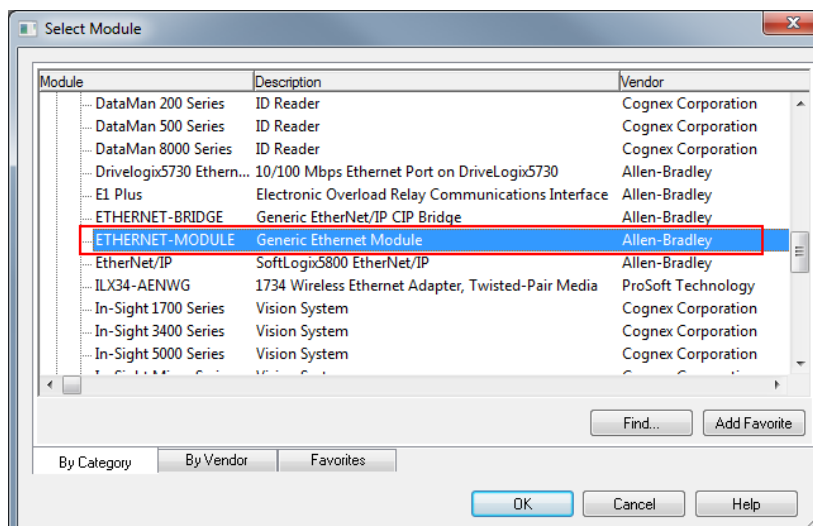
NOTICE

The IP settings in this example can cause serious network problems under certain circumstances. If you are in doubt about the correct IP settings for your network, ask your system administrator for assistance.

1. Right-click on "Ethernet" and execute "New Module..." command from the context menu.



2. Open "Communications" and select "ETHERNET-MODULE / Generic Ethernet Module".



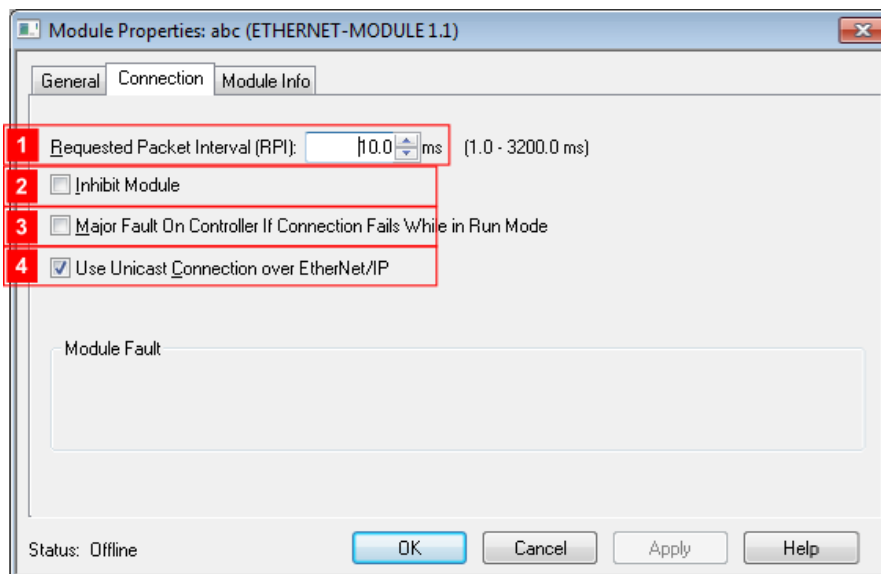
3. Complete the selection with "OK".

4. Enter the module settings:

Settings	Description
1. Name	Name of device, in this example we use "Anybus"
2. Comm Format	Data format for the assembly object instances: "Data – SINT"
3. IP Address	IP address of the Ethernet-Module.
4. Input	Assembly object instance input: "100" with size "314"
5. Output	Assembly object instance output: "150" with size "314"
6. Configuration	Assembly object instance configuration: "1" with size "0"

5. Complete the settings with "OK". Now the module properties window appears.

6. Go to the tab “Connection” and set further properties.



Settings	Description	Value
1. Requested Packet Interval	The RPI time specifies the intervals for the I/O data exchange between adapter and scanner. Supported RPI: 1 ... 3200 ms	“10.0”
2. Inhibit Module	Check/clear this box to inhibit/uninhibit your connection to the module. Inhibiting the module causes the connection to the module to be broken.	“clear”
3. Major Fault On Controller If Connection Fails While in Run Mode	Check this box to configure the controller so that failure of the connection to this module causes a major fault on the controller.	“clear”
4. Use Unicast Connection over EtherNet/IP	Select between Unicast and Multicast for EtherNet/IP connections.	“check”

7. Complete the settings with “OK”.

The I/O configuration is now complete.

The corresponding tags will then be created in the controller tags of the project.

The screenshot shows the 'Controller Tags' dialog for a V19 example controller. The 'Scope' is 'Test_AddOn_AF' and 'Show' is 'All Tags'. The following table represents the data shown in the dialog:

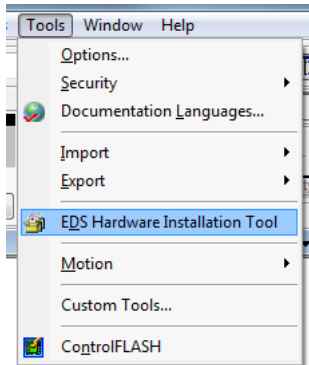
Name	Base Tag	Data Type	Description
+ Anybus:C		AB:ETHERNET_MODULE:C:0	
- Anybus:I		AB:ETHERNET_MODULE_SINT_314Bytes:I:0	
+ Anybus:I.Data		SINT[314]	
- Anybus:O		AB:ETHERNET_MODULE_SINT_314Bytes:O:0	
+ Anybus:O.Data		SINT[314]	

8. Save the I/O configuration.

3.2 I/O Configuration with RSLogix™ 5000 Version 20 or Higher

3.2.1 Register the EDS File for ABC

1. Start “EDS Hardware Installation Tool” and use the EDS wizard to register the EDS file “005A000C004D0300.EDS”.

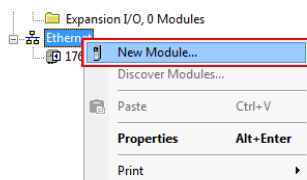


3.2.2 Add New Module to the Hardware Configuration

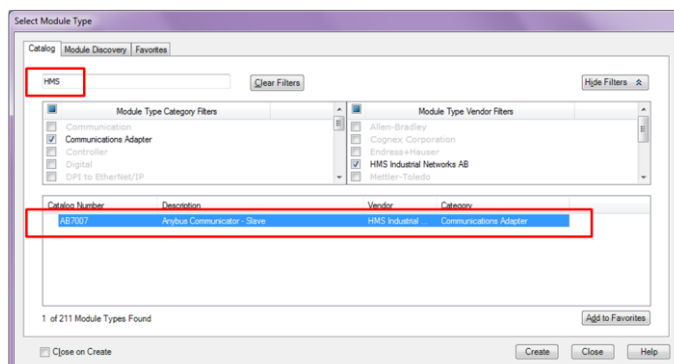
NOTICE

The IP settings in this example can cause serious network problems under certain circumstances. If you are in doubt about the correct IP settings for your network, ask your system administrator for assistance.

1. Right-click on “Ethernet” and execute “New Module...” command from the context menu (The View could differ depending on used hardware).

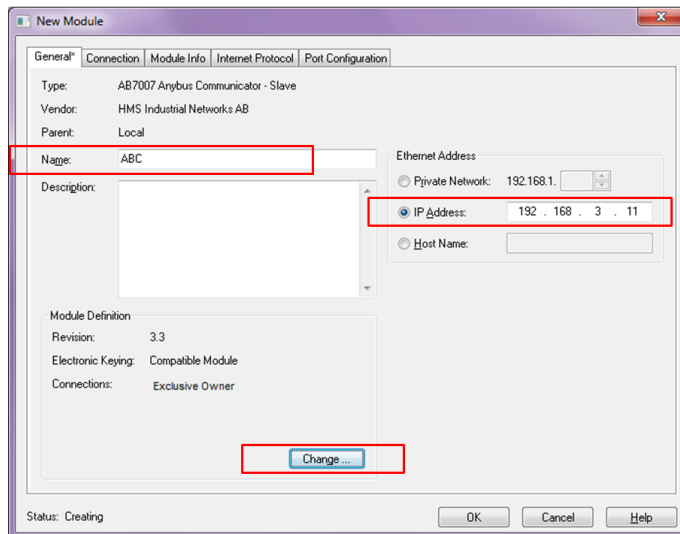


2. Search for “HMS” in the catalog.

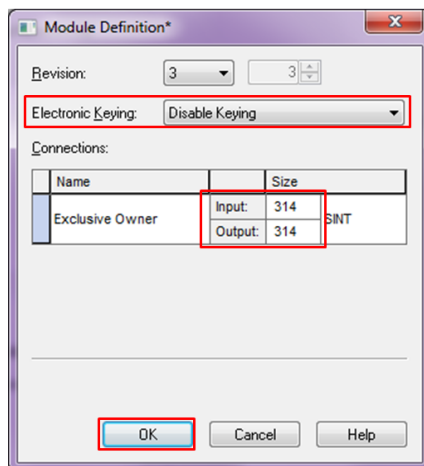


3. Choose catalog number “AB7007”.
4. Execute “Create” command.

5. Enter "Name" of device, for example "ABC".
6. Setup "Ethernet Address" of the ABC (assign IP address via ACM to setup address)




7. Open "Change ..."



8. Choose "Electronic Keying" "Disable Keying"
9. Change "Input" and "Output" size to "314" "SINT".
10. Confirm settings as well as warning with "OK".

The I/O configuration is now complete.

The corresponding tags will then be created in the controller tags of the project.

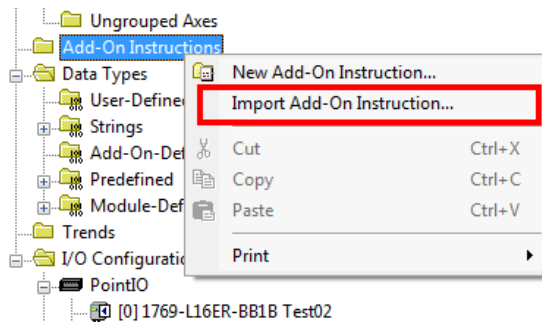
Scope:  Test_AddOn_AF		Show: All Tags		
	Name	Alias For	Base Tag	Data Type
	ABC:I			_005A:AB7007_85E5B736:I:0
	ABC:I.ConnectionFaulted			BOOL
	ABC:I.Data			SINT[314]
	ABC:O			_005A:AB7007_0C170748:O:0
	ABC:O.Data			SINT[314]

11. Save the I/O configuration.

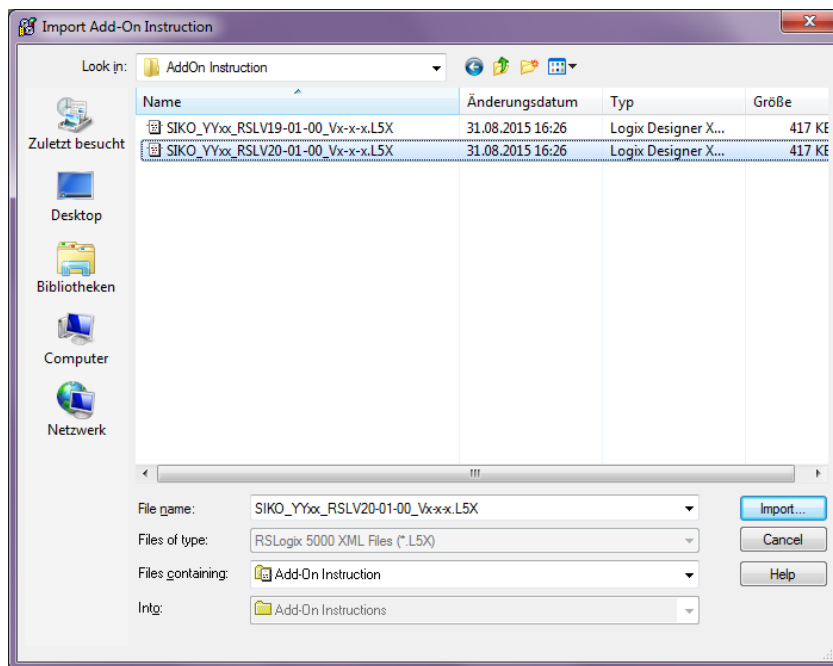
4 Software Configuration

4.1 Import the SIKO AG03-1 Add-On Instruction

1. Right-click on "Add-On Instructions" folder inside the controller organizer.
2. Execute command "Import Add-On Instruction..."



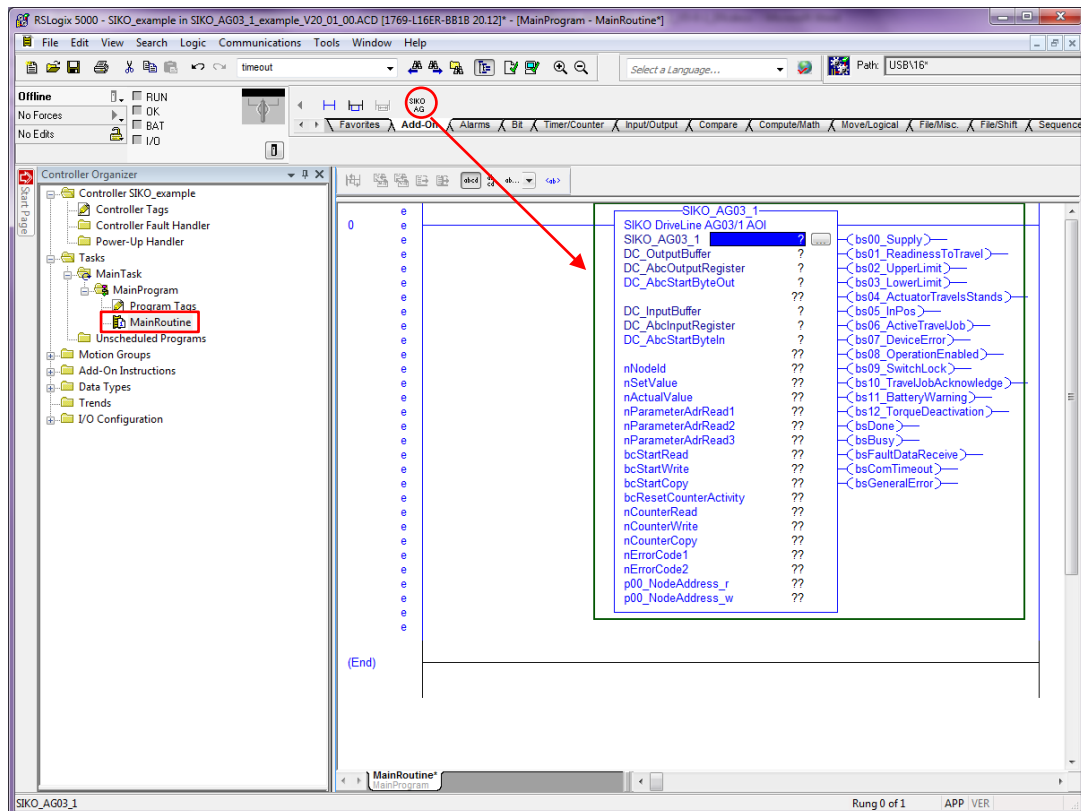
3. For RSLogix™ 5000 V19 choose file "SIKO_AG03-1_RSLV19-01-00_V5-0-1.L5X" or for RSLogix™ 5000 V20 choose file "SIKO_AG03-1_RSLV20-01-00_V5-0-1.L5X" from the folder "AddOn Instruction".



4. Execute "Import..." command.

4.2 Call the AOI SIKO_AG03-1 Cyclically in the User Program.

1. Double-click on "MainRoutine" folder.
2. Go to language element toolbar.
3. Choose tab "Add-On".
4. Drag add-on "SIKO_AG03-1".
5. Drop add-on at rung "0".



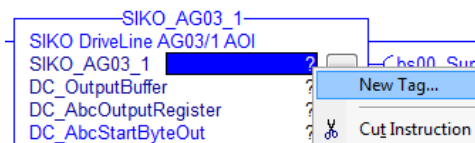
4.3 Setup Add-On Instruction Parameters

After inserting the Add-On Instruction, you'll have to assign the various parameters of the module.

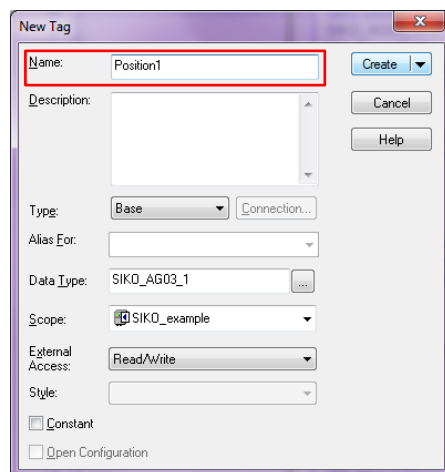
4.3.1 SIKO_AG03-1

Description: Module instance name

1. Create new tag by right-clicking on interrogation mark on the right side of "SIKO_AG03-1".
2. Execute "New Tag..." command.



3. Enter the name of the new tag, for example "Position1".



4. Confirm setting with "Create".

4.3.2 DC_OutputBuffer

Description: Buffer for protocol output transfer

1. Create new tag by pressing "Ctrl + W".
2. Enter the name of the new tag, for example "Position1_CW".
3. Confirm setting with "Create".

4.3.3 DC_AbcOutputRegister

Description: Data output register from ABC

1. Create new entering by double-click "?".
2. Select drop-down menu.
3. Select "ABC:0" by double-click.
4. Confirm setting with "ENTER".

4.3.4 DC_AbcStartByteOut

Description: Address of ABC memory field for outgoing data

1. Create new entering by double-click "?".
2. Enter the number of the field in decimal format. First no. is "204". A further AG03-1 will start 10 Byte higher, i. e. "214", "224" and so on.
3. Confirm setting with "ENTER".

4.3.5 DC_InputBuffer

Description: Buffer for protocol input transfer

1. Create new tag by "Ctrl + W".
2. Enter the name of the new tag, for example "Position1_SW".
3. Confirm setting with "Create".

4.3.6 DC_AbcInputRegister

Description: Data input register from ABC

1. Create new entering by double-click "?".
2. Select drop-down menu.
3. Select "ABC:I" by double-clicking.
4. Confirm setting with "ENTER".

4.3.7 DC_AbcStartByteIn

Description: Address of ABC memory field for incoming data

1. Create new entering by double-click "?".
2. Enter the number of the field in decimal format. First no. is "4". A further AG03-1 will start 10 Byte higher, i. e. "14", "24" and so on.
3. Confirm setting with "ENTER".

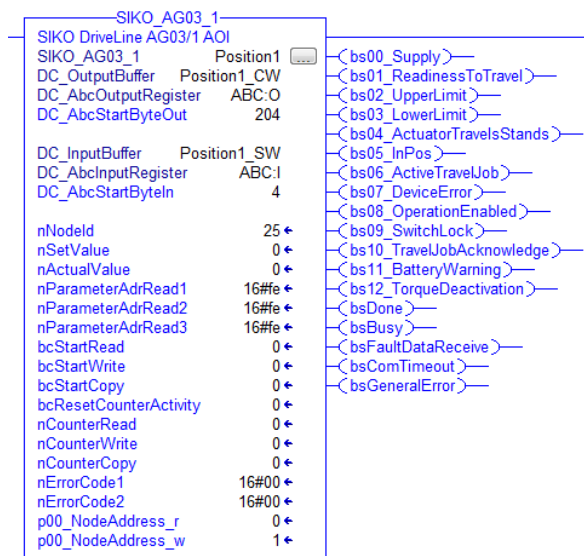
4.3.8 nNodeId

Description: nNodeId is the temporary node address of each SIKONETZ-5 participant.

1. Create new entering by double-click “?”.
2. Enter the node address, for example “25”.
3. Confirm setting with “ENTER”.

NOTE: Before writing the parameters adjust parameter p00_NodeAddress_w accordingly!

4.4 AOI Call After Configuration



4.5 Software Example

4.5.1 Data Exchange

The AOI is designed to send or receive in alternation the "nSetValue" (Write, Parameter: 0xFF "Set Point 2") or the "nActualValue" (Read, Parameter: 0xFE "Actual Position") respectively, while no specific parameter access is active.

With the "nParameterAdrRead1", "nParameterAdrRead2" and "nParameterAdrRead3" further parameter can be included in the data read cycle. With default value 0xFE the inclusion is disabled.

NOTE: If "bsFaultDataReceive" is indicated the complete data exchange is stopped, while Control and Status Word are still updated! A missing or not responding subnetwork participant is indicated by "bsComTimeout" (0,5sec. + time set in parameter 0x02 Bus Timeout).

4.5.2 Parameter Access

The present module contains the parameter data in addition to the process data (CW/SW). Parameters that can be changed (read/write) exist in programming as actual value (_r) and as target value (_w) as well. Furthermore, it is differentiated between pure read parameters (only indicated as actual value) and pure write parameters (only indicated as target value).

A rising edge must be applied either to the "bcStartRead" or to the "bcStartWrite" input on the module described here in order to enable a read or write process of one of the variables.

4.5.3 Read Parameters

If a rising edge is applied to the "bcStartRead" input, then all parameters will be read and can be used for further programming. If counter read value is not reset to "0" the read cycle was interrupted by read failure. This indicates to a communication failure.

4.5.4 Write Parameters

If a rising edge is applied to the "bcStartWrite" input of the module, then all parameters will be transferred to the module. If counter write value is not reset to "0" the write cycle was interrupted by a write failure. This indicates to a communication failure or parameter value is beyond range of value accepted by AG03-1.

4.5.5 Copy Parameters from Read to Write

If a rising edge is applied to the "bcStartCopy" input of the module, then all actual values (_r) are copied to their corresponding target values (_w).

4.5.6 S-Commands

After executing a S-Command a read cycle is been triggered to refresh all actual values (_r).

4.5.7 Counter Value

Count read value	Count write value	Name	Value range (dec)	Default
	1	0xA8 Programming Mode On/Off	0 ... 1	0
1		0x00 Note address	0 ... 31	1
2		0x01 Baud rate	0 ... 2	1
3	2	0x02 Bus Timeout	0 ... 20	20
4	3	0x03 Response parameter to a setpoint write access	0 ... 2	0
5	4	0x0E Configuration programming mode	0 ... 1	0
6	5	0x10 Controller Parameter P	1 ... 500	100
7	6	0x11 Controller Parameter I	0 ... 500	5
8	7	0x12 Controller Parameter D	0 ... 500	0
9	8	0x13 a-Pos	1 ... 100	50
10	9	0x14 v-Pos	Gear 24:1 => 1 ... 200 48:1 => 1 ... 100	30
11	10	0x15 a-Rot	1 ... 100	50
12	11	0x16 a-Inch	1 ... 100	50
13	12	0x17 v-Inch	Gear 24:1 => 1 ... 200 48:1 => 1 ... 100	30
14	13	0x18 UeNumerator	1 ... 10000	1
15	14	0x19 UeDenominator	1 ... 10000	1
16		0x1A EncoderResolution		1600
17	15	0x1B Counting direction	0 ... 1	0
18	16	0x1C Resolution per revolution	1 ... 59999	720
19	17	0x1E Offset value	-9999 ... 9999	0
20	18	0x1F Calibration value	-9999 ... 9999	0
21	19	0x20 Target window1 (near field)	0 ... 9999	10
22	20	0x21 Positioning type (loop type)	0 ... 2	0
23	21	0x22 Loop length	0 ... 9999	800
24	22	0x23 Inpos Mode	0 ... 2	0
25	23	0x24 Delta Inch	-1000000 ... 1000000	1600
26	24	0x25 AccelerationTypeInchingMode2	0 ... 1	0
27	25	0x26 Inching2 Offset	10 ... 100	100
28	26	0x27 Stop Mode Inching2	0 ... 1	0
29	27	0x28 Operating mode	0 ... 1	0
30	28	0x29 Limit_1	-9999999 ... 9999999	10000000
31	29	0x2A Limit_2	-9999999 ... 9999999	-10000000
32	30	0x2D Contouring Error Limit	1 ... 30000	400
33	31	0x36 d-Pos	1 ... 101	101

Count read value	Count write value	Name	Value range (dec)	Default
34	32	0x37 Torque Disable	20 ... 125	125
35		0x60 Output Stage Temperature		0
36		0x61 Voltage Of Control		0
37		0x62 Voltage Of Output Stage		0
38		0x63 Battery voltage		0
39		0x64 Motor Current		0
40		0x65 DeviceCode		0
41		0x66 SoftwareSecondaryController		0
42		0x67 Software Main Controller		0
43		0x68 Serial Number		0
44		0x69 Production Date		0
45		0x6A Gear Reduction		0
46		0x6B Actual Position		0
47		0x6C Actual Rotational Speed		0
48		0x80 Number Of Errors Recorded		0
49		0x81 Error 01		0
50		0x82 Error 02		0
51		0x83 Error 03		0
52		0x84 Error 04		0
53		0x85 Error 05		0
54		0x86 Error 06		0
55		0x87 Error 07		0
56		0x88 Error 08		0
57		0x89 Error 09		0
58		0x8A Error 10		0
59	33	0xAA FreezeAV	0 ... 1	0
60		0xFA System Status word		0
61		0xFE Position value		0
62		0xFF Setpoint		0
	34	0xA0 System Command	1 ... 3, 5 ... 9	0

4.5.8 Error Codes

If a communication error occurs, there is an error code present at the outputs "nErrorCode1" and "nErrorCode2". Please refer to the AG03-1 manual (keyword: error codes) for a complete description of these error codes.