

# AS-Interface Add-On Instruction for RSLogix 5000

## Introduction

*In this application note, you will be introduced to an Add-On Instruction you may take advantage of to retrieve additional Advanced Diagnostics on your AS-Interface network.*

Get_Diagnostics_Advanced	Read diagnostics including slave lists, all network diagnostic lists, error counters, duplicate address lists, and fault detector
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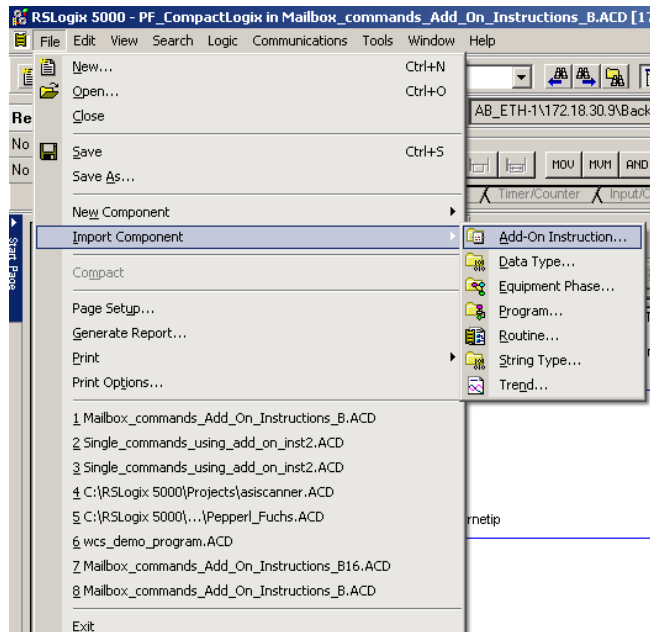
*ASSUMPTION: The Advanced Diagnostics are only available with the assumption that an –EV AS-Interface Gateway has been successfully mapped and recognized by the Rockwell PLC in the I/O configuration.*

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## Exercise #1 - Import the Add-On Instruction

1. Open RSLogix5000 version 20 project or higher
2. Go to menu item File > Import Component > Add-On Instruction...



### ***Import Add-On Instruction***

## Exercise #2 - Create and move mailbox data to/from variables

1. Create the following Controller Tags in RSLogix5000 tag database.

COPY instructions are used to transmit the data received in the mailbox to pass along to the add-on instruction as a variable and not as a pointer. These moves will create a mailbox in "ASI\_Mailbox\_In" array and "ASI\_Mailbox\_Out" array that will be used by the add-on instruction.

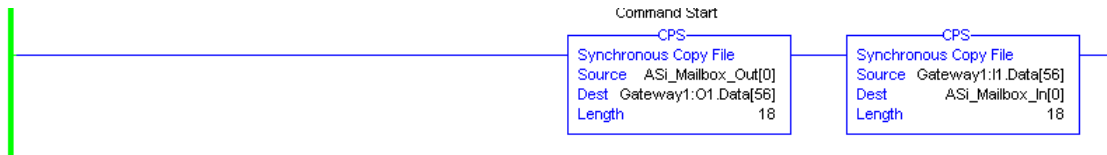
The variables must be of type INT and size 18

Name	Value	Style	Data Type	Desc
+ Gateway1:I1	{ ... }		_0039:223636_4...	
+ Gateway1:Q1	{ ... }		_0039:223636_6...	
+ ASI_Mailbox_Out	{ ... }	Decimal	INT[18]	
+ ASI_Mailbox_In	{ ... }	Decimal	INT[18]	

NOTE: The length of the mailbox is fixed to 18 integer words.

## 2. Add copy Instructions to move data to and from mailboxes

The following rung of logic is required in order to get the information successfully transferred.



### Mailbox:

NOTE: The add-on instruction uses a mailbox for sending and receiving data. The mailbox, also referred to as the command interface, is mapped at the end of the data block.

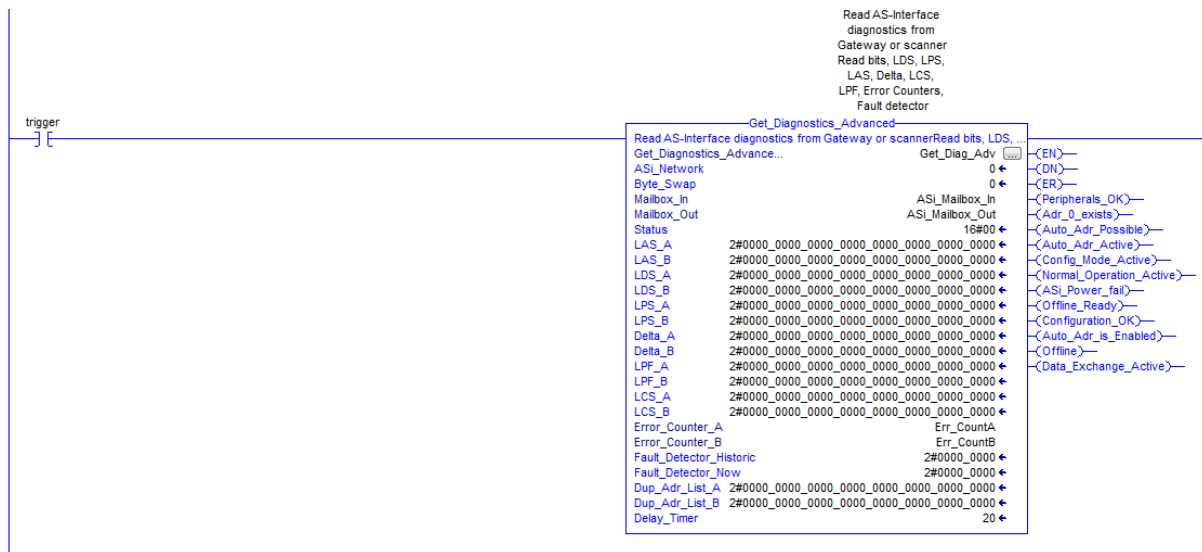
NOTE: Mailbox start location varies based on mapping selected

Gateway1:11.Data[51]	0	Decimal	INT	Network 2, Analog Input 4 address 30, Network 2, Analog In...
Gateway1:11.Data[52]	0	Decimal	INT	Network 2, Analog Input 1 address 29
Gateway1:11.Data[53]	0	Decimal	INT	Network 2, Analog Input 2 address 29
Gateway1:11.Data[54]	0	Decimal	INT	Network 2, Analog Input 3 address 29, Network 2, Analog In...
Gateway1:11.Data[55]	0	Decimal	INT	Network 2, Analog Input 4 address 29, Network 2, Analog In...
Gateway1:11.Data[56]	0	Decimal	INT	Large Mailbox 1 Response Start
Gateway1:11.Data[57]	0	Decimal	INT	
Gateway1:11.Data[58]	0	Decimal	INT	
Gateway1:11.Data[59]	0	Decimal	INT	

## Exercise #3 - Configuring Parameters of Add-On Instructions

### Get\_Diagnostics Advanced Add On Instruction

This Add On instruction will retrieve the diagnostics data from an As-I network connected to an –EV AS-I gateway. If a dual network gateway is being used then the instruction must be run twice once on network 1 and the second time on network 2.



Retrieves Advanced –EV Gateway diagnostics from Network 1.

### Input Parameters

- **ASi\_Network** – This is the network you are retrieving diagnostics from. Value range 1 or 2
- **Byte\_Swap** – Used to swap mailbox data bytes for use from AS-I CompactLogix
- **Mailbox\_In** – The variable that you moved the input mailbox data to.
- **Mailbox\_Out** – The variable that you moved the output mailbox data to.
- **Delay\_Timer** – Do not change

## Outputs

**Status** – This can be used to diagnose problems with the gateway if there is a problem with the instruction. Possible status are:

- 00h=Success
- 11h=General Fault
- 12h=illegal value
- 13h=length short
- 14h=no access
- 21h=general fault
- FEh=timeout
- FFh=pending

**LAS\_A** – List of Activated Slaves. Nodes that are both in the project list and detected are made active. Possible values are:

- bit 1 = Address 1A
- bit 31 = Address 31A

**LAS\_B** – List of Activated Slaves. Nodes that are both in the project list and detected are made active. Possible values are:

- bit 1 = Address 1B
- bit 31 = Address 31B

**LDS\_A** – List of Detected Slaves. Nodes that are placed on the network at a unique address. Possible values are:

- bit 0 = address 0
- bit 1 = Address 1A
- bit 31 = Address 31A

**LDS\_B** – List of Detected Slaves. Nodes that are placed on the network at a unique address. Possible values are:

- bit 0 = Address 0
- bit 1 = Address 1B
- bit 31 = Address 31B

**LPS\_A** – List of Projected Slaves. Node addresses that should be on the network. Possible values are:

- bit 1 = Address 1A
- bit 31 = Address 31A

**LPS\_B** – List of Projected Slaves. Node addresses that should be on the network. Possible values are:

- bit 1 = Address 1B
- bit 31 = Address 31B

**Delta\_A** – Slave Delta List. A addresses that are detected but not projected or projected but not detected

bit 0 = address 0  
bit 1 = Address 1A  
bit 31 = Address 31A

**Delta\_B** – Slave Delta List. B addresses that are detected but not projected or projected but not detected

bit 0 = Address 0  
bit 1 = Address 1B  
bit 31 = Address 31B

**LPF\_A** – List of Peripheral faults. A addresses that have a peripheral fault. Usually caused by input short, output short or Analog out of range.

bit 1 = Address 1A  
bit 31 = Address 31A

**LPF\_B** – List of Peripheral faults. B addresses that have a peripheral fault. Usually caused by input short, output short or Analog out of range.

bit 1 = Address 1B  
bit 31 = Address 31B

**LCS\_A** – List of Corrupted Slaves. A addresses that generated a configuration error since the last time this list was read. Cleared after being sent once.

bit 1 = Address 1A  
bit 31 = Address 31A

**LCS\_B** – List of Corrupted Slaves. B addresses that generated a configuration error since the last time this list was read. Cleared after being sent once.

bit 1 = Address 1B  
bit 31 = Address 31B

**EN** – Turned on once the rung is enabled

**DN** – Turned on when rung is enabled and the instruction has completed the diagnostic retrieval or error.

**ER** – Turned on if the diagnostic retrieval was not successful. If DN is on and ER is not then the status will be 0 and the diagnostic retrieval was good.

**Peripherals\_OK** – No nodes have a peripheral fault

**Adr\_0\_exists Output** – A node with address 0 is on the network

**Auto\_Adr\_Possible** – Automatic addressing will work if there is a single node failure

**Auto\_Adr\_Active** – Exactly one node is missing from the network and the gateway is ready to perform automatic addressing if a new one is connected

**Config\_Mode\_Active** – Gateway/Scanner is in Configuration/Projected mode

**Normal\_Operation\_Active** – Gateway running normally

**ASi\_Power\_fail** – Voltage on the AS-i gateway is too low

**Offline\_Ready** – AS-i network is off line

**Configuration\_OK** – Projected configuration, matches active configuration

**Auto\_Adr\_is\_Enabled** – Automatic addressing has been enabled

**Offline** – Mode will be changed to offline or has already been changed

**Data\_Exchange\_Active** – Data exchange between Scanner/Gateway and nodes is available. Also set in offline phase.

## Exercise #4 – Running the add-on instruction

NOTE: The Add-on instruction does not run continuously. Each execution requires that the rung go from false to true. The instruction is done when the DN bit is on. The instruction was a success when the DN bit is on and the ER bit is off. When the error bit is on the status can be evaluated for the error reason code