

User Instructions Add-On Instruction (AOI) IND560_IntDiv_Input_Data

This AOI is intended to be used with the Mettler Toledo Terminal IND560, software version 3 or greater. The AOI was created using Allen-Bradley RSLogix5000 version 16 and is intended for RSLogix5000 version 16 or greater.

User requirements:

Users will need an understanding the IND560 Terminal PLC Interface Data Formats and the Message Slot data layout for Integer or Divisions Data Format.

Applicable Mettler Toledo Terminal PLC interfaces:

Allen Bradley Remote I/O (RIO)

EtherNet/IP (using the RSLogix5000 generic module profile only, input data INT)

Note: The AOI is primarily intended to be used for Allen Bradley Remote I/O (RIO) communications. The AOI is not intended to be used with an IND560 Add-On Profile, which would be usable for EtherNet/IP communications.

Applicable Mettler Toledo PLC Data Formats:

Integer

Divisions

AOI provides:

Conversion of integer weight data into an RSLogix5000 Data Type REAL using a parameter input of the scale terminal Increment Size; the Increment Size must be the same as used for scale calibration. Or conversion of Divisions weight data into an RSLogix5000 Data Type REAL using a parameter input of the scale terminal Increment Size and the parameter input Use_Divisions.

Conversion of the Scale Status integer into sixteen (16) separate RSLogix5000 Data Type BOOL bits.

Within the RSLogix5000 application program one AOI is used for each input Message Slot.

Adding AOI to RSLogix5000:

Within the RSLogix5000 in the Configuration window right click on Add-On Instructions; click on Import Instruction; a new window will open, click on IND560_IntDiv_Input_Data.L5X; click on Import button. AOI will load creating the Add-On Instruction, a Data Type of the same name as the AOI and a new Tab to the Instruction Types over the programming screen window. The new Data Type will be included in any screen requiring Data Type entry. The Instruction will also appear in the window screen when keyboard inserting a new instruction to the program logic.

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Adding AOI to RSLogix5000 application program:

Within the RSLogix5000 application program one AOI is used for each input Message Slot. A Tag must be associated to the AOI when inserting into the application program; this tag must use the RSLogix5000 Data Type of the same name as the AOI (IND560_IntDiv_Input_Data). In the example below the Tag is RIO_IND560_In_Slot_1.

The screenshot displays the RSLogix 5000 software interface. The left pane shows the project tree with the following structure:

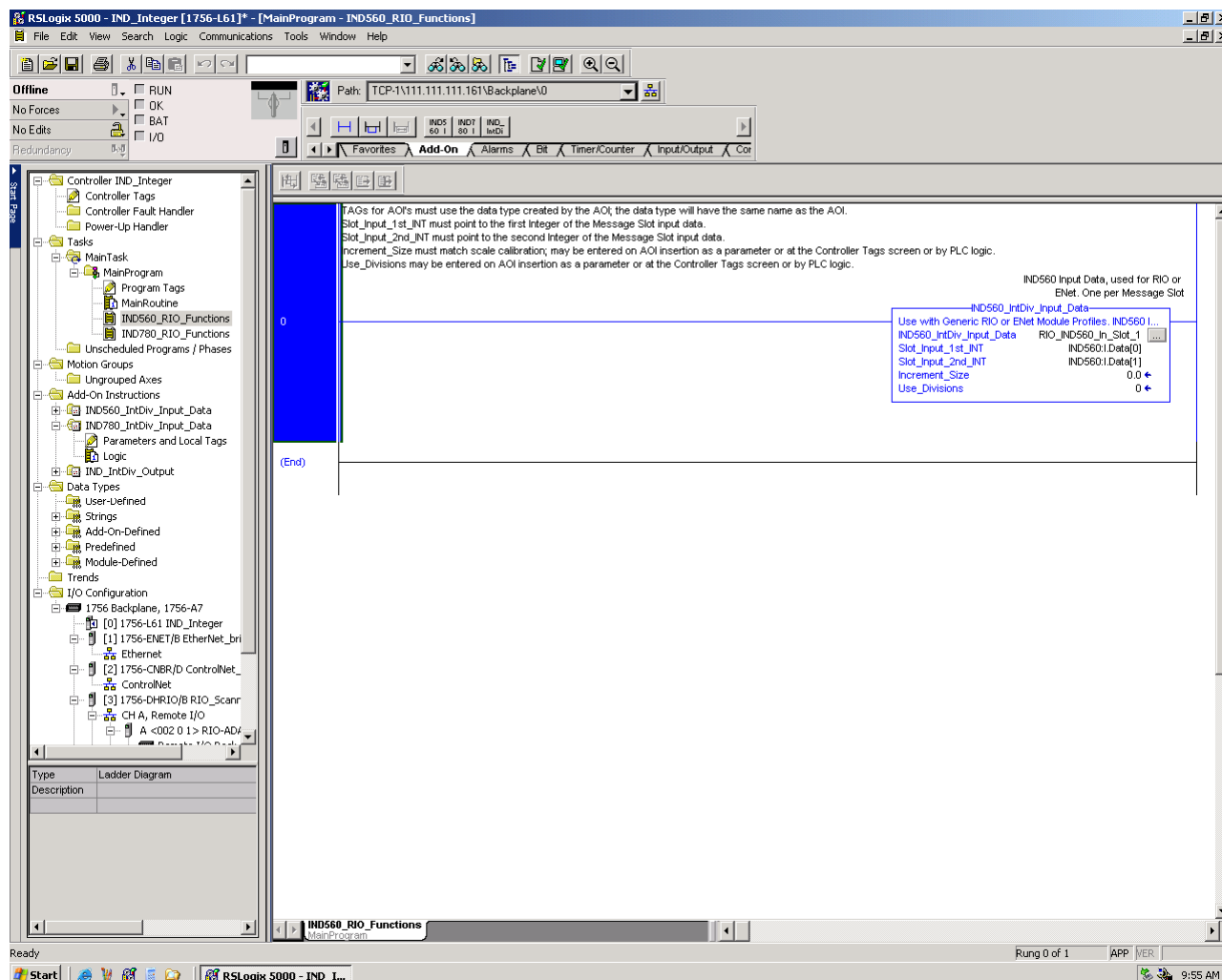
- Controller IND_Integer [1756-161]* - [Controller Tags - IND_Integer(controller)]
 - Controller Tags
 - Controller Fault Handler
 - Power-Up Handler
 - Tasks
 - MainTask
 - MainProgram
 - Program Tags
 - MainRoutine
 - IND560_RIO_Functions
 - IND780_RIO_Functions
 - Unscheduled Programs / Phases
 - Motion Groups
 - Ungrouped Axes
 - Add-On Instructions
 - IND560_IntDiv_Input_Data
 - IND780_IntDiv_Input_Data
 - Parameters and Local Tags
 - Logic
 - IND_IntDiv_Output
 - Data Types
 - User-Defined
 - Strings
 - Add-On-Defined
 - Predefined
 - Module-Defined
 - Trends
 - I/O Configuration
 - 1756 Backplane, 1756-A7
 - [0] 1756-161 IND_Integer
 - [1] 1756-ENET/B EthernetNet_bri
 - Ethernet
 - [2] 1756-CNBR/D ControlNetNet
 - ControlNet
 - [3] 1756-DHRI/O/B RIO_Scann
 - CH A, Remote I/O
 - A <002 0 1> RIO-ADx

The main pane shows the tag table for the selected scope (IND_Integer). The table has the following columns: Name, Alias For, Base Tag, Data Type, Style, and Description.

Name	Alias For	Base Tag	Data Type	Style	Description
IND560:1			AB:RIO_8IOGROUP:1:0		
IND560:0			AB:RIO_8IOGROUP:0:0		
IND780:1			AB:RIO_8IOGROUP:1:0		
IND780:0			AB:RIO_8IOGROUP:0:0		
Local:3:I			AB:1756_DHRIO:1:0		
Local:4:I			AB:1756_DNB_20Bytes:1:0		
Local:4:O			AB:1756_DNB_20Bytes:0:0		
Local:4:S			AB:1756_DNB_Status_64B...		
RIO_IND560_In_Slot_1			IND560_IntDiv_Input_Data		IND560 Input Data, used for RIO or ENet. One per Message Slot
-RIO_IND560_In_Slot_1.EnableIn			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Enable Input ...
-RIO_IND560_In_Slot_1.EnableOut			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Enable Outpu...
-RIO_IND560_In_Slot_1.Increment_Size			REAL	Float	IND560 Input Data, used for RIO or ENet. One per Message Slot Scale Calibrat...
-RIO_IND560_In_Slot_1.Use_Divisions			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Perform Divisi...
-RIO_IND560_In_Slot_1.Weight			REAL	Float	IND560 Input Data, used for RIO or ENet. One per Message Slot Weight Data I...
-RIO_IND560_In_Slot_1.Feed_Under			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Target Feed ...
-RIO_IND560_In_Slot_1.FastFeed_OK			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Target Fast F...
-RIO_IND560_In_Slot_1.TolOK_Over			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Target Toler...
-RIO_IND560_In_Slot_1.Compar_5			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Comparator 5 ...
-RIO_IND560_In_Slot_1.Compar_4			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Comparator 4 ...
-RIO_IND560_In_Slot_1.Compar_3			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Comparator 3 ...
-RIO_IND560_In_Slot_1.Compar_2			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Comparator 2 ...
-RIO_IND560_In_Slot_1.Compar_1			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Comparator 1 ...
-RIO_IND560_In_Slot_1.Enter_Key			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Enter Key stat...
-RIO_IND560_In_Slot_1.Discrete_In_1			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Input 1 (0.0.1)...
-RIO_IND560_In_Slot_1.Discrete_In_2			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Input 2 (0.0.2)...
-RIO_IND560_In_Slot_1.Discrete_In_3			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Input 3 (0.0.3)...
-RIO_IND560_In_Slot_1.Motion			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Motion Status...
-RIO_IND560_In_Slot_1.Net_Mode			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Net Mode Sta...
-RIO_IND560_In_Slot_1.Update_InProcess			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Update in Pro...
-RIO_IND560_In_Slot_1.Data_OK			BOOL	Decimal	IND560 Input Data, used for RIO or ENet. One per Message Slot Data OK bit
RIO_IND560_In_Slot_2			IND560_IntDiv_Input_Data		IND560 Input Data, used for RIO
RIO_IND560_In_Slot_3			IND560_IntDiv_Input_Data		IND560 Input Data, used for RIO
RIO_IND560_In_Slot_4			IND560_IntDiv_Input_Data		IND560 Input Data, used for RIO
RIO_IND780_In_Slot_1			IND780_IntDiv_Input_Data		IND780 Input Data, used for RIO
RIO_IND780_In_Slot_2			IND780_IntDiv_Input_Data		IND780 Input Data, used for RIO
RIO_IND780_In_Slot_3			IND780_IntDiv_Input_Data		IND780 Input Data, used for RIO
RIO_IND780_In_Slot_4			IND780_IntDiv_Input_Data		IND780 Input Data, used for RIO
RIO_IND780_Out_Slot_1			IND_IntDiv_Output		IND780 Output Data driver

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Within the RSLogix5000 application program insert the AOI where desired. The first requirement for the AOI block will be the entry of the Tag created earlier. In the example below the Tag is RIO_IND560_In_Slot_1.



Input Parameters:

Slot_Input_1st_INT and *Slot_Input_2nd_INT* are required Input Parameters. *Increment_Size* and *Use_Divisions* are also Input Parameters but need not an entry when AOI is inserted in the application program; these two Parameters are visible in the AOI Tag as elements of the Tag. The parameter *EnableIn* is a system parameter and is part of every AOI.

Slot_Input_1st_INT is the Data Type INT and must be pointed to the first input data INT of the input Message Slot from the IND560 terminal into the PLC; this will always be an even number (0, 2, 4, 6 and so on) of the input data array.

Slot_Input_2nd_INT is the Data Type INT and must be pointed to the second input data INT of the input Message Slot from the IND560 terminal into the PLC; this will always be an odd number (1, 3, 5, 7 and so on) of the input data array.

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Increment_Size is the Data Type REAL. The increment size entered must match the scale calibration size to assure correct conversion of the input weight data to a REAL. The increment size may be entered when the AOI is inserted and it will be a constant unless the PLC logic changes the increment size. The increment size may be entered at the Tag monitor screen and will be a constant unless the PLC logic changes the increment size. Be sure to save the program to assure the constants are saved as part of the program. The increment size may be entered into the Tag element *Increment_Size* by the program logic if desired.

Use_Divisions is the Data Type BOOL. This parameter must be set to one (1) or ON if the weight input data from the terminal is Data Format Divisions. The *Use_Divisions* parameter may be entered when the AOI is inserted and it will be a constant unless the PLC logic changes the state of *Use_Divisions*. The *Use_Divisions* parameter may be entered at the Tag monitor screen and will be a constant unless the PLC logic changes the state of *Use_Divisions*. Be sure to save the program to assure the constants are saved as part of the program. The state of *Use_Divisions* may be controlled by the program logic if desired.

Output Parameters:

The parameter *EnableOut* is a system parameter and is part of every AOI. The AOI Output Parameters are weight and the scale status bits.

Weight is the Data Type REAL. This Output Parameter is the math result of the data from the Input Parameters *Slot_Input_1st_INT*, *Increment_Size*, and the state of *Use_Divisions*.

Feed_Under is the Data Type BOOL. This Output Parameter matches the state of bit 0 of the Input Parameter *Slot_Input_2nd_INT*.

FastFeed_OK is the Data Type BOOL. This Output Parameter matches the state of bit 1 of the Input Parameter *Slot_Input_2nd_INT*.

TolOK_Over is the Data Type BOOL. This Output Parameter matches the state of bit 2 of the Input Parameter *Slot_Input_2nd_INT*.

Compar_5 is the Data Type BOOL. This Output Parameter matches the state of bit 3 of the Input Parameter *Slot_Input_2nd_INT*.

Compar_4 is the Data Type BOOL. This Output Parameter matches the state of bit 4 of the Input Parameter *Slot_Input_2nd_INT*.

Compar_3 is the Data Type BOOL. This Output Parameter matches the state of bit 5 of the Input Parameter *Slot_Input_2nd_INT*.

Compar_2 is the Data Type BOOL. This Output Parameter matches the state of bit 6 of the Input Parameter *Slot_Input_2nd_INT*.

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Compar_1 is the Data Type BOOL. This Output Parameter matches the state of bit 7 of the Input Parameter *Slot_Input_2nd_INT*.

Enter_key is the Data Type BOOL. This Output Parameter matches the state of bit 8 of the Input Parameter *Slot_Input_2nd_INT*.

Discrete_in_1 is the Data Type BOOL. This Output Parameter matches the state of bit 9 of the Input Parameter *Slot_Input_2nd_INT*.

Discrete_in_2 is the Data Type BOOL. This Output Parameter matches the state of bit 10 of the Input Parameter *Slot_Input_2nd_INT*.

Discrete_in_3 is the Data Type BOOL. This Output Parameter matches the state of bit 11 of the Input Parameter *Slot_Input_2nd_INT*.

Motion is the Data Type BOOL. This Output Parameter matches the state of bit 12 of the Input Parameter *Slot_Input_2nd_INT*.

Net_Mode is the Data Type BOOL. This Output Parameter matches the state of bit 13 of the Input Parameter *Slot_Input_2nd_INT*.

UpDate_inProcess is the Data Type BOOL. This Output Parameter matches the state of bit 14 of the Input Parameter *Slot_Input_2nd_INT*.

Data_OK is the Data Type BOOL. This Output Parameter matches the state of bit 15 of the Input Parameter *Slot_Input_2nd_INT*.

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User edit of the AOI:

The AOI was created using RSLogix5000 version 16; there are no imbedded AOI's or non-standard data types within the AOI.

The AOI is not protected; the Parameters, Local Tags and Logic may be edited by the user if desired. The user must assume responsibility for the operation and usability of the AOI when editing.

Contact Rockwell Software Support for questions of AOI development programming and editing; Mettler Toledo Technical Support is unable to provide assistance with AOI development programming and editing

Below is a screen capture of the AOI Parameter screen.

The screenshot displays the RSLogix 5000 - IND_Integer [1756-161] software interface. The main window shows the 'Add-On Instruction Definition - IND560_IntDiv_Input_Data v1.0' dialog box, which is used for configuring the parameters of the AOI. The dialog box has tabs for 'General', 'Parameters', 'Local Tags', 'Scan Modes', 'Change History', and 'Help'. The 'Parameters' tab is currently selected, showing a table of parameters with columns for Name, Usage, Data Type, Default, Style, Req, Vis, and Description.

Name	Usage	Data Type	Default	Style	Req	Vis	Description
EnableIn	Input	BOOL	1	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Enable Input - System Defined Parameter
EnableOut	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Enable Output - System Defined Parameter
Slot_Input_1st_INT	InOut	INT		Decimal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1st Integer of Slot Input Data
Slot_Input_2nd_INT	InOut	INT		Decimal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2nd Integer of Slot Input Data
Increment_Size	Input	REAL	0.0	Float	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Scale Calibration Increment Size
Use_Divisions	Input	BOOL	0	Decimal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Perform Divisions conversion
Weight	Output	REAL	0.0	Float	<input type="checkbox"/>	<input type="checkbox"/>	Weight Data in a Real
Feed_Under	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Target Feed bit or Over/Under logic OK bit
FastFeed_OK	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Target Fast Feed bit or Over/Under logic OK bit
TolOK_Over	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Target Tolerance OK bit or Over/Under Logic Over bit
Compar_5	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Comparator 5 Status bit
Compar_4	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Comparator 4 Status bit
Compar_3	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Comparator 3 Status bit
Compar_2	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Comparator 2 Status bit
Compar_1	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Comparator 1 Status bit
Enter_Key	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Enter Key status bit
Discrete_In_1	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Input 1 (0.0.1) status bit
Discrete_In_2	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Input 2 (0.0.2) status bit
Discrete_In_3	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Input 3 (0.0.3) status bit
Motion	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Motion Status bit
Net_Mode	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Net Mode Status bit
UpDate_InProcess	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Update in Process bit
Data_OK	Output	BOOL	0	Decimal	<input type="checkbox"/>	<input type="checkbox"/>	Data OK bit

The dialog box also includes a 'Logic' tab and a 'Data Type Size: 24 byte (s)' field. The 'OK', 'Cancel', 'Apply', and 'Help' buttons are visible at the bottom right.