

How Test, Deploy and Refine MA



Agenda

1	Setting up an initial dashboard
2	Troubleshooting the Charts
3	Use of Thresholds and Filters
4	New Moving Average Features in v8.16.00



MA Desktop – pre 8.16.00

Instrument Manager by Data Innovations LLC - [Moving Averages Desktop]

System Configuration Diagnostics Security Specimen Management SSR DC SR MM MA Laboratory Intelligence Reports Window Help





TP



Data Value Protocol Name	Data Value Protocol Name	Data Value Protocol Name	Data			
Data Value Protocol Name	Data Value Protocol Name	Data Value Protocol Name	Data	Value		
Protocol Name Last Restart Target SD Target Mean Error High Warning High Warning Low Error Low	Protocol Name Last Restart Target SD Target Mean Error High Warning High Warning Low Error Low	Protocol Name Last Restart Target SD Target Mean Error High Warning High Warning Low Error Low	Desta a l Nessa	value		
Last Restart Target SD Target Mean Error High Warning High Warning Low Error Low	Last Restart Target SD Target Mean Error High Warning High Warning Low Error Low Error Low	Last Restart Target SD Target Mean Error High Warning High Warning Low Error Low Error Low	Protocol Name			
Target SD Target Mean Error High Warning High Warning Low Error Low	Target SD Target Mean Error High Warning High Warning Low Error Low Error Low	Target SD Target Mean Error High Warning High Warning Low Error Low Error Low	Last Restart	<u> </u>		
Target Mean Error High Warning High Warning Low Error Low	Target Mean Error High Warning High Warning Low Error Low	Target Mean Error High Warning High Warning Low Error Low	Target SD	<u> </u>		
Error High Warning Low Error Low	Error High Warning Low Error Low	Error High Warning Low Error Low	Target Mean	<u> </u>		
Warning Low Error Low	Warning Low Error Low	Warning Low Error Low	Error High	<u> </u>		
Varning Low Error Low	Warning Low Error Low	Warning Low Error Low	Warning High	<u> </u>		
Error Low	Error Low	Error Low	Warning Low	ļ		
			Error Low			
						_

MA Desktop – 8.16.00

- Grid allows easy placement of charts
- Add a chart by pressing the plus symbol



Adding a Protocol

- A list of available protocols appears
- Highlight protocol
- Press Select
 Protocol
- Protocols may be sorted by the four categories listed at the top.

Dashboard: Demo			D	4	0	0	0
	ALB		×		ALT		
4.7			37.9 -				
4.4			29.1 27.4 23.9				
4.1	Select a Protocol				×		
20	Please select a Protocol to add to the	Dashboard.			Â		
8 ⁰ , 8 ^{1,0} , 8 ^{1,0} , 9 ^{1,0} , 9	Protocol Name 1	Location	Site	Status	5	0.91,45 0.150 0.155	10 AM
					=		
6.02 J	Creat			Normal	^		
5.02	Select I	Protocol		Cancel			
4.82 - 4.42 -					+		
4.02			_				
2.82 ⁽⁵⁾	a ¹² a ¹² a ¹² a ¹²	1,45' _0,50' _0,55' _ AM'					
	5 0 0 0° 0	· · · · · ·					

Multiple Dashboards

- Dashboards can be set to match your workflow
- Protocols can be on more than one dashboard
- A protocol can appear only once in a dashboard

	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	$\sim$
			Ъ	3
		×		
		85.9		
	Open/New Dashb	ooard		
softer	Select a dashboard from Dashboard Name	n the list to open		
	RUG		*	
	Chemistry 1			
i ^{2, 2,} 10 ^{1, 2} 10 ¹	A1c only			10:01 10:08
	Base Presentation			
	Demo			
	Evenings			
	Nights			
Int	Weekend		-	•
	Open	New	Cancel	

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### **Trouble Shooting**



# Click in Open space of a chart displays that chart



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# Click on a point and results it used are displayed

Point	t Information						×
ALT	-						
Seri Name Runni Last R	ies : C2 ing Mean: 25.6 Restart: 07/03/2018 10:11			<b>Running SD:</b> 9. <b>Status:</b> Normal	6		
Poir Time: Res	nt 07/03/2018 10:22 Sults			<b>Value:</b> 84.4			x Export to Excel
	MA Result Value	Fluid	Processed Result	Test Status	Specimen ID	Result Date/Time	Specimen Type
Ē	353	Serum	353	Released	B787937.02	07/03/2018 10:21	R
Ŵ	16	Serum	16	Released	B787893.01	07/03/2018 10:21	R
Ŵ	10	Serum	10	Released	B793108.01	07/03/2018 10:22	R E
Ē	19	Serum	19	Released	B789565.01	06/01/1900 1:00	R
Ē	24	Serum	24	Released	B790459.02	06/01/1900 1:00	R

# **Removing Outlier Results**

- Thresholds
  - High level cutoffs
  - Centered around the mean
- Filters
  - More specific
  - Based on demographics
    - Age, Gender, Location, Diagnosis, Physician, etc.
  - Based on Values
    - Asymmetrical Thresholds
    - Non-numeric results (e.g. > , <, null etc.)</p>



# **Setting Thresholds**





# **After Threshold Applied**



# What's wrong with Series 2



#### **Point Information**

Moving	Averages Desktop						
			Creat	(07/03/2018 10:35 - 07/03/2	018 10:50)		▶ \$2 =
Poir	nt Information						×
Cre	eat						^ 
Se	ries						
Name Runr Last	e: C2 ling Mean: 24.86 Restart: 07/03/2018 10:09			Running SD: 2 Status: Normal	4.17		
Time	• 07/03/2018 10:38			Value: 13.96			
_				Value. 10.00			
Re	sults						∑ Export to Excel ≡
	MA Result Value	Fluid	Processed Result	Test Status	Specimen ID	Result Date/Time	Specimen Type
1	0.9	Serum	0.9	Released	B793885.01	07/03/2018 10:38	R
1	1.5	Serum	1.5	Released	B787529.02	07/03/2018 10:38	R
t di	65.8	Urine	65.8	Released	B787500.01	07/03/2018 10:38	R
•	0.8	Serum	0.8	Released	B787771.01	07/03/2018 10:38	R
1	0.8	Serum	0.8	Released	B792105.02	07/03/2018 10:38	R v
				Close			
	10. 10.	<i>'</i> 0. <i>'</i> 0.	<i>'</i> 0. <i>'</i> 0.	<i>1</i> 0. <i>1</i> 0.	<i>1</i> 0. <i>1</i> 0.	<i>1</i> 0. <i>1</i> 0.	<i>1</i> 0. <i>1</i> 0. <i>1</i> 0.
							A

#### **Filters**

Filter	C b d D I	2020	×
🏆 New Filter Edit Filter 🗎	Copy 🗙 Delete		
Filter	Data Element	Operator	Criteria
Patient Status is In Patient	Patient Status	is equal to	Ψ.
<ul> <li>Patient Status is Out Patient</li> <li>QC</li> </ul>	Patient Status Specimen Type	is equal to is equal to	'O' 'Q'
Exclude all specimens where Patient S	itatus is equal to 'l'		

- Once a filter is entered, it is available for use for other protocols.
- Some default filters are available.
- Check the box for any filter you want applied to this protocol.

#### Adding a New Filter – Serums Only

M Filter	- Ad 31	1.03.0	×
😵 New Filter 🛛 Edit Filter	🖹 Copy 🗙 Delete		
Filter	Data Element	Operator	Criteria
Patient Status is In Patient	Patient Status	is equal to	T
☐ Patient Status is Out Patient ☑ QC	Patient Status Specimen Type	is equal to is equal to	'O' 'Q'
Exclude all specimens where Patien	nt Status is equal to "I"		
		0	K Cancel

• If a filter that you need does not exist a new filter can be added.

#### Step 1 – Select the data element

M Filter Wizard - Step 1 of 3	×
Which Data Element do you want to filter?	
All Available Data Elements	
First Level Review Completed Date/Time	*
First Query to IM Date/Time	
First Result to IM Date/Time	
First Result to LIS Date/Time First Sorted Date/Time	
First Clored Distor Time	
Fluid	
Fluid Group Generation Number	
Gentamycin Synergy Screen Result	
Hemolysis Hold Test Flag	
Hospital Service Code	
ICD Code	Ŧ
Cancel < Back Next > Finish	
	1.

- The first step is to select the data element to be evaluated.
- All data elements are available however they will not all apply to your situation.
- Once selected, press next

# Step 2 – Determine Condition



- The list of options will very based on the data element selected.
- Keep in mind that you will be EXCLUDING results that meet this condition.

#### Step 2 – Enter the Criteria

M Filter Wizard - Step 2 of 3	X
Enter criteria for data element:	
Where Fluid	
is not equal to	
-	Add
'Serum'	Remove
Cancel < Back Next >	Finish

• Depending on the data element, multiple criteria may be added.

# Step 3 – Finalize the Filter

🔣 Filter Wizard - S	tep 3 of 3			x			
Finish filter setup.							
Specify a name for t	his filter:						
Serum Only							
Setup filter options:							
🔲 Turn on this filte	r for the Current f	Protocol					
Roview Filter							
Exclude all specime is not equal to	ens where Fluid						
'Serum'							
L							
,		,					
Cancel	< Back	Next>	Finish				
				1			

- Enter a name the reflect what the purpose of the filter.
- May turn on for current protocol.
- The filter itself is listed in the Review section. Ensure that this is what you really want.

#### Filter is added to the list

M Filter	Copy 🗙 Delete	1.000	×
Filter         Patient Status is In Patient         Patient Status is Out Patient         QC         ✓         Serum Only	Data Element Patient Status Patient Status Specimen Type Fluid	Operator is equal to is equal to is equal to is not equal to	Criteria T' 'O' 'Q' 'Serum'
Exclude all specimens where Patient :	Status is equal to 'l'	0	K Cancel

• Filter is added to the list and can be used for other protocols

• Remember this is what is EXCLUDED.

### Significant improvement but more is needed



#### Look at point data again

M Mo	oving Averages Desktop							
=				Creat (07/03/2018 11:11 -	07/03/2018 11:26)			
_	Point Information							~
(	Creat							
ę	Series							
N F L	Name: C2 Running Mean: 1.11 Last Restart: 07/03/2018 11:11			Runni Status	ng SD: 0.41 s: Normal			
ł	Point							
1	Time: 07/03/2018 11:15			Value	: 7.86			
F	Results						☑ Export t	o Excel
	MA Result Value	Fluid	Processed Result	Test Status	Specimen ID	Result Date/Time	Specimen Type	
	<u>m</u> 0.7	Serum	0.7	Released	B792510.02	07/03/2018 11:15	R	
	<b>m</b> 0.8	Serum	0.8	Released	B793034.01	07/03/2018 11:15	R	
	1.3	Serum	1.3	Released	B796153.01	07/03/2018 11:15	R	Ξ
	135.7	Serum	35.7	Released	B784759.02	07/03/2018 11:15	R	
	<b>₪</b> 0.8	Serum	0.8	Released	B789333.01	07/03/2018 11:15	R	•
		<u>.</u>	<u>.</u>	Close		λ.·	۸	
	N° N°	NY NY				NY NY	N N N	

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#### Add Thresholds

łM	Protocol Configuration						
1	1						
	General Protocol Options						
	Name	Creat					
	Description	Creat					
	Site						
	Location						
	Enabled	Yes					
	Days to keep raw result data	5					
	Days to keep averaged points	5					
	Automatically Restart Protocol	Never					
	X-Axis Time Range - Value	15					
	X-Axis Time Range - Units	Minute(s)					
	Graph minimum value						
	Graph maximum value						
	Graph major unit						
	Graph Y-axis label						
	Filter*	Applied Filters: 2					
	Automatic result exclusion						
	Exclusion Low*	0.1 (Absolute Value)					
	Exclusion High*	5 (Standard Deviations)					
	Decimal Separator						
	Trigger Notifier Event on Removal of Result	- None -					
	Trigger Notifier Event on Series Restart	- None -					
Ð	Override General Appearance Settings	No					
	Override General Columns To Be Shown In Data Grid	No					
	Columns to be shown in data grid	MA Result Value, Fluid, Processed Result, Test Status, Specime					
Ð	Protocol Details						
	Series						
Ð	C1						
⊞	C2						
Ð	Warnings and Errors						
Cł	Changing items marked with ** will require a restart. Changing items marked with * will suggest a restart						

- Low threshold to remove any result with "<" or ">" symbol
- Thresholds don't need to be the same "unit"

#### **Delete Results**

. Movi	Moving Averages Desktop								
				Creat	(07/03/2018 11:17 - 07/03/2	018 11:32)			
Po	oint	Information						×	
С	rea	at						^	
Na Ru La	eri Ime: Innii Ist R OİR	<b>ES</b> C1 ng Mean: 1.55 estart: 07/03/2018 11:11			Running SD: 0 Status: Normal	.85			
Time: 07/03/2018 11:24					<b>Value:</b> 39.88				
Results					Export to Excel				
		MA Result Value	Fluid	Processed Result	Test Status	Specimen ID	Result Date/Time	Specimen Type	
	Ŵ	0.5	Serum	0.5	Released	B789823.01	07/03/2018 11:24	R	
	Ŵ	1.4	Serum	1.4	Released	B792525.01	07/03/2018 11:24	R	
		) 195.9	Serum	195.9	Released	B784850.03	07/03/2018 11:24	R	
	Ŵ	0.6	Serum	0.6	Released	B795395.01	07/03/2018 11:24	R	
	Ŵ	1	Serum	1	Released	B795556.01	07/03/2018 11:24	R	
					Close				
		N. N.	N. N.	N. N.	N. N.	N. N.	N. N.	V. V. V.	

#### Star indicates point was removed



#### Improved – recalculate Mean and SD?



# Try different settings



# **Other Features -**

• "Slider" reveals protocol information



Done

Moving Averages Desktop

Protocol Data

Protocol Name Last Restart

Target SD

Error High

Warning High Target Mean

Warning Low

Error Low

✓ Series

🗹 C1 🥪

🗹 C2 🥥

C

0.6

5.22

4.96

4.42

3.88

3.62

: 0

: 0

Potassium

# **Other Features**

- Shows assigned values
- Allows to turn a series off or on
- Show individual series stats
- Restart individual series
- Restart all series

Moving Averages Desktop	
Protocol Data	Potassiu
Protocol Name Potassium 6.58	
Last Restart 07/03/2018 9:54	
Target SD 0.6	
Error High 5.22	
Warning High 4.96	
Target Mean         4.42         5.22	
Warning Low 3.88 4.96	
Error Low 3.62	MI
Series	A man
	K.
<b>I C 2 ⊘ 3</b> .88	
3.62	
2.26	
- 0 ^{1,0}	

#### **Other Features**

	‡ ≡					
Select Date Rang						
Export Point Data						
Generate Report						

	Enter a new ra	nge		×
Ľ	Start Date		Start Time	~
	7/3/2018		1:47:55 PM	1
~	End Date		End Time	• 4
	7/3/2018		2:02:55 PM	
	Accept Ran	ge	Cancel	



# **Other Features**

- Generate Report
  - Creates a report (pdf)
  - Shows Chart that was displayed
  - Time range that of chart
  - Statistics by series
  - All results that made up chart points
  - Place for free text comments at end of report.



#### Protocol Information

 Last Restart
 07/03/2018 10:11

 Target SD
 0.8

 Error High
 5.4

 Warning High
 5

 Target Mean
 4.3

 Warning Low
 3.6

 Error Low
 3.2

Series Information

#### Summary

- Review results that make up "aberrant" data points.
- Adjust information in result grid to provide insights
- Thresholds used to set boundaries.
- Exclusion filters used to remove results based on specific criteria
- Multiple filters may be used.
- This is an iterative process.
- MA calculator
  - Honors thresholds and exclusion filters
  - Consider recalculating after thresholds and filters have been added.

# Questions?

Thank you for your time!

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