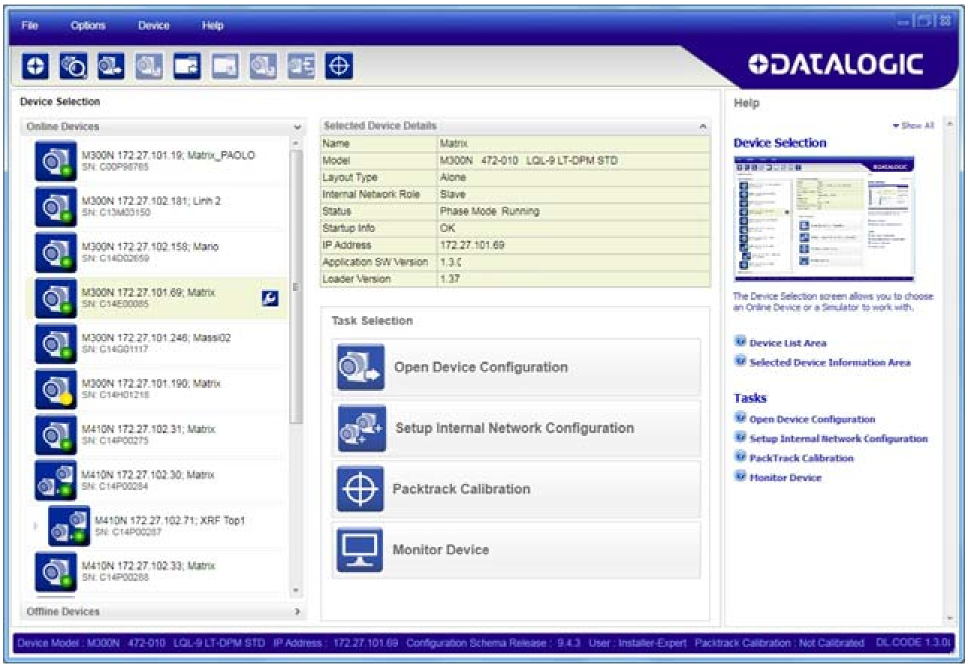
USER'S MANUAL



M300N 172.27.101.19; Matrix_PAOLO
SN: C00P98765

M300N 172.27.102.181; Linh 2
SN: C13M03150

M300N 172.27.102.158; Mario
SN: C14D02659

M300N 172.27.101.69; Matrix
SN: C14E00065

M300N 172.27.101.246; Massi02
SN: C14G01117

M300N 172.27.101.190; Matrix
SN: C14H01218

M410N 172.27.102.31; Matrix
SN: C14P00275

M410N 172.27.102.30; Matrix
SN: C14P00284

M410N 172.27.102.71; XRF Top1
SN: C14P00287

M410N 172.27.102.33; Matrix
SN: C14P00288

Name	Matrix
Model	M300N 472-010 LQL-9 LT-DPM STD
Layout Type	Alone
Internal Network Role	Slave
Status	Phase Mode Running
Startup Info	OK
IP Address	172.27.101.69
Application SW Version	1.3.(
Loader Version	1.37

Device Selection

The Device Selection screen allows you to choose an Online Device or a Simulator to work with.

- Device List Area
- Selected Device Information Area

Tasks

- Open Device Configuration
- Setup Internal Network Configuration
- PackTrack Calibration
- Monitor Device

Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated DL.CODE 1.3.0(

> DL.CODE™

DATALOGIC

DATALOGIC

Datalogic Automation Srl
Via Lavino, 265
40050 - Monte S. Pietro
Bologna - Italy

DL.CODE™ User's Manual

Ed.: 12/2015

This manual refers to software version 1.3.0 and later.

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CONTENTS

REFERENCES

CONVENTIONS

This manual uses the following conventions:

"DL.CODE™" refers to the Datalogic User Interface client application running on a PC.

"User" or "Installer" refer to anyone using DL.CODE.

"Device" refers to physical devices used in the reading stations: i.e. Matrix readers.

"You" refers to the System Administrator or Technical Support person using this manual to install, configure, operate, maintain or troubleshoot a plant equipped with DL.CODE.

REFERENCE DOCUMENTATION

The documentation related to DL.CODE™ is listed below:

- Device specific Help On Line
- This User's Manual

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Datalogic provides several services as well as technical support through its website. Log on to **www.datalogic.com** and click on the **Industrial Automation** links for further information:

- **PRODUCTS – FIXED INDUSTRIAL BARCODE READERS**

  Select your product from the links on the **Fixed Industrial Barcode Readers** page. The product page describes specific Info, Features, Applications, Models, Accessories, and Downloads including documentation, software drivers, and utility programs.

- **SUPPORT & SERVICES – INDUSTRIAL AUTOMATION**

  Several links from the **Industrial Automation** list take you to additional services such as: Service Program which contains Maintenance Agreements and Warranty Extensions; Repair Centers; On-Line RMA Return Material Authorizations; Technical Support through email or phone; Downloads for additional downloads.

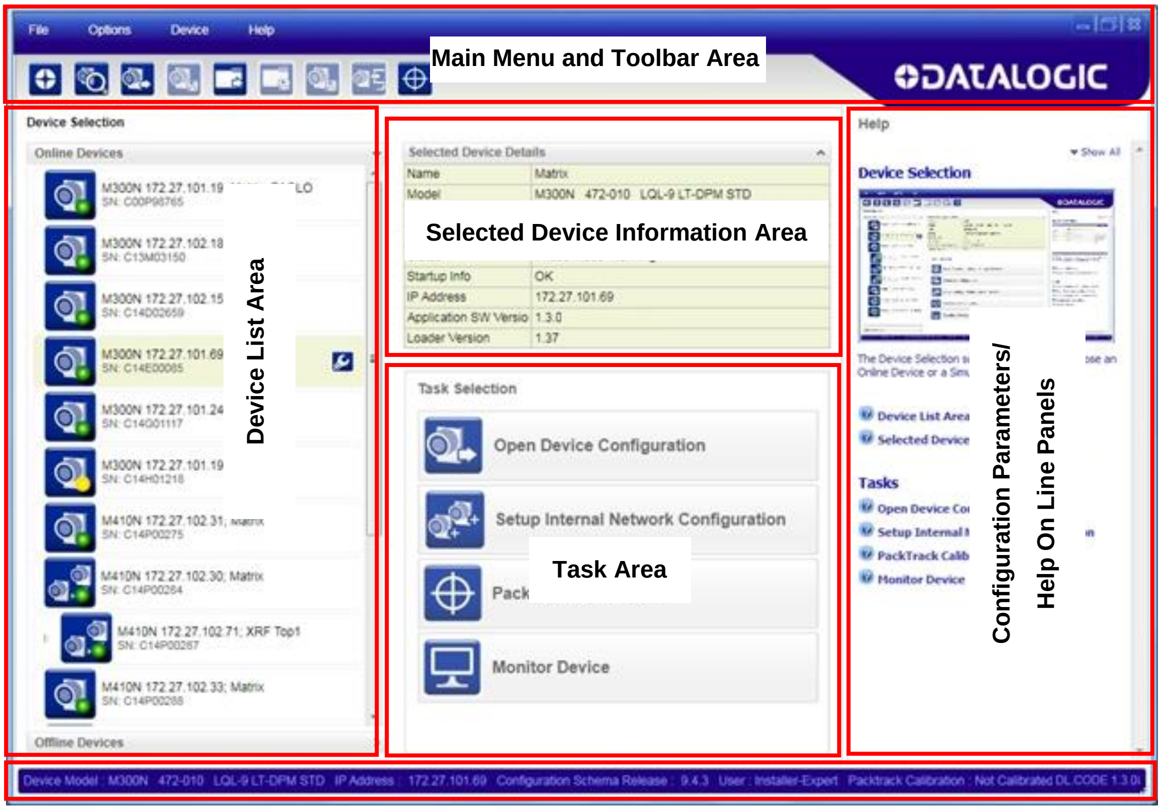
1 INTRODUCTION

DL.CODE™ software is a User Interface client application that provides reading device configuration for Stand Alone, and Master/Slave configurations. It is installed in and runs on Windows-based PCs (usually laptops), and connection takes place through an Ethernet TCP/IP interface.

It also provides visual monitoring of images that can be stored in an Image Database either locally on the device or to the local or a remote PC.

DL.CODE provides PackTrack Calibration for omnidirectional reading and tracking stations used in Logistics applications.

DL.CODE offers statistic and diagnostic information at reading station level whether the station is made up of a single reader or several readers connected in a Master Slave configuration.



Name	Matrix
Model	M300N 472-010 LQL-9 LT-DPM STD
Startup Info	OK
IP Address	172.27.101.69
Application SW Versio	1.3.0
Loader Version	1.37

Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated DL.CODE 1.3.0

Figure 1 – Main Window Areas

1.1 MAIN FEATURES

A summary of the DL.CODE main features is listed below:

- Simultaneous Device Monitoring from different remote PCs
- 3 different access levels
- User and Session Language configuration in real time
- System configuration
- Dynamic content and automatic page update

1.2 CONFIGURATION AND MONITORING SESSIONS

Device configuration can be performed using DL.CODE running on a remote PC through a single session. Multiple instances of DL.CODE cannot be run on a PC and once a device is connected for configuration it cannot be accessed by another PC running DL.CODE.

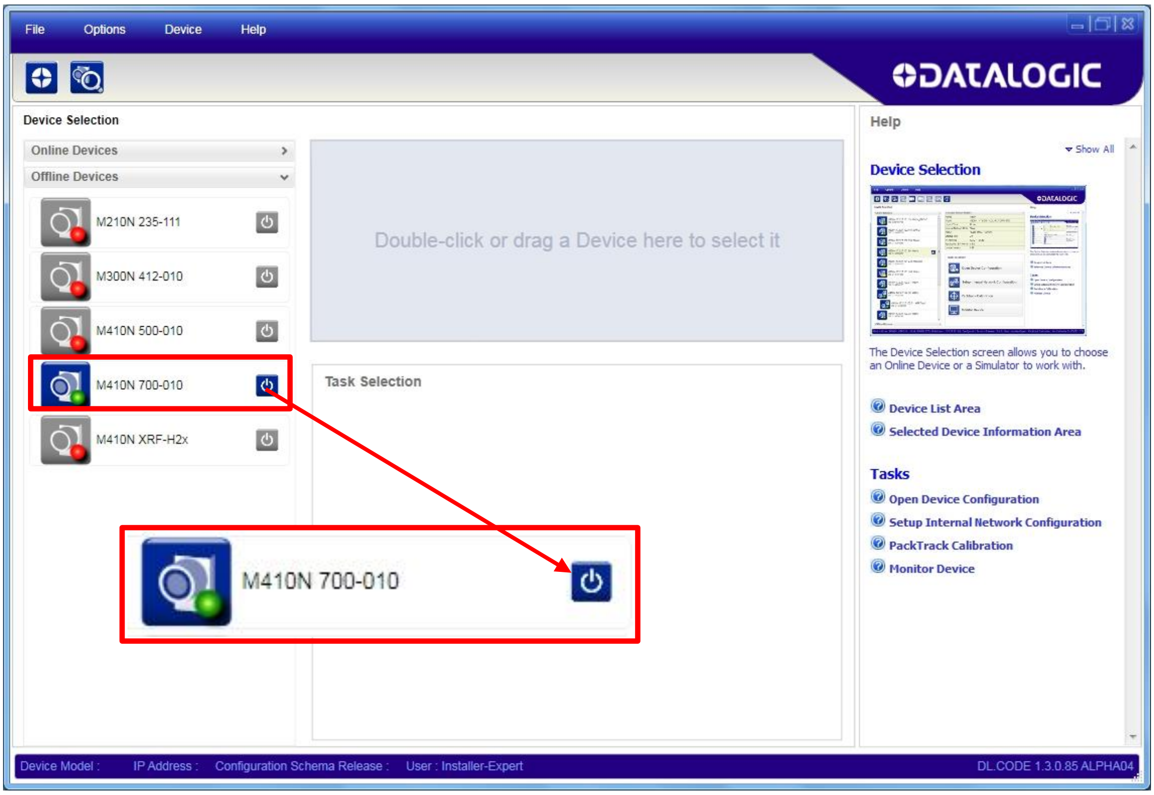
However the Monitoring feature can be accessed simultaneously by several PCs running DL.CODE.

1.3 SIMULATORS

DL.CODE has different device prototypes which can be loaded as Offline devices. This allows offline configurations to be prepared and loaded to a device at a later time.

To load a Simulator, Click on the *Offline Devices* tab at the bottom of the Device List Area to open the list of available simulators.

A Matrix 210N simulator is selected by default. To select a different reader click its Simulator Power button icon.



Double-click or drag a Device here to select it

The Device Selection screen allows you to choose an Online Device or a Simulator to work with.

Now you can double-click or drag the simulator into the Selected Device Information Area and begin a new configuration. See Chapter 3.

1.4 DEVICE CONFIGURATION

DL.CODE is designed to simplify standard configuration by grouping the basic functions into three major parameter groups: Decoding, Operating Mode, and Output.

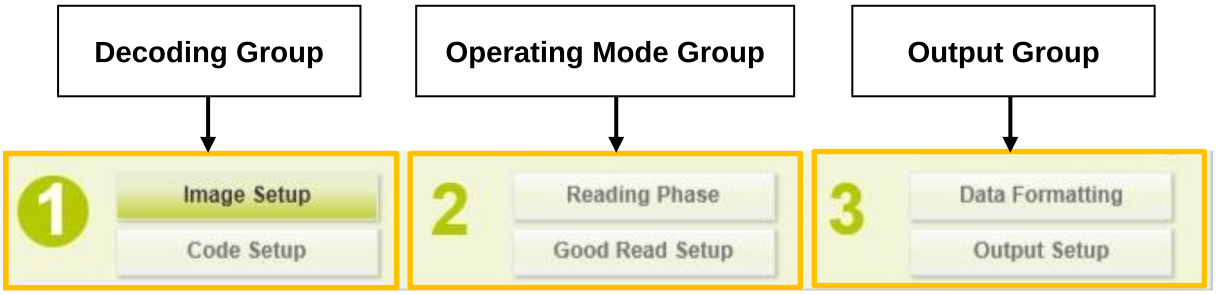


Figure 2 – DL.CODE Configuration Groups

Each major group is sub-divided into two parts as follows:

1. **Decoding:**

   - Image Setup: this group manages the photometry for image acquisition. It contains a **Focus Calibration** tool with oscilloscope for manual focusing, and most importantly an **Image Auto Setup** routine to automatically set the photometry.

   - Code Setup: this group manages code symbology selection and configuration including Code Filtering parameters and the ROI windowing tool. It also contains the **Code Autolearn** routine to find unknown code symbologies on an acquired image. For DPM applications it also provides an advanced **DPM Autolearn** routine (see chp. 11).

2. **Operating Mode:**

   - Reading Phase: this group manages the operating mode for image acquisition.

   - Good Read Setup: this group manages data collection: Code Collection, Code Combination, Code Presentation, or Match Code.

3. **Output:**

   - Data Formatting: this group manages the output message to the Host.

   - Output Setup: this group manages the digital outputs as well as the Green/Red Spots.

2 INSTALLATION

2.1 DL.CODE DISTRIBUTION CONTENTS

The DL.CODE program distribution contains the following:

- Complete Installation of DL.CODE
- .NET Framework (if not already present)
- This manual

2.2 HARDWARE REQUIREMENTS

Typical hardware requirements for a DL.CODE Client PC are:

- 2.00 GHz or faster microprocessor
- 1 GB RAM
- 2 GB hard disk for 64-bit machines; 1 GB hard disk for 32-bit machines
- 100 Base-T Ethernet
- One 19" or larger monitor (optimized for 1280x1024 resolution)

2.3 SOFTWARE REQUIREMENTS

- One of the following Windows Operating System:
  - Windows XP (32 or 64-bit)
  - Windows Vista (32 or 64-bit)
  - Windows 7 (32 or 64-bit)

- Web Browser: Google Chrome, Mozilla Firefox, Microsoft Internet Explorer, Opera, etc.

NOTE: The Google Chrome Web Browser is recommended for its superior performance characteristics.

2.4 INSTALLING DL.CODE

1. On the PC that will be used for configuration, (running Windows XP, Vista, or 7), download the DL.CODE mini-DVD .zip file. Extract the files maintaining the folder structure and run the **start.hta** file to access the installation pop-up. Click on the **Install DL.CODE** link to run the installation program and follow the installation procedure.

2. When the installation is complete the DL.CODE entry is created in the Start>Programs bar under "Datalogic" as well as a desktop icon. Double-click the desktop icon to run it.

3 QUICK START

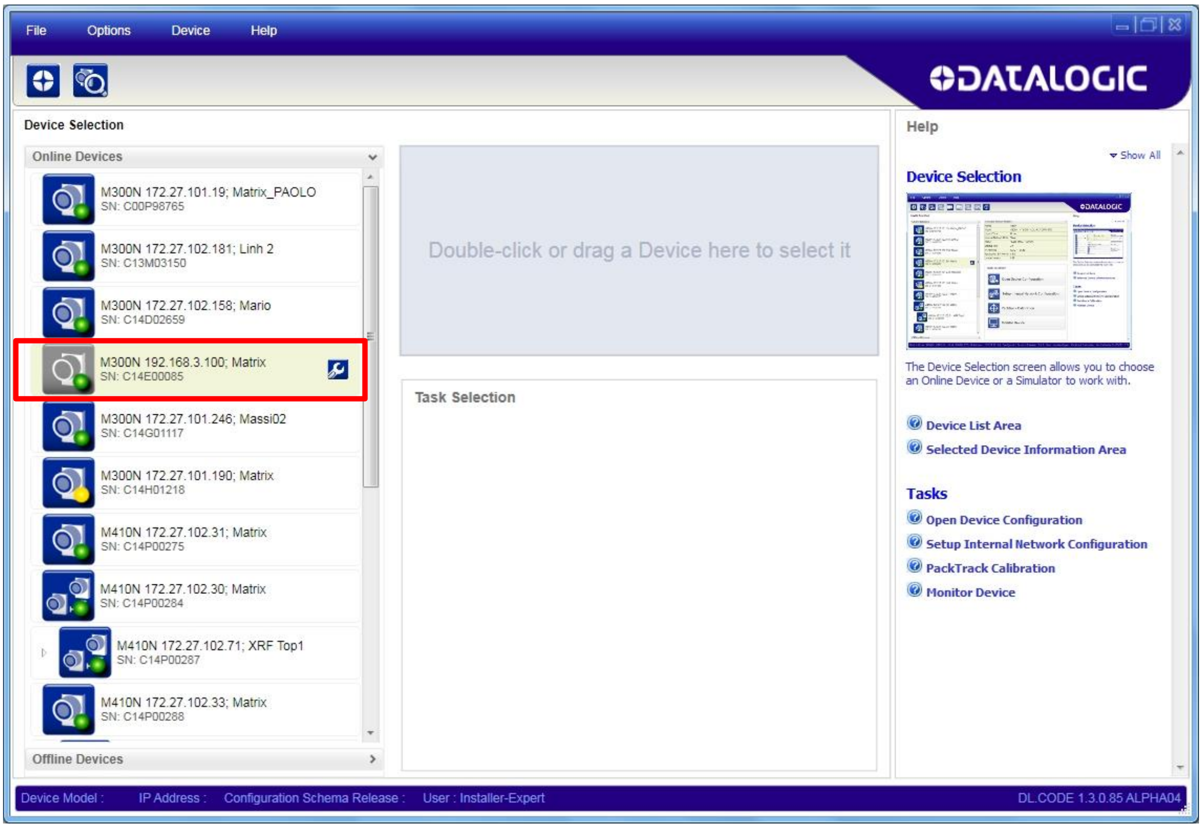
To help you get started, here is an example configuration demonstrating the basic steps of DL.CODE configuration.

To configure your device for your application using DL.CODE, the following preliminary steps are assumed:

- The reading device(s) are installed and running.
- DL.CODE is installed and running (chapter 2).

3.1 DEVICE DISCOVERY

The User Interface opens and displays a list of all the devices belonging to the Local Area Network. DL.CODE has a discovery feature to accomplish this task.



M300N 172.27.101.19; Matrix_PAOLO
SN: C00P98765

M300N 172.27.102.181; Linh 2
SN: C13M03150

M300N 172.27.102.158; Mario
SN: C14D02659

M300N 192.168.3.100; Matrix
SN: C14E00085

M300N 172.27.101.246; Massi02
SN: C14G01117

M300N 172.27.101.190; Matrix
SN: C14H01218

M410N 172.27.102.31; Matrix
SN: C14P00275

M410N 172.27.102.30; Matrix
SN: C14P00284

M410N 172.27.102.71; XRF Top1
SN: C14P00287

M410N 172.27.102.33; Matrix
SN: C14P00288

Device Selection

The Device Selection screen allows you to choose an Online Device or a Simulator to work with.

Device List Area
Selected Device Information Area

Tasks
Open Device Configuration
Setup Internal Network Configuration
PackTrack Calibration
Monitor Device

Device Model : IP Address : Configuration Schema Release : User : Installer-Expert DL.CODE 1.3.0.85 ALPHA04

Figure 3 – Device Discovery

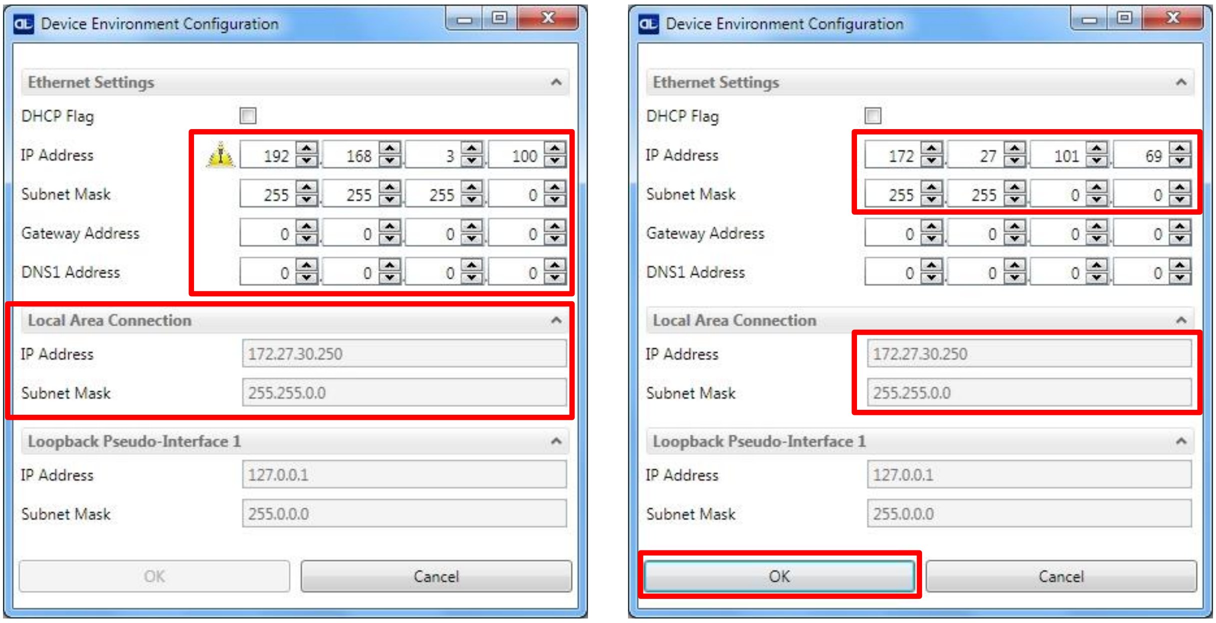
The discovery feature will also show devices not belonging to the LAN and display them in grey (see Figure 3).

The following procedure will demonstrate an example configuration.

1. First, the device must be added to the LAN by aligning its IP Address to the network. The network administrator should provide valid LAN address(es).

2. Click on the device wrench icon 🔧 to open the Device Environment Configuration window.

3. Change the Ethernet Settings (IP Address, Subnet Mask, Gateway Address etc.) according to the network requirements. See also Figure 4 below.



Device Environment Configuration

Ethernet Settings
DHCP Flag □
IP Address 192 168 3 100
Subnet Mask 255 255 255 0
Gateway Address 0 0 0 0
DNS1 Address 0 0 0 0

Local Area Connection
IP Address 172.27.30.250
Subnet Mask 255.255.0.0

Loopback Pseudo-Interface 1
IP Address 127.0.0.1
Subnet Mask 255.0.0.0

OK Cancel

Device Environment Configuration

Ethernet Settings
DHCP Flag □
IP Address 172 27 101 69
Subnet Mask 255 255 0 0
Gateway Address 0 0 0 0
DNS1 Address 0 0 0 0

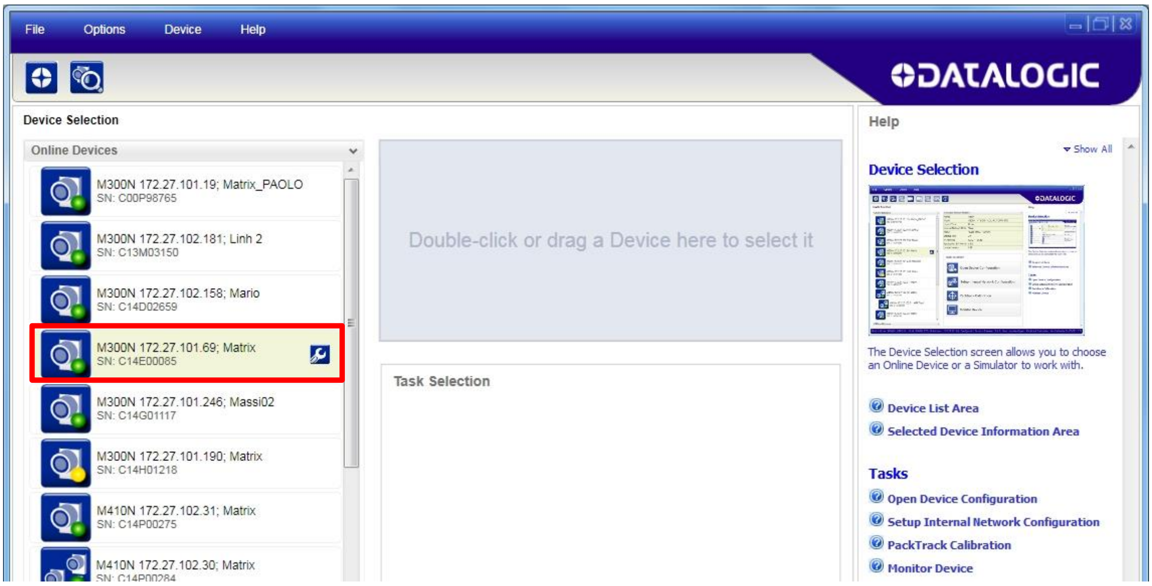
Local Area Connection
IP Address 172.27.30.250
Subnet Mask 255.255.0.0

Loopback Pseudo-Interface 1
IP Address 127.0.0.1
Subnet Mask 255.0.0.0

OK Cancel

Figure 4 - Device Environment Configuration Window

4. Click OK; the device will reappear in the list of Online Devices (in color) meaning it is now part of the LAN and can be configured. The new IP address will also be displayed.



Device Selection

Online Devices

M300N 172.27.101.19; Matrix_PAOLO
SN: C00P98765

M300N 172.27.102.181; Linh 2
SN: C13M03150

M300N 172.27.102.158; Mario
SN: C14D02659

M300N 172.27.101.69; Matrix
SN: C14E00085

M300N 172.27.101.246; Massi02
SN: C14G01117

M300N 172.27.101.190; Matrix
SN: C14H01218

M410N 172.27.102.31; Matrix
SN: C14P00275

M410N 172.27.102.30; Matrix
SN: C14P00284

Double-click or drag a Device here to select it

Task Selection

Help

Show All

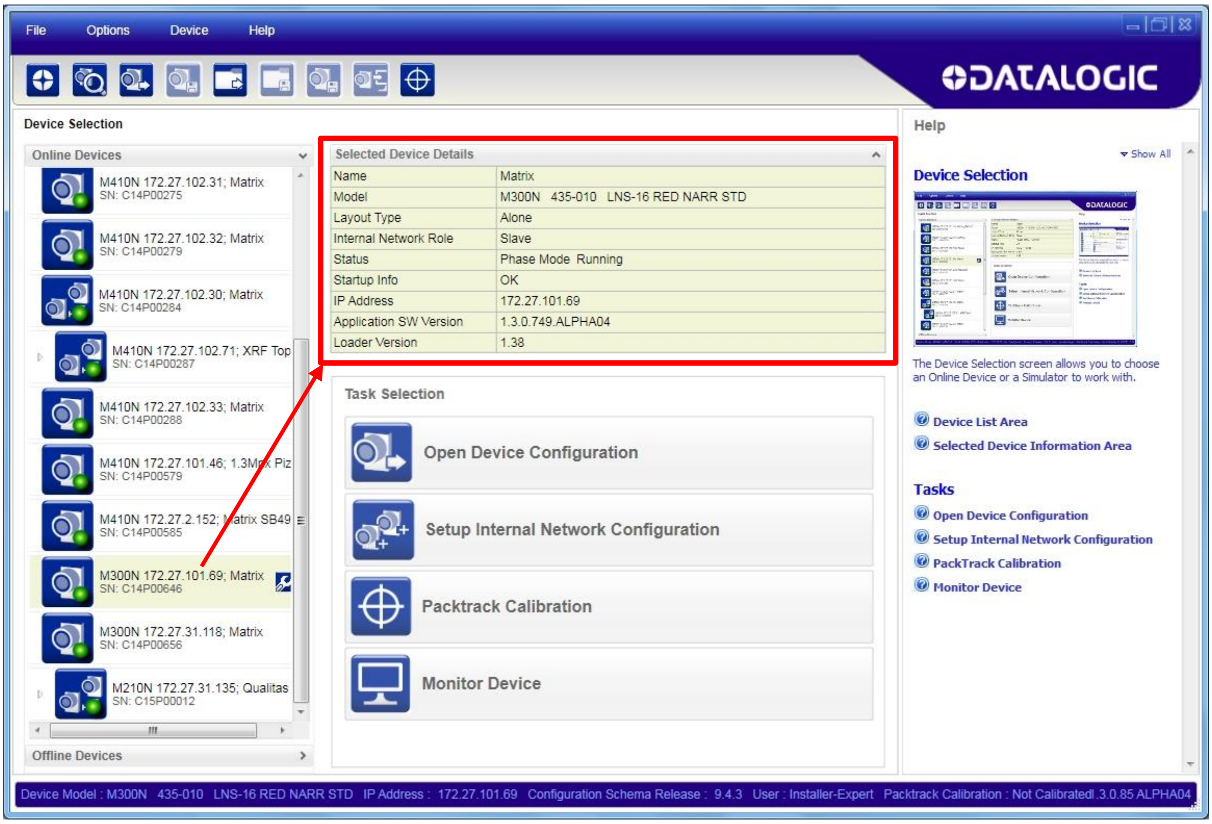
Device Selection

The Device Selection screen allows you to choose an Online Device or a Simulator to work with.

Device List Area
Selected Device Information Area

Tasks
Open Device Configuration
Setup Internal Network Configuration
PackTrack Calibration
Monitor Device

5. Double-click on or drag the device icon into the Selected Device Information Area. Details about the device will be displayed in this area.



Device Selection

Online Devices

- M410N 172.27.102.31; Matrix SN: C14P00275
- M410N 172.27.102.32; Matrix SN: C14P00279
- M410N 172.27.102.30; Matrix SN: C14P00284
- M410N 172.27.102.71; XRF Top SN: C14P00287
- M410N 172.27.102.33; Matrix SN: C14P00288
- M410N 172.27.101.46; 1.3Mpx Piz SN: C14P00579
- M410N 172.27.2.152; Matrix SB49 SN: C14P00585
- M300N 172.27.101.69; Matrix SN: C14P00646
- M300N 172.27.31.118; Matrix SN: C14P00656
- M210N 172.27.31.135; Qualitas SN: C15P00012

Offline Devices

Selected Device Details

Name	Matrix
Model	M300N 435-010 LNS-16 RED NARR STD
Layout Type	Alone
Internal Network Role	Slave
Status	Phase Mode Running
Startup Info	OK
IP Address	172.27.101.69
Application SW Version	1.3.0.749.ALPHA04
Loader Version	1.38

Task Selection

- Open Device Configuration
- Setup Internal Network Configuration
- Packtrack Calibration
- Monitor Device

Help

Show All

Device Selection

The Device Selection screen allows you to choose an Online Device or a Simulator to work with.

- Device List Area
- Selected Device Information Area

Tasks

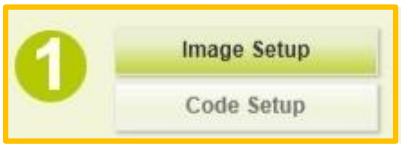
- Open Device Configuration
- Setup Internal Network Configuration
- PackTrack Calibration
- Monitor Device

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibratedl 3.0.85 ALPHA04

3.2 DECODING CONFIGURATION PARAMETERS

The Decoding Configuration parameters are divided into two groups: optical/illumination parameters called **Image Setup** and code definition parameters called **Code Setup**.

Decoding Group

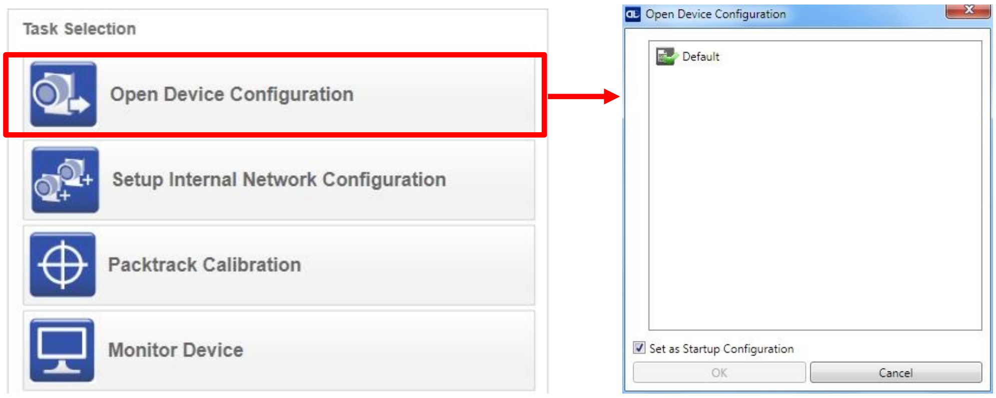


3.2.1 Image Setup

To begin configuration, the reader must be correctly mounted so that its Field of View covers the application reading area.

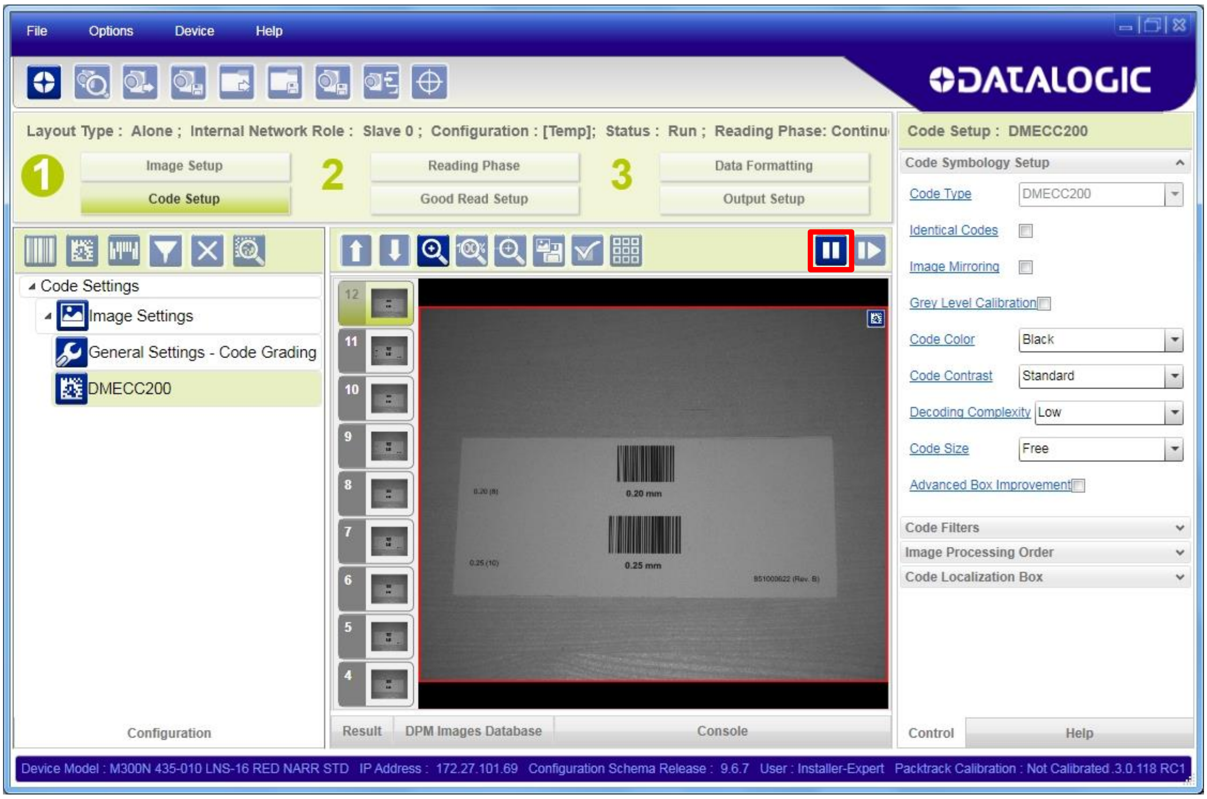
1. From the Task Area select Open Device Configuration.

2. The Open Device Configuration window opens showing the list of currently saved configurations (jobs) saved on the device. For new devices, the only saved job is the Default configuration. Click OK. The device enters run mode and begins acquiring images.


Task Selection
Open Device Configuration
Setup Internal Network Configuration
Packtrack Calibration
Monitor Device
Open Device Configuration
Default
OK
Cancel

☑ Set as Startup Configuration

3. Place the **Grade A Barcode Test Chart** in the reading area. Once positioned, stop image acquisition by clicking on the Pause button.



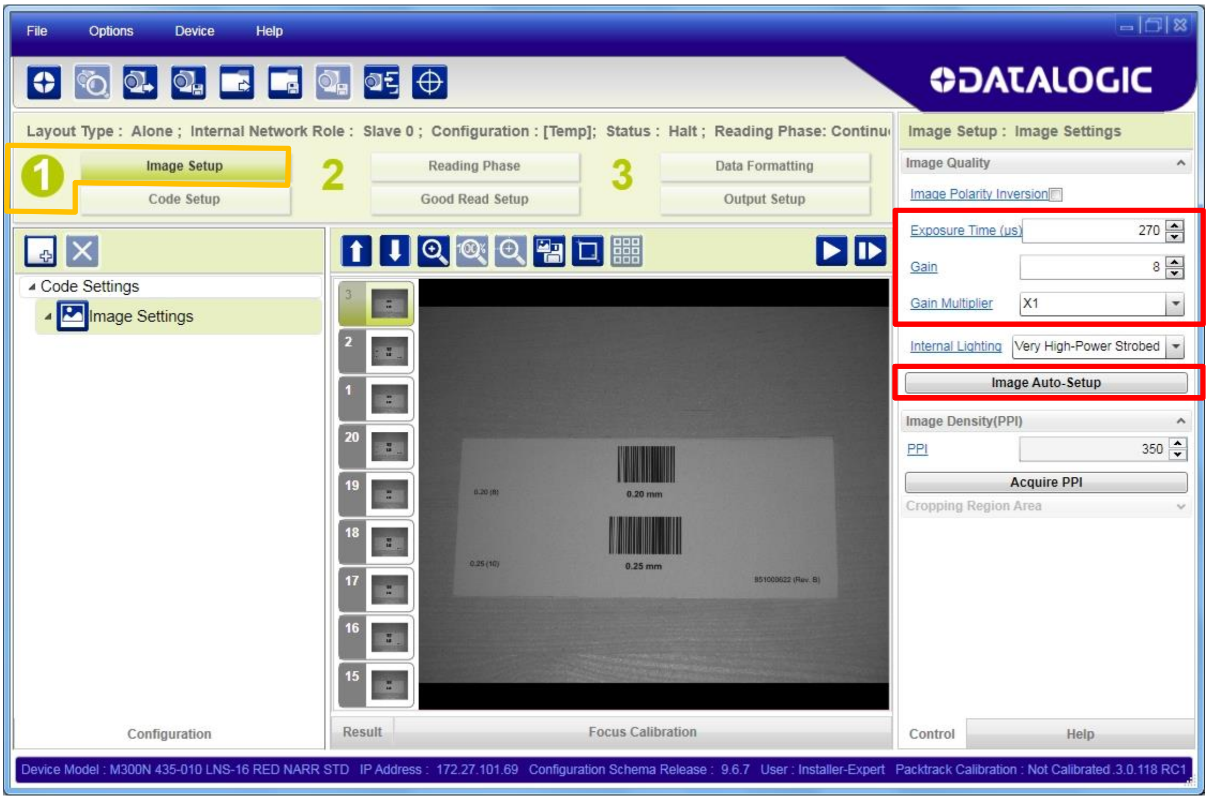
Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp]; Status : Run ; Reading Phase: Continu

Code Setup : DMECC200

Code Type	DMECC200
Identical Codes	□
Image Mirroring	□
Grey Level Calibration	□
Code Color	Black
Code Contrast	Standard
Decoding Complexity	Low
Code Size	Free
Advanced Box Improvement	□

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated 3.0.118 RC1

4. Click the Image Setup button and then click the Image Auto Setup button to automatically acquire the best exposure time and gain values.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp]; Status : Halt ; Reading Phase: Continu

Image Setup : Image Settings

Exposure Time (us) 270

Gain 8

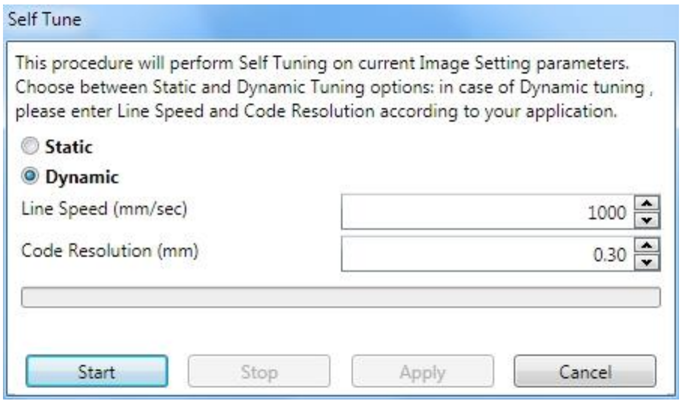
Gain Multiplier X1

Internal Lighting Very High-Power Strobed

PPI 350

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated 3.0.118 RC1

5. Select the Static or Dynamic Self-Tuning option; Start Autolearn and Apply to the Image Setup.



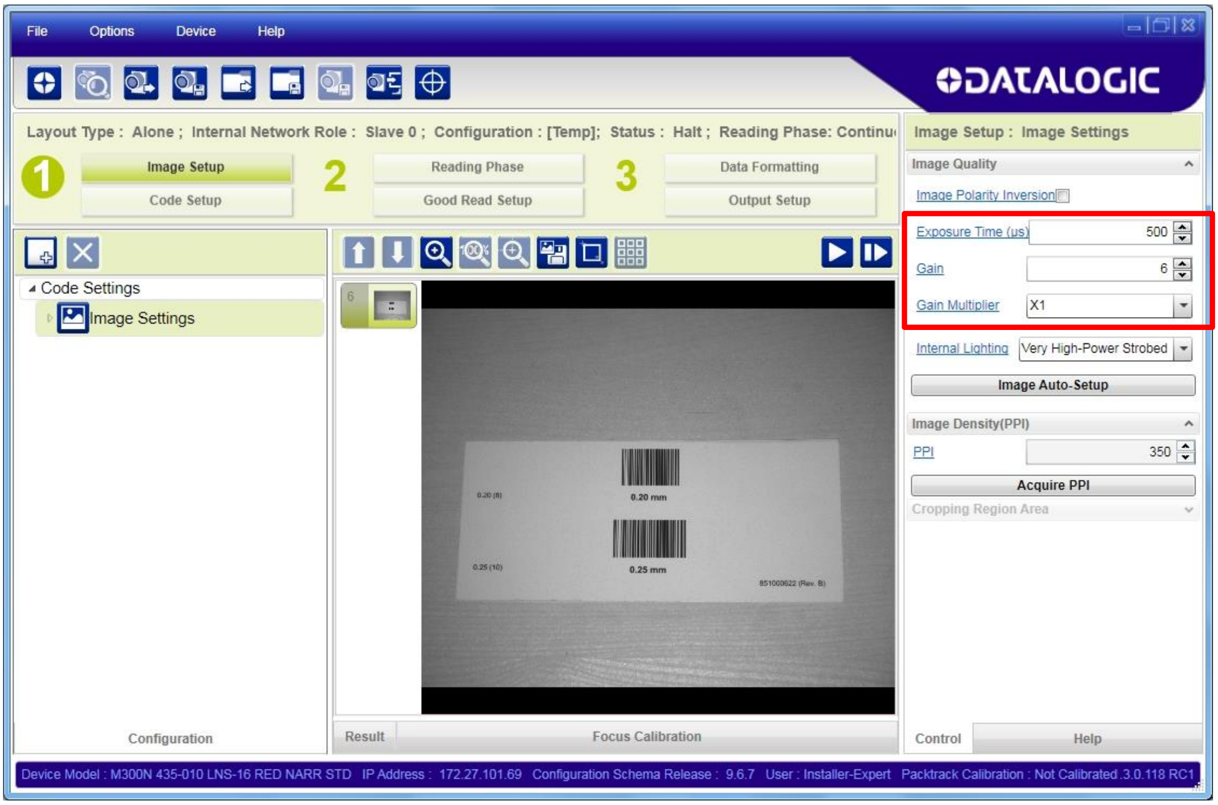
This procedure will perform Self Tuning on current Image Setting parameters. Choose between Static and Dynamic Tuning options: in case of Dynamic tuning , please enter Line Speed and Code Resolution according to your application.

○ Static

● Dynamic

Line Speed (mm/sec) 1000

Code Resolution (mm) 0.30



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp]; Status : Halt ; Reading Phase: Continu

Image Setup : Image Settings

Image Quality

Image Polarity Inversion □

Exposure Time (us) 500

Gain 6

Gain Multiplier X1

Internal Lighting Very High-Power Strobed

Image Auto-Setup

Image Density(PPI)

PPI 350

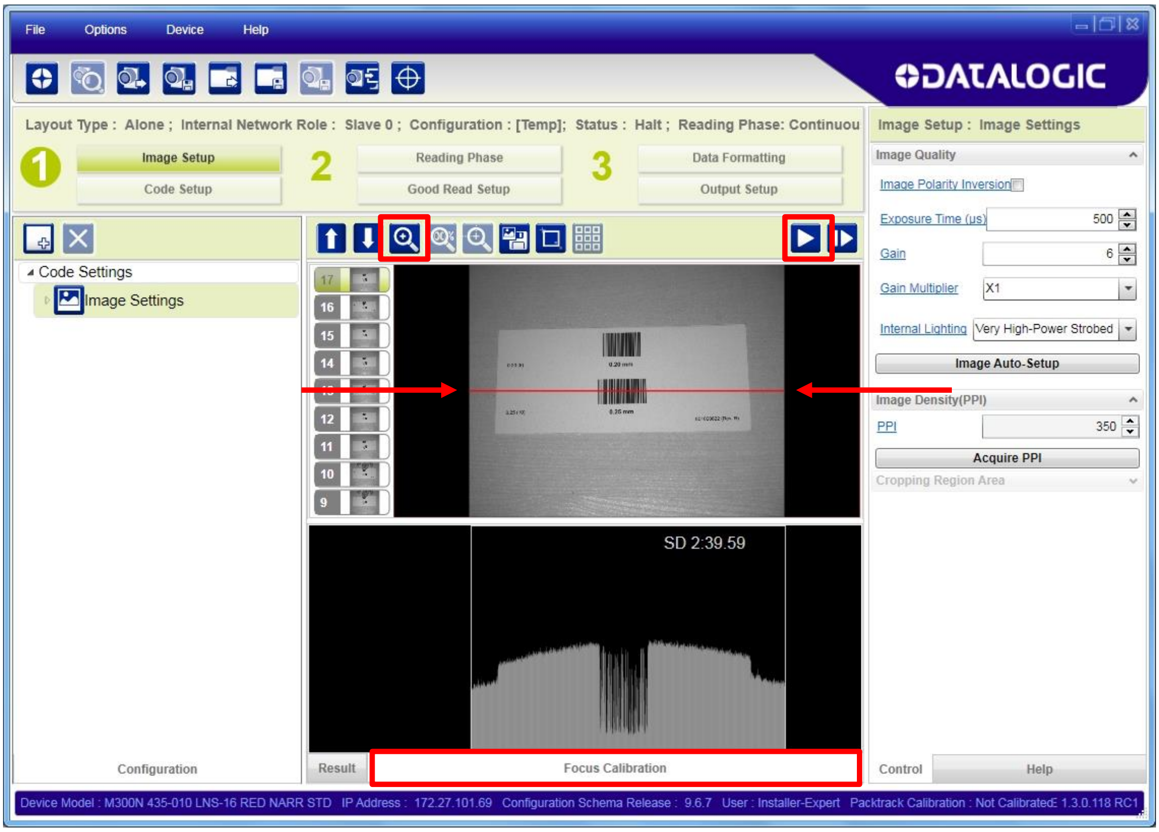
Acquire PPI

Cropping Region Area

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated 3.0.118 RC1

NOTE: For applications having multiple lighting or code reading conditions, up to 10 different Image Setups can be configured by adding them with the ⊞ icon.

6. Now click on the Focus Control tab at the bottom of the window. The oscilloscope view is shown in the bottom panel and can be used for manual focus adjustment.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp]; Status : Halt ; Reading Phase: Continuou

Image Setup : Image Settings

Image Quality

Image Polarity Inversion □

Exposure Time (us) 500

Gain 6

Gain Multiplier X1

Internal Lighting Very High-Power Strobed

Image Density(PPI)

PPI 350

Cropping Region Area

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated 1.3.0.118 RC1

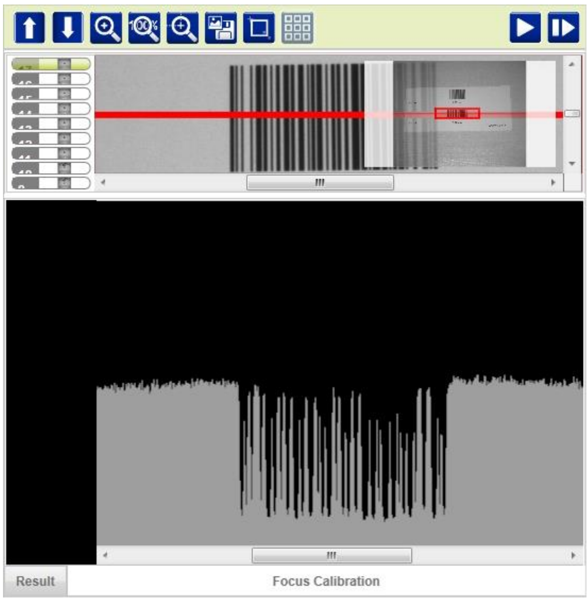
The red line in the image panel above the oscilloscope must pass through the code. Click Play to enter run mode and reposition the code.

NOTE: To enlarge the visual image of the code and the oscilloscope views, you can drag the Focus Calibration window up and click on the zoom image icon repositioning it on the code.

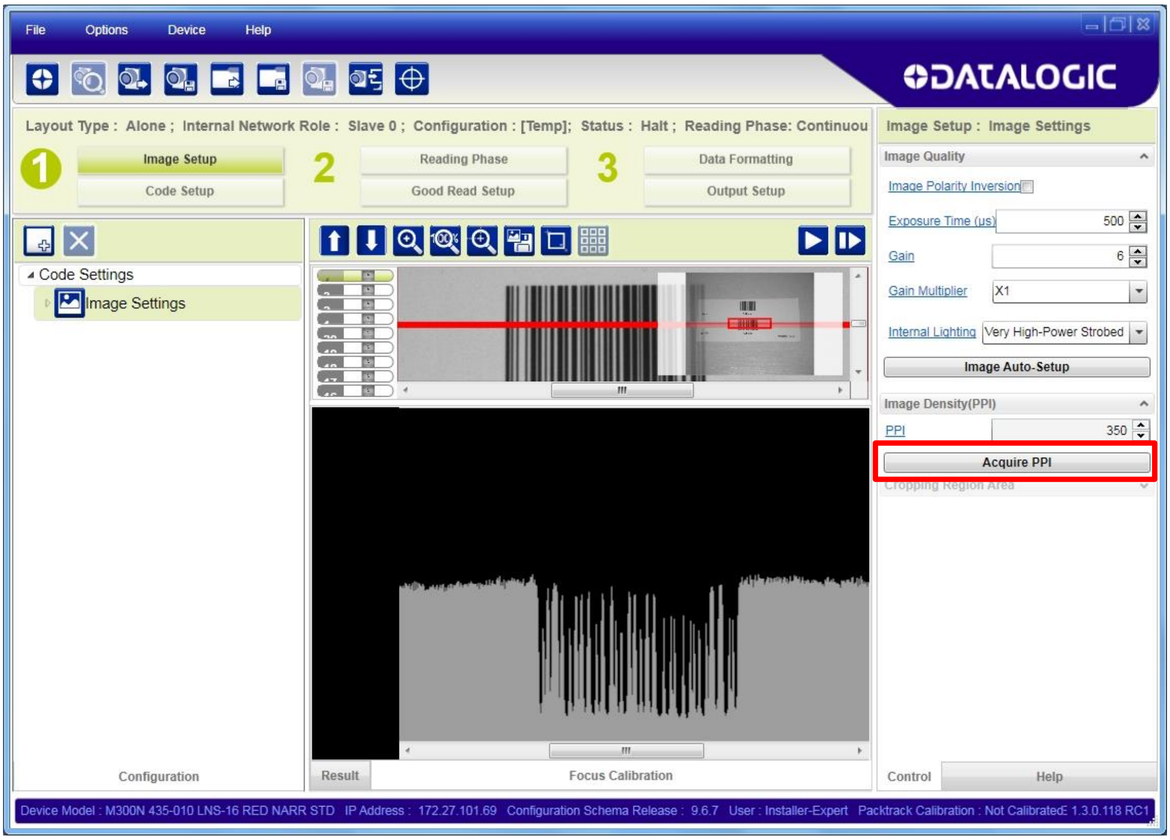
While in run mode, manually adjust the focus until the bars relative to the code in the oscilloscope demonstrate their maximum length (focus).

You can also see the visual focus on the code view.

When focused, click Pause to stop image acquisition.



7. Click the **Acquire PPI** button to automatically set Image Density so that reader will function correctly and to the fullest extent of its capabilities. This procedure is necessary for first time installations, or if the focal distance is changed.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp]; Status : Halt ; Reading Phase: Continuou

Image Setup : Image Settings

Image Polarity Inversion ☐

Exposure Time (us) 500

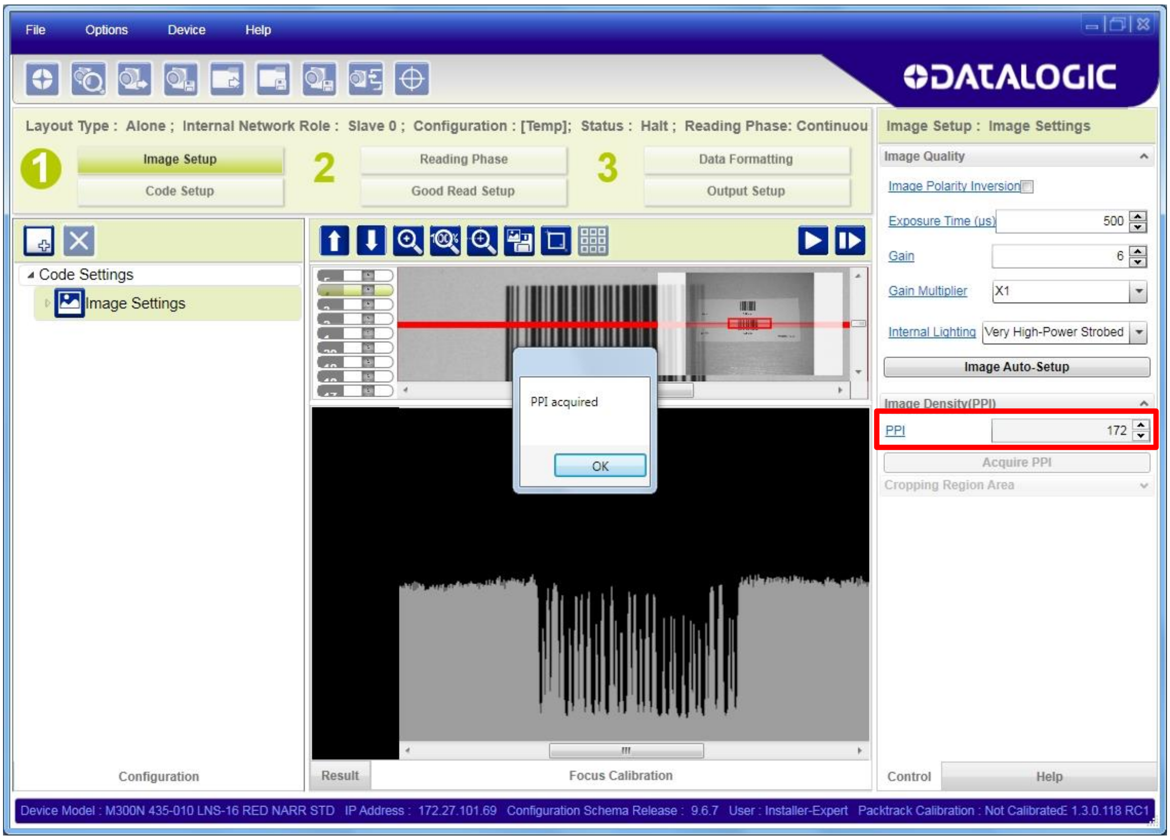
Gain 6

Gain Multiplier X1

Internal Lighting Very High-Power Strobed

PPI 350

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated: 1.3.0.118 RC1



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp]; Status : Halt ; Reading Phase: Continuou

Image Setup : Image Settings

Image Polarity Inversion ☐

Exposure Time (us) 500

Gain 6

Gain Multiplier X1

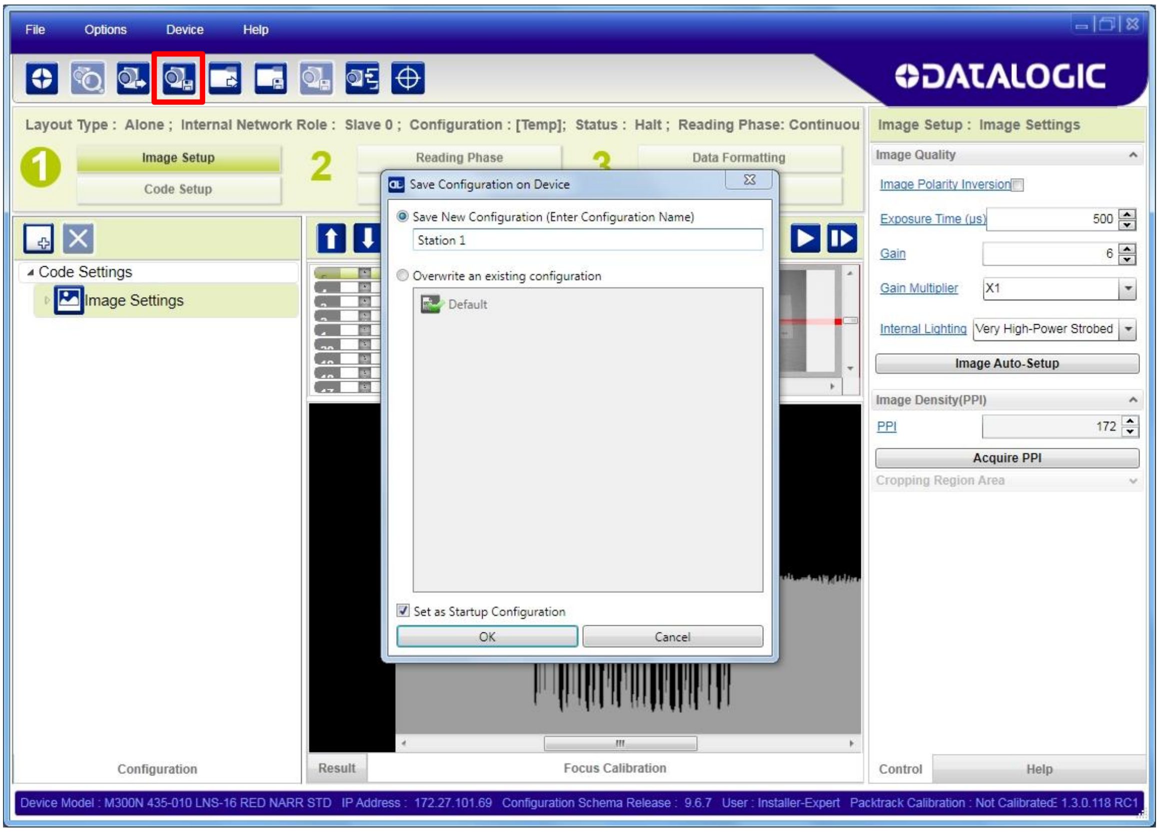
Internal Lighting Very High-Power Strobed

PPI 172

PPI acquired

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated: 1.3.0.118 RC1

NOTE: At this point it is probably a good idea to save the configuration from temporary memory to permanent memory giving it a specific name.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp]; Status : Halt ; Reading Phase: Continuou

Save Configuration on Device

● Save New Configuration (Enter Configuration Name)

Station 1

○ Overwrite an existing configuration

Default

☑ Set as Startup Configuration

OK Cancel

Image Setup : Image Settings

Image Quality

Image Polarity Inversion □

Exposure Time (us) 500

Gain 6

Gain Multiplier X1

Internal Lighting Very High-Power Strobed

Image Density(PPI)

PPI 172

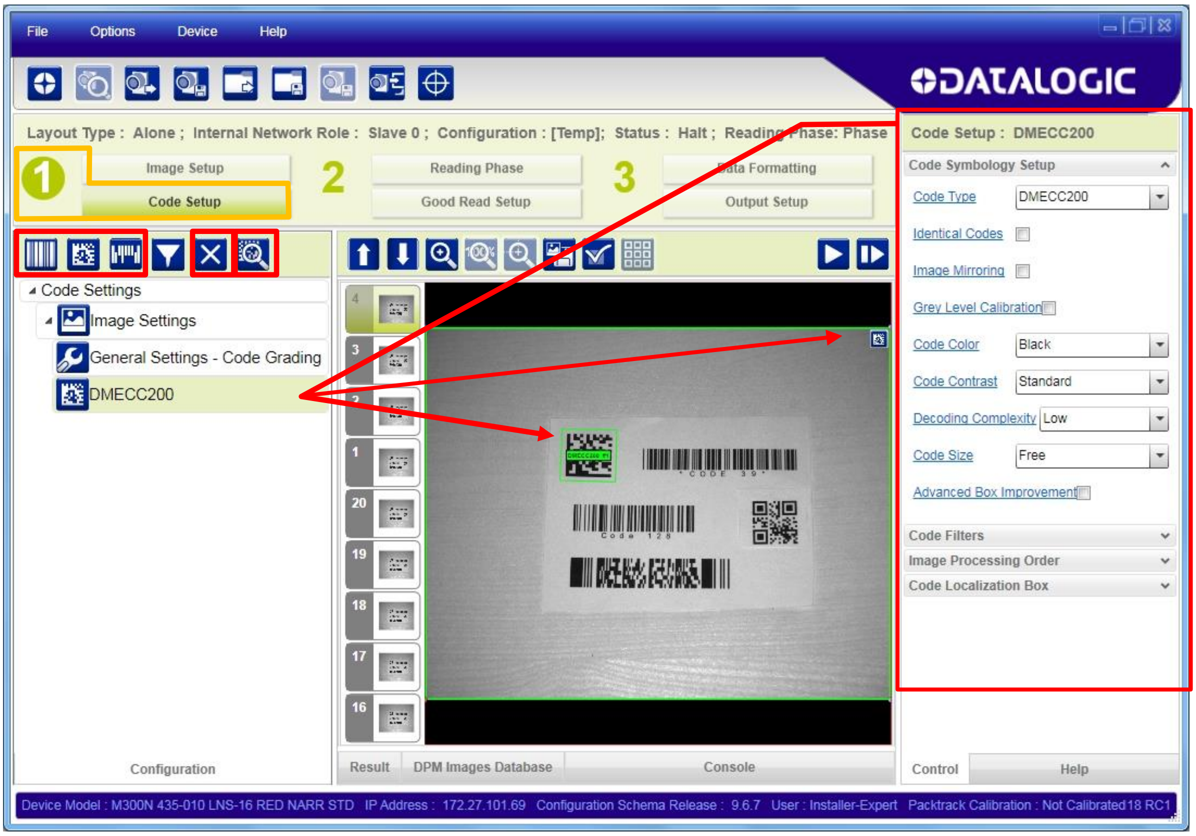
Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated 1.3.0.118 RC1

8. Now place **an application specific code** in front of the reader and **only** click the **Image Auto-Setup** button to register any changes in lighting or code surface contrast.

   Do not repeat Focus Calibration or PPI.

3.2.2 Code Setup

1. Click on the Code Setup button. By default, the Data Matrix ECC 200 symbology is enabled. If this symbology is among those in your application it will be shown in the image display with its code symbology name and a green box around it indicating it is decoded.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp]; Status : Halt ; Reading Phase: Phase

Code Setup : DMECC200

Code Symbology Setup

Code Type: DMECC200

Identical Codes □

Image Mirroring □

Grey Level Calibration □

Code Color: Black

Code Contrast: Standard

Decoding Complexity: Low

Code Size: Free

Advanced Box Improvement □

Code Filters

Image Processing Order

Code Localization Box

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated 18 RC1

NOTE: The large green box for each symbol indicates the code localization area which by default is equal to the maximum FoV. It can be resized and moved by dragging its borders with the mouse. The code must be found within this area in order to be decoded.

2. Add your application specific codes to the Code Settings by selecting them from the icons over the Configuration Parameters tree area. If the Data Matrix symbology is not used, then delete it from the Code Settings with the ☒ icon.

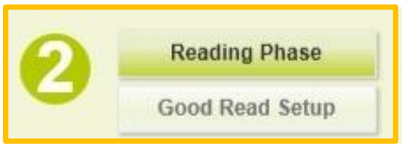
   If you don't know the code type you can use the Code Autolearn feature by clicking on the 🔍 icon. See par. 4.4 for details.

3. For each code symbology set the relative parameters according to your application.

3.3 OPERATING MODE CONFIGURATION PARAMETERS

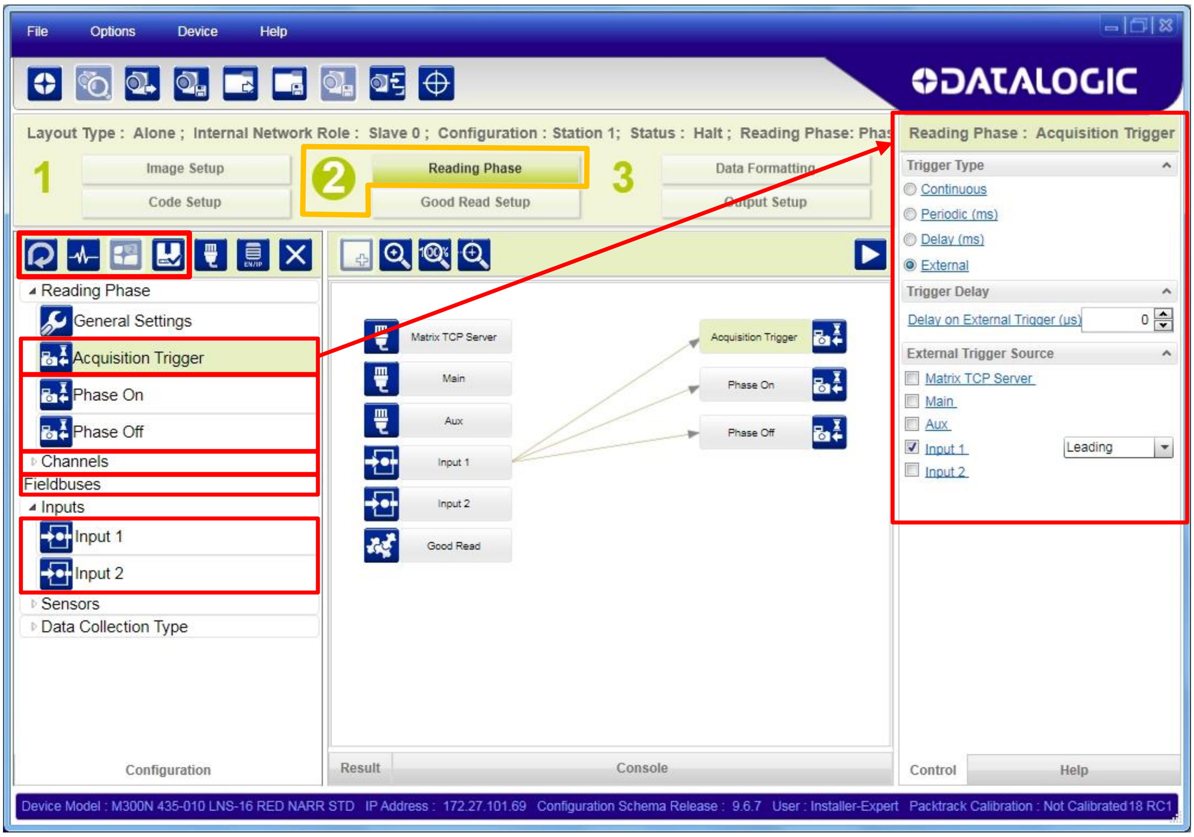
The Operating Mode Configuration parameters are divided into two groups: **Reading Phase** parameters and **Good Read Setup** parameters.

Operating Mode Group



3.3.1 Reading Phase

1. Select your application specific Operating Mode from the icons over the Configuration Parameters tree area: Continuous, One Shot, Phase Mode or PackTrack.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : Station 1; Status : Halt ; Reading Phase: Phas

Reading Phase : Acquisition Trigger

Trigger Type
○ Continuous
○ Periodic (ms)
○ Delay (ms)
● External

Trigger Delay
Delay on External Trigger (us) 0

External Trigger Source
□ Matrix TCP Server
□ Main
□ Aux
☑ Input 1 Leading
□ Input 2

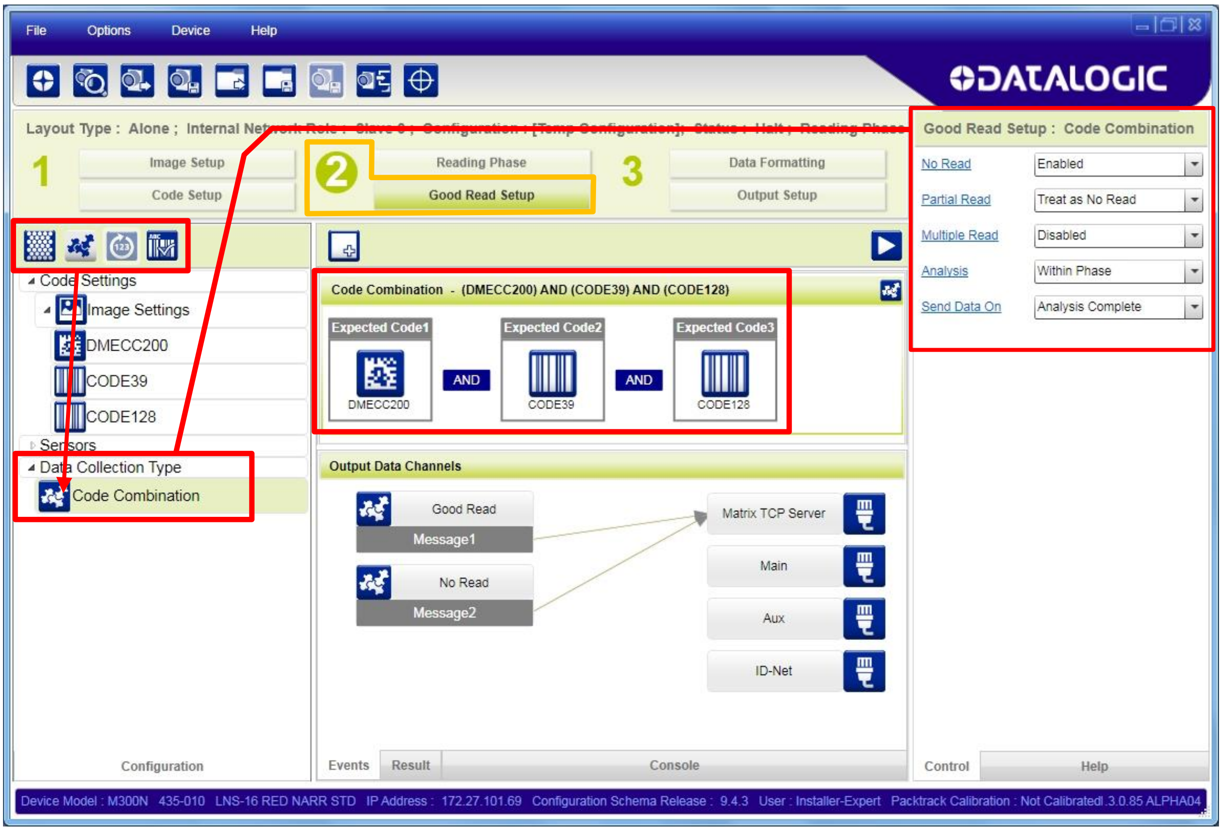
Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated18 RC1

2. Configure the relative Operating Mode parameters from the Reading Phase parameters panel. Different groups will appear in the panel depending on the selected icons over the Configuration Parameters tree area.

3.3.2 Good Read Setup

1. Select your specific data collection type from the icons over the Configuration Parameters tree area: Code Collection, Code Combination, Presentation or Match Code. Not all data collection types are available for all Operating Modes; for example PackTrack Operating Mode only supports Code Combination. Incompatible data collection types will be shown in grey and cannot be selected.

   The following example shows Code Combination. By default, the Expected Codes (when more than one code type is selected), are in logical AND, which means that all codes are required to be decoded to produce a Good Read condition.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Phase

Good Read Setup : Code Combination

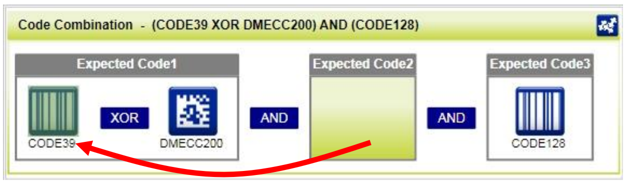
No Read: Enabled
Partial Read: Treat as No Read
Multiple Read: Disabled
Analysis: Within Phase
Send Data On: Analysis Complete

Code Combination - (DMECC200) AND (CODE39) AND (CODE128)

Expected Code1: DMECC200 AND Expected Code2: CODE39 AND Expected Code3: CODE128

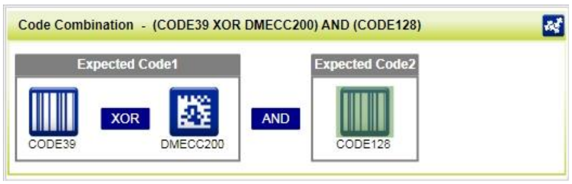
Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated|.3.0.85 ALPHA04

2. If a Good Read condition should be produced when any single code is decoded, independent from the others, then they need to be combined in logical XOR. To do this, drag the code icon(s) from their relative Expected Code box into the Expected Code box of the XOR combination you wish to create. Then delete the empty box by selecting it with the mouse (highlighted) and pressing the delete key on your keyboard.



Code Combination - (CODE39 XOR DMECC200) AND (CODE128)

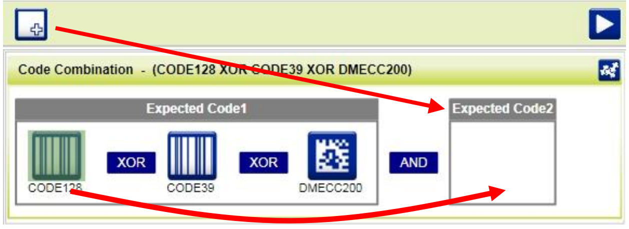
Expected Code1: CODE39 XOR DMECC200 AND Expected Code2 AND Expected Code3: CODE128



Code Combination - (CODE39 XOR DMECC200) AND (CODE128)

Expected Code1: CODE39 XOR DMECC200 AND Expected Code2: CODE128

To create a logical AND condition from a logical XOR, create a new Expected Code box using the ⊞ icon. Then drag the desired code icon from one box to the other.



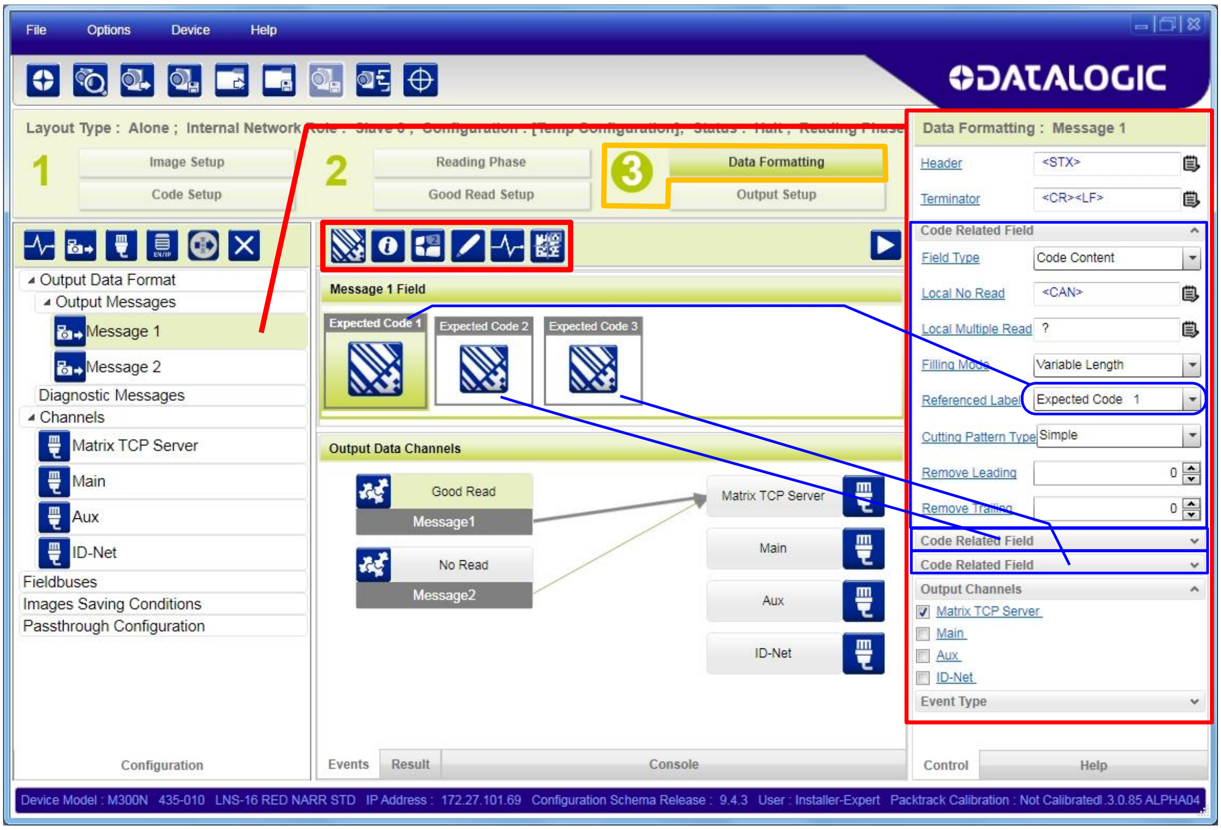
3.4 OUTPUT CONFIGURATION PARAMETERS

The Output Configuration parameters are divided into two groups: **Data Formatting** parameters and **Output Setup** parameters.

Output Group

3.4.1 Data Formatting

1. Configure your application specific Data Formatting Message(s) from the Configuration Parameters tree area: Message 1, Message 2, etc.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Phase

Data Formatting : Message 1

Header <STX>

Terminator <CR><LF>

Code Related Field

- Field Type: Code Content
- Local No Read <CAN>
- Local Multiple Read: ?
- Filling Mode: Variable Length
- Referenced Label: Expected Code 1
- Cutting Pattern Type: Simple
- Remove Leading: 0
- Remove Trailing: 0

Code Related Field

Code Related Field

Output Channels

- ☑ Matrix TCP Server
- □ Main
- □ Aux
- □ ID-Net

Event Type

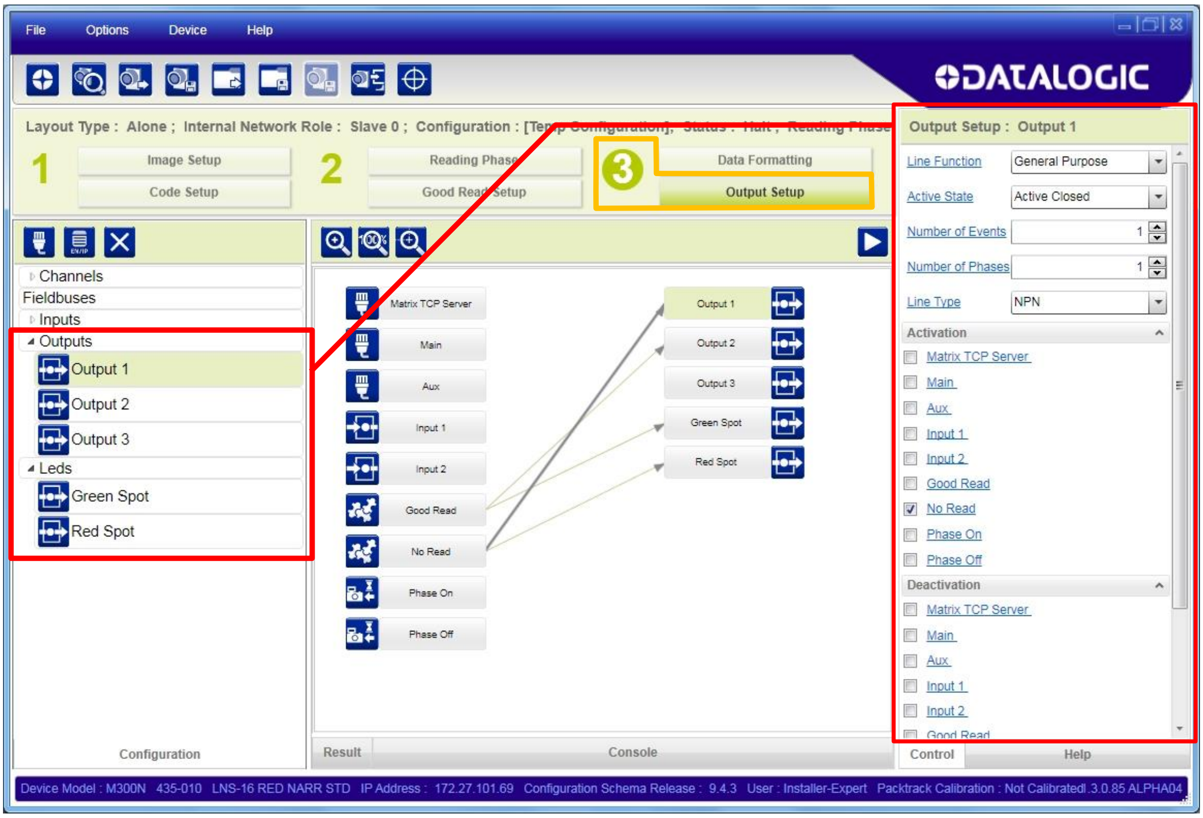
Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated| 3.0.85 ALPHA04

You can add fields to the output message by clicking on the icons above the Message Field area. They will be appended to the message. You can drag them to position them between other fields in the message so that the output message is ordered according to your application requirements.

Each field has its own relative configuration parameters in the parameters panel.

3.4.2 Output Setup

1. Configure your application specific Digital Output(s) and Green/Red Spots (if used) from the Configuration Parameters tree area: Output 1, Output 2, etc.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Phase

Output Setup : Output 1

Line Function: General Purpose

Active State: Active Closed

Number of Events: 1

Number of Phases: 1

Line Type: NPN

Activation

- ☐ Matrix TCP Server
- ☐ Main
- ☐ Aux
- ☐ Input 1
- ☐ Input 2
- ☐ Good Read
- ☑ No Read
- ☐ Phase On
- ☐ Phase Off

Deactivation

- ☐ Matrix TCP Server
- ☐ Main
- ☐ Aux
- ☐ Input 1
- ☐ Input 2
- ☐ Good Read

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibratedl.3.0.85 ALPHA04

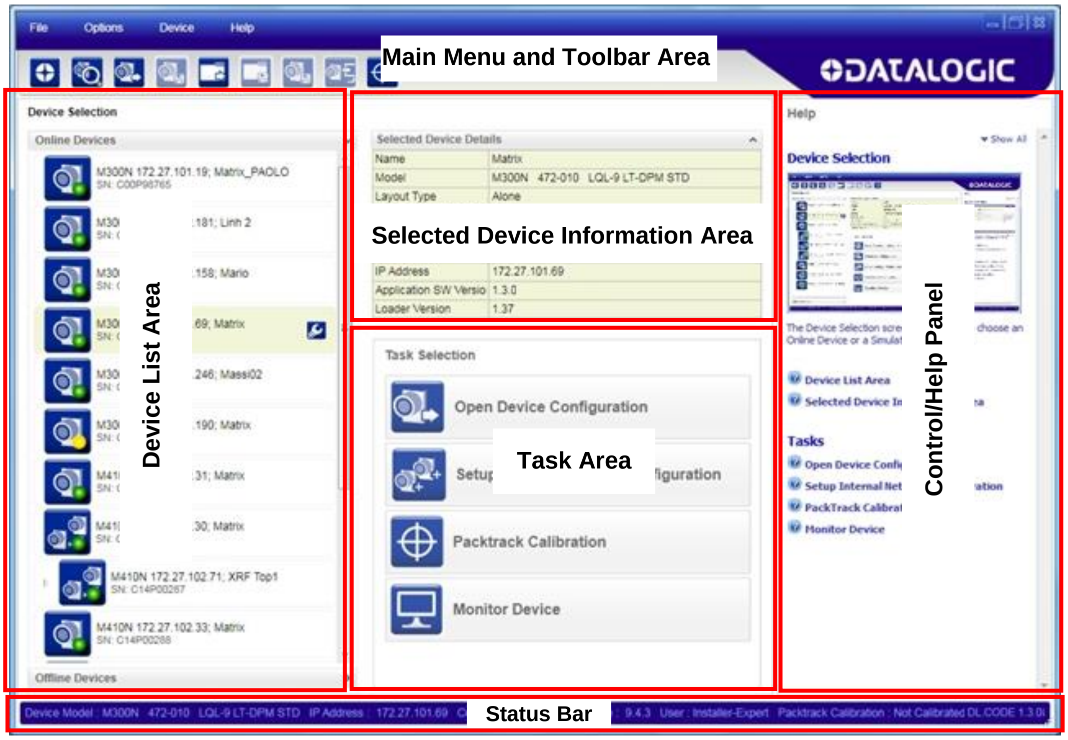
NOTE: Save the configuration from temporary memory to permanent memory, overwriting the previously saved configuration.

4 DL.CODE USER INTERFACE

4.1 DL.CODE DEVICE DISCOVERY WINDOW

After loading your specific device from the discovery window (drag & drop from the Device Selection Area), the DL.CODE Device Discovery window presents the following principal areas:

- **Main Menu and Toolbar Area** – allows access to the major program functions and commands. See par. 4.2.
- **Device List Area** – shows all the discovered devices both on and off the LAN. The colored icons next to the device labels indicate network status, see par. 4.1.1. Double-clicking or dragging an available device icon onto the Device Information Area connects it to DL.CODE for configuration.
- **Device Information Area** – this area shows all device specific information: Name, Model, Role, running software and version details.
- **Task Area** – Presents a graphical list of the main features to be performed upon device connection: create a new configuration (Stand Alone or Master/Slave), Open an existing configuration, perform PackTrack calibration, or switch to Monitor mode. These selections are also available in the File and Device Menus.
- **Control/Help Panel** – In the DL.CODE opening window this panel provides a Help description for Device Selection. Once a new or existing configuration is loaded, this is the key area which allows all the individual device configuration parameters to be set. Context sensitive Help is also available from this panel. See par. 4.1.2.
- **Status Bar** – a reserved area that keeps specific information about the connected device, SW schema revision, user level, calibration status, and program version always visible.



M300N 172.27.101.19; Matrix_PAOLO
SN: C00P98765

M410N 172.27.102.71; XRF Top1
SN: C14P00267

M410N 172.27.102.33; Matrix
SN: C14P00288

Name	Matrix
Model	M300N 472-010 LQL-9 LT-DPM STD
Layout Type	Alone
IP Address	172.27.101.69
Application SW Versio	1.3.0
Loader Version	1.37

Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.69 ... 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated DL.CODE 1.3.0

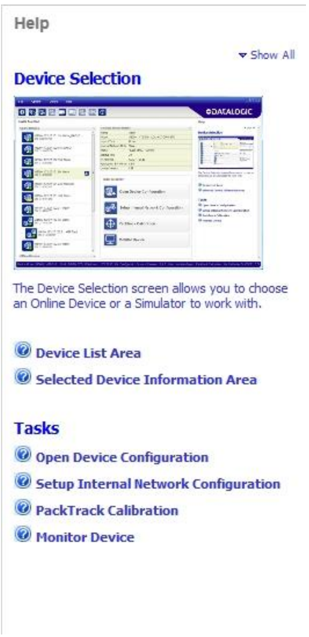
Figure 5 – Device Discovery Window Areas

4.1.1 Device List Area

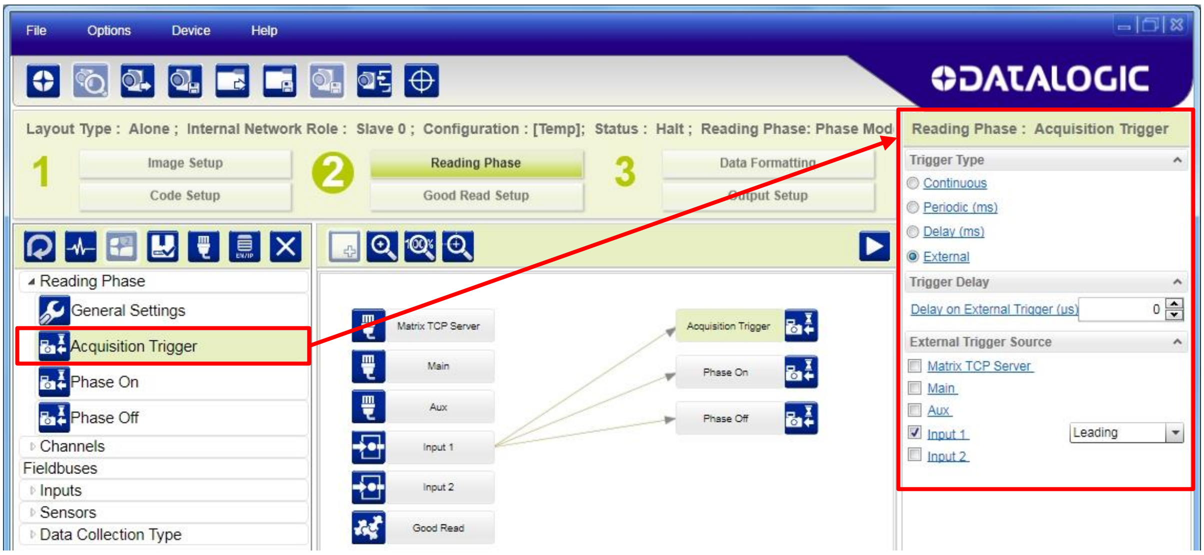
The Device List area shows all the discovered devices both on and off the LAN. The icons indicate the Device status as shown in the table below:

🟢	Stand Alone device connected to the network with a valid LAN IP address. Available for configuration through DL.CODE.
🟡	Stand Alone device connected to the network with a valid LAN IP address but currently connected to DL.CODE by another User. Not available for configuration through DL.CODE (double-clicking or dragging the icon has no effect).
🟢	Device connected to the network but without a valid LAN IP address (i.e. default IP address). The IP addressing parameters must be modified to connect to the LAN. See par. 3.1.
🔴	Offline device deactivated. Only one offline device at a time can be activated.
▷ 🟢	Master device connected to the network with a valid LAN IP address. Available for configuration through DL.CODE.

4.1.2 Control/Help Panel

Upon opening DL.CODE, the Device Selection Help Page is displayed with dropdown descriptions briefly explaining how to connect to your device and the various configuration selections. Click on the ? icon to open the dropdown description.	 Help ▾ Show All Device Selection The Device Selection screen allows you to choose an Online Device or a Simulator to work with. Device List Area Selected Device Information Area Tasks Open Device Configuration Setup Internal Network Configuration PackTrack Calibration Monitor Device

When a new configuration is created or an existing one is opened, the Control page showing all of the configuration parameters for the selected configuration step or item is displayed in the Help/Control area.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp]; Status : Halt ; Reading Phase: Phase Mod

- Reading Phase
  - General Settings
  - Acquisition Trigger
  - Phase On
  - Phase Off
- Channels
- Fieldbuses
- Inputs
- Sensors
- Data Collection Type

Reading Phase : Acquisition Trigger

Trigger Type

○ Continuous
○ Periodic (ms)
○ Delay (ms)
● External

Trigger Delay

Delay on External Trigger (us) 0

External Trigger Source

□ Matrix TCP Server
□ Main
□ Aux
☑ Input 1 Leading
□ Input 2

By clicking on any parameter name with a hyperlink, the relative contextual help page will open and present the specific parameter description.

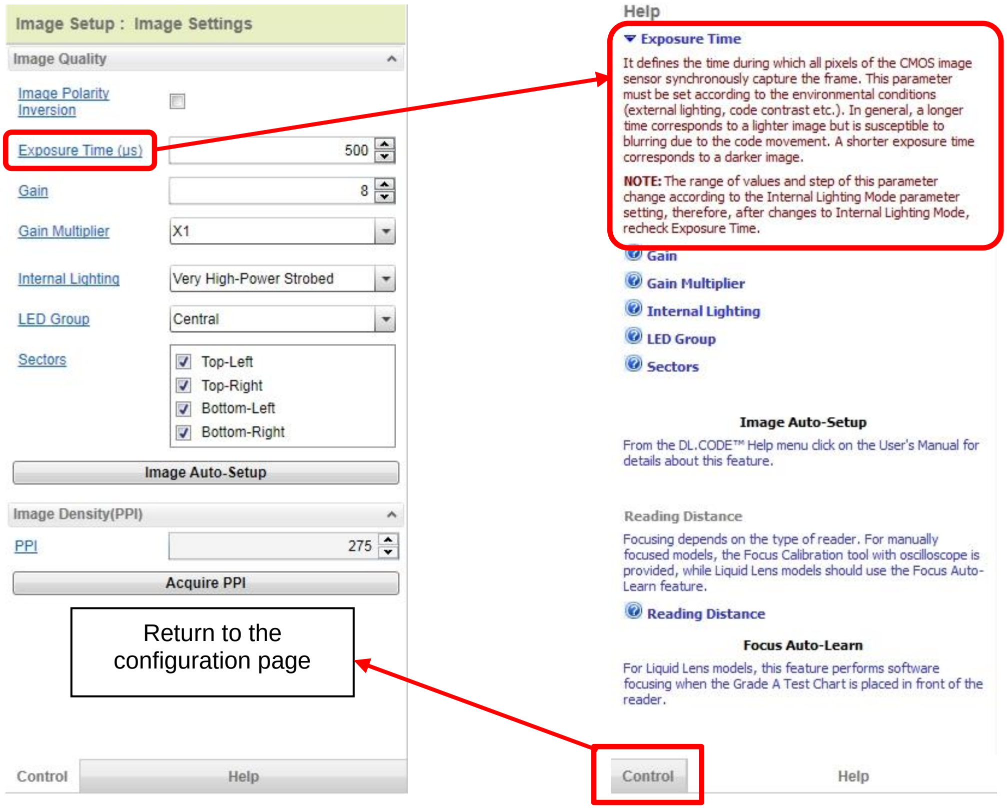


Image Setup : Image Settings

Image Quality

Image Polarity Inversion	□
Exposure Time (us)	500
Gain	8
Gain Multiplier	X1
Internal Lighting	Very High-Power Strobed
LED Group	Central
Sectors	☑ Top-Left ☑ Top-Right ☑ Bottom-Left ☑ Bottom-Right

Image Density(PPI)

PPI	275

Return to the configuration page

Help

▼ Exposure Time

It defines the time during which all pixels of the CMOS image sensor synchronously capture the frame. This parameter must be set according to the environmental conditions (external lighting, code contrast etc.). In general, a longer time corresponds to a lighter image but is susceptible to blurring due to the code movement. A shorter exposure time corresponds to a darker image.

NOTE: The range of values and step of this parameter change according to the Internal Lighting Mode parameter setting, therefore, after changes to Internal Lighting Mode, recheck Exposure Time.

- Gain
- Gain Multiplier
- Internal Lighting
- LED Group
- Sectors

Image Auto-Setup

From the DL.CODE™ Help menu click on the User's Manual for details about this feature.

Reading Distance

Focusing depends on the type of reader. For manually focused models, the Focus Calibration tool with oscilloscope is provided, while Liquid Lens models should use the Focus Auto-Learn feature.

- Reading Distance

Focus Auto-Learn

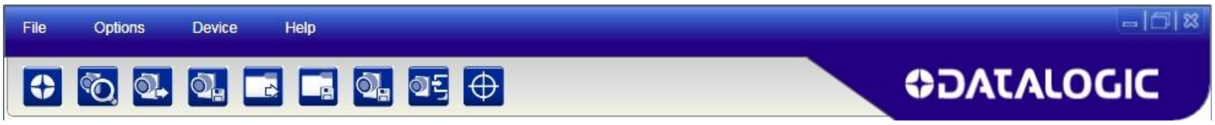
For Liquid Lens models, this feature performs software focusing when the Grade A Test Chart is placed in front of the reader.

Figure 6 – Control Panel and Relative Contextual Help Page

To return to the parameter page, click on the **Control** bar.

4.2 DL.CODE MAIN MENU AND TOOLBAR

The Main Menu and Toolbar icons are located at the top of the DL.CODE window as shown below.



The Main Menu presents the following items:

File:

- **Getting Started**: returns to the initial Device Discovery window to load a different device. You will be prompted to Save or Discard the current configuration.
- **Open**: load a previously saved configuration from the device memory or from a .dlcfg file selected from a disk/directory of your choice.
- **Save**: save the current configuration to the device memory or to a .dlcfg file selected from a disk/directory of your choice.
- **Setup Internal Network**: sets the current device's internal network Role to Master and performs the Net Auto-set feature to automatically recognize its connected ID-NET Slaves. The Internal Network Configuration window allows ID-NET configuration management. See chapter 9 for details.
- **Monitor**: sets the device to run mode for testing configuration results. An image window is displayed along with Statistics, Diagnostics and a Console for output message verification. See chapter 7 for details on using and configuring the Monitor.
- **Exit**: exits the DL.CODE User Interface.

Options:

- **Change Language**: allows you to change the display language used for DL.CODE in real time. The selected language will also be used for successive sessions.
- **UI Settings**: opens a window where various settings regarding DL.CODE presentation on the PC. The following DL.CODE features can be configured: console presentation, Image Buffer positioning and behavior, Simulator Settings, and selecting which features to enable for viewing. The Monitor can also be configured from this window by selecting the Monitor tab.
- **Change Log Level**: allows the configuration log level to be changed between Verbose, Information and Error.
- **Change User**: allows the configuration access level to be changed between Basic-User (no parameters modification allowed), Basic-Installer (medium level of parameter modification allowed) and Expert-Installer (maximum level of parameter modification allowed).
- **Restore UI to Default**: restores all UI panels to their default positions.

Device:

- **Connect to Device**: if not already connected to a device, this allows you to connect to a device on the LAN by inputting its IP Address into the dialog box and clicking Connect.

- **Find Devices**: searches for new devices connected to the LAN without disconnecting from the current device.
- **Settings**: opens device configuration windows for configuring Environment parameters (see chp. 12), Advanced Configuration Settings, resetting Statistics and/or Diagnostic counters and viewing HMP shortcuts.
- **Update Package**: allows updating the device firmware (application program, schema, etc.)
- **Change Current Configuration**:
- **Restart Device**: performs a software reset on the loaded device.
- **Backup/Restore**: manages all the backup and restore options to and from the device as well as restoring the default settings.
- **RAM Image Buffer Settings**: opens the RAM Image Buffer Management window to either save or discard images in the device's RAM Image Buffer.
- **PackTrack Calibration**: launches the Packtrack Calibration procedure. See chapter 10 for details.

Help:

- **About**: opens the information window containing the DL.CODE program release version number.
- **DL.CODE User's Manual**: opens this manual.

Toolbar buttons:

⊕	Getting Started: Disconnects the current device and returns to the Device Discovery window. If the current configuration hasn't been saved you will be prompted to do so before disconnecting.
	Find Devices: Executes a device discovery to find new or modified devices on the LAN without disconnecting from the current device.
	Open Device Configuration: Open a previously saved configuration from the device memory. You can create a new configuration by opening a configuration in the list and then saving it with a new name.
	Save on Device: Save the current configuration to the device.
	Load from PC: Open a previously saved .dlcfg configuration file from the local PC or from a remote network location.
	Save on PC: Save the current configuration to a .dlcfg file on the local PC or to a remote network location.
	Save Configuration in Temporary Memory:
	Configuration/Monitor Switch: toggles between the Configuration environment and the Monitor environment. See chp. 7 for details.
⊕	PackTrack Calibration: starts the PackTrack Calibration feature. See chapter 10.

4.2.1 User Levels

DL.CODE has a 3-level user interface (**Basic User** level, **Basic Installer** level, **Expert Installer** level).

Each level can be accessed by selecting it from the Options Menu.

The User levels have the following access rights.

Basic User: only access to the Monitor feature is given. No device configuration.

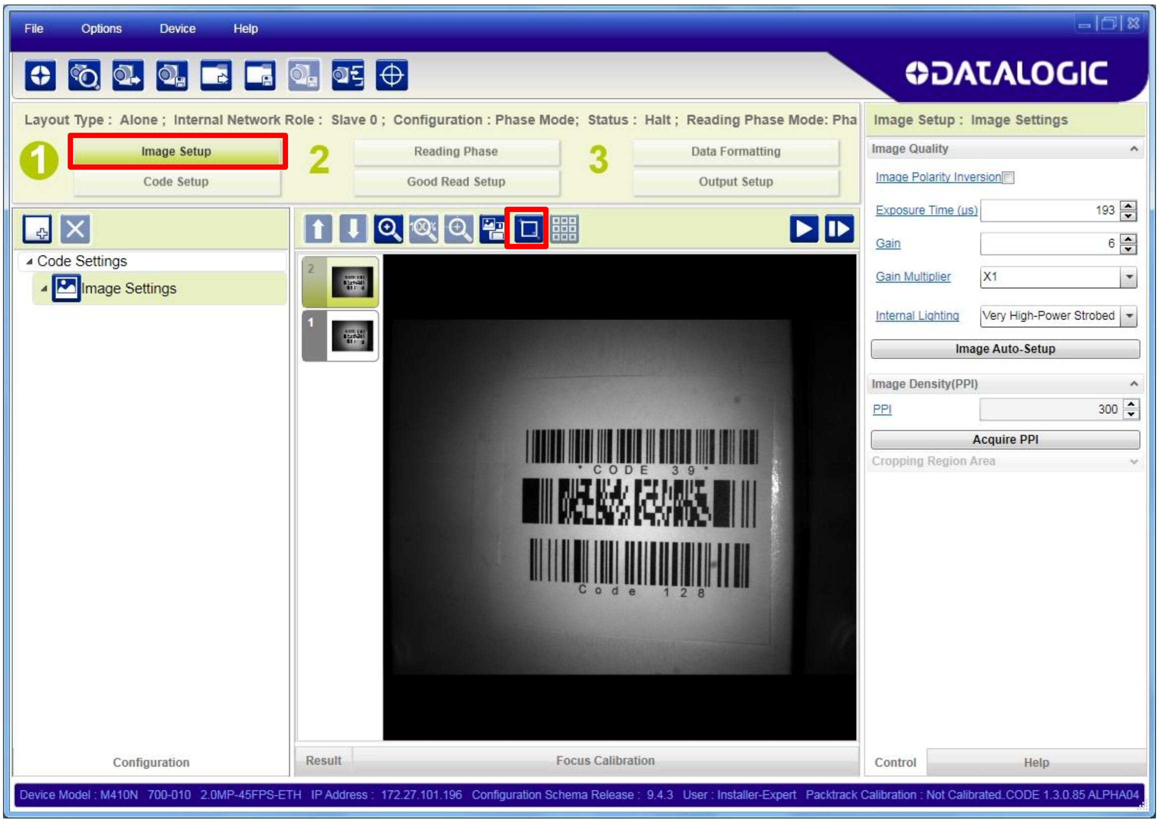
Basic Installer: a subset of program features and configuration parameters is allowed.
No Master/Slave configuration, no multiple Image Setup configuration, no Postal Codes configuration, no Code Filter configuration, no Fieldbus configuration.

Expert Installer: access is given to all program features and configuration parameters.

4.3 IMAGE CROPPING

In some applications, the Image Cropping feature in DL.CODE can help to increase decoding and result performance. Image cropping is performed from the Image Setup tab by clicking on the Add Cropping Region icon as shown below.

Image cropping allows reducing the Image processing area from the full FoV to a smaller area where codes are present. By excluding portions of the FoV, processing time is reduced.



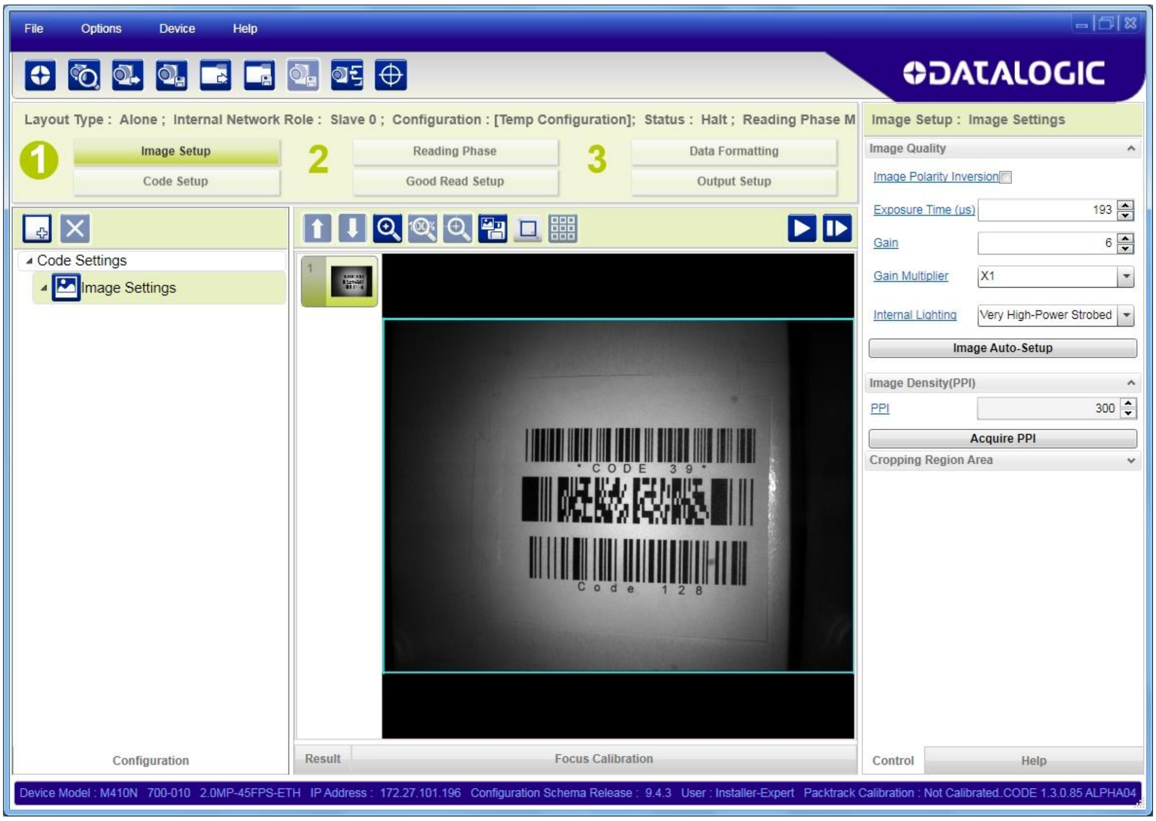
Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : Phase Mode; Status : Halt ; Reading Phase Mode: Pha

Image Setup : Image Settings

Image Polarity Inversion □
Exposure Time (us) 193
Gain 6
Gain Multiplier X1
Internal Lighting Very High-Power Strobed
PPI 300

Device Model : M410N 700-010 2.0MP-45FPS-ETH IP Address : 172.27.101.196 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated CODE 1.3.0.85 ALPHA04

After clicking the Add Cropping Region icon, a blue border appears which by default is equal to the FoV.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Phase M

Image Setup : Image Settings

Image Quality

Image Polarity Inversion □

Exposure Time (us) 193

Gain 6

Gain Multiplier X1

Internal Lighting Very High-Power Strobed

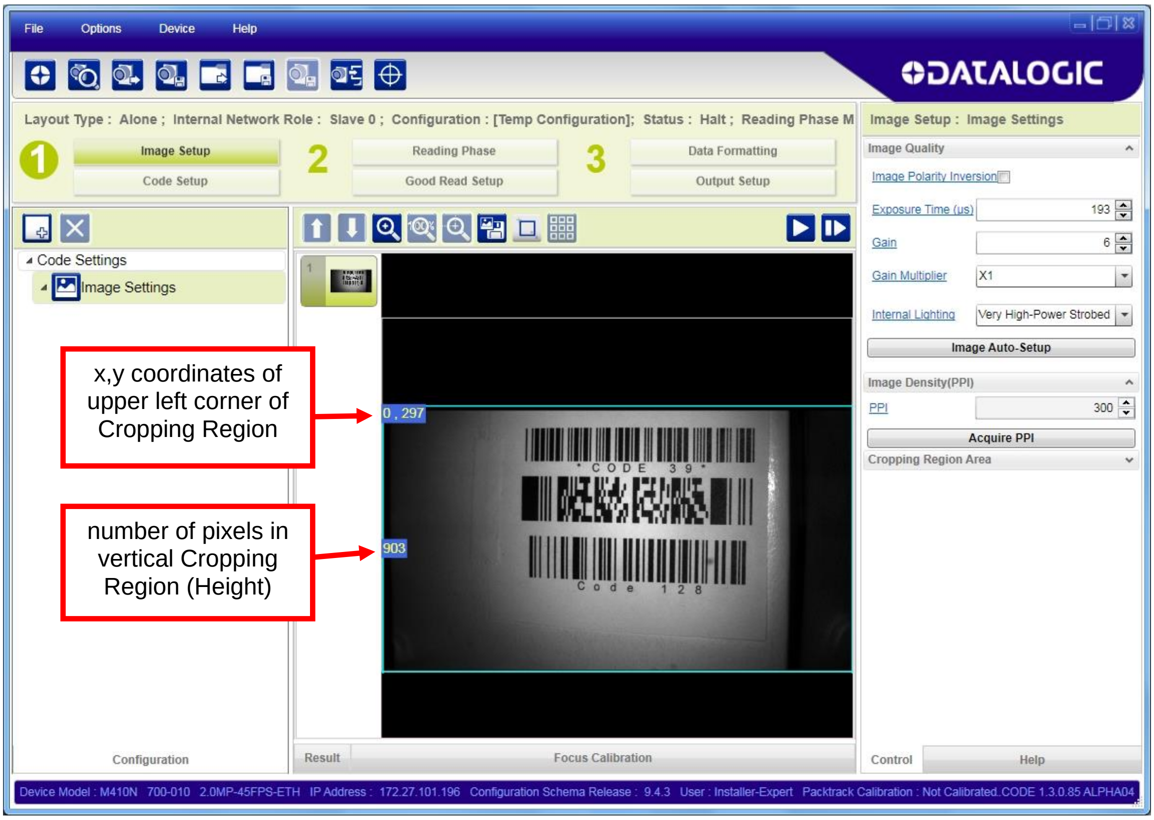
Image Density(PPI)

PPI 300

Cropping Region Area

Device Model : M410N 700-010 2.0MP-45FPS-ETH IP Address : 172.27.101.196 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated CODE 1.3.0.85 ALPHA04

By dragging the edges with the mouse (resizing) you can crop the image (measured in pixels), to a specific location where codes are present.



x,y coordinates of upper left corner of Cropping Region

number of pixels in vertical Cropping Region (Height)

Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Phase M

Image Setup : Image Settings

Image Quality

Image Polarity Inversion □

Exposure Time (us) 193

Gain 6

Gain Multiplier X1

Internal Lighting Very High-Power Strobed

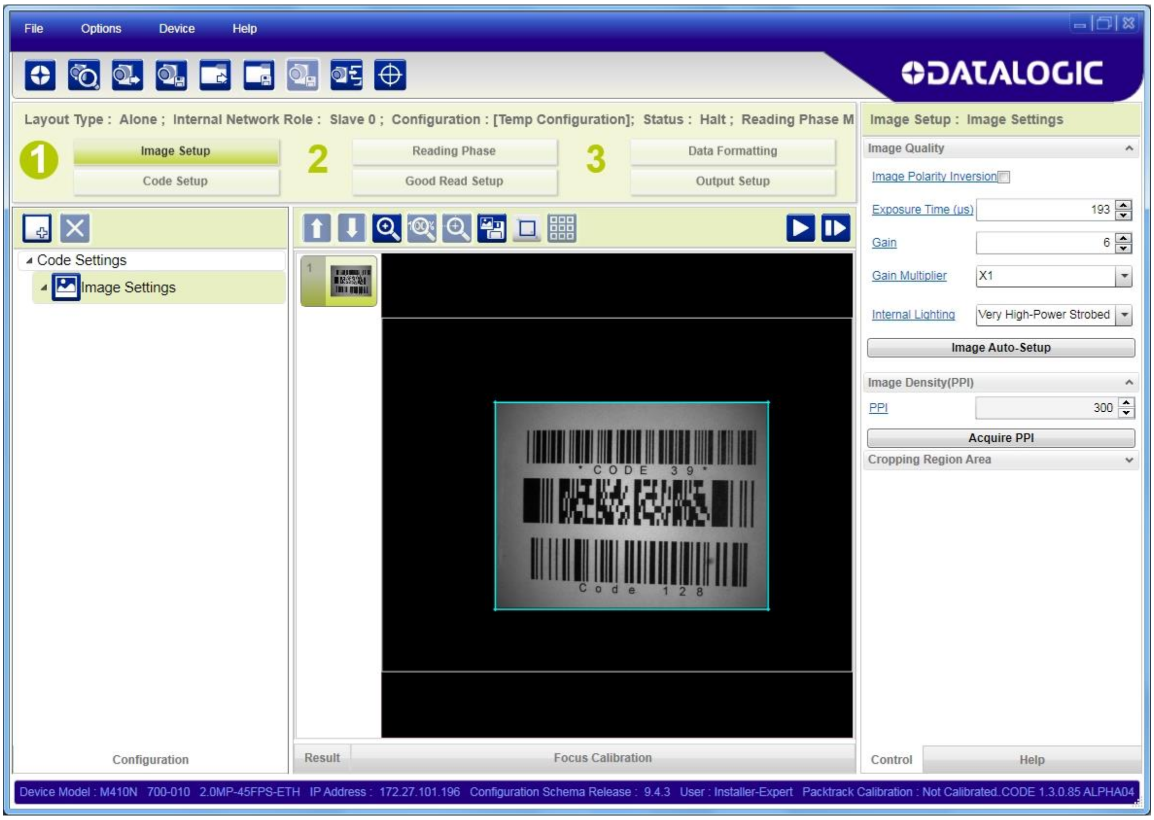
Image Density(PPI)

PPI 300

Cropping Region Area

Device Model : M410N 700-010 2.0MP-45FPS-ETH IP Address : 172.27.101.196 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated CODE 1.3.0.85 ALPHA04

The cropped area can be moved by dragging its center.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Phase M

Image Setup : Image Settings

Image Quality

Image Polarity Inversion □

Exposure Time (us) 193

Gain 6

Gain Multiplier X1

Internal Lighting Very High-Power Strobed

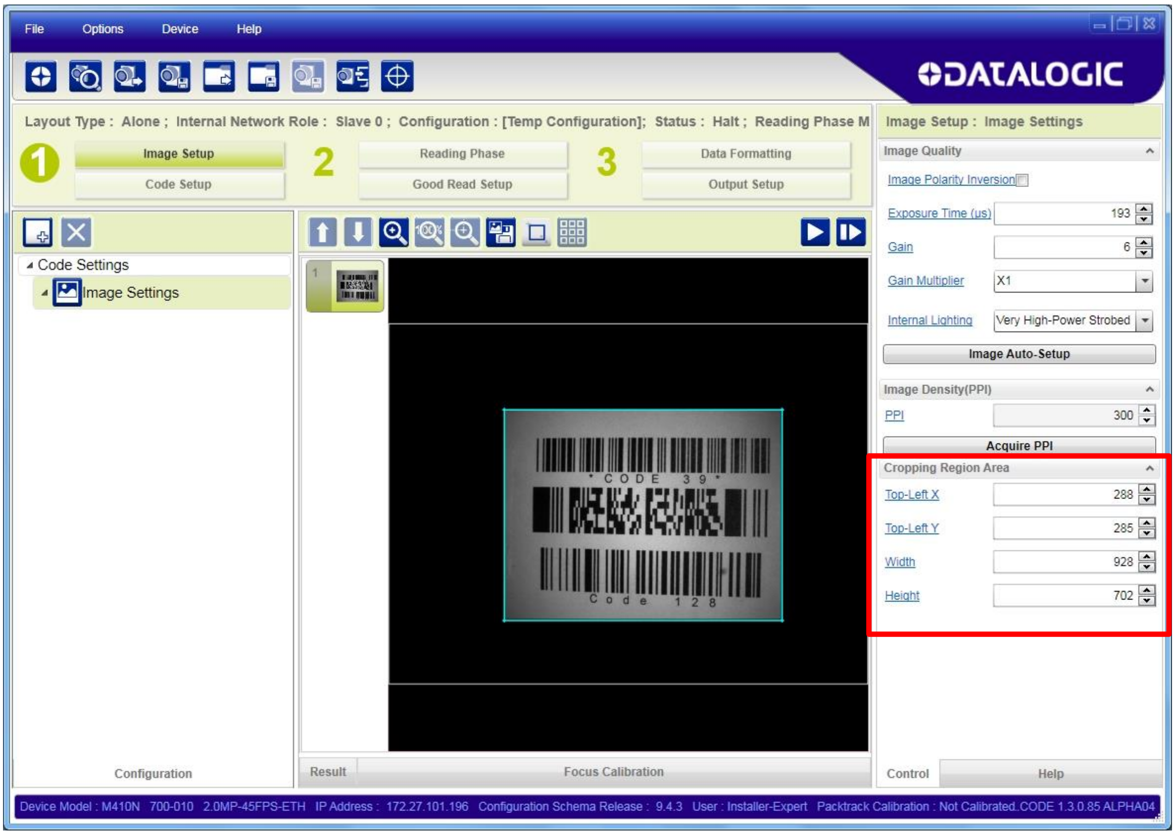
Image Density(PPI)

PPI 300

Cropping Region Area

Device Model : M410N 700-010 2.0MP-45FPS-ETH IP Address : 172.27.101.196 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated CODE 1.3.0.85 ALPHA04

You can also set the cropped image size and position through the Cropping Region Area group of parameters; size = **Width** and **Height**, position = **Top-Left X,Y** coordinates.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Phase M

Image Setup : Image Settings

Image Quality

Image Polarity Inversion □

Exposure Time (us) 193

Gain 6

Gain Multiplier X1

Internal Lighting Very High-Power Strobed

Image Density(PPI)

PPI 300

Cropping Region Area

Top-Left X 288

Top-Left Y 285

Width 928

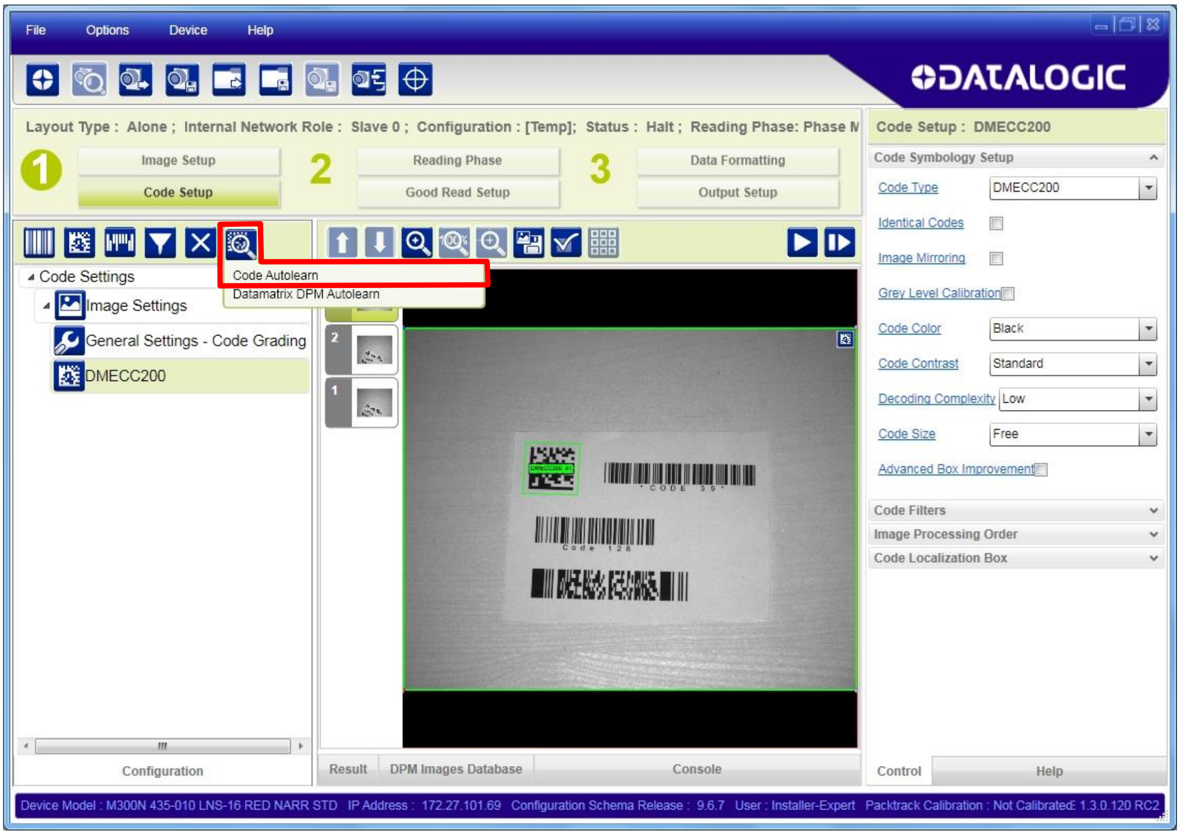
Height 702

Device Model : M410N 700-010 2.0MP-45FPS-ETH IP Address : 172.27.101.196 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated CODE 1.3.0.85 ALPHA04

4.4 CODE AUTOLEARN FEATURE

From the Code setup page you can run the Code Autolearn feature which will recognize all the codes present in the captured image.

1. From the Code Setup Page click on the Autolearn icon and select Code Autolearn.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp]; Status : Halt ; Reading Phase: Phase M

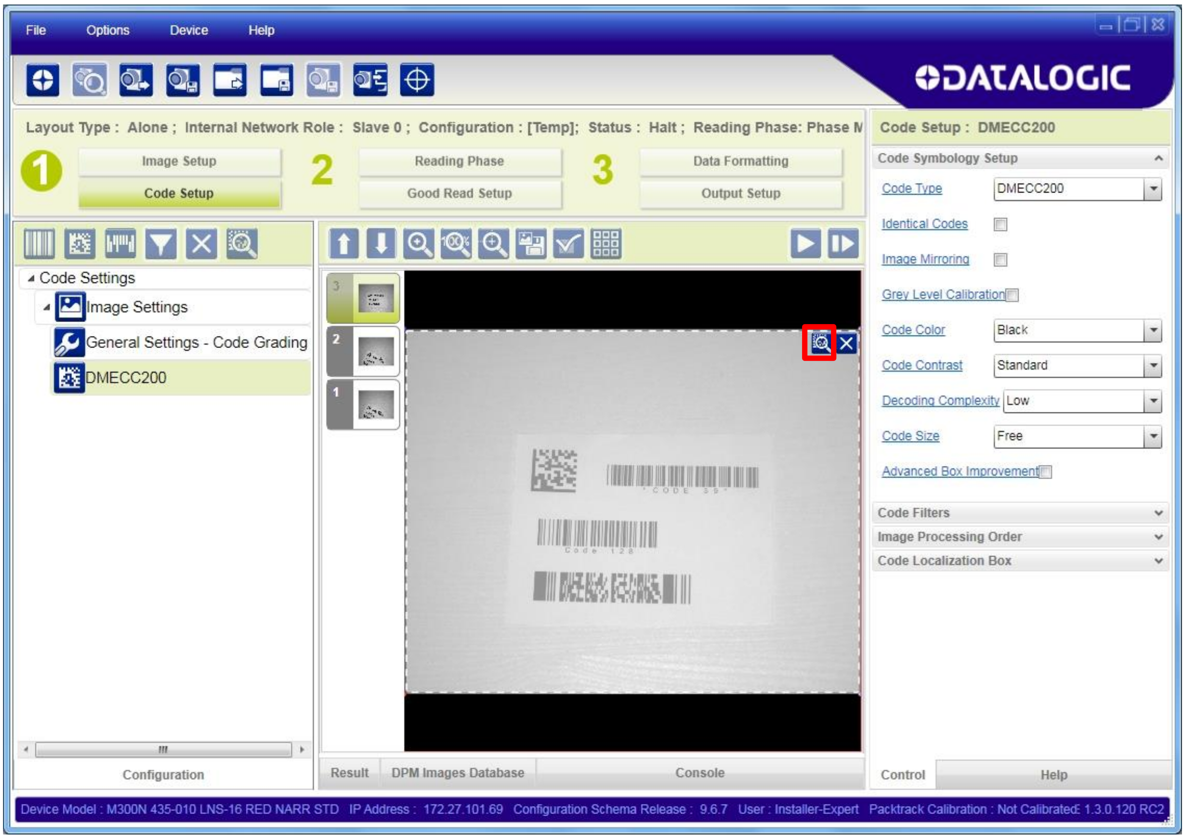
Code Setup : DMECC200

Code Type	DMECC200
Identical Codes	□
Image Mirroring	□
Grey Level Calibration	□
Code Color	Black
Code Contrast	Standard
Decoding Complexity	Low
Code Size	Free
Advanced Box Improvement	□

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated 1.3.0.120 RC2

The Autolearn region (equal to the FoV) is shown in grey. You can reduce and/or move the search area by dragging the borders or the center of the area with the mouse.

- Reducing the area can reduce the time necessary to find the code(s).
- Moving the search area allows finding specific code(s) in the image.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp]; Status : Halt ; Reading Phase: Phase M

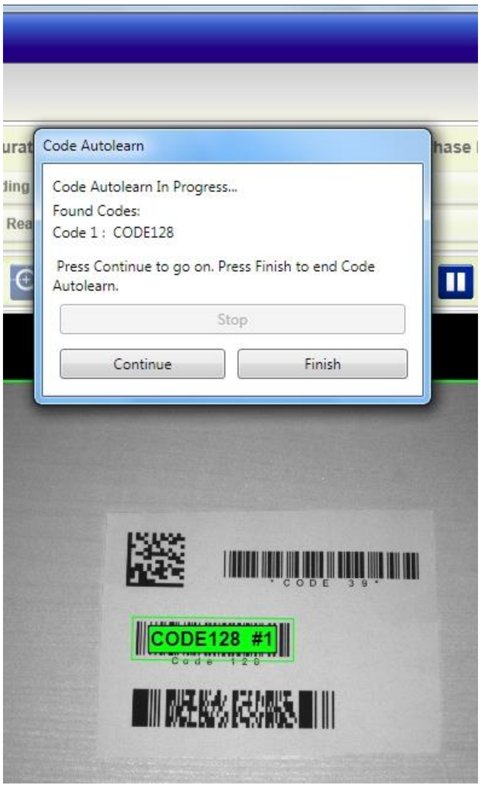
Code Setup : DMECC200

Code Type: DMECC200
Identical Codes: □
Image Mirroring: □
Grey Level Calibration: □
Code Color: Black
Code Contrast: Standard
Decoding Complexity: Low
Code Size: Free
Advanced Box Improvement: □

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated 1.3.0.120 RC2

2. Whether the area is reduced or not, you can start the Autolearn feature by clicking on the Autolearn icon in the display area.

   Each autolearn iteration locates a single code symbology and you will be prompted to Continue (if you need to find other codes) or to Finish.



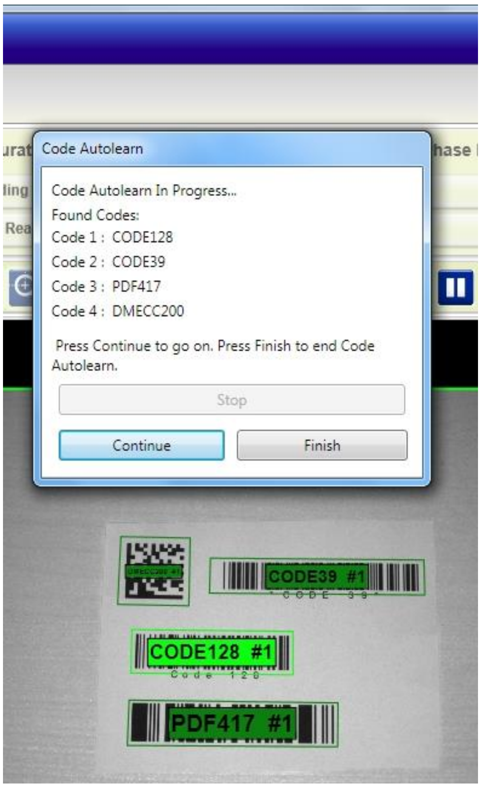
Code Autolearn

Code Autolearn In Progress...

Found Codes:

Code 1 : CODE128

Press Continue to go on. Press Finish to end Code Autolearn.



Code Autolearn

Code Autolearn In Progress...

Found Codes:

Code 1 : CODE128

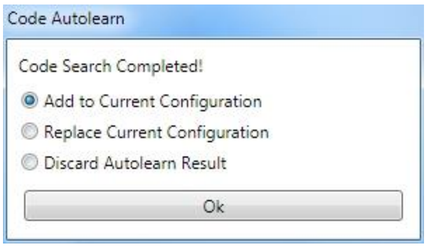
Code 2 : CODE39

Code 3 : PDF417

Code 4 : DMECC200

Press Continue to go on. Press Finish to end Code Autolearn.

3. When you have located all the code symbologies, click on Finish. You will be prompted to choose a saving selection.



Code Autolearn

Code Search Completed!

● Add to Current Configuration

○ Replace Current Configuration

○ Discard Autolearn Result

4.5 DPM AUTOLEARN FEATURE

See chapter 11.

4.6 CODE FILTERING

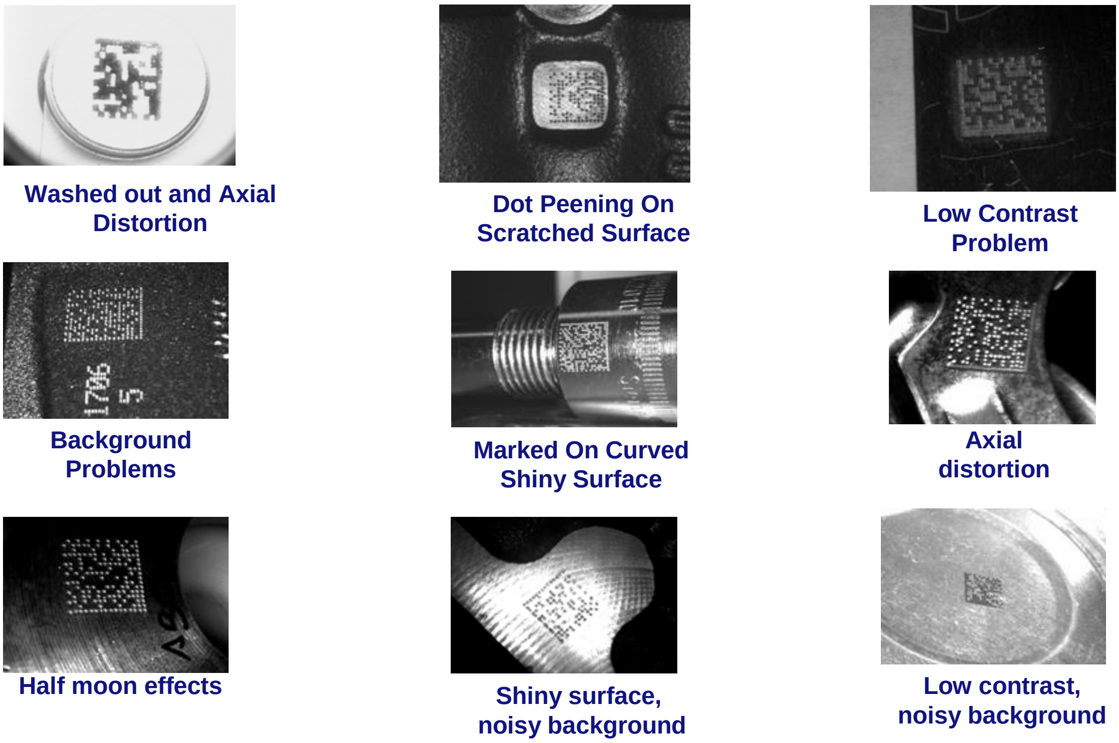
Code Filtering is typically done in DPM applications where the marking technique produces module shapes or textures that can make decoding difficult. Special DPM algorithms are provided to improve decoding as well as pre-processing Code Filters which modify the image to compensate for defects.

The following paragraphs detail the DPM parameters used to enhance decoding capabilities.

4.6.1 DPM Algorithms

For **Data Matrix** family codes the ***Decoding Complexity*** parameter is available when Processing Mode is set to Standard and selects the decoding algorithm according to the printing/marking technique used to create the symbol and on the overall printing/marking quality.

The possible selections progress from Low to Very High where Low can improve decoding time for good print/mark quality and/or relatively normal size codes. This is the default setting. Very High can improve the decode rate for low print/mark quality and/or small size codes. This algorithm is much more aggressive but in general it may have longer decoding times than the lower complexity algorithms. **To minimize decoding time it is better to select the lowest value that still guarantees good decoding.**



Washed out and Axial Distortion

Dot Peening On Scratched Surface

Low Contrast Problem

Background Problems

Marked On Curved Shiny Surface

Axial distortion

Half moon effects

Shiny surface, noisy background

Low contrast, noisy background

Figure 7 – Problematic Direct Part Marking Examples

For **QR** code the ***Decoding Method*** parameter allows the Dot Peen Decoding algorithm to be selected which improves the decode rate for low quality Direct Part Mark codes and in general for Direct Part Mark codes with dot peening type module shapes.

4.6.2 Code Filters

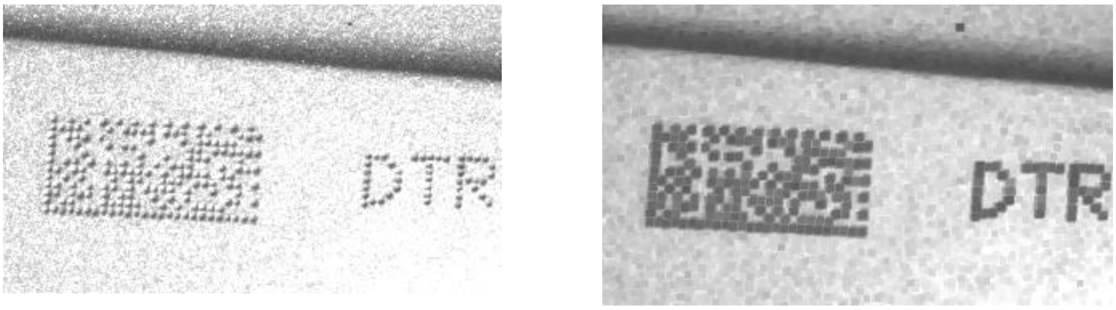
The following Code Filters can be applied to DPM codes to improve decoding.

Image Filter

Sets the filter to be applied to the image before being processed. This parameter can be used to successfully decode particular ink-spread printed codes (ex. direct part mark codes).

A different filter can be applied to each ***Image Acquisition Setup***.

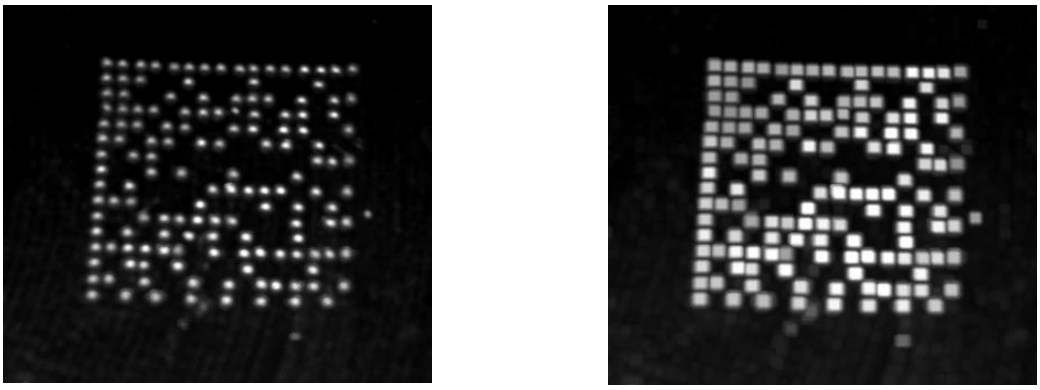
The ***Erode*** Filter enlarges the image dark zones to increase readability.



Before - No Read After - Readable

Erode

The ***Dilate*** Filter enlarges the image white zones to increase readability.



Before - No Read After - Readable

Dilate

The ***Close*** filter eliminates dark areas (defects) in the white zones of the image.

Before - No Read

After - Readable

Close

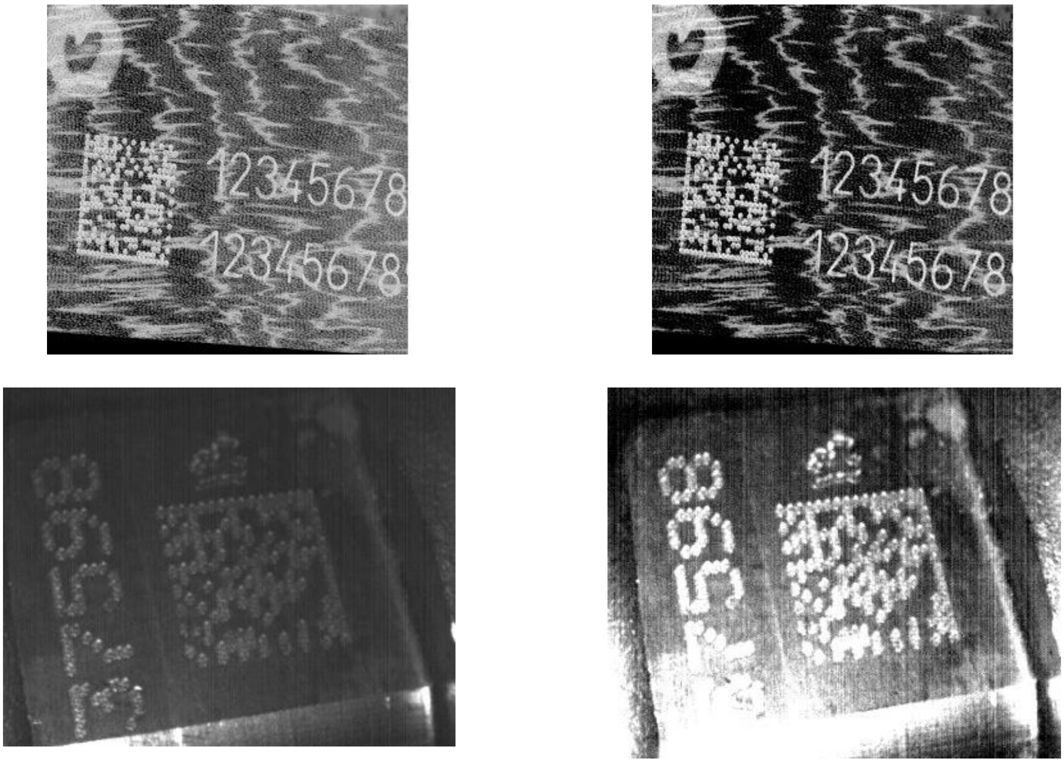
The ***Open*** filter eliminates white areas (defects) in the dark zones of the image.

Before - No Read

After - Readable

Open

The ***Contrast Stretching*** filter maximizes image contrast.



Before - No Read

After - Readable

Contrast Stretching

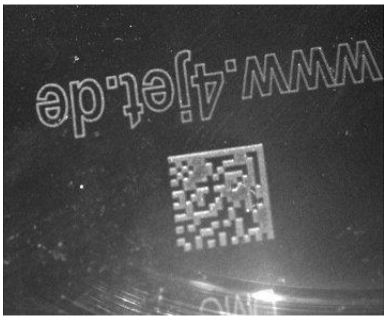
The ***Histogram Equalization*** filter makes the gray level distribution uniform.

Before - No Read

After - Readable

Histogram Equalization

The ***Smoothing*** filter deletes small (insignificant) details in the center of the image.

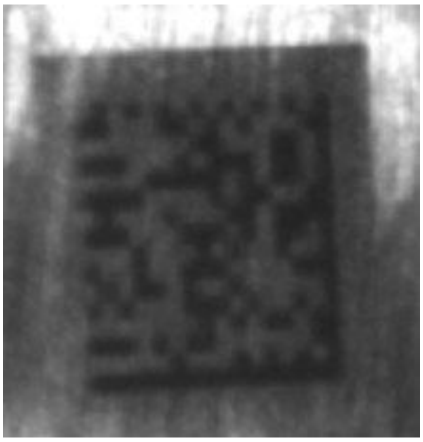


Before - No Read

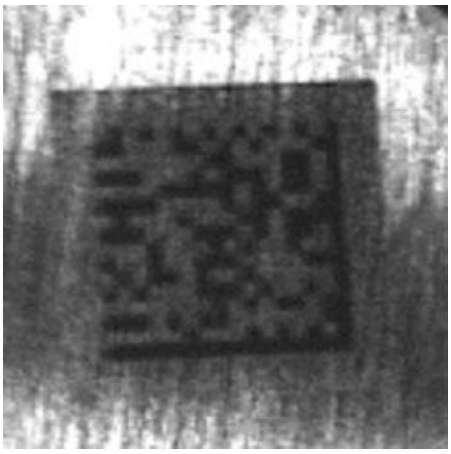
After - Readable

Smoothing

The ***Sharpening*** filter improves out of focus images.



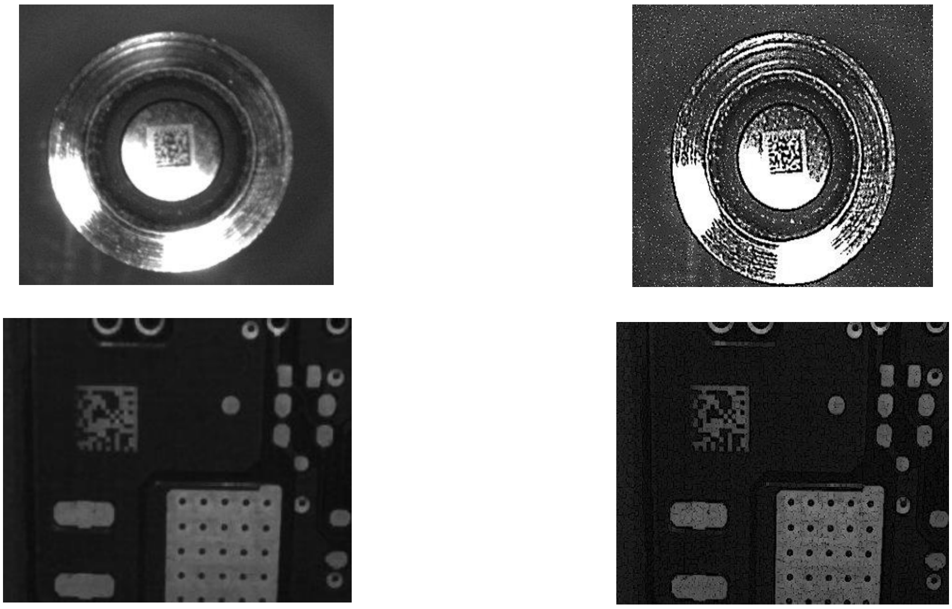
Before - No Read



After - Readable

Sharpening

The ***Deblurring*** filter improves blurred images.



Before - No Read After - Readable

Deblurring

The ***Black Enhancement*** filter produces a nonlinear increase in the black level for light images.

Before - No Read After - Readable

Black Enhancement

The ***White Enhancement*** filter produces a nonlinear increase in the white level for dark images.

Before - No Read After - Readable

White Enhancement

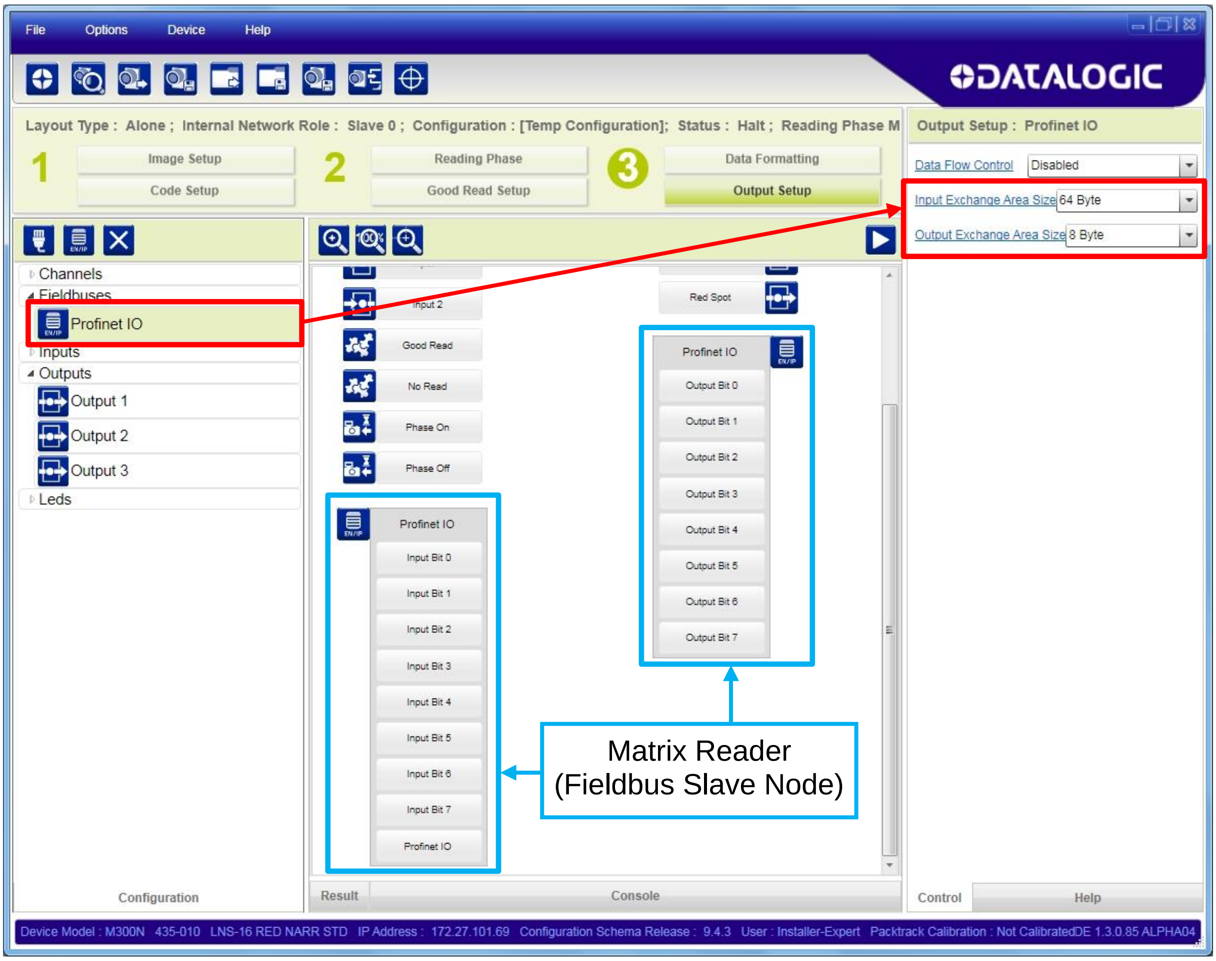
4.7 MATRIX CONTROL BY FIELDBUS CHANNEL

The Matrix reader can be controlled by signals coming from the Fieldbus Master as well as echoing its input signals to the Fieldbus Master.

4.7.1 Fieldbus Input/Output Representation in DL.CODE

For HMS Fieldbus and the embedded Profinet-IO channels, communication with the Matrix reader takes place through Input/Output Exchange Areas. The size of these areas is defined in the relative parameters.

The Input and Output Exchange Area Size parameters refer to the Fieldbus Master.; Input **to** the Master, Output **from** the Master.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Phase M

Output Setup : Profinet IO

Data Flow Control: Disabled

Input Exchange Area Size: 64 Byte

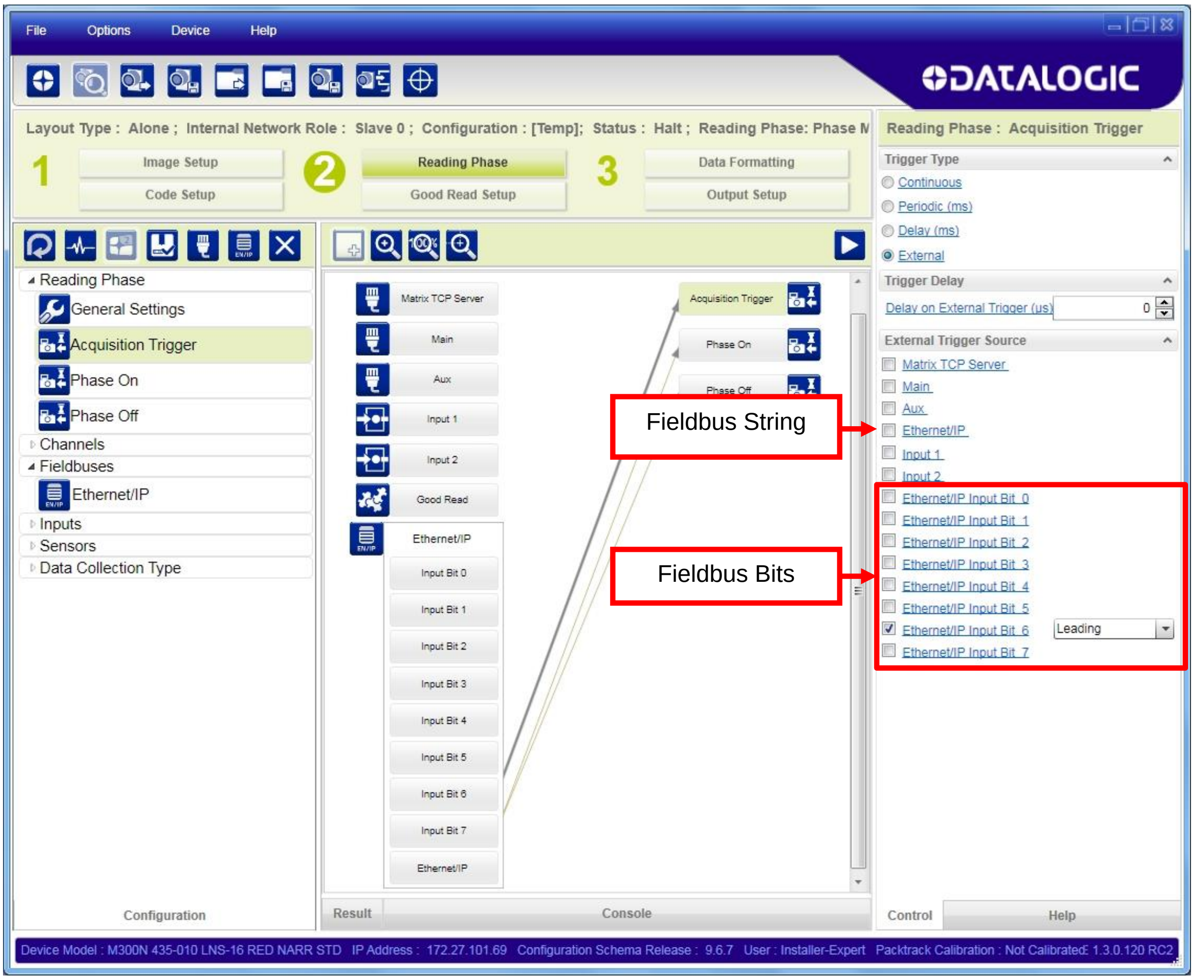
Output Exchange Area Size: 8 Byte

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not CalibratedDE 1.3.0.85 ALPHA04

NOTE: All other representations in DL.CODE show the fieldbus input and output channels from the Matrix reader perspective (Fieldbus Slave Node). Therefore fieldbus slave node Input Bits are **from** the Fieldbus Master and fieldbus slave node Output Bits are **to** the Fieldbus Master.

4.7.2 Fieldbus Reading Phase Control

The Fieldbus Master can control the reading phase by assigning either communication strings or individual communication bits to reading phase parameters. These bits are received on the Matrix fieldbus channel as Input Bits.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp]; Status : Halt ; Reading Phase: Phase M

Reading Phase : Acquisition Trigger

Trigger Type

○ Continuous
○ Periodic (ms)
○ Delay (ms)
● External

Trigger Delay

Delay on External Trigger (us) 0

External Trigger Source

□ Matrix TCP Server
□ Main
□ Aux
□ Ethernet/IP
□ Input 1
□ Input 2
□ Ethernet/IP Input Bit 0
□ Ethernet/IP Input Bit 1
□ Ethernet/IP Input Bit 2
□ Ethernet/IP Input Bit 3
□ Ethernet/IP Input Bit 4
□ Ethernet/IP Input Bit 5
☑ Ethernet/IP Input Bit 6 Leading
□ Ethernet/IP Input Bit 7

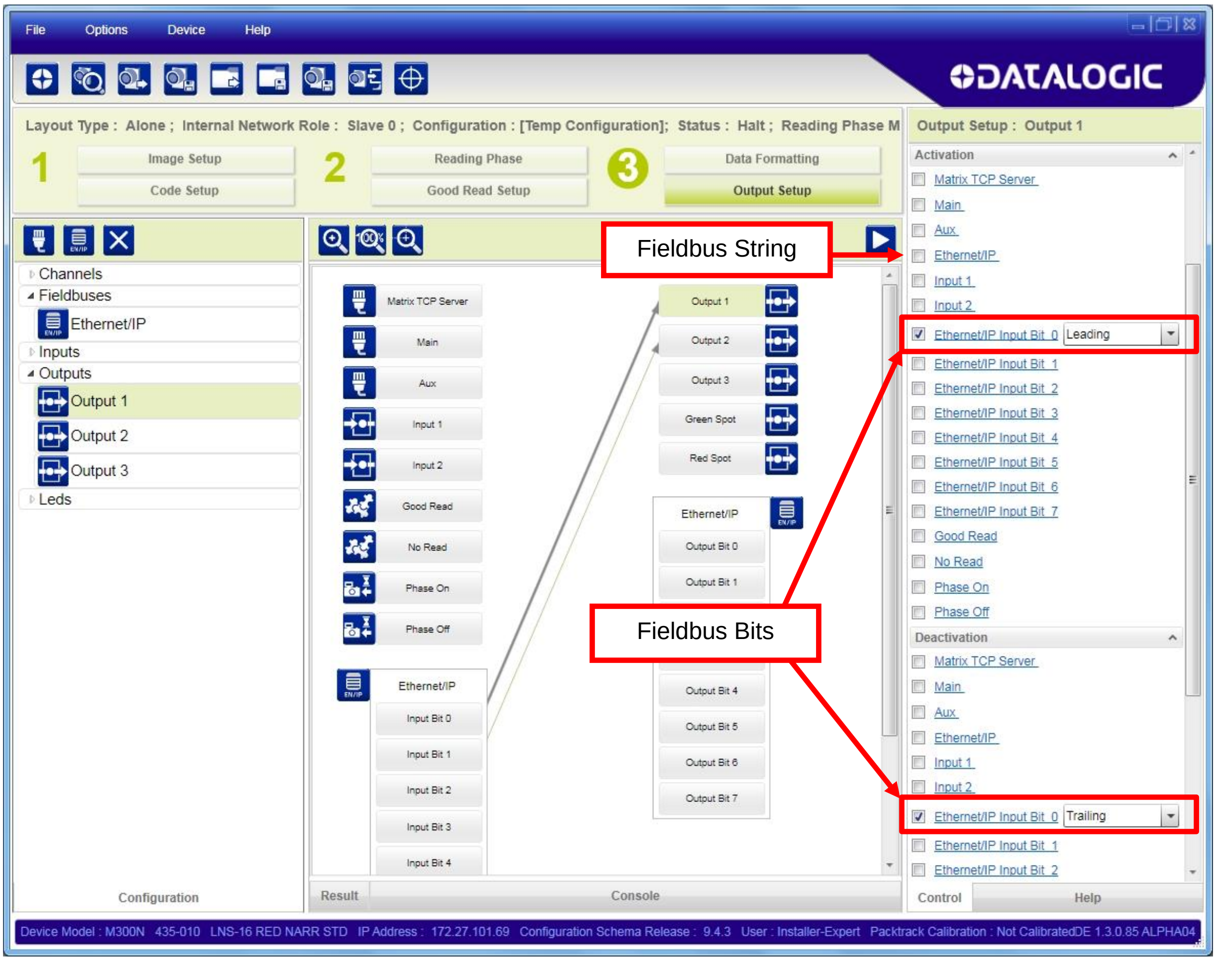
Fieldbus String

Fieldbus Bits

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated 1.3.0.120 RC2

4.7.3 Fieldbus Digital Output Control

The Fieldbus Master can also drive the Matrix reader's Digital Outputs by assigning either communication strings or individual communication bits to the Digital Output Activation and Deactivation parameters. These bits are received on the Matrix fieldbus channel as Input Bits.



Fieldbus String

Fieldbus Bits

Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Phase M

Output Setup : Output 1

Activation

☑ Ethernet/IP Input Bit 0 Leading

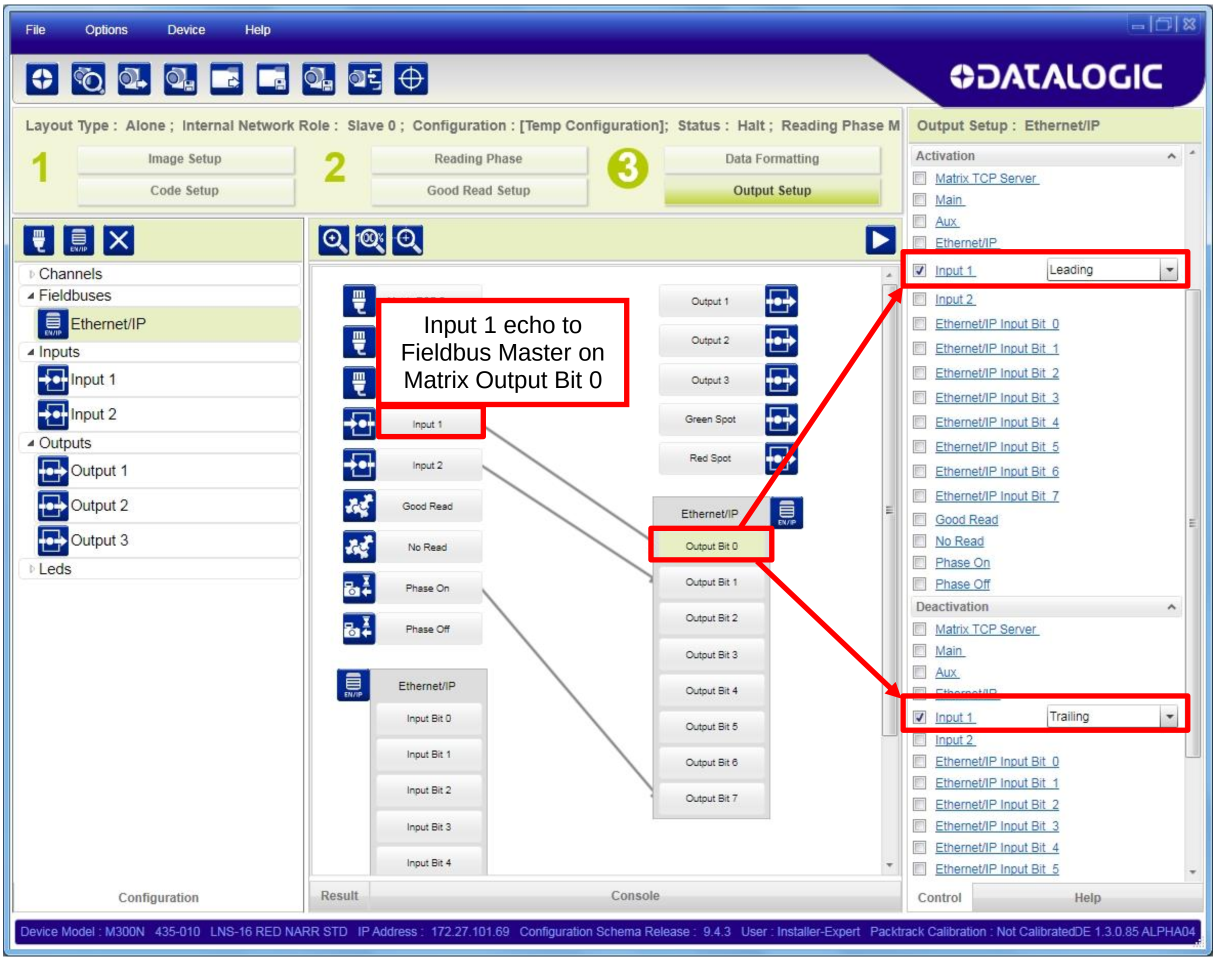
Deactivation

☑ Ethernet/IP Input Bit 0 Trailing

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not CalibratedDE 1.3.0.85 ALPHA04

4.7.4 Digital Input Echo to Fieldbus

The Fieldbus Master can receive the Matrix Reading Phase and Input signal echoes by assigning them as sources to the fieldbus individual communication Output Bit Activation and Deactivation parameters. These bits are sent on the Matrix fieldbus channel as Output Bits.


Input 1 echo to Fieldbus Master on Matrix Output Bit 0

Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Phase M

Output Setup : Ethernet/IP

Activation

☑ Input 1 Leading

Deactivation

☑ Input 1 Trailing

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not CalibratedDE 1.3.0.85 ALPHA04

4.8 BACKUP AND RESTORE THROUGH DL.CODE

DL.CODE allows Backup and Restore to be performed to the configuration PC via file or to an external storage device such as BM100.

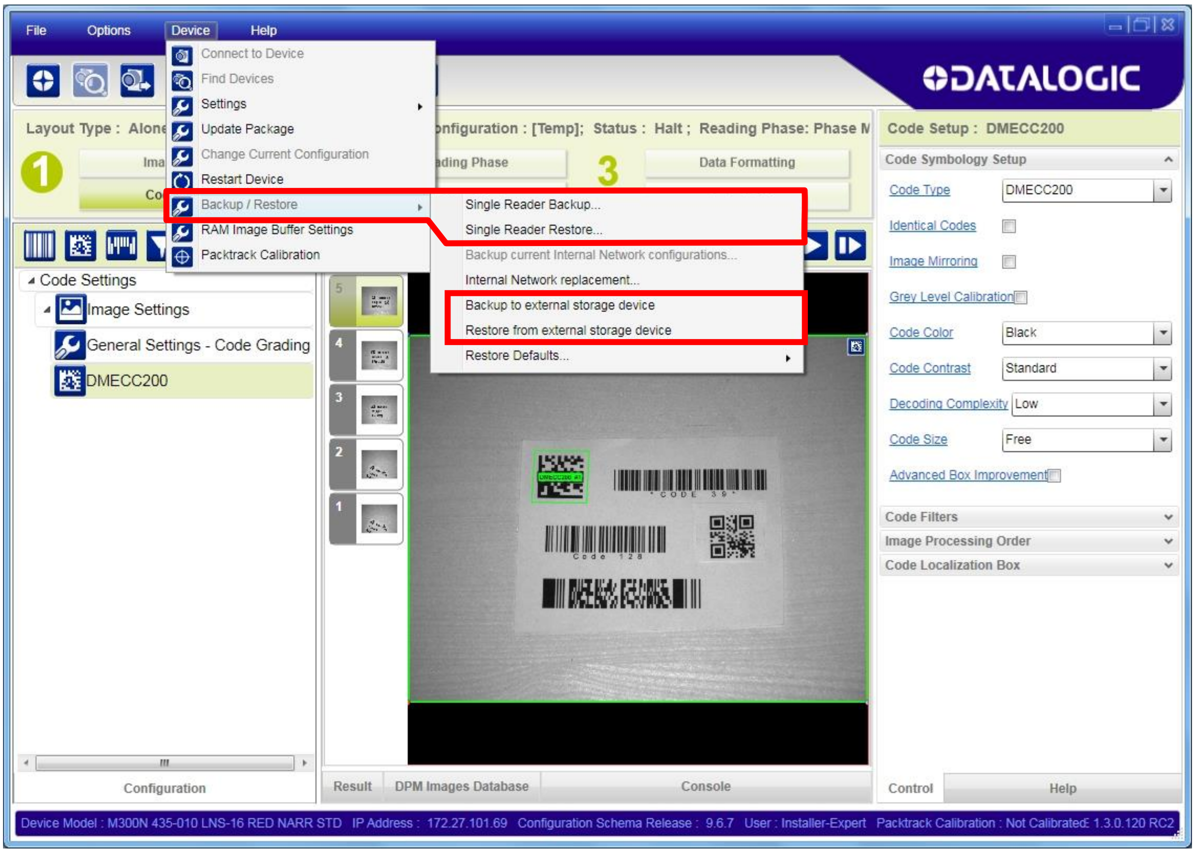
It can be performed for Single Reader and Internal Network (Master/Slave) configurations.

Backup and Restore functions allow performing Complete Configuration and Environment parameter storage for Single Reader and ID-NET (Master/Slave) network devices as well as device firmware. Backup and Restore can be applied to any reader connected through a device having external backup memory, regardless of the reader's network configuration.

Backup to and Restore from external device is supported by DL.CODE for all reading devices when connected to:

- CBX + BM100
- QLM-Series Gateways

NOTE: Before executing a Backup to a BM100 backup module make sure the Write Protection switch is set to Unlocked.



Layout Type : Alone

Configuration : [Temp]; Status : Halt ; Reading Phase: Phase M

Code Setup : DMECC200

Code Type: DMECC200

Identical Codes: □

Image Mirroring: □

Grey Level Calibration: □

Code Color: Black

Code Contrast: Standard

Decoding Complexity: Low

Code Size: Free

Advanced Box Improvement: □

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated 1.3.0.120 RC2

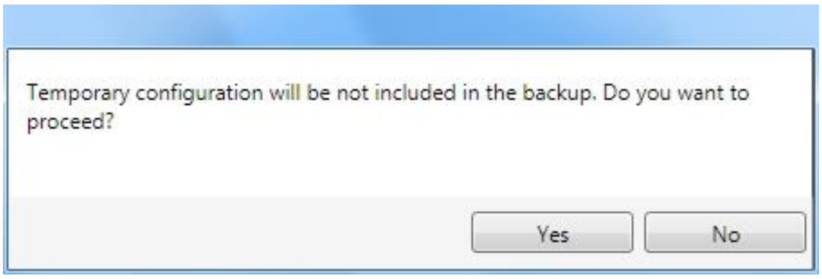
4.8.1 Backup

To perform a **Backup**:

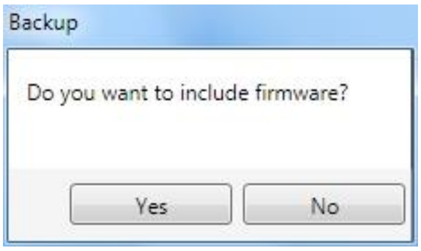
1. From the DL.CODE Device menu, select either **Single Reader Backup** (to file on PC); or **Backup to external storage device**.

NOTE: For ID-NET network Backup, select the **Backup current Internal Network configurations** selection.

You will be reminded that configuration in temporary memory will not be saved so you should save the configuration to the reader before performing Backup.


Temporary configuration will be not included in the backup. Do you want to proceed?

If you are performing a backup to a file you will be asked whether to include the firmware or not.

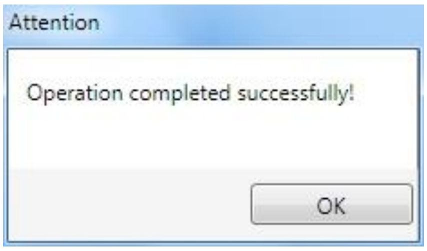

Backup

Do you want to include firmware?

Device backup. Please wait....

Backup to external storage device. Please wait....

At the end of the backup, DL.CODE shows a message indicating successful completion.


Attention

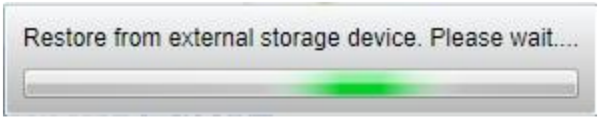
Operation completed successfully!

4.8.2 Restore

To perform a **Restore**:

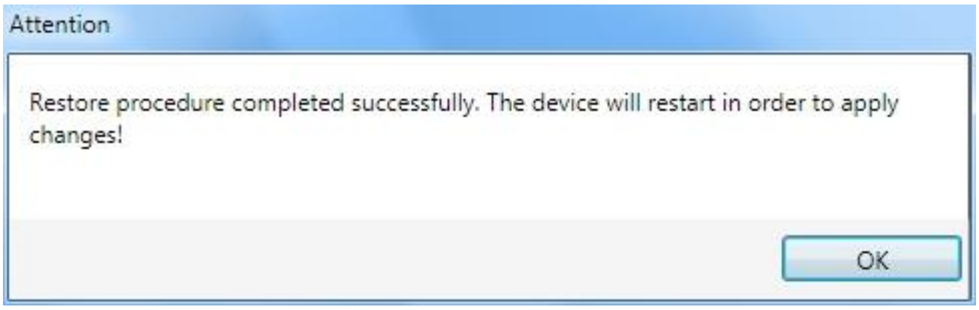
1. From the DL.CODE Device menu, select either **Single Reader Restore** (from file on PC); or **Restore from external storage device**.

NOTE: For ID-NET network Restore, select the **Internal Network replacement** selection.


Restore from external storage device. Please wait....

If restoring an ID-NET network though the Master, this may take a few minutes.

At the end of the restore, DL.CODE shows a message indicating successful completion.


Attention

Restore procedure completed successfully. The device will restart in order to apply changes!

4.8.3 Replacement

CAUTION: The replacement device **must be the exact same model** as the device it is replacing.

The **Restore** function also provides easy and secure Single Device Replacement:

1. Remove the device to be replaced.
2. Connect the new device (make sure the new device has been previously set to factory default).
3. Run the Restore procedure by selecting either **Single Reader Restore** (from file on PC) or **Restore from external storage device** item (see: Restore procedure).

NOTE: In case of Backup or Restore operation failures, error messages will be displayed in the Monitor Diagnostic page.

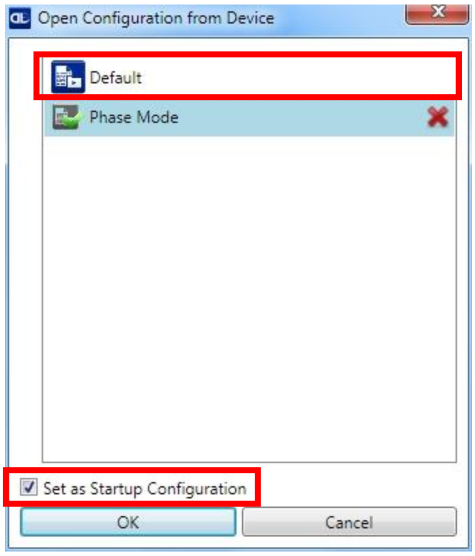
4.9 RESTORE DEFAULTS

The device parameters are divided into two main classes, Configuration and Environment which are affected differently by the Restore Defaults commands.

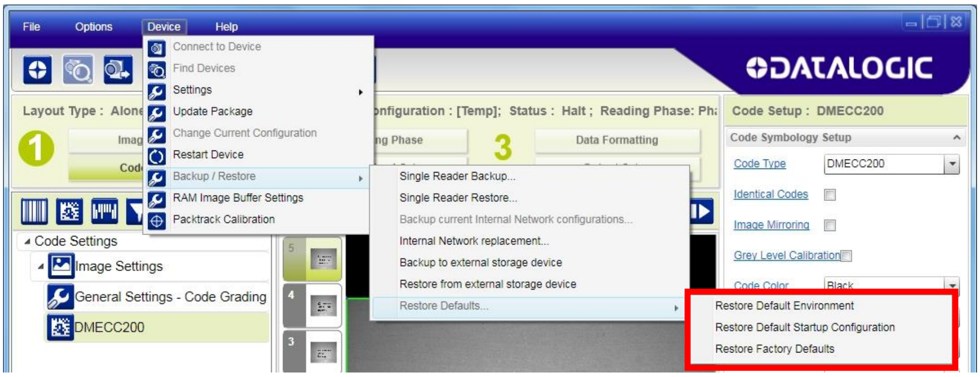
- The Configuration parameters are the ones set in the various steps of the configuration process and are specific to each application. When multiple configurations (jobs) are saved on a single device, these parameters can be different from one configuration to the next.
- Environment parameters regard the device Identity and Position in a Network (Ethernet, ID-NET, etc.) and are not influenced by the Default (or any other) Configuration present in memory.

4.9.1 Restore Default Startup Configuration

The Default configuration is always present on the reader and in fact it is not modifiable and cannot be deleted. It can always be restored by simply selecting it from the Open from Device configuration list.


Open Configuration from Device
Default
Phase Mode
☑ Set as Startup Configuration
OK
Cancel

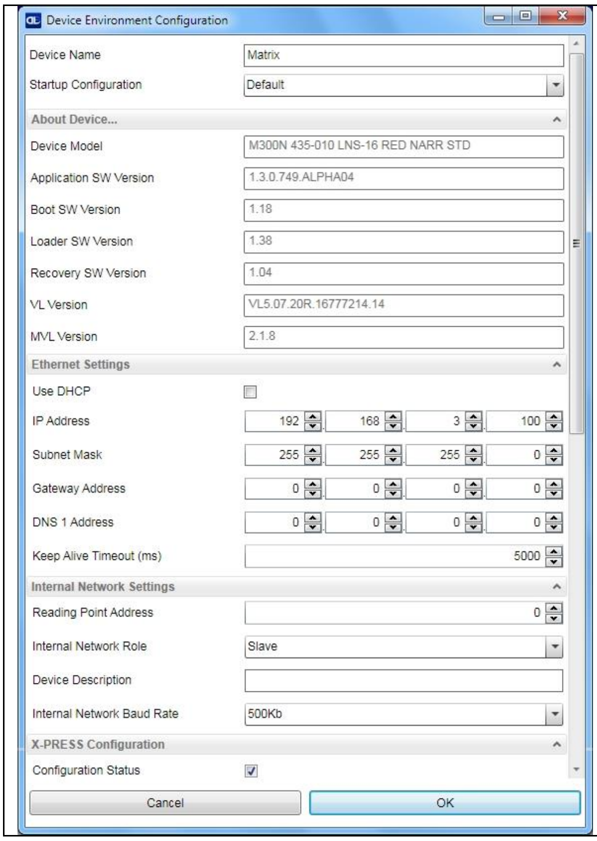
The same action can be performed from the Device menu >Backup/Restore > Restore Defaults > **Restore Default Startup Configuration**. The Default Configuration will be set to run at startup and the reader will be reset.



Any previously saved configurations on the device will remain in memory, but the Default configuration is set as the startup configuration.

4.9.2 Restore Default Environment

Restore Default Environment returns all Environment parameters to their factory default settings. The default IP address will be restored as well as all the parameters managed in the Device Environment Configuration window.



Device Environment Configuration

Device Name	Matrix
Startup Configuration	Default
About Device...	
Device Model	M300N 435-010 LNS-16 RED NARR STD
Application SW Version	1.3.0.749.ALPHA04
Boot SW Version	1.18
Loader SW Version	1.38
Recovery SW Version	1.04
VL Version	VL5.07.20R.16777214.14
MVL Version	2.1.8
Ethernet Settings	
Use DHCP	□
IP Address	192 168 3 100
Subnet Mask	255 255 255 0
Gateway Address	0 0 0 0
DNS 1 Address	0 0 0 0
Keep Alive Timeout (ms)	5000
Internal Network Settings	
Reading Point Address	0
Internal Network Role	Slave
Device Description	
Internal Network Baud Rate	500Kb
X-PRESS Configuration	
Configuration Status	☑

The Factory Default static IP address for all Matrix N Family readers is:

IP Address = 192.168.3.100

Any previously saved configurations on the device will remain in memory, but the Default configuration is set as the startup configuration.

4.9.3 Restore Factory Defaults

In order to return a device to its absolute Factory default parameters (for example device replacement) it is necessary to use the **Restore Factory Defaults** command. You will be prompted to confirm.

All Environment parameters will be restored to Factory default values **and any existing configurations stored on the device will be erased**. The device will be reset and therefore start in run mode with the factory default configuration.

4.10 SOFTWARE RESET

At any time the device can be reset by the Restart Device command (↻) in the DL.CODE Device Menu.

CAUTION: Remember to save the current configuration before restarting.

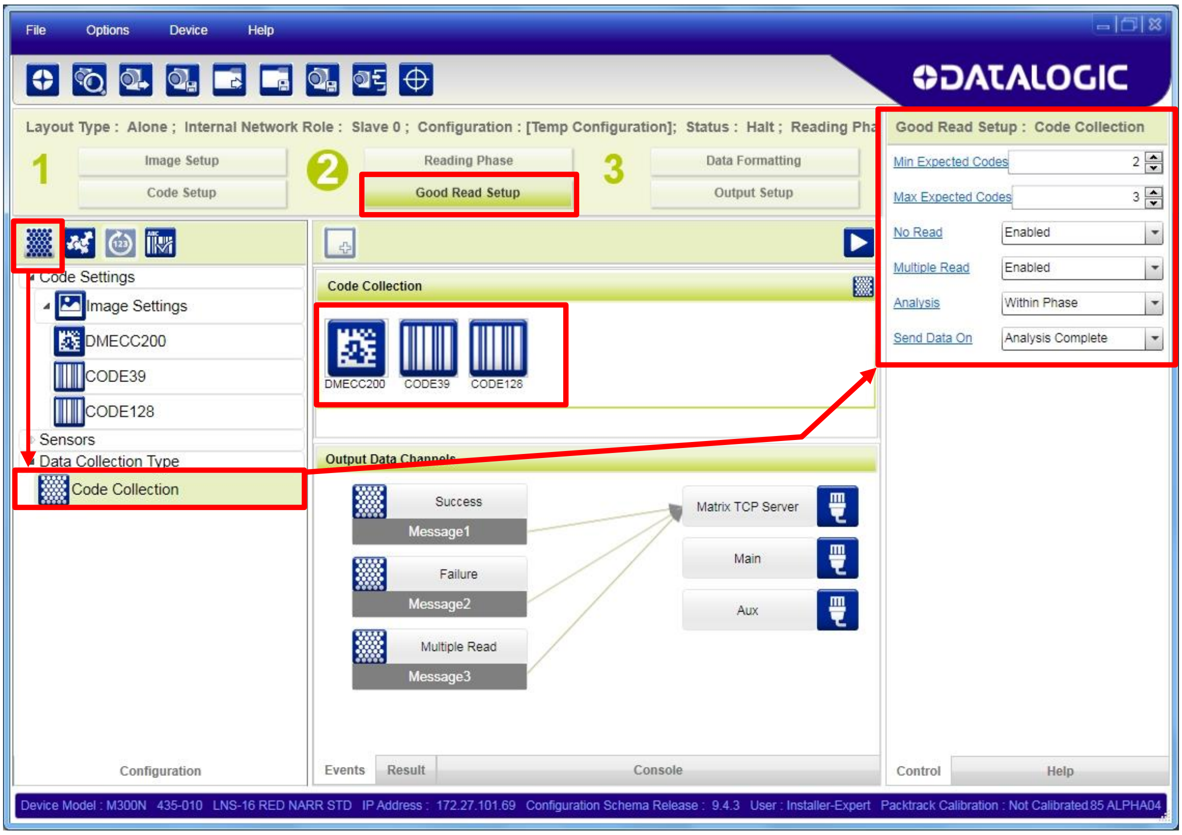
5 DATA COLLECTION METHODS

5.1 CODE COLLECTION

Valid Operating Modes: Continuous, One Shot, Phase Mode

In Code Collection mode the reader can collect several codes before providing a single output result.
The number of codes to be collected is set by the *Min Expected Codes* and *Max Expected Codes*.
The type of output message sent to the host depends on the *No Read* and *Multiple Read* parameter settings and can be modified and formatted in the Data Formatting Output Group.

Example:



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Pha

Good Read Setup : Code Collection

Min Expected Codes	2
Max Expected Codes	3
No Read	Enabled
Multiple Read	Enabled
Analysis	Within Phase
Send Data On	Analysis Complete

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated 85 ALPHA04

As shown in the figure above, the following parameters are set:

The DMECC200, CODE39 and CODE128 code types are enabled and present in the Code Collection.
Min Expected Codes = 2; Max Expected Codes = 3; No Read is Enabled; Multiple Read is Enabled

Case 1: two or three codes (of the enabled code types) are read
Output: the content of **Message 1 Success** is sent to the Host. This corresponds to a Good Read message and by default contains the code content.

Case 2: one code is read

Output: the content of **Message 2 Failure** is sent to the Host. This corresponds to the No Read message because it doesn't satisfy the minimum expected codes criteria.

Case 3: four codes (of the enabled code types) are read

Output: the content of **Message 3 Multiple Read** is sent to the Host. This corresponds to the Multiple Read message because it exceeds the maximum expected codes criteria.

If the Multiple Read parameter is Disabled, then Case 3 is considered a Good Read and the content of **Message 1 Success** is sent to the Host containing the first three decoded codes.

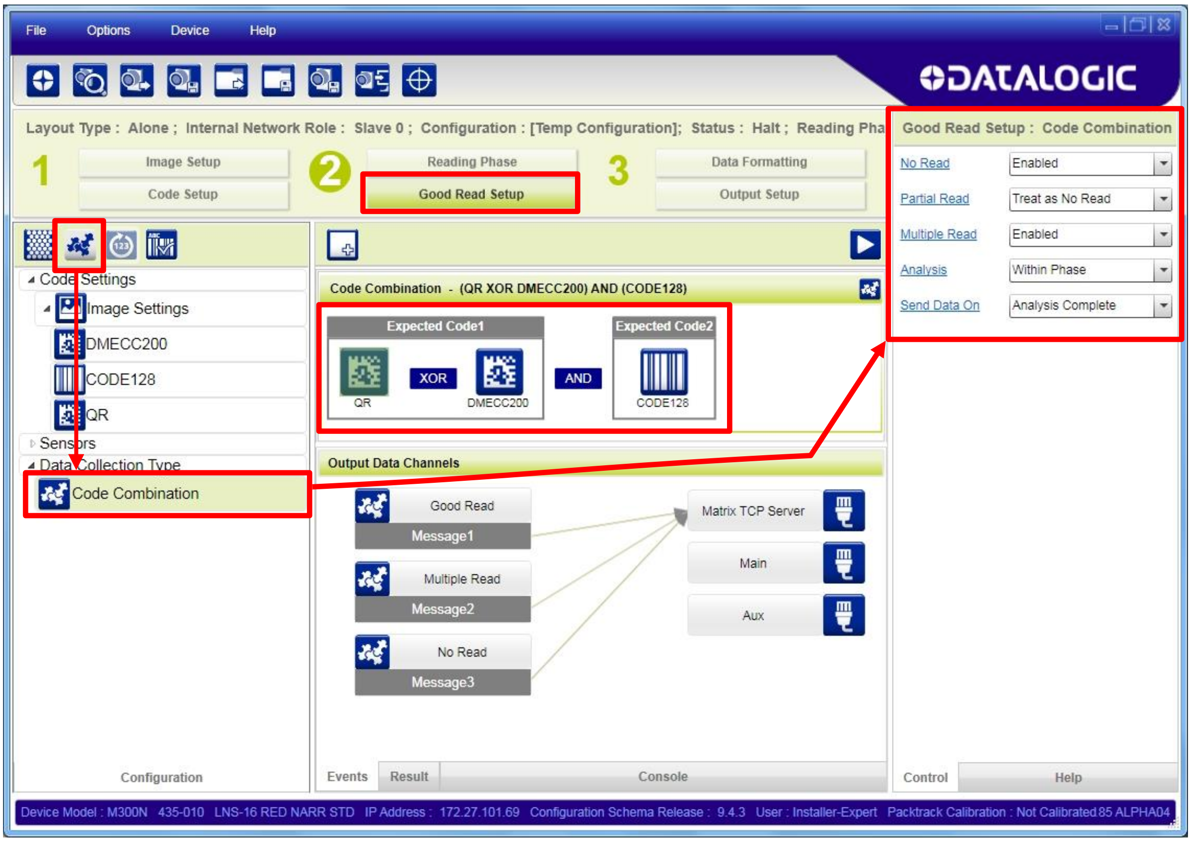
In Phase Mode, by setting ***Analysis*** to *Within Phase* only the reading phase is considered and a single result is provided to the user for each phase. On the other hand, by selecting *Within An Image* the reader searches for the defined number of codes within each acquired image and a result is provided to the user after each image decoding.

5.2 CODE COMBINATION

Valid Operating Modes: <u>Continuous</u>, <u>One Shot</u>, <u>Phase Mode</u>, <u>PackTrack</u>

In Code Combination mode the output results sent to the Host depend not only on the codes read but on meeting their configured logical combination criteria.

Example:



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Pha

Good Read Setup : Code Combination

No Read	Enabled
Partial Read	Treat as No Read
Multiple Read	Enabled
Analysis	Within Phase
Send Data On	Analysis Complete

Code Combination - (QR XOR DMECC200) AND (CODE128)

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated 85 ALPHA04

As shown in the figure above, the following parameters are set:

The DMECC200, QR Code and CODE128 types are enabled and present in the Code Combination with the following logical combination:

DMECC200 OR QRCode AND Code128.

No Read is Enabled; Multiple Read is Enabled; Partial Read is treated as No Read

Case 1: codes (DMECC200 AND Code128) or (QR Code AND Code128) are read
Output: the content of **Message 1 Good Read** is sent to the Host. This message by default contains the code content.

Case 2: only one of the three codes (DMECC200, QR Code or Code128) is read
Output: this is a Partial Read which, in this example, is treated as a No Read. The content of **Message 2 No Read** is sent to the Host.

Case 3: all three codes (DMECC200, QR Code and Code128) or (only DMECC200 and QR Code) are read
Output: the content of **Message 3 Multiple Read** is sent to the Host.

If the Multiple Read parameter is Disabled, then for Case 3:

- all three codes read (DMECC200, QR Code and Code128), is considered a Good Read and the content of **Message 1 Good Read** is sent to the Host containing one of the 2D codes (whichever was decoded first) AND Code128.
- reading (only DMECC200 and QR Code), is considered a Partial Read which, in this example, is treated as a No Read and the content of **Message 2 No Read** is sent to the Host.

In Phase Mode, by setting ***Analysis*** to *Within Phase* only the reading phase is considered and a single result is provided to the user for each phase. On the other hand, by selecting *Within An Image* the reader searches for the defined combination of codes within each acquired image and a result is provided to the user after each image decoding.

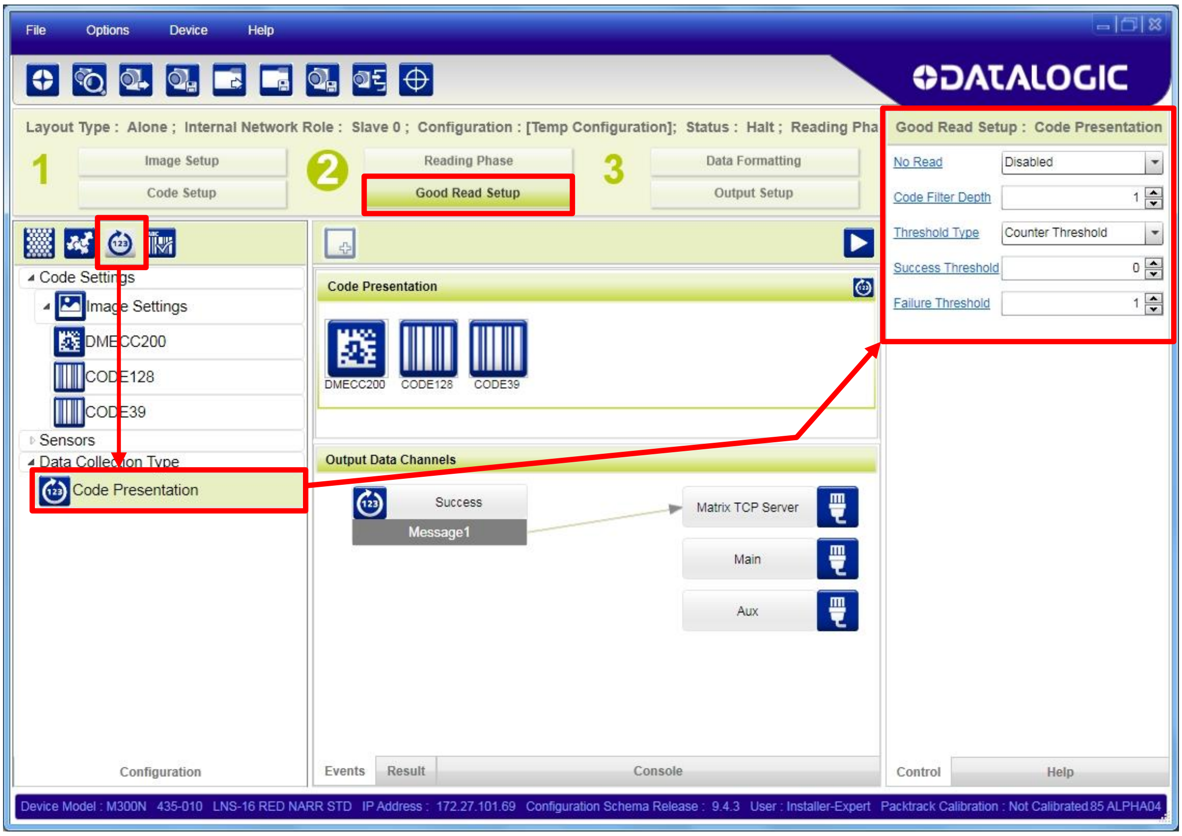
NOTE: In Code Combination mode, the configured expression can contain up to a maximum of 50 codes.

5.3 CODE PRESENTATION

Valid Operating Modes: Continuous, One Shot

In Code Presentation mode typically a code is placed in front of the reader manually and the successful output results are sent to the Host. Usually No Reads are disabled and the configuration should correctly manage Multiple Reads.

Example:



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Pha

Good Read Setup : Code Presentation

No Read	Disabled
Code Filter Depth	1
Threshold Type	Counter Threshold
Success Threshold	0
Failure Threshold	1

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated 85 ALPHA04

As shown in the figure above, the following parameters are set:

The DMECC200, CODE128 and CODE39 types are enabled and present in the Code Presentation:
No Read is Disabled; Code Filter Depth is 1, and multiple reads are handled by the Acquisition Counter Threshold: Success Threshold=0, Failure Threshold=1.

Case 1: any code or combination of codes (of the enabled code types) is read in a single acquisition.
Output: the content of **Message 1 Success** is sent to the Host containing one occurrence of all of the decoded codes. This message by default contains the code content.

Case 2: any code or combination of codes is presented to the reader repeatedly
Output: this is a multiple read condition which is managed as follows:

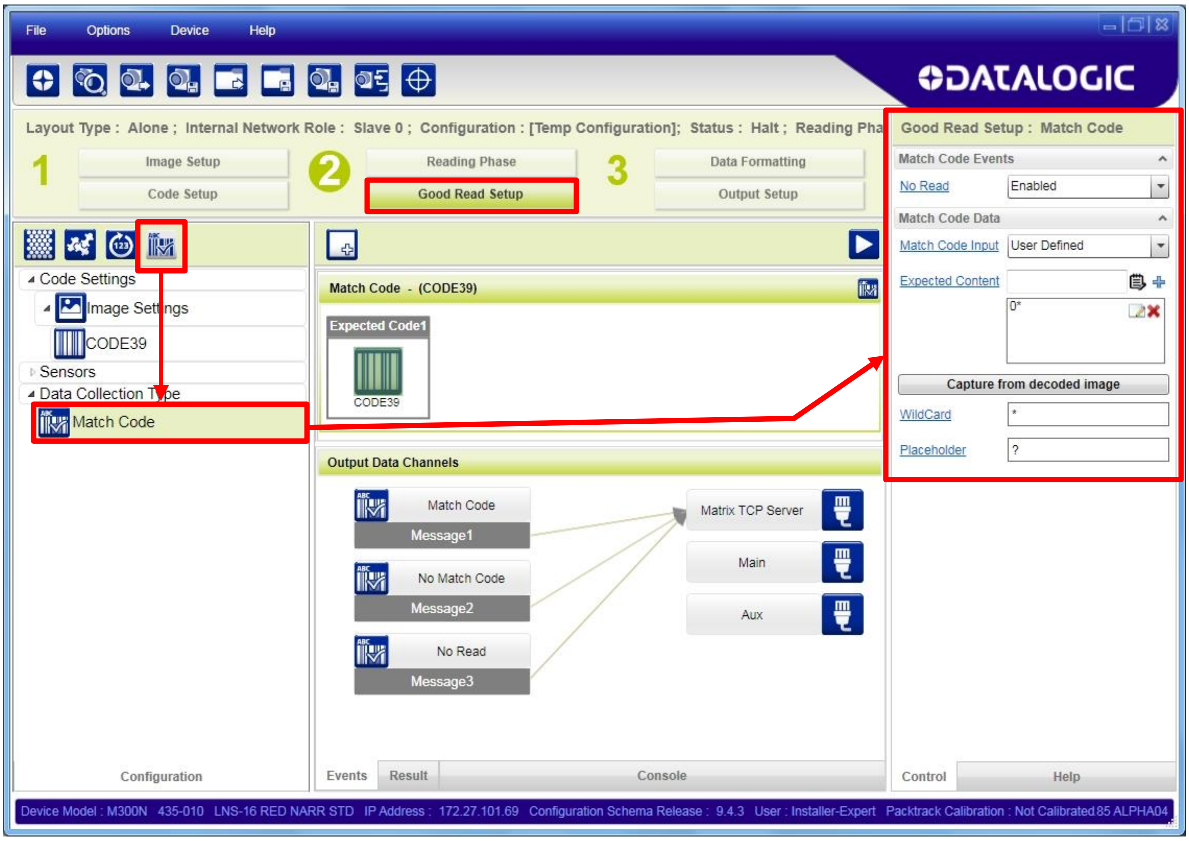
- Success Threshold=0, the same code (by content and type) cannot be read in successive acquisitions.
- Failure Threshold=1, the same code (by content and type) can only be read after at least 1 acquisition without a code.

5.4 MATCH CODE

Valid Operating Modes: Continuous, One Shot, Phase Mode

In Match Code mode the output results sent to the Host depend on whether the codes read meet the match code criteria or not.

Example:



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Pha

Match Code - (CODE39)

Output Data Channels

Good Read Setup : Match Code

Match Code Events

No Read: Enabled

Match Code Data

Match Code Input: User Defined

Expected Content: 0*

WildCard: *

Placeholder: ?

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated 85 ALPHA04

As shown in the figure above, the following parameters are set:

CODE39 type is enabled and present in the Match Code:
No Read is Enabled; Match Code Input is User Defined where the Expected Content = "0*" (all codes must begin with zero but can be followed by any string – wildcard).

Case 1: a CODE39 type is read and its content begins with 0 (zero).
Output: the content of **Message 1 Match Code** is sent to the Host. This message by default contains the code content.

Case 2: a CODE39 type is read but its content does not begin with 0 (zero).
Output: the content of **Message 2 No Match Code** is sent to the Host.

Case 3: no CODE39 type is read.
Output: the content of **Message 3 No Read** is sent to the Host.

6 MESSAGE FORMATTING

Message Formatting is extremely flexible to allow a high level of customization depending on the application requirements.

This however makes formatting more complex, so here we will break down the main characteristics.

Information relative to code reading is transmitted in standard formats on the device's selected interface. We refer to this as the OUTPUT MESSAGE.

The general format of the OUTPUT MESSAGE is:

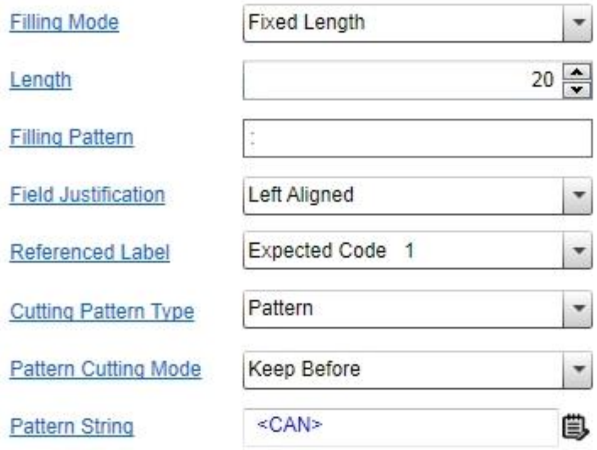
<HEADER><RESULTS><TERMINATOR>

The RESULTS component is composed of several optional fields which are used in different combinations to create different output messages (like Successful Read, No Read, Statistical Data, Diagnostic Data, etc.). These fields can be inserted into the output message in any order. A list of the formatting fields is given in the table below.

Fields	Icon	Meaning
Code Related		Report various code related information types in the output message: Code Content, Number of Characters, Code Symbology, Pixels Per Element, Average Module Size (mils), Symbol Size, Decoding Time, X-Coordinate, Y-Coordinate, Angle, Slave Number, Bounding Box. Each Code Related field can only contain one information type, but you can include multiple Code Related fields in the output message.
Global Statistics	ⓘ	Include Global Statistical Counters in the output message.
Global Reading		This field offers different types of information depending on the data collection Analysis Mode and on the Operating Mode. • When analyizing within an image, the Image Processing Time can be included in the output message to monitor performance. Typically used for Troubleshooting or fine tuning during installation. • For Phase mode, several phase related counters are available. • For PackTrack mode you can add the Pack ID to the output message.
Custom		Define custom strings to be included in the output message. Typically used to customize Failure messages like No Read or Multiple Read.
Diagnostics		Monitor individual Diagnostic Failure events by including them in the output message. Typically used for Troubleshooting. These can also be included independently from the Code Reading events by defining them in the Diagnostic Message. In this case they will be sent at regular intervals depending on the defined timeout.
Code Quality Grading		Include code quality trending to monitor print quality of code labels.

6.1 FIELD LENGTH MANAGEMENT

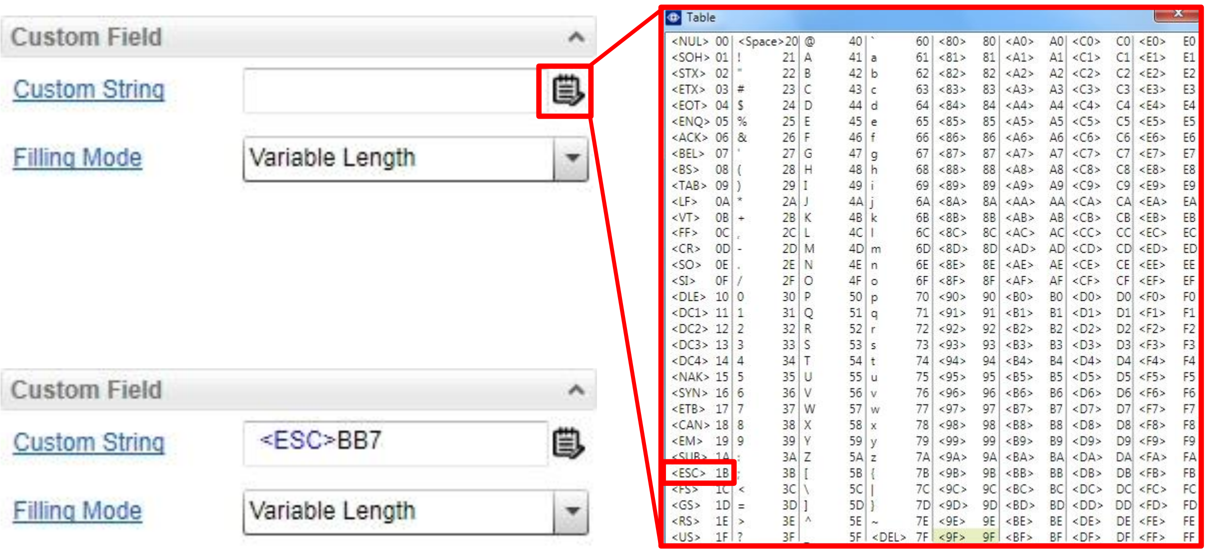
All field types by default are Variable Length fields but they also support Fixed Lengths with cutting and filling mode options.



Filling Mode	Fixed Length
Length	20
Filling Pattern	:
Field Justification	Left Aligned
Referenced Label	Expected Code 1
Cutting Pattern Type	Pattern
Pattern Cutting Mode	Keep Before
Pattern String	<CAN>

6.2 INPUT STRINGS

All Input String fields have a table icon to the right of the field which allows you to input all ASCII characters including non-printable characters.



Custom Field

Custom String	
Filling Mode	Variable Length

Custom Field

Custom String	<ESC>BB7
Filling Mode	Variable Length

Table

<NUL>	00	<Space>	20	@	40	`	60	<80>	80	<A0>	A0	<C0>	C0	<E0>	E0
<SOH>	01	!	21	A	41	a	61	<81>	81	<A1>	A1	<C1>	C1	<E1>	E1
<STX>	02	"	22	B	42	b	62	<82>	82	<A2>	A2	<C2>	C2	<E2>	E2
<ETX>	03	#	23	C	43	c	63	<83>	83	<A3>	A3	<C3>	C3	<E3>	E3
<EOT>	04	$	24	D	44	d	64	<84>	84	<A4>	A4	<C4>	C4	<E4>	E4
<ENQ>	05	%	25	E	45	e	65	<85>	85	<A5>	A5	<C5>	C5	<E5>	E5
<ACK>	06	&	26	F	46	f	66	<86>	86	<A6>	A6	<C6>	C6	<E6>	E6
<BEL>	07	'	27	G	47	g	67	<87>	87	<A7>	A7	<C7>	C7	<E7>	E7
<BS>	08	(	28	H	48	h	68	<88>	88	<A8>	A8	<C8>	C8	<E8>	E8
<TAB>	09	)	29	I	49	i	69	<89>	89	<A9>	A9	<C9>	C9	<E9>	E9
<LF>	0A	*	2A	J	4A	j	6A	<8A>	8A	<AA>	AA	<CA>	CA	<EA>	EA
<VT>	0B	+	2B	K	4B	k	6B	<8B>	8B	<AB>	AB	<CB>	CB	<EB>	EB
<FF>	0C	,	2C	L	4C	l	6C	<8C>	8C	<AC>	AC	<CC>	CC	<EC>	EC
<CR>	0D	-	2D	M	4D	m	6D	<8D>	8D	<AD>	AD	<CD>	CD	<ED>	ED
<SO>	0E	.	2E	N	4E	n	6E	<8E>	8E	<AE>	AE	<CE>	CE	<EE>	EE
<SI>	0F	/	2F	O	4F	o	6F	<8F>	8F	<AF>	AF	<CF>	CF	<EF>	EF
<DLE>	10	0	30	P	50	p	70	<90>	90	<B0>	B0	<D0>	D0	<F0>	F0
<DC1>	11	1	31	Q	51	q	71	<91>	91	<B1>	B1	<D1>	D1	<F1>	F1
<DC2>	12	2	32	R	52	r	72	<92>	92	<B2>	B2	<D2>	D2	<F2>	F2
<DC3>	13	3	33	S	53	s	73	<93>	93	<B3>	B3	<D3>	D3	<F3>	F3
<DC4>	14	4	34	T	54	t	74	<94>	94	<B4>	B4	<D4>	D4	<F4>	F4
<NAK>	15	5	35	U	55	u	75	<95>	95	<B5>	B5	<D5>	D5	<F5>	F5
<SYN>	16	6	36	V	56	v	76	<96>	96	<B6>	B6	<D6>	D6	<F6>	F6
<ETB>	17	7	37	W	57	w	77	<97>	97	<B7>	B7	<D7>	D7	<F7>	F7
<CAN>	18	8	38	X	58	x	78	<98>	98	<B8>	B8	<D8>	D8	<F8>	F8
<EM>	19	9	39	Y	59	y	79	<99>	99	<B9>	B9	<D9>	D9	<F9>	F9
<SUB>	1A	:	3A	Z	5A	z	7A	<9A>	9A	<BA>	BA	<DA>	DA	<FA>	FA
<ESC>	1B	;	3B	[	5B	{	7B	<9B>	9B	<BB>	BB	<DB>	DB	<FB>	FB
<FS>	1C	<	3C	\	5C	|	7C	<9C>	9C	<BC>	BC	<DC>	DC	<FC>	FC
<GS>	1D	=	3D	]	5D	}	7D	<9D>	9D	<BD>	BD	<DD>	DD	<FD>	FD
<RS>	1E	>	3E	^	5E	~	7E	<9E>	9E	<BE>	BE	<DE>	DE	<FE>	FE
<US>	1F	?	3F	_	5F	<DEL>	7F	<9F>	9F	<BF>	BF	<DF>	DF	<FF>	FF

Just single-click on the desired character to insert it into the string.

While it is quicker to type normal characters directly from your keyboard, non-printable characters must be entered using the table.

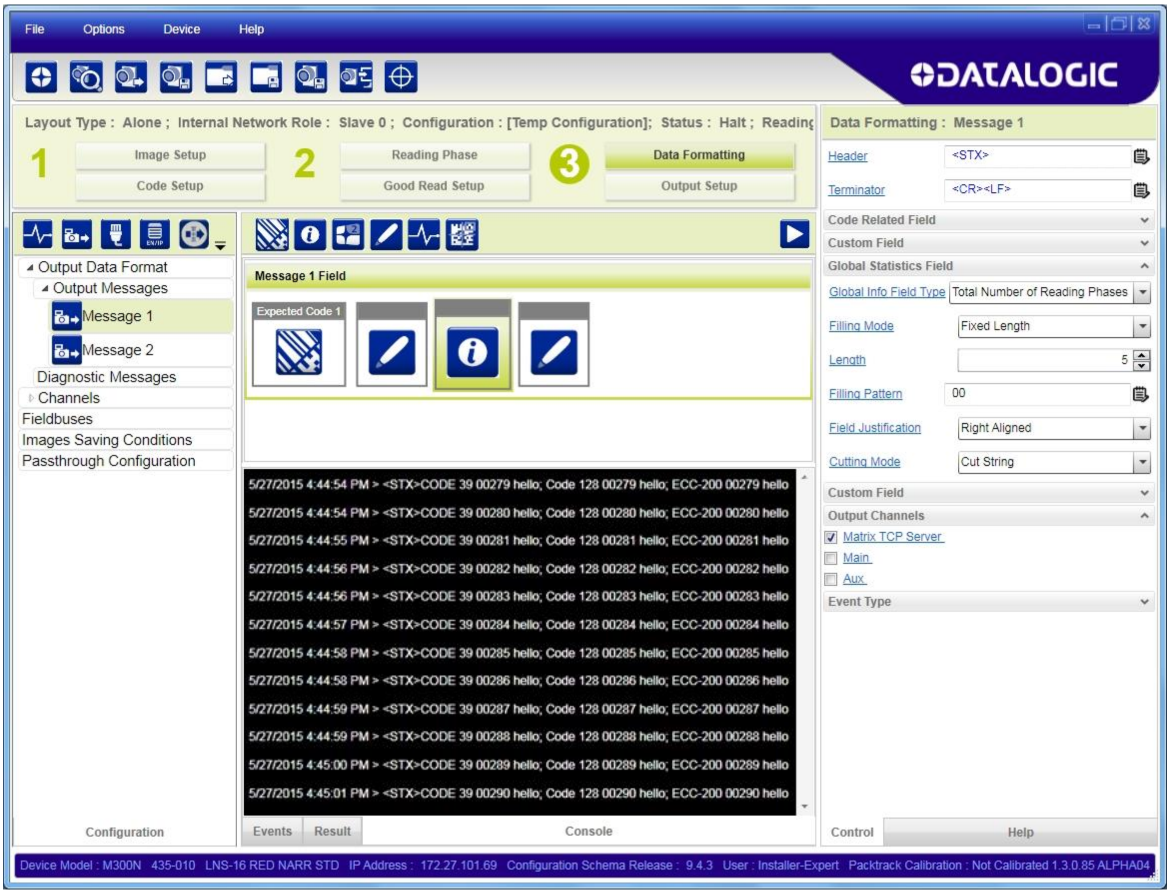
6.3 FIELD SEPARATOR

When Operating Mode is set to Code Collection or Code Presentation, the Field Separator character or string is used to separate each formatted code message within the complete output message #n. For example:

[Header] [formatted Code1] [Field Separator] [formatted Code2] ... [Terminator]

Each defined message #n can have a different Field Separator.

Example:



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading

Data Formatting : Message 1

Header: <STX>

Terminator: <CR><LF>

Global Info Field Type: Total Number of Reading Phases

Filling Mode: Fixed Length

Length: 5

Filling Pattern: 00

Field Justification: Right Aligned

Cutting Mode: Cut String

☑ Matrix TCP Server

□ Main

□ Aux

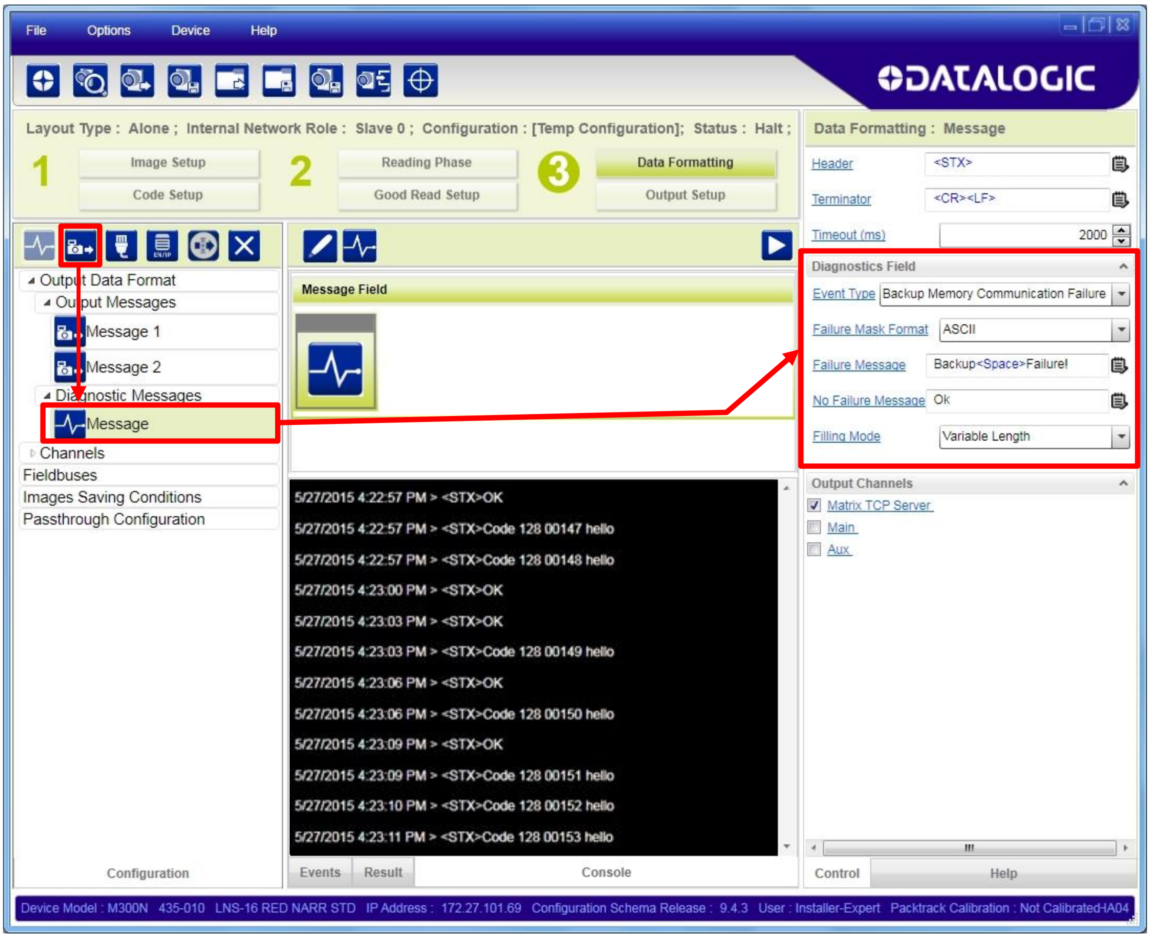
```
5/27/2015 4:44:54 PM > <STX>CODE 39 00279 hello; Code 128 00279 hello; ECC-200 00279 hello
5/27/2015 4:44:54 PM > <STX>CODE 39 00280 hello; Code 128 00280 hello; ECC-200 00280 hello
5/27/2015 4:44:55 PM > <STX>CODE 39 00281 hello; Code 128 00281 hello; ECC-200 00281 hello
5/27/2015 4:44:56 PM > <STX>CODE 39 00282 hello; Code 128 00282 hello; ECC-200 00282 hello
5/27/2015 4:44:56 PM > <STX>CODE 39 00283 hello; Code 128 00283 hello; ECC-200 00283 hello
5/27/2015 4:44:57 PM > <STX>CODE 39 00284 hello; Code 128 00284 hello; ECC-200 00284 hello
5/27/2015 4:44:58 PM > <STX>CODE 39 00285 hello; Code 128 00285 hello; ECC-200 00285 hello
5/27/2015 4:44:58 PM > <STX>CODE 39 00286 hello; Code 128 00286 hello; ECC-200 00286 hello
5/27/2015 4:44:59 PM > <STX>CODE 39 00287 hello; Code 128 00287 hello; ECC-200 00287 hello
5/27/2015 4:44:59 PM > <STX>CODE 39 00288 hello; Code 128 00288 hello; ECC-200 00288 hello
5/27/2015 4:45:00 PM > <STX>CODE 39 00289 hello; Code 128 00289 hello; ECC-200 00289 hello
5/27/2015 4:45:01 PM > <STX>CODE 39 00290 hello; Code 128 00290 hello; ECC-200 00290 hello
```

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated 1.3.0.85 ALPHA04

6.4 INDEPENDENT DIAGNOSTIC MESSAGES

As a troubleshooting tool or for error monitoring a Diagnostic Message can be sent independently from the code reading message.

For demonstration purposes, the figure below shows the Diagnostic Message for a **Backup Memory Communication Failure** being monitored and sent every 3 seconds on the output independently from the code reading output message.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ;

Data Formatting : Message

Header: <STX>
Terminator: <CR><LF>
Timeout (ms): 2000

Diagnostics Field
Event Type: Backup Memory Communication Failure
Failure Mask Format: ASCII
Failure Message: Backup<Space>Failure!
No Failure Message: Ok
Filling Mode: Variable Length

Output Channels
☑ Matrix TCP Server
☐ Main
☐ Aux

```
5/27/2015 4:22:57 PM > <STX>OK
5/27/2015 4:22:57 PM > <STX>Code 128 00147 hello
5/27/2015 4:22:57 PM > <STX>Code 128 00148 hello
5/27/2015 4:23:00 PM > <STX>OK
5/27/2015 4:23:03 PM > <STX>OK
5/27/2015 4:23:03 PM > <STX>Code 128 00149 hello
5/27/2015 4:23:06 PM > <STX>OK
5/27/2015 4:23:06 PM > <STX>Code 128 00150 hello
5/27/2015 4:23:09 PM > <STX>OK
5/27/2015 4:23:09 PM > <STX>Code 128 00151 hello
5/27/2015 4:23:10 PM > <STX>Code 128 00152 hello
5/27/2015 4:23:11 PM > <STX>Code 128 00153 hello
```

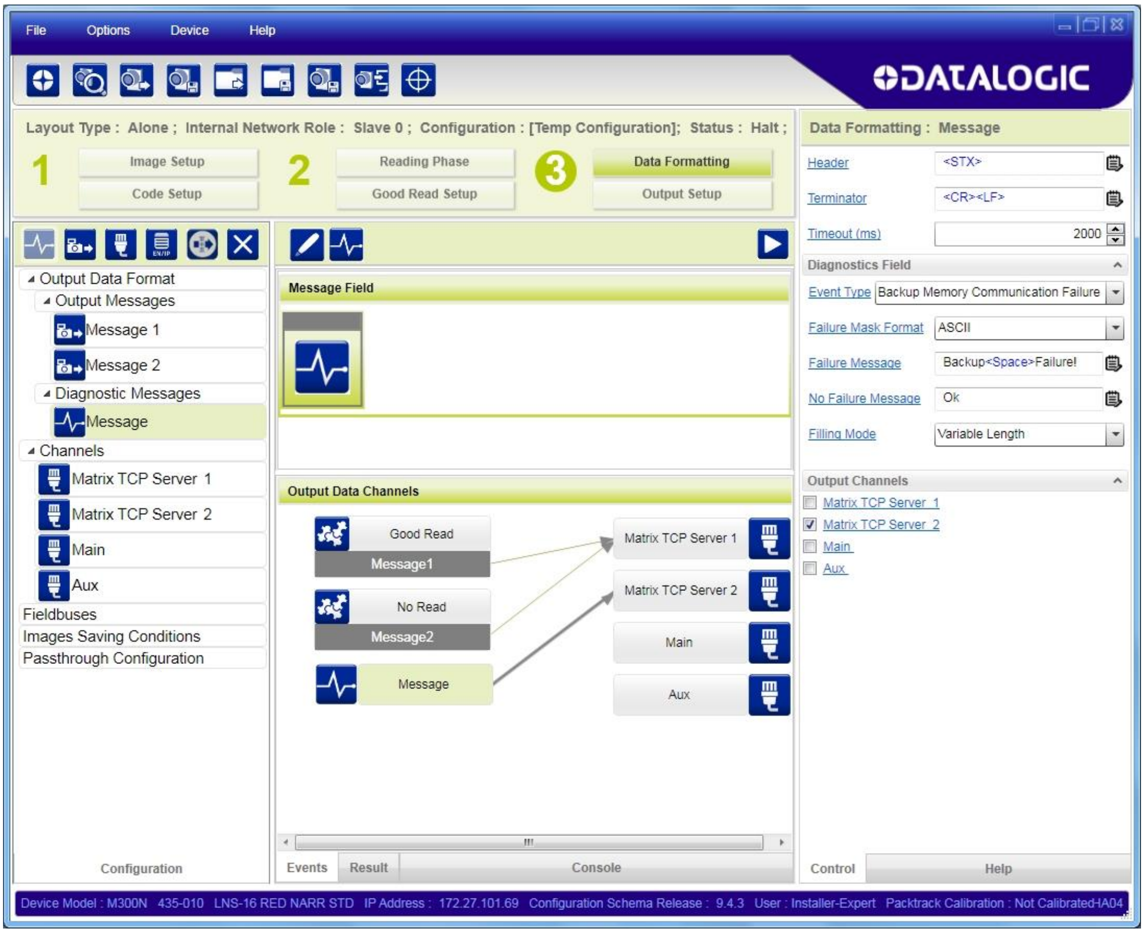
Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not CalibratedHA04

Typically only the Failure string is defined to avoid unnecessary message traffic.

Only upon failures, the Failure Mask sends a fixed 32-character mask. Each character represents the Standalone/Master device + 31 Slaves. The ASCII mask sends 0 =OK and 1 = Failure. The Binary mask sends non-printable characters.

The mask is appended to the Failure Content message (if defined).

This monitoring could be sent to another channel so as not to interfere with data communication, for example to another Matrix TCP Server connection, as shown below.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ;

Data Formatting : Message

Header: <STX>

Terminator: <CR><LF>

Timeout (ms): 2000

Diagnostics Field

Event Type: Backup Memory Communication Failure

Failure Mask Format: ASCII

Failure Message: Backup<Space>Failure!

No Failure Message: Ok

Filling Mode: Variable Length

Output Channels

☐ Matrix TCP Server 1

☑ Matrix TCP Server 2

☐ Main

☐ Aux

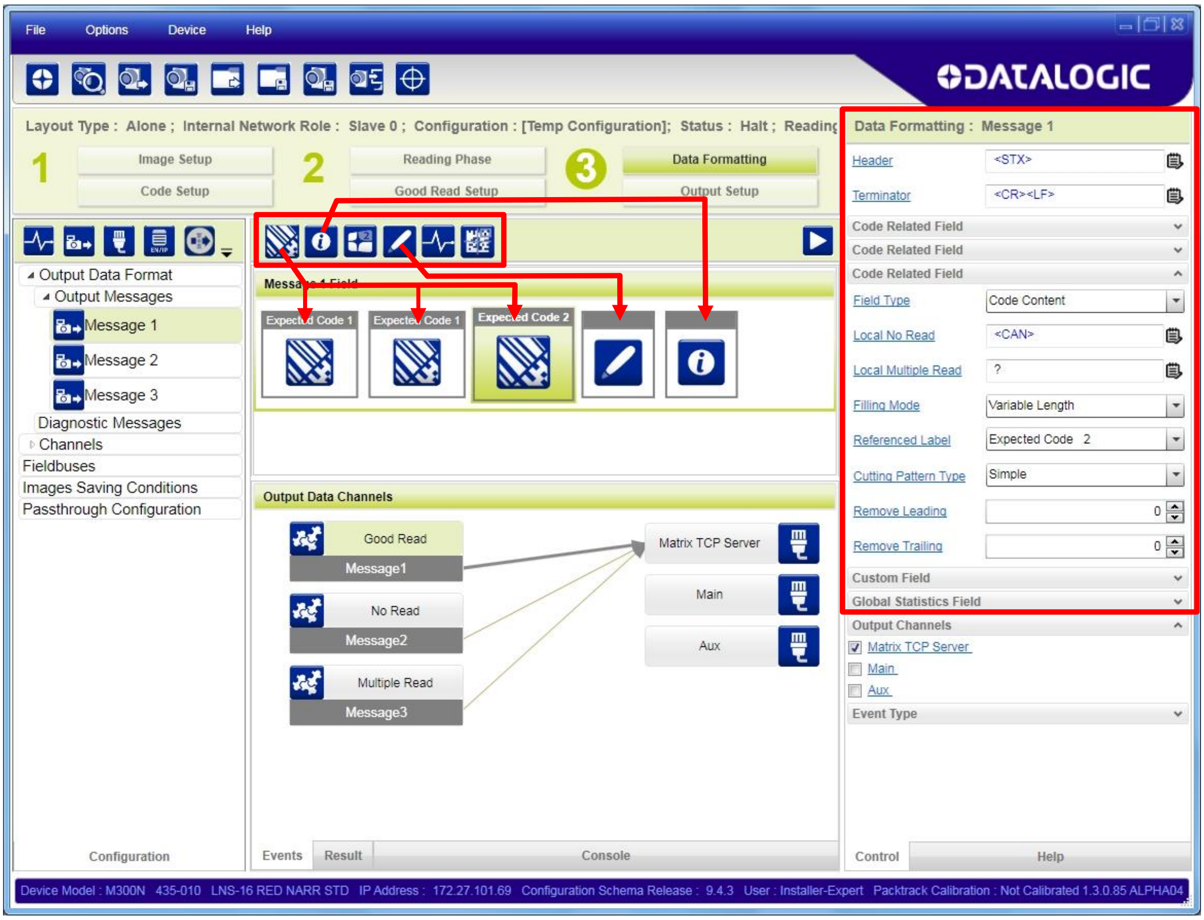
Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not CalibratedHA04

Several Diagnostic fields can be added to the Diagnostic Message for complete monitoring.

6.5 CODE COMBINATION MESSAGE FORMATTING EXAMPLE

In Code Combination the expected result is always known in terms of code reading.
To simplify these examples we will not consider Code Cutting or Justification, all fields are considered with the default value as Variable Length fields.

Recalling the example in par. 5.2:



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading

Data Formatting : Message 1

Header: <STX>
Terminator: <CR><LF>
Field Type: Code Content
Local No Read: <CAN>
Local Multiple Read: ?
Filling Mode: Variable Length
Referenced Label: Expected Code 2
Cutting Pattern Type: Simple
Remove Leading: 0
Remove Trailing: 0

Output Channels:
☑ Matrix TCP Server
□ Main
□ Aux

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated 1.3.0.85 ALPHA04

The DMECC200, QR Code and Code128 types are enabled and present in the Code Combination with the following logical combination:

DMECC200 OR QRCode AND Code128.

No Read is Enabled; Multiple Read is Enabled; Partial Read is treated as No Read

1. Click on the various field icons to add them to the Message Field Area to compose the message.

   You can drag them into different positions to change the ordering of the message fields.

   You can also delete them by selecting the field with the mouse (highlighted in green), and then delete it using your keyboard.

Then modify the Data Formatting parameters of each field in the parameters panel.

The Data Formatting Parameters are:

Message 1 = Good Read
Header String = <STX>
Terminator String = <CR><LF>

Referenced Label = Expected Code 1
Code Related Field = Code Symbology
Code Related Field = Code Content

Referenced Label = Expected Code 2
Code Related Field = Code Content

Custom Field
Custom String = <Space>->Space>

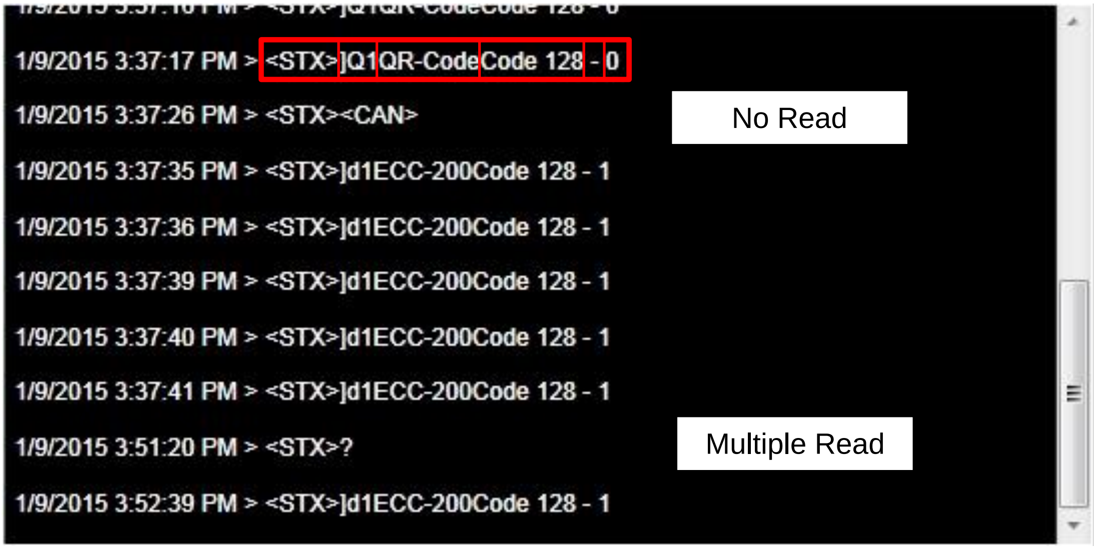
Global Statistics Field
Global Info Field Type = Total Number of No Reads

Message 2 = No Read
Custom Field
Custom String = <CAN>

Message 3 = Multiple Read
Custom Field
Custom String = <?>

The Output Messages are:

Case 1: codes (DMECC200 AND Code128) or (QR Code AND Code128) are read
Output: the content of **Message 1 Good Read** is sent to the Host.



```
1/9/2015 3:37:16 PM > <STX>]Q1QR-CodeCode 128 - 0
1/9/2015 3:37:17 PM > <STX>]Q1QR-CodeCode 128 - 0
1/9/2015 3:37:26 PM > <STX><CAN>
1/9/2015 3:37:35 PM > <STX>]d1ECC-200Code 128 - 1
1/9/2015 3:37:36 PM > <STX>]d1ECC-200Code 128 - 1
1/9/2015 3:37:39 PM > <STX>]d1ECC-200Code 128 - 1
1/9/2015 3:37:40 PM > <STX>]d1ECC-200Code 128 - 1
1/9/2015 3:37:41 PM > <STX>]d1ECC-200Code 128 - 1
1/9/2015 3:51:20 PM > <STX>?
1/9/2015 3:52:39 PM > <STX>]d1ECC-200Code 128 - 1
```

7 MONITOR

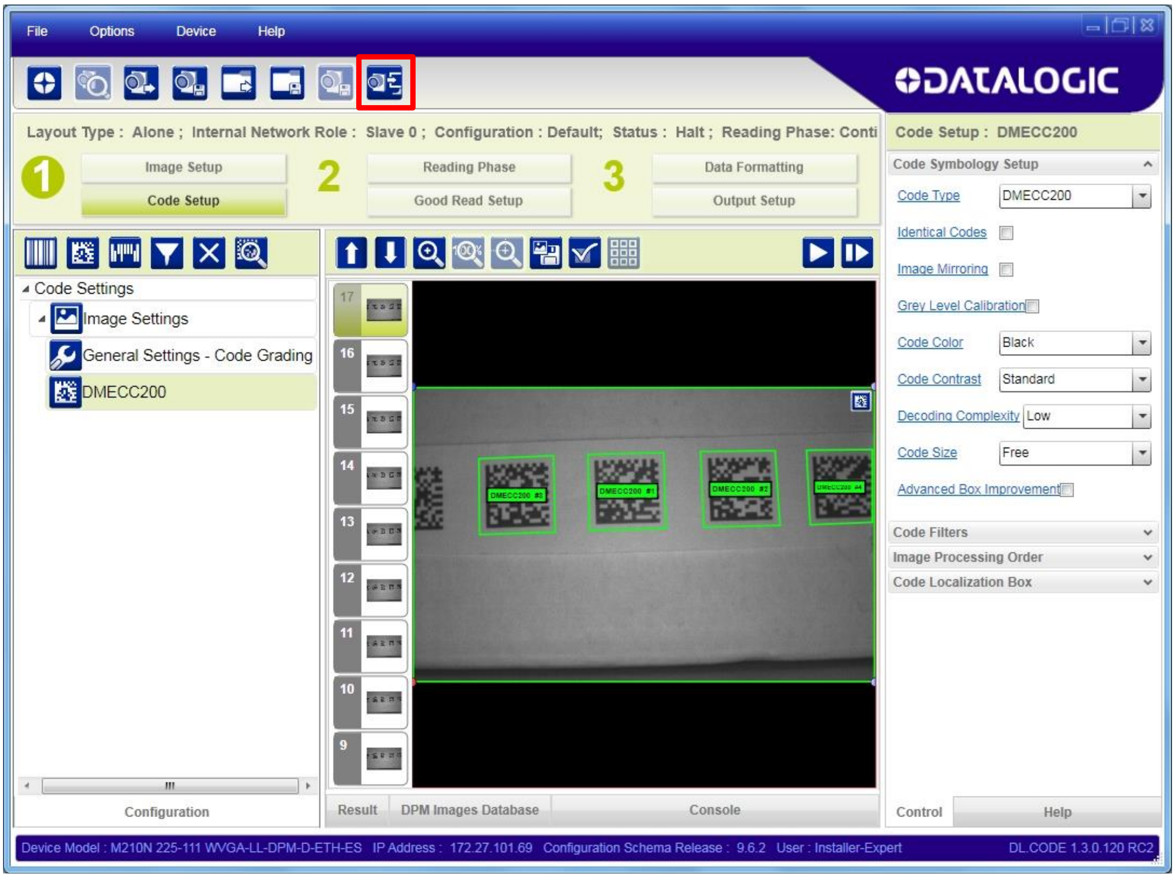
The Monitor feature is designed to check device operation from a remote PC even simultaneously with other monitoring PCs.

It can be used during installation or troubleshooting to check the device operation. The device operates with a minimum of DL.CODE overhead and therefore reading results are much closer to real-time performance.

Monitor also provides diagnostic alarm feedback.

7.1 ACESSING THE MONITOR

You can access the Monitor page through the File menu or the Monitor icon.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : Default; Status : Halt ; Reading Phase: Conti

Code Setup : DMECC200

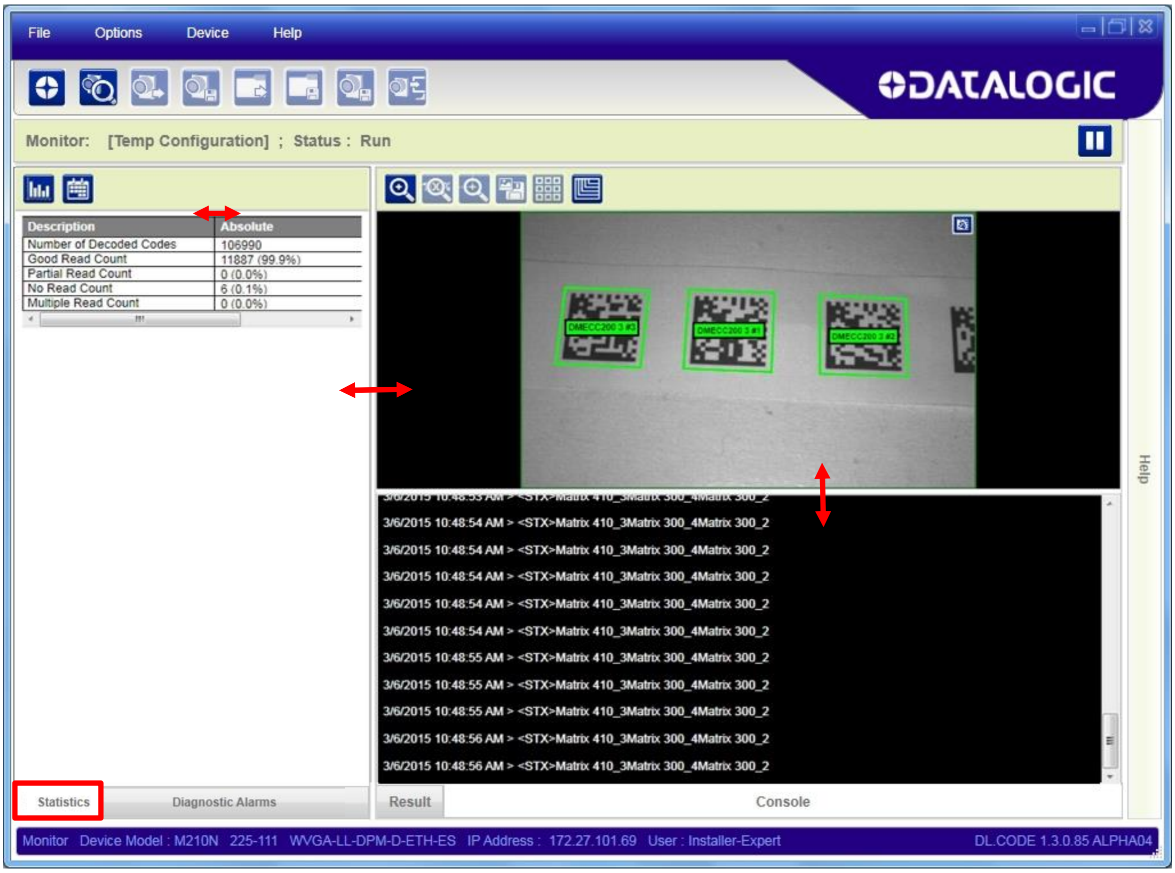
Code Type: DMECC200
Identical Codes ☐
Image Mirroring ☐
Grey Level Calibration ☐
Code Color: Black
Code Contrast: Standard
Decoding Complexity: Low
Code Size: Free
Advanced Box Improvement ☐

Device Model : M210N 225-111 WVGA-LL-DPM-D-ETH-ES IP Address : 172.27.101.69 Configuration Schema Release : 9.6.2 User : Installer-Expert DL.CODE 1.3.0.120 RC2

7.2 MONITORING STATISTICS

The Monitor loads with the reader in run mode and the Statistics page open. If the device is reading (in Continuous operating mode or One Shot/Phase Mode with trigger active), the reader will show image acquisition.

You can resize the various windows by dragging the edges with the mouse.



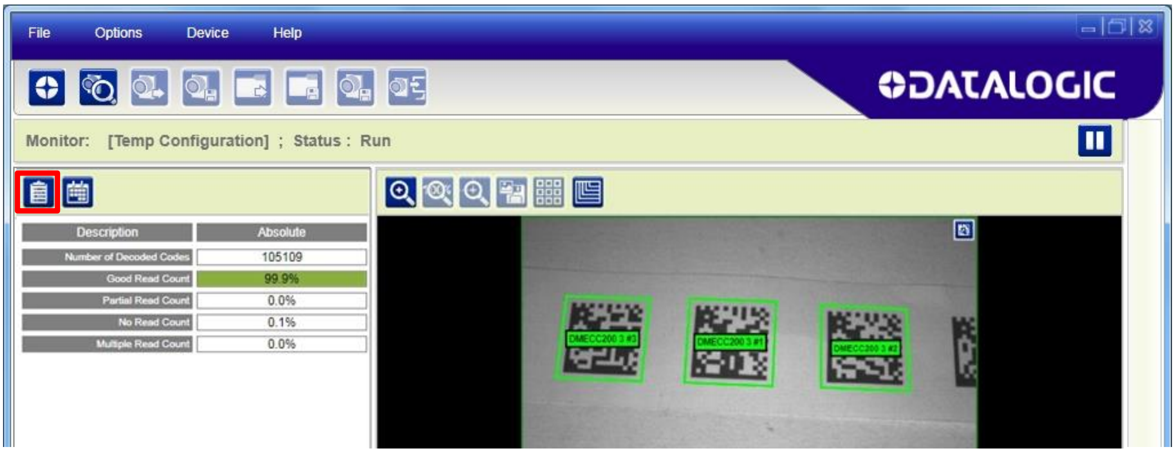
Monitor: [Temp Configuration] ; Status : Run

Description	Absolute
Number of Decoded Codes	106990
Good Read Count	11887 (99.9%)
Partial Read Count	0 (0.0%)
No Read Count	6 (0.1%)
Multiple Read Count	0 (0.0%)

```
3/6/2015 10:48:54 AM > <STX>Matrix 410_3Matrix 300_4Matrix 300_2
3/6/2015 10:48:54 AM > <STX>Matrix 410_3Matrix 300_4Matrix 300_2
3/6/2015 10:48:54 AM > <STX>Matrix 410_3Matrix 300_4Matrix 300_2
3/6/2015 10:48:54 AM > <STX>Matrix 410_3Matrix 300_4Matrix 300_2
3/6/2015 10:48:54 AM > <STX>Matrix 410_3Matrix 300_4Matrix 300_2
3/6/2015 10:48:55 AM > <STX>Matrix 410_3Matrix 300_4Matrix 300_2
3/6/2015 10:48:55 AM > <STX>Matrix 410_3Matrix 300_4Matrix 300_2
3/6/2015 10:48:55 AM > <STX>Matrix 410_3Matrix 300_4Matrix 300_2
3/6/2015 10:48:56 AM > <STX>Matrix 410_3Matrix 300_4Matrix 300_2
3/6/2015 10:48:56 AM > <STX>Matrix 410_3Matrix 300_4Matrix 300_2
```

Monitor Device Model : M210N 225-111 WVGA-LL-DPM-D-ETH-ES IP Address : 172.27.101.69 User : Installer-Expert DL.CODE 1.3.0.85 ALPHA04

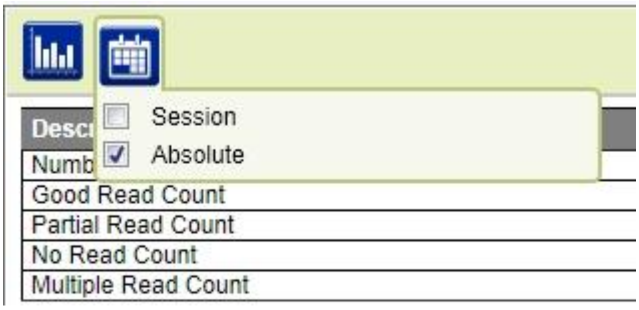
You can toggle between table view and chart view statistics by clicking on the icon.



Monitor: [Temp Configuration] ; Status : Run

Description	Absolute
Number of Decoded Codes	105109
Good Read Count	99.9%
Partial Read Count	0.0%
No Read Count	0.1%
Multiple Read Count	0.0%

You can also switch between Session and Absolute statistics.



□ Session
☑ Absolute

Desc
Numb
Good Read Count
Partial Read Count
No Read Count
Multiple Read Count

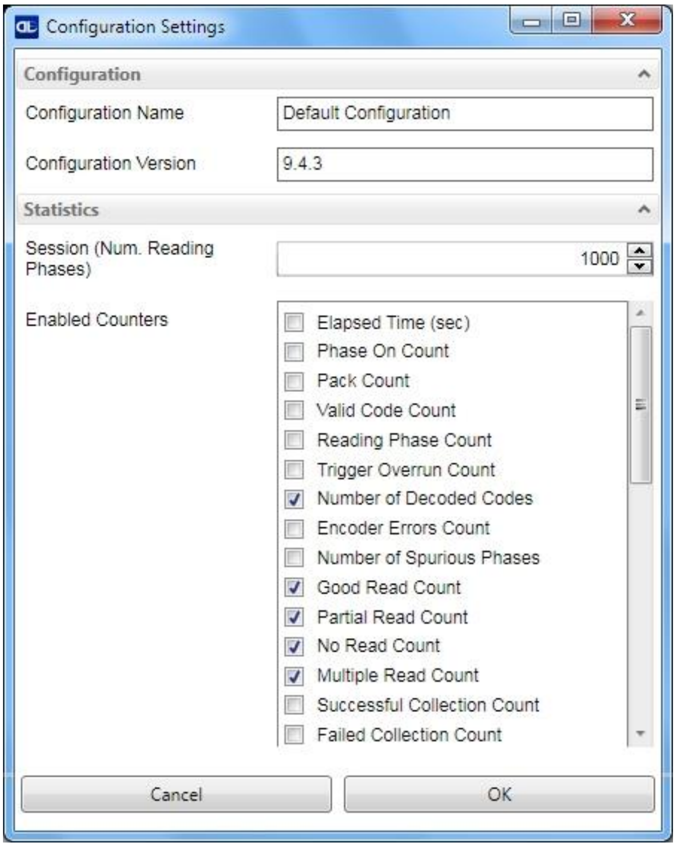
- **Session Statistics**: keep track of the various reporting fields from the last session or the last time the Statistics were reset up to the maximum Session number of reading phases. See below. A session ends if the device is connected to the DL.CODE configuration environment.

- **Absolute Statistics**: keep track of the various reporting fields from the last device power on or the last time the Statistics were reset.

7.2.1 Statistics Settings

From the Device menu > Settings > Configuration Settings you can set the number of reading phases to monitor for a Session (from 10 to 1000).

You can also choose which fields to visualize in the Monitor Statistics page.



Configuration Settings

Configuration

Configuration Name: Default Configuration

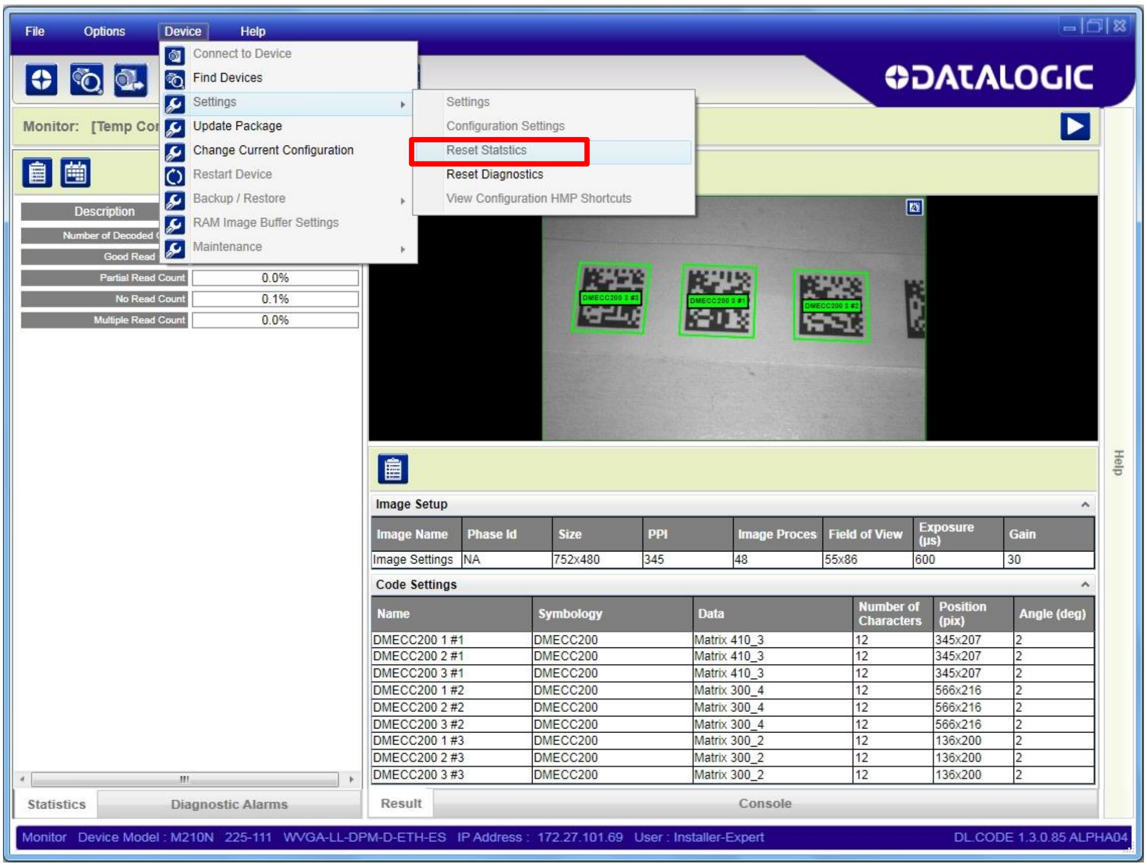
Configuration Version: 9.4.3

Statistics

Session (Num. Reading Phases): 1000

Enabled Counters:
□ Elapsed Time (sec)
□ Phase On Count
□ Pack Count
□ Valid Code Count
□ Reading Phase Count
□ Trigger Overrun Count
☑ Number of Decoded Codes
□ Encoder Errors Count
□ Number of Spurious Phases
☑ Good Read Count
☑ Partial Read Count
☑ No Read Count
☑ Multiple Read Count
□ Successful Collection Count
□ Failed Collection Count

You can reset all the statistics (both Session and Absolute) by selecting the Reset Statistics command from the Device menu > Settings.



Description	
Number of Decoded (	
Good Read	
Partial Read Count	0.0%
No Read Count	0.1%
Multiple Read Count	0.0%

Image Setup

Image Name	Phase Id	Size	PPI	Image Proces	Field of View	Exposure (µs)	Gain
Image Settings	NA	752x480	345	48	55x86	600	30

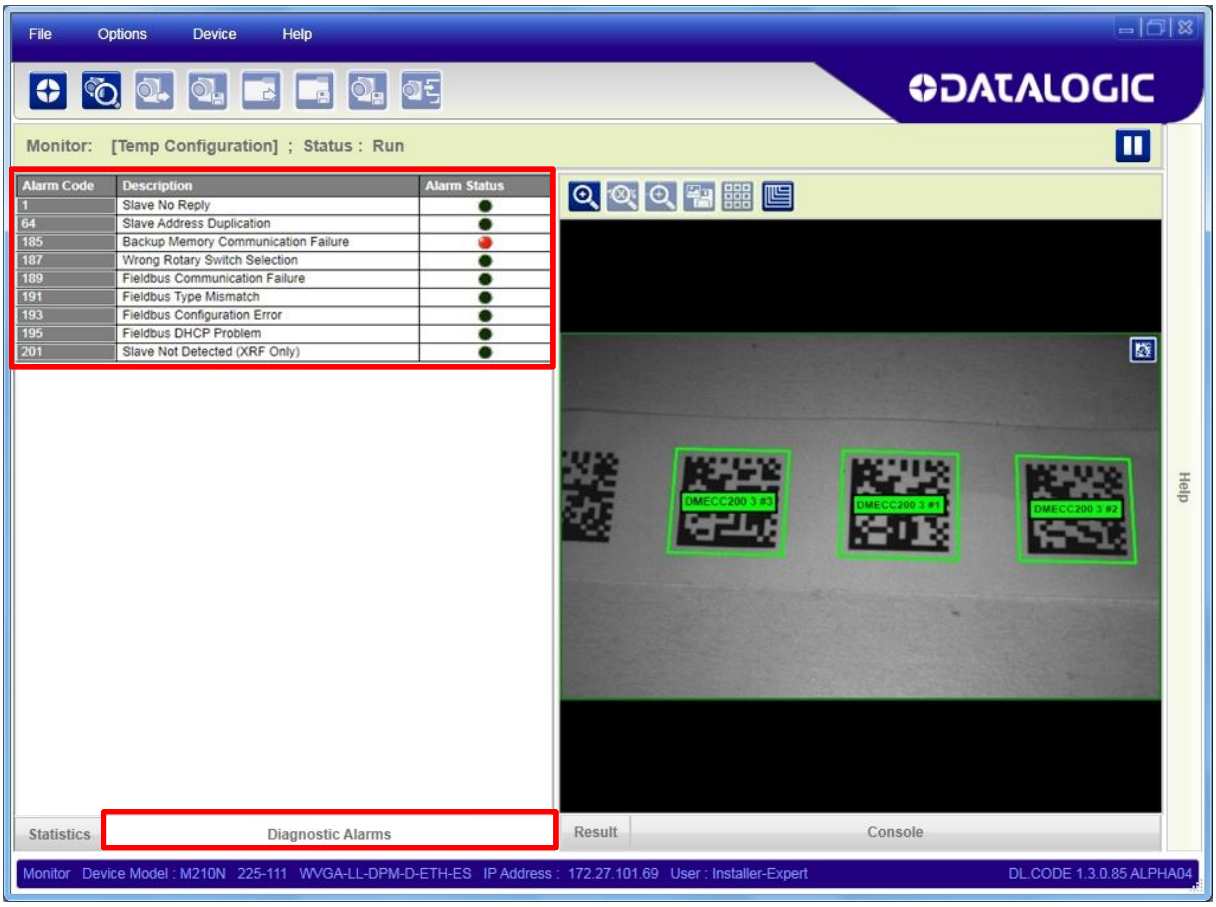
Code Settings

Name	Symbology	Data	Number of Characters	Position (pix)	Angle (deg)
DMECC200 1 #1	DMECC200	Matrix 410_3	12	345x207	2
DMECC200 2 #1	DMECC200	Matrix 410_3	12	345x207	2
DMECC200 3 #1	DMECC200	Matrix 410_3	12	345x207	2
DMECC200 1 #2	DMECC200	Matrix 300_4	12	566x216	2
DMECC200 2 #2	DMECC200	Matrix 300_4	12	566x216	2
DMECC200 3 #2	DMECC200	Matrix 300_4	12	566x216	2
DMECC200 1 #3	DMECC200	Matrix 300_2	12	136x200	2
DMECC200 2 #3	DMECC200	Matrix 300_2	12	136x200	2
DMECC200 3 #3	DMECC200	Matrix 300_2	12	136x200	2

Monitor Device Model : M210N 225-111 WVGA-LL-DPM-D-ETH-ES IP Address : 172.27.101.69 User : Installer-Expert DL.CODE 1.3.0.85 ALPHA04

7.3 MONITORING DIAGNOSTIC ALARMS

Any Diagnostic Alarms will show up as a warning light on the alarm panel.



Monitor: [Temp Configuration] ; Status : Run

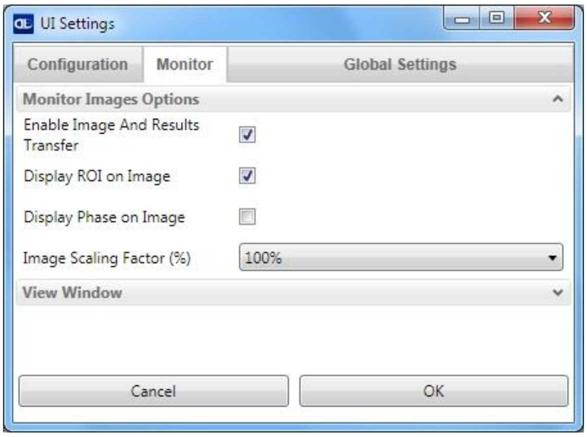
Alarm Code	Description	Alarm Status
1	Slave No Reply	●
64	Slave Address Duplication	●
185	Backup Memory Communication Failure	🔴
187	Wrong Rotary Switch Selection	●
189	Fieldbus Communication Failure	●
191	Fieldbus Type Mismatch	●
193	Fieldbus Configuration Error	●
195	Fieldbus DHCP Problem	●
201	Slave Not Detected (XRF Only)	●

Monitor Device Model : M210N 225-111 WVGA-LL-DPM-D-ETH-ES IP Address : 172.27.101.69 User : Installer-Expert DL.CODE 1.3.0.85 ALPHA04

7.4 MONITOR SETTINGS

7.4.1 Monitor Images Options

Several options can be set for the Monitor window. They are set in the Options>UI Settings menu on the Monitor tab.



Monitor Images Options

Enable Image And Results Transfer ☑

Display ROI on Image ☑

Display Phase on Image □

Image Scaling Factor (%) 100%

View Window

Enable Image and Results Transfer: enables the image feedback in the Monitor window.

Display ROI on Image: shows the bounding box around each code on the image.

Display Phase on Image: shows the Phase identification number in white letters in the upper left-hand side of the image.

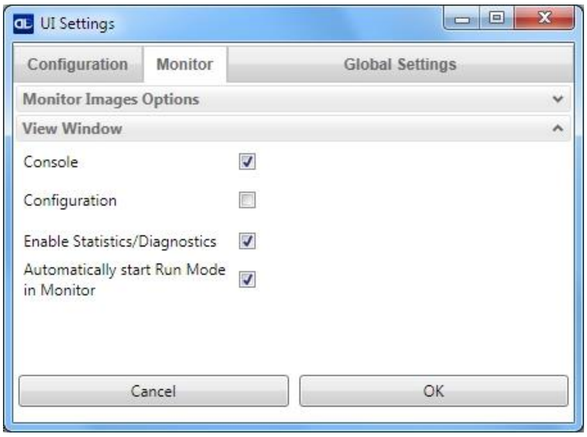
Image Scaling Factor: allows downsizing the image subsampling to increase the visualization performance.

7.4.2 View Window

You can select several options to view in the Monitor window.

Console: shows the Console panel to view output messages.

Configuration: shows the Configuration panel to allow viewing the configuration parameters (read-only). Configuration cannot be performed from the Monitor window.



Monitor Images Options

View Window

Console ☑

Configuration □

Enable Statistics/Diagnostics ☑

Automatically start Run Mode in Monitor ☑

Statistics/Diagnostics: shows the Statistics and Diagnostic Alarms panels.

Automatically start Run Mode in Monitor: when launching Monitor the window opens with the device in Run Mode. This is the default setting.

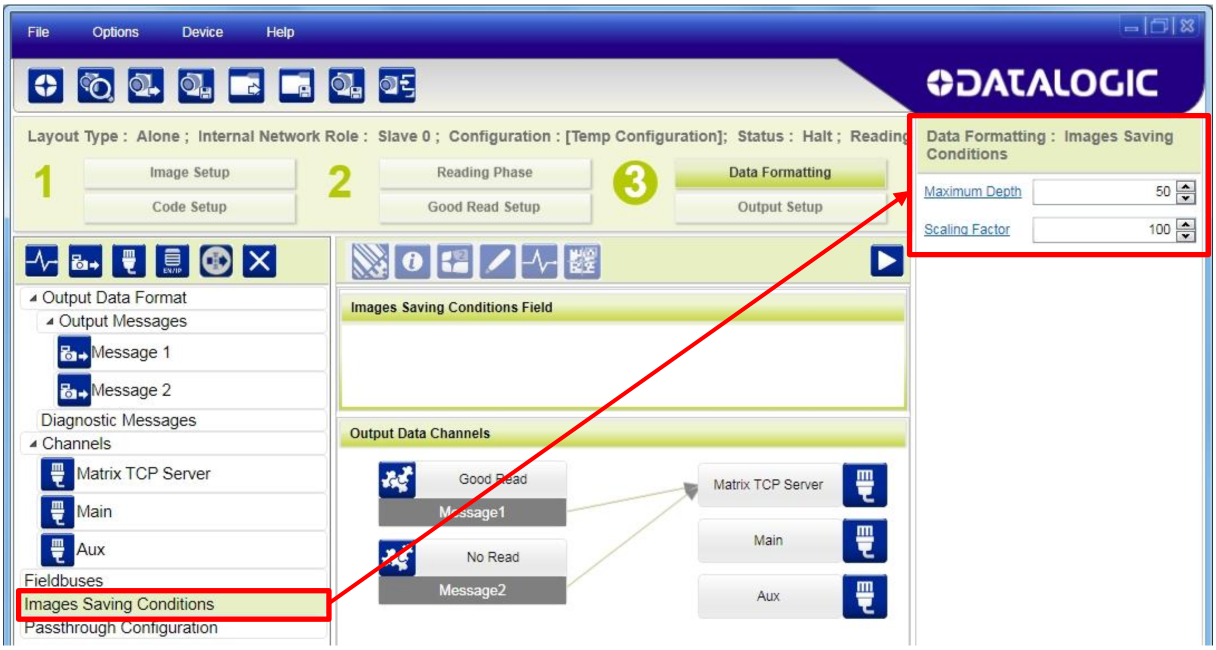
8 IMAGE SAVING

8.1 DEVICE IMAGE BUFFER

The Device Image Buffer allows saving captured images to the internal device memory (RAM) for data collection analysis. These images can either be sent to a remote or local PC or an FTP server at run time; or they can be downloaded from the buffer when the device is offline (not in run mode).

CAUTION: The internal device memory has a circular buffer to avoid overrunning the available memory. To save images correctly to the internal buffer, you need to calculate the number of images the buffer can hold based on the image resolution for your device model.

More images can be stored in memory by scaling down the image size.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading

Data Formatting : Images Saving Conditions

Maximum Depth 50

Scaling Factor 100

NOTE: Transferring images remotely may slightly reduce the decoding rate. It is recommended to use this feature only when enough time is available to guarantee the decoding of all images.

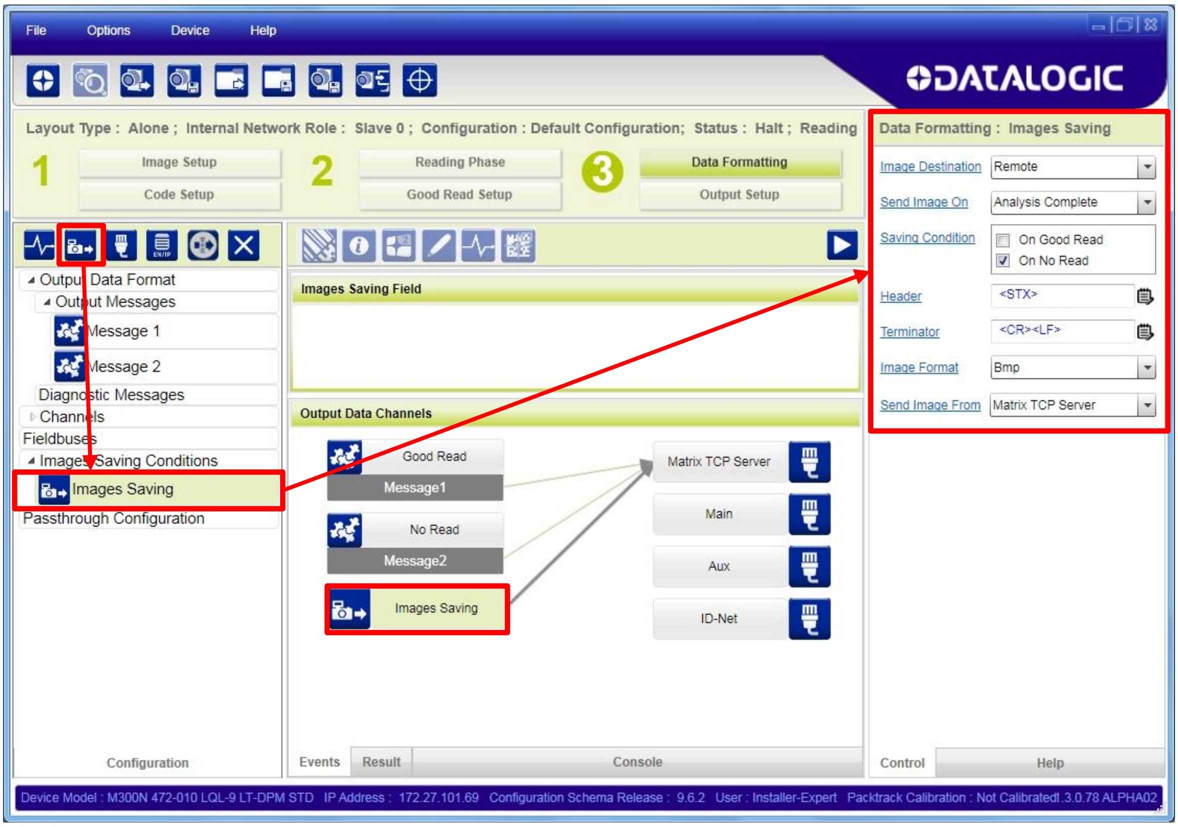
Image Saving Conditions

Maximum Depth sets the total number of images that can be sent from or saved to the Device Image Buffer. Set this figure to a practical value taking into consideration the above mentioned CAUTION.

Scaling Factor allows reducing the size of images to be saved so that a greater number of images can be saved in the Device Image Buffer.

8.1.1 Image Saving Using Matrix TCP Server/Client

To add an image saving condition to the configuration, click on the Add Image Saving Condition icon.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : Default Configuration; Status : Halt ; Reading

Data Formatting : Images Saving

Image Destination	Remote
Send Image On	Analysis Complete
Saving Condition	☐ On Good Read ☑ On No Read
Header	<STX>
Terminator	<CR><LF>
Image Format	Bmp
Send Image From	Matrix TCP Server

Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.2 User : Installer-Expert Packtrack Calibration : Not Calibrated! 3.0.78 ALPHA02

When selecting a Remote **Image Destination**, the default value is **Send Image From** Matrix TCP Server (on-board Ethernet) channel to an external TCP Client. If desired, a different dedicated Matrix channel can be added for image transfer.

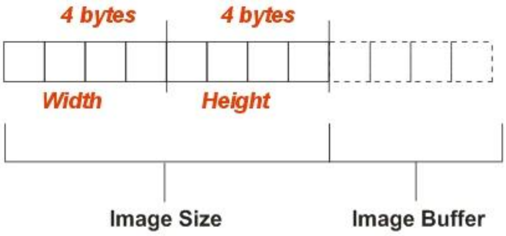
According to the selected **Saving Condition** parameter, after data collection analysis is complete, images can be sent at run time directly from the Device Image Buffer to a remote or local PC.

The Image Saving format is:

[Header] [Image Buffer] [Terminator]

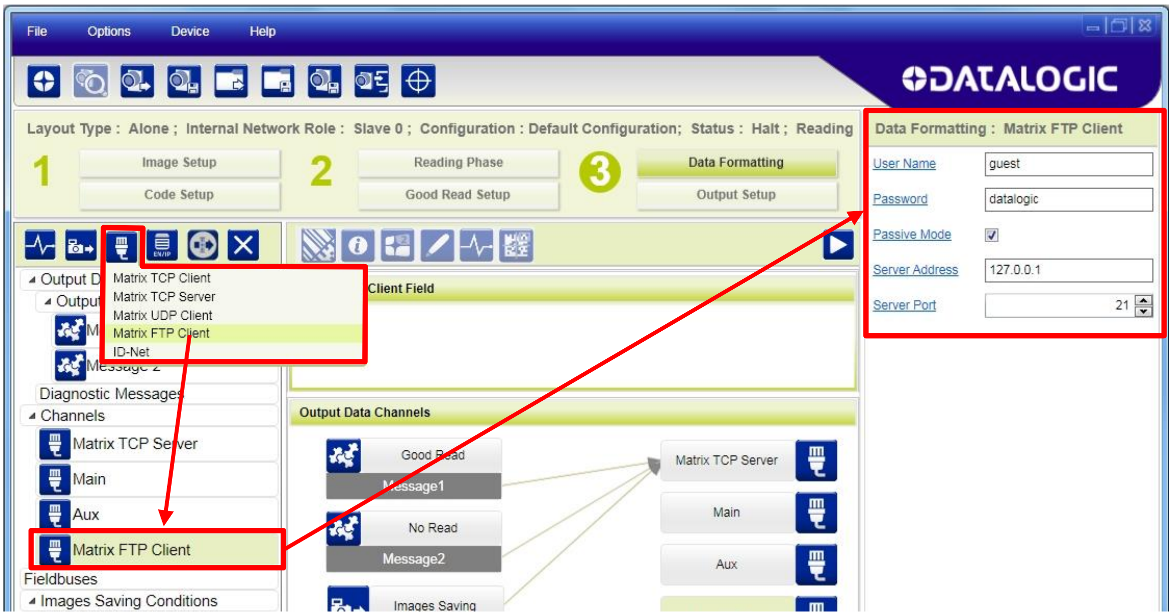
The Image Buffer contains the image data in the selected format (.bmp, .jpg, .png, .tif).

If the RAW data format is selected, the Image Buffer data is preceded by 8 bytes which indicate the image size: the first 4 bytes indicate the image columns (width) while the last 4 bytes indicate the image lines (height) in little-endian ordering.



8.1.2 Image Saving Using Matrix FTP Client

Images can be sent at run time directly from the device image buffer to an external FTP Server through a Matrix FTP Client channel. The Matrix FTP Client must be added as a new communication channel since it is disabled by default. Do this by selecting the channel icon.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : Default Configuration; Status : Halt ; Reading

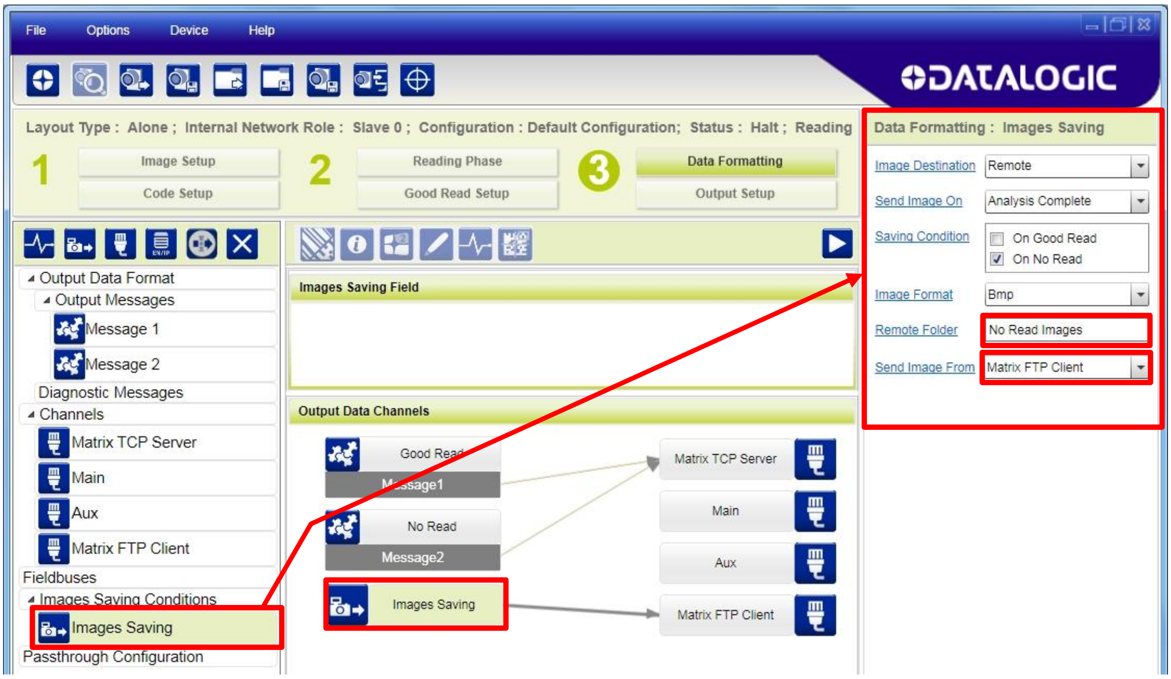
Data Formatting : Matrix FTP Client

User Name: guest
Password: datalogic
Passive Mode: ☑
Server Address: 127.0.0.1
Server Port: 21

- The Server Address must match the external FTP Server PC.
- The Username and Password must match the ones required by the external FTP Server PC.

Now select Images Saving and set the **Send Image From** parameter to Matrix FTP Client.

Input the name of the Remote Folder on the FTP Server to which the image files must be saved.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : Default Configuration; Status : Halt ; Reading

Data Formatting : Images Saving

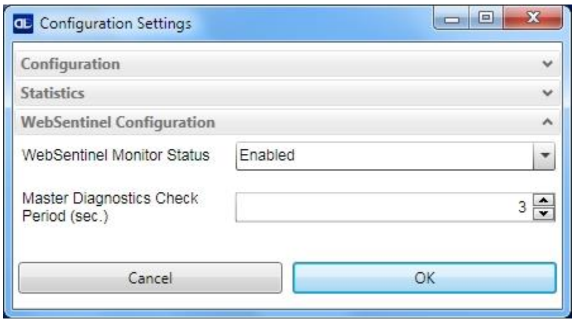
Image Destination: Remote
Send Image On: Analysis Complete
Saving Condition: □ On Good Read ☑ On No Read
Image Format: Bmp
Remote Folder: No Read Images
Send Image From: Matrix FTP Client

8.1.3 Image Saving On Demand to WebSentinel FTP Server

Images can be sent to the WebSentinel FTP Server through a Matrix FTP Client channel upon receiving a Download command from Datalogic WebSentinel™ through the Download buttons in the Event Search tab. See the description in the Datalogic WebSentinal User's Manual.

This selection applies only to One Shot and Phase Mode Operating Modes.

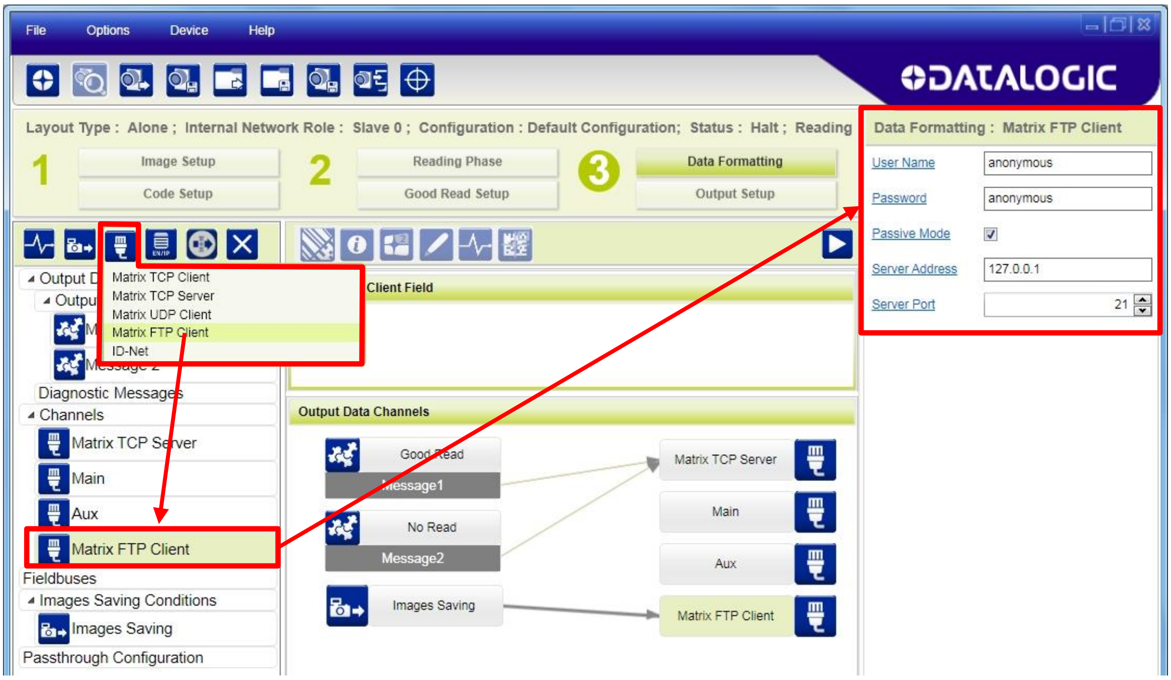
NOTE: In order for Datalogic WebSentinel to communicate with the Matrix array you must enable WebSentinel Monitor Status in the DL.CODE Device>Settings>Configuration Settings menu.



WebSentinel Monitor Status: Enabled

Master Diagnostics Check Period (sec.): 3

The Matrix FTP Client must be added as a new communication channel since it is disabled by default. Do this by selecting the channel icon.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : Default Configuration; Status : Halt ; Reading

Data Formatting : Matrix FTP Client

User Name: anonymous

Password: anonymous

Passive Mode: ☑

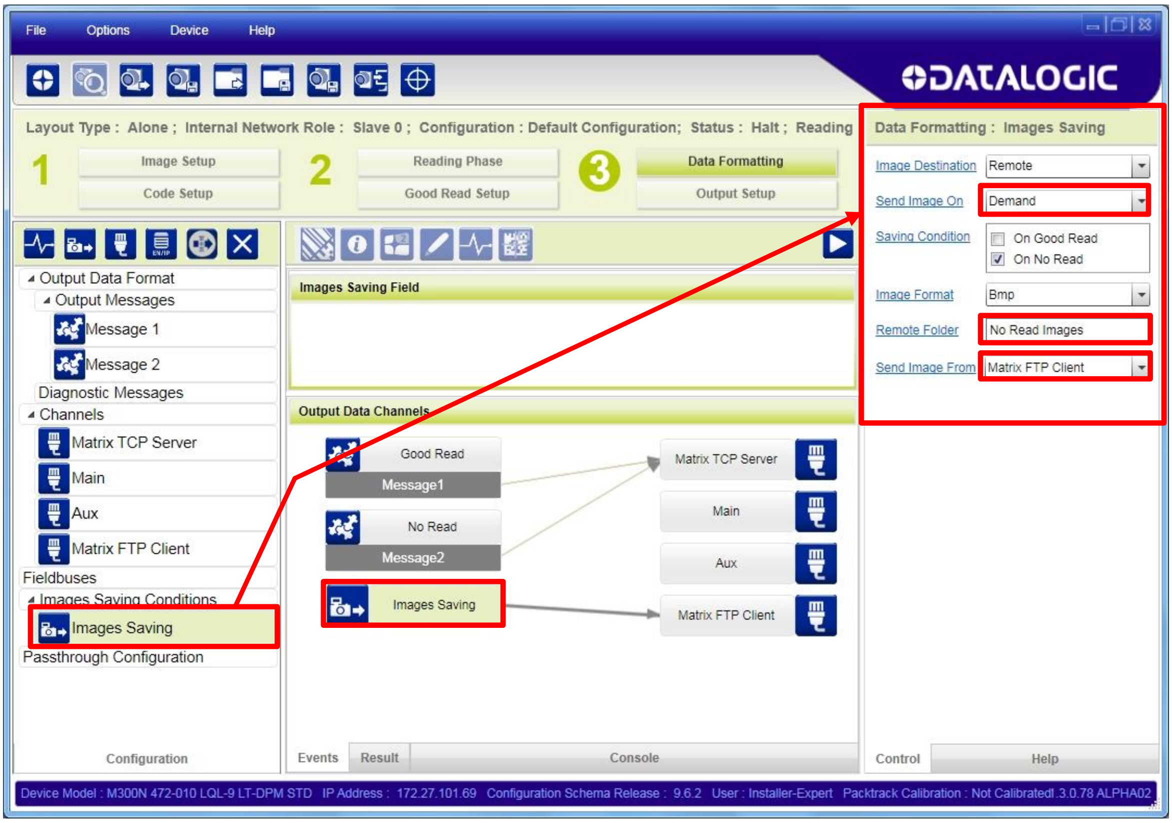
Server Address: 127.0.0.1

Server Port: 21

- The Server Address must match the external WebSentinel FTP Server PC.
- The Username and Password must match the ones required by the external WebSentinel FTP Server PC. For WebSentinel the defaults are **anonymous**, **anonymous**.

Now select Images Saving and set **Send Image On** to Demand and set the **Send Image From** parameter to Matrix FTP Client.

Input the name of the Remote Folder on the FTP Server to which the image files must be saved.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : Default Configuration; Status : Halt ; Reading

Data Formatting : Images Saving

Image Destination: Remote

Send Image On: Demand

Saving Condition: □ On Good Read ☑ On No Read

Image Format: Bmp

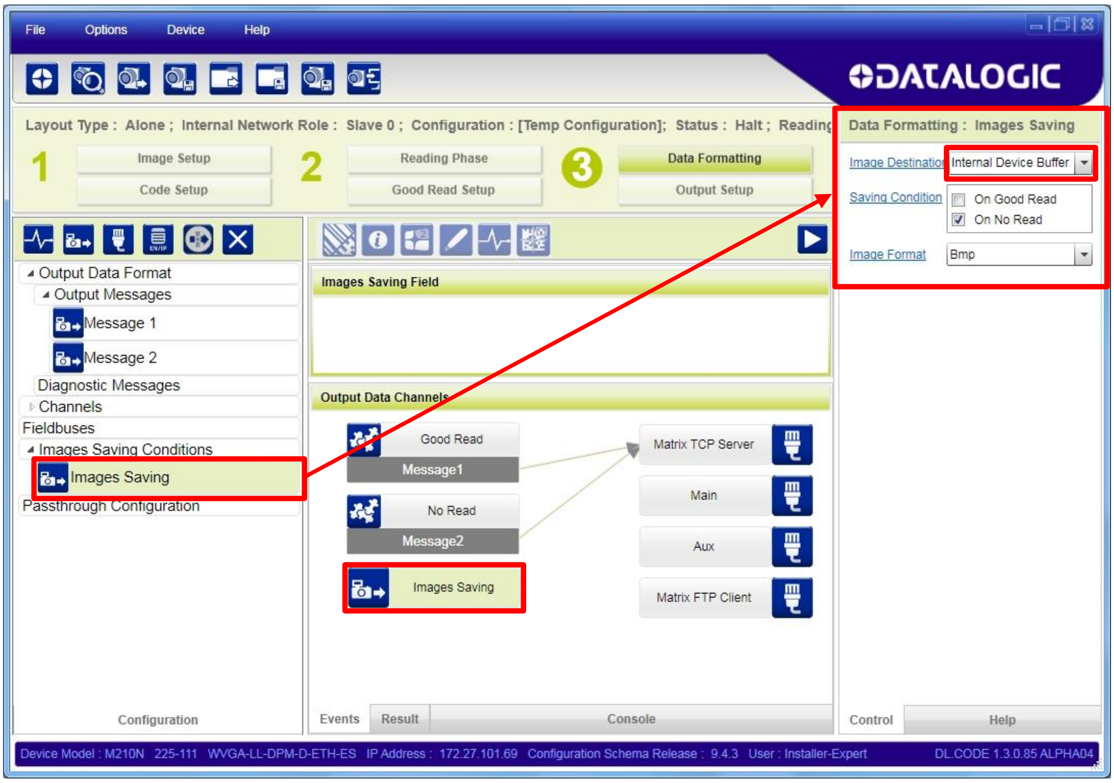
Remote Folder: No Read Images

Send Image From: Matrix FTP Client

Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.2 User : Installer-Expert Packtrack Calibration : Not Calibratedl.3.0.78 ALPHA02

8.1.4 Image Saving Using Internal Buffer

Images can be saved to the Device Image Buffer and be downloaded to a PC when the device is offline.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp Configuration]; Status : Halt ; Reading

Data Formatting : Images Saving

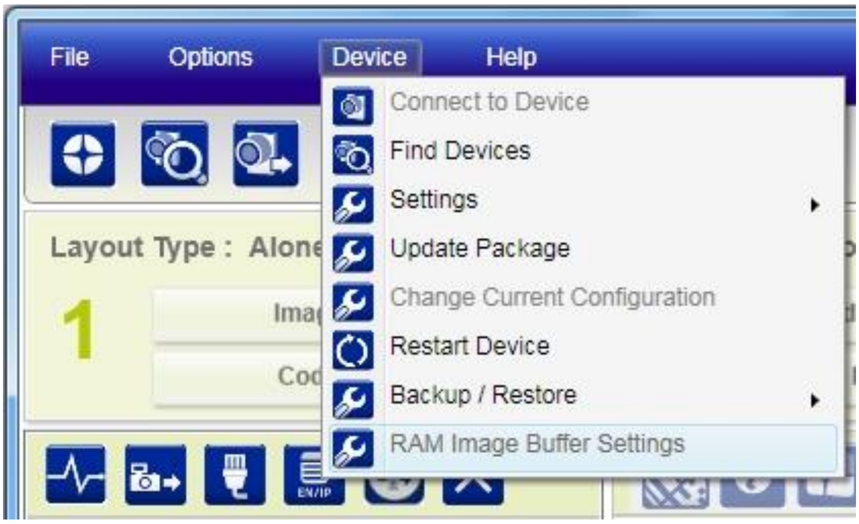
Image Destination: Internal Device Buffer

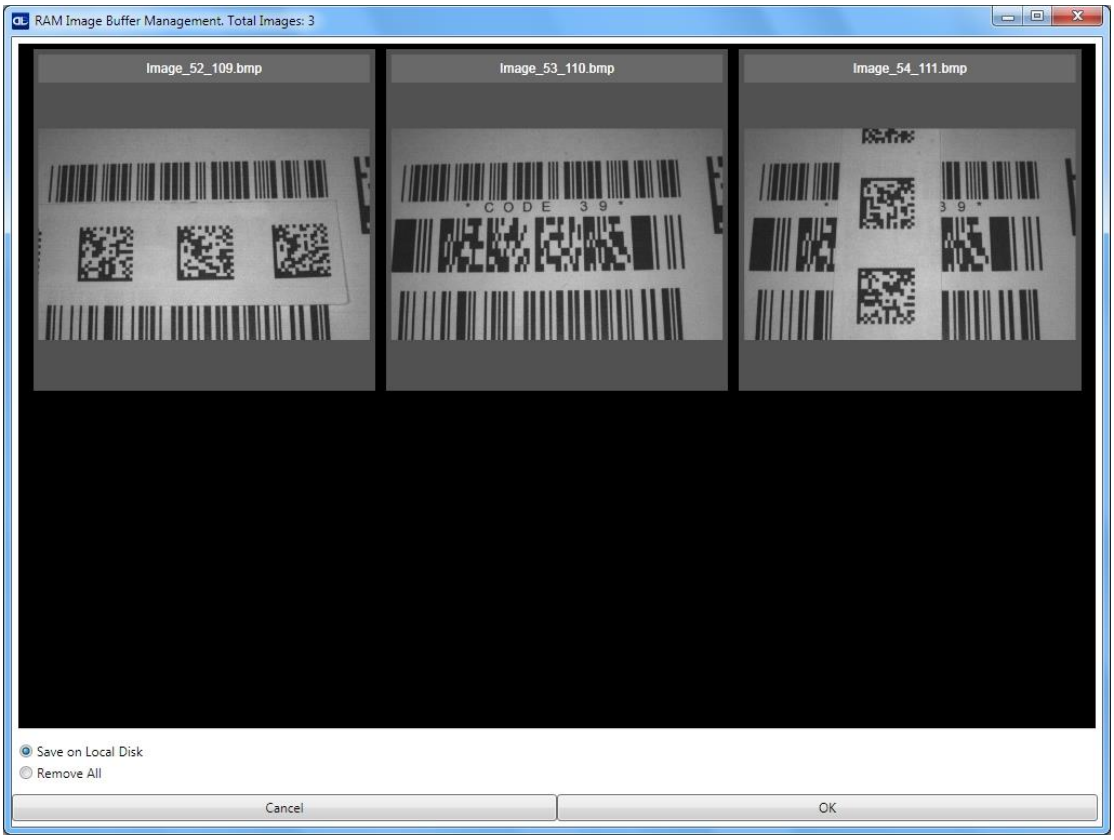
Saving Condition: □ On Good Read ☑ On No Read

Image Format: Bmp

Device Model : M210N 225-111 WVGA-LL-DPM-D-ETH-ES IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert DL.CODE 1.3.0.85 ALPHA04

To download the saved images, the device must be in offline mode. Through the Device menu>RAM Image Buffer you can access the **Image Buffer Management** window.



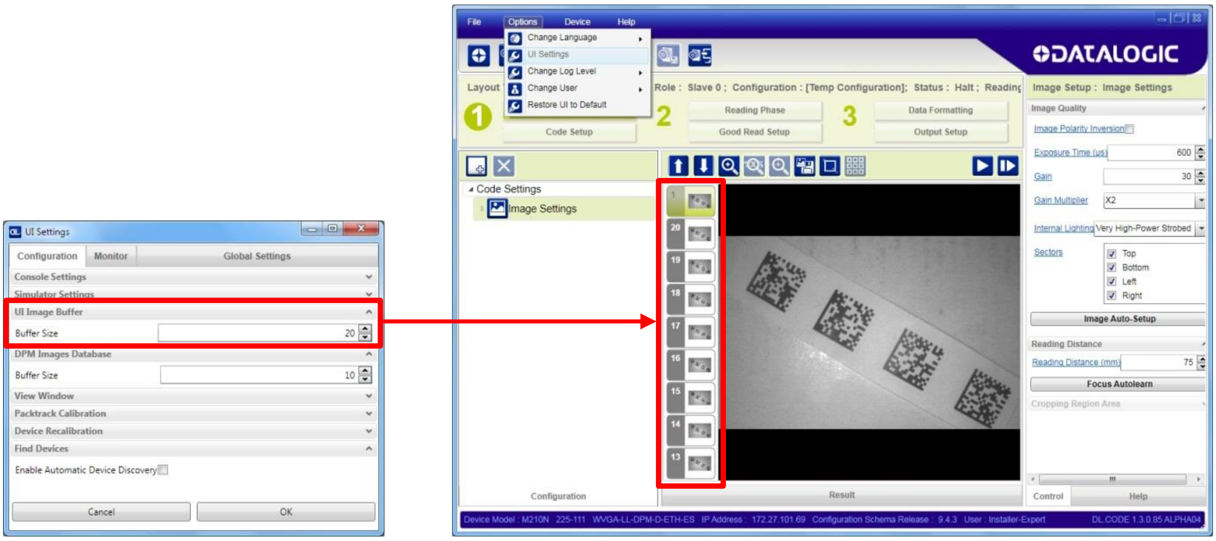


Upon opening this window, the images in the Device Image Buffer (RAM) are transferred to the DL.CODE Device Image Buffer Management window and the images are deleted from the device RAM.

You can save all the images in a zip file to the PC or you can delete the images from the DL.CODE Image Buffer Management memory.

8.2 UI IMAGE BUFFER

The UI Image Buffer manages the images captured through the DL.CODE Play and Capture features.



UI Settings

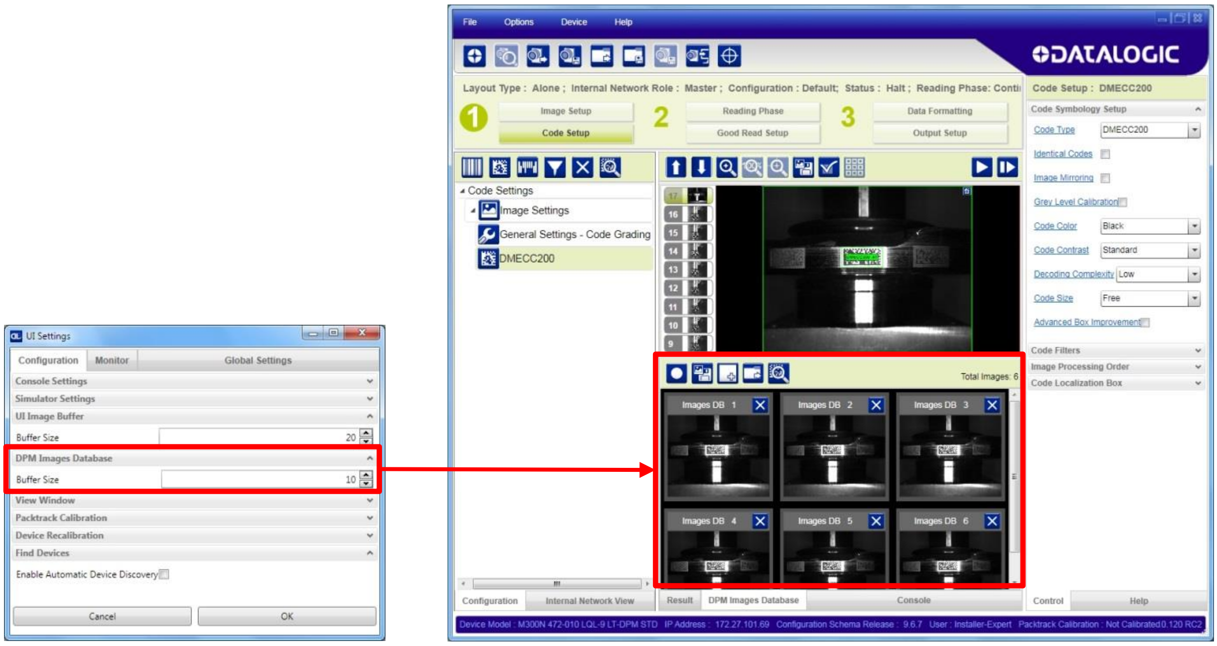
Configuration | Monitor | Global Settings

Console Settings
Simulator Settings
UI Image Buffer
Buffer Size 20
DPM Images Database
Buffer Size 10
View Window
Packtrack Calibration
Device Recalibration
Find Devices
Enable Automatic Device Discovery □

Cancel | OK

8.3 DPM AUTOLEARN IMAGES DATABASE

The DPM Image Database allows saving images to be used by the DPM Autolearn Calibration tool to help find the best combination of parameters for DPM applications.



UI Settings

Configuration | Monitor | Global Settings

Console Settings
Simulator Settings
UI Image Buffer
Buffer Size 20
DPM Images Database
Buffer Size 10
View Window
Packtrack Calibration
Device Recalibration
Find Devices
Enable Automatic Device Discovery □

Cancel | OK

See chapter 11 for details.

9 MULTI DEVICE CONFIGURATION OPTIONS

NOTE: DL.CODE now supports several different multi device configuration types using the PASS-THROUGH configuration. In particular this feature allows MULTIDATA ID-NET network configurations to be made. Master/Slave SYNCHRONIZED ID-NET network configurations are also configurable as before.

9.1 PASS-THROUGH CONFIGURATIONS

Starting from software version 1.3.0, DL.CODE and Matrix N family readers support pass-through multi device configurations.

The pass-through configuration allows individually working devices (Alone), to collect data from other devices (also working Alone), and pass this data to a third device through a different communication channel. See the figure below as an example.

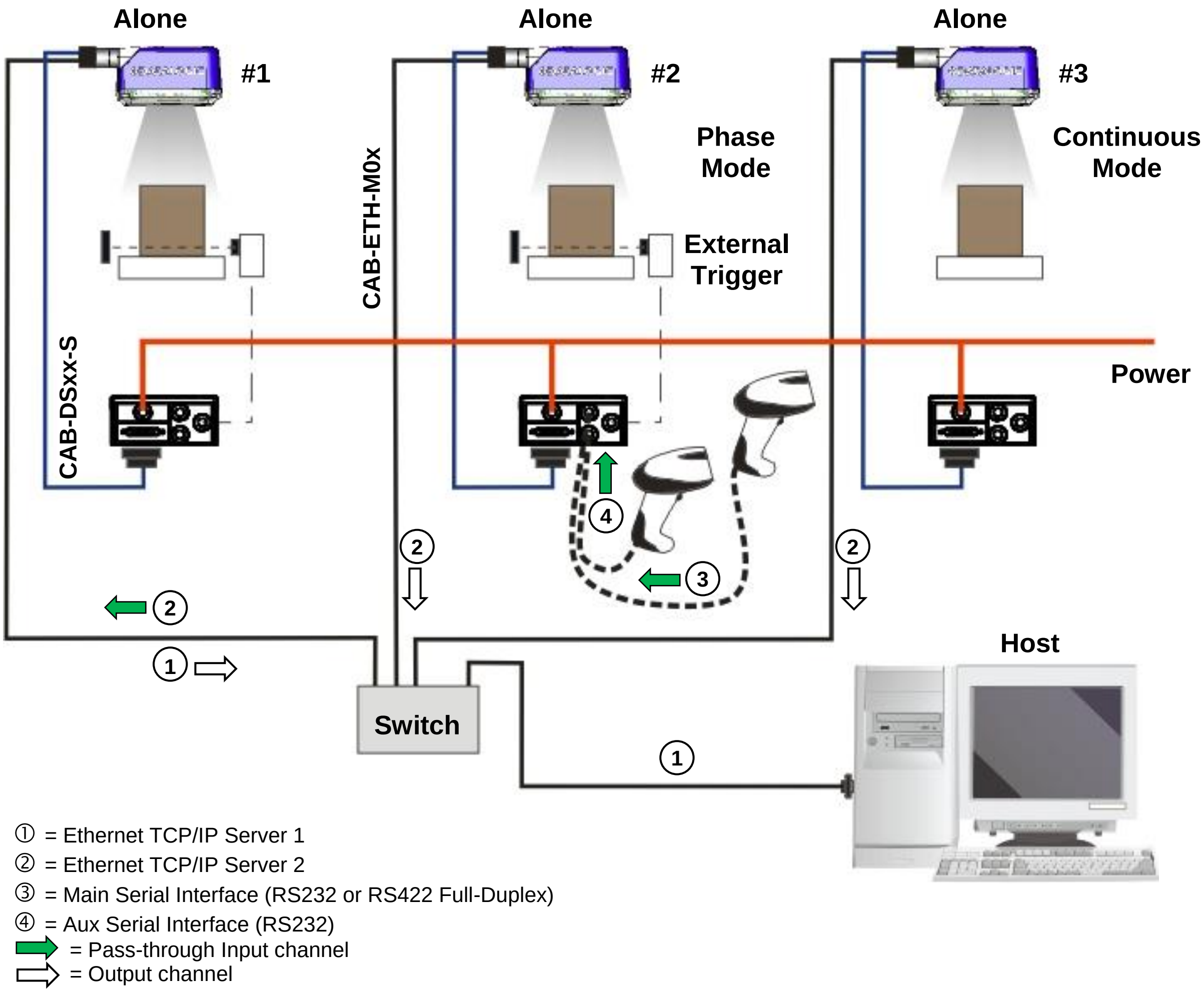
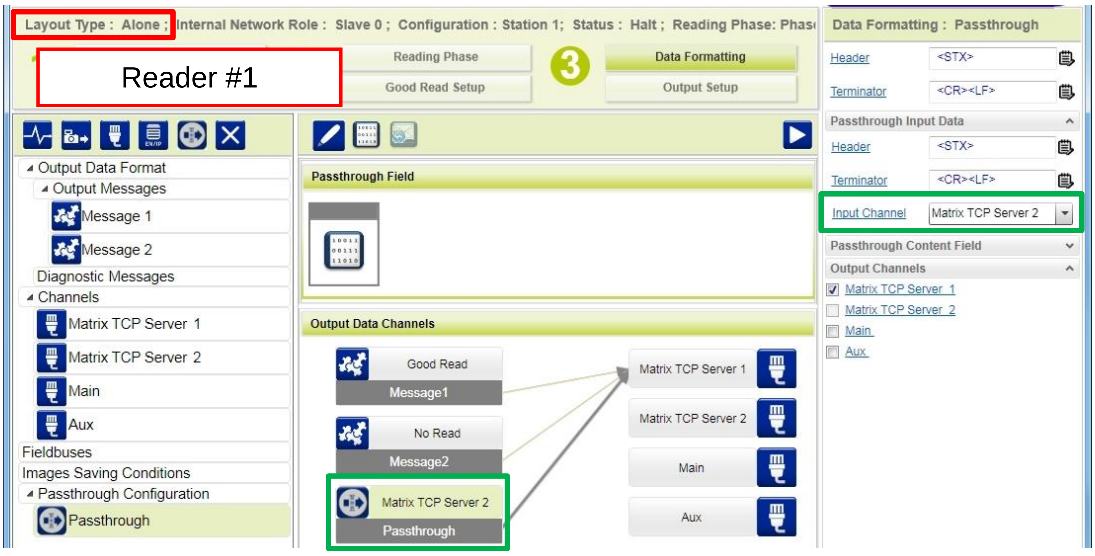

Alone
Alone
Alone
#1
#2
#3
Phase Mode
Continuous Mode
External Trigger
CAB-ETH-M0x
CAB-DSxx-S
Power
4
2
2
3
2
1
Host
Switch
1
① = Ethernet TCP/IP Server 1
② = Ethernet TCP/IP Server 2
③ = Main Serial Interface (RS232 or RS422 Full-Duplex)
④ = Aux Serial Interface (RS232)
= Pass-through Input channel
= Output channel

Figure 8 – Example Pass-through Layout

The following screenshots show the configuration settings for the three devices in the example above.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : Station 1; Status : Halt ; Reading Phase: Phas

Data Formatting : Passthrough

Header <STX>

Terminator <CR><LF>

Passthrough Input Data

Header <STX>

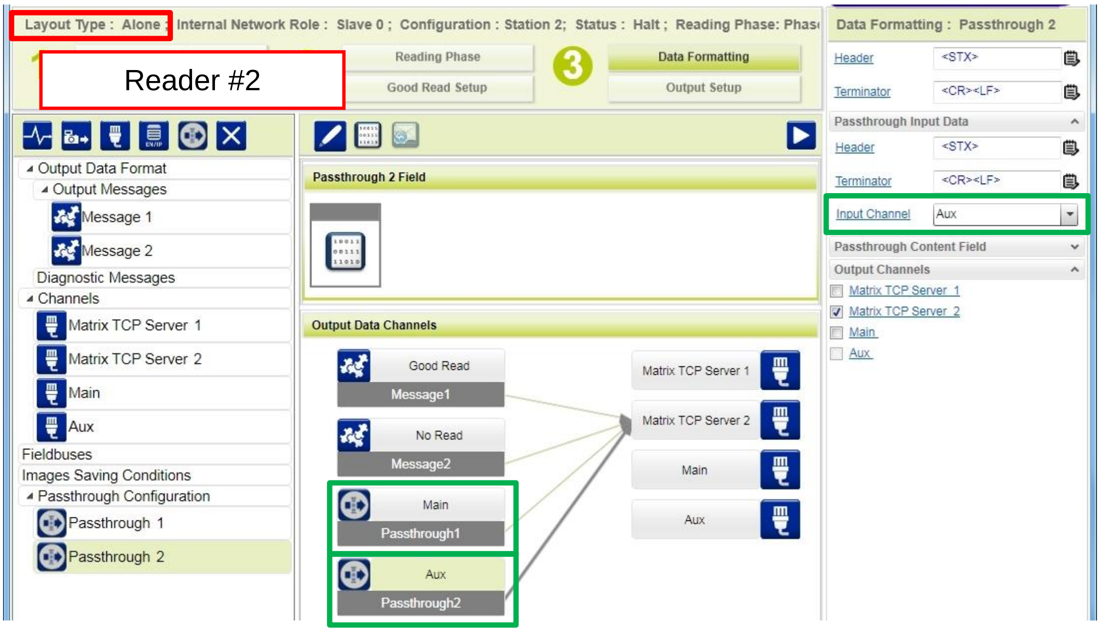
Terminator <CR><LF>

Input Channel Matrix TCP Server 2

Passthrough Content Field

Output Channels

☑ Matrix TCP Server 1
□ Matrix TCP Server 2
□ Main
□ Aux



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : Station 2; Status : Halt ; Reading Phase: Phas

Data Formatting : Passthrough 2

Header <STX>

Terminator <CR><LF>

Passthrough Input Data

Header <STX>

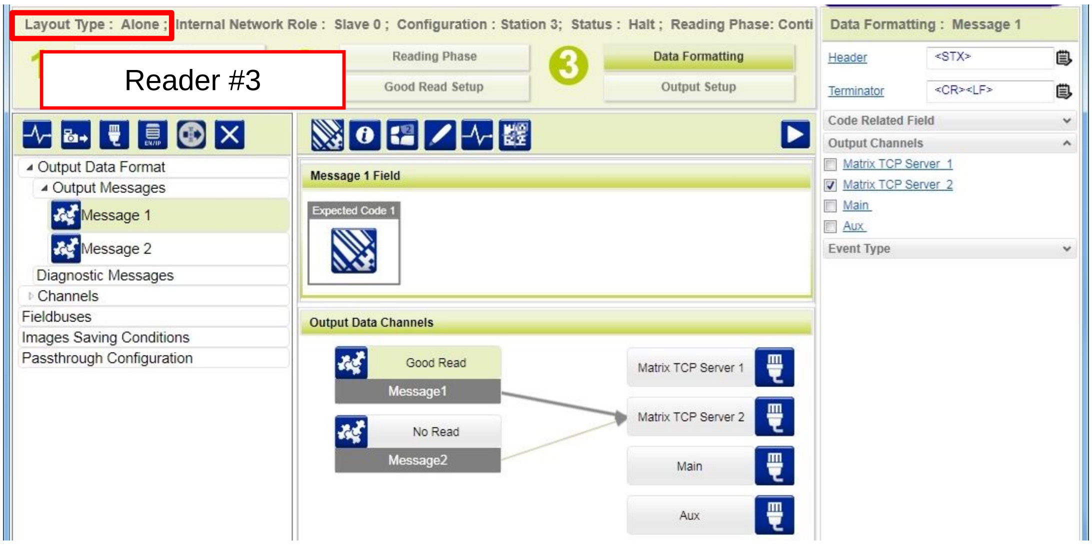
Terminator <CR><LF>

Input Channel Aux

Passthrough Content Field

Output Channels

□ Matrix TCP Server 1
☑ Matrix TCP Server 2
□ Main
□ Aux



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : Station 3; Status : Halt ; Reading Phase: Conti

Data Formatting : Message 1

Header <STX>

Terminator <CR><LF>

Code Related Field

Output Channels

□ Matrix TCP Server 1
☑ Matrix TCP Server 2
□ Main
□ Aux

Event Type

9.2 INTERNAL NETWORK CONFIGURATIONS

Internal Network configurations (also called Master/Slave configurations), are designed to collect data from several devices connected together in an ID-NET™ network and send data output to the Host system.

DL.CODE has a Net Autoset feature for the Internal ID-NET Network which automatically recognizes and assigns addresses to all connected Slave readers.

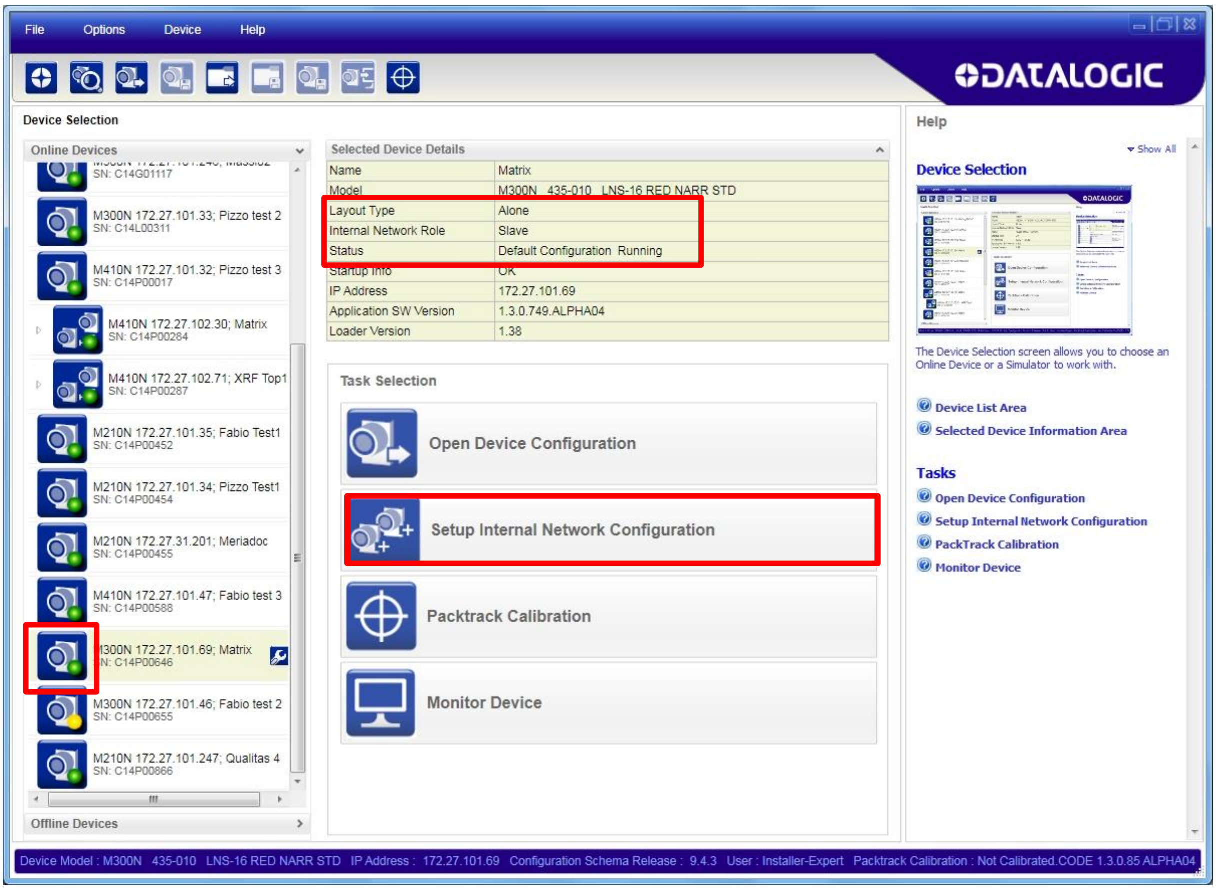
In order to automatically recognize the ID-NET Slaves, all devices must be physically installed and electrically connected (including ID-NET network wiring).

The general procedure is to:

1. Mount all the readers (mechanical and electrical installation) with factory default settings (Layout Type = Alone, Internal Network Role = Slave).
2. Connect to the designated Master device in DL.CODE and open the Setup Internal Network Configuration. You will be prompted to change the device to Master. Click OK. The Slave units will automatically be recognized.
3. Depending on the application, select Multidata, Synchronized Phase Mode or Synchronized PackTrack Configuration.

Master Configuration

First start with the desired device to assign as ID-NET Master (current default setting is Slave). Click on Setup Internal Network Configuration from the Task area.



M300N 172.27.101.240; Massi02
SN: C14G01117
M300N 172.27.101.33; Pizzo test 2
SN: C14L00311
M410N 172.27.101.32; Pizzo test 3
SN: C14P00017
M410N 172.27.102.30; Matrix
SN: C14P00284
M410N 172.27.102.71; XRF Top1
SN: C14P00287
M210N 172.27.101.35; Fabio Test1
SN: C14P00452
M210N 172.27.101.34; Pizzo Test1
SN: C14P00454
M210N 172.27.31.201; Meriadoc
SN: C14P00455
M410N 172.27.101.47; Fabio test 3
SN: C14P00588
M300N 172.27.101.69; Matrix
SN: C14P00646
M300N 172.27.101.46; Fabio test 2
SN: C14P00655
M210N 172.27.101.247; Qualitas 4
SN: C14P00866

Name	Matrix
Model	M300N 435-010 LNS-16 RED NARR STD
Layout Type	Alone
Internal Network Role	Slave
Status	Default Configuration Running
Startup Info	OK
IP Address	172.27.101.69
Application SW Version	1.3.0.749.ALPHA04
Loader Version	1.38

Device Selection

The Device Selection screen allows you to choose an Online Device or a Simulator to work with.

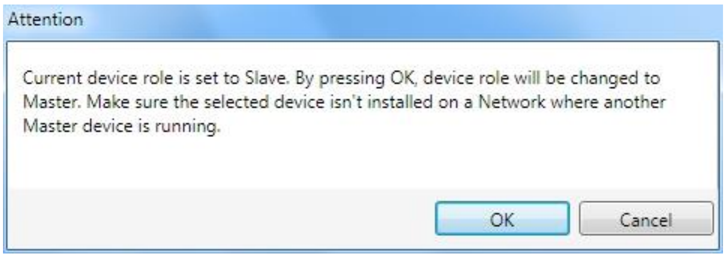
- Device List Area
- Selected Device Information Area

Tasks

- Open Device Configuration
- Setup Internal Network Configuration
- PackTrack Calibration
- Monitor Device

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not Calibrated CODE 1.3.0.85 ALPHA04

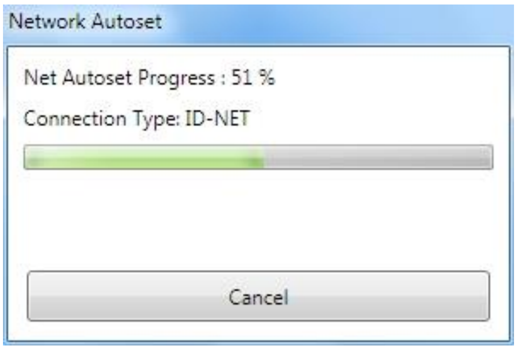
You will be advised that the device role will be changed to Master.



Attention

Current device role is set to Slave. By pressing OK, device role will be changed to Master. Make sure the selected device isn't installed on a Network where another Master device is running.

Click OK. The Net Autoset feature automatically starts to find Slave devices connected to the ID-NET network of the Master.

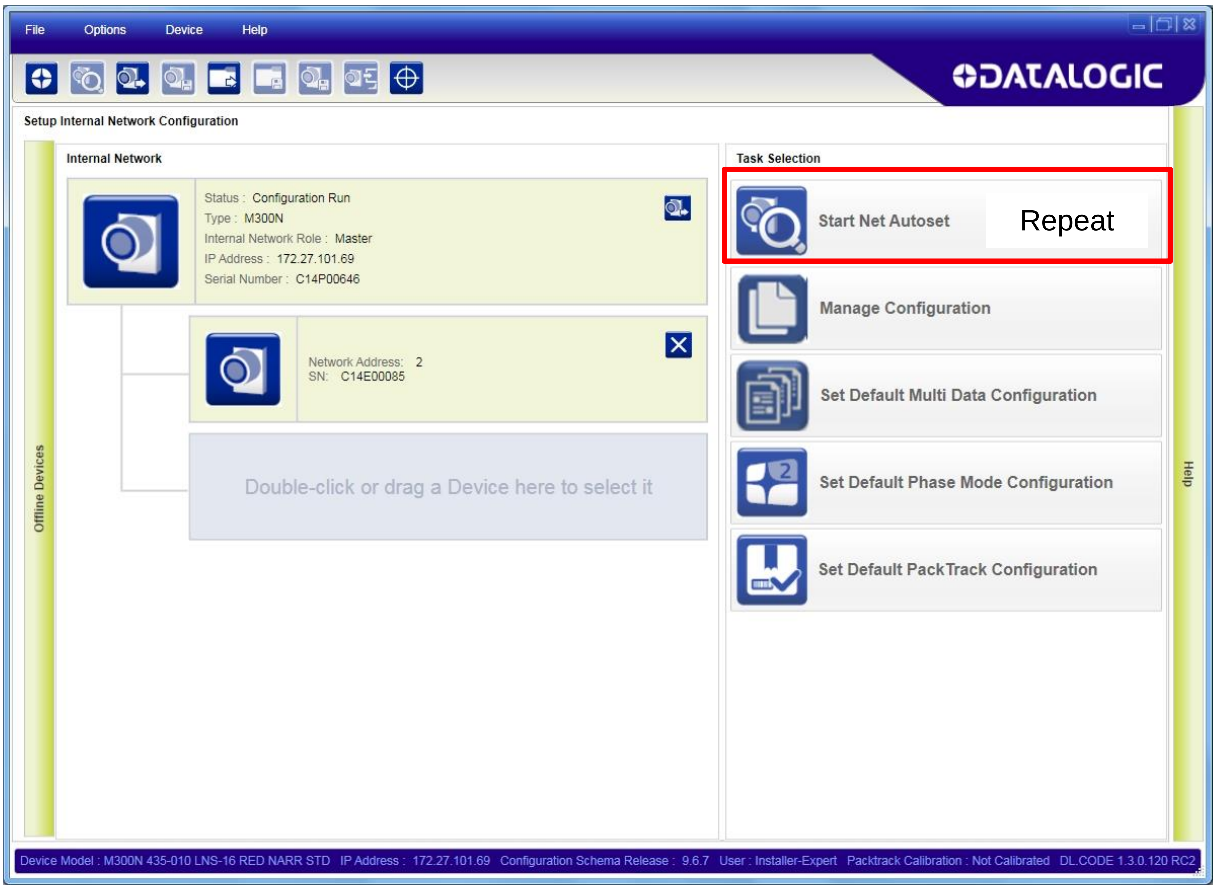


Network Autoset

Net Autoset Progress : 51 %

Connection Type: ID-NET

When finished, all the Slaves should have been correctly recognized. If not, verify all device connections and power and then repeat the operation by clicking on the Start Net Autoset button.



Setup Internal Network Configuration

Internal Network

Status : Configuration Run
Type : M300N
Internal Network Role : Master
IP Address : 172.27.101.69
Serial Number : C14P00646

Network Address: 2
SN: C14E00085

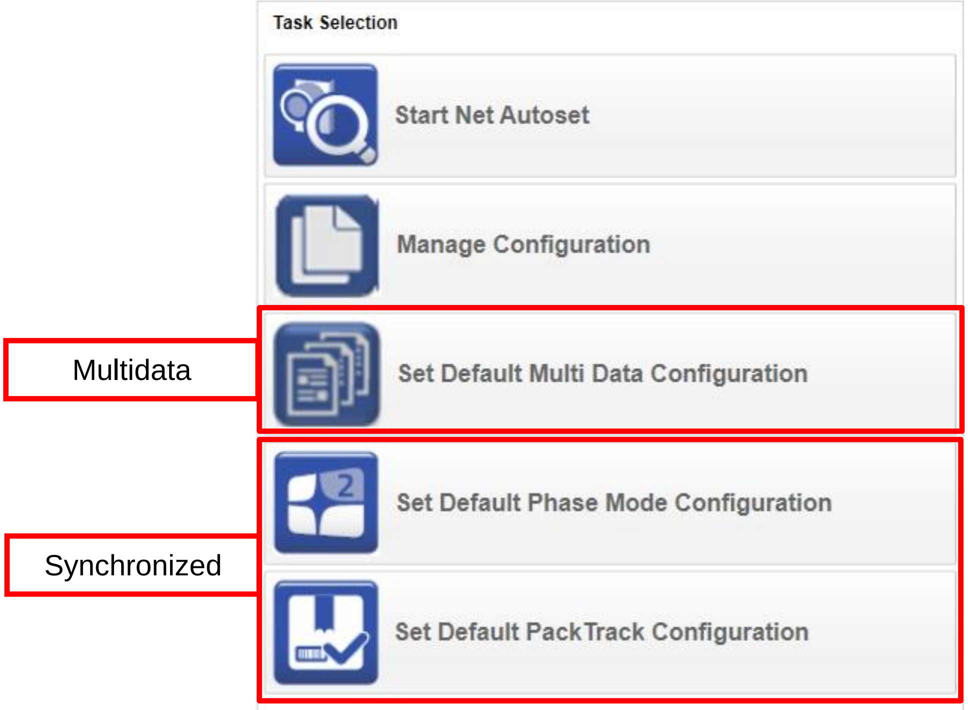
Double-click or drag a Device here to select it

Task Selection

Device Model : M300N 435-010 LNS-16 RED NARR STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated DL.CODE 1.3.0.120 RC2

File
Options
Device
Help
DATALOGIC
Start Net Autoset
Repeat
Manage Configuration
Set Default Multi Data Configuration
Set Default Phase Mode Configuration
Set Default PackTrack Configuration
Offline Devices
Help

Depending on the application, select one of the Default Internal Network Configurations: **Multidata**, **Synchronized Phase Mode** or **Synchronized PackTrack**.



Task Selection

Start Net Autoset

Manage Configuration

Set Default Multi Data Configuration

Set Default Phase Mode Configuration

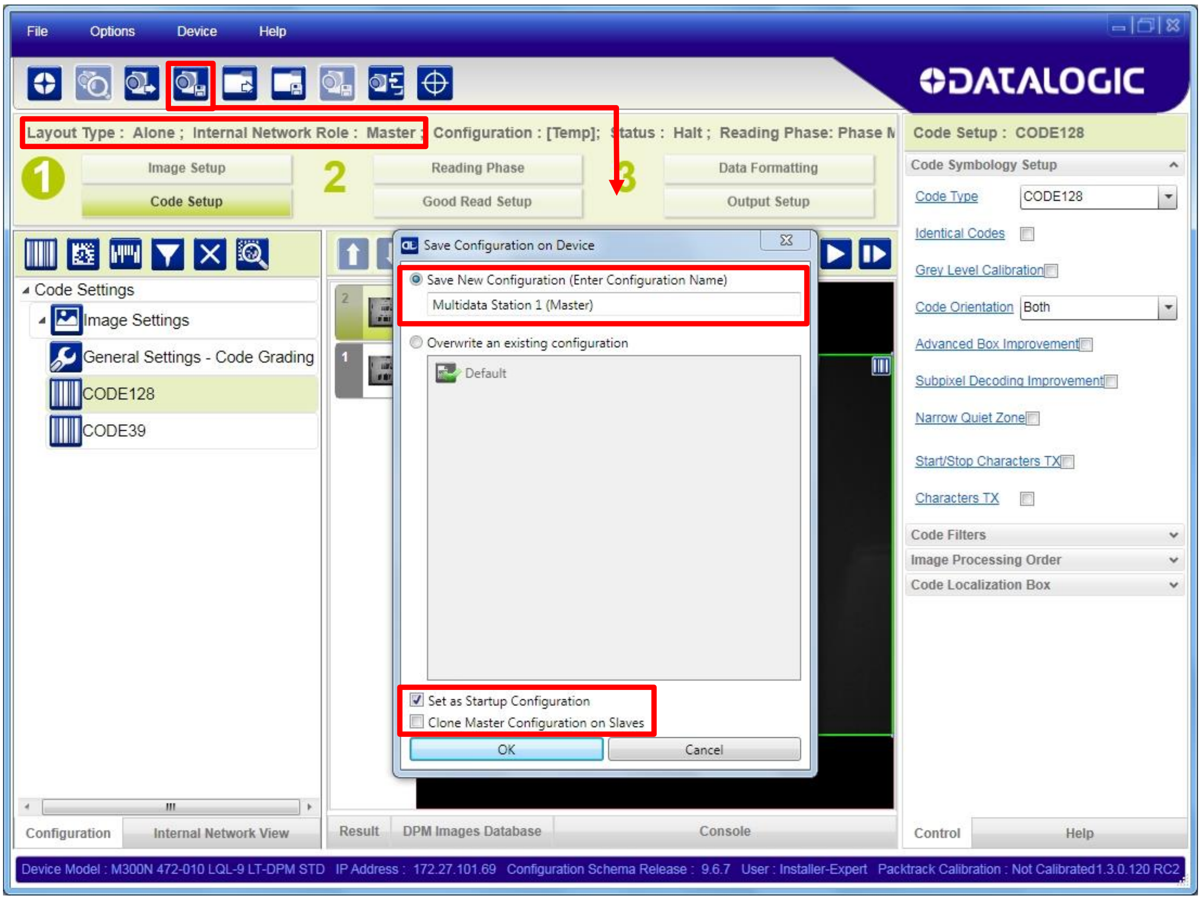
Set Default PackTrack Configuration

This selection will open a pre-configured job for the Master reader according to the selection. Follow the specific application instructions in the following paragraphs.

9.2.1 Multidata ID-NET Network Configurations

The Multidata ID-NET network communications between Master and Slave are managed by the application job (configuration) using the pass-through feature. A pre-configured job is loaded with the correct pass-through settings for both the Master and Slaves when the Default Multidata Configuration is selected from the Internal Network Setting feature.

1. Complete the configuration of all the application parameters (including Image Setup) and save them to the Master with an application specific name and **without** the option to **Clone Master configuration on Slaves**.



Layout Type : Alone ; Internal Network Role : Master ; Configuration : [Temp]; Status : Halt ; Reading Phase: Phase N

Code Setup : CODE128

Save Configuration on Device

● Save New Configuration (Enter Configuration Name)

Multidata Station 1 (Master)

○ Overwrite an existing configuration

Default

☑ Set as Startup Configuration

☐ Clone Master Configuration on Slaves

Code Type: CODE128

Identical Codes ☐

Grey Level Calibration ☐

Code Orientation: Both

Advanced Box Improvement ☐

Subpixel Decoding Improvement ☐

Narrow Quiet Zone ☐

Start/Stop Characters TX ☐

Characters TX ☐

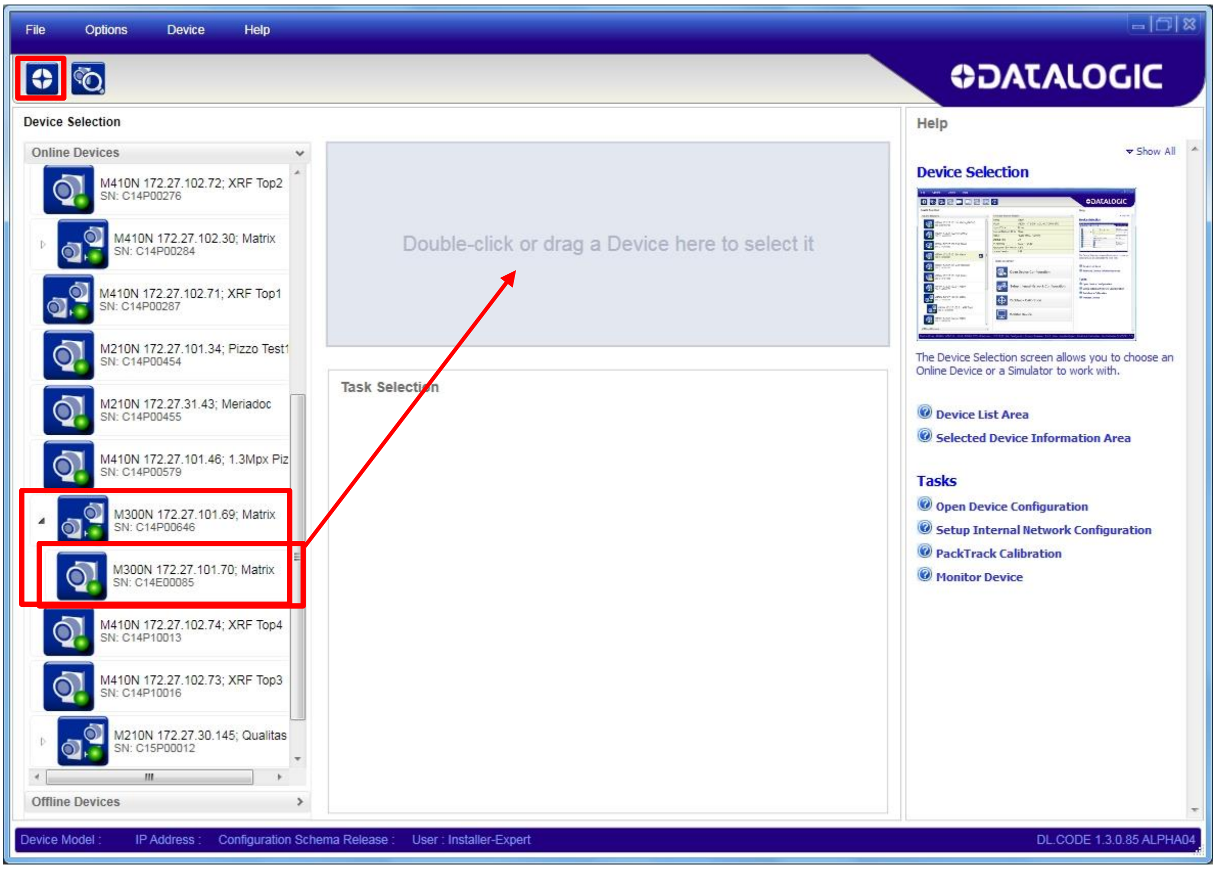
Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated1.3.0.120 RC2

Figure 9 – Saving Multidata Configuration to Master

The jobs must not be cloned because the Master and Slaves have different input/output communication channels. The readers are also working independently from each other, often on separate stations with different code reading requirements, different operating modes, etc.

2. Connect to each Slave reader via Ethernet (see note below), and set all the configuration parameters of each Slave device.

NOTE: If necessary, Slave device photometric (Image Setup) parameters must be configured separately through DL.CODE. This is preferably done through each device's Ethernet TCP/IP channel. If Slave devices are not connected to Ethernet you must temporarily (manually) connect them one by one to perform Image Setup.



M410N 172.27.102.72; XRF Top2 SN: C14P00276
M410N 172.27.102.30; Matrix SN: C14P00284
M410N 172.27.102.71; XRF Top1 SN: C14P00287
M210N 172.27.101.34; Pizzo Test1 SN: C14P00454
M210N 172.27.31.43; Meriadoc SN: C14P00455
M410N 172.27.101.46; 1.3Mpx Piz SN: C14P00579
M300N 172.27.101.69; Matrix SN: C14P00646
M300N 172.27.101.70; Matrix SN: C14E00085
M410N 172.27.102.74; XRF Top4 SN: C14P10013
M410N 172.27.102.73; XRF Top3 SN: C14P10016
M210N 172.27.30.145; Qualitas SN: C15P00012

Double-click or drag a Device here to select it

Device Selection

The Device Selection screen allows you to choose an Online Device or a Simulator to work with.

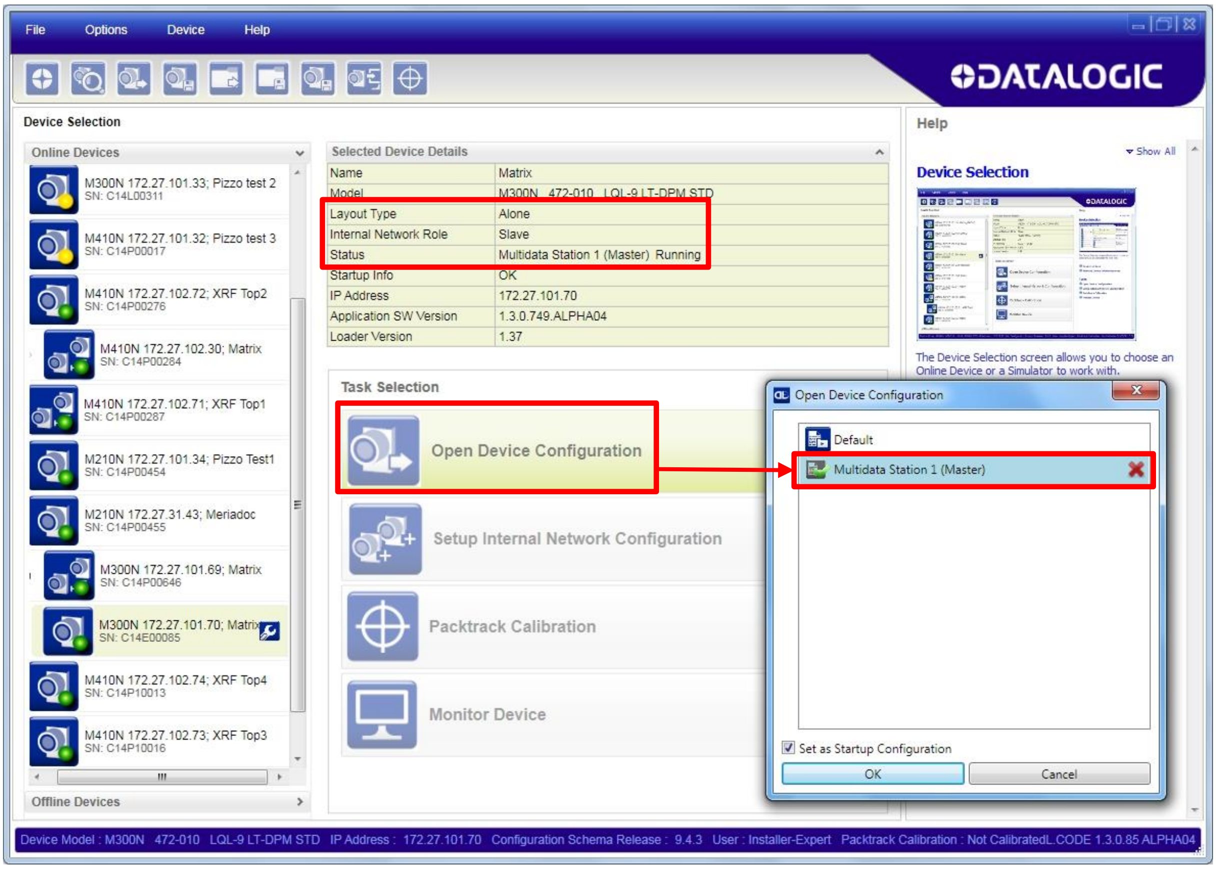
- Device List Area
- Selected Device Information Area

Tasks

- Open Device Configuration
- Setup Internal Network Configuration
- PackTrack Calibration
- Monitor Device

Device Model : IP Address : Configuration Schema Release : User : Installer-Expert DL.CODE 1.3.0.85 ALPHA04

Open the Slave specific application job, (the first time it has the Master Specific name).



M300N 172.27.101.33; Pizzo test 2 SN: C14L00311
M410N 172.27.101.32; Pizzo test 3 SN: C14P00017
M410N 172.27.102.72; XRF Top2 SN: C14P00276
M410N 172.27.102.30; Matrix SN: C14P00284
M410N 172.27.102.71; XRF Top1 SN: C14P00287
M210N 172.27.101.34; Pizzo Test1 SN: C14P00454
M210N 172.27.31.43; Meriadoc SN: C14P00455
M300N 172.27.101.69; Matrix SN: C14P00646
M300N 172.27.101.70; Matrix SN: C14E00085
M410N 172.27.102.74; XRF Top4 SN: C14P10013
M410N 172.27.102.73; XRF Top3 SN: C14P10016

Selected Device Details

Name	Matrix
Model	M300N 472-010 LQL-9 LT-DPM STD
Layout Type	Alone
Internal Network Role	Slave
Status	Multidata Station 1 (Master) Running
Startup Info	OK
IP Address	172.27.101.70
Application SW Version	1.3.0.749.ALPHA04
Loader Version	1.37

Open Device Configuration

- Default
- Multidata Station 1 (Master)

☑ Set as Startup Configuration

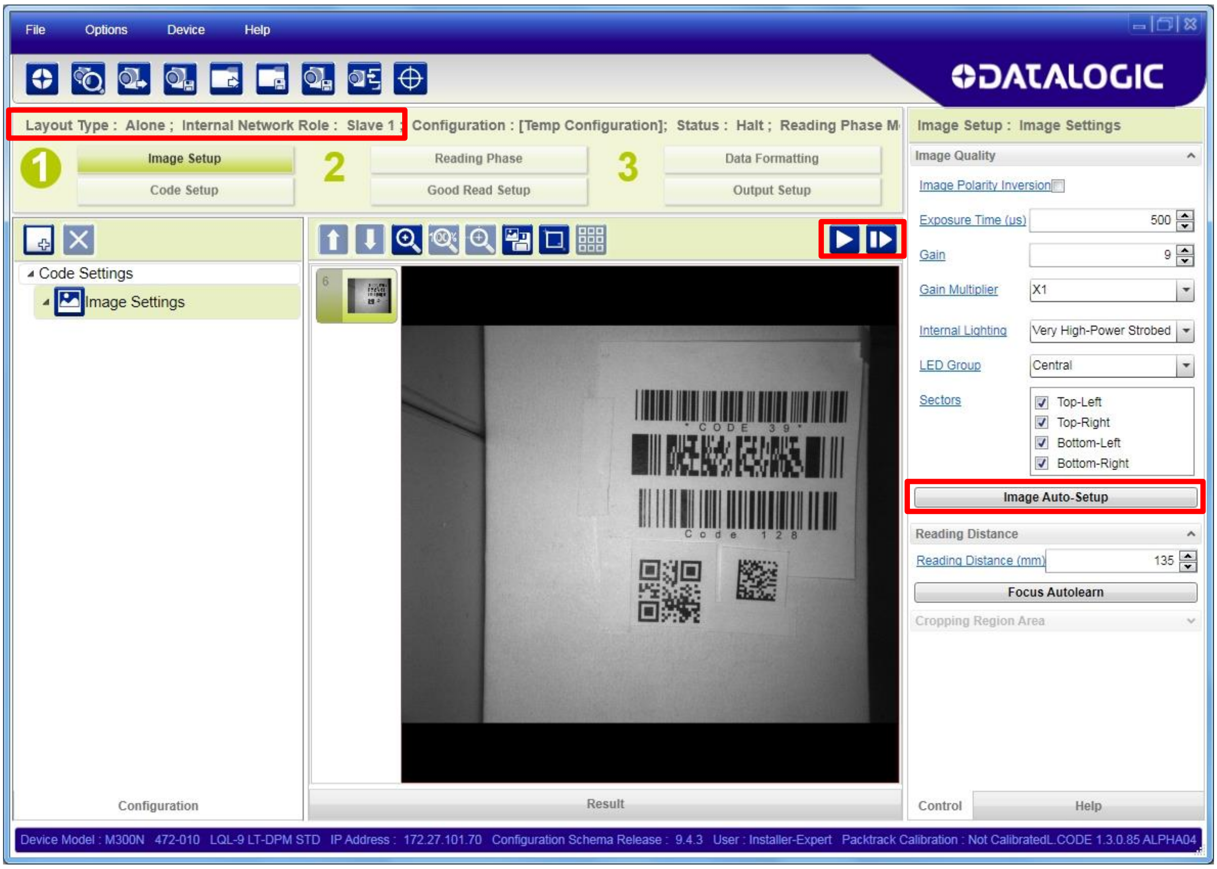
OK Cancel

Device Selection

The Device Selection screen allows you to choose an Online Device or a Simulator to work with.

Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.70 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not CalibratedL.CODE 1.3.0.85 ALPHA04

When the configuration opens, pause run mode and set all the application specific configuration parameters (including Image Setup).



Layout Type : Alone ; Internal Network Role : Slave 1 ; Configuration : [Temp Configuration]; Status : Halt ; Reading Phase M

Image Setup : Image Settings

Image Quality

Image Polarity Inversion □

Exposure Time (us) 500

Gain 9

Gain Multiplier X1

Internal Lighting Very High-Power Strobed

LED Group Central

Sectors ☑ Top-Left ☑ Top-Right ☑ Bottom-Left ☑ Bottom-Right

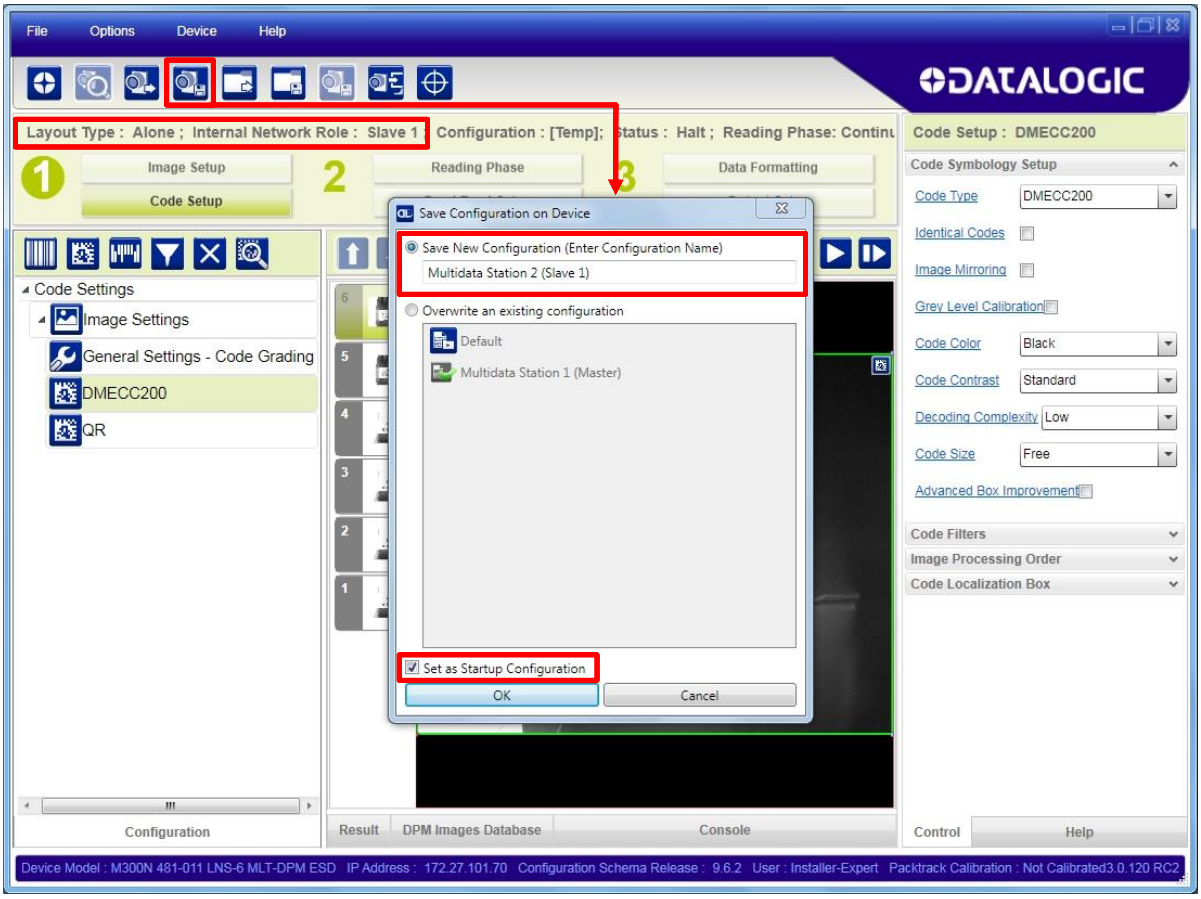
Reading Distance

Reading Distance (mm) 135

Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.70 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not CalibratedL.CODE 1.3.0.85 ALPHA04

Verify the focus and decoding with the capture image and Code Setup page.

3. Now save them, to a new Slave specific application job name[1].



Layout Type : Alone ; Internal Network Role : Slave 1 ; Configuration : [Temp]; Status : Halt ; Reading Phase: Continu

Code Settings
- Image Settings
- General Settings - Code Grading
- DMECC200
- QR

Save Configuration on Device

● Save New Configuration (Enter Configuration Name)
Multidata Station 2 (Slave 1)

○ Overwrite an existing configuration
- Default
- Multidata Station 1 (Master)

☑ Set as Startup Configuration

OK Cancel

Code Setup : DMECC200

Code Symbology Setup

Code Type	DMECC200
Identical Codes	□
Image Mirroring	□
Grey Level Calibration	□
Code Color	Black
Code Contrast	Standard
Decoding Complexity	Low
Code Size	Free
Advanced Box Improvement	□

Device Model : M300N 481-011 LNS-6 MLT-DPM ESD IP Address : 172.27.101.70 Configuration Schema Release : 9.6.2 User : Installer-Expert Packtrack Calibration : Not Calibrated3.0.120 RC2

Figure 10 – Saving Multidata Configuration to Slave 1

Repeat this procedure for each Slave device until the entire network is configured.

[1] An application job with the same name as the Master's (but with Slave specific configuration parameters), has been saved to the Slaves. Each Slave has its own configuration parameters saved in its own copy of the application job. There are no common parameters managed by the Master for Multidata configurations.

Example Multidata ID-NET Configuration

The Multidata ID-NET network takes advantage of the pass-through configuration to allow all the connected readers to work independently from each other (Layout Type = Alone).

In this way data is collected over the ID-NET network and passed –through the Master to the Host system on a different communication channel. See the figure below as an example.

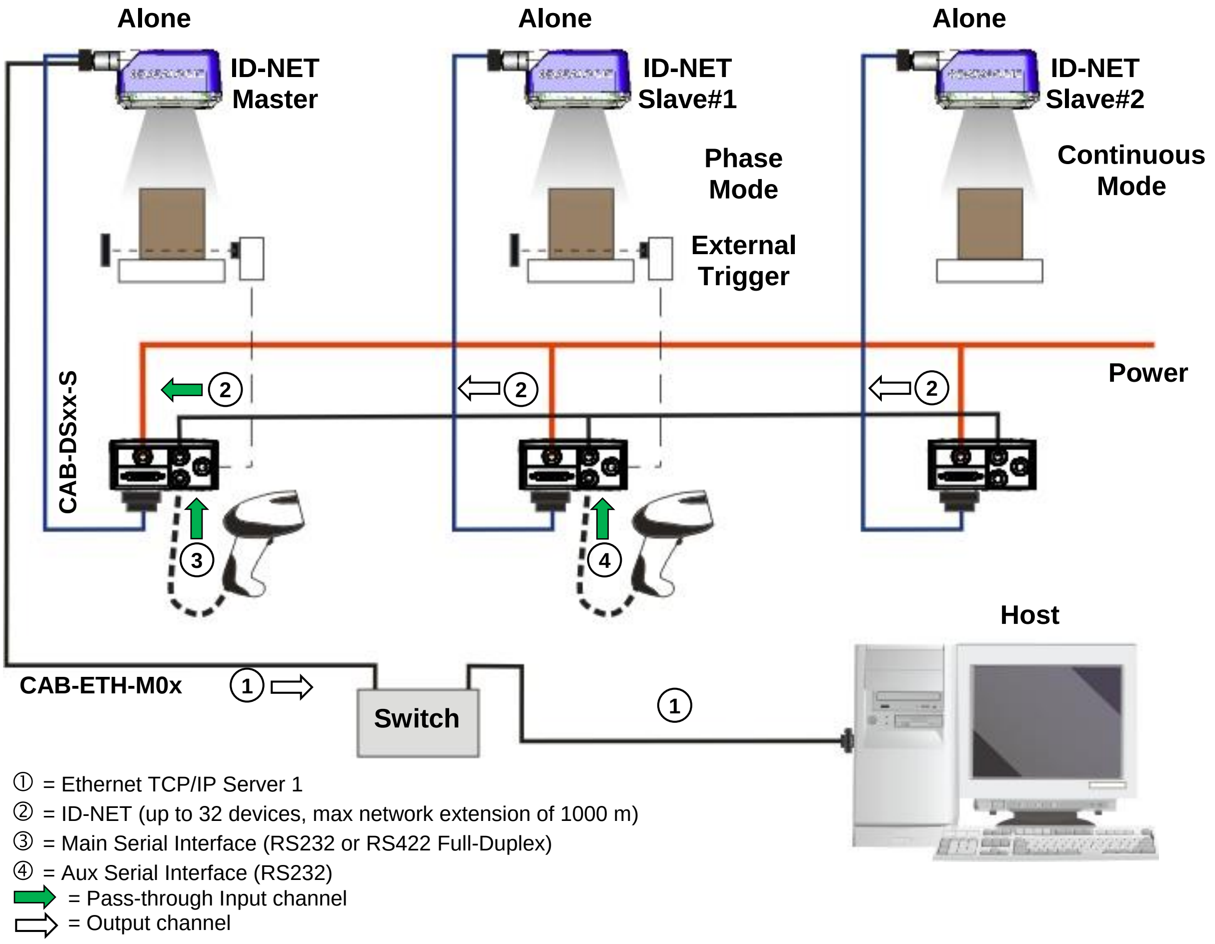
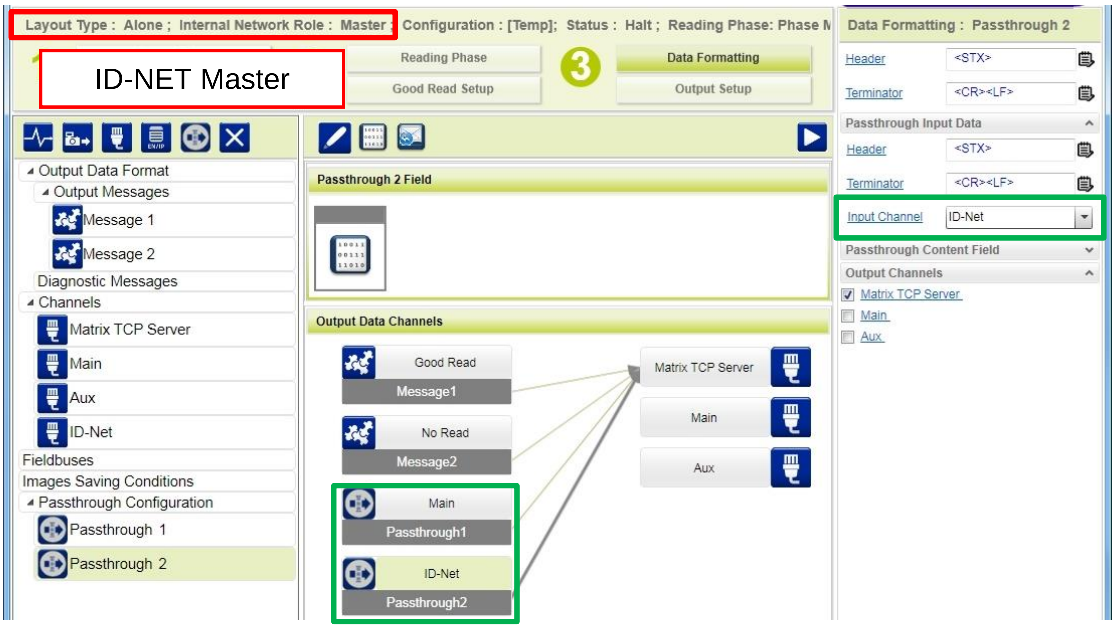

Alone
ID-NET
Master
Alone
ID-NET
Slave#1
Phase
Mode
External
Trigger
Alone
ID-NET
Slave#2
Continuous
Mode
Power
CAB-DSxx-S
2
2
2
3
4
Host
CAB-ETH-M0x
1
Switch
1
① = Ethernet TCP/IP Server 1
② = ID-NET (up to 32 devices, max network extension of 1000 m)
③ = Main Serial Interface (RS232 or RS422 Full-Duplex)
④ = Aux Serial Interface (RS232)
= Pass-through Input channel
= Output channel

Figure 11 – Example (Pass-through) ID-NET Multidata Layout

The following screenshots show the pass-through configuration settings for the three devices in the example above.



Layout Type : Alone ; Internal Network Role : Master ; Configuration : [Temp]; Status : Halt ; Reading Phase: Phase M

ID-NET Master

Data Formatting : Passthrough 2

Header <STX>

Terminator <CR><LF>

Passthrough Input Data

Header <STX>

Terminator <CR><LF>

Input Channel ID-Net

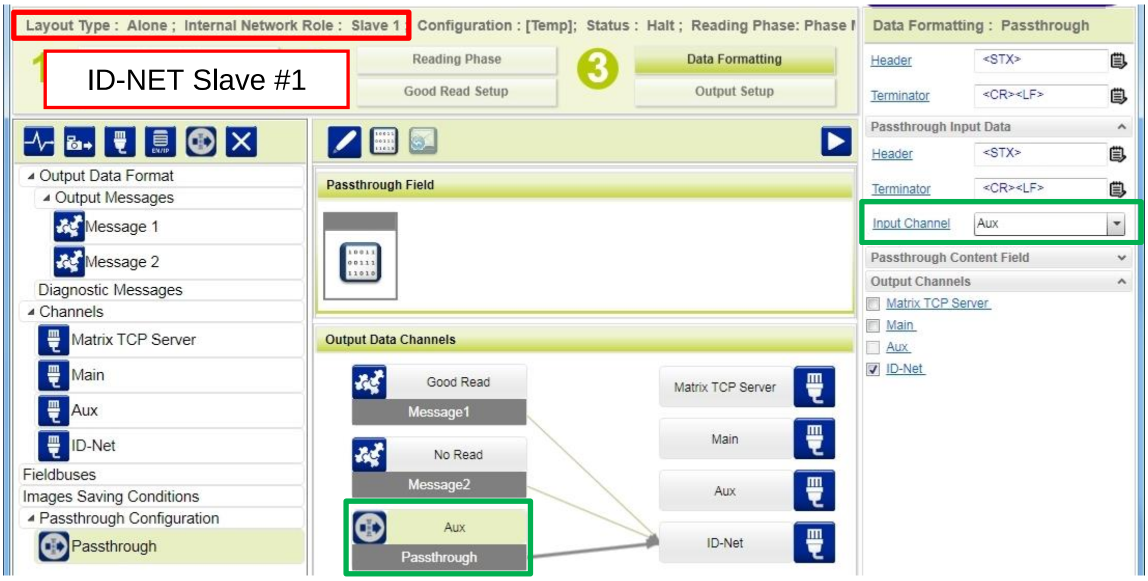
Passthrough Content Field

Output Channels

☑ Matrix TCP Server

□ Main

□ Aux



Layout Type : Alone ; Internal Network Role : Slave 1 ; Configuration : [Temp]; Status : Halt ; Reading Phase: Phase I

ID-NET Slave #1

Data Formatting : Passthrough

Header <STX>

Terminator <CR><LF>

Passthrough Input Data

Header <STX>

Terminator <CR><LF>

Input Channel Aux

Passthrough Content Field

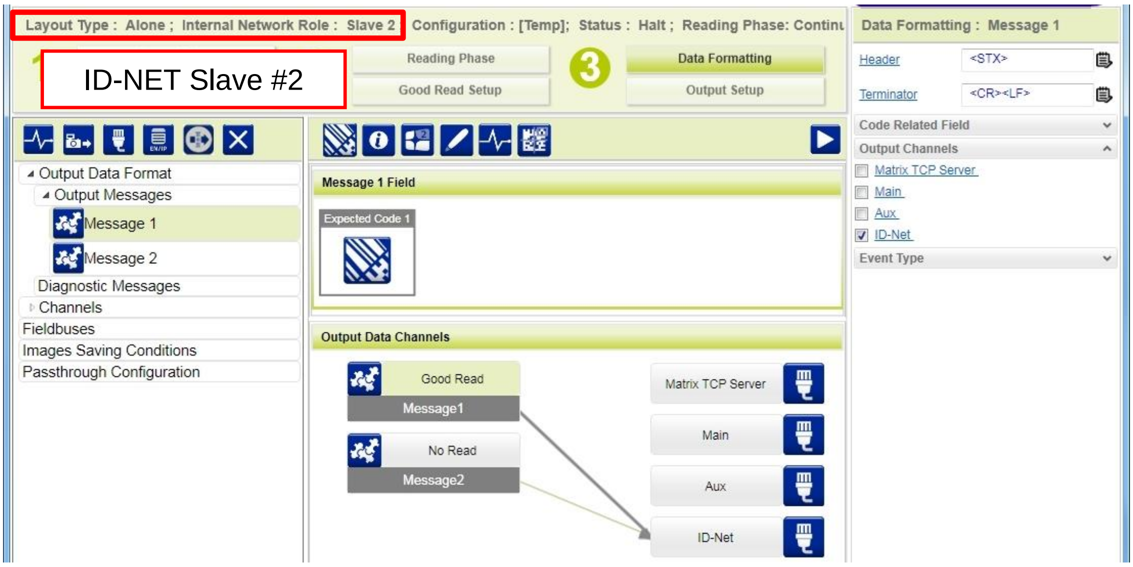
Output Channels

□ Matrix TCP Server

□ Main

□ Aux

☑ ID-Net



Layout Type : Alone ; Internal Network Role : Slave 2 ; Configuration : [Temp]; Status : Halt ; Reading Phase: Continu

ID-NET Slave #2

Data Formatting : Message 1

Header <STX>

Terminator <CR><LF>

Code Related Field

Output Channels

□ Matrix TCP Server

□ Main

□ Aux

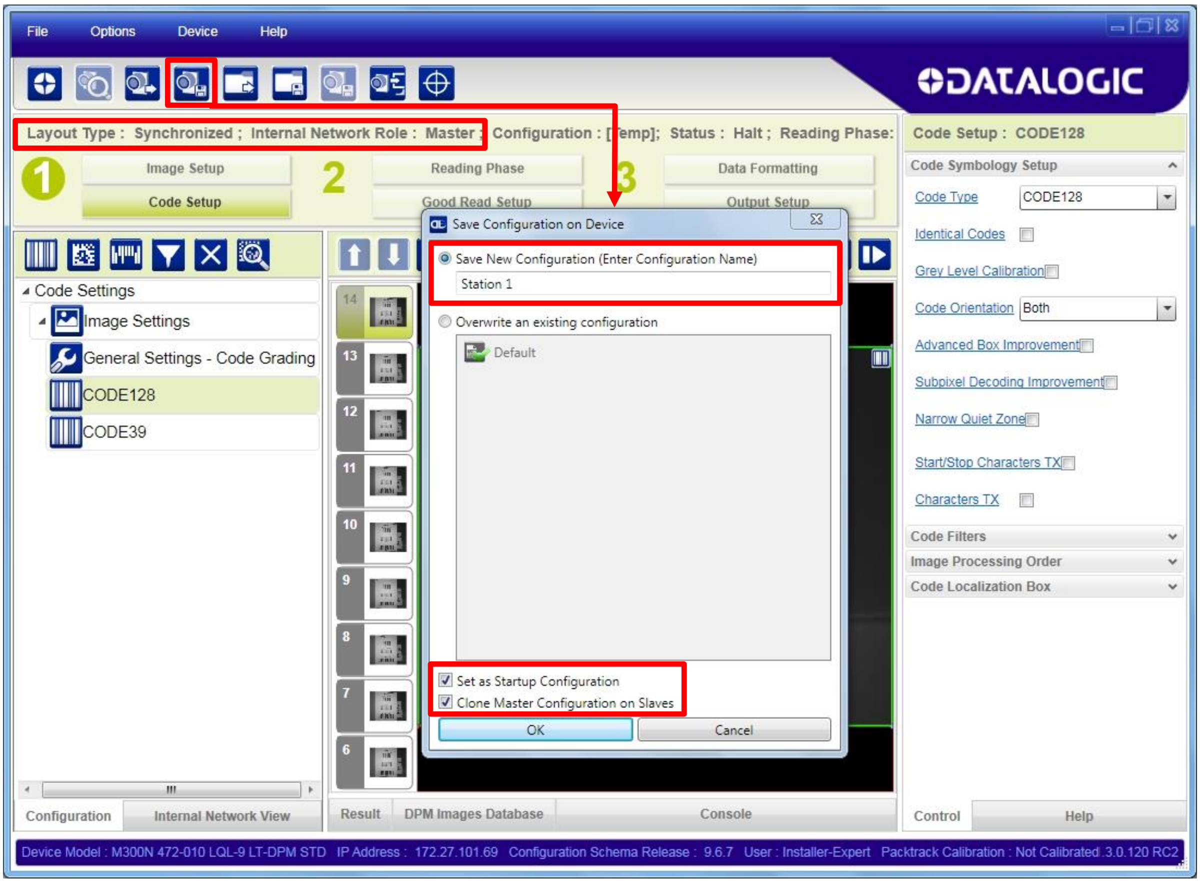
☑ ID-Net

Event Type

9.2.2 Synchronized ID-NET Network Configurations

The Synchronized ID-NET network communications between Master and Slave are internally managed by the application software. A pre-configured job is loaded with the Synchronized Layout Type and the correct Operating Mode for both the Master and Slaves when either the Phase Mode or PackTrack Configuration is selected from the Internal Network Setting feature.

1. Complete the configuration of all the application parameters (including Image Setup) and save them to the Master with an application relative name and **with** the option to **Clone Master configuration on Slaves**.



Layout Type : Synchronized ; Internal Network Role : Master ; Configuration : [Temp]; Status : Halt ; Reading Phase:

Save Configuration on Device

● Save New Configuration (Enter Configuration Name)

Station 1

○ Overwrite an existing configuration

Default

☑ Set as Startup Configuration

☑ Clone Master Configuration on Slaves

OK Cancel

Code Setup : CODE128

Code Symbology Setup

Code Type: CODE128

Identical Codes □

Grey Level Calibration □

Code Orientation: Both

Advanced Box Improvement □

Subpixel Decoding Improvement □

Narrow Quiet Zone □

Start/Stop Characters TX □

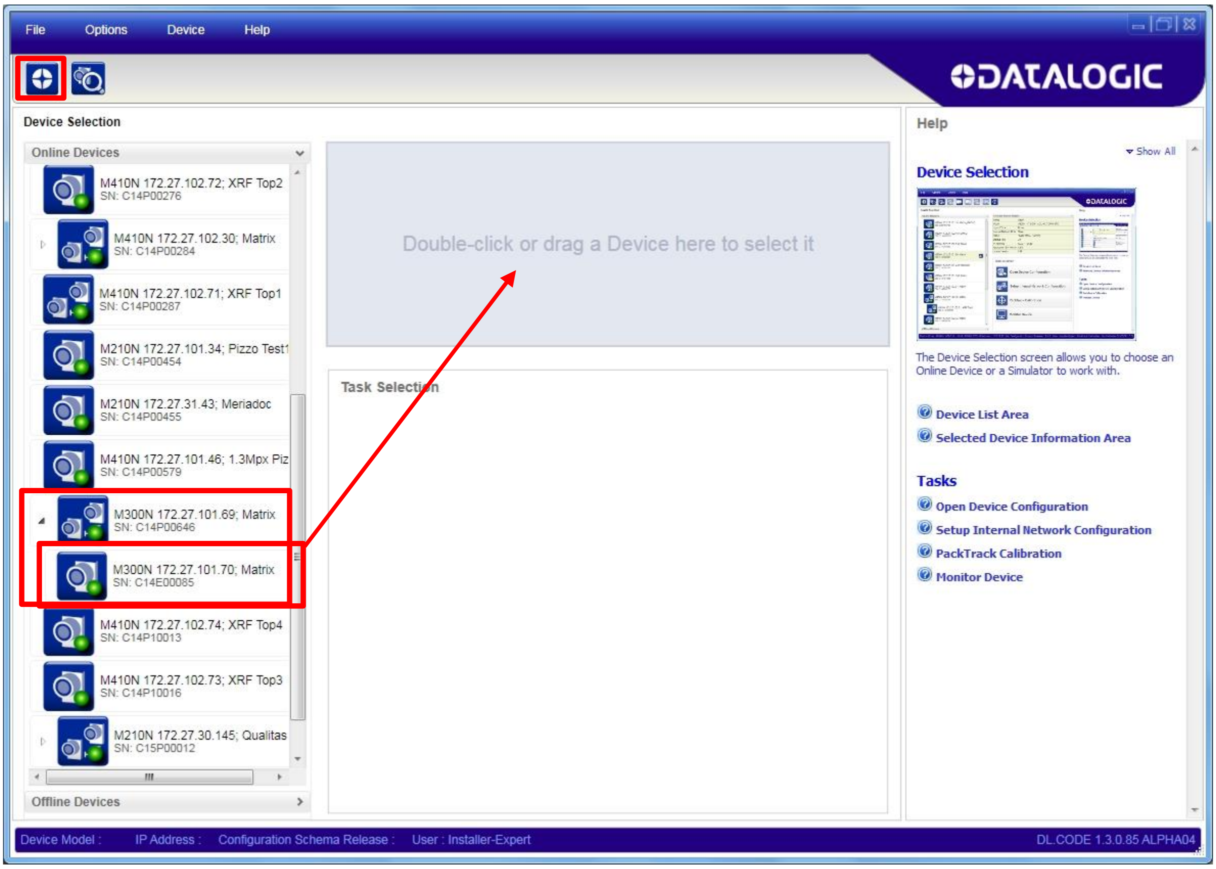
Characters TX □

Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated 3.0.120 RC2

Figure 12 – Saving Synchronized Phase Mode Configuration to Master

2. Connect to each Slave reader via Ethernet (see note below), and set the Slave specific parameters.

NOTE: If necessary, Slave device photometric (Image Setup) parameters must be configured separately through DL.CODE. This is preferably done through each device's Ethernet TCP/IP channel. If Slave devices are not connected to Ethernet you must temporarily (manually) connect them one by one to perform Image Setup.



M410N 172.27.102.72; XRF Top2
SN: C14P00276

M410N 172.27.102.30; Matrix
SN: C14P00284

M410N 172.27.102.71; XRF Top1
SN: C14P00287

M210N 172.27.101.34; Pizzo Test1
SN: C14P00454

M210N 172.27.31.43; Meriadoc
SN: C14P00455

M410N 172.27.101.46; 1.3Mpx Piz
SN: C14P00579

M300N 172.27.101.69; Matrix
SN: C14P00646

M300N 172.27.101.70; Matrix
SN: C14E00085

M410N 172.27.102.74; XRF Top4
SN: C14P10013

M410N 172.27.102.73; XRF Top3
SN: C14P10016

M210N 172.27.30.145; Qualitas
SN: C15P00012

Double-click or drag a Device here to select it

Device Selection

The Device Selection screen allows you to choose an Online Device or a Simulator to work with.

Device List Area

Selected Device Information Area

Tasks

Open Device Configuration

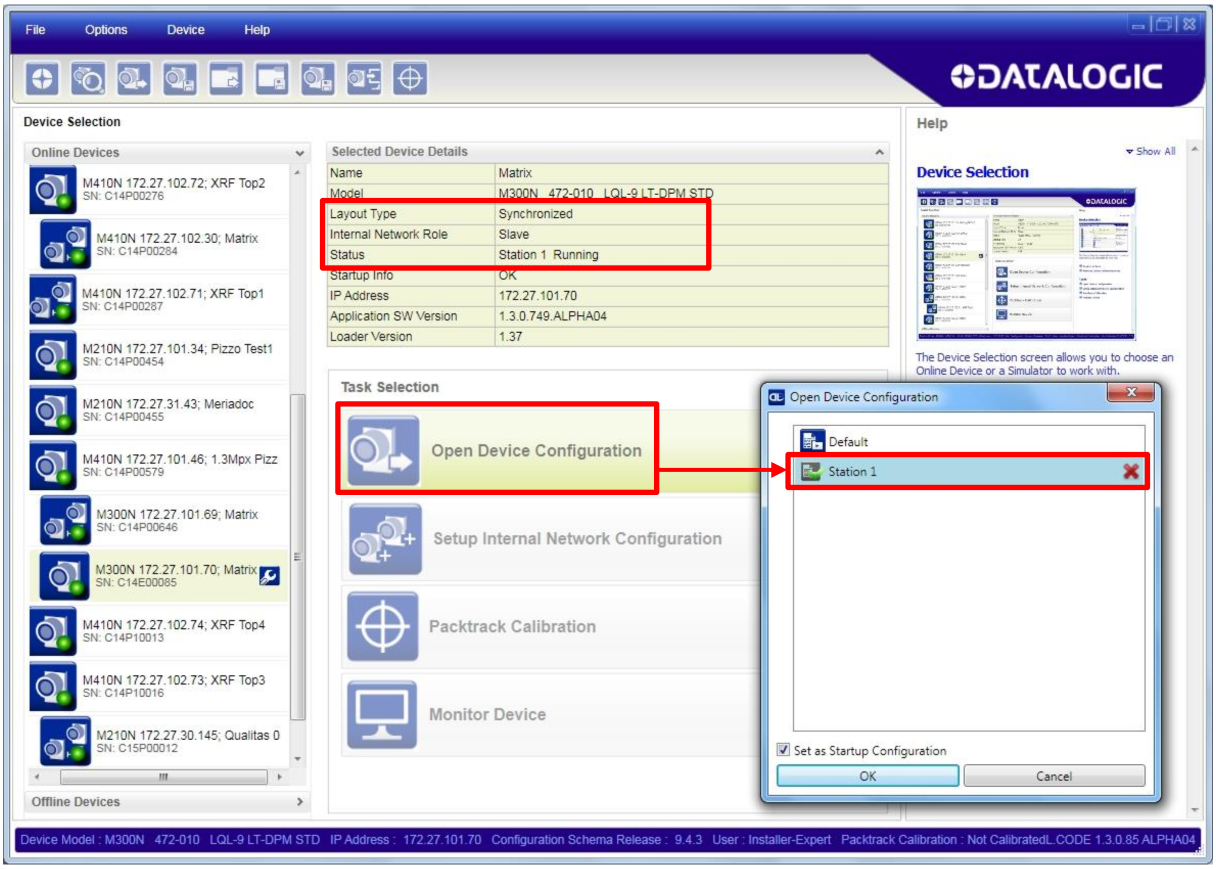
Setup Internal Network Configuration

PackTrack Calibration

Monitor Device

Device Model : IP Address : Configuration Schema Release : User : Installer-Expert DL.CODE 1.3.0.85 ALPHA04

Open the cloned application job.



M410N 172.27.102.72; XRF Top2
SN: C14P00276

M410N 172.27.102.30; Matrix
SN: C14P00284

M410N 172.27.102.71; XRF Top1
SN: C14P00287

M210N 172.27.101.34; Pizzo Test1
SN: C14P00454

M210N 172.27.31.43; Meriadoc
SN: C14P00455

M410N 172.27.101.46; 1.3Mpx Pizz
SN: C14P00579

M300N 172.27.101.69; Matrix
SN: C14P00646

M300N 172.27.101.70; Matrix
SN: C14E00085

M410N 172.27.102.74; XRF Top4
SN: C14P10013

M410N 172.27.102.73; XRF Top3
SN: C14P10016

M210N 172.27.30.145; Qualitas 0
SN: C15P00012

Selected Device Details

Name	Matrix
Model	M300N 472-010 LQL-9 LT-DPM STD
Layout Type	Synchronized
Internal Network Role	Slave
Status	Station 1 Running
Startup Info	OK
IP Address	172.27.101.70
Application SW Version	1.3.0.749.ALPHA04
Loader Version	1.37

Open Device Configuration

Setup Internal Network Configuration

Packtrack Calibration

Monitor Device

Device Selection

The Device Selection screen allows you to choose an Online Device or a Simulator to work with.

Open Device Configuration

- Default
- Station 1

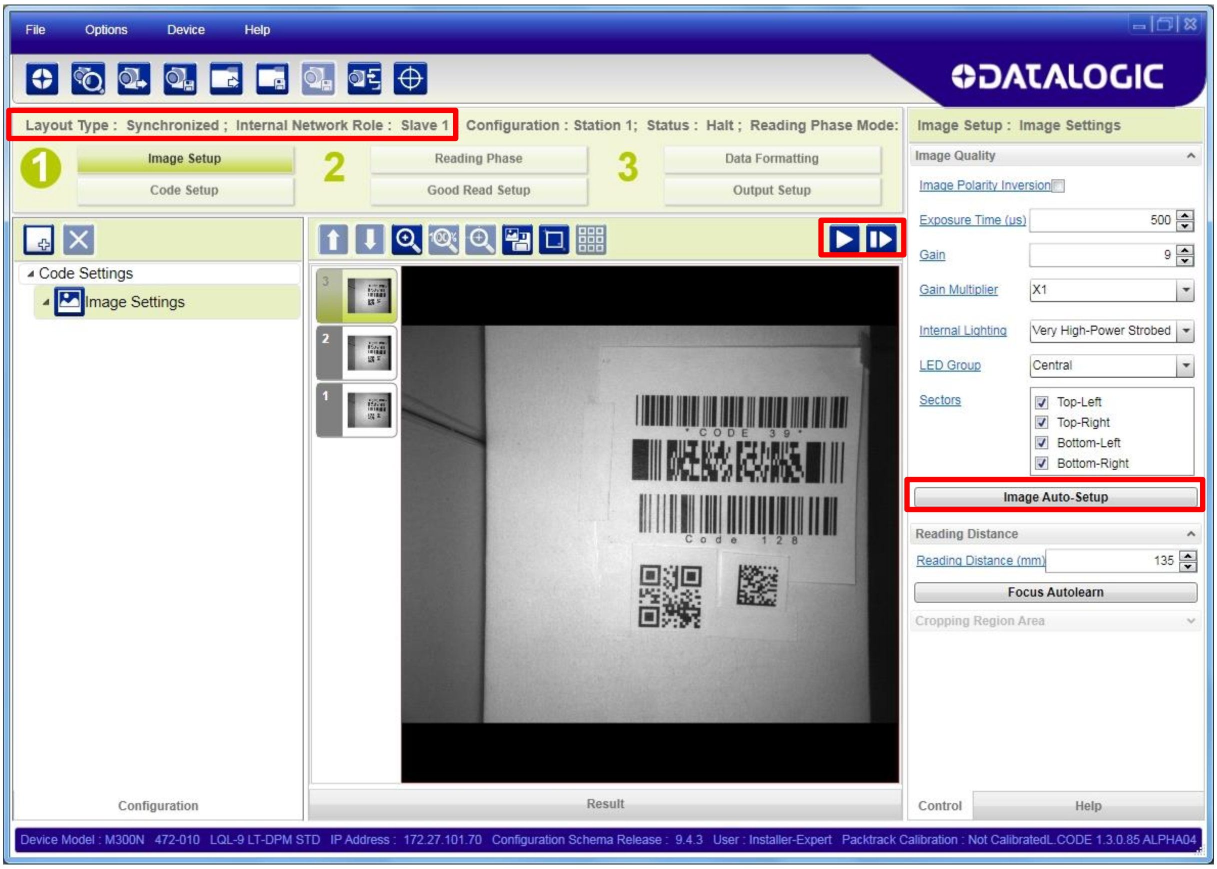
☑ Set as Startup Configuration

OK Cancel

Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.70 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not CalibratedL.CODE 1.3.0.85 ALPHA04

When the job opens, pause run mode and configure the Slave specific parameters. These depend on the application and include the following:

- photometric parameters (Image Auto-Setup feature in the Image Setup step)
- Acquisition Trigger Delays necessary to avoid lighting interference between adjacent or oppositely positioned readers (Reading Phase step)
- Images Saving if used (Data Formatting step)
- Encoder Sensor: if used, (for all Slaves, the Encoder Type must be set to **Internal**)



Layout Type : Synchronized ; Internal Network Role : Slave 1 Configuration : Station 1; Status : Halt ; Reading Phase Mode:

Image Setup : Image Settings

Image Quality

Image Polarity Inversion □

Exposure Time (us) 500

Gain 9

Gain Multiplier X1

Internal Lighting Very High-Power Strobed

LED Group Central

Sectors ☑ Top-Left ☑ Top-Right ☑ Bottom-Left ☑ Bottom-Right

Image Auto-Setup

Reading Distance

Reading Distance (mm) 135

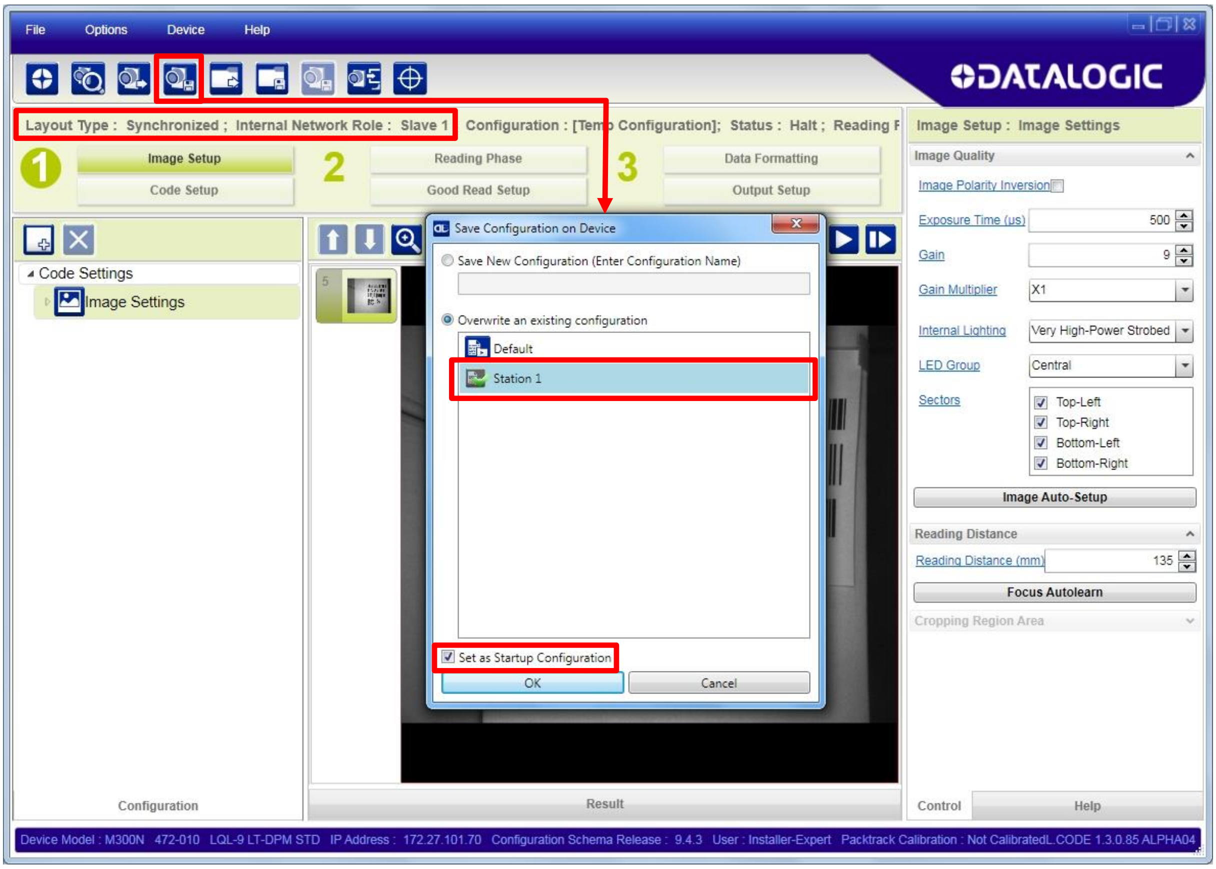
Focus Autolearn

Cropping Region Area

Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.70 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not CalibratedL.CODE 1.3.0.85 ALPHA04

Verify the focus and decoding with the capture image ▶ and Code Setup page.

3. Now save them, overwriting the cloned application job[2].



Layout Type : Synchronized ; Internal Network Role : Slave 1 Configuration : [Temp Configuration]; Status : Halt ; Reading F

Save Configuration on Device

○ Save New Configuration (Enter Configuration Name)

● Overwrite an existing configuration

- Default
- Station 1

☑ Set as Startup Configuration

OK Cancel

Image Setup : Image Settings

Image Quality

Image Polarity Inversion	□
Exposure Time (us)	500
Gain	9
Gain Multiplier	X1
Internal Lighting	Very High-Power Strobed
LED Group	Central
Sectors	☑ Top-Left ☑ Top-Right ☑ Bottom-Left ☑ Bottom-Right

Reading Distance

Reading Distance (mm)	135

Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.70 Configuration Schema Release : 9.4.3 User : Installer-Expert Packtrack Calibration : Not CalibratedL.CODE 1.3.0.85 ALPHA04

Figure 13 – Saving Synchronized Phase Mode Configuration to Slave

Repeat this procedure for each Slave device until the entire network is configured.

[2] An application job with the same name as the Master's has been cloned to the Slaves. Each Slave can have its own Image Setup parameters saved in its own copy of the application job. Common parameters managed by the Master such as Operating Mode cannot be modified in the Slave jobs and are shown in grey.

Example Synchronized ID-NET Configuration

When the device is working in a **Synchronized** Layout Type, the ID-NET connection is used to collect data from several readers to build a multi-point or a multi-sided reading system; there can be one Master and up to 31 Slaves connected together.

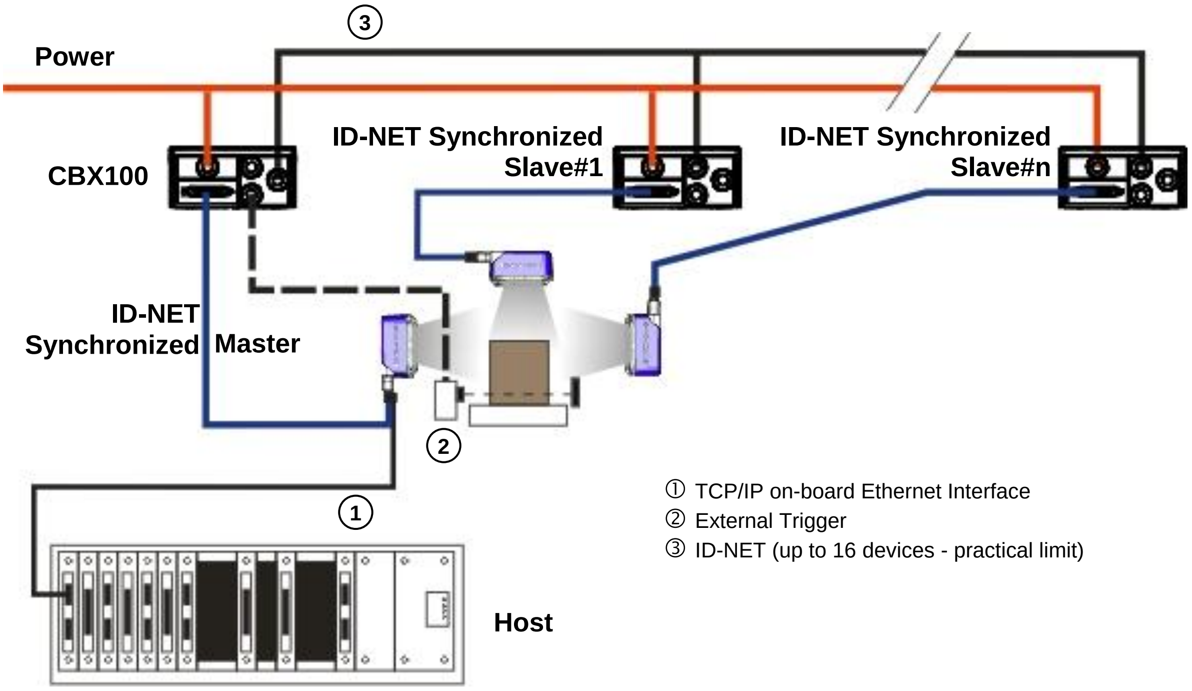
The Slave readers are connected together using the ID-NET interface. Every slave reader must have an ID-NET address in the range 1-31.

The Master reader is also connected to the Host on one of its communication channels. In the following example the TCP/IP on-board Ethernet interface is used.

For a Master/Slave Synchronized layout the External Trigger signal is unique to the system; there is a single reading phase and a single message from the Master reader to the Host computer. **It is not necessary to bring the External Trigger signal to all the readers.**

In the Master/Slave Synchronized layout the Master operating mode can only be set to PackTrack or Phase Mode.

The TCP/IP and ID-NET interfaces are connected as shown in the following figures.


3
Power
CBX100
ID-NET Synchronized Slave#1
ID-NET Synchronized Slave#n
ID-NET Synchronized Master
2
1
Host

① TCP/IP on-board Ethernet Interface
② External Trigger
③ ID-NET (up to 16 devices - practical limit)

Figure 14 – Example ID-NET Synchronized Layout with Master on-board TCP/IP Ethernet Interface to Host

The Master reader can be connected to the CBX series connection box with the advantage of the Backup and Restore configuration function (CBX + BM100 module).

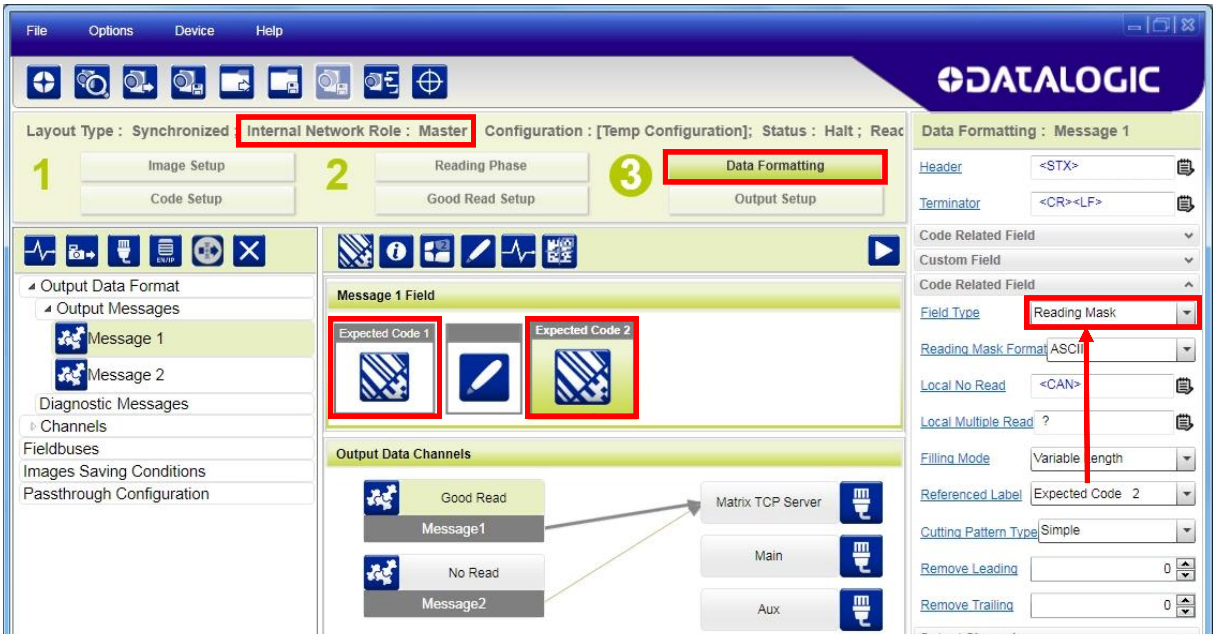
All devices always support multiple output channels (i.e. for data monitoring).

9.2.3 Verify Master/Slave Synchronized Configuration

From the Master configuration, run the application and monitor the output data from the DL.CODE Console or a configured channel terminal.

If necessary, as a troubleshooting tip, you can temporarily apply the **Reading Mask** field in place of each Code Content field to verify if all devices are reading. To do this:

1. Connect to the Master device via Ethernet and from the Data Formatting step, change each Expected Code Field Type from Code Content to Reading Mask.



Layout Type : Synchronized Internal Network Role : Master Configuration : [Temp Configuration]; Status : Halt ; Reac

Data Formatting : Message 1

Header <STX>

Terminator <CR><LF>

Code Related Field

Field Type Reading Mask

Reading Mask Format ASCII

Local No Read <CAN>

Local Multiple Read ?

Filling Mode Variable Length

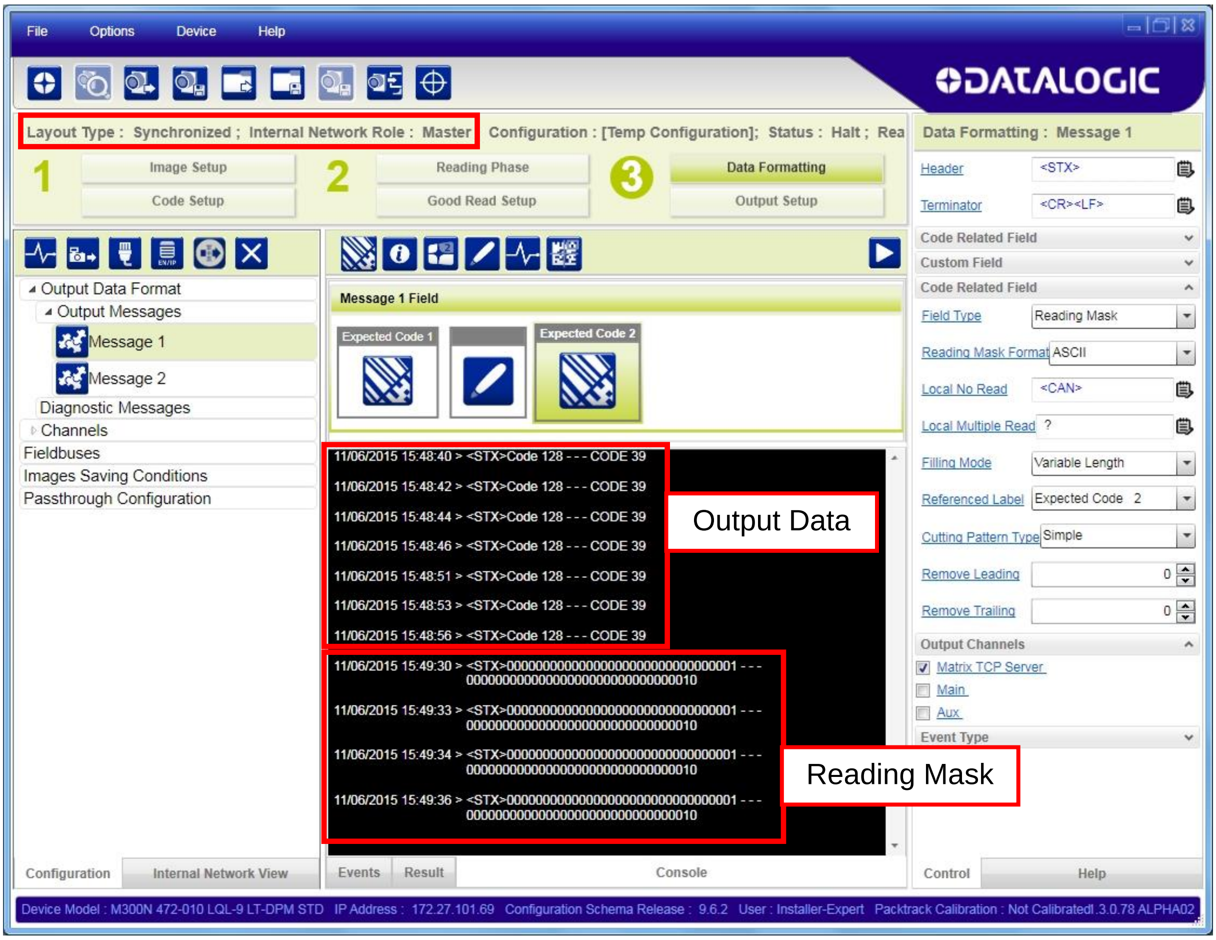
Referenced Label Expected Code 2

Cutting Pattern Type Simple

Remove Leading 0

Remove Trailing 0

2. Run the application and monitor the output data from the DL.CODE Console or a configured channel terminal.



Layout Type : Synchronized ; Internal Network Role : Master   Configuration : [Temp Configuration]; Status : Halt ; Rea

```
11/06/2015 15:48:40 > <STX>Code 128 - - - CODE 39
11/06/2015 15:48:42 > <STX>Code 128 - - - CODE 39
11/06/2015 15:48:44 > <STX>Code 128 - - - CODE 39
11/06/2015 15:48:46 > <STX>Code 128 - - - CODE 39
11/06/2015 15:48:51 > <STX>Code 128 - - - CODE 39
11/06/2015 15:48:53 > <STX>Code 128 - - - CODE 39
11/06/2015 15:48:56 > <STX>Code 128 - - - CODE 39
11/06/2015 15:49:30 > <STX>00000000000000000000000000000001 - - -
                      00000000000000000000000000000010
11/06/2015 15:49:33 > <STX>00000000000000000000000000000001 - - -
                      00000000000000000000000000000010
11/06/2015 15:49:34 > <STX>00000000000000000000000000000001 - - -
                      00000000000000000000000000000010
11/06/2015 15:49:36 > <STX>00000000000000000000000000000001 - - -
                      00000000000000000000000000000010
```

Data Formatting : Message 1

Header	<STX>
Terminator	<CR><LF>

Code Related Field
Custom Field
Code Related Field

Field Type	Reading Mask
Reading Mask Format	ASCII
Local No Read	<CAN>
Local Multiple Read	?
Filling Mode	Variable Length
Referenced Label	Expected Code 2
Cutting Pattern Type	Simple
Remove Leading	0
Remove Trailing	0

Output Channels

☑ Matrix TCP Server
☐ Main
☐ Aux

Event Type

Device Model : M300N 472-010 LQL-9 LT-DPM STD   IP Address : 172.27.101.69   Configuration Schema Release : 9.6.2   User : Installer-Expert   Packtrack Calibration : Not Calibrated!.3.0.78 ALPHA02

The Reading Mask shows which device reads which Expected Code. The mask is composed of a fixed 32-character string (0=No Read or 1=Read) representing the 32 possible readers in an ID-NET network. The Master is the last character in the string (first character to the right). The Slaves are shown in order from right to left (1 to 31).

Example: Master + Slave 1 = 00000000000000000000000000000011

The figure above shows the Master reading Code 128 and Slave 1 reading Code 39.

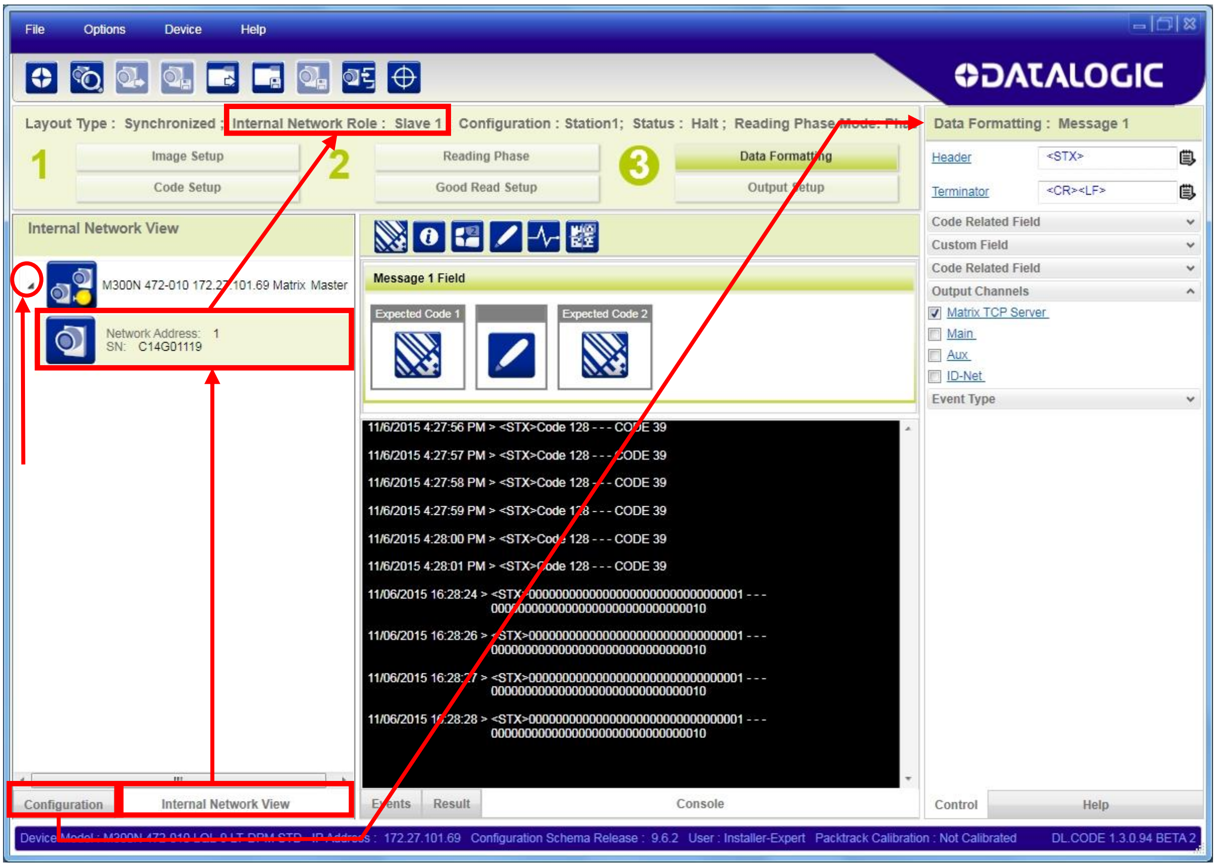
3. After verifying correct functioning of the reading devices, return the Expected Code fields from Reading Mask to Code Content.

4. If you haven't made any other changes you can exit without saving. Otherwise, save the Master device configuration overwriting its previous one, making sure to save **without Clone Master Configuration on Slaves**, otherwise the Slave configurations will be overwritten.

To view the connected Slave configurations:

1. Click on the Internal Network View tab at the bottom of the screen
2. Open the Master branch by clicking on the arrow to the left of the Master icon.
3. Select any slave.
4. Click The Configuration tab at the bottom of the screen.

By selecting the various configuration steps above you can visualize the slave configuration.



Layout Type : Synchronized ; Internal Network Role : Slave 1 ; Configuration : Station1; Status : Halt ; Reading Phase Mode: Pha

Data Formatting : Message 1

Header <STX>

Terminator <CR><LF>

☑ Matrix TCP Server
☐ Main
☐ Aux
☐ ID-Net

M300N 472-010 172.27.101.69 Matrix Master

Network Address: 1
SN: C14G01119

```
11/6/2015 4:27:56 PM > <STX>Code 128 - - - CODE 39
11/6/2015 4:27:57 PM > <STX>Code 128 - - - CODE 39
11/6/2015 4:27:58 PM > <STX>Code 128 - - - CODE 39
11/6/2015 4:27:59 PM > <STX>Code 128 - - - CODE 39
11/6/2015 4:28:00 PM > <STX>Code 128 - - - CODE 39
11/6/2015 4:28:01 PM > <STX>Code 128 - - - CODE 39
11/06/2015 16:28:24 > <STX>0000000000000000000000000000001 - - -
                      0000000000000000000000000000010
11/06/2015 16:28:26 > <STX>0000000000000000000000000000001 - - -
                      0000000000000000000000000000010
11/06/2015 16:28:27 > <STX>0000000000000000000000000000001 - - -
                      0000000000000000000000000000010
11/06/2015 16:28:28 > <STX>0000000000000000000000000000001 - - -
                      0000000000000000000000000000010
```

Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.2 User : Installer-Expert Packtrack Calibration : Not Calibrated DL.CODE 1.3.0.94 BETA 2

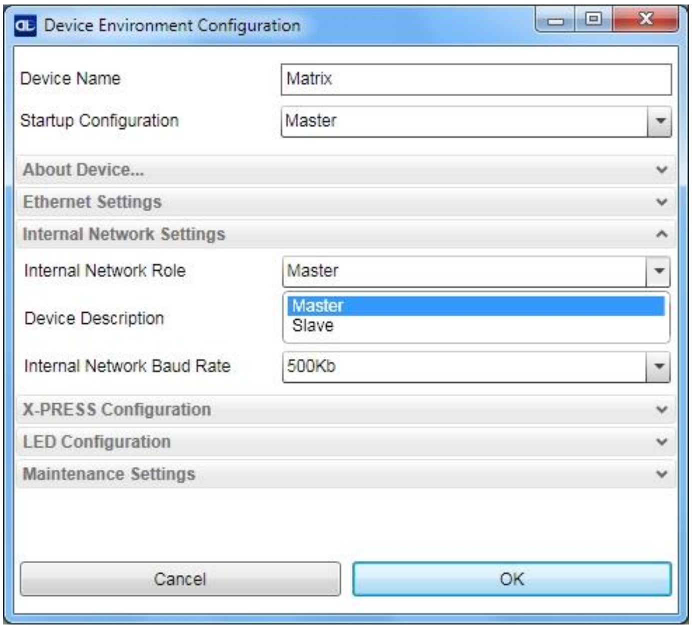
NOTE: You can modify some Slave Synchronized parameters from this view but you cannot save them here.

To save changed slave parameters here, you must click on the Master and Save the configuration overwriting it, making sure to save **without Clone Master Configuration on Slaves**, otherwise all the Slave configuration parameters will be overwritten.

9.2.4 Alternative Device Role Selection

To set up a Master/Slave Internal Network Role you can also enter the Device Environment settings from the Device menu>Settings>Settings and open the Internal Network Settings group.

Change the Internal Network Role to Master or Slave accordingly.



Device Environment Configuration

Device Name: Matrix

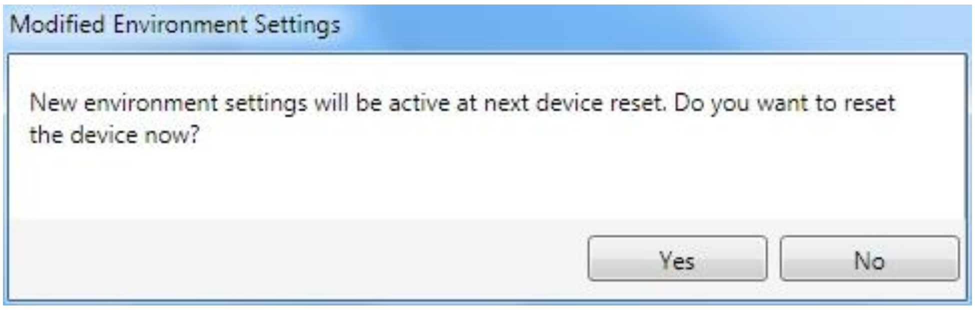
Startup Configuration: Master

Internal Network Role: Master

Device Description

Internal Network Baud Rate: 500Kb

After clicking OK you will be prompted to reset the device to be recognized as Master.

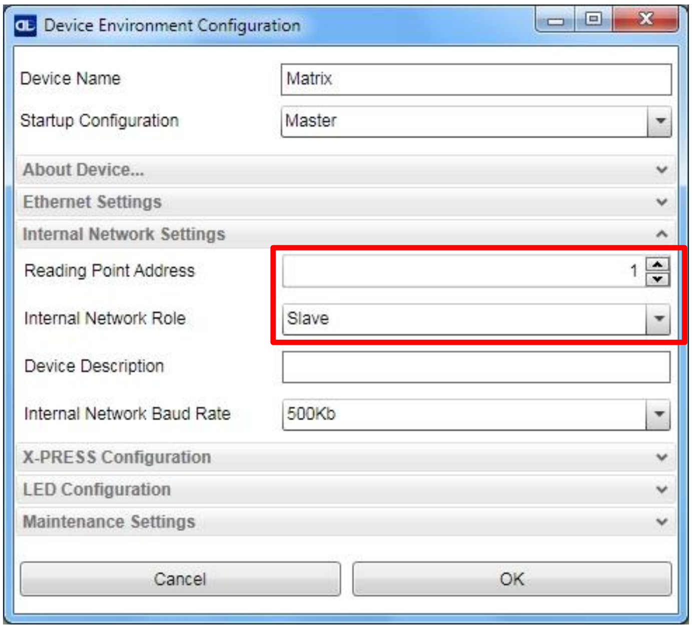


Modified Environment Settings

New environment settings will be active at next device reset. Do you want to reset the device now?

Click Yes and wait for the device to reset. It may be necessary to wait several seconds and then perform a Discovery to refresh the device list area. You should now see the Master device with its relative icon.

Likewise you can set the device **Internal Network Role** to Slave and the **Reading Point Address** (ID-NET address) according to the network configuration.



Device Environment Configuration

Device Name: Matrix

Startup Configuration: Master

About Device...

Ethernet Settings

Internal Network Settings

Reading Point Address: 1

Internal Network Role: Slave

Device Description:

Internal Network Baud Rate: 500Kb

X-PRESS Configuration

LED Configuration

Maintenance Settings

Complete the Slave configuration and save it to the device.

Complete all the ID-NET Slaves in the same way.

The Master must be set to expect the same number of slaves as foreseen by the application. Now by simply making the electrical connections the network will be automatically recognized upon power up.

10 PACKTRACK CALIBRATION

PackTrack Calibration can be performed on all Standalone or Master Matrix N family readers that support this feature.

10.1 REQUIREMENTS

The following is a list of required hardware/software that supports PackTrack for Matrix and is necessary for performing the PackTrack Calibration.

- DL.CODE release: 1.00 or later
- Matrix N Standard Application Program Software: 1.00
- Products: Matrix 300N™ Matrix 410N™, XRF410N™
- PackTrack Calibration Pattern

CAUTION: print either the **A4** or **Letter** size pdf file according to the paper size you are using. Printing on the wrong size paper or rescaling the Calibration Pattern will cause PackTrack calibration errors.

- Tape Measure
- These instructions

10.2 TOP CALIBRATION USING DL.CODE

CAUTION: The conveyor must be STOPPED while performing this procedure!

NOTE: Standard Setup including optical Calibration must be completed before performing PackTrack Calibration.

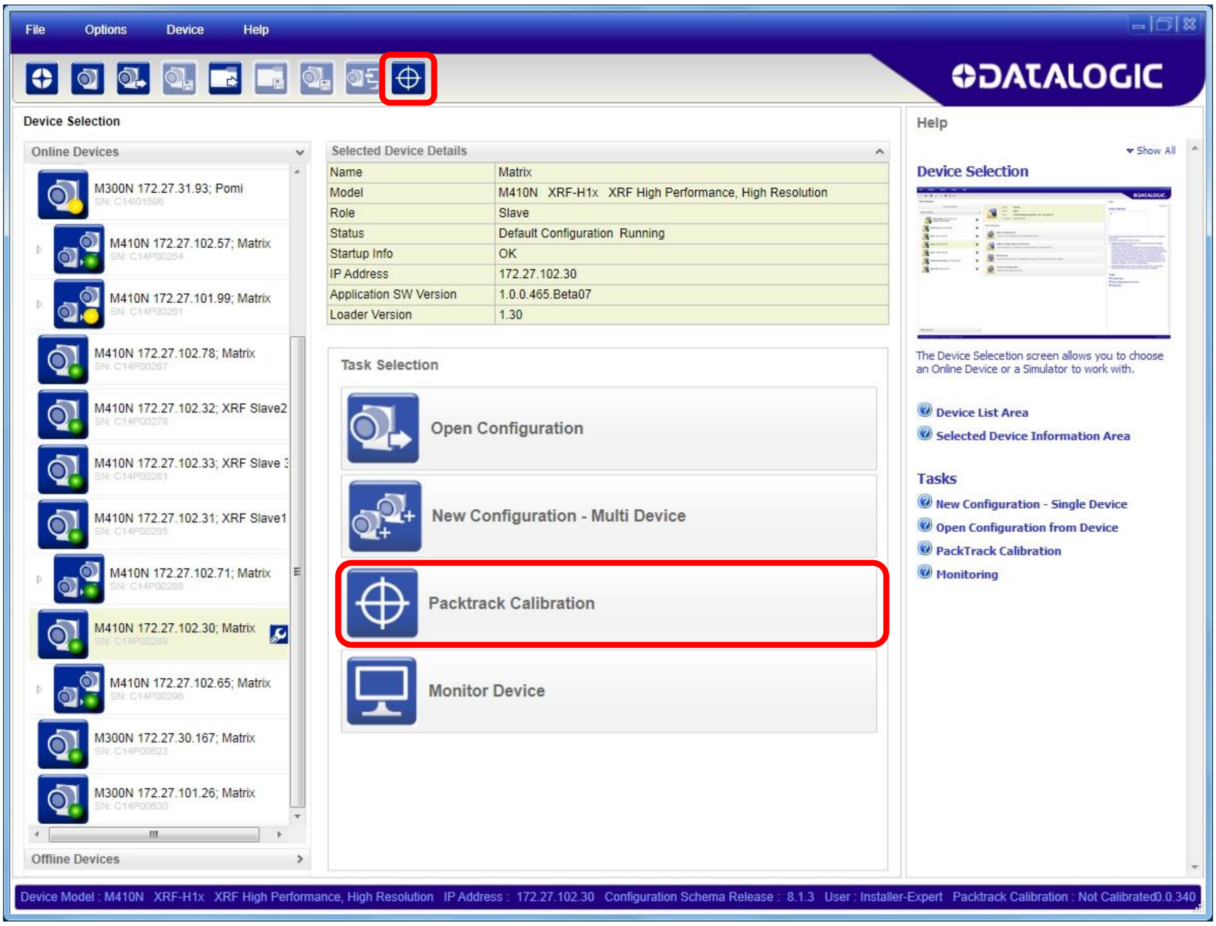
Calibration is performed using the Calibration Pattern positioned on the plane corresponding to the tallest pack, (Near Plane, i.e. closest to the Matrix reader) and on the plane corresponding to the shortest pack, (Far Plane, i.e. farthest from the Matrix reader).

The PackTrack Calibration is completed only after both planes have been calibrated and saved in Flash.

NOTE: Once a completed calibration is performed, it is not possible to perform calibration on a single plane, for example modifying one plane while maintaining the previous parameters of the other plane. The PackTrack Calibration always requires both steps to be completed.

STEP 1 – Run PackTrack Calibration:

a) Select **PackTrack Calibration** from the toolbar icon or item in the DL.CODE Task Area.



M300N 172.27.31.93; Pomi
SN: C14I01596

M410N 172.27.102.57; Matrix
SN: C14P00254

M410N 172.27.101.99; Matrix
SN: C14P00261

M410N 172.27.102.78; Matrix
SN: C14P00267

M410N 172.27.102.32; XRF Slave2
SN: C14P00278

M410N 172.27.102.33; XRF Slave 3
SN: C14P00281

M410N 172.27.102.31; XRF Slave1
SN: C14P00285

M410N 172.27.102.71; Matrix
SN: C14P00288

M410N 172.27.102.30; Matrix
SN: C14P00289

M410N 172.27.102.65; Matrix
SN: C14P00296

M300N 172.27.30.167; Matrix
SN: C14P00623

M300N 172.27.101.26; Matrix
SN: C14P00630

Selected Device Details

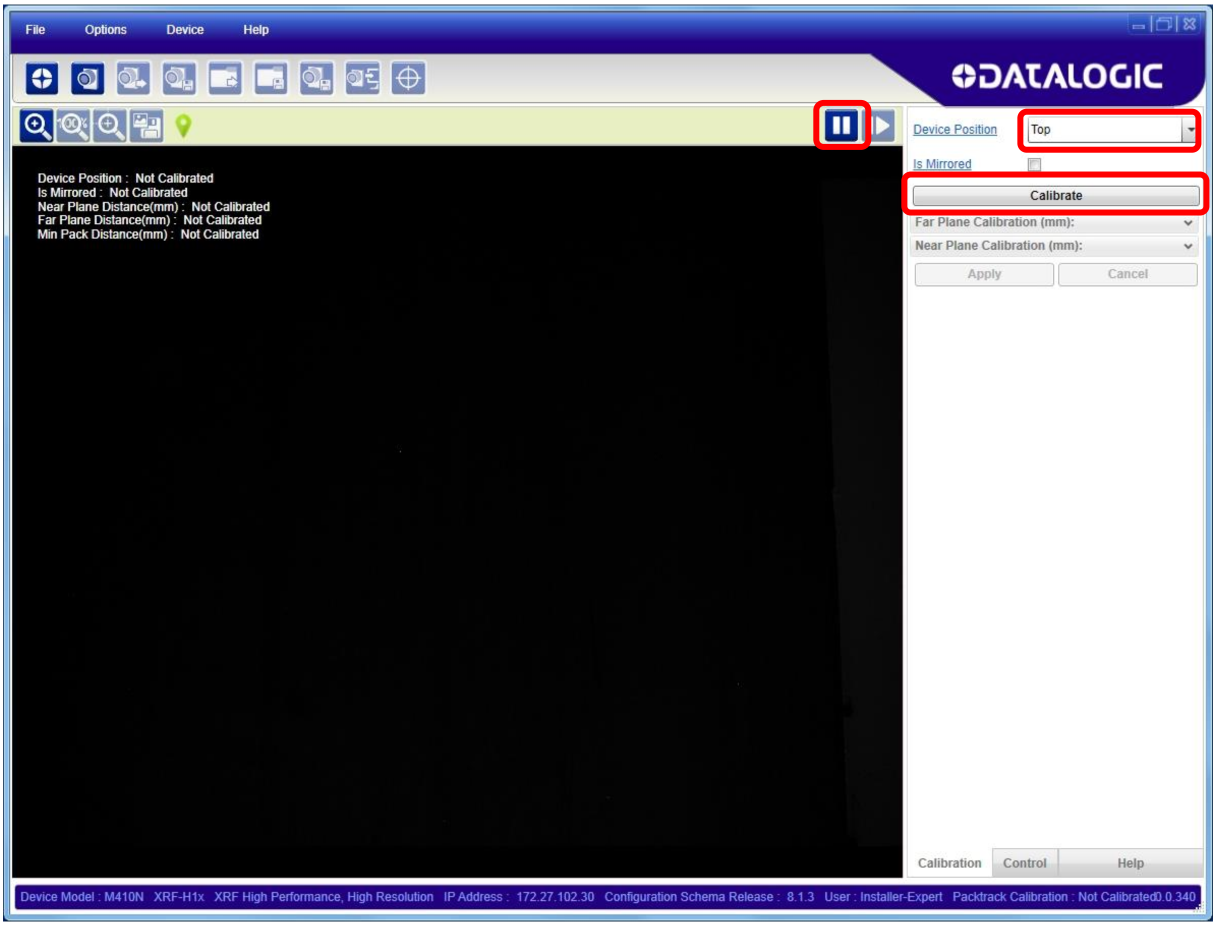
Name	Matrix
Model	M410N XRF-H1x XRF High Performance, High Resolution
Role	Slave
Status	Default Configuration Running
Startup Info	OK
IP Address	172.27.102.30
Application SW Version	1.0.0.465.Beta07
Loader Version	1.30

The Device Selecetion screen allows you to choose an Online Device or a Simulator to work with.

Device Model : M410N XRF-H1x XRF High Performance, High Resolution IP Address : 172.27.102.30 Configuration Schema Release : 8.1.3 User : Installer-Expert Packtrack Calibration : Not Calibrated0.0.340

b) Set the Device Position to **Top** from the dropdown list.

c) Click on the **Calibrate** button to open the Calibration Planes panel for co-ordinate input.



Device Position : Not Calibrated
Is Mirrored : Not Calibrated
Near Plane Distance(mm) : Not Calibrated
Far Plane Distance(mm) : Not Calibrated
Min Pack Distance(mm) : Not Calibrated

Device Position: Top

Is Mirrored: □

Far Plane Calibration (mm):

Near Plane Calibration (mm):

Device Model : M410N XRF-H1x XRF High Performance, High Resolution IP Address : 172.27.102.30 Configuration Schema Release : 8.1.3 User : Installer-Expert Packtrack Calibration : Not Calibrated0.0.340

STEP 2 – Determine the PackTrack System Reference Point:

a) Determine the PackTrack System Reference Point, if possible **on the conveyor frame surface**, where the X, Y, Z co-ordinates = (0,0,0). Visibly mark this point on a piece of tape or other surface, so that it can be used to make the measurements necessary for calibration. The Y = 0 value **normally** corresponds to the PS Line position.

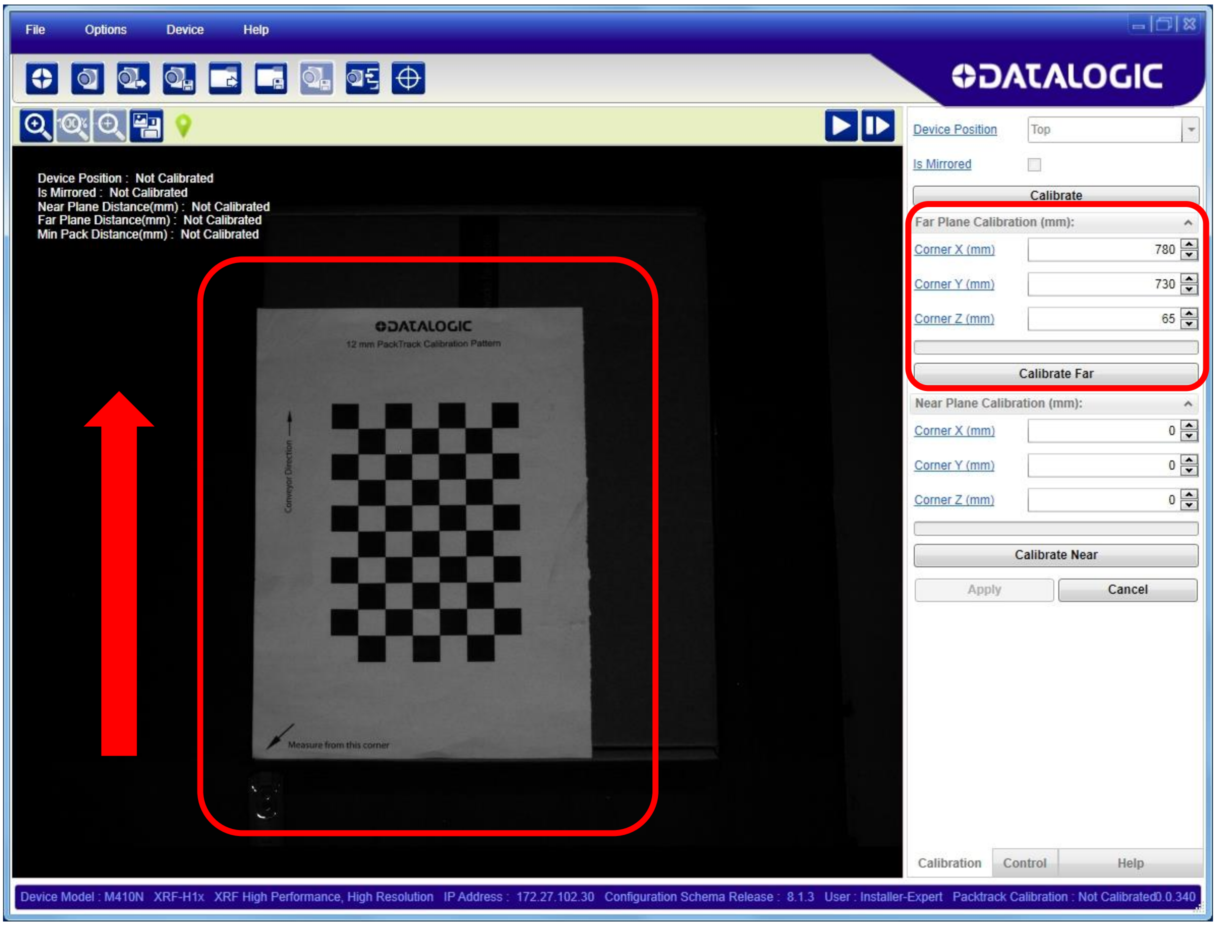
STEP 3 – Far Plane Calibration:

NOTE: Step 3 and Step 4 can be inverted.

a) The reader should already be running (illuminator flashing and acquiring images) so that positioning can be seen on the monitor. The pause button should be shown indicating the reader is running.

b) Place the Calibration Pattern so that it is completely visible in the monitor window and it corresponds to the plane representing the lowest pack allowed to pass through the system on the conveyor. This is the Far Plane which can also be on the conveyor surface.

NOTE: the Calibration Pattern must be aligned so that the y-axis is parallel to the conveyor movement direction.



Device Position : Not Calibrated
Is Mirrored : Not Calibrated
Near Plane Distance(mm) : Not Calibrated
Far Plane Distance(mm) : Not Calibrated
Min Pack Distance(mm) : Not Calibrated

Device Position: Top
Is Mirrored: □

Far Plane Calibration (mm):
Corner X (mm): 780
Corner Y (mm): 730
Corner Z (mm): 65

Near Plane Calibration (mm):
Corner X (mm): 0
Corner Y (mm): 0
Corner Z (mm): 0

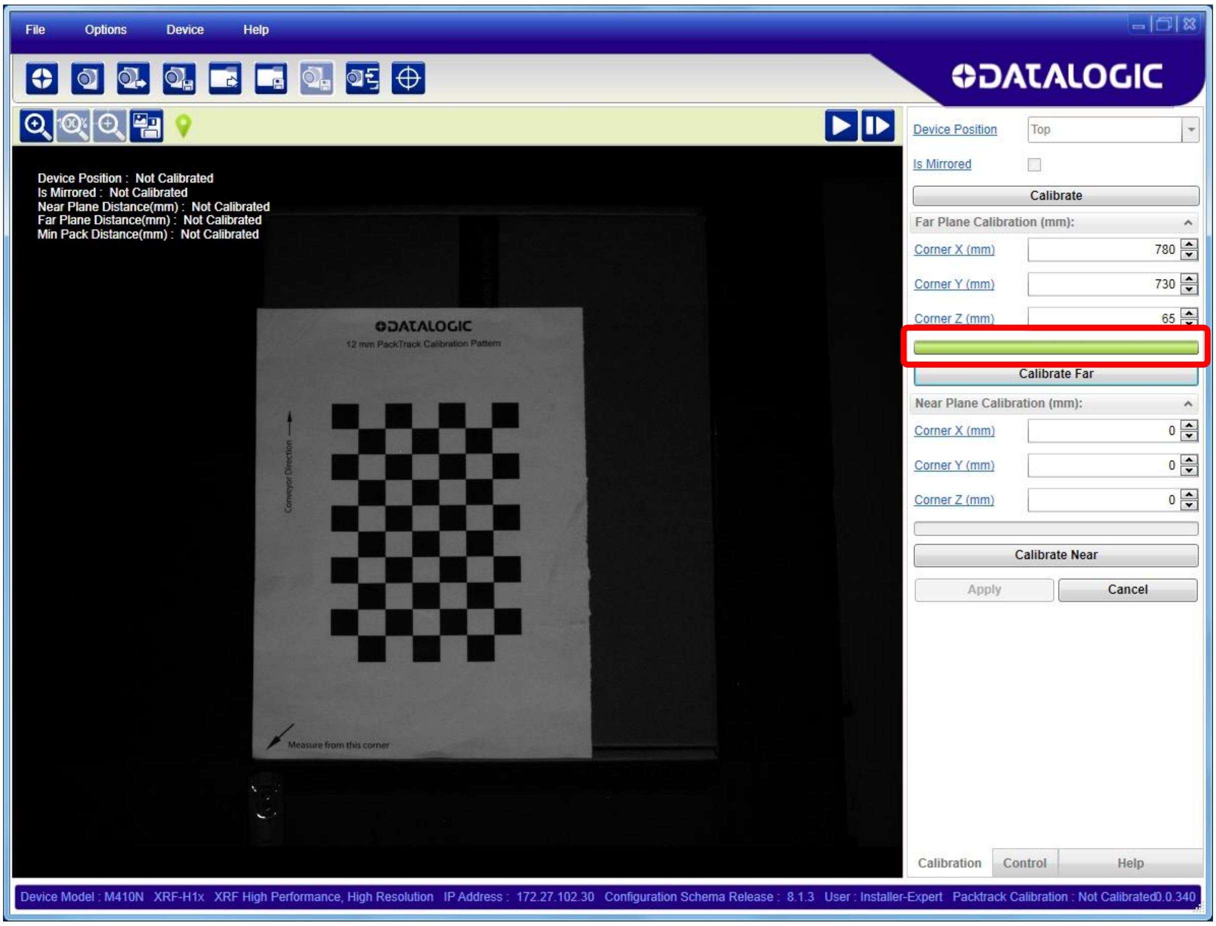
Device Model : M410N XRF-H1x XRF High Performance, High Resolution IP Address : 172.27.102.30 Configuration Schema Release : 8.1.3 User : Installer-Expert Packtrack Calibration : Not Calibrated0.0.340

c) Press the **Pause** button.

d) Using the tape measure, physically measure the X, Y and Z offsets from the System Reference Point to the lower left corner of the Calibration Pattern and input this data **(mm)** into the Far Plane Calibration boxes.

e) Press the **Calibrate Far** button for start Far Calibration.

f) Wait until the operation finishes. An orange progression bar runs above the **Calibrate Far** button and should end in a solid green bar indicating successful calibration of the far plane.



Device Position : Not Calibrated
Is Mirrored : Not Calibrated
Near Plane Distance(mm) : Not Calibrated
Far Plane Distance(mm) : Not Calibrated
Min Pack Distance(mm) : Not Calibrated

Device Position: Top
Is Mirrored: □

Far Plane Calibration (mm):
Corner X (mm): 780
Corner Y (mm): 730
Corner Z (mm): 65

Near Plane Calibration (mm):
Corner X (mm): 0
Corner Y (mm): 0
Corner Z (mm): 0

Device Model : M410N XRF-H1x XRF High Performance, High Resolution IP Address : 172.27.102.30 Configuration Schema Release : 8.1.3 User : Installer-Expert Packtrack Calibration : Not Calibrated0.0.340

Possible Error Causes:

- Calibration Pattern is not completely contained in the Field of View.
- Calibration Pattern is partially obscured by objects covering it

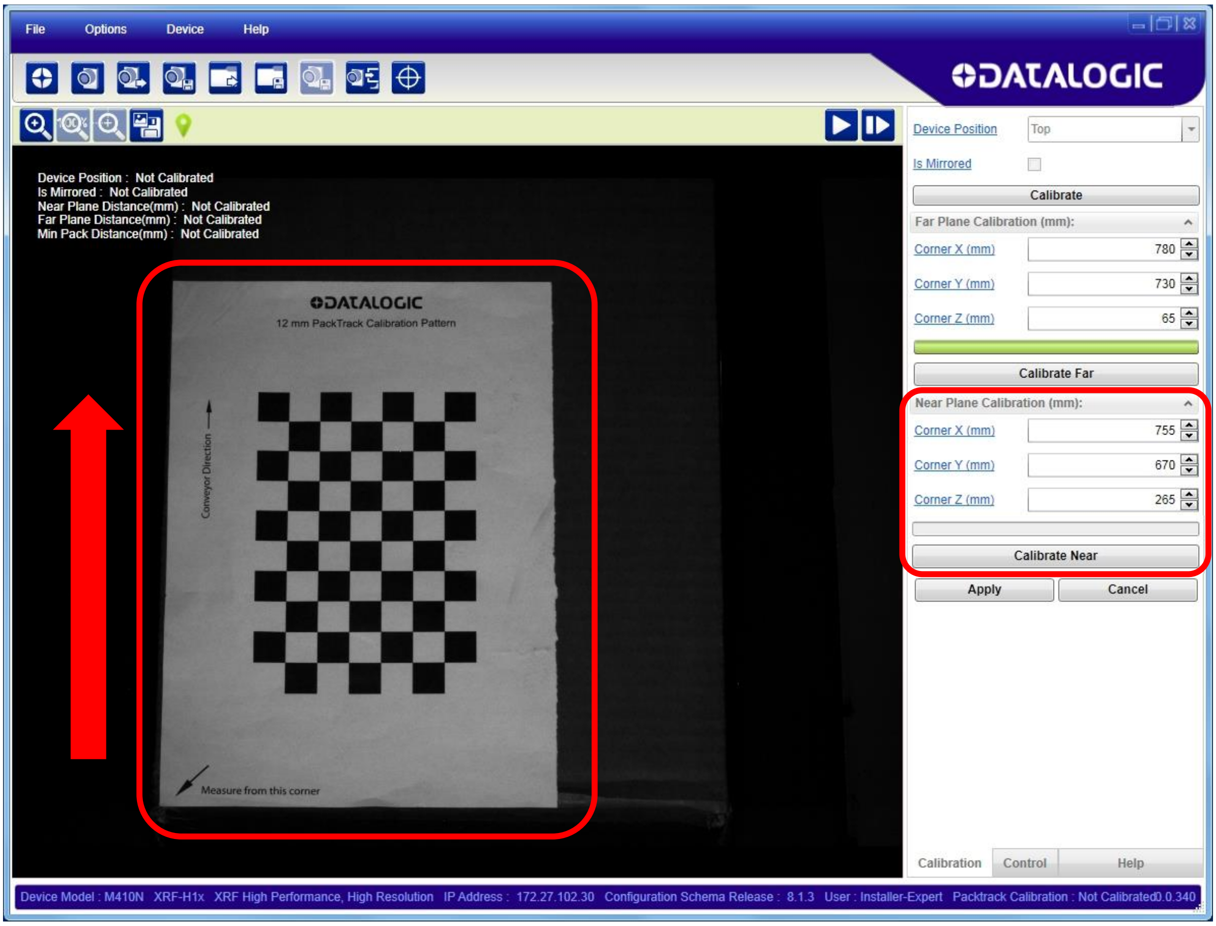
STEP 4 – Near Plane Calibration:

NOTE: Step 3 and Step 4 can be inverted.

a) Press the **Play** button. The reader again begins to acquire images.

b) Place the Calibration Pattern on a pack so that it is completely visible in the monitor window and it corresponds to the plane representing the tallest pack allowed to pass through the system on the conveyor. This is the Near Plane.

NOTE: the Calibration Pattern must be aligned so that the y-axis is parallel to the conveyor movement direction.



Device Position : Not Calibrated
Is Mirrored : Not Calibrated
Near Plane Distance(mm) : Not Calibrated
Far Plane Distance(mm) : Not Calibrated
Min Pack Distance(mm) : Not Calibrated

Device Position: Top
Is Mirrored: □

Far Plane Calibration (mm):

Corner X (mm)	780
Corner Y (mm)	730
Corner Z (mm)	65

Near Plane Calibration (mm):

Corner X (mm)	755
Corner Y (mm)	670
Corner Z (mm)	265

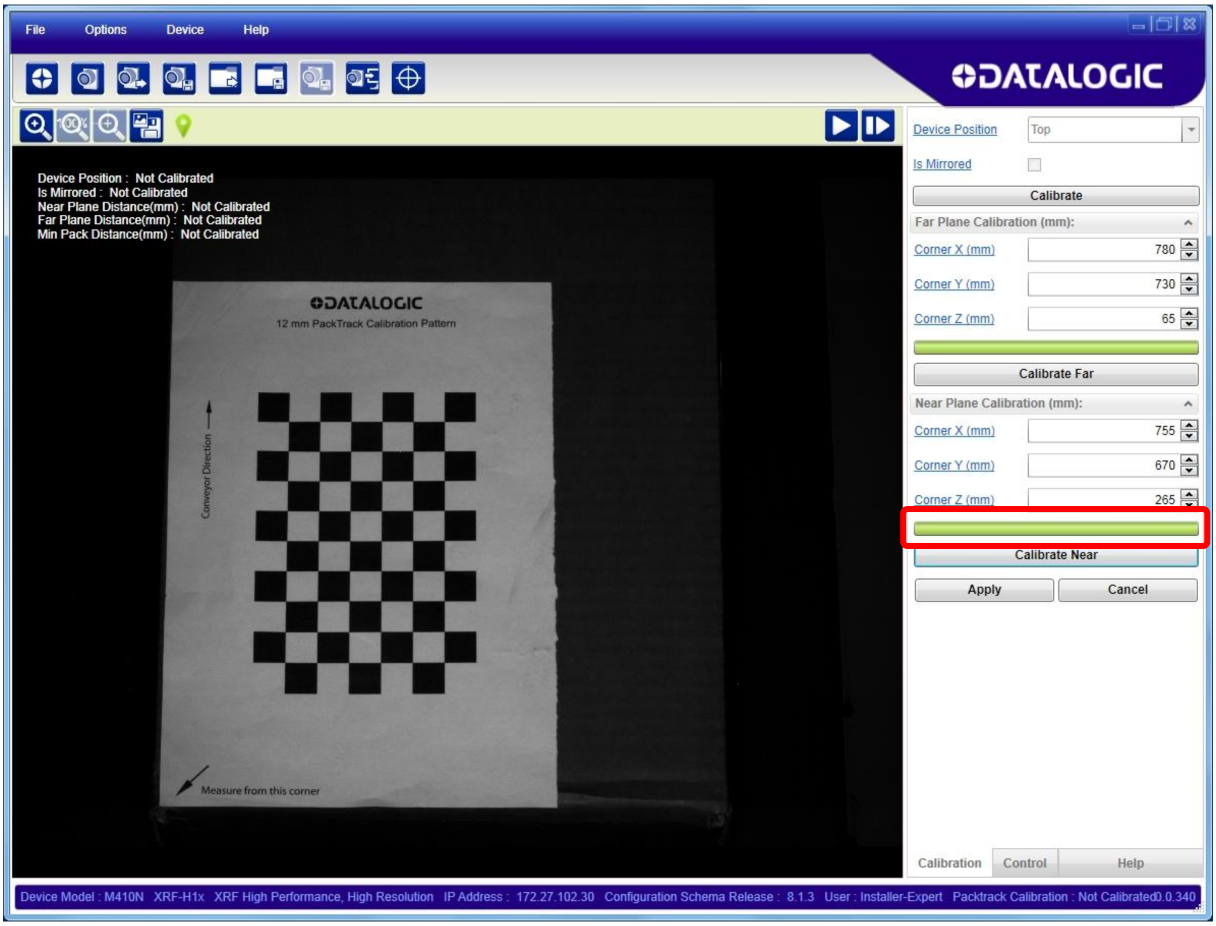
Device Model : M410N XRF-H1x XRF High Performance, High Resolution IP Address : 172.27.102.30 Configuration Schema Release : 8.1.3 User : Installer-Expert Packtrack Calibration : Not Calibrated0.0.340

c) Press the **Pause** button.

d) Using the tape measure, physically measure the X, Y and Z offsets from the System Reference Point to the lower left corner of the pack (aligned with the Calibration Pattern) and input this data **(mm)** into the Near Plane Calibration boxes.

e) Press the **Start** button for Near Calibration.

f) Wait until the operation finishes. An orange progression bar runs above the **Calibrate Near** button and should end in a solid green bar indicating successful calibration of the near plane.



Device Position : Not Calibrated
Is Mirrored : Not Calibrated
Near Plane Distance(mm) : Not Calibrated
Far Plane Distance(mm) : Not Calibrated
Min Pack Distance(mm) : Not Calibrated

Device Position: Top

Is Mirrored: □

Far Plane Calibration (mm):

Corner X (mm): 780

Corner Y (mm): 730

Corner Z (mm): 65

Near Plane Calibration (mm):

Corner X (mm): 755

Corner Y (mm): 670

Corner Z (mm): 265

Device Model : M410N XRF-H1x XRF High Performance, High Resolution IP Address : 172.27.102.30 Configuration Schema Release : 8.1.3 User : Installer-Expert Packtrack Calibration : Not Calibrated0.0.340

Possible Error Causes:

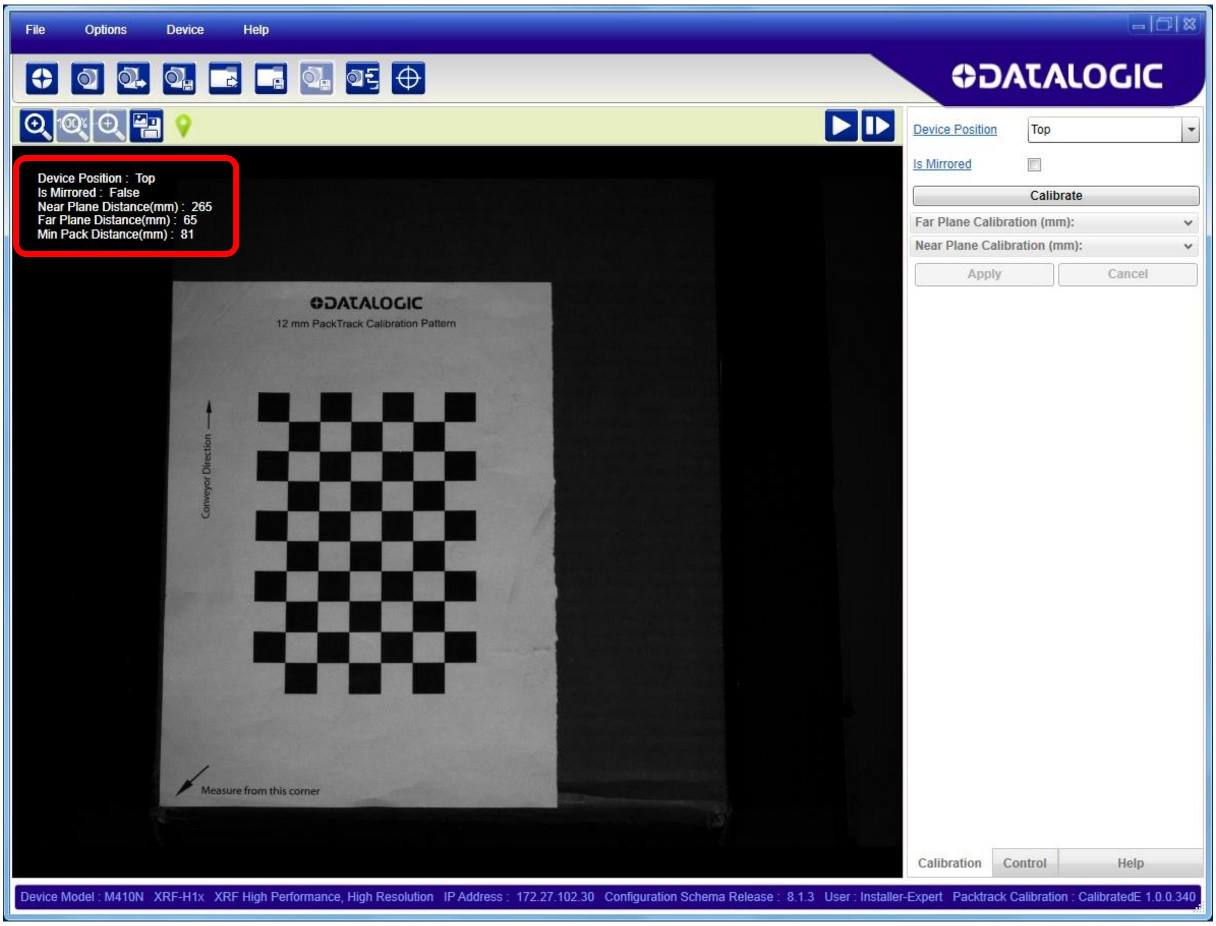
- Calibration Pattern is not completely contained in the Field of View.
- Calibration Pattern is partially obscured by objects covering it

In this case (first time calibration), it is possible to repeat the Near Calibration without losing the previously completed Far Calibration.

NOTE: the items in the monitor window are still shown as "Not Calibrated" because the calibration has not been saved yet.

STEP 5 – Saving Calibration:

g) Click on the **Apply** button to save the calibration values in the reader's flash memory.



Device Position : Top
Is Mirrored : False
Near Plane Distance(mm) : 265
Far Plane Distance(mm) : 65
Min Pack Distance(mm) : 81

Device Position: Top
Is Mirrored: □
Far Plane Calibration (mm):
Near Plane Calibration (mm):

Device Model : M410N XRF-H1x XRF High Performance, High Resolution IP Address : 172.27.102.30 Configuration Schema Release : 8.1.3 User : Installer-Expert Packtrack Calibration : CalibratedE 1.0.0.340

The calibration also advises the minimum distance between packs (Min Pack Distance), for which correct code to pack assignment can be guaranteed.

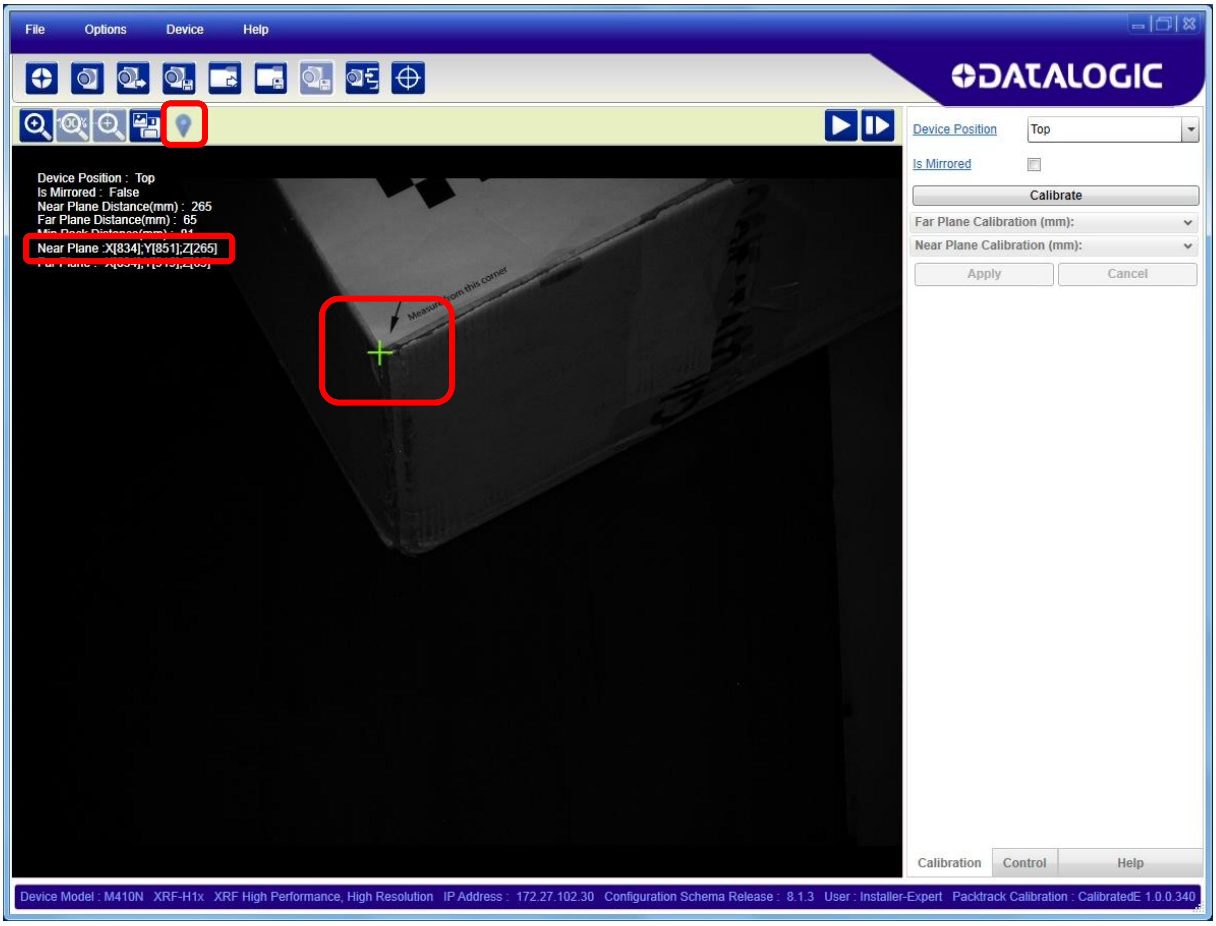
At this point PackTrack Calibration has been successfully completed.

STEP 6 – Verify Calibration Results:

a) Place a pack, code or other object onto either the Near or Far plane at a different coordinate from the calibration, however it must be visible in the monitor window.

b) Click on the **Show Real World Coordinates** icon. A green cross will appear in the monitor window. Drag this cross with the mouse to an easy-to-measure reference point (i.e. pack edge).

c) Using the tape measure, physically measure the X and Y coordinates from the System Reference Point and compare them to the data shown in the monitor window for the reference plane you are measuring.



Device Position : Top
Is Mirrored : False
Near Plane Distance(mm) : 265
Far Plane Distance(mm) : 65
Min Pack Distance(mm) : 81
Near Plane :X[834];Y[851];Z[265]
Far Plane : X[834];Y[915];Z[65]

Device Position: Top

Is Mirrored: □

Far Plane Calibration (mm):

Near Plane Calibration (mm):

Device Model : M410N XRF-H1x XRF High Performance, High Resolution IP Address : 172.27.102.30 Configuration Schema Release : 8.1.3 User : Installer-Expert Packtrack Calibration : CalibratedE 1.0.0.340

11 DPM CALIBRATION

11.1 PRE CONFIGURATION

Before performing DPM Calibration the reader should be pre-calibrated using the Grade A test chart.

In addition there are several factors that require attention in order to produce the best decoding results for DPM code reading applications.

1. The best reading results occur in static applications (no code movement during image acquisition).
2. When using internal illumination, reduce skew angle to minimum to allow uniform lighting on the code surface.
3. The code should be placed as close as possible to the center of the FoV.
4. Reduce reading distance to reduce ambient lighting interference.
5. The best internal illumination chain combination in part depends on the reading distance. More light is applied to the surface at closer distances.

11.2 DPM AUTOLEARN

DL.CODE provides a DPM Autolearn Calibration tool to help find the best combination of parameters for DPM applications. This tool is sufficient for many DPM applications, however some particularly difficult applications may be improved by some manual calibration fine tuning.

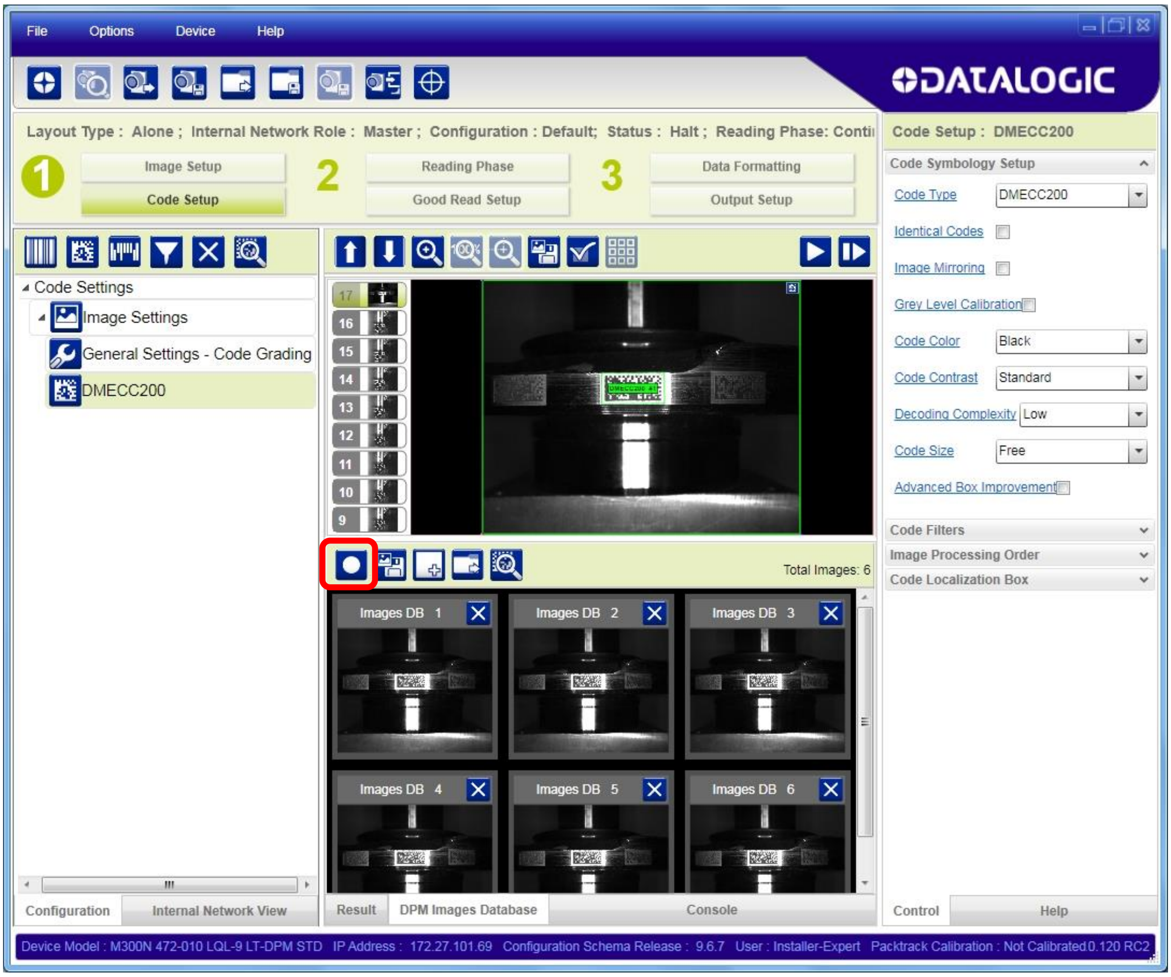
11.3 DPM AUTOLEARN USING IMAGES DATABASE

DL.CODE provides a DPM Autolearn Calibration tool to help find the best combination of parameters for DPM applications. This tool is sufficient for many DPM applications, however some particularly difficult applications may be improved by some manual calibration fine tuning.

1. After initial setup (Image Auto-Setup and Focusing), place the DPM code at the center of the FoV at the same reading distance.

2. From Code Setup, click on the DPM Images Database tab at the bottom of the screen.

3. Click on the Start Recoding Images icon to start image recording.



Layout Type : Alone ; Internal Network Role : Master ; Configuration : Default; Status : Halt ; Reading Phase: Conti

Total Images: 6

Code Setup : DMECC200

Code Symbology Setup

Code Type: DMECC200

Identical Codes □

Image Mirroring □

Grey Level Calibration □

Code Color: Black

Code Contrast: Standard

Decoding Complexity: Low

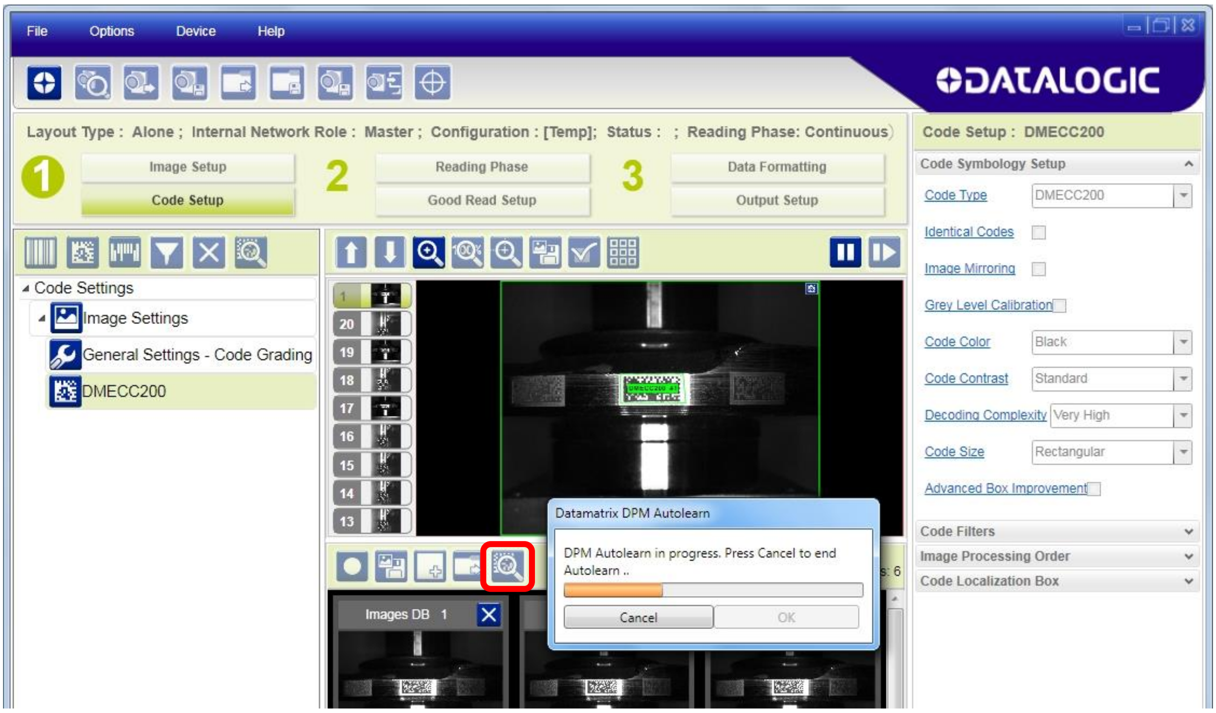
Code Size: Free

Advanced Box Improvement □

Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated 0.120 RC2

4. When several images have been acquired, click on the Stop Recoding Images icon to stop image recording. You will then see the images in the Image Database (saved to the Images Database Buffer).

5. Click on the DPM Autolearn icon to start the DPM calibration and wait until the calibration finishes.



Layout Type : Alone ; Internal Network Role : Master ; Configuration : [Temp]; Status : ; Reading Phase: Continuous

Code Setup : DMECC200

Code Symbology Setup

Code Type	DMECC200
Identical Codes	□
Image Mirroring	□
Grey Level Calibration	□
Code Color	Black
Code Contrast	Standard
Decoding Complexity	Very High
Code Size	Rectangular
Advanced Box Improvement	□

Code Filters

Image Processing Order

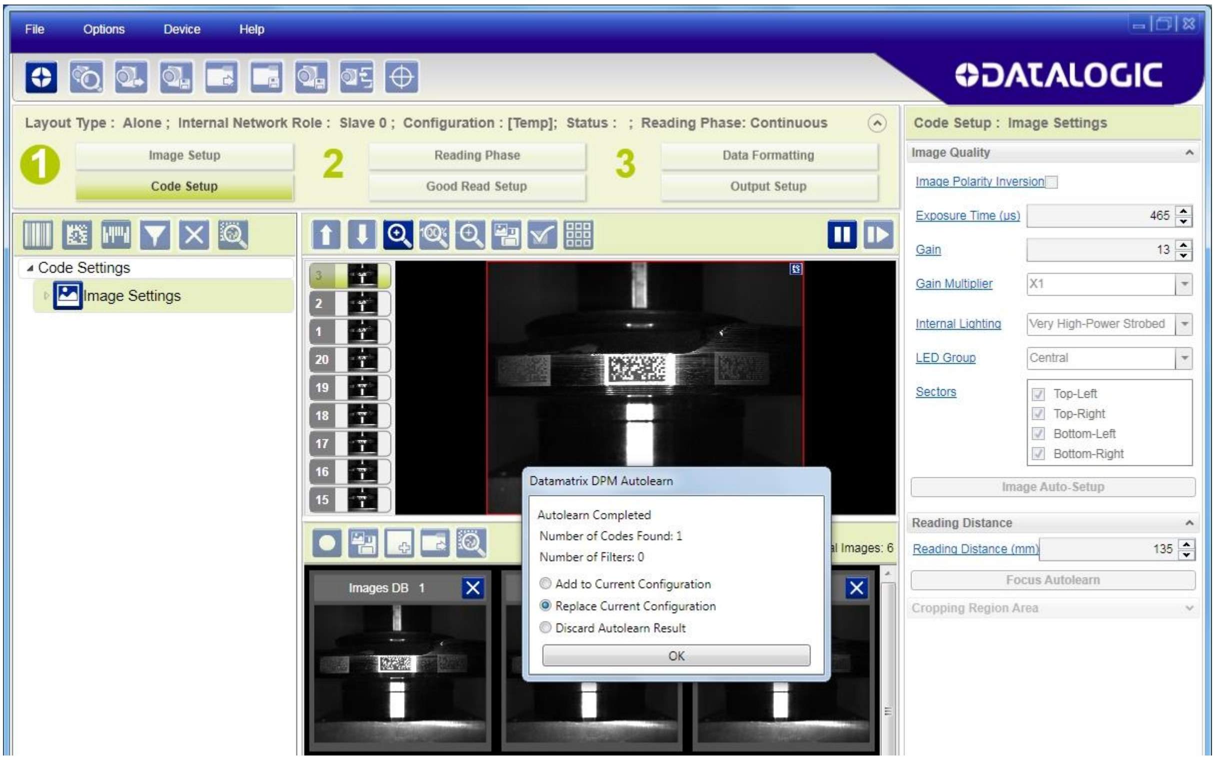
Code Localization Box

Datamatrix DPM Autolearn

DPM Autolearn in progress. Press Cancel to end Autolearn ..

Cancel OK

6. At the end of the calibration you will be prompted to **Add to** or **Replace the Current Configuration**, or to **Discard the Autolearn Result**.



Layout Type : Alone ; Internal Network Role : Slave 0 ; Configuration : [Temp]; Status : ; Reading Phase: Continuous

Code Setup : Image Settings

Image Quality

Image Polarity Inversion	□
Exposure Time (us)	465
Gain	13
Gain Multiplier	X1
Internal Lighting	Very High-Power Strobed
LED Group	Central
Sectors	☑ Top-Left ☑ Top-Right ☑ Bottom-Left ☑ Bottom-Right

Image Auto-Setup

Reading Distance

Reading Distance (mm)	135

Focus Autolearn

Cropping Region Area

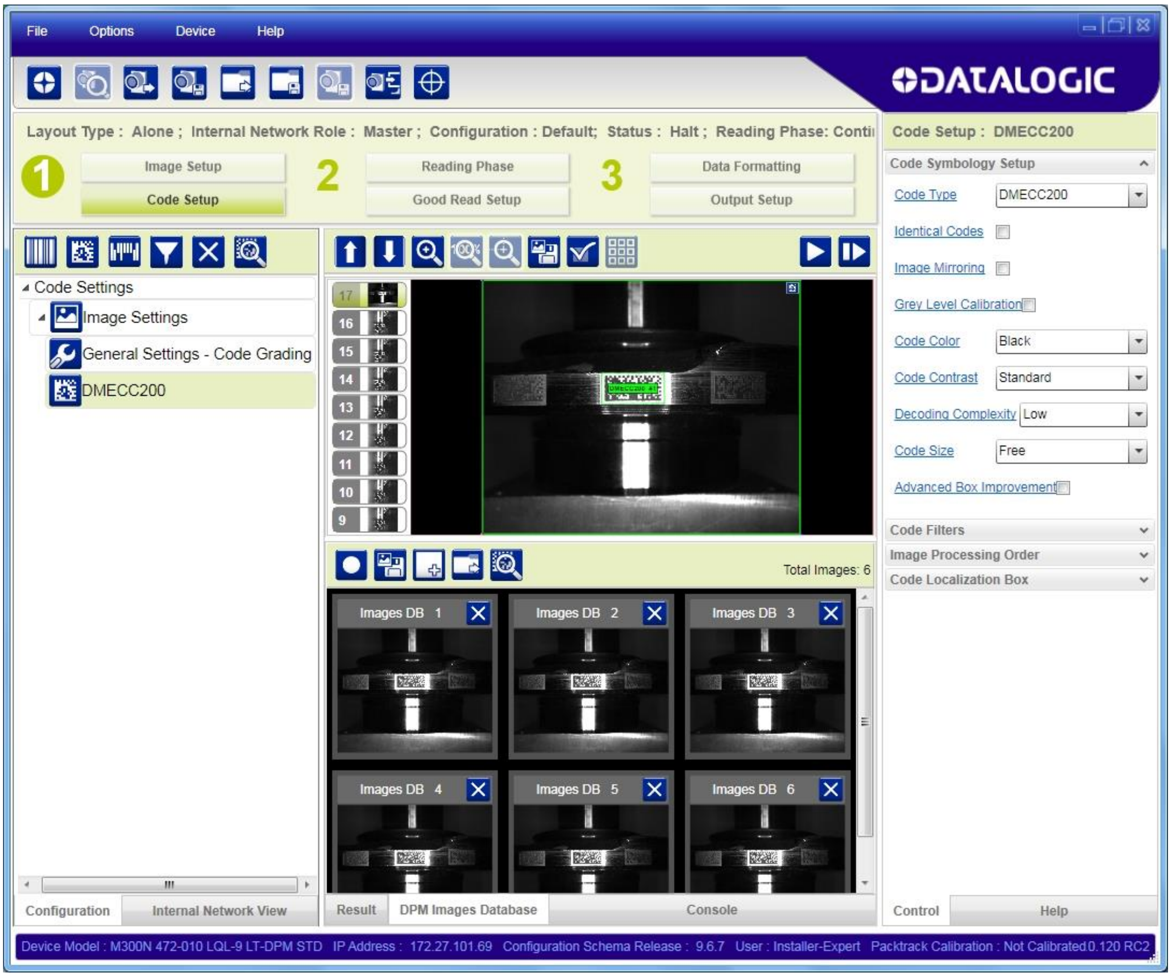
Datamatrix DPM Autolearn

Autolearn Completed
Number of Codes Found: 1
Number of Filters: 0

○ Add to Current Configuration
● Replace Current Configuration
○ Discard Autolearn Result

OK

Accepting the new configuration should show good decoding results in the monitor window.



Layout Type : Alone ; Internal Network Role : Master ; Configuration : Default; Status : Halt ; Reading Phase: Conti

Code Setup : DMECC200

Code Symbology Setup

Code Type	DMECC200
Identical Codes	☐
Image Mirroring	☐
Grey Level Calibration	☐
Code Color	Black
Code Contrast	Standard
Decoding Complexity	Low
Code Size	Free
Advanced Box Improvement	☐

Code Filters

Image Processing Order

Code Localization Box

Device Model : M300N 472-010 LQL-9 LT-DPM STD IP Address : 172.27.101.69 Configuration Schema Release : 9.6.7 User : Installer-Expert Packtrack Calibration : Not Calibrated 0.120 RC2

11.4 DPM MANUAL CONFIGURATION

12 DEVICE ENVIRONMENT SETTINGS

12.1 ACCESSING DEVICE ENVIRONMENT SETTINGS

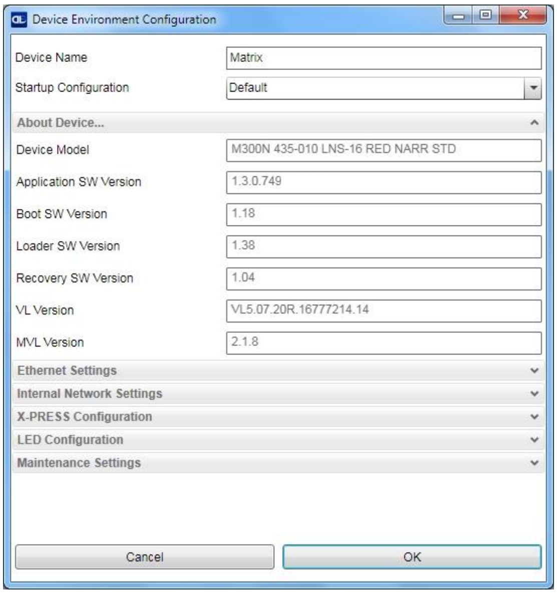
To access the device environment settings obviously the device must be connected to DL.CODE. From the Device>Settings>Settings menu open the Device Environment Configuration window.

This window presents the following fields:

Device Name (default "Matrix") can be personalized by typing a new name in this field.

Startup Configuration which can be changed by selecting a different configuration from the dropdown list (if any).

About Device gives details about the various software components currently loaded and running on this device. This data is important to know for troubleshooting purposes.



Device Environment Configuration

Device Name: Matrix
Startup Configuration: Default

About Device...

Device Model: M300N 435-010 LNS-16 RED NARR STD
Application SW Version: 1.3.0.749
Boot SW Version: 1.18
Loader SW Version: 1.38
Recovery SW Version: 1.04
VL Version: VL5.07.20R.16777214.14
MVL Version: 2.1.8

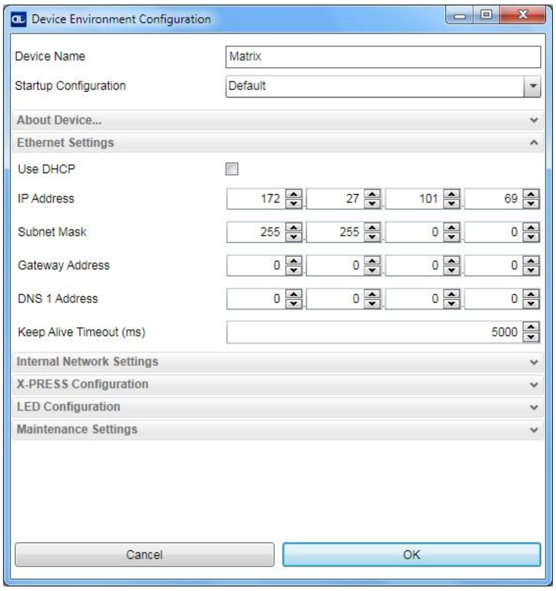
12.2 ETHERNET SETTINGS

This window presents all the Ethernet Settings for correct device connection to the LAN.

It can also be accessed directly by clicking on the wrench icon in the device list area as shown in par. 3.1.

Change the Ethernet Settings (IP Address, Subnet Mask, Gateway Address etc.) according to the network requirements.

The **Keep Alive Timeout** parameter selects the period for which a signal is sent from the device to maintain the Ethernet connection with the DL.CODE UI configuration environment.



Device Environment Configuration

Device Name: Matrix
Startup Configuration: Default

About Device...

Ethernet Settings

Use DHCP: □
IP Address: 172 27 101 69
Subnet Mask: 255 255 0 0
Gateway Address: 0 0 0 0
DNS 1 Address: 0 0 0 0
Keep Alive Timeout (ms): 5000

12.3 INTERNAL NETWORK SETTINGS

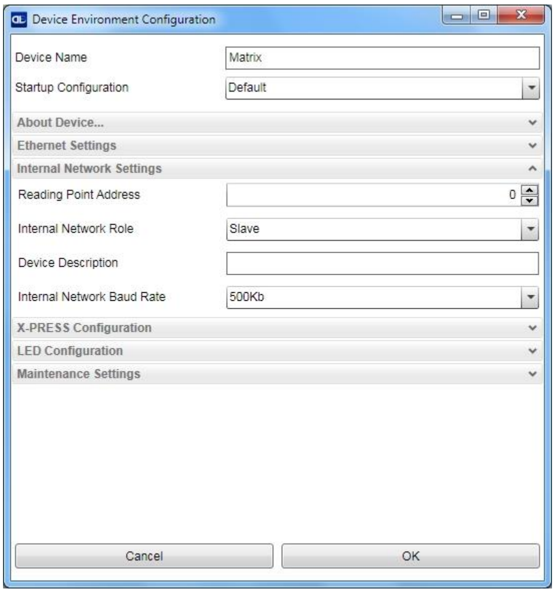
NOTE: All devices are pre-assigned an Internal Network Role independent from their use. If the device is not used in an ID-NET network then this setting can be ignored.

This window allows managing the device role in an ID-NET network (Master or Slave).

A specific description can be typed into the **Device Description** field to distinguish this device from others in the network (i.e. a name to indicate the device position in the network).

The ID-NET Baud Rate is selected here and must be common to all devices in the network.

See the device Reference Manual for details on ID-NET network configuration.



Device Name: Matrix
Startup Configuration: Default

Reading Point Address: 0
Internal Network Role: Slave
Device Description:
Internal Network Baud Rate: 500Kb

12.4 X-PRESS CONFIGURATION

This window allows managing the HMI X-PRESS™ behaviour. See the device Reference Manual for more details on the X-PRESS features.

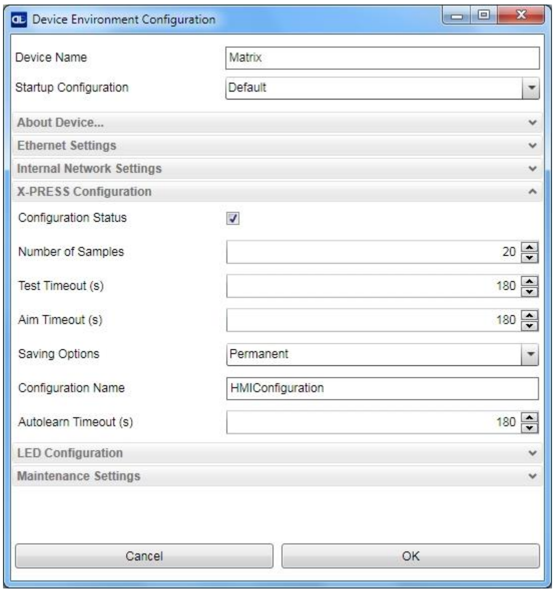
Configuration Status enables/disables the X-PRESS features available through the multifunction key on the device.

Number of Samples selects the number of samples to analyze for the Test percentage.

Test Timeout sets when the expired timeout causes the Test feature to exit.

Aim Timeout sets when the expired timeout causes the Aim/Autofocus feature to exit.

Saving Options selects whether the X-PRESS Setup and Learn features will save their results to Permanent or Temporary memory. If set to Permanent memory, the configuration will be saved as the default configuration in the job list having the Configuration Name.



Device Name: Matrix
Startup Configuration: Default

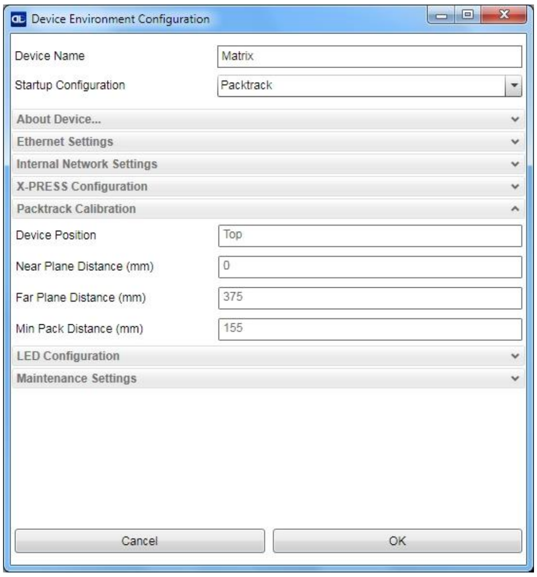
Configuration Status: ☑
Number of Samples: 20
Test Timeout (s): 180
Aim Timeout (s): 180
Saving Options: Permanent
Configuration Name: HMIConfiguration
Autolearn Timeout (s): 180

Configuration Name is the name given to the configuration saved to permanent memory by the X-PRESS Setup and Learn procedures.

Autolearn Timeout sets when the expired timeout causes the Learn feature to exit.

12.5 PACKTRACK CALIBRATION

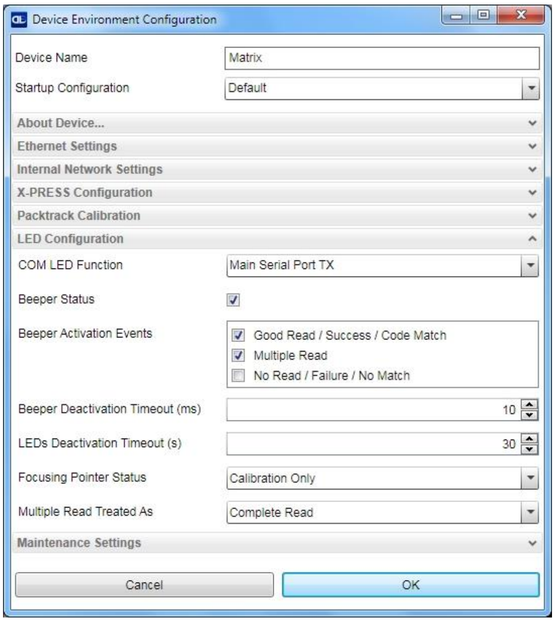
This window shows the PackTrack Calibration parameter settings (read-only) for the device.



Device Name: Matrix
Startup Configuration: Packtrack
Device Position: Top
Near Plane Distance (mm): 0
Far Plane Distance (mm): 375
Min Pack Distance (mm): 155

12.6 LED CONFIGURATION

This window manages the device LEDs and Beeper behaviour.



Device Name: Matrix
Startup Configuration: Default
COM LED Function: Main Serial Port TX
Beeper Status: ☑
Beeper Activation Events: ☑ Good Read / Success / Code Match ☑ Multiple Read □ No Read / Failure / No Match
Beeper Deactivation Timeout (ms): 10
LEDs Deactivation Timeout (s): 30
Focusing Pointer Status: Calibration Only
Multiple Read Treated As: Complete Read

COM LED Function selects whether the COM LED on the device (which signals activity on the Main Serial port) is ON when data is transmitted by the device (TX) or received from the Host (RX).

Beeper Status enables/disables the device beeper.

Beeper Activation Events selects which events will trigger the beeper.

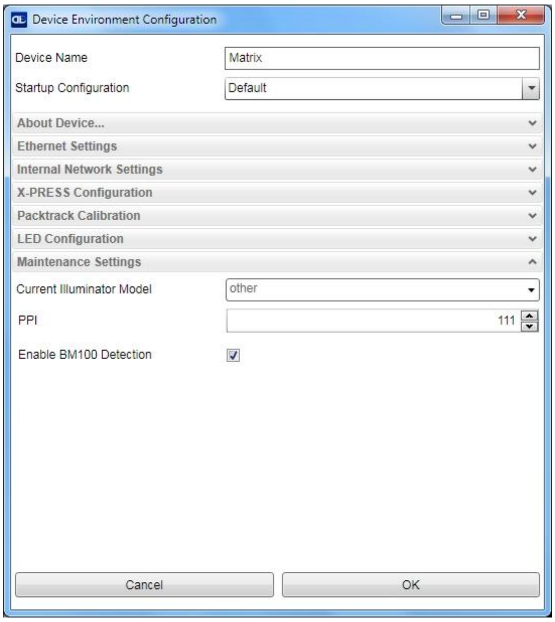
Beeper Deactivation Timeout determines the length of the beeper signal.

LEDs Deactivation Timeout determines the length of time the LED signals are ON.

Focusing Pointer Status (for devices with laser pointers) sets the aiming system management: **Disabled** - laser pointers always OFF; **Always On** - laser pointers always ON; **Calibration Only** - laser pointers only ON during calibration procedures.

Multiple Read Treated As determines which device LED will be activated on a Multiple Read event: **Complete Read** – the Good Read LED will be activated; **No Read** – the Status LED will be activated.

12.7 MAINTENANCE SETTINGS



Device Environment Configuration

Device Name: Matrix

Startup Configuration: Default

Current Illuminator Model: other

PPI: 111

Enable BM100 Detection: ☑

Current Illuminator Model shows the internal illuminator model associated with this device.

If the device is not correctly associated with its internal illuminator incorrect functioning and/or damage can occur. For Matrix 410N devices see the following Illuminator Management procedure.

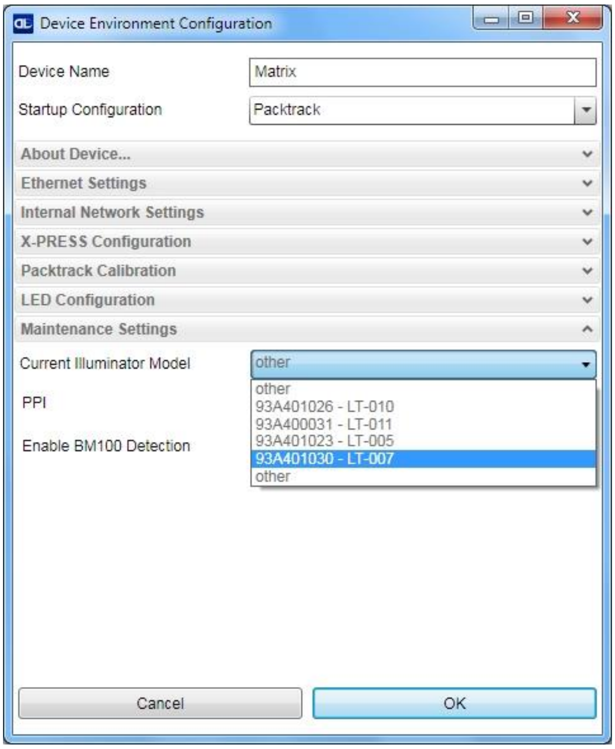
PPI is the same value saved in the Image Setup **Acquire PPI** image density setting procedure. Here it can be set manually although it is advised to use the Acquire PPI procedure.

Enable BM100 Detection if enabled, at startup, the reader sends a message to recognize the presence of, and communicate with, the External Backup Memory (BM100 Backup Module or integrated QLM-Series accessories). If using the Backup Memory, this parameter must be enabled.

DL.CODE Illuminator Management Procedure for Matrix 410N

1. In the DL.CODE Maintenance Settings > Current Illuminator Model item, select the correct Illuminator being used from the dropdown list.
2. Click OK and at the device reset prompt click Yes and wait until the device resets. You can confirm by reopening this item from the same menu.

The above procedure must also be performed before any attempt to use the X-PRESS configuration on readers mounting the LT-005, LT-007, LT-010 or LT-011 illuminators.



Device Environment Configuration

Device Name: Matrix

Startup Configuration: Packtrack

Current Illuminator Model: other

13 MAINTENANCE

As with nearly all electronic components, performance may drift over time making it necessary to calibrate the device at periodic intervals for optimal reading performance. There is a Recalibration Tool provided in DL.CODE which performs the recalibration procedure. If it ever becomes necessary to perform this procedure, contact our Technical Support team for assistance.

This procedure is intended to be performed by trained technicians and not performed frequently (i.e. only after several years of operation and only if the focus level adversely affects decoding).

14 TROUBLESHOOTING

Problem	Solution
Device is not displayed in the Device Selection Area	In order to be found by DL.CODE, Online devices must be powered on and connected to the Local Area Network; if you don't see the desired device within this list, please verify its connections to the LAN and assure it is powered on; then click on the Discovery icon to run a new device search.
Cannot Configure the Device (parameters and icons appear in grey)	The device is in run mode. Click on the Pause button ⏸ to exit run mode.
The User is not able to download images	the FTP Username and FTP Password must be the same as the ones defined in the FTP Client.
Some Images are missing	Image availability depends heavily on the number of images transferred and the rate of transfer, (system throughput and network bandwidth). Since Image downloading is usually based on specific criteria (i.e. No Read or Multiple Read conditions) the FTP Server is adequate to handle most applications. In extreme cases where a high throughput application requires all images to be downloaded it is possible that some images may not be available on the reader having been overwritten in the device's circular buffer. See an example in the figure below.

DATALOGIC

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