

# AG25, AG26

**RSLogix™ 5000 EtherNet/IP™  
Add-On Instruction**

Software Description



## Table of contents

<b>1</b>	<b>General Notes.....</b>	<b>3</b>
1.1	Trademarks .....	3
1.2	Liability .....	3
1.3	Limitations .....	3
1.4	Requirements .....	3
1.5	Versions Overview .....	4
1.6	List of Abbreviations .....	4
<b>2</b>	<b>I/O Configuration in the Scanner .....</b>	<b>5</b>
2.1	I/O Configuration with RSLogix™ 5000 Version 19 or Lower .....	5
2.1.1	Add New Module to the Hardware Configuration .....	5
2.2	I/O Configuration with RSLogix™ 5000 Version 20 or Higher .....	9
2.2.1	Register the EDS File for SIKO AG2X .....	9
2.2.2	Add New Module to the Hardware Configuration .....	9
<b>3</b>	<b>Software Configuration .....</b>	<b>11</b>
3.1	Import the SIKO AG2X AOI .....	11
3.2	Call the AOI SIKO_AG2X Cyclically in the User Program .....	12
3.3	Setup AOI Parameters .....	13
3.3.1	SIKO_AG2X .....	13
3.3.2	DC_OUTPUT .....	13
3.3.3	DC_INPUT .....	13
3.3.4	GetMsgData .....	14
3.3.5	SetMsgData .....	14
3.3.6	GetMsg .....	14
3.3.7	SetMsg .....	17
3.3.8	Timeout .....	19
3.4	AOI Call after Configuration .....	20
3.5	Software Example .....	21
3.5.1	Parameter Access .....	21
3.5.2	Read Parameters .....	21
3.5.3	Write Parameters .....	21
3.5.4	Copy Parameters from Read to Write .....	21
3.5.5	S-Commands .....	21
3.5.6	Counter Value .....	22
3.5.7	Error Codes .....	24
3.5.8	Module Status .....	25

## **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 Add-On Instruction is using unconnected CIP generic messages to read and write parameters. If you want to enable more than 16 unconnected messages at one time, use a management strategy to control the number of unconnected messages that are enabled at one time.

### **1.4 Requirements**

- Basic knowledge of handling and programming Allen-Bradley® systems.
- Familiarity with EtherNet/IP™.

## 1.5 Versions Overview

This manual is related to the following AOIs:

- SIKO\_AG2X\_RSLV20-01-00\_V1-6-0.L5X
- SIKO\_AG2X\_RSLV19-01-00\_V1-6-0.L5X
- SIKO\_AG2X\_RSLV18-02-00\_V1-6-0.L5X
- SIKO\_AG2X\_RSLV17-01-00\_V1-6-0.L5X

## 1.6 List of Abbreviations

EIP	EtherNet/IP™
SW	Status Word
CW	Control Word
AOI	Add-On Instruction

## 2 I/O Configuration in the Scanner

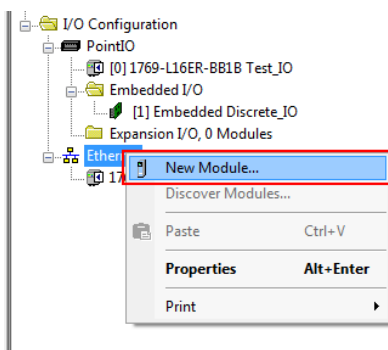
From software version 20 onwards, EDS files are used for the I/O configuration.

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

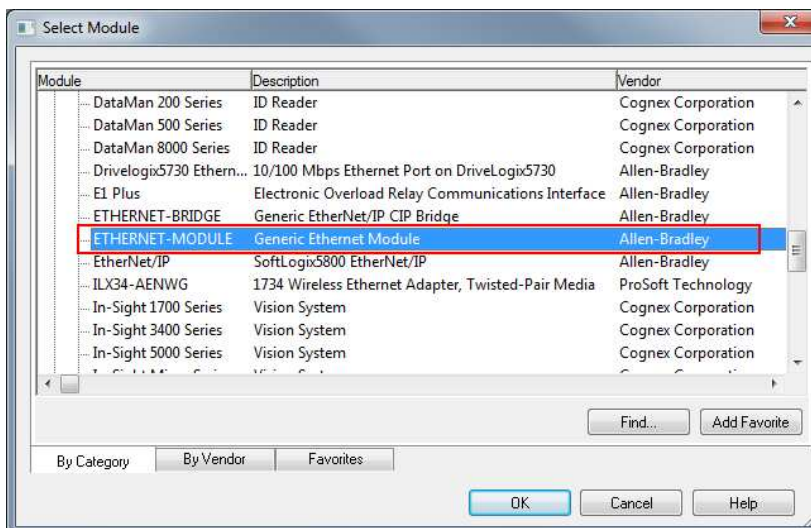
### 2.1 I/O Configuration with RSLogix™ 5000 Version 19 or Lower

#### 2.1.1 Add New Module to the Hardware Configuration

1. Right-click on “Ethernet” and execute the “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:

The 'New Module' dialog box is shown with the following settings highlighted by red boxes and numbers:

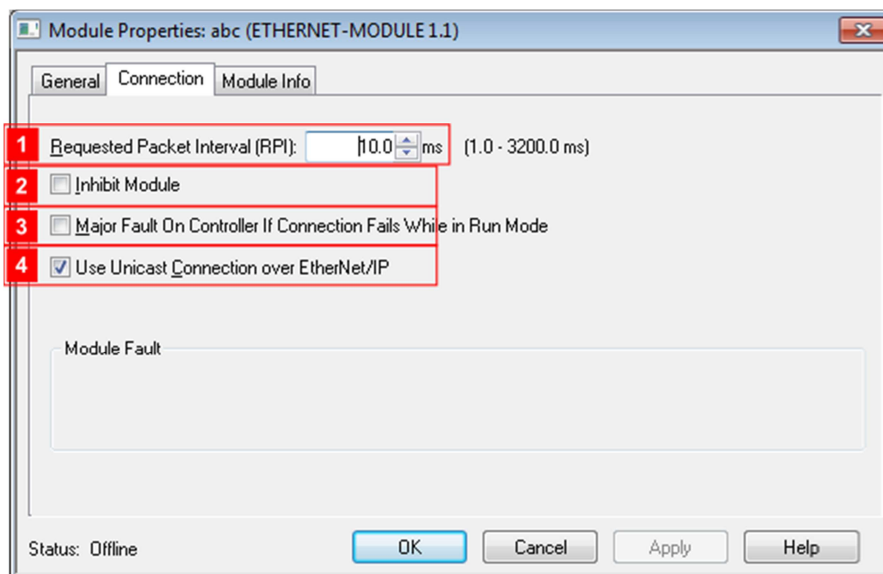
- 1** Name: Drive1
- 2** Comm Format: Data - SINT
- 3** IP Address: 192 . 168 . 1 . 164
- 4** Input: 100 (Assembly Instance) with size 7 (8-bit)
- 5** Output: 150 (Assembly Instance) with size 7 (8-bit)
- 6** Configuration: 1 (Assembly Instance) with size 0 (8-bit)

Other visible settings include: Type: ETHERNET-MODULE Generic Ethernet Module, Vendor: Allen-Bradley, Parent: abc, Description: (empty), Address / Host Name: (empty), and Status Input/Output: (empty). The 'Open Module Properties' checkbox is checked. Buttons for OK, Cancel, and Help are at the bottom right.

Settings	Description
1. Name	Name of device, in this example we use "Drive1"
2. Comm Format	Data format for the assembly object instances: "Data - SINT"
3. IP Address	IP address of the drive.
4. Input	Assembly object instance input: "100" with size "7"
5. Output	Assembly object instance output: "150" with size "7"
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.

Name	Alias For	Base Tag	Data Type	Description
+ Drive1:C			AB:ETHERNET_...	
- Drive1:I			AB:ETHERNET_...	
- Drive1:I.Data			SINT[7]	
+ Drive1:I.Data[0]			SINT	
+ Drive1:I.Data[1]			SINT	
+ Drive1:I.Data[2]			SINT	
+ Drive1:I.Data[3]			SINT	
+ Drive1:I.Data[4]			SINT	
+ Drive1:I.Data[5]			SINT	
+ Drive1:I.Data[6]			SINT	
- Drive1:O			AB:ETHERNET_...	
- Drive1:O.Data			SINT[7]	
+ Drive1:O.Data[0]			SINT	
+ Drive1:O.Data[1]			SINT	
+ Drive1:O.Data[2]			SINT	
+ Drive1:O.Data[3]			SINT	
+ Drive1:O.Data[4]			SINT	
+ Drive1:O.Data[5]			SINT	
+ Drive1:O.Data[6]			SINT	

8. Save the I/O configuration.



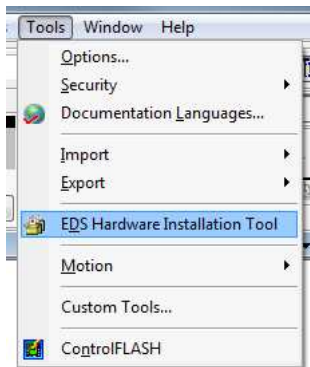
## 2.2 I/O Configuration with RSLogix™ 5000 Version 20 or Higher

### 2.2.1 Register the EDS File for SIKO AG2X

1. Start the EDS Hardware Installation Tool and use the EDS wizard to register the EDS file "053E002B\_SIKO\_AG2X\_a\_b.eds"

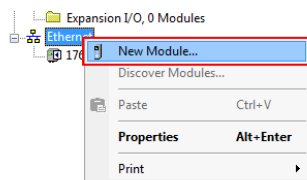
a = Major Revision

b = Minor Revision

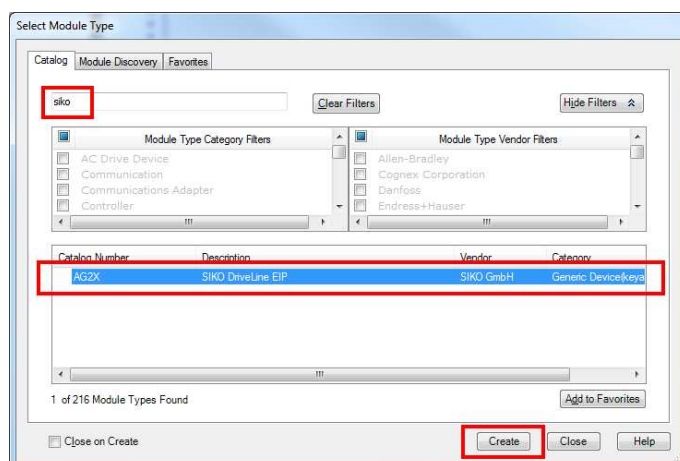


### 2.2.2 Add New Module to the Hardware Configuration

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



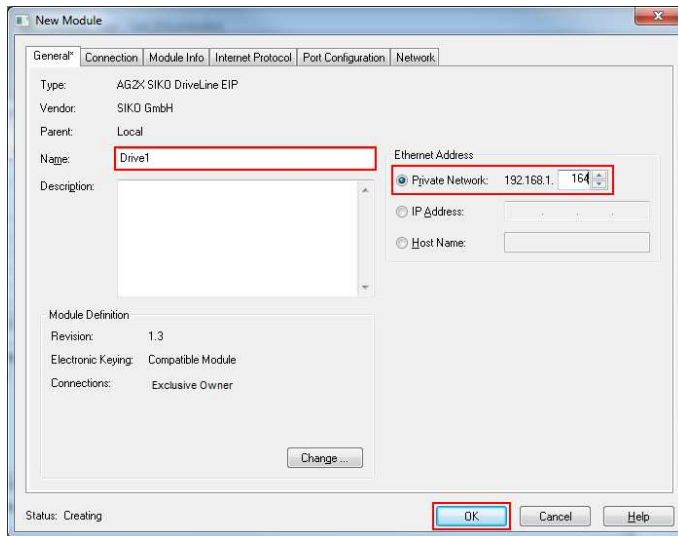
2. Search for "siko" in the catalog.



3. Choose catalog number "AG2X".

4. Execute the "Create" command.

5. Enter the name of the drive, for example "Drive1".
6. Setup the ethernet address of the drive (assign IP address via DHCP/BOOTP or use the dip-switches of the drive to setup the address)



7. Confirm 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.

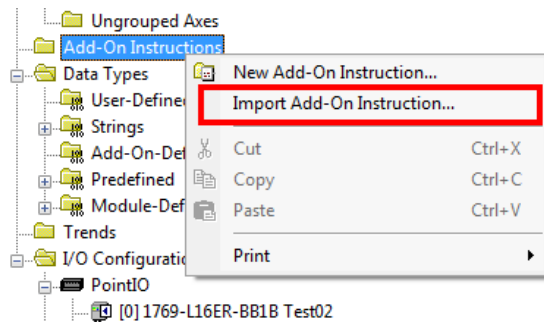
Scope: <span>Test_I0</span>		Show: AB:Embedded_Discretel0:C:0, AB:Embedded_Discretel0:I:0, AB:Embedded_Discretel0:O:0, _053E:AG2X_03...		Enter Name Filter...	
Name	Value	Force Mask	Style	Data Type	
Drive1:I	{...}	{...}		_053E:AG2X_03...	
Drive1:I.ConnectionFaulted	0		Decimal	BOOL	
Drive1:I.Data	{...}	{...}	Decimal	SINT[7]	
+ Drive1:I.Data[0]	0		Decimal	SINT	
+ Drive1:I.Data[1]	0		Decimal	SINT	
+ Drive1:I.Data[2]	0		Decimal	SINT	
+ Drive1:I.Data[3]	0		Decimal	SINT	
+ Drive1:I.Data[4]	0		Decimal	SINT	
+ Drive1:I.Data[5]	0		Decimal	SINT	
+ Drive1:I.Data[6]	0		Decimal	SINT	
Drive1:O	{...}	{...}		_053E:AG2X_2C...	
Drive1:O.Data	{...}	{...}	Decimal	SINT[7]	
+ Drive1:O.Data[0]	0		Decimal	SINT	
+ Drive1:O.Data[1]	0		Decimal	SINT	
+ Drive1:O.Data[2]	0		Decimal	SINT	
+ Drive1:O.Data[3]	0		Decimal	SINT	
+ Drive1:O.Data[4]	0		Decimal	SINT	
+ Drive1:O.Data[5]	0		Decimal	SINT	
+ Drive1:O.Data[6]	0		Decimal	SINT	

8. Save the I/O configuration.

### 3 Software Configuration

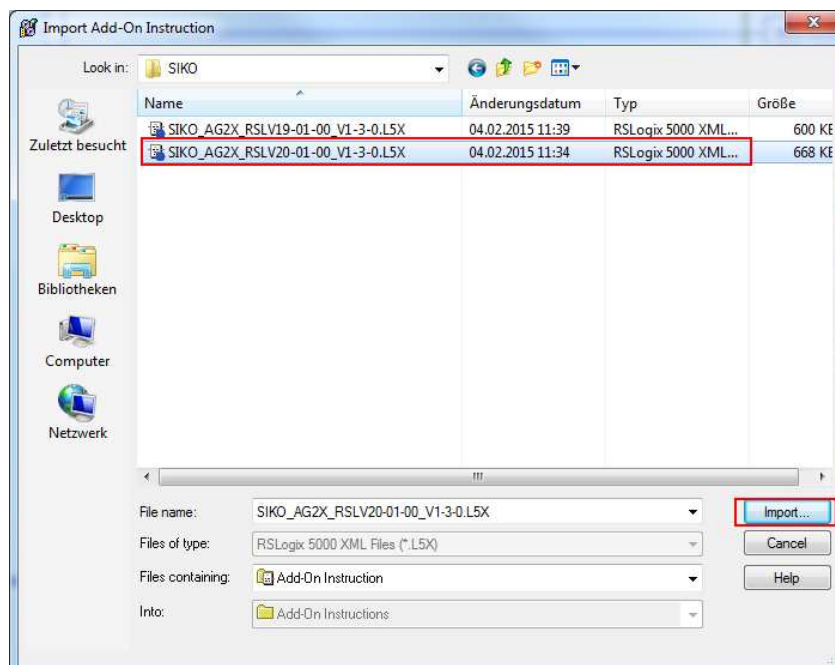
#### 3.1 Import the SIKO AG2X A0I

1. Right-click on the folder "Add-On Instructions" inside the window "Controller Organizer".
2. Execute the command "Import Add-On Instruction...".



3. Choose the file to import according to the used RSLogix™ version:

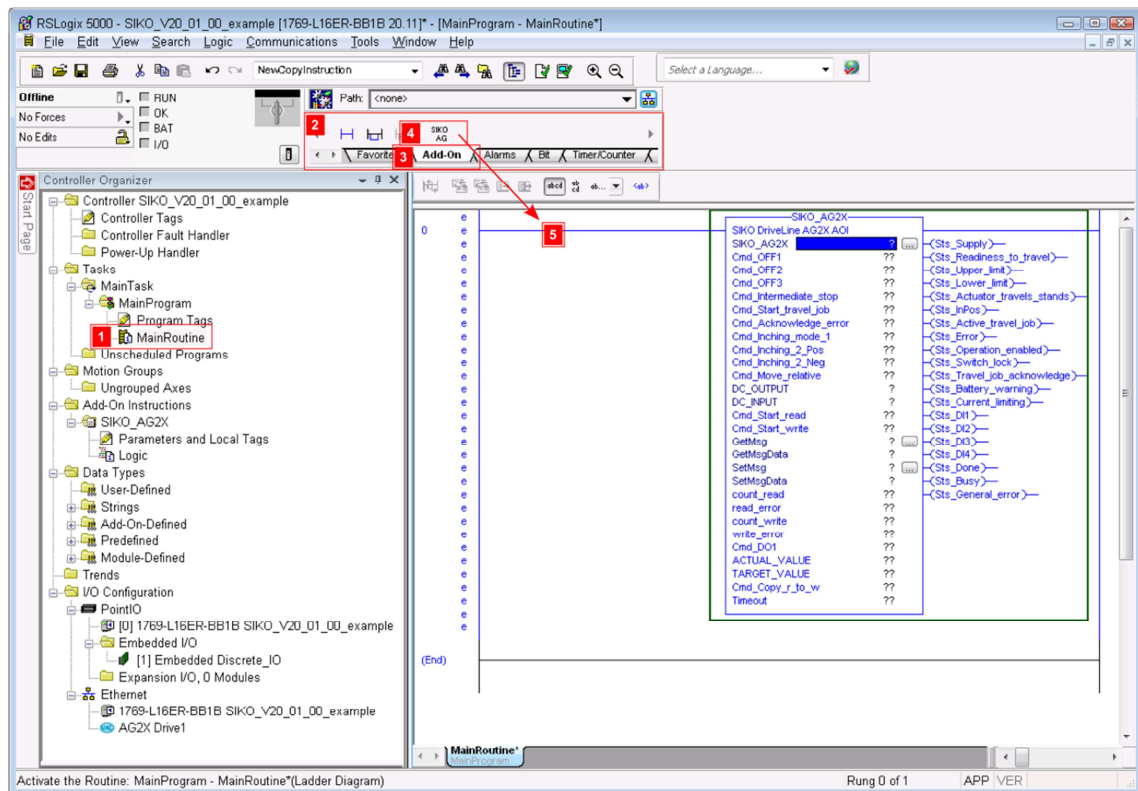
RSLogix™ 5000 Version	File
V20.01	SIKO_AG2X_RSLV20-01-00_V1-6-0.L5X
V19.01	SIKO_AG2X_RSLV19-01-00_V1-6-0.L5X
V18.02	SIKO_AG2X_RSLV18-02-00_V1-6-0.L5X
V17.01	SIKO_AG2X_RSLV17-01-00_V1-6-0.L5X



4. Execute the "Import" command.

### 3.2 Call the AOI SIKO\_AG2X Cyclically in the User Program.

1. Double-click on the folder "MainRoutine".
2. Go to the toolbar "Language Element".
3. Choose the tab "Add-On".
4. Drag the AOI "SIKO AG".
5. Drop the AOI at rung 0.



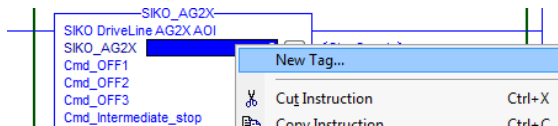
### 3.3 Setup AOI Parameters

After inserting the AOI, you'll have to assign the various parameters of the module.

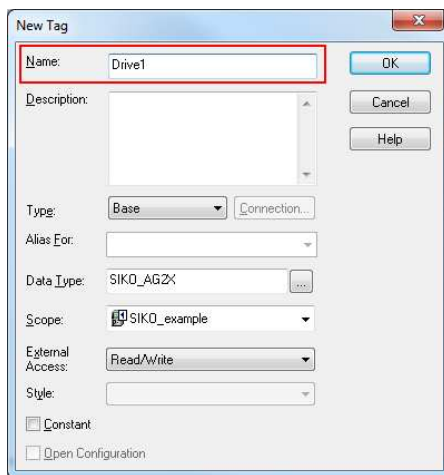
#### 3.3.1 SIKO\_AG2X

Description: Module instance name

1. Create a new tag by right-clicking on the interrogation mark on the right side of "SIKO\_AG2X".
2. Execute the "New Tag..." command.



3. Enter the name of the new tag, for example "Drive1".



4. Confirm the setting with "OK".

#### 3.3.2 DC\_OUTPUT

Description: Process data output

1. Connect the outputs of the drive. In this example use tag "Drive1:O.Data".

#### 3.3.3 DC\_INPUT

Description: Process data input

1. Connect the inputs of the drive. In this example use tag "Drive1:I.Data".

### 3.3.4 GetMsgData

Description: Data read from drive

1. Create a new tag by right-clicking on the interrogation mark on the right side of "GetMsgData".
2. Enter the name of the new tag, for example "Drive1\_GetMsgData".
3. Confirm the setting with "OK".

### 3.3.5 SetMsgData

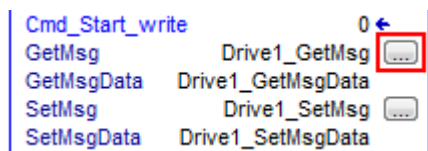
Description: Data write to drive

1. Create a new tag by right-clicking on the interrogation mark on the right side of "SetMsgData".
2. Enter the name of the new tag, for example "Drive1\_SetMsgData".
3. Confirm the setting with "OK".

### 3.3.6 GetMsg

Description: Get Message Tag

1. Create a new tag by right-clicking on the interrogation mark on the right side of "GetMsg" and execute the "New Tag..." command.
2. Enter the name of the new tag, for example "Drive1\_GetMsg".
3. Confirm the setting with "OK".
4. View the configuration dialog of the message by clicking the button on the right side of the tag name.



5. Go to the tab "Configuration" and set the properties.

Settings	Description	Value
1. Message Type	Select the type of message to be sent from the pull-down list.	"CIP Generic"
2. Service Type	The type of service performed by the message.	"Get Attribute Single"
3. Service Code	The service code that is to be performed on the specified object.	"e"
4. Class	The type or class of object to which the service is to be sent.	"a2"
5. Instance	The instance of the object to which the service is to be sent.	"1"
6. Attribute	The attribute of the object to which the service is to be sent.	"5"
7. Destination Element	A local destination tag will contain data received from the service.	"Drive1_GetMsgData"

6. Apply the settings for the tab "Configuration".

7. Go to the tab "Communication".
8. Use the button "Browse" to setup the path to the drive.



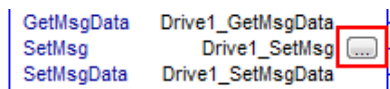
9. Apply the settings for the tab "Communication".
10. Complete the settings with "OK".



### 3.3.7 SetMsg

Description: Set Message Tag

1. Create a new tag by right-clicking on the interrogation mark on the right side of "SetMsg" and execute the "New Tag..." command.
2. Enter the name of the new tag, for example "Drive1\_SetMsg".
3. Confirm the setting with "OK".
4. View the configuration dialog of the message by clicking the button on the right side of the tag name.



5. Go to the tab "Configuration" and set the properties.

Message Configuration - Drive1\_SetMsg

Configuration Communication Tag

1 Message Type: CIP Generic

2 Service Type: Set Attribute Single

3 Service Code: 10 (H) 5 Class: a2 (Hex) 7 Source Element: Drive1\_SetMsgData

4 Instance: 1 6 Attribute: 5 (Hex) 8 Source Length: 4 (Bytes)

Destination Element: New Tag...

☐ Enable
 ☐ Enable Waiting
 ☐ Start
 ☐ Done
 Done Length: 0

☐ Error Code:
 Extended Error Code:
 ☐ Timed Out

Error Path:

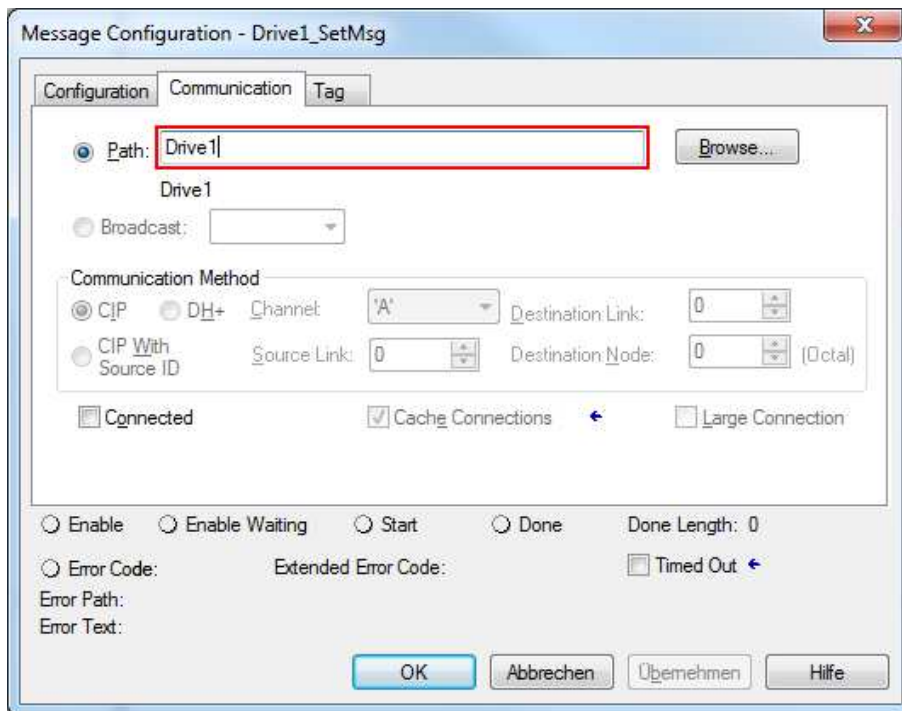
Error Text:

OK Abbrechen Übernehmen Hilfe

Settings	Description	Value
1. Message Type	Select the type of message to be sent from the pull-down list.	"CIP Generic"
2. Service Type	The type of service performed by the message.	"Set Attribute Single"
3. Service Code	The service code that is to be performed on the specified object.	"10"
4. Class	The type or class of object to which the service is to be sent.	"a2"
5. Instance	The instance of the object to which the service is to be sent.	"1"
6. Attribute	The attribute of the object to which the service is to be sent.	"5"
7. Source Element	A local source tag that contains data that is to be sent with the service.	"Drive1_SetMsgData"
8. Source Length	The number of bytes in the source tag.	"4"

6. Apply the settings for the tab "Configuration".

7. Go to the tab "Communication".
8. Use the button "Browse..." to setup the path to the drive.



9. Apply the settings for the tab "Communication".
10. Complete the settings with "OK".

### 3.3.8 Timeout

Description: Timeout value for message instructions used by the AOI in milliseconds.

If a message instruction could not be executed within the specified timeout period, a fault will be generated (error code 16#0000\_F001).

Default value is 5000.

### 3.4 AOI Call after Configuration



### 3.5 Software Example

#### 3.5.1 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 "Cmd\_Start\_read" or to the "Cmd\_Start\_write" input on the module described here in order to enable a read or write process of one of the variables.

#### 3.5.2 Read Parameters

If a rising edge is applied to the "Cmd\_Start\_read" 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.

#### 3.5.3 Write Parameters

If a rising edge is applied to the "Cmd\_Start\_write" input of the module, then all parameters will be transferred to the drive. 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 drive.

#### 3.5.4 Copy Parameters from Read to Write

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

#### 3.5.5 S-Commands

After executing a S-Command a read cycle must be triggered manually to refresh all actual values (\_r).

### 3.5.6 Counter Value

Count read value	Count write value	Name	Value range (dec)	Default
1	1	LED Functionality	0 ... 1	0
2	2	Service Interface Baudrate	0 ... 3	1
3	3	Digital Output 1 Functionality	0 ... 3	0
4		Digital Output Functionalities State		-
5	4	Digital Outputs Polarity	0 ... 15	0
6	5	Digital Input 1 Functionality	0 ... 11	0
7	6	Digital Input 2 Functionality	0 ... 11	0
8	7	Digital Input 3 Functionality	0 ... 11	0
9	8	Digital Input 4 Functionality	0 ... 11	0
10		Digital Input Functionalities State		-
11	9	Digital Inputs Polarity	0 ... 15	0
12	10	Controller Parameter P	1 ... 500	300
13	11	Controller Parameter I	0 ... 500	2
14	12	Controller Parameter D	0 ... 500	0
15	13	A-Pos	1 ... 100	50
16	14	V-Pos	Gear 66:1 $\Rightarrow$ 1 ... 75 rpm 98:1 $\Rightarrow$ 1 ... 50 rpm 188:1 $\Rightarrow$ 1 ... 30 rpm 368:1 $\Rightarrow$ 1 ... 15 rpm	10
17	15	D-Pos	1 ... 101	101
18	16	A-Rot	1 ... 100	50
19	17	A-Inch	1 ... 100	50
20	18	V-Inch	Gear 66:1 $\Rightarrow$ 1 ... 75 rpm 98:1 $\Rightarrow$ 1 ... 50 rpm 188:1 $\Rightarrow$ 1 ... 30 rpm 368:1 $\Rightarrow$ 1 ... 15 rpm	10
21	19	Pos Window	0 ... 1000	10
22	20	Gear Ratio Numerator	1 ... 10000	1
23	21	Gear Ratio Denominator	1 ... 10000	1
24	22	Spindle Pitch	0 ... 1000000	0
25	23	Calibration Value	-999999 ... 999999	0
26	24	Software Limit 1	-9999999 ... 9999999	99999
27	25	Software Limit 2	-9999999 ... 9999999	-19999
28	26	Delta Inch	-1000000 ... 1000000	720
29	27	Sense of Rotation	0 ... 1	0
30	28	Pos Type	0 ... 2	0
31	29	Operating Mode	0 ... 1	0
32	30	Inching 2 Stop Mode	0 ... 1	0

Count read value	Count write value	Name	Value range (dec)	Default
33	31	Inpos Mode	0 ... 2	0
34	32	Loop Length	0 ... 30000	360
35	33	Contouring Error Limit	1 ... 30000	400
36	34	Current Limiting	25 ... 110	110
37	35	Inching 2 Offset	10 ... 100	100
38	36	Inching 2 Acceleration Type	0 ... 1	0
39	37	Offset Value	-999999 ... 999999	0
40	38	PCM Position 1	DINT	0
41	39	PCM Position 2	DINT	0
42	40	PCM Position 3	DINT	0
43	41	PCM Position 4	DINT	0
44	42	PCM Position 5	DINT	0
45	43	PCM Position 6	DINT	0
46	44	PCM Position 7	DINT	0
47	45	PCM Acceleration 1	1 ... 100	50
48	46	PCM Acceleration 2	1 ... 100	50
49	47	PCM Acceleration 3	1 ... 100	50
50	48	PCM Acceleration 4	1 ... 100	50
51	49	PCM Acceleration 5	1 ... 100	50
52	50	PCM Acceleration 6	1 ... 100	50
53	51	PCM Acceleration 7	1 ... 100	50
54	52	PCM Velocity 1	Gear 66:1 $\Rightarrow$ 1 ... 75 rpm 98:1 $\Rightarrow$ 1 ... 50 rpm 188:1 $\Rightarrow$ 1 ... 30 rpm 368:1 $\Rightarrow$ 1 ... 15 rpm	10
55	53	PCM Velocity 2	see PCM Velocity 1	10
56	54	PCM Velocity 3	see PCM Velocity 1	10
57	55	PCM Velocity 4	see PCM Velocity 1	10
58	56	PCM Velocity 5	see PCM Velocity 1	10
59	57	PCM Velocity 6	see PCM Velocity 1	10
60	58	PCM Velocity 7	see PCM Velocity 1	10
61	59	PCM Deceleration 1	1 ... 101	101
62	60	PCM Deceleration 2	1 ... 101	101
63	61	PCM Deceleration 3	1 ... 101	101
64	62	PCM Deceleration 4	1 ... 101	101
65	63	PCM Deceleration 5	1 ... 101	101
66	64	PCM Deceleration 6	1 ... 101	101
67	65	PCM Deceleration 7	1 ... 101	101
68		Output Stage Temperature		-
69		Voltage of Control		-

Count read value	Count write value	Name	Value range (dec)	Default
70		Voltage of Output Stage		-
71		Voltage of Battery		-
72		Motor Current		-
73		Actual Position		-
74		Actual Rotational Speed		-
75		Serial Number		-
76		Production Date		-
77		SW Motor Controller		-
78		Gear Reduction		-
79		System Status Word		-
80		Encoder Resolution		-
81		Device ID		-
82		Number of Errors		-
83		Error Number 1		-
84		Error Number 2		-
85		Error Number 3		-
86		Error Number 4		-
87		Error Number 5		-
88		Error Number 6		-
89		Error Number 7		-
90		Error Number 8		-
91		Error Number 9		-
92		Error Number 10		-
	66	S Command	0 ... 8	0

### 3.5.7 Error Codes

If a communication error occurs, there is an error code present at the outputs "read\_error" or "write\_error". The error code outputs (32 bit) "read\_error" and "write\_error" are a combination of message error code and extended message error code.

The error code 16#0000\_F001 is a manufacturer specific error code.

Its meaning is that a message instruction could not be executed within the specified timeout period.

For all other error codes please refer to the RSLogix™ 5000 help system (keyword: Error codes, message) for a complete description of these error codes.

Format of the outputs "read\_error" and "write\_error":

16#xxxx\_yyyy

xxxx = Extended message error code

yyyy = Message error code

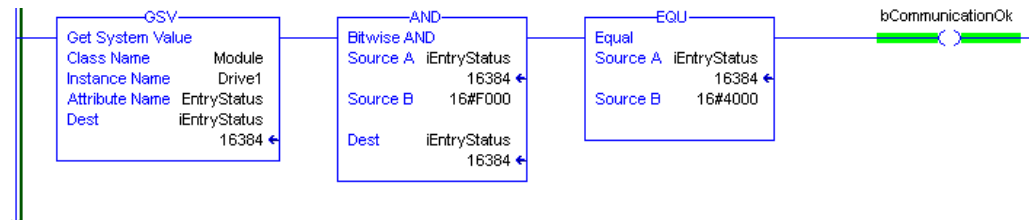


### 3.5.8 Module Status

In some cases it could be useful to know the communication status of the drives.

Rockwell provides the possibility to check the communication status of each connected module via get system value commands (GSV). The specified module must be present in the I/O configuration section of the controller organizer and must have a device name.

In the following example the module status of "Drive1" is read via the GSV command.



For further details see RSLOGIX5000 or Studio5000 help system (search for GSV, MODULE object).