Lab Exercise 1.1 – Getting Connected

At the end of this lab exercise, Participants will be able to:

- Set the IP Address on both their Computer and DataMan Reader
- Connect to the DataMan reader

The Participant will utilize the following DataMan Functions to successfully complete this exercise:

- Setup Tool
- Connect to Reader

Set a Static IP Address on your computer.

Follow the steps below to complete the lab exercise:

1. Open the Network and Sharing Center.

Control Panel > All Control Panel Items > Network and Sharing Center

2. Select **Change adapter settings** from the right-hand menu.



The Network Connections display.



3. Select the Ethernet adapter.

NOTE: If you have a VPN connection make sure that you do not select that adapter.



4. Right click and select **Properties** from the list.



The Ethernet Properties display.

🖗 Ethernet Properties	\times									
Networking Authentication Sharing										
Connect using:										
Intel(R) Ethernet Connection (4) I219-LM										
Configure										
This connection uses the following items:										
Client for Microsoft Networks										
File and Printer Sharing for Microsoft Networks										
Gos Packet Scheduler										
✓ ↓ Intel(R) Technology Access Filter Driver										
✓ Internet Protocol Version 4 (TCP/IPv4)										
< >>										
Install Uninstall Properties										
Description										
Transmission Control Protocol/Internet Protocol. The default										
wide area network protocol that provides communication across diverse interconnected networks.										
OK Cancel										

5. Click the Internet Protocol Version 4 (TCP/IPv4) link and click the Properties button.



6. Click the **Use the following IP address** button and enter the information below and click the **OK** button.

Obtain an IP address automatically						
Ouse the following IP address:						
IP address:	192 . 168 . 1 . 200					
Subnet mask:	255 . 255 . 255 . 0					
Default gateway:						

7. Click the **Close** button to close the Ethernet Properties dialog box.

Launch the DataMan Setup Tool

Follow the steps below to complete the lab exercise:

 Click the DataMan icon on your desktop to launch the DataMan software. The DataMan Setup Tool launches showing all the readers on the network.

🎒 🎙 💻 🔛 O (🎯					Data	Man Setup Tool						- 6	83
Home View												Q & A	Help
Connect	ORefresh → Grouping Device Type	Filter Filter	×	📩 📩 🗌 Vi	ew Hidden (0)								
Maintenance	Name	Туре 🔺	Address	Firmware Version	Status	Open in Documents	Interface	MAC Address	MST Group				-
Repair & Support	4 DM260												
Backup	- 1 DM262-3CFFC4	DM260	10.11.80.35	5.7.0_cr11	Misconfigured		Network	00-D0-24-3C-FF-C4					
Restore	▲ CM360												
Update Firmware	- OM362-246ACC	DM360	10.11.80.7	5.7.0_sr2	Misconfigured		Network	00-D0-24-24-6A-CC					
Deader Course	• M363_PJC	DM360	10.11.80.48	5.7.0_sr2	Misconfigured		Network	00-D0-24-47-F8-78					
Reader Groups	4 💼 DM470												
Image Playback	M474-5828AC	DM470	10.11.80.50	6.1.1	Misconfigured		Network	00-D0-24-58-28-AC					
Options	4 💼 DM503												
About	SORTER 1 MASTER	DM503	10.11.80.65	5.6.3	Misconfigured		Network	00-D0-24-1F-F5-12	SORTER 1				
Exit	A DM8000Base												
	DM8000Base-138C14	DM8000Base	10.11.80.7	4.2.2_sr3	Misconfigured		Network	00-D0-24-13-8C-14					
	Lab_1_8500	DM8000Base	10.11.80.164	4.2.2_sr3	Misconfigured		Network	00-D0-24-1D-CE-1A					
	DM8000BaseBT												
	- M8000BaseBT	DM8000BaseBT			Discovered		HID						
	DM8000BaseBT-200570	DM8000BaseBT	10.11.80.43	5.4.3	Misconfigured		Network	00-D0-24-20-05-70					
	Lab_4_8600	DM8000BaseBT	10.11.80.16	5.4.3	Misconfigured		Network	00-D0-24-1F-94-08					
	4 TT DM8050												
	M8050-1C1ED2	DM8050	10.11.80.47	5.4.3	Misconfigured		Network	00-D0-24-1C-1E-D2					
	4 🛅 DM8500												
	DM8500-147340	DM8500	10.11.80.166	4.2.2_sr3	Misconfigured		Network	00-19-88-15-87-B6					-
										Compare Configurations	Process Monitor	Connect	

2. Select your DataMan Fixed Mount Reader from the list to highlight.

NOTE: This exercise uses the DM474 – notice that the Status is **Misconfigured**. This is because the reader is in DHCP mode and you have set a static IP Address on your laptop.

4 DM470						
M474-5828AC	DM470	10.11.80.50	6.1.1	Misconfigured	Network	00-D0-24-58-28-AC



3. Click the **Repair & Support** tab on the left-hand menu (with your Reader highlighted).

Connect	😋 Refresh 👻 🕂 Add Network Dev	rice 🕂 Add Virtual	Device 🗶 Rem	ove Virtual Device 🛛	Grouping Interfa	ce Type 🛛 👻 Filter	Filter	× 🛞	🎽 🛔 🗌 View Hidden (0)
Maintenance	Name	Туре	 Address 	Firmware Version	Status	Open in Documents	Interface	MAC Address	MST Group
Repair & Support	⊳ 🦰 Serial								
Backup	Network								
	- 100 DM262-3CFFC4	DM260	10.11.80.35	5.7.0_cr11	Misconfigured		Network	00-D0-24-3C-FF-C4	L
Restore	- 🎻 DM362-246ACC	DM360	10.11.80.7	5.7.0_sr2	Misconfigured		Network	00-D0-24-24-6A-CC	:
Update Firmware	- 🎻 DM363_РЈС	DM360	10.11.80.48	5.7.0_sr2	Misconfigured		Network	00-D0-24-47-F8-78	
Reader Groups	M474-5828AC	DM470	10.11.80.50	6.1.1	Misconfigured		Network	00-D0-24-58-28-AC	
Image Playback	SORTER 1 MASTER	DM503	10.11.80.65	5.6.3	Misconfigured		Network	00-D0-24-1F-F5-12	SORTER 1
Options	DM8000Base-138C14	DM8000Base	10.11.80.7	4.2.2 sr3	Misconfigured		Network	00-D0-24-13-8C-14	

The **Network Settings** display on the right-hand side of the screen.

4. Click the Use Static IP Address radio button and the Copy PC Network Settings

Copy PC Network Settings • button and select [Intel(R) Ethernet Connection (4) 1219-LM] from the drop-down list.

This auto-populates the IP Address, and Subnet Mask to match your computer's IP address.

Network Settings	
Use DHCP Server	s
IP Address	192.168.1.0
Subnet Mask	255.255.255.0
Default Gateway	· · · ·
Device name	DM474-5828AC Copy PC Network Settings 👻

5. Change the last # in the IP Address to *201* and click the **Apply** button.

Apply

The network settings are updating.

	Network Settings						
Sending updated network settings to DM474-5828AC. Completed							
Close							



6. Click the **Close** button. The IP Address has been assigned to the Reader and the Status is now **Discovered**.

		IP Address	192.168.1.201	ø		
		Subnet Mask Default Gateway	255.255.255.0	I IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		
M474-5828AC	DM470	192.168.1.201 6.1.1	Discovered	Ne	etwork 00-D0-24-58-28-AC	

7. Return to the Connect tab



8. With your Reader highlighted click the **Connect** button at the bottom of the screen.

Compare Configurations	Process Monitor	Connect
------------------------	-----------------	---------

You are now connected to the reader.

Connecting
Establishing connection to device
Retrieving parameters
Retrieving configuration
Connected

And, have entered the DataMan Setup Tool in the **Optimize Image** step.

🏭 🗲 💻 🔛 이 이 💩	DataMan Setup Tool - DM474-5828AC [192.168.1.201]	- @ %
Home Actions Settings System View		Q&A Help 🗸
DM474-5828AC (\$	d D × Image Panel	÷×
Optimize Image	🔑 🔎 🗇 أَمْ Reset ROI 🔤 - 😿 Quarter 🕞 IPEG 🕞 🐜 🔛 + Logging +	
Application Type Undefined Undefined		
Application Steps Train Code After Tuning Train Code After Tuning D Tuning Network Steps Steps Step		





Lab Exercise 2.1 – Optimize Image

At the end of this lab exercise, Participants will be able to:

- Optimize the reader settings using the Tune button
- Utilize the Test button

The Participant will utilize the following DataMan Functions to successfully complete this exercise:

- Tune button
- Test button

Tuning

Follow the steps below to complete the lab exercise:

1. Click the **Reset Configuration** button from the **System** Menu.

Home	Actions	Settings	System	View		
۲		۵ 📄		6	8	

The **Configuration reset** dialog box displays.

Configuratio	n will be reset.
	OK Cancel
Don't show this di	alog again

- 2. Click the **OK** button to continue.
- 3. Navigate to the **Optimize Image** step.



4. Click the **Live** button to enable Live Mode and place the Power Grid demo plate in the FOV.



- 5. Click the **Live** button to disable Live Mode.
- Press the **Tune** button on the top of the Reader for less than 1 second.
 NOTE: You have discovered a hidden feature Tapping the Tune button toggles the aimer lights. Press the Tune button until the aimer is ON.
- 7. Now press and hold the **Tune** button on top of the Reader for approximately 5 seconds until it initiates the tune sequence. You will notice the LEDs flash. **Note:** *The Reader will go through the following process:*
 - Optimize focus
 - Optimize brightness
 - Cycle exposure values
 - Plot points on the graph
 - o Dots above the horizontal line are good reads
 - More dots higher on the graph is the sign of a robust algorithm!
 - When completed it will display and automatically apply the optimum settings
- 8. Click the **Trigger** button to show that it can read the good code.
- 9. Click the **Test** button and cover all but one of the codes on the plate to show that the Power Grid algorithm can easily read all the damaged codes.
 - 1. Quiet Zone Violation
 - 2. Finder Pattern Damage
 - 3. Clocking Pattern Damage
 - 4. Damage All





10. Click the **Code Details** step and set the number of codes (Application Steps \rightarrow Code Details \rightarrow Number of Codes) to **5** hit the **<Enter>** key.

 How many codes do you need to read for each trigger?

 Number of Codes
 5

11. Set the number of Data Matrix codes to **5** and click the **Trigger** *f* button to read all the codes on the plate at the same time.

Sho OY	uld partial result be reported as a good-read?	
N	0	
Que	stion text	
	Data Matrix	5 🜩
þ	QR / Maxi / Aztec	1
	DotCode	1
þ	1D / Stacked / Postal	1 -

All 5 Data Matrix codes are read:



Advanced Tuning Settings:

1. Click the **Reset Configuration** button from the System menu.



The Configuration reset dialog box displays.

Configuration	n will be reset.	
Don't show this dia	OK Cancel	

Click the OK button to close the dialog box.
 Notice that the Tune Code After Tuning checkbox is checked by default.

Basic	Advanced
🗷 Trair	n Code After Tuning
	Live -
	+

NOTE: This feature trains on code properties such as:

- Symbology Type
- Pixels per Module
- 1D Orientation
- 2D Grid Size

Codes with properties that differ from the trained properties may not read



3. Tune the reader on the Ace of Hearts. Do this by clicking the **Tune** button.



4. Turn the card 90° and click the **Trigger** button. Notice that the code did not read because it is trained on a specific orientation.





5. Click the **Code Details** step and notice that other symbologies are greyed out because the reader is trained on Code 128.



- 6. Turn the card back to its original orientation.
- 7. Move the card close to and further away from the reader while triggering. **NOTE**: At some point the reader will not read the code because the ppm will be larger than the trained properties.
- 8. Click the **Disable Untrained Symbologies** checkbox to uncheck the box. All codes are now active.

Basic Advanced				•			
Disable Untrained Symbolog	Disable Untrained Symbologies						
Which symbologies do yo	u need to read?						
Disable All Symbologies Ena	able All Symbologies 📫	📩 💻 Automatic Syml	oology Detection				
⊿	nbologies: 1)						
Data Matrix	QR Code MaxiCode Code Code						
4 🔳 1D (Enabled sym	1bologies: 6)						
Code 128	Code 25	ie 93	Codabar	Interleaved 2			
	MSI						

Can you read a Data Matrix code now?



9. Click the Automatic Symbology Detection button.

Basic	Advanced						
🗌 Disa	ble Untrained Sy	mbologies					
Which	Which symbologies do you need to read?						
Disable	e All Symbologi	es Enable All Symbologies 🛔 🛔 📮 Automatic Symbology Detection					

The Found Symbologies dialog displays.

Hold your code in front of the camera to auto recognize the symbology!					
- Found Symbologies					
Data Matrix					
Select All					
	OK Cancel				

 Hold the Ace of Clubs, Ace of Hearts and Queen of Hearts in front of the reader to auto recognize the symbology on each card. The reader recognizes the symbology on each card and adds them to the Found Symbologies list.

	Hold your code in front of the camera to auto recognize the symbology!
	Found Symbologies
	Select All
	OK Cancel
11. Click the OK	button.



The Warning box displays.

Warning		\times
	The following symbologies will be enabled, and ALL others will be disabled. Continue?	
	Data Matrix Code 39 Code 128	
	Yes No	

12. Click the **Yes** button to continue. The three **Found Symbologies** are now selected

⊿ ■ 2D (Enabled sy	/mbologies: 1) —						
Data Matrix	回 QR Code	MaxiCode					
		* @ :	J				
▲ ■ 1D (Enabled sy	/mbologies: 2)						
Code 128	Code 25	Code 93	Code 39	Codabar	Interleaved 2	UPC/EAN	MSI
						o 000152 450752	
▲ □ Stacked (Enable)	led symbologies:	: 0)					
PDF417							

13. Click the **Untrain Code** button.



Can you read a 1D code in any orientation now?___



Lab Exercise 2.2 – Code Details

At the end of this lab exercise, Participants will be able to:

- Filter specific barcodes by symbology type and string length
- Utilize extended mode for challenging codes
- Read 2 codes within the FOV within the same trigger cycle

The Participant will utilize the following DataMan Functions to successfully complete this exercise:

- Setup Tool
- DataMan Application Steps
 - o Code Details

Follow the steps below to complete the lab exercise:

- 1. Connect your DataMan reader to the DataMan Setup Tool.
- 2. Click the Reset Configuration button from the System Menu.

Home	Actions	Settings	System	View			
		۵ 🗎	Ľ		6	8	

The **Configuration reset** dialog box displays.

Configuration will be reset.	
OK Cancel	
Don't show this dialog again	

- 3. Click the **OK** button to continue.
- 4. Navigate to the **Application Details** step and set the **Trigger Type** to *Single* (*external*).

Basic	Advanced	
Trigge	er Settings	
Trigge	er Type	Single (external) Trigger Assistant



5. Navigate to the **Optimize Image** step and click the down arrow on the **Tune** button to *Optimize Brightness* and *Optimize Focus* using the Ace of Hearts.

0	Tune 🗸		
	☑ Tune Light Banks ☑ Enable Filter Tuning □ Exclude Ambient Light R	 Force Exhaustive Tuning Optimize Focus During Tuning sults 	
۲	Optimize Brightness	Advanced Application De	<u>tails</u>
	 Automatic Exposure Manual Exposure Maximum Exposure (µs) Maximum Gain Factor 		200000
	Optimize Focus	Advanced Application De	<u>tails</u>

6. Navigate to the **Code Details** step – check the *Code 128* checkbox.



7. Click the **Trigger** *b*utton to read the Ace of Hearts. Leave the code enabled.





8. Navigate to the Settings Menu, click the down arrow of the Symbology Settings and select *Code 128.*

Home Act	ions	Setting	gs Syste	em V	iew				
۲		*	ଙ୍ଚ	ৰ্লি	Ø	*	\mathbf{P}	<u></u>	
Back Forwar	d Op In	otimize nage	Test Mode Settings	Read Setups	Application Details	Symbology Settings	Data Validation	Code Quality	Data Formatting
History		*	,			2D Symbol	ogies		is
						Data	Matrix		
						QRO	Code		
						1 D Symbol	ogies		4
						1D S	ymbology Pr	operties	
						Code	128		
						UPC/	EAN		

The Code 128 Properties display.

Code 128 Properties			
Application Type Undefined	Code Size	;;;	+) 3
Application Steps		1 8	30
🖄 Optimize Image	Code Size Max		
		1 8	30

9. Uncheck the Any checkbox and set the Code Size Max to 9.

Code Size —		
Code Size Min		
	1	80
Code Size Max	⊖ —	-+ 9
	1	80

NOTE: The reader will not read any codes with a data string length that is greater than 9 characters.

10. Read the *Ace of Hearts* (ACEHEARTS = 9 characters) and the *King of Hearts* (KINGHEARTS = 10 characters).



Confirm that the Ace of Hearts = READ and the King of Hearts = NO READ.



11. Change the **Code Size Max** to *10* and confirm the King of Hearts can now be read.



12. Navigate to the Code Details step – check the Data Matrix checkbox.





- 13. Place the *Data Matrix* code and the *Ace of Hearts* in the FOV.
- 14. Click the **Advanced** tab and set the following:
 - Number of Codes = 2
 - Data Matrix Max Number of Codes = 1
 - 1D / Stacked / Postal Max Number of Codes = 1

Bas	ic Advanced		Ŧ
	📋 📁 Non-Default Values 🔹 🗐 🛔	≟	
		DM474-5828AC	^
		Global Settings / Setup 0 🛃	
⊿ G	eneral		
1	2D		
Þ	1D		
⊿ M	lulticode		
1	Number of Codes	2	
1	Allow Partial Results		
4	Data Matrix		
	Max. Number of Codes	1	
Þ	QR Code / MaxiCode / Aztec Code		
1	DotCode		
4	1D / Stacked / Postal		
	Max. Number of Codes	1	
	Allow Identical 1D Symbols		
4	Sorting Priority	Symbology, Image Order, Position (Top to Bottom), Position (Left to Right)	

15. Click the **Trigger** ^了 button. Both codes are read.

eood Code	
ACEHEARTS Code 128, 5.37 FPM	CEHEARTS CEHEARTS CEHEARTS CEHEARTS Read CEHEARTS Read Read



16. Try to read only the *Ace of Hearts* or the *Data Matrix* code. Are you able to read only one code?

The reader is configured to multicode reading go to Code Details and set Number of Codes t	without partial results. Single codes may no to 1 or allow partial results.	ot read. To resolve this
REFERENCE CODE		
A	Result History Clear III 📄 🕋 III Result	· ♥ · ♥× Instance Logging ·
		No read

17. Check the **Allow Partial Results** checkbox and click the **Trigger** button to read the *Ace of Hearts*.

4 Multicode	
Number of Codes	2
Allow Partial Results	
🖉 Data Matrix	

The reader will read the Ace of Hearts.

FERENCE CODE		
ά μ	Result History	
ACEHEARTS Y	🗙 Clear 💷 📄 🖀) 🔟 🔻 🍟 🕶 🛋 🔤 Logging 👻
Lode 120, 5.36 PPM	Result	Result Status
	III ACEHEARTS	Read
		🛑 No read



Lab Exercise 3.1 – Application Details

- At the end of this lab exercise, Participants will be able to:
 - Determine which Trigger Mode to use to get the best read result

The Participant will utilize the following DataMan Functions to successfully complete this exercise

• Trigger Modes

Trigger Modes

Follow the steps below to complete the lab exercise:

- Place the Ace of Hearts card in the field of view.
 NOTE: If you do not have a DataMan deck of cards, use the images printed in the Resources section of the training manual.
- 2. Click the down arrow on the **Tune** button to open the Tune menu.

0	Tunc -	
	 ☑ Tune Light Banks ☑ Enable Filter Tuning ☑ Exclude Ambient Light Res 	 Force Exhaustive Tuning Optimize Focus During Tuning ults
*	Optimize Brightness	Advanced Application Details
	O Automatic Exposure Manual Exposure Maximum Exposure (μs) 15 Maximum Gain Factor)
٢	Optimize Focus	Advanced Application Details
[IIII]	Train Code	Advanced Code Details
	Trigger Type	Single (external)
	Timeout [ms] <u>Advanced Application Details</u>	2000 🜩

3. Click on **Optimize Brightness** and **Optimize Focus** from the Tune menu.

The Ace of Hearts displays in the Field of View (FOV).



Click the Application Details step.
 The Basic Application Details display.

DM474-5828AC 🔕		
Application Details		
Application Type Undefined	Basic Advanced	
Application Steps	Trigger Type Select Trigger Input Trigger Assistant	
Optimize Image	Delay Type None 💌	
•	Timeout [ms] 2000 🚖	
Code Details	- Exposure O Automatic Exposure	1
Application Details	Manual Exposure Exposure Assistant	
+	Exposure (μs) 27859 15 200000	
Format Data	Gain Factor	1
•		
Inputs / Outputs	- Махітиш Exposure (µs) 200000)
Communications	Maximum Gain Factor)
Save Settings		



Single (external) Trigger Type

- 1. Set the **Trigger Type** to *Single (external)*.
- 2. Click the **Trigger** button and notice that it only acquires one image per trigger.
- 3. Set the **Delay Type** to *Time* and set the **Start Delay Time (ms)** to *1000ms*.

Trigger Settings	
Trigger Type	Single (external) Select Trigger Assistant
Delay Type	Time 💌
Start Delay Time (ms)	1000 📥
Timeout [ms]	2000 🛨

- 4. Click the **Trigger** button and notice that it now has a delay of 1 second before acquiring the image.
- 5. Set the Start Delay Time (ms) back to 0.

Continuous (external) Trigger Type

- 1. Set the **Trigger Type** to *Continuous (external)*.
- 2. Remove the card from the FOV.
- 3. Hold down the trigger button and move a code through the FOV. Notice that once the reader reads the code, the string is output, and the trigger cycle ends.
- 4. Set the **Interval Time** to 100,000µs. Notice how much faster the reader acquires between images.
- 5. Set the **Interval Time** to 0μ s. Notice that the reader updates to the max frame rate of the reader.
- 6. With this interval, trigger the reader and attempt to read the code. If the code is
- o. not read it is because the decode time is longer than the entered μ s.
- 7. Change the **Interval Time** back to $100,000\mu$ s and note the reader reads the code.

Burst (external) Trigger Type

- 1. Set the **Trigger Type** to *Burst (external)*.
- 2. Remove the code from the FOV.
- 3. Set the Interval time to 1,000,000 µs.
- 4. Trigger the reader and notice it acquires 2 burst images with the default settings. NOTE: All images in a burst sequence can be viewed in the Results Display menu by enabling Transfer All Images from the Advanced tab of the Optimize Image application step. Optimize Image → Display Image Settings → Image Transfer Settings → Transfer All Images.



COGNEX

- 5. Return to the **Application Details** step, and set the Burst Length to 9, and the Interval time to $500,000 \ \mu s$.
- Click the trigger button and pass the card through the FOV.
 NOTE: The images in a burst sequence can be viewed in the Results History window by expanding the + sign.

Manual (button) Trigger Type

- 1. Set the **Trigger Type** to *Manual (button)*.
- 2. Hold down the trigger button until it reads the Ace of Hearts code.
- Click the **Optimize Image** step and click the **Automatic Exposure** radio button in the Tune menu.



4. Remove the card from the FOV and move your hand closer to and further away from the light while holding the trigger – notice the auto exposure taking place.

Presentation (internal) Trigger Type

- 1. Return to the Application Details step.
- 2. Set the **Trigger Type** to *Presentation (internal)*.
- 3. Place the card in the FOV notice that it reads continuously.

Self (internal) Trigger Type

- 1. Set the Trigger Type to Self (internal).
- 2. Set the Interval time to $40,000 \ \mu s$.
- 3. In the Image Panel, click the **Enable/disable image transfer** button to disable the image transfer.



4. On the **Code Details** Application Step, uncheck the Data Matrix check-box to disable the symbology. The reader is now reading even faster!



Bonus:

Never Read Same Code Twice

Perform with your Reader still in Self (internal) trigger mode with your card in the FOV.

Decode Settings	
Never Read Same Code Twice	
Don't Reread Last N Codes	0
Delay Mode After First Read After Last Read	
Code Re-Read Delay [ms]	
0	60000

Enable the Never Read Same Code Twice box

- $\sqrt{1}$ Try to read the same code twice and notice that it will not do so unless another code is read in between (Read the Ace of Hearts and then the King of Hearts)
- $\sqrt{-}$ Place another card in the FOV and notice the read
- $\sqrt{}$ Place the Ace of Hearts back and notice that it will read it again.

Disable the Never Read Same Code Twice box

- $\sqrt{}$ Change the Delay Mode to After First Read
- $\sqrt{}$ Set the Re-Read Delay to 1000 ms
- $\sqrt{}$ Leave the code in the FOV and notice that the reader outputs every 1 second
- $\sqrt{}$ Change the Delay Mode to After Last Read
- $\sqrt{}$ Leave the code in the FOV and notice that it will only output once
- $\sqrt{1}$ The code must be removed from the FOV for 1 second before it will output again







Lab Exercise 4.1 – Data Validation

At the end of this lab exercise, Participants will be able to:

- Utilize the Data Validation functionality
- Calculate the mil size of a barcode and the maximum FOV for that code size
- Explore the Process Control Metrics available in the Setup Tool

The Participant will utilize the following DataMan Functions to successfully complete this exercise:

- Setup Tool
- DataMan Validation
- Process Control Metrics

Data Validation – Match String Validation

Follow the steps below to complete the lab exercise:

- 1. Connect your DataMan reader to the DataMan Setup Tool.
- 2. Click the **Reset Configuration** button from the **System** Menu.

Home	Action	s Set	tings	System	View			
		(i)				<u>ئ</u>	8	li Reset Configuration ▼

The **Configuration reset** dialog box displays.



- 3. Click the **OK** button to continue.
- 4. Navigate to the **Optimize Image** step and click the down arrow on the **Tune** button to *Optimize Brightness* and *Optimize Focus* using the Ace of Hearts.
- 5. Click the **Trigger** button to ensure you can read the Ace of Hearts.
- 6. Navigate to the **Settings** Menu and select **Data Validation**.

Home	Action	s Settin	gs Syste	em V	iew											
Back	Forward	Optimize Image	Test Mode Settings	Read Setups	Application Details	Symbology Settings	Data Validation	Code Quality	Data Formatting	Buffering and Transfer	Communication Settings	System Settings	Master/Slave	Table View	Setup 0	•



The **Data Validation** page displays.

Data Validation	
Application Type	Data Matrix QR Code / MaxiCode / Aztec Code 1D / Stacked / Postal
Undefined 💌	None
Application Steps	ISO Validation GS1 Validation
🖄 Optimize Image	Match String Validation
•	Pattern-Matching Validation
Code Details	- Validation Failure Action
	Transmit annotated decoded string
+	Append CR/LF

7. On the **1D/Stacked/Postal** tab select *Match String Validation*.

NOTE: Match String Validation enables you to specify an exact string to match against the string encoded by the symbol. Only symbols containing a string that matches the specified string will generate a Pass result. The Match String field displays.

8. Enter **ACEHEARTS** in the Match String field.

Match String	ACEHEARTS	

9. Click the **Trigger** button and review the results. **NOTE**: *Click the* **Plus sign** to expand the results.

-		_	
	FERENCE CO		Result History I Clear Ⅲ P III V III IIII III IIII III III IIII IIII IIIII III IIII IIII IIII IIII IIIII IIII
			Result Result Status
			🖃 🎹 ACEHEARTS 😡 Valid
	ACEHEARTS Code 128, 5.37 PPM		🗄 😥 Validation Type: Match String
			Match String: ACEHEARTS

10. Enter **ACECLUBS** in the Match String field.



DataMan Standard

11. Click the **Trigger** 5 button and review the results.



- 12. Change the card in the FOV to the King of Hearts.
- 13. Click the **Trigger** *button* and review the results.

 K				
۷				
WHITE	AMAG		Result History	
IAGE	EWH		🗙 Clear 🕕 📄 🕋 🞹 👻 🛶 📼 Log	gging 👻
DAN	TE		Result Result Status	
			🗈 🎹 KINGHEARTS 🔗 Invalid	
	V		🗄 🥵 Validation Failure: No match	
<inval< th=""><th>id position="0" error_code</th><th></th><th> Error Position: 0</th><th></th></inval<>	id position="0" error_code		Error Position: 0	
Code	128, 5.37 PHM		Error Code: 127	

- 14. Change the card in the FOV back to the Ace of Hearts.
- 15. Enter aCEHEARTS in the Match String field.

Match String	aCEHEARTS

16. Click the **Trigger 5** button and review the results.

Is it valid?



NOTE: *aCEHEARTS* is not a valid match. The Match String field is case sensitive.

Data Validation - Pattern-Matching Validation

- 17. On the 1D/Stacked/Postal tab select Pattern-Matching Validation.
 NOTE: Pattern-Matching Validation enables a user to input a specific string of characters to confirm if they are present in the data string.
 The Pattern field displays.
- 18. Enter HEARTS in the pattern field.



19. Click the **Trigger** button and review the results.





- 20. Change the card in the FOV to the *King of Hearts*.
- 21. Click the **Trigger** *button* and review the results.

	K S	DAMA					
Ang agained of Long Call and Filled with a Stable	SE <	SE V		Result History			
	AMA	VHITE		🗙 Clear 🕕	D 🛛 🔟	• 🖞 • 🔹 🛛	Logging 🔻
				Result		Result Status	
			1	⊡ <mark>Ⅲ KINGH</mark>	EARTS	😥 Valid	
	KING	IEARTS X		🗄 😥 Vali	dation Type:	Pattern-Matching	
	Code 1	14 538 FFM		Mato	h Pattern: HE	ARTS	

NOTE: Both codes are valid because HEARTS is a subset of the string contained in both strings.

- 22. Change the card in the FOV to the 4 of Diamonds.
- 23. Click the **Trigger** 5 button and review the results.



NOTE: The code fails because the pattern (Diamonds) does not match the pattern we were searching for (Hearts).



Read Setups

Follow the steps below to complete the lab exercise:

- 1. Connect your DataMan reader to the DataMan Setup Tool.
- 2. Click the **Reset Configuration** button from the **System** Menu.

Home	Actions	s Sett	ings	System	View			
		(i)		Ľ		6	8	lo Reset Configuration ▼

The **Configuration reset** dialog box displays.

Configuration will be reset.
OK Cancel
Don't show this dialog again

- 3. Click the **OK** button to continue.
- 4. Navigate to the **Application Details** step and set the Trigger Type to *Single* (*external*).
- 5. Navigate to the **Optimize Image** step and click the down arrow on the **Tune** button to *Optimize Brightness* and *Optimize Focus* using the Ace of Hearts.
- 6. Click the **Trigger** button to ensure you can read the Ace of Hearts.
- 7. Navigate to the **Settings** Menu and select **Read Setups**.

Hom	e Action	s Settin	gs Syst	tem V	iew										
	۲	2	ଙ୍ଚ	র্লি		*	P	0		_	10101	٢			
Back	Forward	Optimize Image	Test Mode Settings	Read Setups	Application Details	Symbology Settings	Data Validation	Code Quality	Data Formatting	Buffering and Transfer	Communication Settings	System Settings	Table View	Setup 0	-

8. Click the **Add Setup** button to add a second read setup.

🎬 🗲 💻 📔 ට් C 👌 🛛 Pane Tools										DataMan Setup Tool	DM474-5828AC[192.16	58.1.201]	
Home Actio	Add Setup	ngs S Selete C Setup (bystem	View Setu Last S	Read Setups p 0 v Successful Decode	Copy	aste Reset Values	Non-Default Values Difference to Reference Filter	Expand Highlighted Rows Only	Set Reference Read Setup	 Read Setup Settings Global Settings All Settings 	Expand Collapse	Reset Layout



The Add Setup dialog displays.

NOTE: You have the option to use the default values or copy values from the current setup.

Add S	Setup
Initialize New Setup	
Copy values from setup	Setup 0 💌
Name	Setup 1
	OK Cancel

- 9. Select the **Copy Values from setup** and click the **OK** button.
- 10. Change the **Name** of the setups click into the **Setup0** field and rename to *1D* and click into the **Setup1** field and rename to *2D*.

			DM474-5828AC						
		Setup 0	運	Setup 1					
⊿ Read Setup				·					
	Name	1D		2D]				
	Enabled								

11. Return to the **Settings** tab and select *2D* from the **Active Read Setup** drop-down list.

Home	Action	s Settin	gs Syste	em Vi	ew Read	Setups								
		1	@	িল		~			<u></u>	<u> </u>	10101	Ö		
\odot	0				4.4	1		e				-	-	10
Back	Forward	Optimize	Test Mode	Read	Application	Symbology	Data	Code	Data Formatting	Buffering and	Communication	System	Table	
		Image	Settings	Setups	Details	Settings	Validation	Quality	_	I ranster	Settings	Settings	View	ID
		*				*			*		*	•		2D
His	story							Panes						Active Read Cotup

Hold the Data Matrix code about 3 – 4 inches from the lens of the reader and click the Trigger [✓] button.



The reader does not read the code – it is too close to the lens.



13. While in the 2D Active Setup, with the Data Matrix code 3 - 4 inches in front of the reader Tune the code.

NOTE: The settings required to read the code at this distance will automatically be applied to the setup.



14. When it is done, click the Last Successful Decode radio button as the Starting Setup.



Trigger the reader to confirm that the reader can now read both the 1D code at desk level and the 2D code close to the lens.
 NOTE: When you trigger the reader, if it can get a read, it does. If No Read, (you switched codes) it will trigger again utilizing the second setup.



16. Navigate to the **Application Details** step and change the **Trigger Type** to *Self* (*internal*).



17. Set the **Interval** (μ s) field to 500,000 μ s.

Interval (µs) 500000 🖨 µs 🔹 Interval Ass	stant
--	-------

The reader will now cycle through both reads continually.

Calculate Mil Size - *If time allows*

Follow the steps below to complete the lab exercise:

- 1. Connect your DataMan reader to the DataMan Setup Tool.
- 2. Adjust the mounting of the reader so that the horizontal FOV is the exact width of this paper.
- 3. Click the **Live** button to place the reader into Live View, move the reader until the barcode below is in the center of the FOV.
- 4. Navigate to the **Code Details** step and confirm the **1D** symbologies are enabled.



5. Return to the **Optimize Image** step and click the **Trigger** button to read the barcode below.





6. Navigate to the **Code Details** step and confirm the **1D** symbologies are enabled.



- 7. Note the PPM value reported in the results display.Note: This is the number of pixels in the minimum module.
- 8. Calculate the mil size of the bar code.
 - a. Pixel Width = 8.5 (in) / Horizontal Pixels
 - b. Mil Size = Pixel Width *PPM value = pixels per narrow bar* 1000
 - a. 8.5 (in) / 1280 pixels = .00664 *3.15 ppm = 0.0209* 1000 = 21mil
 - Note: Recommended Minimum mil sizes per code:
 - 1D Linear 1.1 PPM
 - 2D Printed 2.5 PPM
 - 2D Direct Part Mark 4 PPM
- 9. Calculate the Maximum FOV with the 21 mil code for the DataMan 262.
 - a. ((Mil Size / 1000) / minimum recommended PPM) * Reader Pixels
 - b. ((21 / 1000) / 1.0) * 1280 = **26.88 in Max FOV**


Lab Exercise 4.2 – Format Data

At the end of this lab exercise, Participants will be able to:

• Format the output data and No Read strings using a DataMan 8600 USB handheld

The Participant will utilize the following DataMan Functions to successfully complete this exercise:

Setup Tool

Follow the steps below to complete the lab exercise:

- 1. Connect your DataMan handheld reader to the DataMan Setup Tool.
- 2. Open a blank Excel spreadsheet on your computer and highlight a cell.
- 3. Using your handheld reader, scan the Ace of Hearts barcode. Was anything entered in the highlighted cell?

A1	L	- :	× ✓	f _x	
	А	В	С	D	E
1					
2					
3					

NOTE: The answer is No, if your reader is in USB Com mode. It may need to be converted to USB Keyboard mode. When in USB Keyboard mode, the reader will emulate a keyboard input, typing the decoded data string wherever the curser is located on the screen.

4. Scan the USB Keyboard code below.



NOTE: The code above is used for corded readers only. If you are communicating through a Base Station via USB, there is a separate code to Enable the USB Keyboard for the base station shown below.





COGNEX

5. Now, highlight a cell in the Excel spreadsheet and scan the Ace of Hearts several times.

Was anything entered in the cells this time?



NOTE: The answer is Yes. The cells between scans are skipped because the default data formatting includes both a <*CR*> and <*LF*> at the end of the string which Excel interprets as 2 <*Return*> commands.

What if we do not want the extra space? If your reader is in USB Keyboard it will need to be converted to USB-COM mode.

6. In the **Repair & Support** tab of the DataMan Setup Tool, select the DM8600 reader and click the **Convert to USB-COM** button, or, you can scan the USB-COM code below.



7. When your reader is back in USB-COM mode, you can select it from the Connect window and click the **Connect** button.



8. Navigate to the **Format Data** application step and check the **Universal Standard** box under Basic Formatting



9. Click on the **Standard** hyperlink. The **Universal** menu displays.

Data Matrix	QR Code / MaxiCode / Aztec Code	DotCode	1D / Stacked	/ Postal	Universal	•
Leading Text						
]	
- Data						
General V	alidation Quality					-
<sub-string></sub-string>						^
<full string=""></full>	ve [me]					
<trigger td="" time<=""><td>></td><td></td><td></td><th></th><th></th><td></td></trigger>	>					
<symbology:< td=""><td>`</td><td></td><td></td><th></th><th></th><td>~</td></symbology:<>	`					~
	Set Sub-	String Range				
	Add		Remove			
<full string=""></full>						
	xt					
CR/L	F					

- 10. Type \r in the Terminating Text field.
 NOTE: The \r translates only to <CR>.
- 11. Save the settings to the reader by clicking the **Save Settings** button in the Application Steps.



12. The Configuration dialog box displays. Click the **OK** button to continue.





13. Click the Round **X** ⁽²⁾ on the DM8600 pane to disconnect the reader.

DM8600-1C784	$\triangleleft \triangleright \times$
Format Data	

- 14. Scan the USB Keyboard code in Step #4.
- 15. Place your curser in a cell in the Excel spreadsheet and scan the Ace of Hearts bar code a few times.

Notice that it is no longer skipping a cell.

10	ACEHEARTS	
11	ACEHEARTS	
12	ACEHEARTS	
13	ACEHEARTS	

16. Trigger the reader without reading a barcode to generate a No Read and notice the output sequence.

It is skipping a cell again.

13	ACEHEARTS	
14	ACEHEARTS	
15		
16		
47		

NOTE: This is because the data formatting applies to a No Read also because we created it in the Universal tab. So, the reader is sending a blank string + < CR >.

What if we don't want to skip a cell during a No Read?

17. In the **Repair & Support** tab of the DataMan Setup Tool, select the DM8600 reader and click the **Convert to USB-COM** button, or, you can scan the USB-COM code below.



18. When your reader is back in USB-COM mode, you can select it from the Connect window and click the **Connect** button.



COGNEX

19. Navigate to the **Format Data** application step and uncheck the Universal Standard box and check the **1D** / **Stacked** / **Postal** box under Basic Formatting

1 1

				, f	Format Data			
Basic	Standard	Perl Style	Scripting					•
۲	Basic Formatting	J						
	Universal		Star	andard	Perl Style			
	Data Matrix		Sta	andard	Perl Style			
	1D / Stacked / Po	ostal	🔽 <u>St</u>	andard	Perl Style			
	QR Code / Maxi	Code / Aztec Co	ode 🔲 <u>St</u>	andard	Perl Style			
	DotCode		Sta	andard	Perl Style			

20. Click on the Standard hyperlink.The 1D / Stacked / Postal menu displays.

Data Matrix	QR Code / MaxiCode / Aztec Code	DotCode	1D / Stacked / Postal	Universal 🔹					
Leading Text	Leading Text								
	Start_								
Data									
General	alidation Quality			-					
<sub-string></sub-string>				^					
<decode i="" in<="" td=""><td>ne [ms]></td><td></td><th></th><td></td></decode>	ne [ms]>								
<trigger time<br=""><symbology:< td=""><td>></td><td></td><th></th><td>~ </td></symbology:<></trigger>	>			~					
	Set Sub-	String Range							
	Add Remove								
<full string=""></full>									
- Terminating Te	ext								
_End\r	_End\r								
CR/L	F								

- 21. Select **<Full string>** under the Data General tab and click the **Add** button.
- 22. Type *Start*_ in the Leading Text field and _*End\r* in the Terminating Text field.

23. Save the settings to the reader by clicking the **Save Settings** button in the Application Steps.



24. The Configuration dialog box displays. Click the **OK** button to continue.



25. Click the Round **X** ⁽²⁾ on the DM8600 pane to disconnect the reader.



- 26. Scan the USB Keyboard code in Step #4.
- 27. Place your curser in a cell in the Excel spreadsheet and scan the Ace of Hearts bar code a few times and also create some No Reads.

16	Start_ACEHEARTS_End						
17	Start_ACEHEARTS_End						
18	Start_ACEHEARTS_End						
19	Start_ACEHEARTS_End						
20							
21							

Notice the new data formatting and that it is no longer skipping a cell for No Reads. But, what if we want to define a specific No Read string?

- 28. Connect to the reader using the process in step #6.
- 29. Define a No Read string
- Navigate to the Inputs / Outputs application step, click the Advanced tab, open the No Read Output String menu and enter NoRead\r in the No Read Output String field.



Basic	Advanced			•
88	Don-Def	fault Values	- E 🛔 🛔	



				DM8600-1C7844		^
			Global Settings / Setu 🕍	Setup 1	Setup 2	
4	Sys	stem Settings				
	De	vice Name	DM8600-1C7844			
	⊳ I	Beeper				
	⊿ (Dutputs				
		No Read Output String		-		
		No Read Output String	NoRead∖r			
		No Read Action		•		

31. Save the settings to the reader by clicking the **Save Settings** button in the Application Steps.



32. The Configuration dialog box displays. Click the **OK** button to continue.



33. Click the Round **X** ⁽²⁾ on the DM8600 pane to disconnect the reader.

DM8600-1C784 🔇	$\triangleleft \triangleright \times$
Format Data	

- 34. Scan the USB Keyboard code in Step #4.
- 35. Place your curser in a cell in the Excel spreadsheet and scan the Ace of Hearts bar code a few times and also create some No Reads.

25	Start_ACEHEARTS_End					
26	Start_ACE	HEARTS_E	nd			
27	Start_ACE	HEARTS_E	nd			
28	NoRead					
29	NoRead					
30	NoRead					
31	Start_ACEHEARTS_End					
32	Start_ACEHEARTS_End					



Scripting Lab #1

Multi Code Reading Demo

The *challenge* is to read codes that are close together on a box, making sure there are no double reads and all the codes are output in one string.

The solution is a script that allows the user to read 3 codes but holds the output until all 3 codes have been read. Then it outputs all 3 codes at once. If the same code reads twice the script will cause a data validation failure action and the user can continue scanning until 3 unique codes are read.

The Never read the same code twice functionality in the Setup tool only applies to multicode reading within a single trigger. To ensure the same code is not read on separate triggers a script is needed.

Scan Configuration Codes:

Here is an example to simulate scanning a box:

Reset to Factory Defaults:





Sample Codes:





```
// Read 3 codes but hold the output until the last code is read
var storedResults = [];
function onResult (decodeResults, readerProperties, output)
{
    if (decodeResults[0].decoded)
    ł
        if (storedResults.indexOf(decodeResults[0].content) == -1)
        {
            // if decoded then add to storedResults
            storedResults.push(decodeResults[0].content);
        }
        else
        {
            // if the same code is scanned twice the reader will error
            output.events.system = Event.system.validationFailure;
        }
    }
    // if there are three storedResults
    if (storedResults.length >= 3)
    Ł
        // output all three
        output.content = storedResults.join(",");
        storedResults = [];
    }
    else
    {
        // output nothing if there are not 3 codes
        output.content = ""
    ł
}
```





Lab Exercise 5.1 – Inputs / Outputs

At the end of this lab exercise, Participants will be able to:

- Disable the TRIG Button and TUNE Button on the reader
- Disable the beeper on a good read

The Participant will utilize the following DataMan Functions to successfully complete this exercise:

- TRIG Button tab
- TUNE Button tab
- Outputs tab

Inputs and Outputs

Follow the steps below to complete the lab exercise:

- 1. Connect your DataMan reader to the DataMan Setup Tool via Ethernet.
- 2. Click the **Reset Configuration** button from the **System** Menu.

Home	Actions	Settings	System	View		
		۵ 📄			8	Reset Configuration

3. The **Configuration reset** dialog box displays. Click the **OK** button to continue.



4. Click the **Tune** button on the **Optimize Image** application step to Tune the reader on the Ace of Hearts.





- 4. Click the **Tune** button on the **Optimize Image** application step to Tune the reader on the Ace of Hearts.
- 5. Navigate to the **Inputs/Outputs** application step.



The Inputs/Outputs page displays.

Basic Advar	nced								-
Device Name Device Description									
DM474-5828AC									
TRIG Button	TUNE Button	Inputs	Outputs	Output Delay	Pulse Encoder	Buffering and	<u>Fransfer</u>		-
		0		1		2		3	

6. Click the **TRIG Button** tab.

The TRIG Button controls display.

TRIG Button	TUNE Button	Inputs	Outputs	Output Delay	Pulse Encoder					
- 3 second buttor	3 second button press action									
🗹 Optimize B	Optimize Brightness									
🔲 Optimize F	Optimize Focus									
Read Conf	iguration Code									
🗷 Train Code	3									
Set Match	String									
Test Mode	Test Mode									
🗷 Disable Re	ader Button									

- 7. Check the **Disable Reader Button** checkbox as shown above.
- 8. Next, click the **TUNE Button** tab.



- 9. Check the **Disable Reader Button** checkbox as shown above.
- 10. Click the **TUNE** button on your reader.



- 11. Click the **TRIG** Button on your reader. Did anything happen?
- 12. Trigger your reader multiple times to get both good and bad reads on the Ace of Hearts. Notice the beeping sound on the good reads.
- 13. Click the **Outputs** tab.

TRIG Button	TUNE Button	Inputs	Outputs	Output Delay	Pulse Encoder	<u>Buff</u>	ering and Transfer	•
		0		1			2	3

Notice the Enable Beeper on Good Read checkbox is checked.

🕼 Enable Beeper on Good Read	Error LED Pulse Duration [ms]
Beep Length (ms)	
□	0 30000
0 50	
Light Ring Pulse Duration [ms]	
_U€5	
5 10000	

14. Uncheck the **Enable Beeper on Good** Read checkbox.

Enable Beeper on Good Read	Error LED Pulse Duration [ms]
Beep Length (ms)	
	50 0 30000
0 50	

15. Trigger your reader multiple times to get both good and bad reads on the Ace of Hearts. Notice, there is now no beeping sound for any of the reads – good or bad.



Master / Slave

If the DataMan readers in the classroom are on the network the Instructor will tell you which reader you should select as your second reader. Each class member will have the opportunity for their reader to be the Master and the Slave in the grouping.

If you are using a DataMan 470 series reader it will require a feature key to complete this activity.

Follow the steps below to complete the lab exercise:

- 1. Connect your DataMan reader to the DataMan Setup Tool.
- 2. Click the **Reset Configuration** button from the **System** Menu.
- 3. The **Configuration reset** dialog box displays. Click the **OK** button to continue.
- 4. Connect to a second reader on the network.
- 5. Click the tab that corresponds to your reader, and click the **Settings** tab.



6. Click the Master/Slave button on the Settings tab.



The Master/Slave settings display.

Independent Triggering	
8	
No	
Group	
onse	
^{.]} 0	60000
e 3	Independent Triggering No roup nse

7. Click the Edit Group button.



The Select Group to Open dialog displays.

Select Group to Open						
The master/slave triggering group name of the device was not found in any user created groups. A new grouping will be created and populated with devices having the same trigger group name.						
Open New Grouping Cancel						

The Edit Groups tab displays.

S <i>4</i>		0	C O							DataMan Setup 1	ool
Home	Edi	t Groups	View								
Save	New Group	Remove Node	Rename Group	Toggle Group Triggering	Set Master Device	Apply and Save Grouping to Devices	Refresh Grouping Info	± ∓ ← →	Grouping Interface Type Filter Refresh	Expand Collapse All	Connect
Edit Nodes			Master/Slave			Nodes	Discovered Devices	Expand/Collapse	Connect		

- 8. Click on the folder with your reader's name. Confirm that the Grouping tab is selected.
- 9. Rename the folder to Line1.



10. Click the Refresh Grouping Info button.

This will update the PC.



11. Click the Apply and Save Grouping to Devices button.

This will update the Reader.



12. Confirm the Grouping Tab and Group Name have updated to Line1.

DM474-5828AC	DM362-246ACC	Grouping: Li	nel 🛛						
Edited Group Grouping may be invalid. See warning flags in the editor.									
Name	Туре	Address	Firmware Version	Status	Open in Documents	Interfa			
Line1				Unknown					

13. Click the **Grouping: Line 1** tab.

DM474-5828AC	DM362-247854 🛽 Grouping: Line1 🕲
Edited Group	Grouping may be invalid. See warning flags in the editor.

14. Highlight your second reader on the Discovered Devices and click the **Add Discovered Device(s)** button to add it to the group.

NOTE: You can also drag and drop the reader into the group.

The second reader is added to the group folder.

	M474-5828	3AC 🛛 DM362-2	246ACC (Grouping: Li	ne1 🛛					
Ec	Edited Group Grouping may be invalid. See warning flags in the editor.									
Ν	ame		Туре	Address	Firmware Version	Status	Open in Documents	Interfa		
▲ Line1 Unknown										
	- 🔼	Master device no	tspecified	i.						
	Þ 🜗	DM474-5828AC	DM470	192.168.1.201	6.1.3_sr1	Discovered	Reader Configuration	Netwo		
	۵	DM362-246ACC	DM360	192.168.1.204	5.7.0_sr2	Discovered	Reader Configuration	Netwo		



15. Select your reader and click the **Set Master Device** button.



- 16. Click the **Refresh Grouping Info** button. This will update the PC.
- 17. Click the **Apply and Save Grouping to Devices** button. This will update the Reader and eliminate error messages.
- 18. Click on the reader tab belonging to your DataMan reader.
- 19. Place the *Ace of Hearts* under your reader, and the *Queen of Hearts* under your second reader.
- 20. Click the **Trigger** button. The LEDs on both readers will flash.
- 21. Expand the Decode Results, verify the Master Reader is the collector of the decoded information.

NOTE: The code with the image graphic III is from the Master Reader.

Result History		ዋ	×
🔀 Clear 🔟 📄 🕋 🞹 🗸 🍟 🔹 🗱	🔤 Logging 👻		
Result	Result Status		
□ III QUEENHEARTS<0x0D><0x0A>AC	Read		
QUEENHEARTS	Read		
···· III ACEHEARTS	Read		

- 22. Click the second reader's tab.
- 23. Click the **Trigger** *button*. The LEDs on both readers will flash.
- 24. Review the **Results History** of your second reader.

Result History		д	×
🔀 Clear 🔟 📋 🕋 🔟 👻 🔫 🔹 📣	🔤 Logging 🕞		
Result	Result Status		
III QUEENHEARTS	Read		
	Read		



25. Click your Master reader's tab and review the **Results History**.



- 26. The Configured Settings on both the Master and Slave Readers must be the same.
 - a. Code Details step
 - a. 1D = Code 128 checked
 - b. How many codes = 2
 - c. Partial Results = Yes
 - d. Codes = 2 1D/Stacked/Postal
 - b. Application Details
 - a. Trigger = Continuous
 - b. Decode Settings
 - i. Never Read Same Code Twice = checked
 - ii. Code Re-Read Delay = 300
- 27. Click the **Trigger** button.
 - The LEDs on both readers will flash.
- 28. Review the results for both readers.

Remove a Reader from a Group

- 1. Click on the **Grouping: Line1** tab.
- 2. Click on the Edit Groups tab.
- 3. Click on the **Reader** to be removed from the group.
- 4. Click on the **Edit Groups** tab and click the **Remove Node** button.



- 6. Click the Refresh Grouping Info button.
- 7. Click the Apply and Save Grouping to Devices button.



Lab Exercise 6.1 – Deployment

At the end of this lab exercise, Participants will be able to:

• Utilize the utilities available in the DataMan Setup Tool to finish deploying the application

The Participant will utilize the following DataMan Functions to successfully complete this exercise:

- Code Quality Metrics
- RTM Lean
- Backup/Restore Configurations
- Update Firmware

Code Quality Metrics – 1D Codes

Follow the steps below to complete the lab exercise:

- 1. Connect your DataMan reader to the DataMan Setup Tool.
- 2. Navigate to the Optimize Image application and uncheck the **Train Code After Tuning** checkbox.

Optimize Image					
Application Type	Basic Advanced				
Undefined 🖵	Train Code After Tuning				
Application Steps					
🖄 Optimize Image	Live -				
	•				

3. Tune the reader on the Ace of Hearts with the barcode horizontal in the image.





Manually adjust the settings using the settings below the image.
 NOTE: Your settings will likely not match those in the screenshot below. Adjust your settings to create a good contrast between dark and light.

Exposure (µs)	*• O		μs
Gain Factor		+ 1.93	
Focus		-1.18	Diopter
			mm
Image Panel (Code Quality		4 Þ 🗙

5. Trigger the reader to ensure that it can read the code.



6. Open the **View** menu and click the **Code Quality** button.



The Code Quality window opens.

Code Quality	₽	×

Trigger the reader and confirm the *Ace of Hearts* is read.
 Note that nothing displays in the **Code Quality** window. We need to enable this.



8. Open the **Settings** menu and click the **Code Quality** button.



The Code Quality menu displays.

9. Under the **General** tab, click the **1D Readability (Cognex)** radio button under the 1D Barcode Metrics options.

General	2D Codes	1D Barcodes	Result String	Report FTP Transfer	•			
_ Data Mat	rix Metrics —							
None								
O ISO/IE	EC 15415							
O AIM-D	PM / ISO/IEC	TR29158						
© SEMI	т10							
QR Code None SISO/IE AIM-D	QR Code Metrics None ISO/IEC 15415 AIM-DPM / ISO/IEC TR29158							
- 1D Barco	de Metrics —							
© None								
ID Re	ID Readability (Cognex)							
© ISO/IE	C 15416							

10. Trigger the reader.

Review the results in the **Code Quality** window.

Code Quality							д	×	
Pass (B) 🗸									
Property	Value	Grade		Average					
Cognex Readability Metrics	(Code 128: We	d Jan 23	14:52	:00 2019 (065	ms))				
Symbol Grade		В	\checkmark						
Symbol Contrast	+0.629	В	\checkmark	В					
Print Growth	-0.034	Α	\checkmark	А					
Minimum Reflectance	+0.054	Α	\checkmark	А					
Edge Contrast Minimu	+0.663	А	\checkmark	А					
Single-Scan Integrity 1		Α	\checkmark	А					
Multi-Scan Integrity 1D	+1.000	А	~	А					



11. Open the View menu and click the Image Viewer button.



The DataMan Setup Image Viewer pop up window displays.

	🖁 DataMan Setup Tool Image Viewer	- C	X C
×	🕨 🔎 🚳 🗄 67 % 👻 📴 🛃 🔛 🗶 😤 Brightness:		0
	REFERENCE CODE		
Wed Jan 23 14:52:00 20 Code 128, 4.96 PPM	19 (865 ms		

Notice the PPM – it is 4.96, this is within the 3-5 range which is ideal for 1D grading.

12. Change the card to the *King of Hearts* and trigger your reader. Review the results in the **Code Quality** window.

Code Quality						Ψ×		
Fail (F) 🔀								
Property	Value	Grade		Average				
Cognex Readability Metrics	(Code 128: We	d Jan 23	15:14	:03 2019 (291	ms))			
Symbol Grade		F	×					
Symbol Contrast	+0.634	В	\checkmark	В				
Print Growth	-0.030	Α	\checkmark	Α				
Minimum Reflectance	+0.046	Α	\checkmark	Α				
Edge Contrast Minimu	+0.580	Α	\checkmark	Α				
Single-Scan Integrity 1		F	×	С				
Multi-Scan Integrity 1D	+0.800	Α	\checkmark	А				





13. Change the card to the *9 of Clubs* and trigger your reader. Review the results in the **Code Quality** window.



14. Look at the **Scan Integrity** grades for each. Notice how they are different. **NOTE**: The system assigns grades A-F based on thresholds for each of the parameters. However, the customer may not be interested in specific parameters, or they may want to adjust the values that define the A-F grade. This is done in the **1D Barcodes** tab in the Code Quality menu by checking the **Custom Threshold** checkbox.

General	2D Codes	1D Barcodes	Result String	Report FTP Transfer	•
1D Reada	ability (Cognex) ISO/IEC 154	16		
Minimu	m Pass Grade	for Overall Result	C	•	
Cust	tom Threshold				
Custom	Thresholds —				
- Multipl	e Scan Integrity	، دا	Minimum Edge Co	ntrast	^
≥ _(0.75 🜩 A	≥	0.15 🖨 A		
≥ (0.60 🜩 B	≥	0.15 🌩 B		
≥ (0.50 🌩 C	≥	0.15 🜩 C		
≥ (0.40 🌩 D	≥	0.15 🌩 D		
	nclude in Over	all Grade	Include in O	verall Grade	
	nclude in Repo	ort	Include in R	eport	
- Minimu	um Reflectance	F	Print Growth		
≤ (0.50 🜩 A	≤	0.20 🖨 A		
≤ (0.50 🌩 B	≤	0.20 🌩 B		
≤ (0.50 🜩 C	≤	0.20 🜩 C		
≤ (0.50 🌩 D	≤	0.20 🌩 D		
	nclude in Over	all Grade	Include in O	verall Grade	
	nclude in Repo	ort	Include in R	eport	
Symbo	ol Contrast (%) -	(^s	Single Scan Integr	ity	
≥ _ (0.70 🚖 A		Include in O	verall Grade	
≥ _(0.55 🌩 B		M Include in R	eport	×



Code Quality Metrics - Data Matrix Codes

15. Open the **Settings** menu and click the **Code Quality** button.

s Settir	ngs Syste	em Vi	ew								
~	6	র্ছি	\mathcal{P}	*	\mathbf{P}	0		È	10101	٢	
Optimize Image	Test Mode Settings	Read Setups	Application Details	Symbology Settings	Data Validation	Code Quality	Data Formatting •	Buffering and Transfer	Communication Settings	System Settings	Table View

The Code Quality menu displays.

16. Under the **General** tab, click the **ISO/IEC 15415** radio button under the Data Matrix Metrics options.



17. Trigger the reader using the Good Data Matrix Code printed in the Resources section.



18. Review the **Code Quality** results to confirm you get a good grade when reading the Data Matrix code.

Pass (A) 🔽								
Property	Value	Grade	Average					
□ ISO/IEC 15415 (Data Matrix	Mon Jan 28 11	:23:23 2019 (8	313 ms))					
Symbol Grade		Α 🗸						
Symbol Contrast	+0.941	Α 🗸	А					
Axial Non-Uniformity	+0.021	Α 🗸	А					
Print Growth	+0.115							
Unused Error Correction	+1.000	Α 🗸	А					
Modulation		Α 🗸	А					
Fixed Pattern Damage		Α 🗸	А					
Grid Non-Uniformity	+0.068	Α 🗸	А					
Extreme Reflectance G		Α 🗸	А					
Contrast Uniformity	+0.508							
Reflectance Margin	+4.000	Α 🗸	А					



19. Put the *Damaged Code* in the FOV and trigger your reader.



Notice that the Fixed Pattern Damage metric fails.

	Fa	ail (F) 🔀		
Property	Value	Grade	Average	
ISO/IEC 15415 (Data Matrix	: Mon Jan 28 13	3:03:52 2019 (3	735 ms))	
Symbol Grade		F 🗙		
Symbol Contrast	+0.941	Α 🗸	А	
Axial Non-Uniformity	+0.010	Α 🗸	А	
Print Growth	+0.096			
Unused Error Correction	+1.000	Α 🗸	Α	
Modulation		Α 🗸	А	
Fixed Pattern Damage		F 🗙	В	
Grid Non-Uniformity	+0.024	A 🗸	А	
Extreme Reflectance G		F 🗙	В	
Contrast Uniformity	+0.708			
Reflectance Margin	+4.000	Α 🗸	А	



Code Quality Reports

Code Quality works while the system is up and running, so you have a couple of options to output the data in real-time.

The first method is to add the grade and code quality values to the output string, so it can be monitored by the customer's system.

Follow the steps below to complete the lab exercise:

1. Open the **Settings** menu and click the **Data Formatting** button.

s Setti	ngs Syste	em Vi	iew								
*	ଙ୍ଚ	র্তি	2	*	\mathbf{P}	0		1	10101	۲	
Optimize Image	Test Mode Settings	Read Setups	Application Details	Symbology Settings	Data Validation	Code Quality	Data Formatting	Buffering and Transfer	Communication Settings	System Settings	Table View
+	-			÷ -			-		+	+ -	
						Panes					

2. Click the **Script-Based Formatting** radio button and click into the blue hyperlink.

Basic	Standard	Perl Style	Scripting				
0	Basic Formatting	I					
	Universal		🖉 Stand	lard	Perl Style	•	
	Data Matrix		Stand	lard	Perl Style	•	
	1D / Stacked / Po	ostal	Stand	lard	Perl Style	•	
	QR Code / MaxiC	Code	Stand	lard	Perl Style	•	
O	Script-Based For	rmatting					

The Scripting Data Formatting page displays.



3. Click Insert Snippet → Simple Formatting → Outputting code quality parameters.

Basic	Standard	Perl Style	Scripting		-	
Data Fo	rmatting	FTP Storage	Communication		•	Þ
* [) () A	Complete Word	↔ Insert Snippet 👻			l
1	/ Defaul	t script f	Simple formatting		Data formatter (Empty data formatting entry point function)	
f	unction	onResult (Data Validation		Converting read code to upper case (Converts read data to all upper case. Single code only.)	
6	if (d	ecodeResul	Advanced formatting		Converting read code to lower case (Converts read data to all lower case. Single code only.)	
	{		User output generation		Outputting code quality parameters (Outputs various code quality values.)	
	, 0	utput.conte	nt = decodeResults[0	4	Outputting code quality parameters verbosely (Outputs various code quality values verbosely.)	

The Snippet script displays.



 Place the Good Code in the FOV and trigger your reader. Notice that the script added the same parameters you see in the Code Quality pane (at the bottom of the screen) to the output string:

	Pa	iss (A) 🔽				
Property	Value	Grade		Average		
⊟ ISO/IEC 15415 (Data Matrix)	2DMax with Po	werGrid S	SC: 0).94(A) ANU: 0	.02(A) PG: 0.1	1(A) UEC: 1.0
Symbol Grade		А	\checkmark			
Symbol Contrast	+0.941	Α	\checkmark	А		
Axial Non-Uniformity	+0.020	А	\checkmark	А		
Print Growth	+0.109					
Unused Error Correction	+1.000	Α	\checkmark	А		
Modulation		Α	\checkmark	А		
Fixed Pattern Damage		Α	\checkmark	В-		
Grid Non-Uniformity	+0.063	Α	\checkmark	А		
Extreme Reflectance G		Α	\checkmark	B-		
Contrast Uniformity	+0.517					
Reflectance Margin	+4.000	Α	\checkmark	А		

2DMax with PowerGrid SC: 0.94(A) ANU: 0.02(A) PG: 0.11(A) UEC: 1.00(A) MOD: 4.00(A) FPD: 4.00(A) MR: -1.00(NA) GNU: 0.06(A) ExtRef (15415 only): 1.00(A)



- SC = Symbol Contrast
- ANU = Axial Non-uniformity
- PG = Print Growth
- UEC = Unused Error Correction
- MOD = Modulation
- FPD = Fixed Pattern Damage
- MR = Reflectance Margin
- GNU = Grid Non-uniformity
- ExtRef = Extreme Reflectance Grade

NOTE: This is completed with the sample script that we enabled, and as a result it is completely customizable.



NOTE: As you can see, you can change the order and labels very easily with no programming experience required. The end user simply accepts and outputs and parses the data in the system to take action where needed.



RTM Lean

Follow the steps below to complete the lab exercise:

- 1. Connect your DataMan reader to the DataMan Setup Tool.
- 2. Click the **Reset Configuration** button from the **System** Menu.



The **Configuration reset** dialog box displays.

Configuration will be reset.
OK Cancel
Don't show this dialog again

- 3. Click the **OK** button to continue.
- 4. Open the **Settings** menu and click the **Code Quality** button.

s Settin	ngs Syste	em Vi	iew								
X	ଙ୍ଚ	ৰ্ছি		*	\mathbf{P}	\odot		È	1010	٢	
Optimize Image	Test Mode Settings	Read Setups	Application Details	Symbology Settings	Data Validation	Code Quality	Data Formatting	Buffering and Transfer	Communication Settings	System Settings	Table View

5. Check the **Data Matrix Metrics** *AIM-DPM/ISO/IEC TR29158* and the **1D Barcode Metrics** *ISO/IEC 15416* radio buttons.

General	2D Codes	1D Barcodes	Result String	Report FTP Transfer	•
Data Ma None ISO/II AIM-E	trix Metrics — EC 15415 DPM / ISO/IEC T10	TR29158			
QR Code None ISO/II AIM-E	e Metrics EC 15415 DPM / ISO/IEC	TR29158			
1D Barco None 1D Re ISO/II	ode Metrics — eadability (Cog EC 15416	inex)			



6. Navigate to the **Optimize Image** application step and uncheck the **Train Code After Tuning** checkbox.



7. Navigate to the **Application Details** application step and set the Timeout[ms] to 500.

	Trigger Settings		
	Trigger Type	Single (external) Select Trigger Input	Trigger Assistant
~	Delay Type	None	•
Application Details	Timeout [ms]	500 🌩	

8. Return to the **Optimize Image** application step and click the **Tune** button to Tune the reader on the Ace of Hearts.

DM474-5828AC (2)		4 Þ 🗙	(Image Panel	# ×
Optimize Image			👂 🔎 🏟 🚸 Reset ROI 😽 🗸 🖉 Quarter 👻 JPE	iG 🔹 📸 🔛 👻 Logging 👻
Application Type Basic Advanced	Read Performance Tuning Results	•	The reader is trained for Code 128 5.0ppm 89dg. Cod properties may not read.	es outside of these Untrain Code
Application Steps	1400			
	1200	0	A V	J
Code Details	800			EFERENC
Application Details	600		I E E E E E E E E E E E E E E E E E E E	SE CODE
Format Data	400		ACEHEARTS Code 123 4 59 FP	¥
inputs / Outputs	0 Brightness			
Communications	Light Exposure (µs) Gain Focus (dx) Decode Time (ms) Image Time (ms) Status 0 1013 28.52 -1.16 49 None OK		Exposure (µs) 🗰 🕀	(€) 1013 µs
Save Settings			Gain Factor	€ 28.92
Cognex HPIA	Apply Selected	Clear	Image Panel (2) Code Quality (2)	mm

9. Click the down arrow on the **Test** button and set the **Trigger Off [ms]** to 500.





10. Click the **Test** button to enable Test Mode. This will simulate an external trigger to the reader roughly 2 times per second.



11. Return to the **Home** page and Connect to the **RTM Lean** Network Device.

	🕮 🗲	📮 🕻	0 0 0					
	Home	Actions	Settings	System	View			
RTM Controller								
RTM Lean	RTM Controller	127.0.0.1		Discovered		Network	00-D0-24-00-00-00	

The list of available readers displays. Select your reader from the list and click the OK OK button.

evice Name	Туре	IP Address	Firmware Version	Origin	Status	
DM363_PJC	DM360	10.11.80.48	5.7.0_sr2	Automatically Discovered	Misconfigured	_
DM474-5828AC	DM470	192.168.1.201	6.1.3_sr1	Automatically Discovered	Discovered	
DM8000Base-138C14	DM8000Base	10.11.80.10	4.2.2_sr3	Automatically Discovered	Misconfigured	
DM8000BaseBT-200570	DM8000BaseBT	10.11.80.43	5.4.3	Automatically Discovered	Misconfigured	
M8050-1C1ED2	DM8050_BT	10.11.80.47	5.4.3	Automatically Discovered	Misconfigured	
T DM8072-61AF9C	DM8070_BT	10.11.80.69	5.7.2_sr1	Automatically Discovered	Misconfigured	
DM8072BaseBT	DM8000BaseBT	10.11.80.68	5.7.2_sr1	Automatically Discovered	Misconfigured	
P DM8100-1ACE5E	DM8150	10.11.80.26	4.2.2_sr3	Automatically Discovered	Misconfigured	

The Collection Configuration page displays.

NOTE: You are connected to the DM474 and the RTM Lean Network Device.

DM474-5828AC 🔕 RTM Lean 🔇

Collection Configuration



13. Check all the checkboxes within the **Data Collection** Settings section and the **Collection Enabled** checkbox, then click the **Apply** button. **NOTE**: *If you are already connected to the RTM Lean you may need to click the*

Configuration cog to get to the Collection Configuration page.

I	Device Configuration					
I				_		
I	🕂 Add Device 🔀 Remove De	vice		Se	Settings Diagnostics	
I	Device	Collection Enabled			C Data Collection	
I	DM474-5828AC				Please select the data to collect from the selected device	
I			•		Detailed Trigger Information for NoReads	
I					NoRead Images (via FTP)	
I					Detailed Trigger Information for Good Reads	
I					Code Positions for Heat Map	
I					Device Configuration Changes	
I						
1					NOTE: Depending on the trigger frequency of your application, enabling NoRead Image collection and Detailed Trigger Information may affect system performance.	
I					affect system performance.	

The Data Collection warning box displays.

1	Data collection is limited in RTM Lean, if you start new data collection now: all other device related data and all data older than 48 hours will be deleted. Do you wish to continue?
	Yes No
🗆 Don	't show this dialog again

- 14. Click the **Yes** button to continue. **Note**: *The Real Time Monitoring window within the Setup Tool must remain open for data to be collected.*
- 15. Click the **Performance Overview** button to enter the Performance Overview page.



16. Check the **Read rate** radio button and select the **Last hour** chart. This will show the statistics for the last hour only.

Performance Overview	/ [Tue 13:10 - 14:	10]				
Displaying	Last 48 hours		Last 24 hours		Last hour	
 Read rate Reads per minute NoReads per minute 	ிய	68.42%	۲	68.42%	-fur	-



 Trigger the reader on the Ace of Hearts – get a collection of good and bad reads. Put your finger or another object over the code so the reader cannot read it to get the bad result.



18. Review the Read rate result graph for the Last hour – notice how the graph dips when there is a bad read result.

playing	Last 48 hours		Last 24 hours		Last hour		
Read rate Reads per minute IoReads per minute	الملك	97.1%	-	97.1%	٢	92.59%	
ad rate - DM474-582	8AC						
100%							
95%							
90%							
85%							
00%							
80% -							
/5% -							
/0% -							
65% -							
60%							
55% -							
50% -							1
45% -							Ŧ
40% -							t
35%							+
30%							\pm
25%							+
20%							+
15%							1
10%							-
5% -							
0%							



19. Click the **NoRead Image History** button to see the no read images that have been automatically stored there.



NOTE: The Time Stamp matches the performance chart, so you can correlate the performance trend to the specific no-read images.

20. Click the **Code Quality Overview** button to view the statistics available to the reader.

Home R	Real Time Monito	oring	System View	v					
ብጥ		11 ¹	*		100	۲	1	A	
Performance Overview	Code Quality Overview	Event History	Code Location Heatmap	NoRead Image History	Trigger Performance	Configuration	Display Settings	DM474-5828AC	:
	Aggregated	Views		Detailed	Views	Configura	ation	Devices	
						2			
Code Quality Ove	erview [Tue 09:20	- 10:20]							
Code Quality Ove	erview [Tue 09:20	- 10:20] hours		Last 24 hours		La	ıst hour		

NOTE: The drop down on the left will allow you to see the statistics that are available to the reader. In other words, if you do not have the grading turned on, your device does not have a PCM feature key, or you are not running 5.7 (or higher) firmware, you will not see anything in the list.



21. Change the Plotted Value to **Decodability Grade** (1D ISO/IEC 15416 → Grades → Decodability.



- 21. Place the *King of Hearts* under the reader and notice to Decodability because of the damage inside of the code.
- 22. Click the **Trigger Performance** button.

Home Real Time Monitoring			System View	v					
ሚዮ		71/1 -	*			۲	1		4
Performanc Overview	e Code Quality Overview	Event History	Code Location Heatmap	NoRead Image History	Trigger Performance	Configuration	Display Settings	DM474-5828AC	-
	Aggregated	d Views		Detailed	Views	Configura	ation	Devices	

23. Select *Decode Time* for the **Plotted values** field, and *Edge Determination Grade* for *Color plots based on* field.

Plotted values: Decode Time	me 🔹
Color plots based on: Edge Determ	rmination Grade



DataMan Standard

Reader Pe	otoman	æ														
0.8																
0.7 -							Are starte	end have	42							
0.5																
0.4																
0.3																
0.2 -																
0.1																
				_					_	_	_	_	_	_	_	_
	T ₀	e 10.59	11:00	11.01	11.62	11:03	1104	11.05	11.06	11.07	11.08	11:09	11.10	11.11	11:12	11/

NOTE: If you click on any of the points corresponding to a no-read, then you can see a snapshot of the image here as well.

24. Click the Code Quality button and disable the Data Matrix symbology.



25. Return to Trigger Performance and select *Decode Time* for the **Plotted values** field, and *Symbology* for **Color plots based on** field.

Home F	leal Time Monit	toring	System View	v									
ላጥ		10 ⁴	*		- A	Ö	1	A	*				
Performance Overview	Code Quality Overview	Event History	Code Location Heatmap	NoRead Image History	Trigger Performance	Configuration	Display Settings	DM474-5828AC	- -				
	Aggregated Views				Views	Configura	ation	Devices					
Settings	Settings												
Plotted values:	Decode Time								•				
Color plots based on:	lor plots based on: Symbology												

NOTE: If you introduced any high decode times due to no-reads while changing cards then you may need to adjust the slide bar at the bottom of the graph to get a more granular view. Here you should be able to see how decode times increased when we introduced the King of Hearts, because the damage added more time, but then decreased when we turned off Data Matrix, as the decoder has less to search for.


Buffering and Transfer

In this lab you will learn how to save images to your PC using the Buffering and Transfer menu. You will also learn how to use the Auto no-read image saving functionality.

Follow the steps below to complete this lab exercise:

- 1. Connect your DataMan reader to the DataMan Setup Tool.
- 2. Click the **Reset Configuration** button from the **System** Menu.

Home	Actions	Settings	System	View		
		①		6	8	In the set Configuration ▼

The **Configuration reset** dialog box displays.

Configuration will be reset.	
OK Cancel	
Don't show this dialog again	

- 3. Click the **OK** button to continue.
- 4. Navigate to the **Application Details** step and set the following *Trigger Settings* parameters:
 - **Trigger Type** = *Burst*
 - Interval (µs) = 1,000,000 (1s)
 - Burst Length = 5

	- Trigger Settings	
	Trigger Type	Burst (external) Select Trigger Input
	Delay Type	None 🔽
	Timeout [ms]	2000 🜲
<u>~</u>	Interval (µs)	1000000 🗭 \mu 💌
Application Details	Burst Length	5

5. Return to the **Optimize Image** step – open the **Tune** menu and use the *Optimize Brightness* and *Optimize Focus* settings to ensure that you can read the Ace of Clubs.



COGNEX

6. Open the Settings menu and click the Buffering and Transfer button.



The Buffering and Transfer page displays.

DM474-5828AC 🔇					4 ▷ ×
Buffering and Transfe	r				
Application Type	Image Buffering	Image PC Transfer	Image FTP Transfer	Result FTP Transfer	•
Undefined					

7. Scroll down to the **Buffered Image Settings** and notice that the **Size** is set to *Full* and the **Format** is set to *Bitmap*.

NOTE: These are required settings to re-process an image.

Buffered Image Settings	
Size	Full 👻
Format	Bitmap 💌

8. Click the **Image PC Transfer** tab and create a folder to store images on your PC.

Transfer Folder ——			
C:\Users\jmacdona	Desktop\DataMan Images	•	Open in Image Playback
Image Count	0		Clear Transfer Folder

- 9. Click the **Image Buffering** tab and set the following settings:
 - What Results to Buffer = Read
 - What Images to Buffer for a Result = A//

Leave all other settings as the Defaults.

- Buffering Settings	
What Results to Buffer	Read
What Images to Buffer for a Result	All
Images per Result Limit	0 束
Image Buffer Maximum Size	6 🜩
Available for Setup Tool / DMCC	16 👻

10. Trigger the reader and put the barcode in the FOV so that it can be read on the 3rd image.

NOTE: Since we did not define a multi-code scenario, the reader will stop acquiring when the code is read. So, after 3 images, the reader stops acquiring.

- 11. Click on the **Image PC Transfer** tab notice that the Number of Buffered Images is 1. This is because we told it to buffer ALL Images for a Result.
- 12. Click the **Transfer Now** button.

– Number of Buffered Images –		 	
Number of Buffered	1	Transfer Now	

13. Click the **Open in Image Playback** button. A new tab opens.

_ Ti	ransfer Folder			
	C:\Users\jmacdona\Docun	-	Open in Image Playback	
	Image Count	0		Clear Transfer Folder

An Image Playback tab opens.

DM474-5828AC 🕴	Image Playback - C:\Users\jmacdona\Documents\DataMan Images 🔇

We can see all 3 images that were taken until the code was read in the filmstrip.

					Alasta sourcestants (averabalited) (based and	
	antizes esta dan da manga da m		na haonann dà sha paganna can casan a dan an			
Image count: 3 C:\Users\jmacdona\Docume	nts\DataMan Images\ima	ige00001.bmp				

14. Return to the Reader tab and click the **Clear Transfer Folder** button.

Transfer Folder ——		
C:\Users\jmacdona\	Documents\DataMan Images	Open in Image Playback
Image Count	3	Clear Transfer Folder



15. Click the **Yes** button to delete all files from the specified folder.



- 16. Trigger your reader while covering part of the barcode so that it cannot be read and move it through the FOV.
- 17. After the 5 images have been acquired, look in the **Image PC Transfer** tab.
 - Are there any Buffered Images?
 - No because the What Results to Buffer field is set to Read and there were no images read in this trigger cycle

Buffering Settings						
What Results to Buffer	Read [•				
What Images to Buffer for a Result	All [•				

18. Click on the **Image Buffering** tab and change the **What Results to Buffer** to *No Read* and repeat step 16.

- Buffering Settings							
What Results to Buffer	No Read 🗸						
What Images to Buffer for a Result	All						

- 19. After the 5 images have been acquired, look in the **Image PC Transfer** tab.
 - Are there any Buffered Images?
 - Yes you should now see 5 because the What Results to Buffer field is set to No Read and there were 5 no read images in this trigger cycle.

- Number of Buffered Images		
Number of Buffered	5	Transfer Now
Images		

20. Click the Transfer Now button.

- Number of Buffered Images					
Number of Buffered Images	5		Transfer Now		



21. Click the **Open in Image Playback** button. Notice that the 5 No Read images are now visible.



22. Return to the Reader tab and click the Clear Transfer Folder button.

- Transfer Folder							
C:\Users\jmacdona	\Documents\DataMan Images	Open in Image Playba	ck				
Image Count	5	Clear Transfer Folde	r				

23. Click the **Yes** button to delete all files from the specified folder.





Backup

Follow the steps below to complete this lab exercise:

1. Click the **Home** tab.



2. Click the **Backup** function.



3. Select the **Reader** (or Readers) to backup.

The second secon

4. Click the **Backup** button in the lower right-hand corner.

Open Backup Folder	<u>B</u> ackup
-----------------------	----------------

The **Backup** is run.

Mass Device Backup				
DM474-5828AC - Backing up device: Completed				
Close				



5. Click the **Close** button.

NOTE: This creates a folder on the C: drive with the Reader Name and places a .dmb file into the folder.

📙 🛃 🗖 🖛 Backups		– 🗆 X
File Home Share View		~ 🕐
\leftarrow \rightarrow \checkmark \uparrow \frown \land Documents \rightarrow	Cognex → DataMan → Backups →	✓ ່ບ Search Ba
VisionPro PDF	Name	Date modified Type
즑 OneDrive - Cognex Corporat	DM474-5828AC	1/31/2019 3:45 PM File folder
Attachments	DM8000BaseBT-1EE5FC	1/24/2019 10:38 AM File folder
Documents	DM8600-1C7844	1/25/2019 8:05 AM File folder

NOTE: The Location for the DataMan backup can be updated under the Home tab in the Options menu.

Backup Location -		
C:\Users\jmacdo	na\Documents\Cognex\DataMan\Backups	



Restore

Please read through the steps, but do not complete the Restore of your reader.

1. Click the **Home** tab.



2. Click the **Restore** function.



3. The Configuration Source displays. Click the Latest Backup radio button.

🏭 🗲 💻 📔 🍳 🔿 🚳		DataMan Setup Tool - DM474-5828AC [192.168.1.201]
Home Actions Settings	System View	
Connect	Configuration Source	
	O Configuration File	
Maintenance	O Device	
Repair & Support	Latest Backup	
Backup	Sectory Defaults	

4. Click the down arrow on the **Restore** button and click **Restore with network** settings.



This will start a system reboot.



Compare Configurations of Multiple Readers

Follow the steps below to complete this lab exercise:

NOTE: You must have at least two readers to compare configurations.

1. Click the **Home** tab.

🏔 🧲 I	📮 🔒 🕻	0 C (@			DataMan Setup Tool - DM474-
Home	Actions	Settings	System	View	

2. Click the **Connect** function.



- 3. Verify or Connect to a reader (this will be used as the reference Reader).
- 4. Click the **Compare Configurations** button in the lower right-hand corner.

	Compare Configurations	Process Monitor	Connect
The Openant Openfirmenties of the			

The Compare Configurations 1 tab opens.

Home	Compare	View										
Add Device	Add Config File	Remove Device	Save Settings •	Сору	Paste	Reset Values	Non-Default Values Non-Default Values Filter K	Expand Highlighted Rows Only	Set Reference Read Setup	 Read Setup Settings Global Settings All Settings 	Expand Collap All	se Reset Layout
		Device			Editing			Highlighting		Filtering	Othe	
DM474	DM474-5828AC 🕲 Compare Configurations 1 🕲											
A				DM474-5828AC								
					Global Settings / Setup 0							

5. Click the **Add Device** button.





6. Select a Reader from the list and click the **Add** button.

	🞻 DM362-247854	DM360	10.11.80.52	5.7.0_sr2	Misconfigured	Network	00-D0-24-24-78-54
	- 🎻 DM363_PJC	DM360	10.11.80.48	5.7.0_sr2	Misconfigured	Network	00-D0-24-47-F8-78
•		DUE02	10 11 00 05	F 6 0	10 C 1	N	
							Add Cancel

The readers display to allow a side by side comparison.

NOTE: The filter is set to **Difference to Reference**, so the differences are highlighted in blue on the 2nd reader so you can see at a quick glance what is different.

DM474-5828AC 🕲 Compare Configurations 1 🔕							
	DM474-5828AC	DM362-247854					
	Global Settings / Setup 0 [🛃	Global Settings / Setup 0					
4 Read Setup							
Name	Setup 0	Setup 0					
Enabled							
⊿ System Info							
Device	DM474X	DM362QL					
Serial number	1A1811PP137210	1A1525PB124498					
Device name	DM474-5828AC	DM362-247854					
MAC address	00-D0-24-58-28-AC	00-D0-24-24-78-54					
Firmware version	6.1.3_sr1	5.7.0_sr2					
Bootloader version	2016.09-131-g124964c	4.13					
OS Version	6.1.3_sr1						
Installed hardware	Liquid Lens	Liquid Lens					
Feature keys	IDMax, ImageDownload, IDQuick, BarCode, PostalCode, 2DCode, Valida	ImageDownload, IDQuick, BarCode, Omnidirectional, LadderAndPicket, F					
Startup version		4.12					

Update Firmware

Please read through the steps, but do not update the firmware on your reader.

- 1. Download, install and launch the latest compatible version of the DataMan Setup tool on your PC.
- 2. Connect to your reader. **Note**: When updating a handheld reader it is important that the reader is updated first and then the base. Make sure the reader and base are on the same firmware.
- 3. Click the **System** tab and click the **Update Firmware** link.



The Do you want to apply your new settings to non-volatile memory? displays.

- 4. Click the **No** button.
- 5. The firmware dialog displays, highlight the latest version and click the **Open** button.

🏭 Open					×
\leftrightarrow \rightarrow \checkmark \uparrow \square « Cogne	x > DataMan > Firmware > DM470	ٽ ~	Search DM470		Q
Organize 🔻 New folder				≣ ▼ 🔟	?
👩 Documents \land 🔿	Name	Date modified	Туре	Size	
Notebooks	DM470_v6.1.3_sr1.bin.gz	10/4/2018 4:16 PM	GZ File	123,248 KB	
💻 This PC					•
E Desktop					
Documents					
🖶 Downloads					
👌 Music					
Pictures					
Videos					
🏪 Local Disk (C:)					
🛖 data (\\pc.cogne					
🔿 Network 🗸 🗸					
File name:	:		 Firmware (*.bin. 	gz)	\sim
			Open	Cancel	



The Current Firmware Version dialog displays.

Do you want to update firmware to 6.1.3_sr1?							
Current Firmware Version(s):							
DM474-5828AC [DM470]: 6.1.1_sr1							
Backup device before firmware update Yes No							

6. Click the **Yes** button.

The system will update the firmware.

Checking fi Creating ba Uploading 1 Processing Firmware u Waiting for Resetting ti reconfigura Waiting for Connection Establishin Retrieving Retrieving Connected New Softwa New Bootlo	mware file ckup rmware file firmware update packag odate successful! device to finish updating e device. Restart may be ion device to reboot to the device was lost. V o connection to device arameters configuration re Version: 6.1.3_sr1 ader Version: 2016.09 -1	e its firmware e delayed by several seconds due to internal vait while connection is reestablished 131-g124964c
		Close

7. Click the **Close** button.



FTP with DataMan – If time allows

Note: To complete this lab you may need to turn off your WiFi and/or pause firewalls.

All Ethernet-enabled DataMan readers support FTP. This allows you to send images to a remote server so customers can understand *why* their codes did not read.

We can use the FTP server built into In-Sight Explorer to demonstrate the FTP capabilities.

Follow the steps below to complete the lab exercise:

- 1. Connect your DataMan reader to the DataMan Setup Tool via Ethernet.
- 2. Click the **Reset Configuration** button from the **System** Menu.



The **Configuration reset** dialog box displays.

Configuration w	ill be reset.					
	OK Cancel					
Don't show this dialog again						

- 3. Click the **OK** button to continue.
- 4. Open the **Settings** menu and click the **Buffering and Transfer** button.

5	Settin	gs Syste	System View									
-	<u>×</u>	ବ୍ତ	গি	2	*	\mathbf{P}	$\overline{\mathbf{O}}$			10101	۲	
Op In	timize nage	Test Mode Settings	Read Setups	Application Details	Symbology Settings	Data Validation	Code Quality	Data Formatting	Buffering and Transfer	Communication Settings	System Settings	Table View

The **Buffering and Transfer** page displays.

5. Remain on the **Image Buffering** tab and change the **What Results to Buffer** setting to *All*. Allow all other settings to remain as the defaults.

Buffering and Transfer								
Application Type	Image Buffering	Image PC Transfer	Image FTP Transfer	Result FTP Transfer				
Undefined	– Bufferina Settinas –							
Application Steps	What Results to	Buffer All	All					



- 6. Click the **Image FTP Transfer** tab and set the following Image FTP Transfer settings:
 - Server Address static IP Address of YOUR PC
 - Username admin
 - **Password** *leave empty*

Image Buffering		Image PC Transfer	Image FTP Transfer	Result FTP Transfer
_ In	nage FTP Transfer	r		•
	Server Address		3.1.	21 🌲
	Username			
	Password			
	Server Type		eneric 💌	
	Enable Idle Timeout			
	Idle Timeout [s]		0	

7. In the **File Name Generation Method** section of the Image FTP Transfer tab change the **File Name** to something that identifies your reader (such as the reader model).

File Name Generation Method — Custom File Name							
File Name	DM474	001.bmp					
Max Append Value	999 🜩						
Script Generated File Name	Script Generated File Name						
Server Generated File Name	•						
Path							

8. In the **Image Data** section of the Image FTP Transfer tab change the **Transfer Mode** to *FTP* - *Runtime*.

_ lr	mage Data		
	Number of Buffered Images	0	Transfer Now
	Transfer Mode	FTP - Runtime	

- 9. Open the FTP folder C:\ ProgramData\Cognex\In-Sight\Emulators\5.6.1. **Note**: Your FTP path may be slightly different depending on your In-Sight Explorer version.
- 10. Trigger your reader.

NOTE: You likely will get No results. This is because you need to turn on the emulator by starting In-Sight Explorer. Open and minimize In-Sight Explorer. No need to connect to a sensor.

11. Give it a few seconds to start up and you will see the image from the previous trigger get transferred automatically. Trigger the reader again to send additional images.

NOTE: The BMP images are fully capable of being dragged back into the Setup Tool to verify a read.

12. Return to the **Image Buffering** tab and change the **What Results to Buffer** setting to *No Read*.

Image Buffering		Image PC Transfer	Image FTP Transfer	Result FTP Transfer	
B	ufferina Settinas –			_	
	What Results to Buffer		Read		

13. Trigger your reader and block part of the code until you get a No Read.



You can also send the results that were read via FTP.

14. Click on the **Result FTP Transfer** tab. Enter the **Server Address** and **Username** as you did for the Image FTP Transfer fields.

Image Buffering	Image PC Transfer	Image FTP Transfer	Res	sult FTP Transfer				
Result FTP Transfer								
Server Addre	ess 192	.168.1.	:	21 🌲				
Username	adm	in						
Password								
Server Type	FTF	Generic	•					



- Result FTP Transfer Image PC Transfer Image FTP Transfer Image Buffering Result FTP Transfer Enable Result Transfer via FTP Server Address 192.168.1.200 21 🚔 admin Username Password Server Type **FTP** Generic Enable Idle Timeout Idle Timeout [s] 0 ≑ File Name result.txt Append
- 15. Check the Enable Result Transfer via FTP checkbox.

16. Trigger some reads on different barcodes and open the *result.txt* file to view the results.



Lab Exercise 7.1 – Troubleshooting

At the end of this lab exercise, Participants will be able to:

• Troubleshoot a variety of issues that will be wrong with the system

The Participant will utilize the following DataMan Functions to successfully complete this exercise:

- DataMan Actions
- DataMan Settings
- DataMan System

Follow the steps below to complete the lab exercise:

NOTE: The system should be backed up on a user accessible computer or laptop.

1. The Instructor will ask you to leave the classroom. When you return to the room you will need to troubleshoot any issues with your system and successfully read a code .

NOTE: You should not have to adjust anything in your program. The changes will be environmental. Make the environment adjust to your program, not the program to fit the environment.

2. Once you have successfully finished troubleshooting your system, please assist others in need.







Lab Exercise 8.1 – Determine Correct Optics

At the end of this lab exercise, Participants will be able to:

• Use the Optics Advisor and Charts to determine the correct optics for your application that will use a DataMan Reader.

The Participant will utilize the following DataMan Functions to successfully complete this exercise:

- Lens Advisor Software
- DataMan Optics Charts

Getting the Correct Optics

- 1. Collect the following information and record the:
 - a. Working Distance (WD)
 - b. Field of View (FOV)

If known:

- c. Size of Code
- d. Focal Length
- 2. Use the Lens Advisor Calculator to determine the Lens needed to achieve an in focus image for the DataMan using a C-mount lens.

NOTE: The calculator is located in the Optics Lab Folder or on the Cognex web site at: <u>http://www.cognex.com/ExploreLearn/UsefulTools/LensAdvisor/</u>

- a. FOV- 100 X 200 mm WD- 300 mm
 - □ 32 mm F/2
 - □ 6 mm Lens F/1.4
 - □ 16 mm Lens F/5.6
- b. FOV- 10 X 20 mm WD-300 mm
 - □ 150 mm F/4
 - □ 50 mm Lens F/2.3
 - □ 16 mm Lens F/1.4
- c. FOV- 10 X 20 mm WD- 100 mm
 - □ 75 mm F/8
 - □ 25 mm Lens F/1.4
 - □ 50 mm F/ 5.6



Thought Question:

What would you expect the Focal length to be if we reduced the working distance to 50mm for the FOV of 10 X 20 mm?

3. Use the DataMan Optics Chart to determine the Lens needed to achieve an in focus image for the DataMan using a Liquid Lens:

NOTE: The Charts are found at the end of this lab or in the class lecture PPTs.

- a. FOV- 40 X 60 mm WD-300 mm Code Size 20 mil 2D
 - □ Liquid Lens 18.8 mm
 - □ Liquid Lens 13.3 mm
- b. FOV- 40 X 60 mm WD-100 mm Code Size 10 mil 2D
 - □ Liquid Lens 18.8 mm
 - Liquid Lens 13.3 mm
- c. FOV- 40 X 60 mm WD-140 mm Code Size 10 mil 1D
 - □ Liquid Lens 13.3 mm
 - □ Liquid Lens 18.8mm

Thought Question:

Could you use a C-Mount instead of a Liquid Lens, what are the advantages of using a liquid lens?

If Time Permits:

Use the Specific Optics information in each exercise above to determine the Lens needed to achieve an in focus image for the DataMan 100/200 but use the DataMan 100/200 charts found in the appendix of the class lecture PPTs.





Optics Chart for Liquid Lens 18.8 mm - use for objects that are far away



Optics Chart for Liquid Lens 13.3 mm – use for objects that are near



