



Additional Components & Utilities

Adroit Excel Add-In Tool

Adroit

Authorised Distributor

 **MITSUBISHI
ELECTRIC**
FACTORY AUTOMATION

COPYRIGHT

Copyright © 2021 Advanced Worx 112 (Pty) Ltd. All rights reserved.

Information in this document is subject to change without notice. The software described in this document is furnished under a license agreement or nondisclosure agreement. The software may be used or copied only in accordance with the terms of those agreements. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or any means electronic or mechanical, including photocopying and recording for any purpose other than the purchaser's personal use without the written permission of Advanced Worx 112 (Pty) Ltd.

Advanced Worx 112 (Pty) Ltd
20 Waterford Office Park
189 Witkoppen Road (c/o Waterford Drive)
Fourways
South Africa
<http://adroittech.co.za/>

Version	Date	Author	Comment	Approval
1.0	05.08.2021	J. Duncan / J. Stone	Original	
2.0	15.08.2021	J. Duncan / J. Stone	Update Content	
3.0	30.08.2021	J. Duncan / J. Ndubani	Add additional information	J. Ndubani
4.0	06.09.2021	J. Duncan / J. Ndubani	Add additional information	J. Ndubani
5.0	22.09.2021	J. Duncan / J. Ndubani	Finalise	J. Ndubani
6.0	29.09.2021	J. Duncan	QMS	

Contents

1.	Adroit SCADA - Bulk Configuration	4
1.1.	Overview	4
1.2.	Launch and Enable the Adroit Excel Add-in Tool.....	5
1.3.	Adroit Excel Add-In Menus.....	8
1.3.1.	Agent Server Connection	8
1.3.2.	Variables.....	8
1.3.3.	Sheet/Type Options	8
1.3.4.	Project Management	9
1.3.5.	Agents and Slots	9
1.3.6.	Configurations.....	9
1.3.7.	Scanning, Logging, Alarming and Historical Data	10
2.	Exercises	11
	<i>Exercise 1 – Bulk Creation of Tags using the Adroit Excel Add-in Tool.....</i>	<i>12</i>
	<i>Exercise 2 – Bulk Scanning of Tags using the Adroit Excel Add-in Tool.....</i>	<i>15</i>
	<i>Exercise 3 – Bulk Logging of Tags using the Adroit Excel Add-in Tool</i>	<i>17</i>
	<i>Exercise 4 – Bulk Alarming of Tags using the Adroit Excel Add-in Tool.....</i>	<i>19</i>
	<i>Exercise 5 – Creating Reports that Display Adroit Agent Values</i>	<i>21</i>
	<i>Exercise 6 – Viewing the Historical Data of a Logged Tag (Agent.Slot).....</i>	<i>23</i>
	<i>Exercise 7 – Configuring Security and Auditing Properties of Agents.</i>	<i>26</i>
3.	Batch Plant I/O Schedules.....	28
3.1.	Analog Agents – Bulk Tag Creation.....	28
3.2.	Analog Agents – Bulk Tag Scanning.....	29
3.3.	Digital Agents – Bulk Tag Creation.....	30
3.4.	Digital Agents – Bulk Tag Scanning.....	31
3.5.	StringList Agent.....	32
3.6.	Expression Agents	32
3.7.	Counter Agents	32

1. Adroit SCADA - Bulk Configuration

1.1. Overview

The Adroit Add-in for MS Excel is a bulk and off line configuration tool for your Adroit Agent database (.wgp) file, which is primarily intended for advanced users.

Note: It is therefore assumed that you are familiar with working with the Agent Server and Agents.

However, in addition to being a bulk SCADA configuration tool, this tool also allows you to:

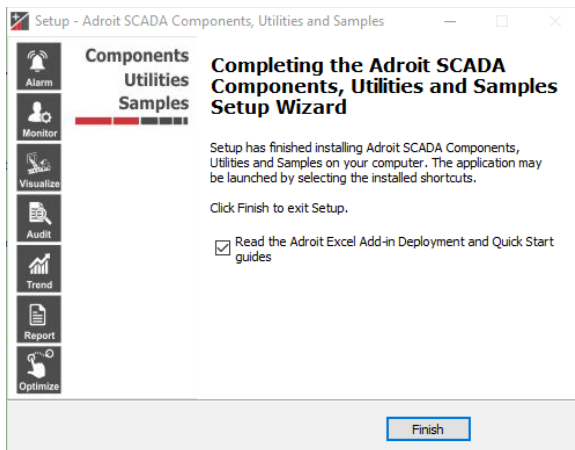
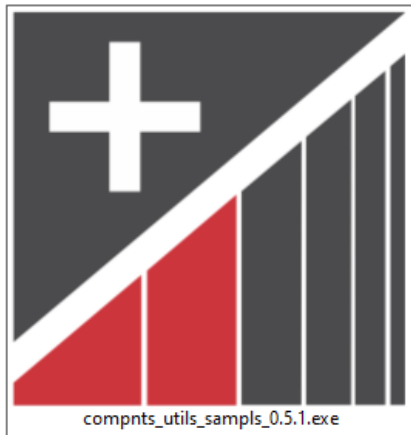
- If you are using a Mitsubishi PLC, to import your Mitsubishi GX Works project variables as Agents.
- Configure the Security and Auditing properties of the required Agents and their slots.
- Create report(s) that display these Adroit Agent values
- View the Historical data of a logged tag (Agent.Slot).

NOTE: Do NOT change the order of the columns of these worksheets; since this application references the column indexes, not the column names.

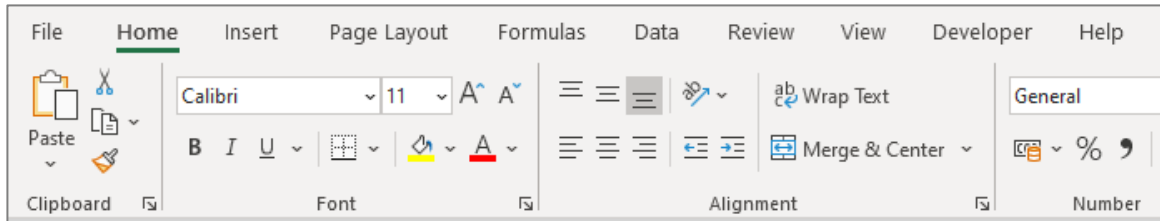
NOTE: If you intend using this utility to bulk configure security, then ensure that your user names do not resemble Excel worksheet cell names (e.g. A4, B1 or CC89).

1.2. Launch and Enable the Adroit Excel Add-in Tool

1. Download and launce the Excel Add-in Tool.

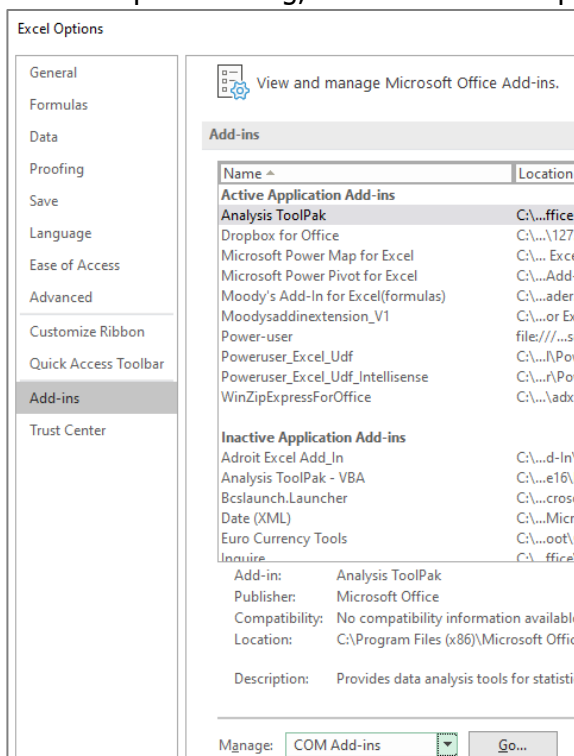


2. Launch an MS Excel workbook.

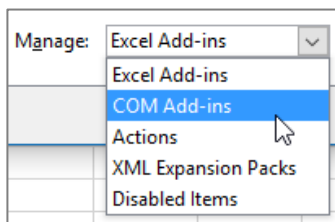


Note: If you do NOT see the Adroit tab in the list of tabs, then you need to do the following:

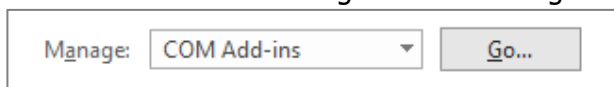
3. Click the File menu and select the Options menu item.
4. In the Excel Options dialog, click the Add-Ins option on the left hand side of this dialog.



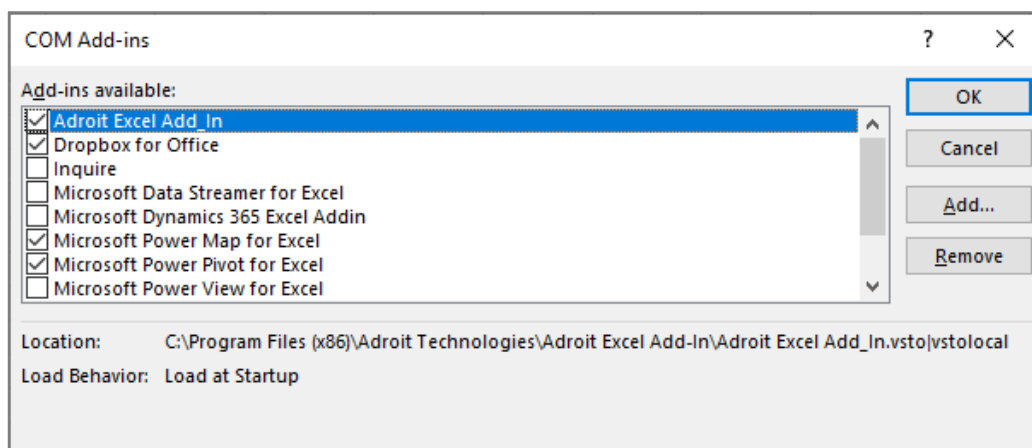
5. At the bottom of this Add-ins dialog open the Manage list and select the COM Add-ins option:



6. Click the Go... button to the right of this Manage list.

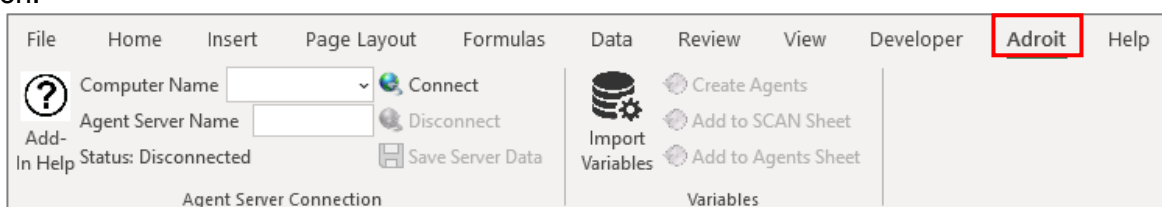


7. In the COM Add-Ins dialog, check the Adroit Excel Add_In option and click OK.



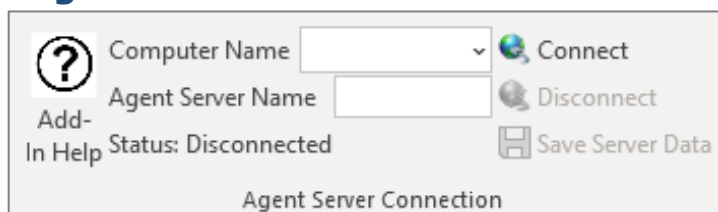
IMPORTANT: If there are any problems preventing the Adroit Excel Add-In from loading they will appear in the details below the Add-Ins available list.

8. The Adroit Excel Add-In should load and the Adroit tab should appear in the list of tabs in the MS Excel ribbon.



1.3. Adroit Excel Add-In Menus

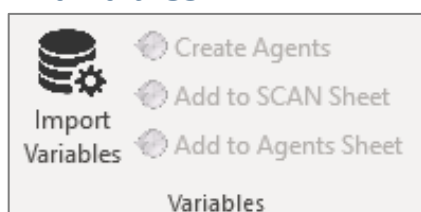
1.3.1. Agent Server Connection



The screenshot shows the 'Agent Server Connection' menu. It includes a question mark icon and 'Add-In Help' text. The main area contains a 'Computer Name' dropdown menu, an 'Agent Server Name' text box, and a 'Status: Disconnected' label. To the right are three buttons: 'Connect' (with a globe icon), 'Disconnect' (with a globe icon and a red X), and 'Save Server Data' (with a floppy disk icon).

Agent Server Connection	
Add-In Help	Access the built-in Help files
Computer Name	The name of your computer, may select from the list of available computers with agent server running on company or private network.
Agent Server Name	The Agent server you are connected to.
Connect	Connects to Agent Server
Disconnect	Disconnects the Agent Server
Save Server Data	Save configuration to .wgp file

1.3.2. Variables

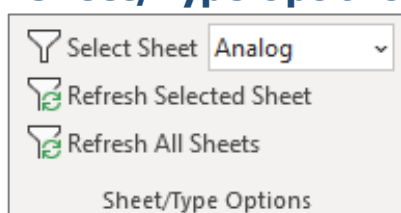


The screenshot shows the 'Variables' menu. It features a database icon and the text 'Import Variables'. Below this are three options, each with a circular icon: 'Create Agents', 'Add to SCAN Sheet', and 'Add to Agents Sheet'.

Variables	
Import Variables	The Adroit Excel Add-in bulk configuration tool can import variables from a GX Works2 or GX Works3 project, as Agents of the connected Agent Server, so that they can be scanned, logged and/or alarmed etc.

Once connected, the following Menus become available

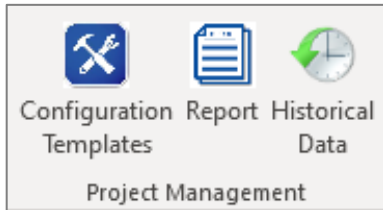
1.3.3. Sheet/Type Options



The screenshot shows the 'Sheet/Type Options' menu. It contains three items: 'Select Sheet' with a dropdown menu showing 'Analog', 'Refresh Selected Sheet' with a green circular arrow icon, and 'Refresh All Sheets' with a green circular arrow icon.

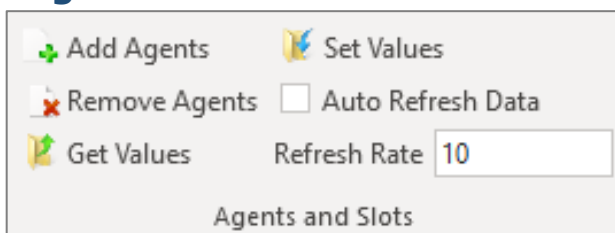
Agent Server Connection	
Selected Sheet	Select the required Agent Sheet/Type (Analog, Digital etc)
Refresh Selected Sheet	Refresh actual sheet only (active sheet)
Refresh All Sheets	Refresh All sheets on actual workbook (Analog, Digital etc)

1.3.4. Project Management



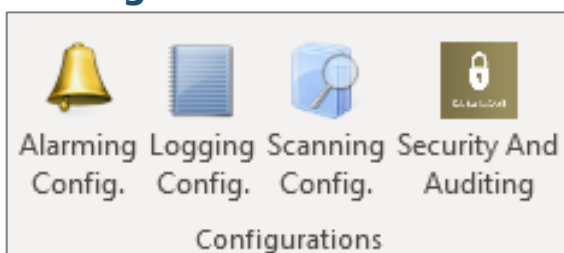
Project Management	
Configuration Templates	Configure/Modify the Agent types and slots (Analog, Digital etc)
Report	Retrieve tags from Agent server onto a sheet for reporting purposes
Historical Data	Used to retrieves logged agent's history

1.3.5. Agents and Slots



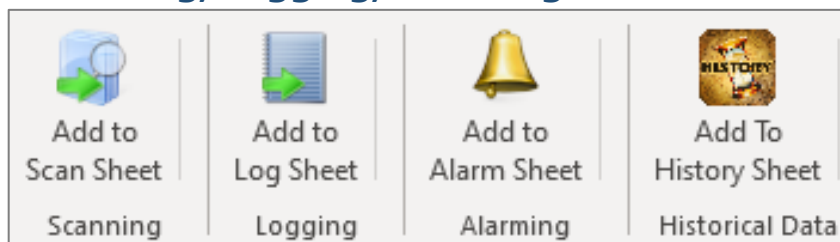
Agents and Slots	
Add Agents	Add Agents to the Agent database (.wgp file)
Remove Agents	Remove Agents to the Agent database (.wgp file)
Get Values	Retrieves the actual value of the slot(s)
Set Values	Updates the actual value of the slot(s)
Auto Refresh Data	Tick box for Auto refresh
Refresh Rate	Rate for Auto Refresh (in sec)

1.3.6. Configurations



Configurations	
Alarming Config.	Displays the list of all the tags that are currently alarmed in the selected Agent database file (.wgp) of the Agent Server.
Logging Config.	Displays the list of all the tags that are currently logged in the selected Agent database file (.wgp) of the Agent Server.
Scanning Config.	Displays the list of all the tags that are currently scanned in the selected Agent database file (.wgp) of the Agent Server.
Security and Auditing	Displays the separate Security and Auditing Settings section, which connects to the required SmartUI Server to bulk configure the security and auditing properties for the applicable Agents and/or their slots.

1.3.7. Scanning, Logging, Alarming and Historical Data



Scanning, Logging, Alarming and Historical Data	
Scanning	Select the tag/s and click the Scanning section and use its Add to Scan Sheet tool to open the AAA_Scanning worksheet and add the selected tags to it.
Logging	Select the tag/s and click the Logging section and use its Add to Log Sheet tool to open the AAB_Logging worksheet and add the selected tags to it.
Alarming	Select the tag/s and click the Alarming section and use its Add to Alarm Sheet tool to open the AAC_Alarming worksheet and add the selected tags to it.
Historical Data*	Enables the user to select any Agent and add it to the history sheet automatically. Note: You can view the historical data of a tag (Agent.Slot), which must be logged before its history can be viewed. Note: Only one tag can be viewed on the sheet at a time.

*Historical Data – Agent's History Menu

 Time Period
 Clear History Sheet

 Fetch History

Sample Rate

Historical Data

2. Exercises

In this section there is a series of step by step exercises on the use of the Adroit Excel Add-In tool.

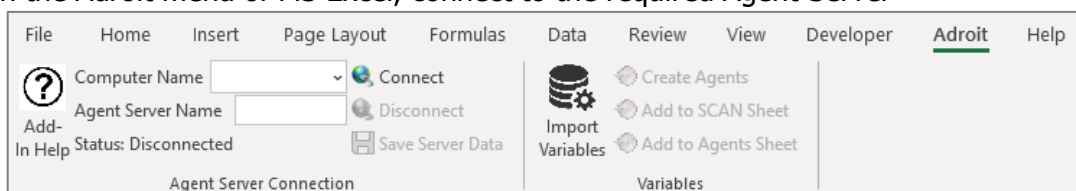
These exercises will cover the following topics:

- Bulk Creation of Tags.
- Bulk Scanning of Tags.
- Bulk Alarming of Tags.
- Bulk Logging of Tags.
- Creating Reports that Display Adroit Agent Values.
- Viewing the Historical Data of a Logged Tag (Agent.Slot)
- Configuring Security and Auditing properties of the required Agents and their Slots.

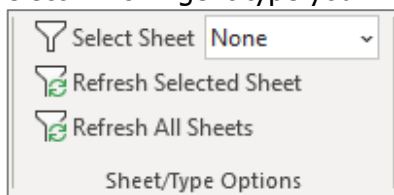
Exercise 1 – Bulk Creation of Tags using the Adroit Excel Add-in Tool

	Objective:	Bulk Adding Tags to the Agent Server using MS Excel. In this exercise we will demonstrate creating Analog and Digital Tags.
	Prerequisites:	MS Excel 32-bit installed Adroit Excel Add-in Tool installed Agent Server, SmartUI Server and Designer running. An active configuration (refer to Adroit Config Editor) I/O Schedule

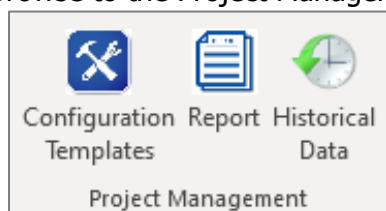
1. Open a new or existing MS Excel workbook and click the Adroit tab on the ribbon.
2. In the Adroit menu of MS Excel, connect to the required Agent Server



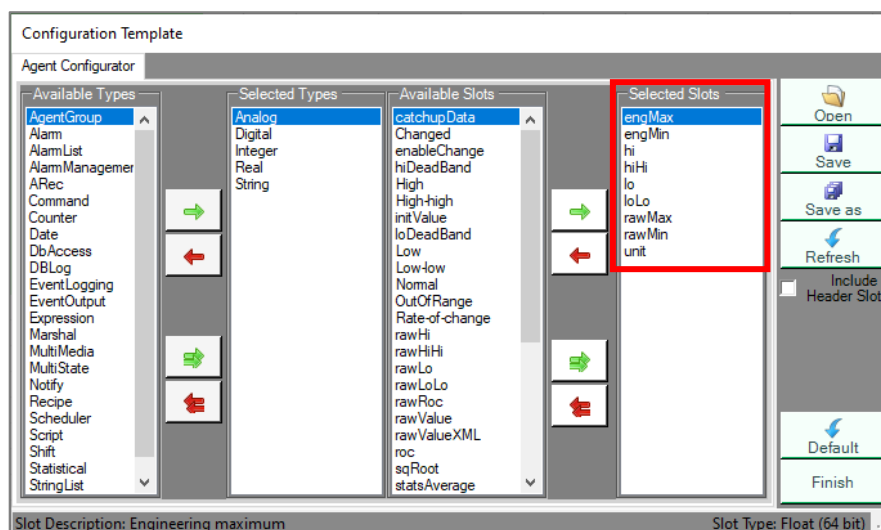
3. Select which Agent type you wish to add from the drop down menu via the Select Sheet option



4. Browse to the Project Management section, click on Configuration Templates.



5. Select the Agent type you wish to configure from Selected Types (in this case Analog) and select the Selected Slots as shown below (as per IO schedule supplied).



Note: For our Training lesson, ensure the Selected Slots correspond to the Analog Agent table supplied in this document.

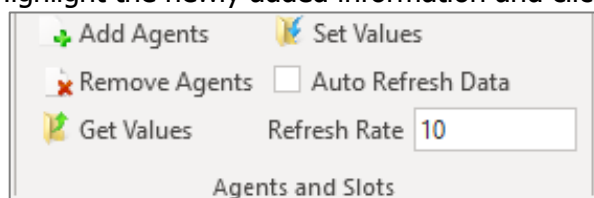
This dialog allows you to double click list items to move them to the corresponding list or use the arrows to either singly or all at once move list items to the corresponding list that the arrow/s point to.

6. Click Save and then Finish.

7. Add the required Tags and configuration from the supplied IO Schedule.

	A	B	C	D	E	F	G	H	I	J	K	L
1		Name	Description	engMax	engMin	hi	hiHi	lo	loLo	rawMax	rawMin	value
2	Analog	<u>SAMPLEANALOGUE</u>	Sample Analogue	1000	0	1000	1000	0	0	1000	0	5
3		ADT_JU_MX_AGIT_TIME_ACT	Actual Mix Time	1000	0	100	100	0	0	1000	0	sec
4		ADT_JU_MX_AGIT_TIME_TGT	Target Mix Time	1000	0	100	100	0	0	1000	0	sec
5		ADT_JU_MX_BTCH_NUM	Batches per shift	1000	0	100	100	0	0	1000	0	
6		ADT_JU_MX_BTCH_NUM_SP	Batches to Run	1000	0	100	100	0	0	1000	0	
7		ADT_JU_MX_FED_A_MASS_ACT	Ingredient A Powd	100	0	70	85	35	20	100	0	Kg
8		ADT_JU_MX_FED_A_MASS_TGT	Ingredient A Powd	100	0	75	85	35	20	100	0	Kg
9		ADT_JU_MX_FED_B_MASS_ACT	Ingredient B Powd	100	0	70	85	35	20	100	0	Kg
10		ADT_JU_MX_FED_B_MASS_TGT	Ingredient B Powd	100	0	100	100	0	0	100	0	Kg
11		ADT_JU_MX_HTR_TEMP_ACT	Heat Temperature	45	0	35	45	15	0	4096	0	°C
12		ADT_JU_MX_HTR_TEMP_TGT	Heat Temperature	45	0	35	45	15	0	4096	0	°C
13		ADT_JU_MX_MIX_TNK_LVL	Mix Tank level	100	0	70	85	5	0	100	0	Kg
14		ADT_JU_MX_PMP_MASS_ACT	Water Mass Actual	100	0	70	85	35	20	100	0	Litres
15		ADT_JU_MX_PMP_MASS_TGT	Water Mass Target	100	0	100	100	0	0	100	0	Litres
16		ADT_JU_MX_VLV_RATE	Outlet Valve Flow	100	0	100	100	0	0	100	0	Kg/s
17		ADT_JU_MX_VLV_TIME	Discharge Time	1000	0	100	100	0	0	1000	0	sec

8. Highlight the newly added information and click the **Add Agents** button.



9. Click the **Set Values** button to write the properties to the Agent Server.

1	Name	Description	engMax	engMin	hi	hiHi	lo	loLo	rawMax	rawMin	unit
2	Analog _SAMPLEANALOGUE	Sample Analogue	1000	0	1000	1000	0	0	1000	0	
3	ADT_JU_MX_AGIT_TIME_ACT	Actual Mix Time	1000	0	100	100	0	0	1000	0	sec
4	ADT_JU_MX_AGIT_TIME_TGT	Target Mix Time	1000	0	100	100	0	0	1000	0	sec
5	ADT_JU_MX_BTCH_NUM	Batches per shift	1000	0	100	100	0	0	1000	0	
6	ADT_JU_MX_BTCH_NUM_SP	Batches to Run	1000	0	100	100	0	0	1000	0	
7	ADT_JU_MX_FED_A_MASS_ACT	Ingredient A Powder Feeder	100	0	70	85	35	20	100	0	Kg
8	ADT_JU_MX_FED_A_MASS_TGT	Ingredient A Powder Target	100	0	75	85	35	20	100	0	Kg
9	ADT_JU_MX_FED_B_MASS_ACT	Ingredient B Powder Feeder	100	0	70	85	35	20	100	0	Kg
10	ADT_JU_MX_FED_B_MASS_TGT	Ingredient B Powder Target	100	0	100	100	0	0	100	0	Kg
11	ADT_JU_MX_HTR_TEMP_ACT	Heat Temperature Actual	45	0	35	45	15	0	4096	0	°C
12	ADT_JU_MX_HTR_TEMP_TGT	Heat Temperature Target	45	0	35	45	15	0	4096	0	°C
13	ADT_JU_MX_MIX_TNK_LVL	Mix Tank level	100	0	70	85	5	0	100	0	Kg
14	ADT_JU_MX_PMP_MASS_ACT	Water Mass Actual	100	0	70	85	35	20	100	0	Litres
15	ADT_JU_MX_PMP_MASS_TGT	Water Mass Target	100	0	100	100	0	0	100	0	Litres
16	ADT_JU_MX_VLV_RATE	Outlet Valve Flow Rate	100	0	100	100	0	0	100	0	Kg/s
17	ADT_JU_MX_VLV_TIME	Discharge Time	1000	0	100	100	0	0	1000	0	sec

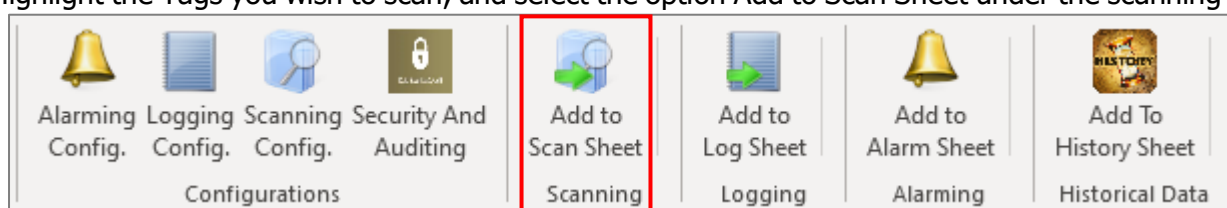
1	Name	Description	delay	pulse	rawValue	state0	state1	value
2	Digital _SAMPLEDIGITAL	Sample Digital agent	3000	0	0	OFF	ON	0
3	ADT_JU_MX_AGIT_START	Agitator Manual Start	3000	1	0	OFF	ON	0
4	ADT_JU_MX_AGIT_STATUS	Mixer Motor	3000	0	0	OFF	ON	0
5	ADT_JU_MX_AGIT_STOP	Agitator Manual Stop	3000	1	0	OFF	ON	0
6	ADT_JU_MX_ALM-RESET	Reset OPC alarms	3000	1	0	OFF	ON	0
7	ADT_JU_MX_AUT_MAN	Automatic / Manual	3000	0	0	Automatic	Manual	0
8	ADT_JU_MX_AUT_STRT	Start OPC	3000	1	0	OFF	ON	0
9	ADT_JU_MX_FED_A_STATUS	Custard Powder Feeder	3000	0	0	OFF	ON	0
10	ADT_JU_MX_FED_B_STATUS	Milk Powder Feeder	3000	0	0	OFF	ON	0
11	ADT_JU_MX_OPC-RESET	Reset OPC	3000	1	0	OFF	ON	0
12	ADT_JU_MX_PMP_MAN_STP	Stop in Manual	3000	1	0	OFF	ON	0
13	ADT_JU_MX_PMP_MAN_STRT	Start in Manual	3000	1	0	OFF	ON	0
14	ADT_JU_MX_PMP_STATUS	Water Pump	3000	0	0	OFF	ON	0
15	ADT_JU_MX_PMP_TRIP	Water Pump Alarm	3000	0	0	OFF	ON	0
16	ADT_JU_MX_VLV_ALM	Discharge Valve Alarm	3000	0	0	OFF	ON	0
17	ADT_JU_MX_VLV_STAT	Outlet Valve	3000	0	0	OFF	ON	0

10. Open the Agent Configurator and check that the Tags have been successfully added.

Exercise 2 – Bulk Scanning of Tags using the Adroit Excel Add-in Tool

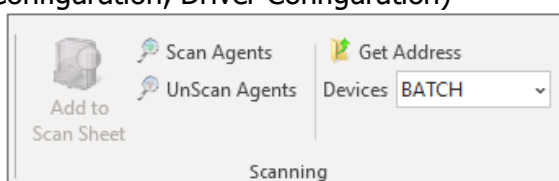
	Objective:	Bulk Scanning Tags to the Agent Server using MS Excel. In this exercise we will demonstrate creating Analog Tags.
	Prerequisites:	MS Excel 32bit installed Adroit Excel Add-in Tool installed Agent Server, SmartUI Server and Designer running. Active Configuration (refer to Adroit Config Editor) Active Driver Configuration (refer to Adroit Config Editor) I/O Schedule

1. Highlight the Tags you wish to scan, and select the option Add to Scan Sheet under the scanning menu.



2. A new sheet **AAA_Scanning** will be created.
3. Copy and paste the OPC Address, Scan Rate and Output Enabled from the IO Schedule for the individual tags to the corresponding columns in this spreadsheet. (please note that your spelling needs to be precise on the addressing)
4. Highlight, in the "Device" column, the tags you would like to scan, then select the device you wish to scan to from the drop-down menu. (in our case BATCH)

Note: Ensure that this device has been created in the Config Editor (Welcome, Agent Server Configuration, Driver Configuration)



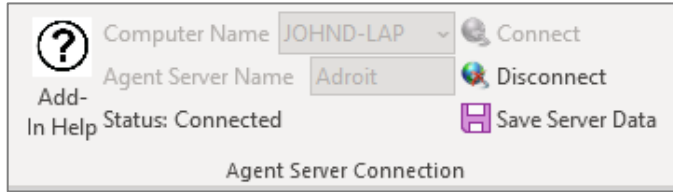
5. With the Tags that you want scanned selected, click the **Scan Agents** option to scan Tags to the selected device.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	AAA_Scanning	Agent Name	Slot Name	Device	Address	Scan Rate (ms)	Deadband	Input Disabled	Output Enabled	Output Initialize	Demand Scan	IO Flags	Description
2		ADT_JU_MX_AGIT_TIME_ACT	rawValue	BATCH	ActualMixTime	1000	0	0	0	0	0	0	
3		ADT_JU_MX_AGIT_TIME_TGT	rawValue	BATCH	TargetMixTime	1000	0	0	1	0	0	0	
4		ADT_JU_MX_BTCH_NUM	rawValue	BATCH	BatchNumber	1000	0	0	0	0	0	0	
5		ADT_JU_MX_BTCH_NUM_SP	rawValue	BATCH	NumBatches	1000	0	0	1	0	0	0	
6		ADT_JU_MX_FED_A_MASS_ACT	rawValue	BATCH	IngMassA	1000	0	0	0	0	0	0	
7		ADT_JU_MX_FED_A_MASS_TGT	rawValue	BATCH	IngTargetA	1000	0	0	1	0	0	0	
8		ADT_JU_MX_FED_B_MASS_ACT	rawValue	BATCH	IngMassB	1000	0	0	0	0	0	0	
9		ADT_JU_MX_FED_B_MASS_TGT	rawValue	BATCH	IngTargetB	1000	0	0	1	0	0	0	
10		ADT_JU_MX_HTR_TEMP_ACT	rawValue	BATCH	ActualMixTemp	1000	0	0	0	0	0	0	
11		ADT_JU_MX_HTR_TEMP_TGT	rawValue	BATCH	TargetTemp	1000	0	0	1	0	0	0	
12		ADT_JU_MX_MIX_TNK_LVL	rawValue	BATCH	-	1000	0	0	-	0	0	0	
13		ADT_JU_MX_PMP_MASS_ACT	rawValue	BATCH	IngMassH2O	1000	0	0	0	0	0	0	
14		ADT_JU_MX_PMP_MASS_TGT	rawValue	BATCH	IngTargetH2O	1000	0	0	1	0	0	0	
15		ADT_JU_MX_VLV_RATE	rawValue	BATCH	DischRate	1000	0	0	1	0	0	0	
16		ADT_JU_MX_VLV_TIME	rawValue	BATCH	ActualDischTime	1000	0	0	1	0	0	0	

Note: Green indicated Scan is OK; Red indicates an error (in this case, this Agent does not require Scanning as it is a calculated value.)

6. Click Refresh Selected Sheet to update the Scanned Tags.

7. Before exiting the Adroit Add-in Tool, ensure you click the Save Agent Server Data button.

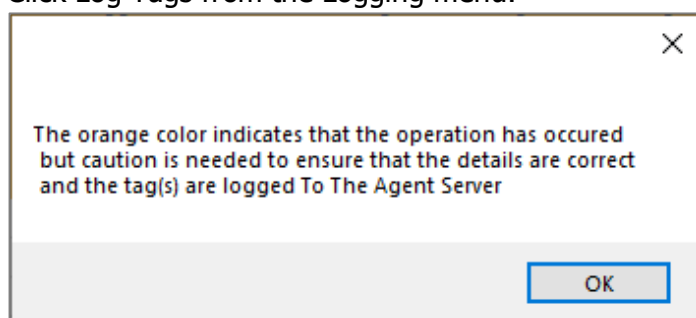


8. Open the Agent Configurator in the Designer to check if the required Agents have been scanned.
9. To unscan Tags, highlight the required Tags and click UnScan Agents. Selection will turn green for a successful process.
10. Click Refresh Selected Sheet to update the Scanned Tags. As they are now unscanned the list is now blank.
11. Open the Agent Configurator in the Designer to check if the required Agents have been unscanned.
12. Disconnect from the server. Close MS Excel.

Exercise 3 – Bulk Logging of Tags using the Adroit Excel Add-in Tool

	Objective:	Bulk Logging Tags to the Agent Server using MS Excel
	Prerequisites:	MS Excel 32bit installed Adroit Excel Add-in Tool installed Agent Server, SmartUI Server and Designer running. I/O Schedule

1. Highlight the Tags you wish to scan, and select the option Add to Log Sheet under the Logging menu.
2. A new sheet **AAB_Logging** sheet will be created.
3. Enter the Slot name that you want to have logged for each Tag.
Note: Default values are provided for ALL the logging parameters EXCEPT for the Slot, which you must specify.
IMPORTANT: When you click Log - all the fields ALWAYS have a green background even when they have been incorrectly specified, since this does not do auto-correction!
 Therefore please ensure that you have correctly specified the slot names and any other details!
4. Select the Tags name you want to Log (please note that your spelling needs to be precise on the addressing)
5. Complete the column Slot for each Tag that you want to log. i.e. value
6. Set the fields in the Start (0/1) column to 1 should you want the logging to start (Default is 0)
7. Click Log Tags from the Logging menu.



8. Once successfully logged, the LogFileName will be displayed. The file is saved to C:\ProgramData\Adroit Technologies\Adroit\Configurations\configuration_name\Data\configuration_name.LGD
9. You can un-log selected tags and then click the Refresh sheets to view the remaining logged items
10. The Get Value / Set Value tools, retrieves or sets the logged slot (value) - these functions are NOT provided by the Scanning sheet.
11. Before exiting the Adroit Add-in Tool, ensure you click the Save Agent Server Data button.

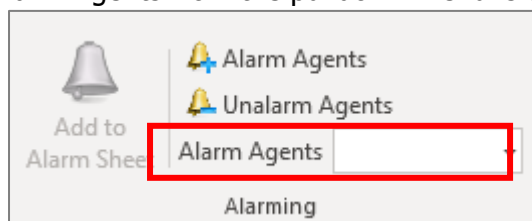
 Add-In Help	Computer Name	JOHND-LAP	 Connect
	Agent Server Name	Adroit	 Disconnect
	Status: Connected	 Save Server Data	
Agent Server Connection			

12. Disconnect from the server. Close MS Excel.

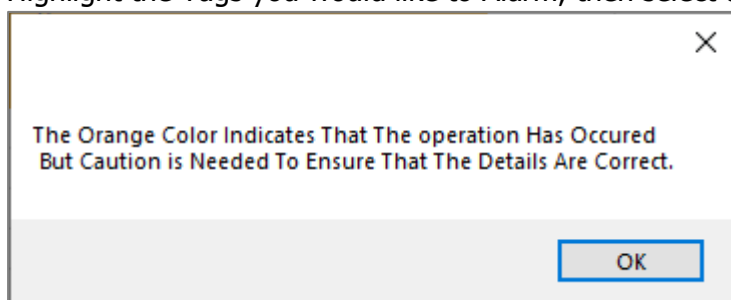
Exercise 4 – Bulk Alarming of Tags using the Adroit Excel Add-in Tool

	Objective:	Bulk Alarming Tags to the Agent Server using MS Excel
	Prerequisites:	MS Excel 32bit installed Adroit Excel Add-in Tool installed Agent Server, SmartUI Server and Designer running. I/O Schedule

1. Highlight the Tags you wish to Alarm from the Select Sheet (see previous exercise), and select the option Add to Alarm Sheet under the Alarming menu.
2. A new sheet **AAC_Alarming** will be created.
3. Highlight the Tags for Alarming in the Alarm Agent column and select **defaultAlarmAgent** from the Alarm Agents from the pulldown menu in the Alarming menu.



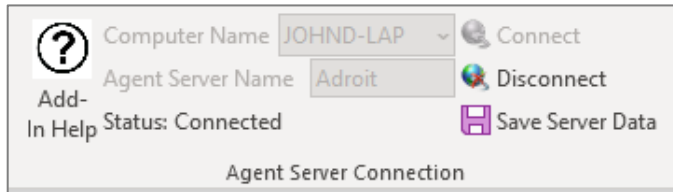
4. Enter the Alarm Type and Route that you have previously configured (please note that your spelling needs to be precise on the addressing)
5. Highlight the Tags you would like to Alarm, then select the Alarm Agents from the Alarming menu.



	A	B	C	D	E	F	G	H	I	J	K
		Alarm Agent	Agent	Agent Type	Alarm Type	Route	Ack. Required (0/1)	Priority	Delay (secs)	Condition	Description
1		defaultAlarmAgent	ADT_JU_MX_AGIT_TIME_ACT	Analog	High	2	True	2	0		
2		defaultAlarmAgent	ADT_JU_MX_AGIT_TIME_TGT	Analog	High	2	True	2	0		
3		defaultAlarmAgent	ADT_JU_MX_BTCH_NUM	Analog	High	2	True	2	0		
4		defaultAlarmAgent	ADT_JU_MX_BTCH_NUM_SP	Analog	High	2	True	2	0		
5		defaultAlarmAgent	ADT_JU_MX_FED_A_MASS_ACT	Analog	High	2	True	2	0		
6		defaultAlarmAgent	ADT_JU_MX_FED_A_MASS_TGT	Analog	High	2	True	2	0		
7		defaultAlarmAgent	ADT_JU_MX_FED_B_MASS_ACT	Analog	High	2	True	2	0		
8		defaultAlarmAgent	ADT_JU_MX_FED_B_MASS_TGT	Analog	High	2	True	2	0		
9		defaultAlarmAgent	ADT_JU_MX_HTR_TEMP_ACT	Analog	High	2	True	2	0		
10		defaultAlarmAgent	ADT_JU_MX_HTR_TEMP_TGT	Analog	High	2	True	2	0		
11		defaultAlarmAgent	ADT_JU_MX_PMP_MASS_ACT	Analog	High	2	True	2	0		
12		defaultAlarmAgent	ADT_JU_MX_PMP_MASS_TGT	Analog	High	2	True	2	0		
13		defaultAlarmAgent	ADT_JU_MX_VLV_RATE	Analog	High	2	True	2	0		
14		defaultAlarmAgent	ADT_JU_MX_VLV_TIME	Analog	High	2	True	2	0		
15		defaultAlarmAgent									

6. Open the Agent Configurator in the Designer to check if the required Alarming has been updated.

7. Before exiting the Adroit Add-in Tool, ensure you click the Save Agent Server Data button.



8. Disconnect from the server. Close MS Excel.

Exercise 5 – Creating Reports that Display Adroit Agent Values

	Objective:	Creating Reports that Display Adroit Agent Values
	Prerequisites:	As per Exercise 2.

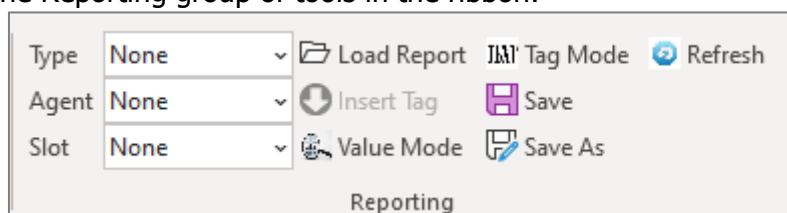
1. If necessary, launch MS Excel, typically open the existing workbook and click the ADROIT tab of the ribbon.
2. Ensure that you are connected to the required Agent Server, via the Agent Server Connection group of tools, as follows: type in or select the name of the required computer from the Computer Name combo box and then select or specify the required Agent Server Name and click the Connect button.
3. Click the Report tool from the Project group (this only becomes available once you have successfully connected to an Agent Server). This opens another worksheet and enables the Reporting group of tools in the ribbon.



4. Open up a new worksheet in the Excel workbook, design the required report in MS Excel, such as its title and company logo and the various descriptions for the tags that you want to report.

Note: If a previous report configuration (.adroitxml file) has been created and saved simply use the Load Report tool from the Reporting group of tools to load this report configuration file and provided you connect to the same Agent Server, you can view this report and its reported Adroit tags, without having to create it from scratch:

5. To insert an Adroit Tag (Agent.Slot) into your report to display its value, do the following steps:
 - a. In the Reporting group of tools in the ribbon:



- i. select the required Agent Type, from this list box, then
 - ii. select the required Agent name from this list box, which lists all the Agents of this Type configured in the connected Agent Server and
 - iii. lastly select the required Slot (value) from this list box, which lists all the slots provided by the selected Agent Type.
- b. In the report worksheet click the cell where you want this value to be displayed and then click the Insert Tag tool to insert the Adroit tag (Agent.Slot), defined by the current selections of the Type, Agent and Slot list boxes.

6. The following two modes are provided to toggle the display of the Adroit tags that you insert into your report:

- a. Value Mode : Typically this should be used before you print or display this report as it displays the current value of the inserted Adroit tags.

	A	B
1	Test Report	2021/09/02
2		
3	Name	Value
4	No. of Batches completed	ADT_JU_MX_BTCH_NUM.value
5	No. of Batches remaining	ADT_JU_MX_BTCH_NUM.SP.value
6	Actual Mixing Time	ADT_JU_MX_AGIT_TIME_ACT.value
7	Target Mixing Time	ADT_JU_MX_AGIT_TIME_TGT.value

- b. Tag Mode : Typically this should be used when designing the report as it displays the currently selected Agent.Slot names.

	A	B
1	Test Report	2021/09/02
2		
3	Name	Value
4	No. of Batches completed	0
5	No. of Batches remaining	1
6	Actual Mixing Time	0
7	Target Mixing Time	5

7. Either save the report you have created using the Save button from the Reporting group of tools or Save As to change the name and/or location.
8. You also have the ability to Save the current report configuration as an .AdroitXML file, which you can then send to another person, who also has the Adroit Excel Add-in and who can then use the Load Report tool to load this .XML file and provided they too are connected to the same Agent Server, will be able to view this report and its reported Adroit tags, without having to create this report from scratch.

Notes:

- By default, the report configuration will be saved in
C:\ProgramData\Adroit Technologies\Adroit Excel Add-In\report name.
- The report configuration will be saved as the workbook name e.g., book1.AdroitXML or the user may specify their report configuration name and location by using the Save-As button.

Exercise 6 – Viewing the Historical Data of a Logged Tag (Agent.Slot)

	Objective:	Viewing the Historical Data of a Logged Tag (Agent.Slot)
	Prerequisites:	As per Exercise 2.

You can view the historical data of a tag (Agent.Slot), which must be logged before its history can be viewed.

IMPORTANT: You need to change your regional date separator to be a "-" character in order for historical data to be retrieved, because this is ONLY VALID data separator that the Agent Server supports.

NOTE: Do NOT change the order of the columns of these worksheets; since this application references the column indexes, not the column names.

NOTE: Only one tag can be viewed on the sheet at a time.

1. If necessary, launch MS Excel, typically open the existing workbook and click the ADROIT tab of the ribbon.
2. Ensure that you are connected to the required Agent Server, via the Agent Server Connection group of tools, as follows: type in or select the name of the required computer from the Computer Name combo box and then select or specify the required Agent Server Name and click the Connect button.
3. Select the Tag you want to view the Historical data in the Select Sheet. 1.e. Analog
4. Click the Historical Data tool from the Project group (this only becomes available once you have successfully connected to an Agent Server). This creates the **Agent's History** worksheet and enables the History Data group of tools in the ribbon.
5. Click the **Add to History Sheet** tool from the History Data group, which is enabled on every Agent type sheet (Analog, Digital etc.) to enable the user to select any Agent and add it to the history sheet automatically.
NOTE: While you can also type in the required Agent Name and Slot of the Agent's History worksheet it is preferable to use this tool to ensure that these names are correctly spelt.
6. Specify the Slot you wish to retrieve in the Slot column. i.e. value
7. Click in the Start Date column for the Tag and select Time Period from the Historical Data menu,
8. Specify the required Start Date and End Date of the Agent's History worksheet by using Time Period tool from the History Data group that defines the historical period for the specified tag that you want to view.



Time Period

Fetch History

Sample Rate

Clear History Sheet

Add To History Sheet

Historical Data

DateTimePicker

Thursday, 02 Septeml

Friday, 03 Septeml

H 16 : Min 53

H 16 : Min 53

Ok

Example:

	A	B	C	D	E	F	G	H
1		Agent Name	Slot	Start Date	End Date	DataLogged DateTime	Slot Value	Quality
2	Agent's History	ADT_JU_MX_BTCH_NUM	value	2021/09/02 16:53:00 PM	2021/09/03 16:53:00 PM			
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								

- Click the Fetch History button from the History Data group to view the values that were logged for the specified tag during the specified historical period, which displays their DataLogged DateTime, Slot Value and its Quality.

	A	B	C	D	E
1		Agent Name	Slot	Start Date	End Date
2	Agent's History	ADT_JU_MX_BTCH_NUM	value	2021/09/02 16:53:00 PM	2021/09/03 16:53:00 PM
3		DataLogged DateTime	Slot Value	Quality	
4		2021/09/02 16:56:59	1.000000	NORMAL VALUE	
5		2021/09/02 16:57:43	2.000000	NORMAL VALUE	
6		2021/09/02 16:58:25	3.000000	NORMAL VALUE	
7		2021/09/02 16:59:11	4.000000	NORMAL VALUE	
8		2021/09/02 17:00:10	5.000000	NORMAL VALUE	
9					
10					
11					
12					
13					
14					

IMPORTANT: You need to change your regional date separator to be a "-" character in order for historical data to be retrieved, because this is ONLY VALID data separator that the Agent Server supports.

The Sample Rate field of the History Data group determines the DataLogged DateTime (and the number of values) , as follows:

- a. **0** = the default value, displays all the logged data points at the time at which they were logged during the specified period.
- b. **1** = only displays a data point for each minute during the specified period

If necessary, you can clear this retrieved history, by clicking the Clear History Sheet button from the History Data group.

Notes:

Exercise 7 – Configuring Security and Auditing Properties of Agents.

	Objective:	Configuring security and auditing properties of the required Agents and their slots.
	Prerequisites:	As per Exercise 2.

This requires you to log into the required SmartUI Server to bulk configure the security and auditing properties (the security properties usually required when using 21 CFR 11) for the applicable Agents and/or their slots in Agent Server, as follows:

IMPORTANT: Due to the current security model and the administration overhead that they cause, you need to plan carefully and only assign the Security and/or Auditing settings to those slots that actually need it.

NOTE: If you intend using this utility to bulk configure security, then ensure that your user names do not resemble Excel worksheet cell names (e.g. A4, B1 or CC89).

- 1 If necessary, launch MS Excel, typically open the existing workbook, and click the ADROIT tab of the ribbon.
- 2 Ensure that you are connected to the required Agent Server, via the Agent Server Connection group of tools, as follows: type in or select the name of the required computer from the Computer Name combo box and then select or specify the required Agent Server Name and click the Connect button.
- 3 Click the Security and Auditing tool in the Configurations group of the ribbon to display the Security and Auditing Settings section (this only becomes available once you have successfully connected to an Agent Server).
- 4 In the Security and Auditing Settings section, click the Connect to SmartUI Server button to display the SmartUI Server Login dialog, so that you can specify the required Username and Password to log into the SmartUI Server associated with the specified Agent Server and click the Login button. When you successfully log into the SmartUI Server all the other settings in the Security and Auditing Settings section are no longer disabled (grayed out).

To bulk configure the **Security properties** of your scanned and output enabled tags:

- Click the Security Config button to add and/or display the Security worksheet, which displays the following configured security properties of each scanned and output enabled Agent (specified by the Agent Name and Description columns) for all the available Users and Groups configured for this Agent Server: ConfigureAccess, ReadAccess, WriteAccess and RemoveAccess.

NOTE: Do NOT change the order of the columns of these worksheets; since this application references the column indexes, not the column names.

- Configure the security properties for these applicable Agents by setting their applicable security properties to be 'True' or 'False' accordingly.

NOTE: By design, the FullAccess security property is NOT displayed as it is read-only and CANNOT be changed!

- Select the Agents whose security settings you want to modify and click the Set Security Config button to write their security properties to the Agent Server.

To bulk configure the **Auditing and Authorization-required Security properties** of your scanned and output enabled tags:

- Click the Audit Config button to add and/or display the Auditing worksheet which contains the statuses of the Audit and AuthorizationRequired properties of the scanned and output enabled Agents and their slots (specified by the TagName and Description columns).

NOTE: Do NOT change the order of the columns of these worksheets; since this application references the column indexes, not the column names.

Typically this will be RAWVALUE slots of the applicable Analog and Digital Agents.

- Configure these auditing-specific security properties for these applicable tags by setting their applicable security properties to be 'True' or 'False' accordingly.
- Select the tags whose auditing-specific security properties you want to modify and click the Set Audit Config button to write these security properties to the Agent Server.

- 5 When you have finished configuring these security and/or auditing-specific security properties of your applicable tags, click the Disconnect From SmartUI Server button to close the client connection made to the Agent Server.

Notes:

1. By default, the security and auditing configuration bulk configure tags that are scanned, and output enabled
2. The user can also be able to configure Tags that are scanned and not output enabled on all available devices or on a specific device.
3. The user can also be able to configure tags that are not scanned, on a specific Agent type.

3. Batch Plant I/O Schedules

3.1. Analog Agents – Bulk Tag Creation

	Info required when Adding Agents										
Agent Type	Name	Description	engMax	engMin	hi	hiHi	lo	loLo	rawMax	rawMin	unit
Analog	ADT_JU_MX_AGIT_TIME_ACT	Actual Mix Time	1000	0	100	100	0	0	1000	0	sec
	ADT_JU_MX_AGIT_TIME_TGT	Target Mix Time	1000	0	100	100	0	0	1000	0	sec
	ADT_JU_MX_BTCH_NUM	Batches per shift	1000	0	100	100	0	0	1000	0	
	ADT_JU_MX_BTCH_NUM_SP	Batches to Run	1000	0	100	100	0	0	1000	0	
	ADT_JU_MX_FED_A_MASS_ACT	Ingredient A Powder Feeder	100	0	70	85	35	20	100	0	Kg
	ADT_JU_MX_FED_A_MASS_TGT	Ingredient A Powder Target	100	0	75	85	35	20	100	0	Kg
	ADT_JU_MX_FED_B_MASS_ACT	Ingredient B Powder Feeder	100	0	70	85	35	20	100	0	Kg
	ADT_JU_MX_FED_B_MASS_TGT	Ingredient B Powder Target	100	0	100	100	0	0	100	0	Kg
	ADT_JU_MX_HTR_TEMP_ACT	Heat Temperature Actual	45	0	35	45	15	0	4096	0	°C
	ADT_JU_MX_HTR_TEMP_TGT	Heat Temperature Target	45	0	35	45	15	0	4096	0	°C
	ADT_JU_MX_MIX_TNK_LVL	Mix Tank level	100	0	70	85	5	0	100	0	Kg
	ADT_JU_MX_PMP_MASS_ACT	Water Mass Actual	100	0	70	85	35	20	100	0	Litres
	ADT_JU_MX_PMP_MASS_TGT	Water Mass Target	100	0	100	100	0	0	100	0	Litres
	ADT_JU_MX_VLV_RATE	Outlet Valve Flow Rate	100	0	100	100	0	0	100	0	Kg/s
	ADT_JU_MX_VLV_TIME	Discharge Time	1000	0	100	100	0	0	1000	0	sec

3.2. Analog Agents – Bulk Tag Scanning

		Info required for Scanning					
Agent Type	Name	Device	OPC Address	Scan Rate	Deadband	Input Disabled	Output Enabled
Analog	ADT_JU_MX_AGIT_TIME_ACT	BATCH	ActualMixTime	1000	0	0	0
	ADT_JU_MX_AGIT_TIME_TGT	BATCH	TargetMixTime	1000	0	0	1
	ADT_JU_MX_BTCH_NUM	BATCH	BatchNumber	1000	0	0	0
	ADT_JU_MX_BTCH_NUM_SP	BATCH	NumBatches	1000	0	0	1
	ADT_JU_MX_FED_A_MASS_ACT	BATCH	IngMassA	1000	0	0	0
	ADT_JU_MX_FED_A_MASS_TGT	BATCH	IngTargetA	1000	0	0	1
	ADT_JU_MX_FED_B_MASS_ACT	BATCH	IngMassB	1000	0	0	0
	ADT_JU_MX_FED_B_MASS_TGT	BATCH	IngTargetB	1000	0	0	1
	ADT_JU_MX_HTR_TEMP_ACT	BATCH	ActualMixTemp	1000	0	0	0
	ADT_JU_MX_HTR_TEMP_TGT	BATCH	TargetTemp	1000	0	0	1
	ADT_JU_MX_MIX_TNK_LVL	BATCH	-	1000	0	0	-
	ADT_JU_MX_PMP_MASS_ACT	BATCH	IngMassH2O	1000	0	0	0
	ADT_JU_MX_PMP_MASS_TGT	BATCH	IngTargetH2O	1000	0	0	1
	ADT_JU_MX_VLV_RATE	BATCH	DischRate	1000	0	0	1
	ADT_JU_MX_VLV_TIME	BATCH	ActualDischTime	1000	0	0	1

3.3. Digital Agents – Bulk Tag Creation

	Info required when Adding Agents							
Agent Type	Name	Description	delay	pulse	rawValue	state0	state1	value
Digital	ADT_JU_MX_AGIT_START	Agitator Manual Start	3000	1	0	OFF	ON	0
	ADT_JU_MX_AGIT_STATUS	Mixer Motor	3000	0	0	OFF	ON	0
	ADT_JU_MX_AGIT_STOP	Agitator Manual Stop	3000	1	0	OFF	ON	0
	ADT_JU_MX_ALM-RESET	Reset OPC alarms	3000	1	0	OFF	ON	0
	ADT_JU_MX_AUT_MAN	Automatic / Manual	3000	0	0	Automatic	Manual	0
	ADT_JU_MX_AUT_STRT	Start OPC	3000	1	0	OFF	ON	0
	ADT_JU_MX_FED_A_STATUS	Custard Powder Feeder	3000	0	0	OFF	ON	0
	ADT_JU_MX_FED_B_STATUS	Milk Powder Feeder	3000	0	0	OFF	ON	0
	ADT_JU_MX_OPC_RESET	Reset OPC	3000	1	0	OFF	ON	0
	ADT_JU_MX_PMP_MAN_STP	Stop in Manual	3000	1	0	OFF	ON	0
	ADT_JU_MX_PMP_MAN_STRT	Start in Manual	3000	1	0	OFF	ON	0
	ADT_JU_MX_PMP_STATUS	Water Pump	3000	0	0	OFF	ON	0
	ADT_JU_MX_PMP_TRIP	Water Pump Alarm	3000	0	0	OFF	ON	0
	ADT_JU_MX_VLV_ALM	Discharge Valve Alarm	3000	0	0	OFF	ON	0
	ADT_JU_MX_VLV_STAT	Outlet Valve	3000	0	0	OFF	ON	0

3.4. Digital Agents – Bulk Tag Scanning

			Info required when Scanning Agents					
Agent Type	Name	Description	Device	OPC Address	Scan Rate (ms)	Deadband	Input Disabled	Output Enabled
Digital	ADT_JU_MX_AGIT_START	Agitator Manual Start	BATCH	StartAgitatorMan	4000	0	0	1
	ADT_JU_MX_AGIT_STATUS	Mixer Motor	BATCH	AgitatorRunning	4000	0	0	0
	ADT_JU_MX_AGIT_STOP	Agitator Manual Stop	BATCH	StopAgitatorMan	4000	0	0	1
	ADT_JU_MX_ALM-RESET	Reset OPC alarms	BATCH	AlmReset	4000	0	0	1
	ADT_JU_MX_AUT_MAN	Automatic / Manual	BATCH	ManAuto	4000	0	0	1
	ADT_JU_MX_AUT_STRT	Start OPC	BATCH	AutoStart	4000	0	0	1
	ADT_JU_MX_FED_A_STATUS	Custard Powder Feeder	BATCH	FeedARunning	4000	0	0	0
	ADT_JU_MX_FED_B_STATUS	Milk Powder Feeder	BATCH	FeedBRunning	4000	0	0	0
	ADT_JU_MX_OPC_RESET	Reset OPC	BATCH	PlantReset	4000	0	0	1
	ADT_JU_MX_PMP_MAN_STP	Stop in Manual	BATCH	StopPumpMan	4000	0	0	1
	ADT_JU_MX_PMP_MAN_STRT	Start in Manual	BATCH	StartPumpMan	4000	0	0	1
	ADT_JU_MX_PMP_STATUS	Water Pump	BATCH	PumpRunning	4000	0	0	0
	ADT_JU_MX_PMP_TRIP	Water Pump Alarm	BATCH	PumpTrip	4000	0	0	0
	ADT_JU_MX_VLV_ALM	Discharge Valve Alarm	BATCH	DischargeAlm	4000	0	0	0
	ADT_JU_MX_VLV_STAT	Outlet Valve	BATCH	DischValveOpen	4000	0	0	0

3.5. StringList Agent

Agent Name	Name	Description	Index	String	Scan OPC Address
StringList	ADT_JU_MX_BTCH_STAT	Plant Phase	0	STOPPED	Status
			1	BATCHING	
			2	MIXING	
			3	HEATING	
			4	DISCHARGING	
			5	BATCH COMPLETE	
			8	OPC ALARM	

3.6. Expression Agents

Agent Name	Name	Description	Engineered Data Range
Expression	ADT_JU_MX_ALM_STAT	Alarm Status	V01 = ADT_JU_MX_BTCH_STAT.index Expression = v1 == 8 ? 1 : 0 Evaluation = Continuous
	ADT_JU_MX_HTR_STATUS	Heater Status	V01 = ADT_JU_MX_BTCH_STAT.index Expression = v1 == 3 ? 1 : 0 Evaluation = Continuous
	ADT_JU_MX_MIX_TOTL_MASS	Tank level Calculation	Value = ADT_JU_MX_MIX_TNK_LVL.value V01 = ADT_JU_MX_FED_A_MASS_ACT.value V02 = ADT_JU_MX_FED_B_MASS_ACT.value V03 = ADT_JU_MX_PMP_MASS_ACT.value V04 = ADT_JU_MX_VLV_RATE.value V05 = ADT_JU_MX_VLV_TIME.value Expression = v1+v2+v3-(v4*v5) Evaluation = Continuous

3.7. Counter Agents

Agent Name	Name	Description	Input Tag	Triggered	Trigger
Counter	ADT_JU_MX_AGIT_DAT	Agitator Data	ADT_JU_MX_AGIT_STATUS.value	1	systemInfo.second
	ADT_JU_MX_FED_A_DAT	Ingredient A Feeder	ADT_JU_MX_FED_A_STATUS.value	1	systemInfo.second
	ADT_JU_MX_FED_B_DAT	Ingredient B Feeder	ADT_JU_MX_FED_B_STATUS.value	1	systemInfo.second
	ADT_JU_MX_HTR_DAT	Heater	ADT_JU_MX_HTR_STATUS.value	1	systemInfo.second
	ADT_JU_MX_PMP_DAT	Water Pump	ADT_JU_MX_PMP_STATUS.value	1	systemInfo.second