M830/M930

PRODUCT REFERENCE GUIDE

2D Camera

DATALOGIC

Datalogic S.r.l.
Via S. Vitalino, 13
40012 Calderara di Reno (BO)
Italy
Tel. +39 051 3147011
Fax +39 051 3147205

Disclaimer

Datalogic has taken reasonable measures to provide information in this manual that is complete and accurate, however, Datalogic shall not be liable for technical or editorial errors or omissions contained herein, nor for incidental or consequential damages resulting from the use of this material. Datalogic reserves the right to change any specification at any time without prior notice.

Trademarks

Datalogic and the Datalogic logo are registered trademarks of Datalogic S.p.A. in many countries, including the U.S.A. and the E.U.

M830 / 930 Camera is a trademark of Datalogic S.p.A. and/or its affiliates. All other trademarks and brands are property of their respective owners.

Patents

See www.patents.datalogic.com for patent list.

This product is covered by one or more of the following patents:

Utility patents: EP2212827B1, EP2517148B1, EP2649555B1, EP2795534B1, EP3074915B1, EP3098757B1, EP3462372B1, EP3693790B1, IT1404187, JP5947819B2, US10161742, US10229301, US10540532, US10699091, US10754123, US10762405, US10817693, US7433590, US8360318, US8888003, US8915443, US9230142, US9349047, US9430689, US9589165, US9785817, US9798948, US9870498, ZL200980163411.X, ZL201080071124.9, ZL201280010789.8

TABLE OF CONTENTS

PREFACE VII
- **About this Manual ..... vii**
- **Manual Conventions ..... vii**
- **Technical Support ..... viii**
  - Technical Support Through The Website viii
- **Reference Documentation ..... viii**
- **Warranty ..... viii**
- **M830/930 Camera End User License Agreement ..... ix**
- **Compliance ..... ix**
  - Laser Safety ix
  - Electrical Safety ix
  - LED Safety ix
  - European Declaration of Conformity ix
  - UKCA Declaration of Conformity ix
  - EAC Compliance ix
    - Customs Union: ix
  - FCC Compliance x
  - CSA Listing x
  - CE Compliance x
- **Marking and Marking Locations ..... xi**
  - Serial Label/Mac Label and Laser/LED Safety xi
  - IEC Label and FCC Label xi
- **Handling ..... xii**

CHAPTER 1. INTRODUCTION 1
- **About the Camera 1**
  - M830/M930 Key Features 2
- **General View 3**
- **M830/M930 Dimensions 4**
- **Reading Station Overview 5**
- **M830 / 930 Camera Models 6**
- **M830/930 Connector Panel and LED Functionality 7**
- **X-Press Configuration 9**
- **SD Card Slot 10**
- **Focusing Devices 11**
  - Range Sensor 11
  - LCC-75xx Kit with DS2 Light Array 12
  - DK-503 Distance Sensor 13
  - DM3610 Dimensioner 14
- **Accessories 15**
  - Industrial Connection Boxes 15
  - Encoder (Tachometer) 16
  - Photoelectric Sensor 17
  - Ethernet Connection Cable (M12-IP67 to RJ45) 18
  - Ethernet Switch 18
  - Sync-net Connection Cable (M12 male to M12 female) 19
  - I/O Cable (M12-IP67 to CBX) 19
  - Power Supply 20

Controller Key 21

CHAPTER 2. MECHANICAL INSTALLATION 22
Preparing for Mechanical Installation 22
Tools Required 23
Unpacking 23
Installation Sequence 26
Installation 27
Dimensions and Clearances 27
Physical Support Requirements and Vibration Limitations 28
Mounting and Positioning 28
Typical Top Camera Positioning 28
Typical Side Camera Positioning 29
Camera Mounting Options 29
Camera Mounting Sequence 30
Range Sensor Mounting Guidelines 32
Mounting the Range Sensor to the Top Camera 32
Mounting the Range Sensor as a Stand-alone 34
General Mounting Guidelines 36
Mounting Structure Considerations 36
Mounting Structure Examples 37
Single Camera 37
Scanning From the Top 37
Multiple Cameras (Three Cameras) 38
Scanning From the Top and Sides 38
Positioning the M830/930 39
Focusing Device Mounting 39

CHAPTER 3. ELECTRICAL INSTALLATION 40
Preparing for Electrical Installation 40
Connecting a M830 / 930 Camera 41
Typical Matrix 830/930 System Block Diagrams 42
Single Matrix 830/930 42
Five Matrix 830/930 Tunnel 43
Five Matrix 830/930 Tunnel with DM3610 Dimensioner 44
Five Matrix 830/930 Tunnel with High Traffic Image Saving 45
General Electrical Installation Guidelines 46
M830 / 930 Camera Connector Panel 47
Power Connector Pin-Out Table (Custom Power Supply) 48
Link 1 and 2 49
Connecting the Range Sensor 50
Ethernet 50
Selecting the Correct CBX Connection Box for Your Application 51
CBX510 Connection Box 52
Photoelectric Sensor Connections to CBX510 52
Photoelectric Sensor to CBX510 (NPN) 53
Photoelectric Sensor to CBX510 (PNP) 54
AS1 55
Encoder/Tachometer Wiring to CBX510 56
Encoder/Tachometer Wiring for NPN Output to CBX510 56
Encoder/Tachometer Wiring for PNP Output to CBX510 57
Digital Output Configuration from CBX510 58
Unpowered Outputs 58
Powered Outputs 59
Focusing Device Wiring 60
DK503 - S-85 Position Sensor 61
LCC 75XX Light Curtain 62
Wiring from DM3610 CBX to M830/930 CBX 63
CBX100 Connection box 63
Photoelectric Sensor Connections to CBX100 64
Photoelectric Sensor to CBX100 (NPN) 65

Photoelectric Sensor to CBX100 (PNP) 66
AS1 Area Sensor to CBX100 Connections 67
Light Curtain to CBX100 Connections 68
Encoder/Tachometer Wiring to CBX100 69
Encoder/Tachometer Wiring for NPN Output to CBX100 69
Encoder/Tachometer Wiring for PNP Output to CBX100 70
Serial Communication Wiring to CBX100 71
RS232 with No Handshaking 71
RS422FD HOST (Full Duplex) 72
Relay Configuration for CBX100 73
Unpowered Outputs 73
Powered Outputs 74
Grounding 75
Check M830/930 Installation 76

CHAPTER 4. FIRST-TIME STARTUP 77
What You Will Need 77
Review Mounting Drawing and Application Specifications 78
e-Genius Connection 78
Software Update 78

CHAPTER 5. FOCUSING DEVICE SETUP 79
Setting up The Range Sensor 80
Setting Up the DM3610 Dimensioner 82
Preparation 83
Understanding DM3610 Focusing and M830/M930 System Orientation 84
Adjusting DM3610 Left Focus Offset 86
Adjusting Right Focus Offset 88
Adjusting Height Offset 90
Setting Up the DS2 Light Curtain 92
Setting Up the S85 Distance Sensor 93
Setup and Calibration 97

CHAPTER 6. CALIBRATION 100
e-Genius Calibration Presets 100
PackTrack Calibration 102
Operating Mode 102
Device Settings 102
Static Calibration 104
Online Calibration 111
Operating Mode 111
Other Camera Checks 113
Setting the M830/M930 to communicate with Websentinel PLUS 114
Set Up Your Image Destination 114
Set Up the Image Saving Options 116
Define Transport Settings 118

CHAPTER 7. MAINTENANCE 120
Overview 120
Recommended Maintenance Frequency 121
Maintenance Tasks 121
Exterior Cleaning 121
Cleaning the Illumination and Camera Window 122
Cleaning the Range Sensor 123
Cleaning the Tachometer 124
Tighten Mounting Hardware 124
Checking Barcode Reading System Connections 124
Verify Barcode Reader Operation 125
Verify Tachometer Operation 125

CHAPTER 8. TROUBLESHOOTING 126
Error Codes and Resolutions 127
Decoder Errors 127
Bypassing an M830/M930 in an Array (Tunnel) 135
Replacing A M830 / 930 Camera 135
Replacing the Range Sensor 136
Resetting the Camera to Factory Default 137

CHAPTER 9. TECHNICAL FEATURES 138

PREFACE

ABOUT THIS MANUAL

This Product Reference Guide (PRG) is provided for users seeking advanced technical information, including connection, programming, maintenance and specifications. The Quick Reference Guide (QRG) and other publications associated with this product can be downloaded free of charge from the Datalogic website listed on the back cover of this manual.

MANUAL CONVENTIONS

The following conventions are used in this document: This symbols listed below are used in the manual to notify the reader of key issues or procedures that must be observed when using the camera.

NOTE: This symbol draws attention to details or procedures that may be useful in improving, maintaining, or enhancing the performance of the hardware or software being discussed.

WARNING: This symbol identifies a hazard or procedure that, if incorrectly performed, could cause personal injury or result in equipment damage. It is also used to bring the user's attention to details that are considered IMPORTANT.

LASER CAUTION: Symbol to warn of laser beam taking care to avoid exposure to laser beam. May be harmful to the eyes and skin.

LED CAUTION: Possibly hazardous optical radiation emitted from this product. Do not stare at operating lamp. May be harmful to the eyes.

ESD CAUTION: This symbol identifies a procedure that requires you take measures to prevent Electrostatic Discharge (ESD) e.g., use an ESD wrist strap. Circuit boards are most at risk. Please follow ESD procedures.

TECHNICAL SUPPORT

Technical Support Through The Website

Datalogic provides several services as well as technical support through its website. Log on to **www.datalogic.com.**

For quick access, from the home page click on the search icon , and type in the name of the product you're looking for. This allows you access to download Data Sheets, Manuals, Software & Utilities, and Drawings.

Hover over the Support & Service menu for access to Services and Technical Support.

REFERENCE DOCUMENTATION

The documentation related to the M830 / 930 Camera system is listed below:

- Range Sensor Quick Start Guide
- M830/M930 Quick Reference Guide

WARRANTY

Datalogic warrants that the Products shall be free from defects in materials and workmanship under normal and proper use during the Warranty Period. Products are sold on the basis of specifications applicable at the time of manufacture and Datalogic has no obligation to modify or update Products once sold. The Warranty Period shall be **two years** from the date of shipment by Datalogic, unless otherwise agreed in an applicable writing by Datalogic.

Datalogic will not be liable under the warranty if the Product has been exposed or subjected to any: (1) maintenance, repair, installation, handling, packaging, transportation, storage, operation or use that is improper or otherwise not in compliance with Datalogic's instruction; (2) Product alteration, modification or repair by anyone other than Datalogic or those specifically authorized by Datalogic; (3) accident, contamination, foreign object damage, abuse, neglect or negligence after shipment to Buyer; (4) damage caused by failure of a Datalogic-supplied product not under warranty or by any hardware or software not supplied by Datalogic; (5)any device on which the warranty void seal has been altered, tampered with, or is missing; (6) any defect or damage caused by natural or man-made disaster such as but not limited to fire, water damage, floods, other natural disasters, vandalism or abusive events that would cause internal and external component damage or destruction of the whole unit, consumable items; (7) use of counterfeit or replacement parts that are neither manufactured nor approved by Datalogic for use in Datalogic-manufactured Products; (8) any damage or malfunctioning caused by non-restoring action as for example firmware or software upgrades, software or hardware reconfigurations etc.; (9) loss of data; (10) any consumable or equivalent (e.g. cables, power supply, batteries, etc.); or (11) any device on which the serial number is missing or not recognizable.

THE DATALOGIC WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE. DATALOGIC SHALL NOT BE LIABLE FOR ANY DAMAGES SUSTAINED BY BUYER ARISING FROM DELAYS IN THE REPLACEMENT OR REPAIR OF PRODUCTS UNDER THE ABOVE. THE REMEDY SET FORTH IN THE WARRANTY STATEMENT IS THE BUYER'S SOLE AND EXCLUSIVE REMEDY FOR WARRANTY CLAIMS. NO EXTENSION OF THIS WARRANTY WILL BE BINDING UPON DATALOGIC UNLESS SET FORTH IN WRITING AND SIGNED BY DATALOGIC'S AUTHORIZED REPRESENTATIVE. DATALOGIC'S LIABILITY FOR DAMAGES ON ACCOUNT OF A CLAIMED DEFECT IN ANY PRODUCT DELIVERED BY DATALOGIC SHALL IN NO EVENT EXCEED THE PURCHASE PRICE OF THE PRODUCT ON WHICH THE CLAIM IS BASED. DATALOGIC SHALL NOT BE LIABLE FOR DAMAGES RELATING TO ANY INSTRUMENT, EQUIPMENT, OR APPARATUS WITH WHICH THE PRODUCT SOLD UNDER THIS AGREEMENT IS USED. Further details on warranty coverage, rights and conditions are addressed under and regulated by the Terms and Conditions of Sales of Datalogic available at https://www.datalogic.com/terms_conditions_sales.

M830/930 CAMERA END USER LICENSE AGREEMENT

COMPLIANCE

Laser Safety

This product conforms to the applicable requirements of IEC60825-1 (Ed. 3). and complies with 21 CFR 10 except for deviations pursuant to laser notice N° 56, date January 19, 2018. This product is classified as a Class 2 laser product according to IEC 60825-1:2014, EN 60825-1:2014+A11:2021.

Electrical Safety

This product conforms to the applicable requirements contained in the Standard for electrical safety EN IEC 62368-1 at the date of manufacture.

LED Safety

The illuminator is classified LED Risk Group 2 at a distance of 20 cm as per IEC 62417/EN 62471 standard.

European Declaration of Conformity

Hereby, Datalogic S.r.l. declares that the full text of the European Declaration of Conformity is available at: www.datalogic.com. Select the link from the downloads section of the product page.

UKCA Declaration of Conformity

Hereby, Datalogic S.r.l. declares that the full text of the UKCA Declaration of Conformity is available at: www.datalogic.com. Select the link from the downloads section of the product page.

EAC Compliance

Customs Union:

The CU Conformity certification has been achieved; this allows the Product to bear the Eurasian Mark of conformity.

FCC Compliance

Modifications or changes to this equipment without the expressed written approval of Datalogic could void the authority to use the equipment.

This device complies with PART 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference which may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

CSA Listing

CSA Listed designations mean a product has been tested and certified by CSA International to meet specific standards, primarily for safety and performance, in the North American market. This certification indicates that the product is safe for use and meets the requirements of relevant standards, including those set by the American National Standards Institute (ANSI), Underwriters Laboratories (UL), and NSF International.

CE Compliance

CE marking states the compliance of the product with essential requirements listed in the applicable European directive. Since the directives and applicable standards are subject to continuous updates, and since Datalogic promptly adopts these updates, therefore the EU declaration of conformity is a living document. The EU declaration of conformity is available for competent authorities and customers through Datalogic commercial reference contacts. Since April 20th, 2016 the main European directives applicable to Datalogic products require inclusion of an adequate analysis and assessment of the risk(s). This evaluation was carried out in relation to the applicable points of the standards listed in the Declaration of Conformity. Datalogic products are mainly designed for integration purposes into more complex systems. For this reason it is under the responsibility of the system integrator to do a new risk assessment regarding the final installation.

WARNING: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

MARKING AND MARKING LOCATIONS

NOTE: Sample labels are shown here only to illustrate their location. Please view the labels on your product for actual details.

Serial Label/Mac Label and Laser/LED Safety

IEC Label and FCC Label

HANDLING

The M830/930 is designed to be used in an industrial environment and is built to withstand vibration and shock when correctly installed. However, it is also a precision product and must be handled correctly before and during installation to avoid damage.

Do not drop the reader!

Do not fine tune positioning of the reader by striking it or its mounting bracket!

Do not weld the reader into position, which can cause electrostatic, heat or reading window damage!

Do not spray paint near the reader which can cause damage to the lens and illumination window!

NOTES

CHAPTER 1
INTRODUCTION

ABOUT THE CAMERA

The Matrix 830/930 is a high performance camera with an integrated image processing system dedicated to automatic code identification on moving parcels. Several readers may be clustered together to permit extended reading areas for single-side and multi-side applications. Captured images are stored on-board and optionally transferred to external supports through integrated Ethernet connectivity. Rugged metal construction, IP65 enclosure rating and operative temperature up to 50°C guarantee a long life cycle even in harsh industrial environments.

The benefits of the M830/930 Camera are many; no mirrors required, factory presets and high throughput. It is a lean 1D and 2D imager which covers one meter wide belts at maximum throughput. This all makes the device easy to install and support and the perfect camera to cover high end logistics.

It can be used with WebSentinel PLUS Investigator which provides no read classification and bar code grading for barcodes read during normal operations. No Read classification post processes saved images of No Reads, and sorts these items into categories to help determine No Read root causes. Bar code grading is helps estimate trends in printing quality and determines decreasing quality before labels can become no reads.

This chapter introduces the basic concepts necessary for camera installation and setup.

M830/M930 Key Features

The Matrix 830/930 has been developed for Automated Parcel Sorting.

Excellent Performance

- Adjustable focus through C-Mount lenses
- Powerful Illumination Lighting Systems
- Outstanding decoding capability on 1D, 2D, Stacked, Postal symbols
- Omni-directional reading
- Frame Rate up to 32 frames/sec
- Image Cropping for higher frame rate
- Up to 100 readable codes in a single frame

Ease of Setup

- e-Genius is a web browser based software to configure the reader parameters via PC Ethernet interface
- User-defined database of Image Acquisition Settings (parameter sets)

Ease of Use

- X-PRESS interface LEDs provide operational and performance feedback
- 360 degree feedback ring for immediate Good Read feedback
- Different operating modes to suit various application requirements
- Multi Image Acquisition Settings for higher reader flexibility
- Image saving and storage with buffering capability
- Diagnostic software tools

Flexible Solution

- Complete set of Accessories like connection boxes, cables and photoelectric sensors
- Ethernet Connectivity with TCP/IP socket for reader parameter configuration, data and image transfer, FTP client, etc.
- Three Ethernet connections, Two serial ports
- General purpose opt-coupled I/Os

Industrial Strength

- Industrial compact 2D reader
- Rugged full metal construction
- Sealed circular connectors
- IP65 protection class
- 50 °C max operating temperature
- Supply voltage ranges 24 VDC Nominal, +/-10%
- No cooling fans needed

GENERAL VIEW

Figure 1 - Camera Front View

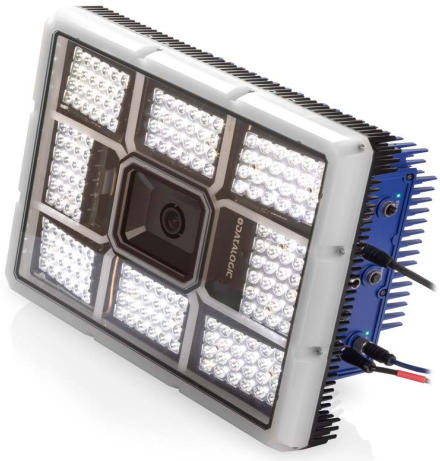
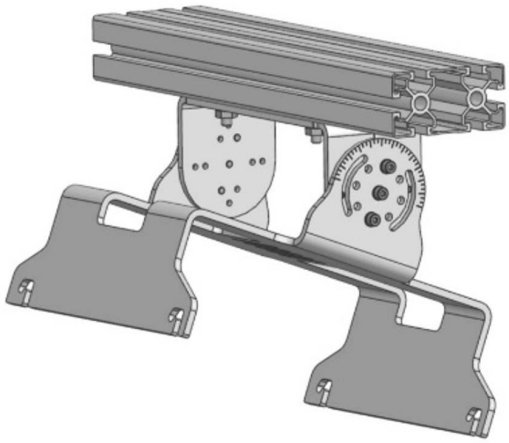
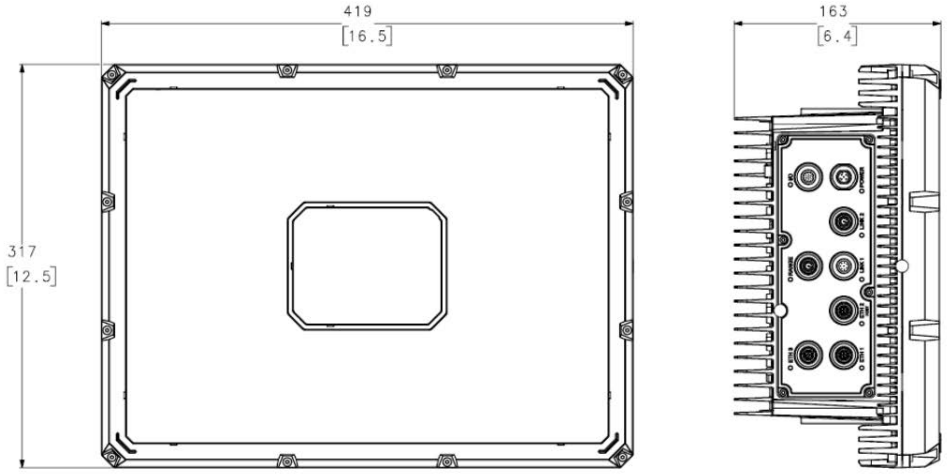


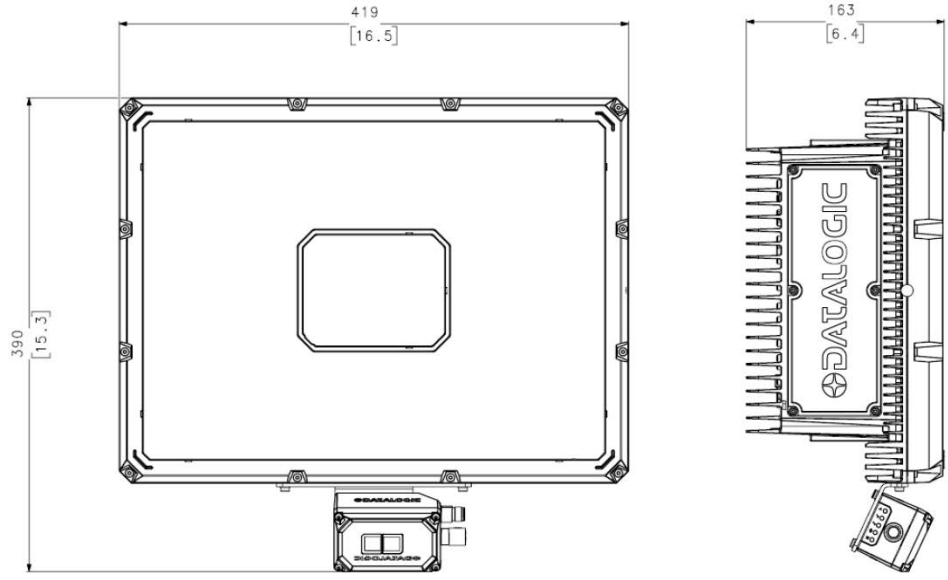
Figure 2 - Camera Back View with Mounting Bracket

Figure 3 - Mounting Bracket



M830/M930 DIMENSIONS





READING STATION OVERVIEW

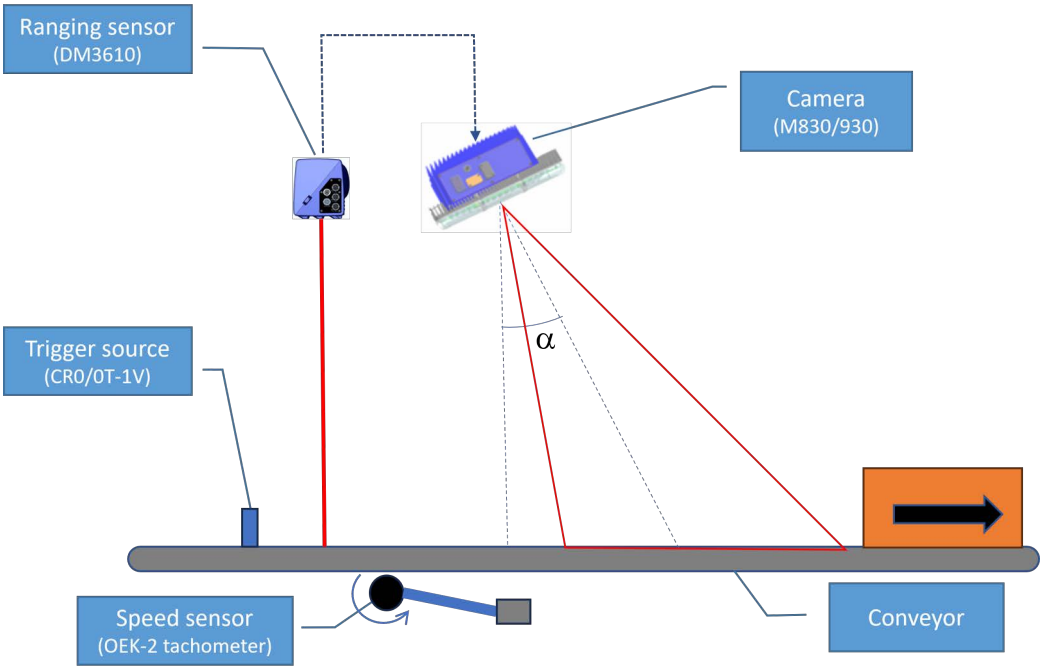
The Matrix 830/930 is a smart camera developed for Automated Parcel Sorting.

The device integrates the following main components:

- A **lighting system** for illuminating the acquisition scene.
- A **camera system** to acquire images of the parcels (autofocus lens, image sensor, frame grabber etc.)
- An **image processing system** to locate and decode optical codes, extract different types of features (e.g. the presence of hazardous material icons) and/or store images on a remote image server.

Most reading system applications use a network of multiple Matrix 830/930 to capture the parcel images from different sides and angles.

An array of one or more cameras working on the same conveyor and collecting information on each parcel is commonly referred as a *reading station* or *tunnel*.



A tunnel uses several kinds of additional sensors:

- **Speed Sensor**: each camera of the tunnel must know the speed of the objects being acquired. The speed sensor is usually an encoder/tachometer connected to the belt. In few applications, the speed sensor may be simulated by the system.
- **Position Sensor** (or Ranging Sensor): detects the position of the parcel on the conveyor (height and/or distance from borders) to allow the cameras to perfectly focus on the parcel surface. In applications where the intrinsic depth of field (DOF) of the cameras is sufficiently high, the position sensor is not required.
- **Trigger Source**: each parcel must be uniquely identified by all the cameras within the reading station. For this reason, all the cameras in a reading station share a unique trigger source. The trigger source can be a dedicated photoelectric sensor, the position sensor (e.g. triggering when the measured height exceeds a certain threshold) or a binary signal generated by the sortation system PLC.

All the sensors are connected to a **Controller** camera that interprets the information and distributes it to the **Client** cameras via the internal **SyncNet** network. One and only one camera per tunnel is connected to a CBX-500 and this automatically defines it as the Controller. The Controller also collects the information on each parcel captured by all the cameras and outputs it to the customer host system (e.g. the PLC controlling the sortation system). In some tunnels the Controller is not a camera, but a specialized device (e.g. SC5100).

The start and stop of an acquisition are triggered by a start/stop event generated by the trigger source (position sensor, photo sensor, read now signal).

The acquisition of a parcel doesn't start when the trigger source detects it, but with a delay computed independently by each camera based on:

- its pose (more specifically: its position on the conveyor, its read angle "alpha", its distance from the trigger device)
- its field of view
- the position of the parcel
- the speed of the conveyor

Based on its mounting position, each camera tries to acquire one (reading angle alpha 15°) or two faces of the parcel (alpha +/-45°).

A typical reading station also includes:

- **Power Supply Systems**: a power supply system can be shared between more cameras (e.g. PWR-480B).
- **System controller**: a device specialized in synchronizing the tunnel distributing sensor data, collecting parcel information and implementing many host communication protocols. (e.g. SC5100)
- **Connection Boxes**: passive/active connection boxes allowing a simpler tunnel installation like CBX510 or CBX100.

M830 / 930 CAMERA MODELS

901640003	MATRIX 830	16Mp, 16MM, Range Sensor Included
901640004	MATRIX 830	16Mp, 16MM
901640005	MATRIX 830	16Mp, 25MM

901640007	MATRIX 930	28Mp, 25MM, Range Sensor Included
901640006	MATRIX 930	28Mp, 25MM,
901640011	MATRIX 930	28Mp, 35MM,
901640008	MATRIX 930	28Mp, 25MM, PREMIUM, Range Sensor Included
901640009	MATRIX 930	28Mp, 25MM, PREMIUM
901640010	MATRIX 930	28Mp, 35MM, PREMIUM

M830/930 CONNECTOR PANEL AND LED FUNCTIONALITY

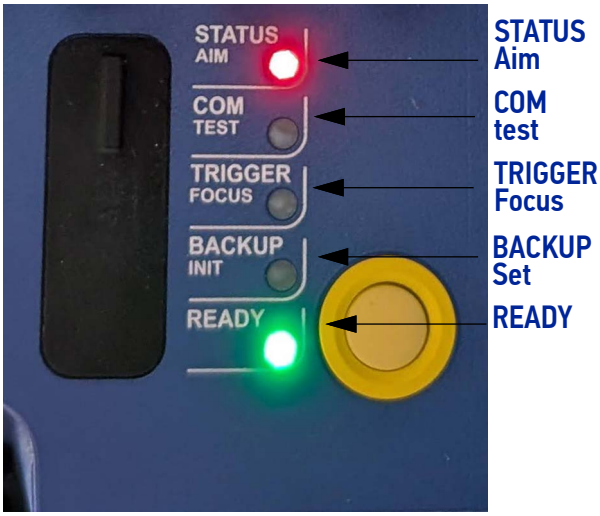
In most applications, the cable connections to the barcode reader will include:

1. **POWER IN** – Main DC power connection for M830 / 930 Camera
2. **RANGE SENSOR** – Provides focus data to the camera. Connect the Range Sensor - typically mounted on the top-back camera - to this port to provide focusing information to the tunnel. This connector provides power supply to the Range Sensor too.
3. **I/O** – CBX connection port for encoder, trigger and other digital I/Os.
4. **ETH 1** – 2.5GB Ethernet port used for low traffic image saving (when a limited number of images are collected via the internal network and transmitted to the image server by a single camera).
5. **ETH 2 HOST** – 1GB Ethernet port used for the communication with the host and for setup.
6. **ETH 3** – 1GB Ethernet port used for high traffic image saving (when each camera is connected to the image server).
7. **LINK 1** – Internal ring network connector
8. **LINK 2** – Internal ring network connector

#	LED	Description
1	POWER	**Solid Blue** – Power LED indicating all internal power supplies are at the correct voltage.
2	RANGE	**Solid Green** – Indicates Range Sensor connected
3	I/O	**Solid Green** – Indicates CBX connected has the ID+ to GND jumper and this camera is the controller for the tunnel. The Tachometer/Encoder must be connected to this unit.
4	ETH 1	**Red** -Network Data activity NOTE: With a Gbit link, Green will always be on and Red will blink, looking like it alternates Green to amber. If connected to 100Mbit network, the LED will only blink Red with activity.
5	ETH 2 HOST	**Red** - Network Data activity NOTE: With a Gbit link, Green will always be on and Red will blink, looking like it alternates Green to amber. If connected to 100Mbit network, the LED will only blink Red with activity.
6	ETH 3	**Red** - Network Data activity NOTE: With a Gbit link, Green will always be on and Red will blink, looking like it alternates Green to amber. If connected to 100Mbit network, the LED will only blink Red with activity.
7	LINK 1	**Red** – SyncNet Data activity NOTE: With a Gbit link, Green will always be on and Red will blink, looking like it alternates Green to amber. If connected to 100Mbit network, the LED will only blink Red with activity.
8	LINK 2	**Red** – SyncNet Data activity NOTE: With a Gbit link, Green will always be on and Red will blink, looking like it alternates Green to amber. If connected to 100Mbit network, the LED will only blink Red with activity.
9	360 degree feedback ring	Programmable feedback function. By default: **Solid blue** – Setup function running **Green flash** - Good read **Red Flash** - No-read

X-PRESS CONFIGURATION

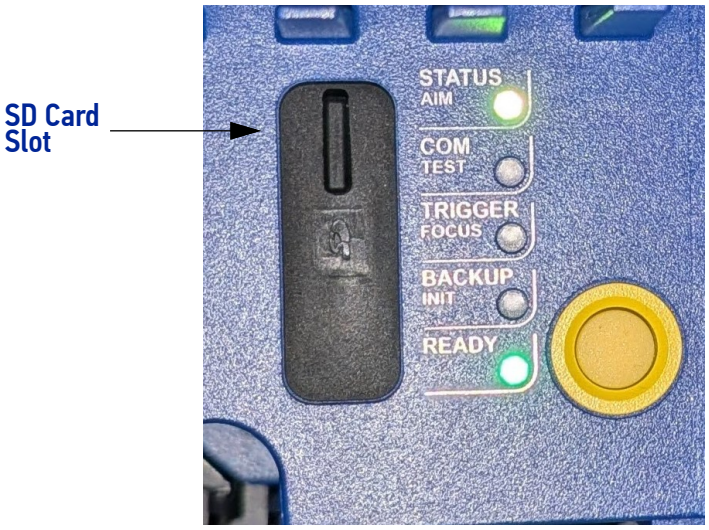
Once the Matrix 830/930 has calibrated image density, you can configure it for optimal code reading relative to your application. This configuration can be performed either through the X-PRESS Interface or the e-Genius configuration program.



LED	RUNTIME BEHAVIOR
STATUS / Aim	Solid Red when an alarm is active. See the Status panel on e-Genius for to get more specific information. Solid Green when no alarm is set
COM / Test	Blinks Yellow when transmitting host messages (serial or Ethernet)
TRIGGER / Focus	Blinks Yellow when the trigger signal state is high
BACKUP / Set	Solid Green when the backup SD is available and contains backup data Off when no backup SD card is available.
READY	Solid Green when the camera is ready to acquire Solid Red when the camera is booting or is in calibration mode.

NOTE: Use the yellow button to reset your camera to Factory Default. See section "Resetting the Camera to Factory Default" on page 137 for further detail.

SD CARD SLOT



Locate the external SD Card slot used for storing the M830/930 software and configuration on the back of the device. The slot supports a standard size SD card.

WARNING: Disconnect power to the M830/930 before removing the SD Card.

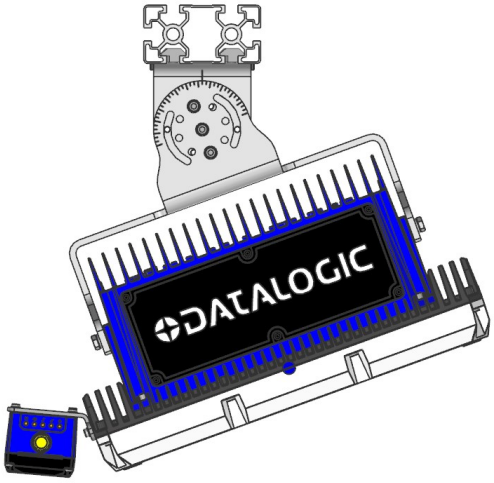
To remove the SD card, push in on the card until a click is heard. The card can then be pulled out. To reinstall, push in on the card until a click is heard.

FOCUSING DEVICES

Range Sensor

The Range Sensor senses the profile of objects on the conveyor allowing the cameras to focus in the correct position. A single Range Sensor mounted on top of the conveyor upstream to the M830/930 cameras provides information to an entire tunnel. Fixing it to the top-back camera using the provided bracket greatly simplifies the mounting and setup. If the minimum parcel height is over 40 mm, the Range Sensor can be used to detect parcels in place of the Photoelectric Sensor.

The Range Sensor is usually sold with one of the cameras, but can be ordered as an accessory.



Range Sensor	
RS100, RANGE SENSOR, MATRIX 830/930	93ACC0453

NOTE: Usually sold with one of the cameras, but can be sold separately.

LCC-75xx Kit with DS2 Light Array

The DS2 Light Array (Light Curtain), part of the LCC-75xx kit, is used to detect the presence of products in top mount applications as they enter the scanning area as well as report the focusing data to the top mounted M830/M930. The AREAscan™ family of the DS2 series covers controlled heights ranging from 150 to 2500 mm, with 5m operating distances for high resolution versions, or 10m for low resolution versions.

Light Curtain Focusing	
LCC-7501 AV7 LIGHT CURTAIN 150 MM+CAB 10M	93ACC0170
LCC-7506 AV7 LIGHT CURTAIN 600 MM+CAB 10M	93ACC0171
LCC-7509 AV7 LIGHT CURTAIN 900 MM+CAB 10M	93ACC0172
LCC-7512 AV7 LIGHT CURTAIN 1200 MM+CAB 10M	93ACC0173

DK-503 Distance Sensor

When a tunnel includes side cameras and a Range Sensor or a DM3610 can't be used, one or two S85 can be used to measure the distance of the parcel from borders and drive the autofocus of the cameras on that border. The DK-503 Distance Kit includes an S85 Class 2 visible red LASER sensor to measure direct proximity from .2 m to 5 m. It includes PNP or NPN, 4-20 mA analog output and RS 485 serial interface.

It comes with:

- Mounting bracket and non-reflective plate
- CVL 2811 Connection cable
- Installation Guide

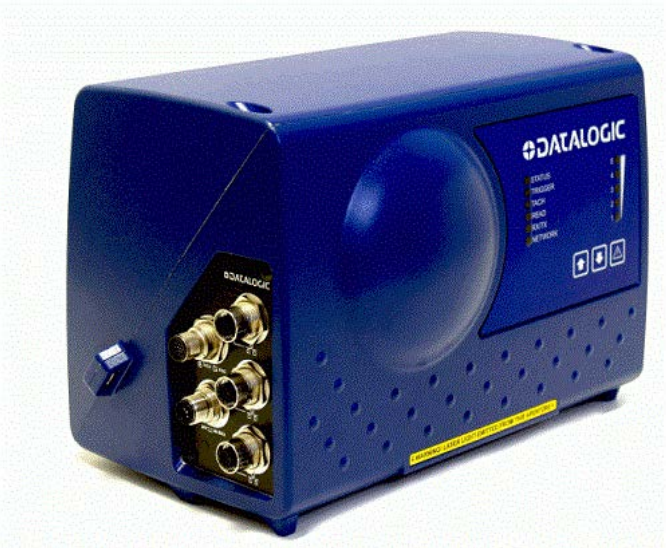
Distance Sensor	
DK-503 DISTANCE KIT RS485 + CABLE 5m	93ACC0263

DM3610 Dimensioner

The DM3610 is used in place of the Range Sensor when the dimensions of the object are requested in addition to focus information.

If the minimum parcel height is over 20 mm, the DM3610 can be used to detect parcels in place of the Photoelectric Sensor.

For complete information about the features and capabilities of the DM3610 Dimensioner, see the dimensioner page on the Datalogic website: www.datalogic.com.



The DM3610 Dimensioner requires the following:

- DM3610
- Power Supply
- Universal Mounting Bracket
- Class 2 EU Adapter (optional)

DM3610	
DM3610-1000 STD NLFT	932702000
DM3610-1100 SING NTEP	932702020
DM3610-1200 SING OIML/MID	932702030
DM3610-1201 SING OIML/MID MOD D	932702031
DM3610-1300 SING MC	932702040

ACCESSORIES

Industrial Connection Boxes

CBX boxes are industrial connection boxes that can be used to connect the barcode readers to an encoder/tachometer, photoelectric sensor, serial devices, relays, or other peripherals.

CBX Connection Box	
CBX100 CONNECTION BOX COMPACT	93A301067
CBX510 CONNECTION BOX MODULAR	93A301087

NOTE: Only CBX510 should be used in a system, If additional I/O is needed CBX100 can be added to other camera systems.

Encoder (Tachometer)

The encoder/Tachometer delivers a train of impulses to the system, which provides feedback on conveyor movement, and it's used to track the package position along the conveyor travel.

Encoder (Tachometer)	
OEK-2 OPTICAL ENCODER (CAB 6m+SPRING)	93ACC1770
OEK-3 OPTICAL ENCODER HI RES,6M CBL+SPRI	93ACC0056
OEK-3 ENCODER HI RES M139,6M CBL +WGT (START/STOP ANTI ROLLBACK)	93ACC0104
OEK-4 ENCODER KIT PNP 250PPR+M12-FREE CABLE	95B082050

Photoelectric Sensor

The Photoelectric Sensor is used in M830/M930 camera systems to detect the presence of an item entering the scanning area.

The photoelectric sensor is used in singulated conveyor systems where the packages are separated by an open space between the trailing edge of one package and the leading edge of the next. In irregular package applications, the photoelectric sensor assists in maintaining the package footprint so that the M830/M930 camera will only scan and provide data for a specific package.

Depending on the application, these devices may need to be configured differently.

While the photoelectric sensor and tachometer work well with belt conveyors, a special configuration is needed for tilt-tray and cross-belt sorter applications.

Photoelectric Sensors	
RETROREFLECTIVE AREA SENSOR	CR0/0T-1V
S62 PNP PHOTOCELL, R3 REFL/BRKT/HDWR KIT	93ACC1895
S62 NPN PHOTOCELL, R3 REFL/BRKT/HDWR KIT	93ACC1894

NOTE: The CR0/0T-1V Area Sensor does not come with a cable. See table below for a list of compatible cables

M12 CONNECTORS, 4 POLES, WITH CABLE	
M12 connector, straight, 4 poles, female, 2m PVC cable	CD12M/0B-020A1
M12 connector, straight, 4 poles, female, 5m PVC cable	CD12M/0B-050A1
M12 connector, straight, 4 poles, female, 10m PVC cable	CD12M/0B-100A1
M12 CONNECTORS, 4 POLES, WITH CABLE	
M12 connector, straight, 4 poles, female, 5m PUR cable	CD12M/0B-050A5
M12 connector, straight, 4 poles, female, 10m PUR cable	CD12M/0B-100A

Ethernet Connection Cable (M12-IP67 to RJ45)

This cable may be connected to the Host or Image port.

Ethernet Connection Cable (M12-IP67 to RJ45)	
CAB-ETH-X-M01 M12-IP67 GETH-X CAB 1M	93A050122
CAB-ETH-X-M03 M12-IP67 GETH-X CAB 3M	93A050123
CAB-ETH-X-M05 M12-IP67 GETH-X CAB 5M	93A050124
CAB-ETH-X-M10 M12-IP67 GETH-X CAB 10M	93A050140

Ethernet Switch

ETH GB SWITCH 8 CH 24Vdc	93ACC1842

Sync-net Connection Cable (M12 male to M12 female)

Sync-net Connection Cable (M12 male to M12 female)	
CABLE M12M TO M12F 0,75M	93A050133
CAB-GE03 M12M TO M12F 3M	93A050079
CAB-GE05 M12M TO M12F 5M	93A050080
CAB-GE10 M12M TO M12F 10M	93A050081

I/O Cable (M12-IP67 to CBX)

I/O Cable (M12-IP67 to CBX)	
CAB-DS03-S M12-IP67 TO CBX 3M	93A050059
CAB-DS05-S M12-IP67 TO CBX 5M	93A050060
CAB-DS10-S M12-IP67 TO CBX 10M	93A051390

Power Supply

Power Supply	
PWR-240B PWR UNIT 110/230VAC 24v, CE	93ACC0264
PWR-480B PWR UNIT 110/230VAC 24v, CE	93ACC0244
PWR-290X3 PWR UNIT 110/230VAC 24v, CE	93ACC0470

Power Cable	
CAB-THOR POWER 3M	93A050169
CAB-THOR POWER 5M	93A050153
CAB-THOR POWER 10M	93A050170

Controller Key

Within a tunnel configuration, one and only one camera is designated as the Controller camera. This camera is typically connected to a CBX-510 unit.

When a CBX-510 is not required, it can be replaced by a Controller Key. The Controller Key is commonly used when a camera needs to be powered on outside of a tunnel.

CONTROLLER KEY, M12	93A200032

CHAPTER 2
MECHANICAL INSTALLATION

NOTE: This product is intended to be installed by Qualified Personnel only.

ESD CAUTION: M830 / 930 Cameras contain electronics that may be affected by electrostatic discharge (ESD). To prevent personal injury or damage to the unit, please follow the safety precautions and warnings found in the References section at the beginning of this manual. Failure to follow these precautions may void your warranty.

WARNING: Disconnect the power supply when installing the device or during maintenance to avoid unintentional exposure to LED light. Avoid starting at the LEDs as one would with any very strong light source, such as the sun. There are no user-serviceable parts inside the reader. Service should only be performed by Datalogic trained and certified technicians.

PREPARING FOR MECHANICAL INSTALLATION

NOTE: Application-specific drawings and documents provided by Datalogic supersede any contradictory content in this manual.

Before mounting any components, please do the following:

- Read all instructions before beginning your installation.
- Define and confirm the accuracy of your application's requirements and structure position, especially the height of the conveyor from the floor.
- Review all installation-specific drawings provided with your equipment.
- Review and plan the mechanical installation of all devices used in your application. Be sure to allow adequate clearance for maintenance.
- Review and plan the power requirements for your application.
- Check the contents of the shipping cartons against the packing list.
- Record all product serial numbers.

NOTE: Refer to the Chapter 3, Electrical Installation **and Reference Documentation for details on connecting your readers to other devices in the system.**

Tools Required

A 13 mm wrench (combination ratcheting wrench recommended) and Philips Screw-driver (#1) + 10 mm wrench (for bracket-camera bolts) + 4 mm Allen key (for mounting the camera bracket) + 3 mm Allen key (for the range sensor) are all the tools needed to assemble and install the M830 / 930 Camera.

UNPACKING

Verify that the Camera and all the parts supplied with the equipment are present and intact when opening the packaging; the list of parts includes:

- Camera
- Mounting Bracket
- 4 bolts and washers
- 4 T-bolts and nuts
- Quick Start Guide
- Test chart and PackTrack Calibration Pattern

NOTE: Be sure to retain shipping boxes and packing material for use if the unit needs to be returned to Datalogic for any reason.

Open the box carefully. Remove all the components from their plastic packaging; check their integrity and compare them with all the packing documents:

1. Remove the top center packaging materials to reveal the scanner.

2. Carefully remove the scanner to reveal the next layer of packaging material.

3. Remove the next layer of packaging to reveal the mounting bracket.

NOTE: Make sure to also remove the bolts and screws included with the product.

INSTALLATION SEQUENCE

NOTE: Everything should be MECHANICALLY INSTALLED before performing any ELECTRICAL INSTALLATION. See Chapter 3, Electrical Installation **for electrical installation details.**

To complete mechanical installation and setup, you must:

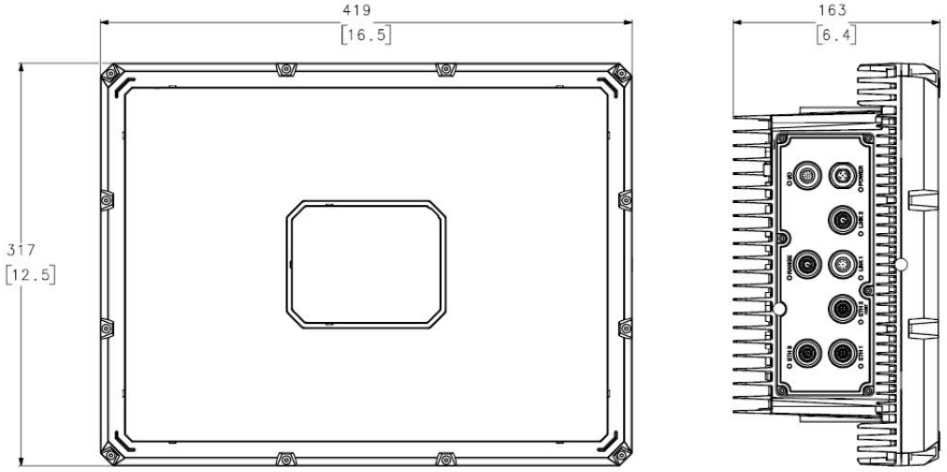
1. Review the details of your application’s requirements.
2. Erect mounting structure or other supporting structures.
3. Determine and mark the Mounting Bracket locations.
4. Mount the cameras as described in "Camera Mounting Sequence" on page 30.
5. Mount the tachometer and other needed sensors (Presence Sensor Photoelectric sensor, Light Curtain, DM3610 Dimensioner, or S85) to the mounting structure and conveyor.
6. Mount the CBX connection box (or the controller) to the mounting structure.
7. Complete electrical installation. (See “Electrical Installation” on page 40.)
8. Align the cameras for proper operation.
9. Configure the cameras (See the E-genius On Line Help).
10. Calibrate the cameras (See “Static Calibration” on page 104.)
11. Check operations.

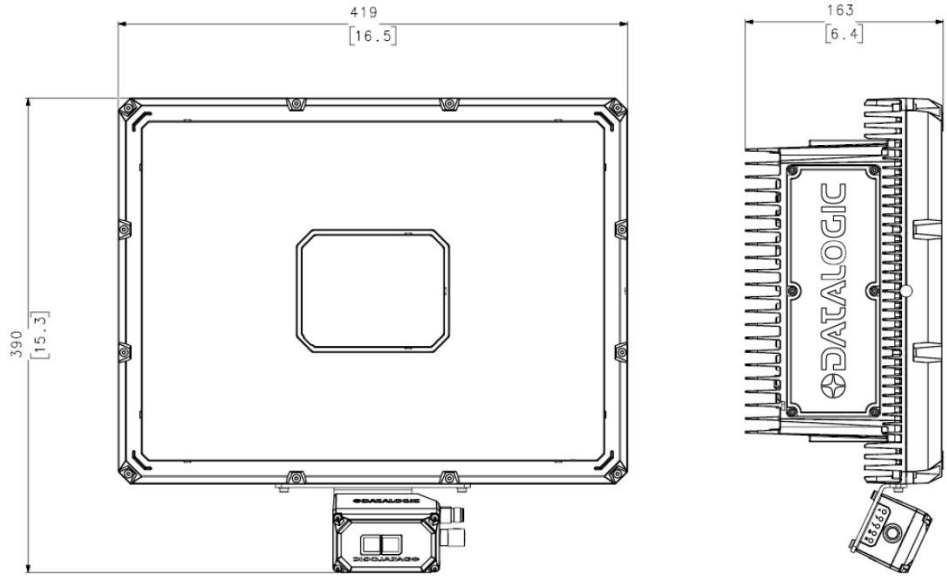
INSTALLATION

Dimensions and Clearances

WARNING: Although the M830/M930 does not require fans, clearances are needed to allow natural air flow.

Mounting the unit with 300 mm [12 in] of clearance (front, top, and sides) is recommended for ease of maintenance.





Physical Support Requirements and Vibration Limitations

For details on the weight of the cameras and vibration limitations, See “Technical Features” on page 138. Multiple-head systems may include further details on the physical support requirements with any application-specific documentation provided.

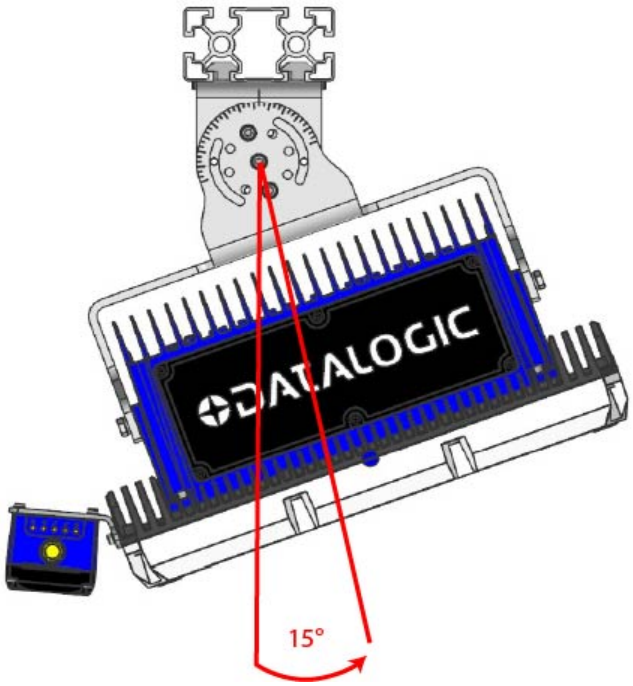
Mounting and Positioning

The M830/M930 system components and in particular the mounting bracket have been designed for installation onto standard Bosch and 80/20 frame profiles (extruded aluminum) and accessories. 45x90 mm profile is recommended for Bosch, although 45x45 and 60x60 mm profiles will work.

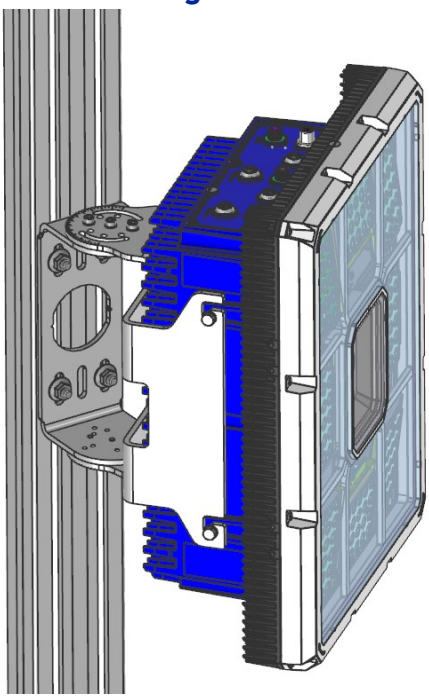
The following illustrations show the various typical mounting positions for the M830/M930 .

NOTE: It is important when mounting the camera that the connector panel is facing away from the conveyor so that the wiring does not interfere with product flow.

Typical Top Camera Positioning



Typical Side Camera Positioning



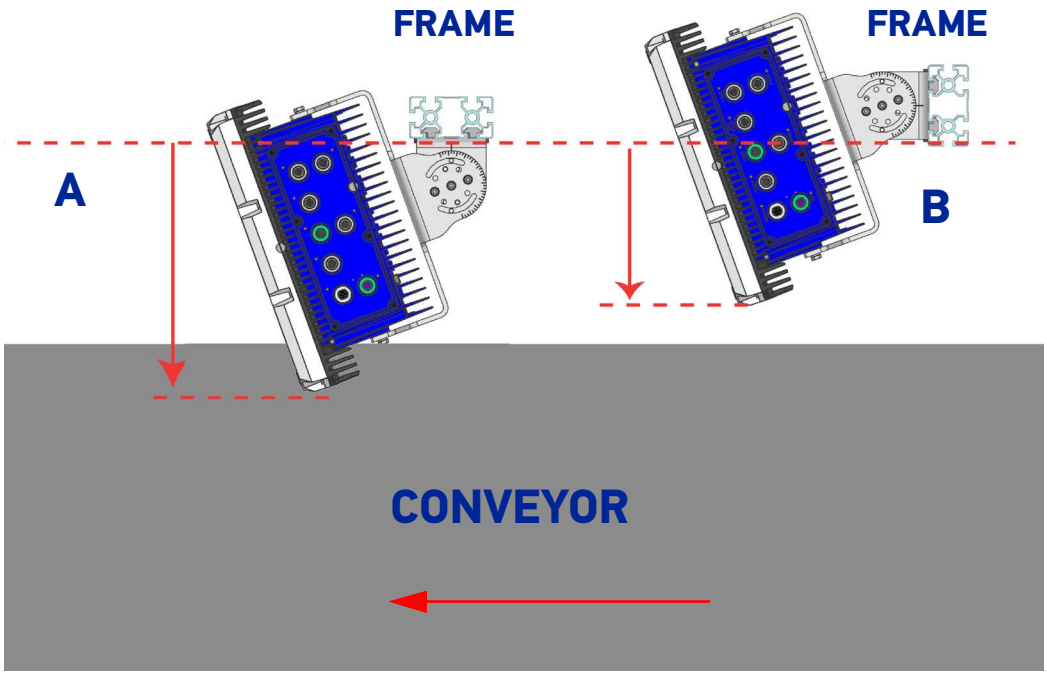
Camera Mounting Options

The diagram below illustrates two possible camera mounting configurations relative to the tunnel frame and the conveyor belt.

Option A : shows the camera mounted on the inner side of the frame. While this configuration is technically correct, it is generally not the preferred solution. Mounting the camera inside the frame typically requires a larger tunnel structure and provides limited mechanical protection, as the camera is suspended within the frame.

Option B : shows the camera mounted on the lateral side of the frame.

This configuration is preferred, as it allows for more compact tunnel dimensions and offers improved protection for the camera. In many applications, lateral mounting enables a more efficient mechanical design of the tunnel.

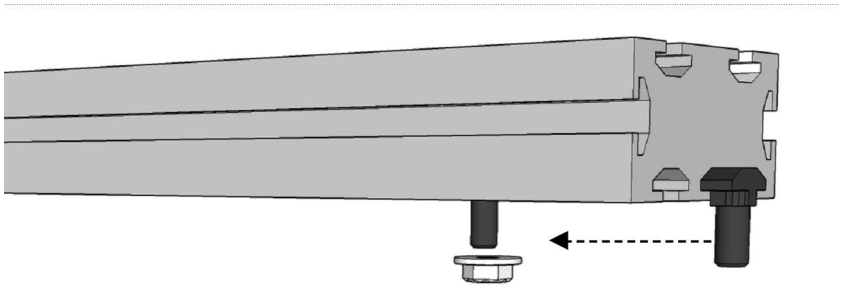


Camera Mounting Sequence

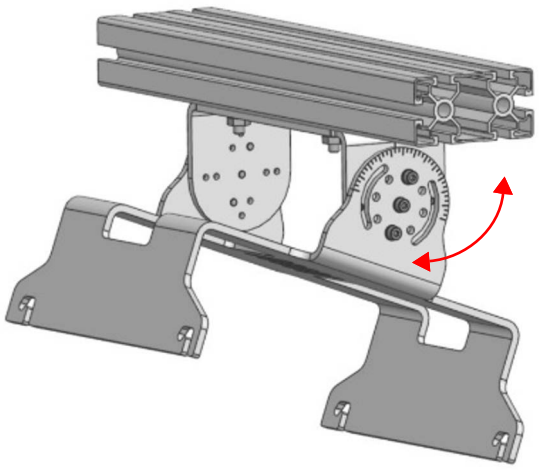
1. The M830/M930 mounting bracket has two parts and comes assembled. It is packaged with your camera.

2. In your mounting kit are the required number of T-bolts and nuts used to attached the mounting bracket to the station frame.

3. Determine where your M830/M930 will go on the structure (according to the measurements specified in your customer specific mounting diagram.) Slide the T-bolts into place,



4. Set the M830/M930 mounting plate in the correct position and tighten the T-bolt nuts. Make sure the bolts holding bracket parts together are loose enough to allow you to rotate the bracket.

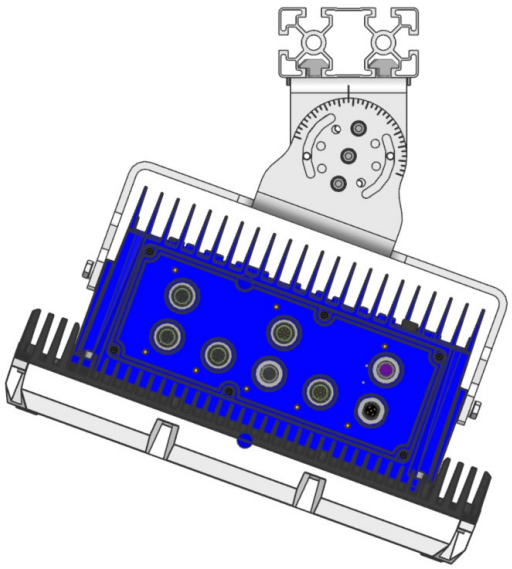


5. Once the brackets are in the correction position (15, 30, 45 or 90 degrees) tighten the bolts.

6. If needed, mount the Range Sensor on the camera (See “Mounting the Range Sensor to the Top Camera” on page 32.)

7. Attach the nuts to the back of the M830/M930.

8. Attach the camera via the four mounting holes by sliding it into place, then tighten the nuts.



Range Sensor Mounting Guidelines

Mount the Range Sensor according to the application drawing and observe the following guidelines:

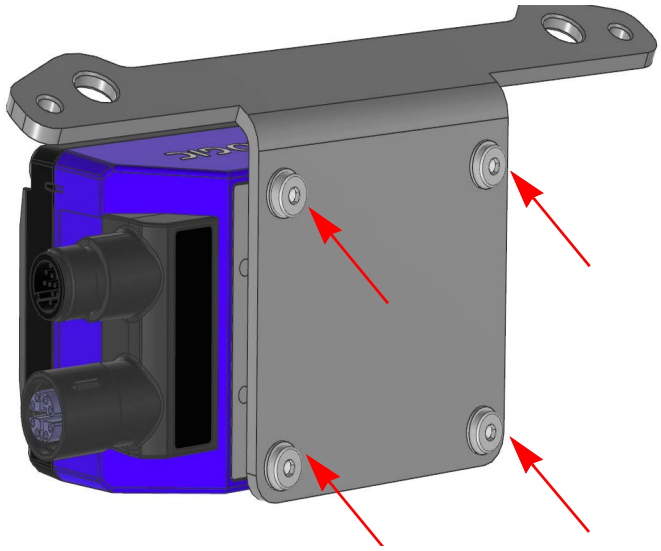
- Install the Range Sensor upstream of the tunnel reading area.
- Position the sensor centered on the conveyor belt.
- Mount the sensor at a distance of up to 2.5 m from the conveyor belt, taking into account a horizontal field of view of 75°.
- Set the sensor with a tilt angle between +30° and -30° relative to the orthogonal axis of the conveyor.
- Ensure a minimum distance between the conveyor orthogonal axis and the nearest camera field of view, calculated as follows:

MinDistance (mm) = 103 (ms) × MaxSpeed (m/s)

Mounting the Range Sensor to the Top Camera

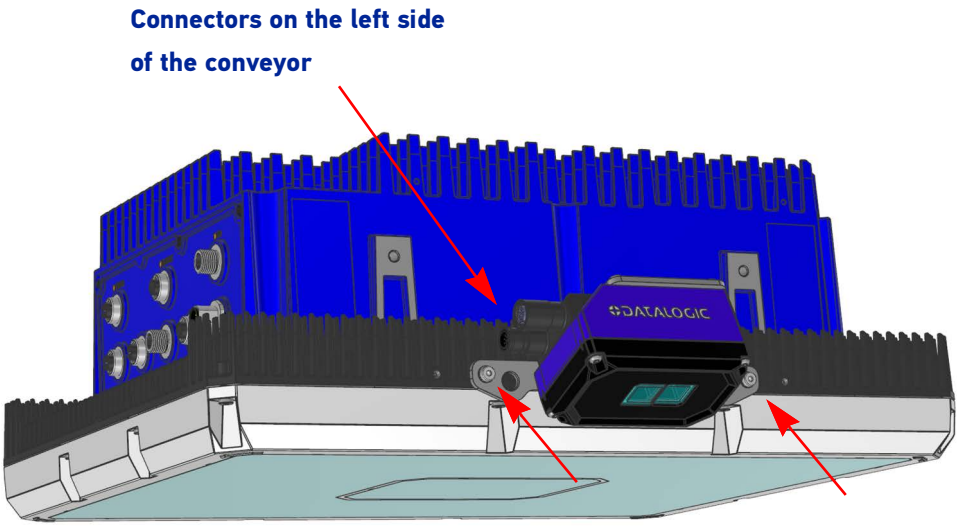
Follow these steps to mount the Range Sensor onto the top back camera:

1. Attach the Bracket to the Range Sensor with four of the provided screws and washers as shown below.

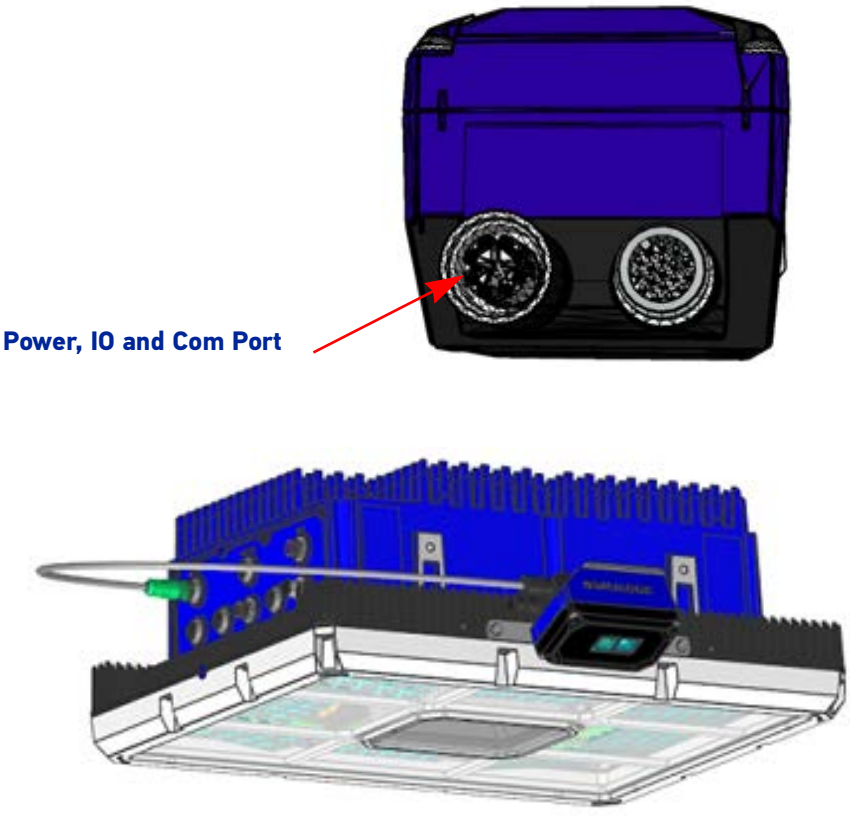


2. Attach Bracket and Range Sensor to the Camera with two of the provided screws and washers as shown below.

NOTE: While the M830/930 camera can be rotated to optimize the cable positioning, the Range Sensor cables must exit on the left side of the conveyor!



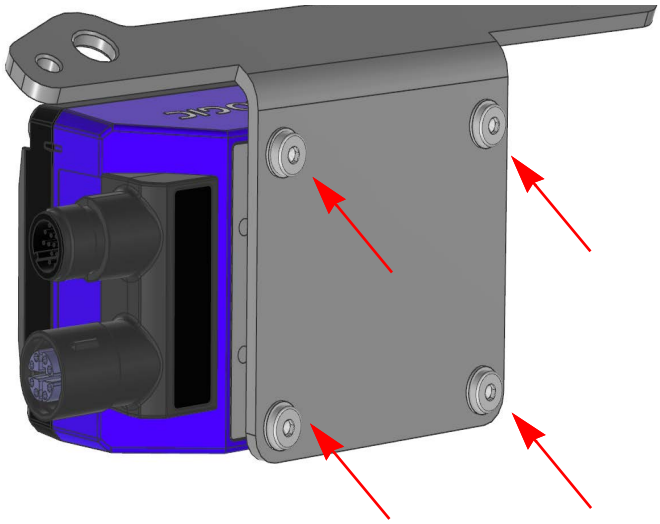
3. Connect the “Power, IO and Com” port of the Range Sensor to the M830/930 “Range” port using the provided cable.



Mounting the Range Sensor as a Stand-alone

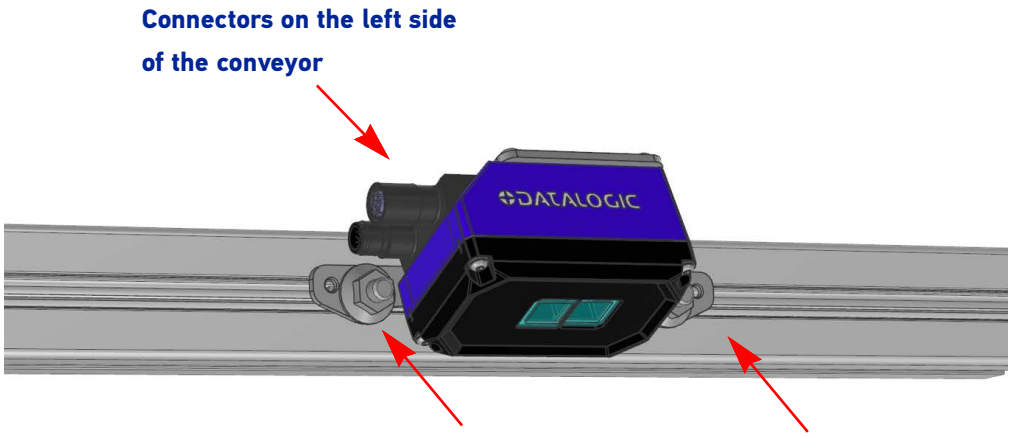
When it is not possible to mount the Range Sensor on the top-back camera, it can be mounted stand-alone:

1. Attach the Bracket to the Range Sensor with four of the provided screws and washers as shown below.

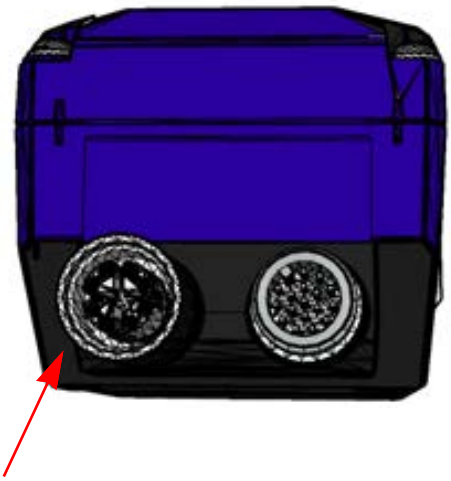


2. Attach the Range Sensor bracket to the Bosh profile in the requested position.

NOTE: Make sure that the Range Sensor cables exit on the left side of the conveyor!



3. Connect the “Power, IO and Com” port of the Range Sensor to the M830/930 “Range” port using the provided cable.



Power, IO and Com Port

General Mounting Guidelines

It is important that you follow these general precautions when installing, setting up, operating, maintaining, troubleshooting, or replacing any Datalogic products, parts or related equipment.

As you plan and install your camera system application, be sure to keep the following guidelines in mind:

- Follow application drawings for structural details and barcode reader placement.
- Determine the proper orientation and position of the barcode reader(s).
- Leave adequate clearances (approximately 300 mm [12 in]) for wiring.
- Route wires carefully to reduce or minimize electrical noise. When power and communication wiring must cross, make their intersection perpendicular. Avoiding sharp wire bends or loops, which can affect performance.
- Proper grounding limits the effects of noise due to Electromagnetic Interference (EMI).

Mounting Structure Considerations

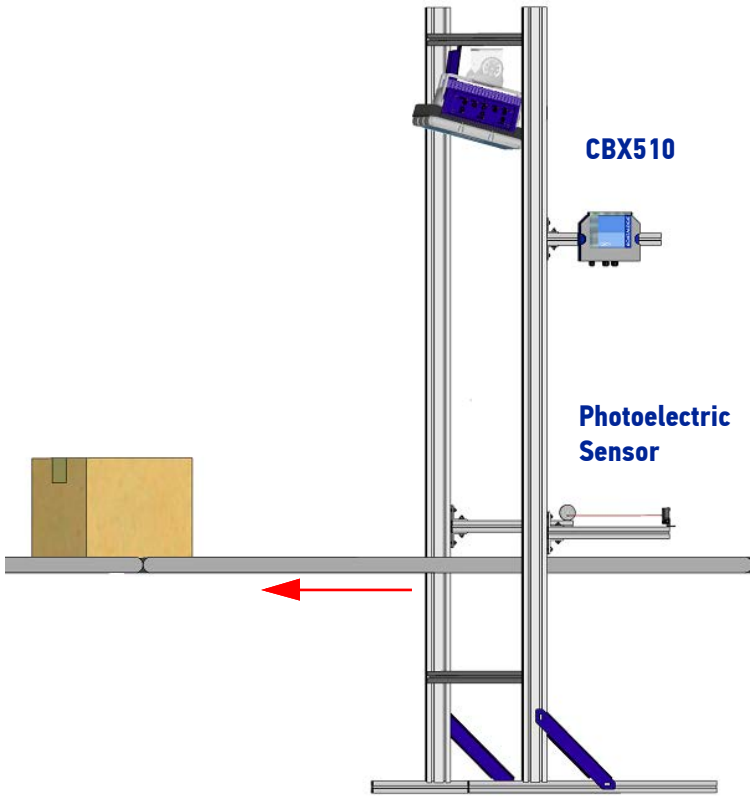
Your first task is to mount your M830 / 930 Camera. You can provide your own mounting structure or Datalogic can design one for you. We recommend using a Datalogic mounting structure for standard applications.

Your mounting structure must provide the following capabilities:

- Position the camera (or the cameras) to cover the necessary field of view, depth of view with the correct resolution.
- Trigger and focusing sensors must be positioned before the reading area of any camera (the actual distance depends on the sensor type and on the maximum conveyor speed)
- It is adjustable enough for you to move your unit to the optimum position for proper scanning.
- It allows a technician access to the barcode reader while it is mounted.
- It must be as vibration free as possible so as not to affect the scanning accuracy.
- It is constructed of steel or aluminum.
- It provides approximately 300 mm [12 in] minimum clearance on all sides. This clearance is necessary to provide proper ventilation, allow access to all panels of the barcode reader, and allow room for proper servicing.

MOUNTING STRUCTURE EXAMPLES

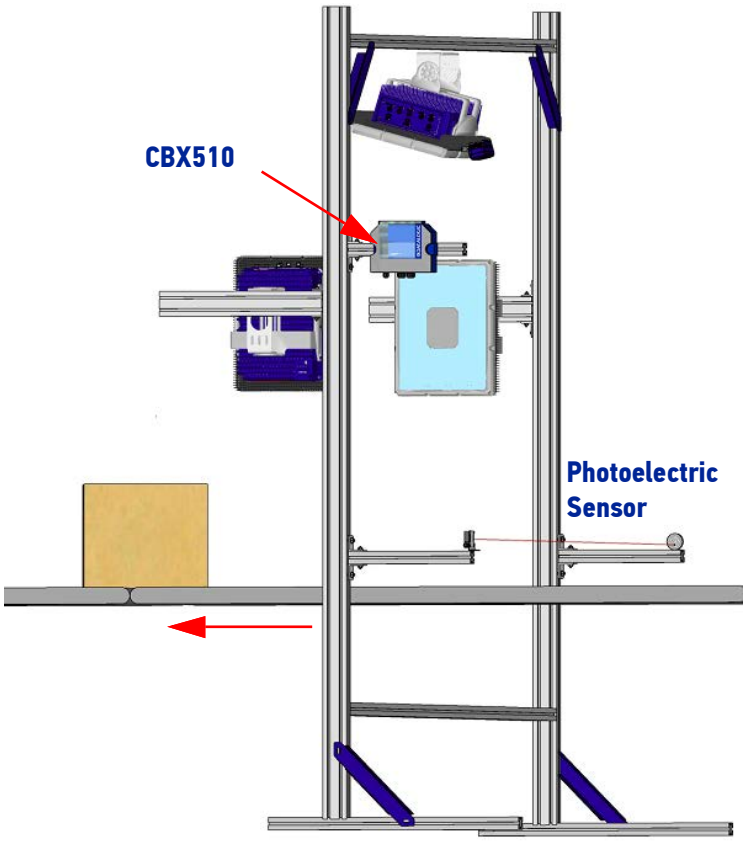
Single Camera



Scanning From the Top

When all the barcodes are on the top side of the parcel you can use a single camera reading from top. The proposed mounting structure has extensible legs and beams to allow different distances between the camera and the conveyor and to allow different conveyor widths. The angle between the camera and a vertical line over the conveyor is usually about 15°. When the Range Sensor is used, it is usually mounted directly on the camera and, in this case, the camera must look to the back of the parcel.

Multiple Cameras (Three Cameras)



Scanning From the Top and Sides

When parcels are aligned to the conveyor sides with no parcel rotation and all of the codes are on the top, left or and right sides of the parcels, three cameras are needed. Like the single cameras structure, the mounting structure has extensible legs and beams to allow different distances between the camera and the conveyor to accommodate different conveyor widths. The mounting angle of the cameras is usually about 15°. When the Range Sensor is used, it is usually mounted directly on the top camera and all cameras must look to the back of the parcel.

Positioning the M830/930

There are two major things to consider before mounting the M830/930 to best determine the position of camera for optimum performance.

- Determine the best distance between the camera front glass and the conveyor
- Determine the proper camera mounting angle

If the mounting structure is provided by Datalogic, we will provide a mechanical drawing that specifies all of the necessary distances and angles for mounting the cameras to the structure.

Should you design your own mounting structure, you will need to determine the following:

- Determine the best distance between the camera front glass and the conveyor
- Determine the proper camera mounting angle
- Determine the mechanical dimensions of the brackets
- Determine the position of the camera's rotation and mounting points

FOCUSING DEVICE MOUNTING

When required, an external device can be used to measure the position of parcels as they enter the field of view of the M830/M930 Camera. This information can be used by the camera to determine the correct position for optimal focusing. Proper mounting of these devices is critical to accurately determining the parcel positions. The Datalogic focusing devices may be one of the following:

- Range Sensor
- DK503 Distance Sensor Kit
- DM3610 Dimensioner
- LCC 75XX Light Curtain

Follow the instructions for correct mounting and positioning of the focusing devices found in each devices reference manual.

Software setup of these devices is explained in "Focusing device Setup" on page 79.

CHAPTER 3
ELECTRICAL INSTALLATION

WARNING: Electrical Installation must be performed by Qualified Service Technicians Only! Procedures may involve exposure to high-voltage. A trained and authorized technician must perform these procedures. Do not attempt to perform any electrical installation procedures unless you are a trained technician

ESD CAUTION: M830 / 930 Cameras contain electronics that may be affected by electrostatic discharge (ESD). To prevent personal injury or damage to the unit, please follow the safety precautions and warnings found in the References section at the beginning of this manual. Failure to follow these precautions may void your warranty.

PREPARING FOR ELECTRICAL INSTALLATION

Before mounting any components, please do the following:

- Read all instructions before beginning your installation.
- Observe all electrical safety requirements discussed in the Introduction to this manual.
- Define and confirm the accuracy of your application's requirements.
- Review all installation-specific drawings.
- Review and plan the power requirements for your application.
- Review and plan the communications requirements for your application.

WARNING: The content of this manual may be superseded by any customer-specific documentation provided by Datalogic. Before proceeding with any installation procedures, be sure to review ALL documentation, especially content that contains details specific to your installation.

NOTE: Everything should be MECHANICALLY INSTALLED before performing any ELECTRICAL INSTALLATION. See Chapter 2, Mechanical Installation **for mechanical installation details.**

CONNECTING A M830 / 930 CAMERA

To install an M830 / 930 Camera, follow this sequence:

1. Mount and connect the Range Sensor to the camera, if used. The Range Sensor Wiring is easier to complete if it's done before mounting the camera on its bracket.
2. Complete mechanical installation.
3. Complete electrical installation (See wiring diagrams in this chapter), observing all electrical safety requirements outlined in this chapter.
4. Ground the mounting structure to protective earth (PE) ground.
5. Wire the tachometer.
6. Connect the M12 end of the Ethernet cable to the barcode reader's Host Net port and network switch as required by your application.
7. Connect the M830 / 930 Camera to its power supply.

WARNING: To turn off your camera, use a power switch or box. Do not disconnect the pin power connection from the unit.

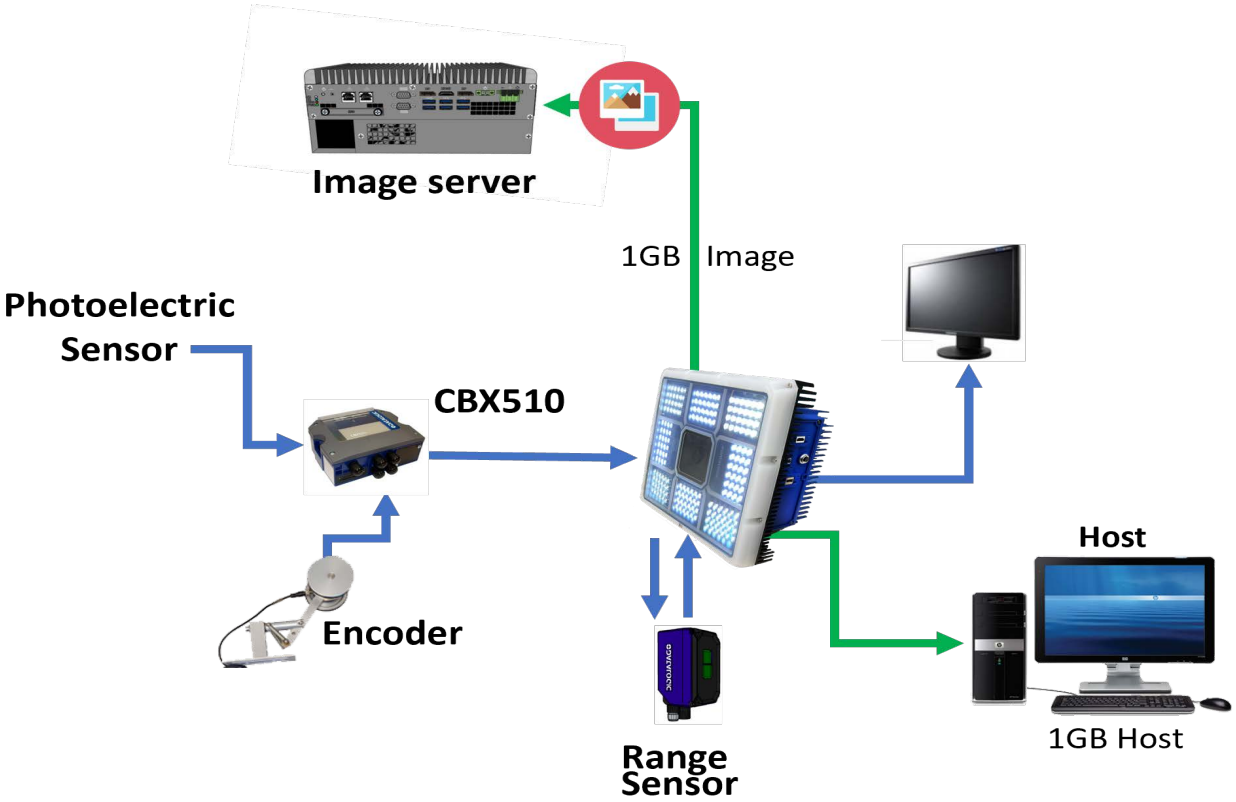
If you attach the power supply to M830/M930 and it is already attached to power, it may cause the M830/M930 to not boot correctly. Recycle power by unplugging the AC cord from the power supply and plugging it back in.

8. Connect the sync cables if multiple cameras are used.
9. Connect the power supply to the power source.
10. Setup / check camera operations *(See "Focusing device Setup" on page 79)*

WARNING: M12 connectors MUST be terminated with a cable or a protective cap in order to maintain IP65 standard.

TYPICAL MATRIX 830/930 SYSTEM BLOCK DIAGRAMS

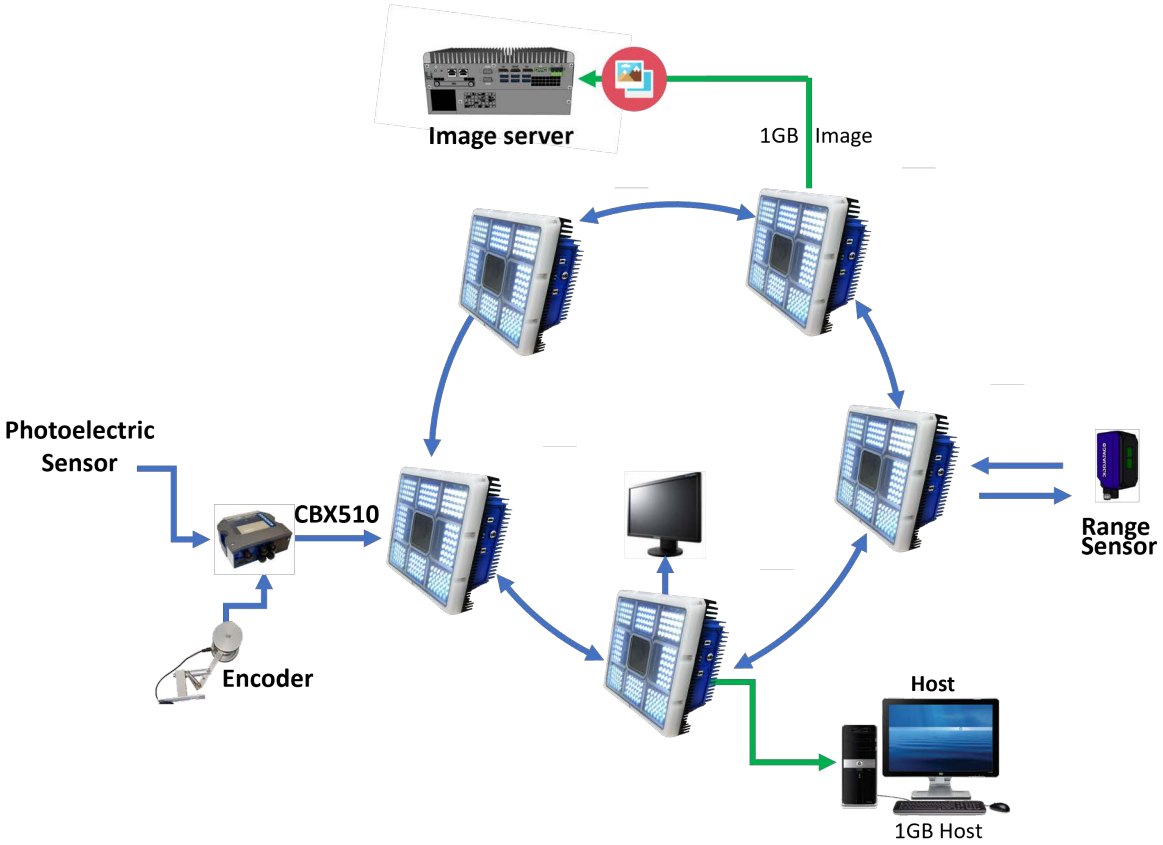
Single Matrix 830/930



The diagram above shows a typical application of a single M830/930 system:

- The encoder and the photoelectric sensor are connected to the camera through the CBX510. All sensors are powered directly by the camera.
- When the Range Sensor is used for focusing, it is connected directly to the camera.
- If light curtains are used, they are connected to the camera main serial port via the CBX.
- The host system is typically connected to the ETH2-HOST Ethernet port.
- An image storage server can be connected to the ETH3 Ethernet port.
- A monitor, mouse, and keyboard can be connected to the optional monitor panel.

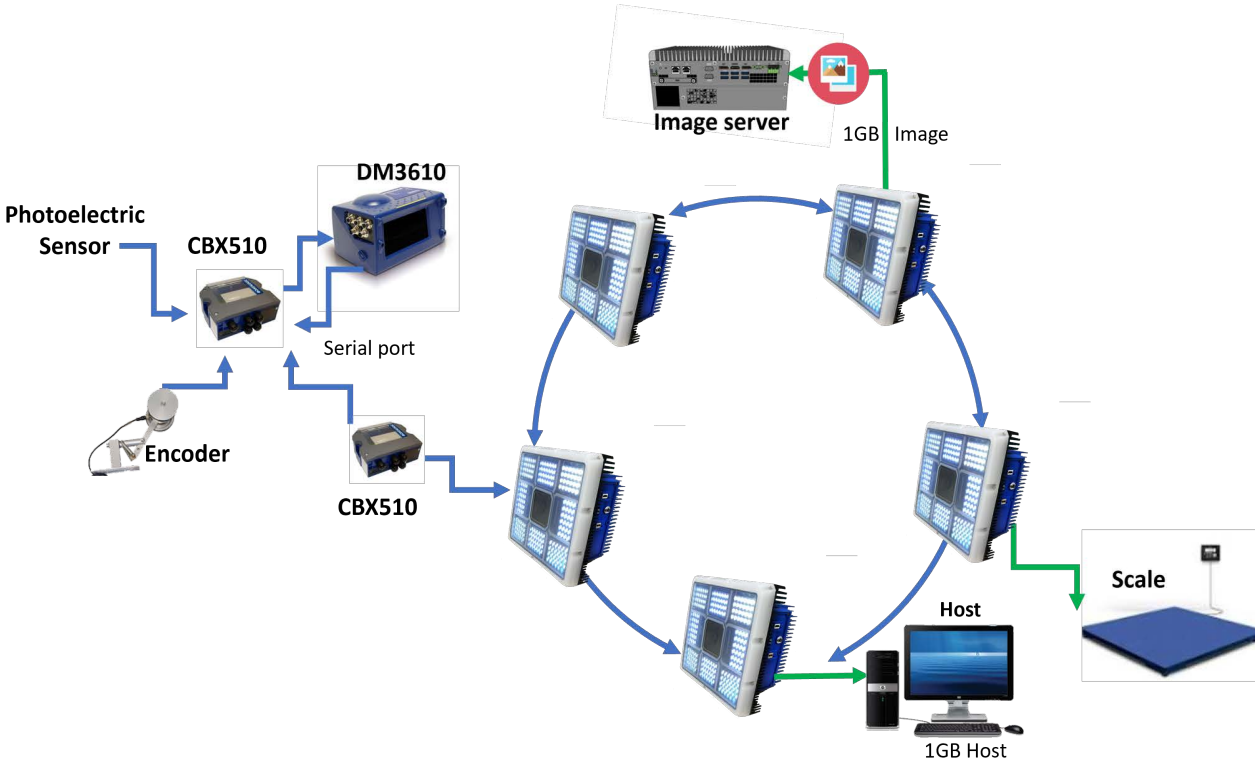
Five Matrix 830/930 Tunnel



The diagram above illustrates a typical application of a multiple Matrix M830/930 tunnel configuration:

- Two or more cameras are interconnected through a high-speed SyncNet ring. All the information coming from the sensors and going to the host are shared via this network.
- The CBX is connected to one of the cameras, designated as the sensor master. This camera manages the acquisition of signals from the connected sensors.
- The Range Sensor must be connected to the top back camera of the tunnel. This camera does not necessarily have to be the sensor master.
- The host system and the optional console can be connected to any camera within the tunnel.
- When a single 1 Gb Ethernet connection is sufficient for image saving (i.e. in applications with low image-saving traffic), it can be connected to the ETH1 Ethernet port of any camera in the tunnel. That camera will collect images from the other cameras via the SyncNet network.

Five Matrix 830/930 Tunnel with DM3610 Dimensioner



The diagram above shows a typical application of a five-camera Matrix 830/930 tunnel integrated with a DM3610 Dimensioner.

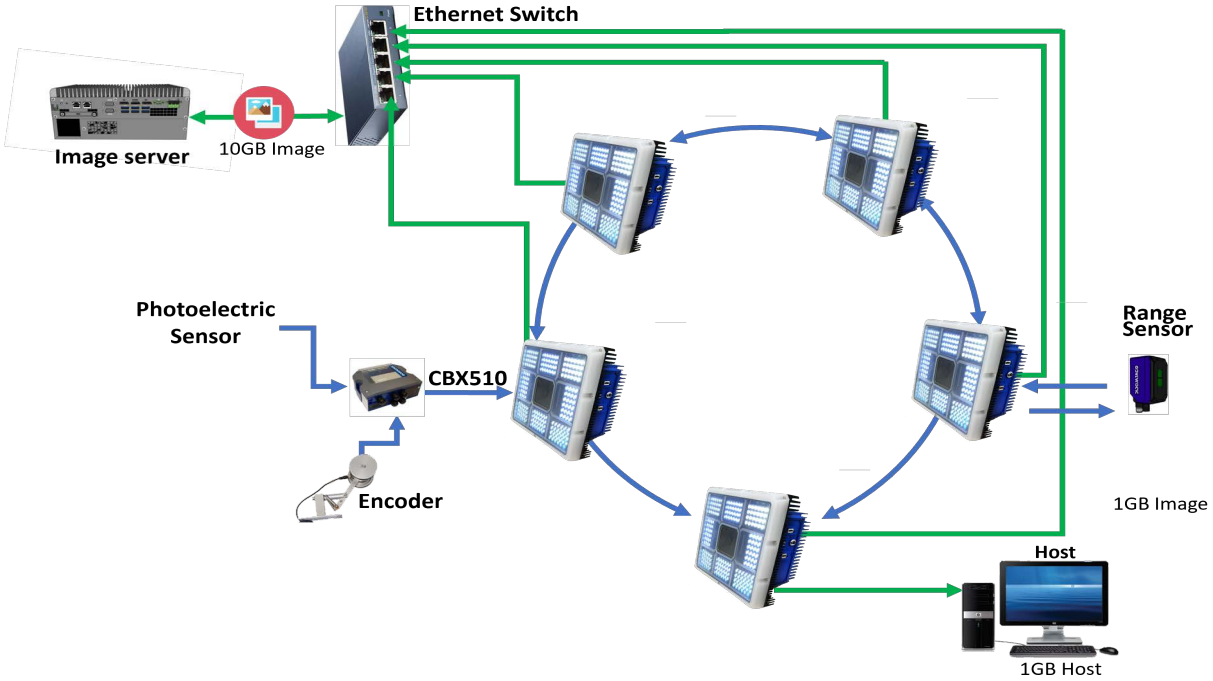
To obtain legal-for-trade measurements with the DM3610, the dimensioner must be connected directly to the CBX unit that manages the encoder and the Photoelectric Sensor. For this reason, an additional CBX unit is required.

In this configuration, the encoder and the Photoelectric Sensor are connected in parallel to the additional CBX, while the DM3610 host serial port is connected to the camera host serial port in order to transfer focusing data.

NOTE: When the DM3610 is used for dimensioning, an Ethernet connection between the DM3610 and the camera system is required. If the DM3610 is used for focusing only, the Ethernet connection is not required.

Additional data providers, such as weighing scales, RFID devices, or similar peripherals, can be connected to any camera within the tunnel directly when using an Ethernet connection or via a CBX100 with a serial port.

Five Matrix 830/930 Tunnel with High Traffic Image Saving



In applications with high image-saving traffic, a single 1-Gb Ethernet connection on one camera is insufficient. In this case, the ETH3 ports of all the cameras can be connected to one or more high-speed network switches that provide sufficient bandwidth for reliable data transfer to the image server

GENERAL ELECTRICAL INSTALLATION GUIDELINES

It is important that you follow these general precautions when installing, setting up, operating, maintaining, troubleshooting or replacing any Datalogic products, parts or related equipment.

As you plan and install your barcode reader(s), be sure to keep the following guidelines in mind:

- Determine the camera is in the proper location as outlined in Chapter 2, Mechanical Installation.
- Leave adequate clearances (approximately 300 mm [12 in]) for wiring.
- Route wires carefully to reduce or minimize electrical noise.
- When extraneous power and communication wiring must cross, make their intersection perpendicular. Avoid running power and data wiring parallel to each other. If possible, maintain one of the following separations between the power and data wiring:
- 300 mm [12 in] gap
- use steel conduit and 25 mm [1 in] gap
- 6.5 mm [0.25 in] of aluminum.

WARNING: When planning your installation wiring, remember all power connections must be quick-disconnect. For PERMANENTLY CONNECTED EQUIPMENT a readily accessible disconnect device must be incorporated in the building installation wiring. For PLUGGABLE EQUIPMENT the socket-outlet must be installed near the equipment and must be easily accessible.

To assure no ESD damage will occur, be sure to observe the precautions outlined in the Introduction to this manual.

Ground the mounting structure to safety ground (protective earth ground (PE)). See section “Grounding” on page 75 for wiring recommendations for safety ground.

M830 / 930 CAMERA CONNECTOR PANEL

After completing mechanical installation, use this section to properly wire your cameras for optimal performance in your application. M830 / 930 Camera wiring connections are made to the connector panel and through the CBX connection box (via the I/O port).

See “M830/930 Connector Panel and LED Functionality” on page 7 for detailed information on wiring.

In most applications, the cable connections to the barcode reader will include:

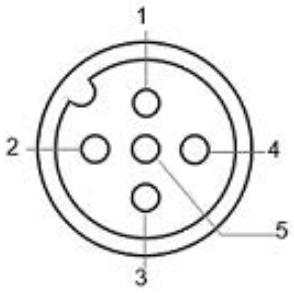
1. **POWER IN**
2. **RANGE SENSOR**
3. **I/O**
4. **ETH 1**
5. **ETH 2 HOST**
6. **ETH 3**
7. **LINK 1**
8. **LINK 2**

POWER CONNECTOR PIN-OUT TABLE (CUSTOM POWER SUPPLY)

A recommended power supply and cabling is available for the M830 / 930 Camera. However, if your installation requires custom power supply wiring, the pin-outs of the M830 / 930 Camera power connector are provided below.

Refer to the Power Cable List on page 20 for the list of supported standard cables.

24 - 2.5A MAX
5 PIN M12 Type Male



POWER INPUT	
Unit Connector (shown)	
5 PIN M12 Type Male	
Pin	Function
1	+24 VDC
2	+24 VDC
3	dc return
4	dc return
5	Protective Earth Chassis

NOTE: When using an M830/930 camera, no power supply is required for the CBX510 connection box. All power and some communication options are fed to the CBX510 through the scanner's 17-pin I/O connector to the CBX510 25-pin connector using the cable provided.

In cases where the AS-I cabling is not used, the alternative CAB-LP-05 cable can be used to connect the power supply to the scanner. Connect the Brown/White pair to +24 Vdc and the Blue/Black pair to dc return.

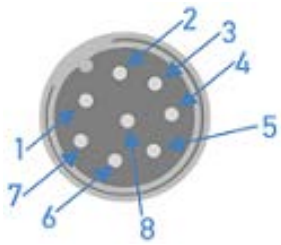
LINK 1 AND 2

If connecting several cameras together, they must be connected via Link 1 and Link 2 ports.

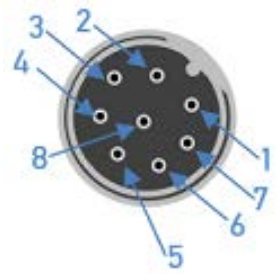
Any Syncnet cable can be used for connection. Refer to the SyncNet Cable List on page 19 for a list of compatible cables.

NOTE: Links in large camera tunnel must have a completed loop. Link cables must be kept as short as possible. Failure to follow these guidelines may cause tachometer errors in the tunnel.

LINK 1

M12 5P FEMALE	Pin	Description
	1	MDI2-
	2	MDI3+
	3	MDI3-
	4	MDI0-
	5	MDI1+
	6	MDI0+
	7	MDI2+
	8	MDI1-

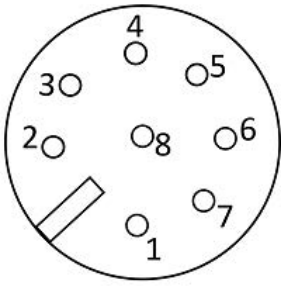
LINK 2

M12 5P MALE	Pin	Description
	1	MDI2-
	2	MDI3+
	3	MDI3-
	4	MDI0-
	5	MDI1+
	6	MDI0+
	7	MDI2+
	8	MDI1-

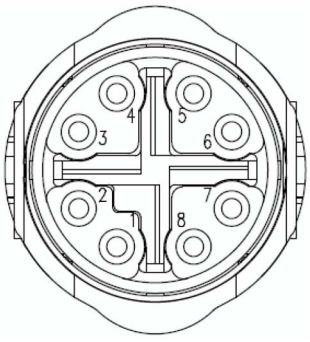
CONNECTING THE RANGE SENSOR

The Range Sensor connects to the camera via a single Power, IO and com connector.

The Range Sensor and SyncNet use the same type of cable. Any SyncNet cable can be used (see cable list on page 19).

24 - 2.5A Max	POWER INPUT		
8 PIN M12 Male	Unit Connector		
	Pin	Name	Description
	1	RX-	RS485 RX- signal
	2	TX-	RS485 TX- signal
	3	TX+	RS485 TX+ signal
	4	PE	CHASSIS GROUND
	5	VS	Power supply +
	6	IN1	Digital Input
	7	RX+	RX+
	8	GND	Power supply -

ETHERNET

8 PIN M12 Female X-coded	Pin	Description
	1	MDI0+
	2	MDI0-
	3	MDI1+
	4	MDI1-
	5	MDI2+
	6	MDI2-
	7	MDI3-
	8	MDI3+

SELECTING THE CORRECT CBX CONNECTION BOX FOR YOUR APPLICATION

As shown in section **"Typical Matrix 830/930 System Block Diagrams" on page 42**, typical applications require a single CBX connection box to connect the trigger and encoder inputs to the master camera. The camera sources power to these devices. Other possible CBX connections are for digital outputs or a serial host.

- **CBX100** - used for slave cameras (and as an alternative for master cameras). It provides general access to digital input/output signals.
- **CBX510** - used for typical standalone or master cameras (cannot be used for slave cameras). It provides general access to digital input/output signals. It doesn't require special jumpers to set operation or power sourcing.

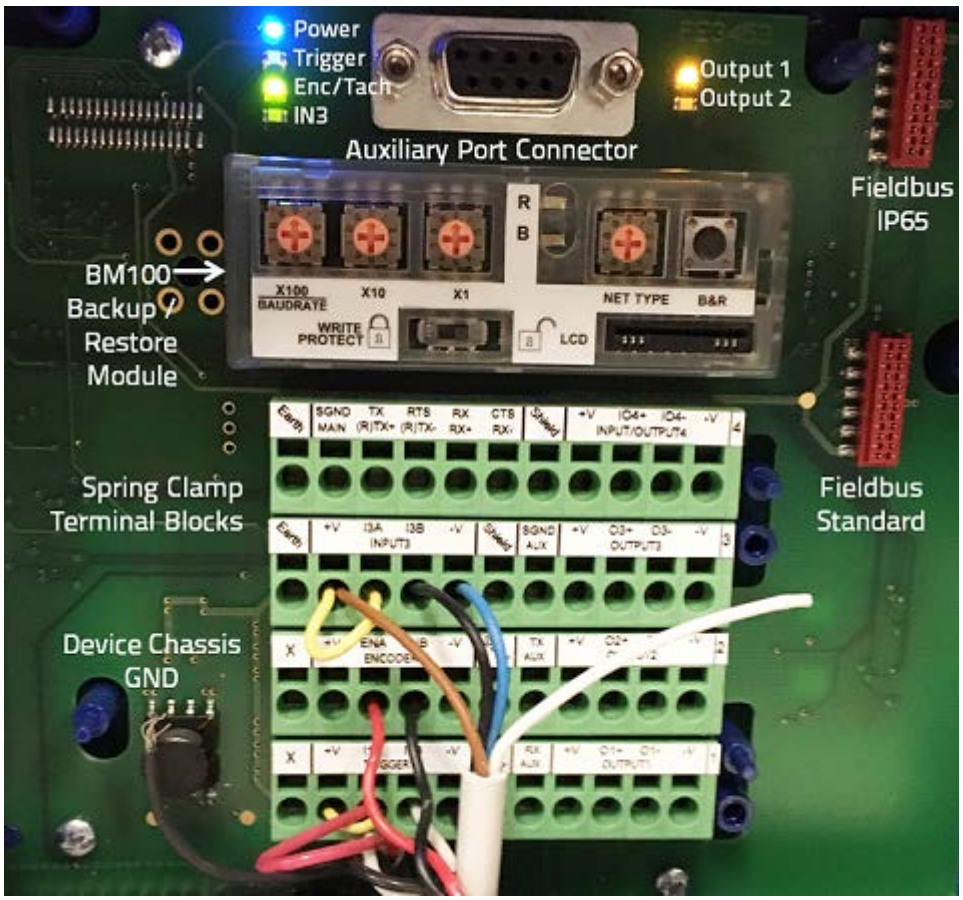
	OPTIONS						
DEVICE	Tach Input	Trigger Input	General Purpose Input	General Purpose Output 1	General Purpose Output 2	Works as Slave	Works as Master
CBX100	X	X		X	X	X *	w/ jumper (Ref to ID+)
CBX510	X	X	X	X	X		X

* When working with a slave the jumper is not installed.

WARNING: Although multiple M830/930 cameras can have a CBX box, only one of the CBX boxes in the system can have the Jumper to make it the Master.

CBX510 CONNECTION BOX

Complete installation information for the connection box is available in the ***CBX510 Installation Manual*** available at www.datalogic.com. The interior of the box is shown below.



WARNING: If you are terminating more than one wire in a single terminal, cut off any tinned ends and twist the wires together before inserting them into the terminal.

Photoelectric Sensor Connections to CBX510

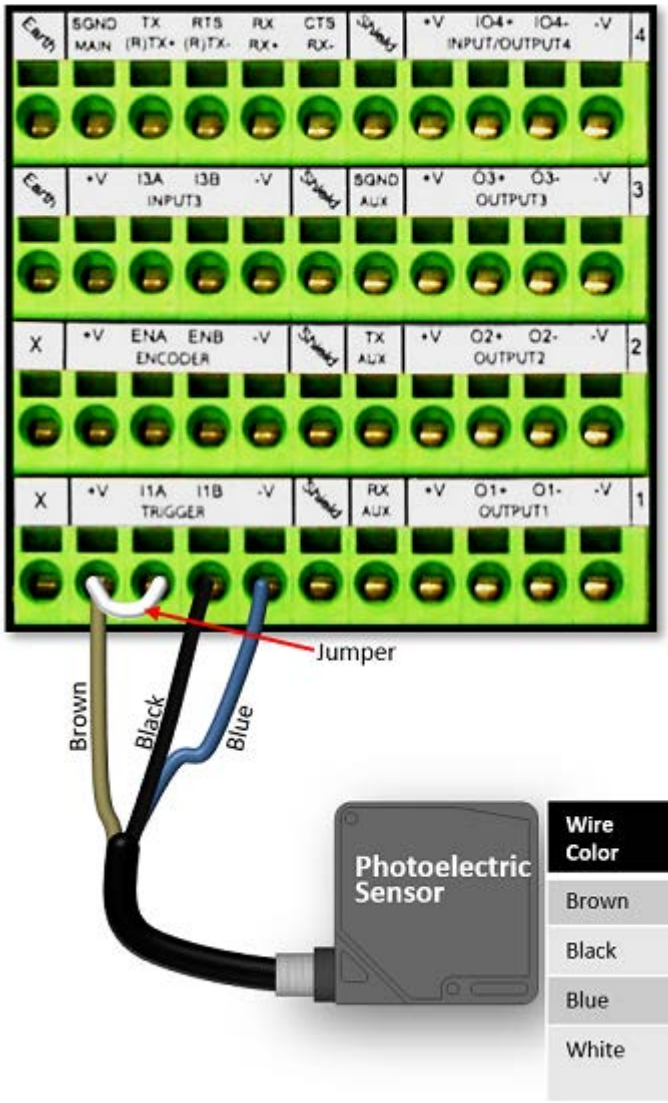
Barcode scanning applications may use a Datalogic photoelectric sensor as a trigger device. The photoelectric sensor is wired directly into the CBX510 terminal block.

If your application uses a trigger other than the one specified by Datalogic, follow the appropriate wiring diagram to assure proper wiring.

NOTE: To confirm the photoelectric sensor is functioning properly, watch the TRIGGER LED first in the CBX and then on the camera while the photoelectric sensor's beam is blocked. The Datalogic photoelectric sensor also includes a status LED.

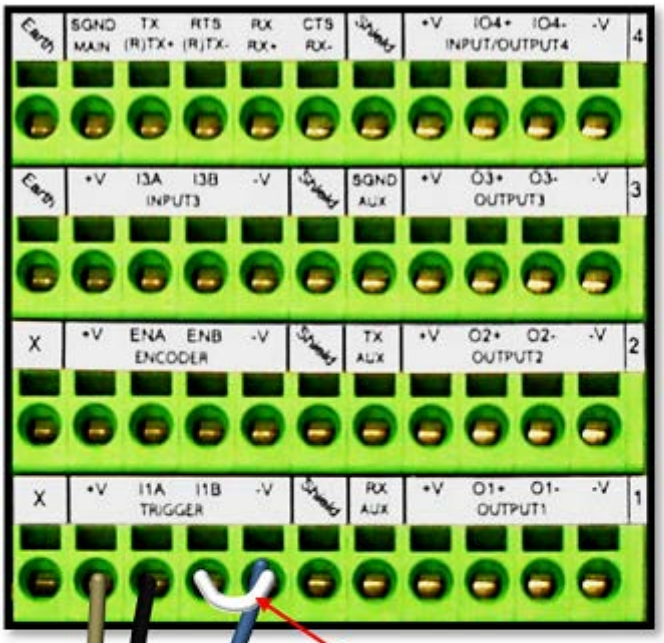
The following diagrams illustrate standard recommended wiring of the Photoelectric Sensor to the CBX510 terminal block.

Photoelectric Sensor to CBX510 (NPN)



Wire Color	
Brown	+V
Black	I1B
Blue	-V
White	Jumper +V I1A

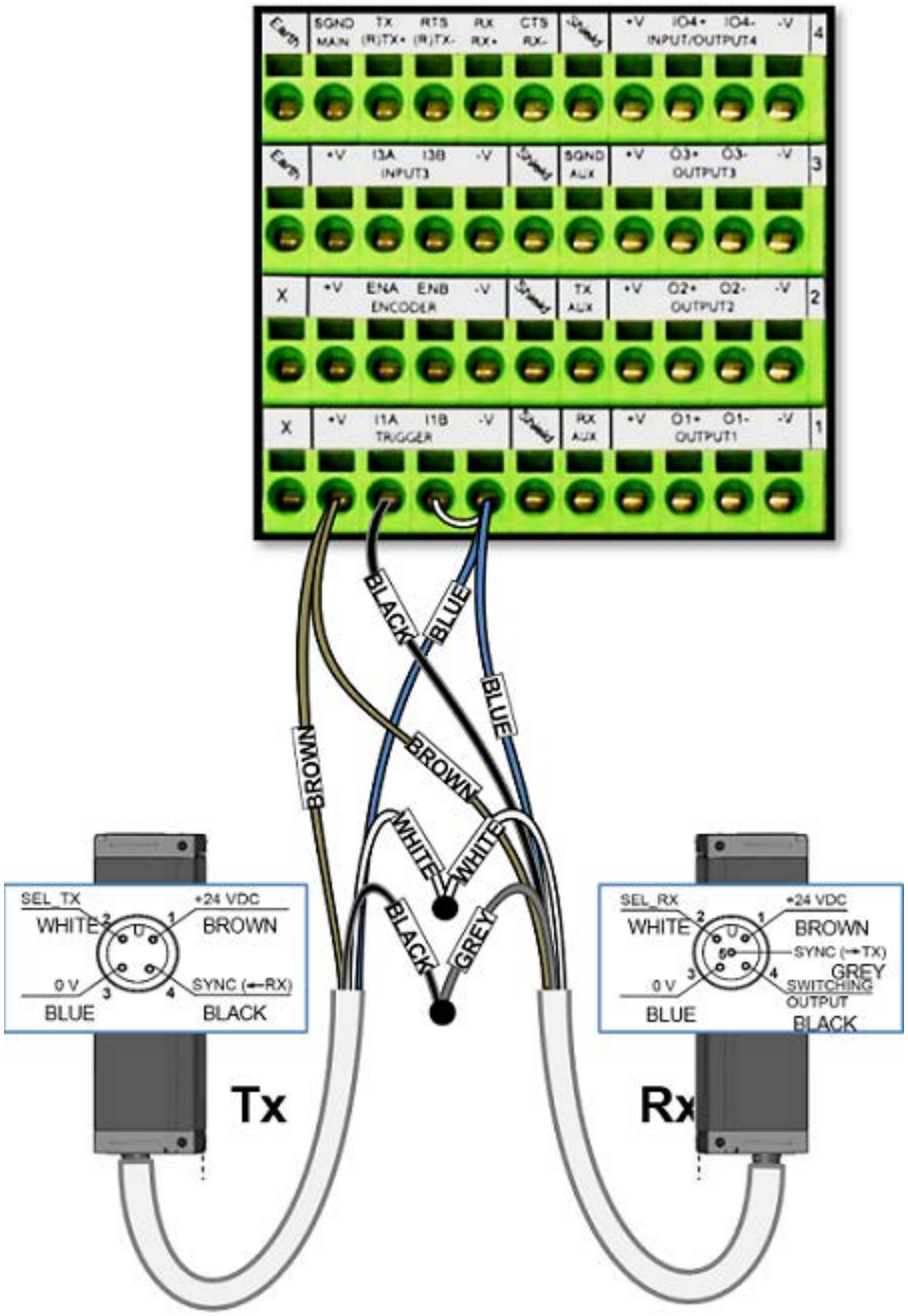
Photoelectric Sensor to CBX510 (PNP)



Wire Color	
Brown	+V
Black	I1A
Blue	-V
White	Jumper I1B -V

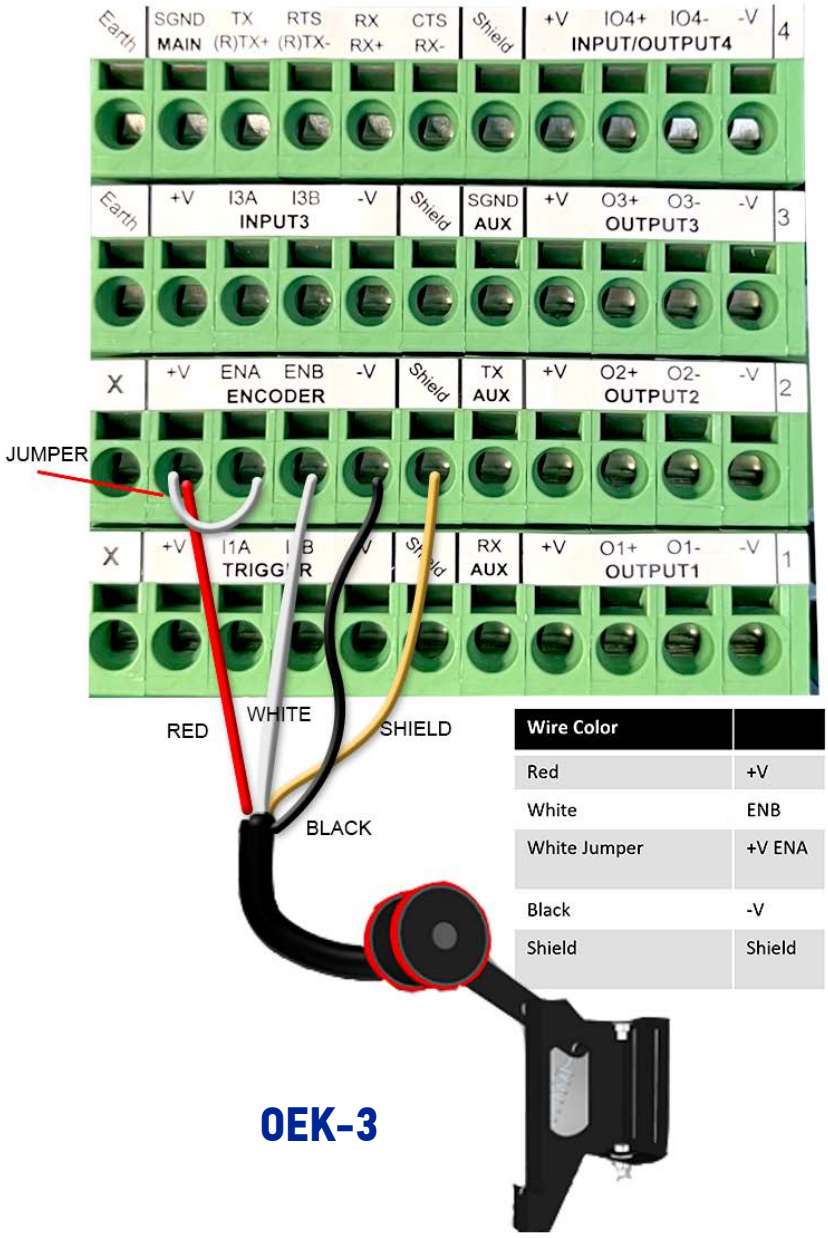
AS1

When using an AS1 for triggering, the AS1 must be wired to the CBX510 connected to the M830/930 using a flying lead to M12 cable (FOCUS CONTROL 5MT CABLE (M12-FREE WIRES) 93A201203.)



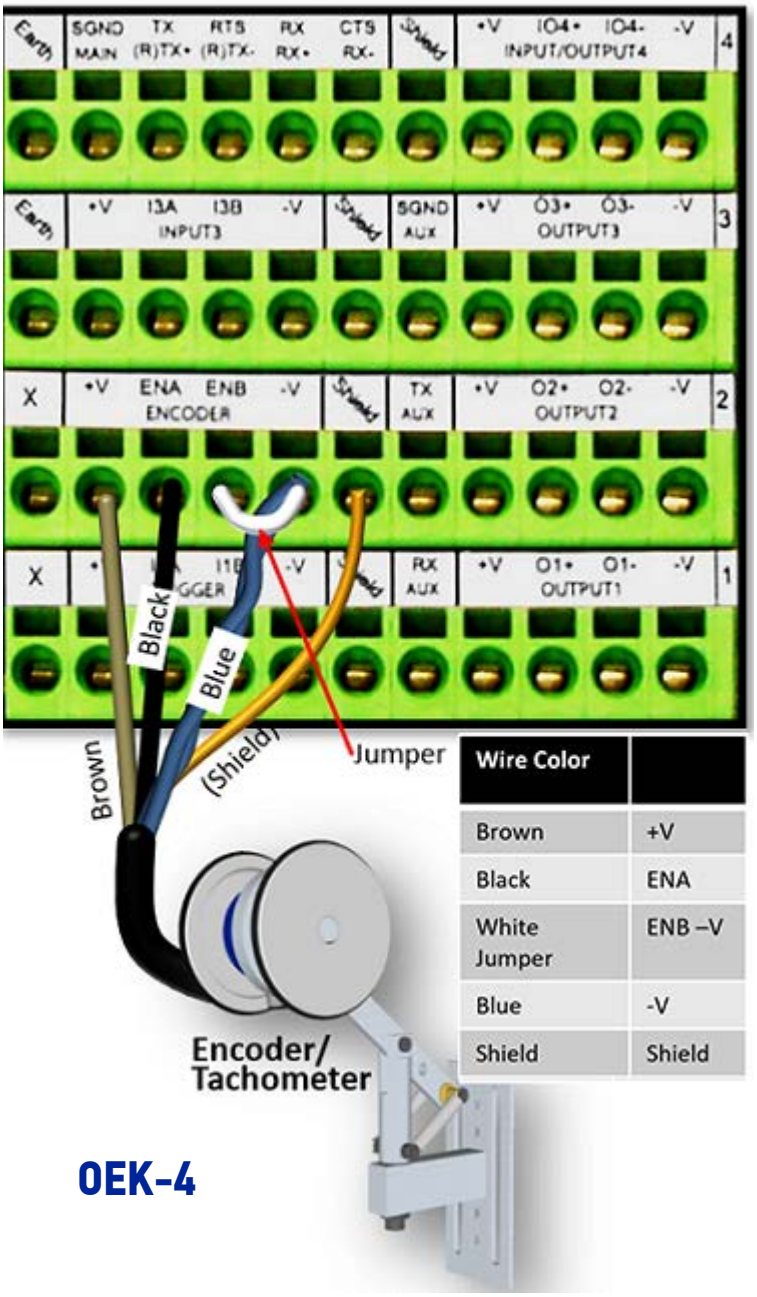
Encoder/Tachometer Wiring to CBX510

Encoder/Tachometer Wiring for NPN Output to CBX510



Wire Color	
Red	+V
White	ENB
White Jumper	+V ENA
Black	-V
Shield	Shield

Encoder/Tachometer Wiring for PNP Output to CBX510

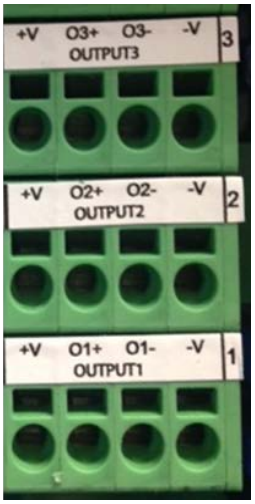


Wire Color	
Brown	+V
Black	ENA
White Jumper	ENB –V
Blue	-V
Shield	Shield

Digital Output Configuration from CBX510

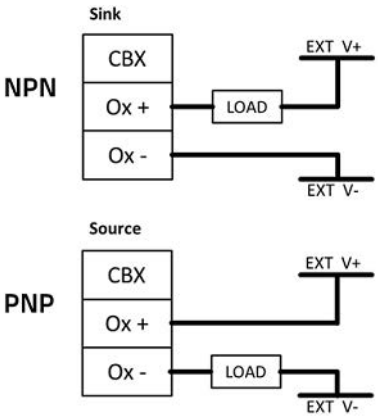
The CBX510 includes an OUTPUT block for wiring relays as needed for external accessories.

Outputs 1 – 3
Maximum Voltage 30V
Collector Current (pulse) 130 mA Max.
Collector Current (continuous) 40 mA Max.
Saturation Voltage (VCE) 1 V at 10 mA Max.
Max. Power Dissipation 90 mW at 50 degrees C Ambient Temperature.

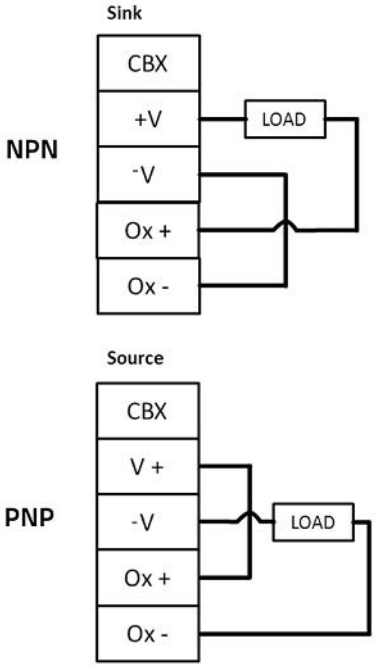


Schematics for Isolated and Non-Isolated digital outputs are provided below.

Unpowered Outputs



Powered Outputs



Focusing Device Wiring

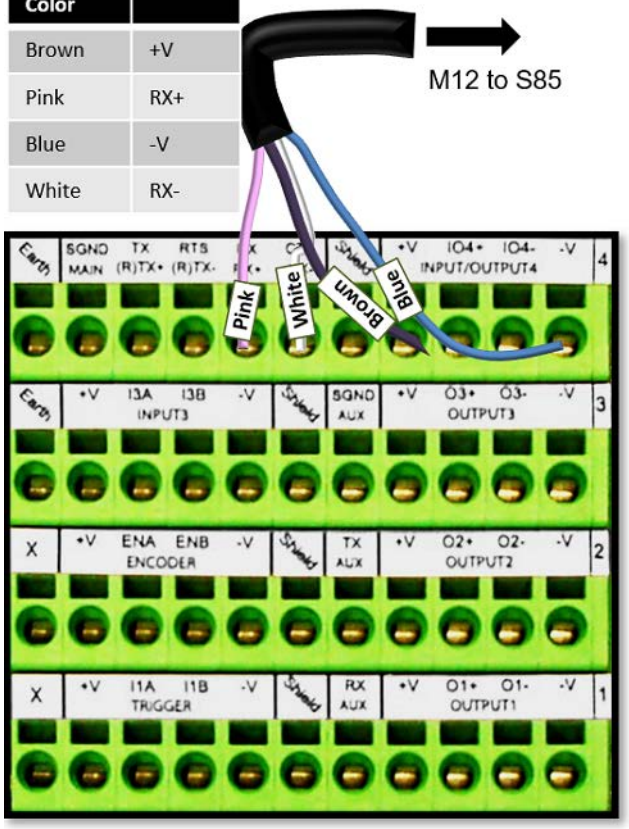
An external device can be used to measure the position of parcels as they enter the Field of view of the M830/930 Camera. This information is used by the camera to determine the correct position for optimal focusing. The Datalogic focusing devices may be one of the following:

- DK503 - S-85 Position Sensor Kit
- LCC 75XX Light Curtain
- DM3610 Dimensioner

DK503 - S-85 Position Sensor

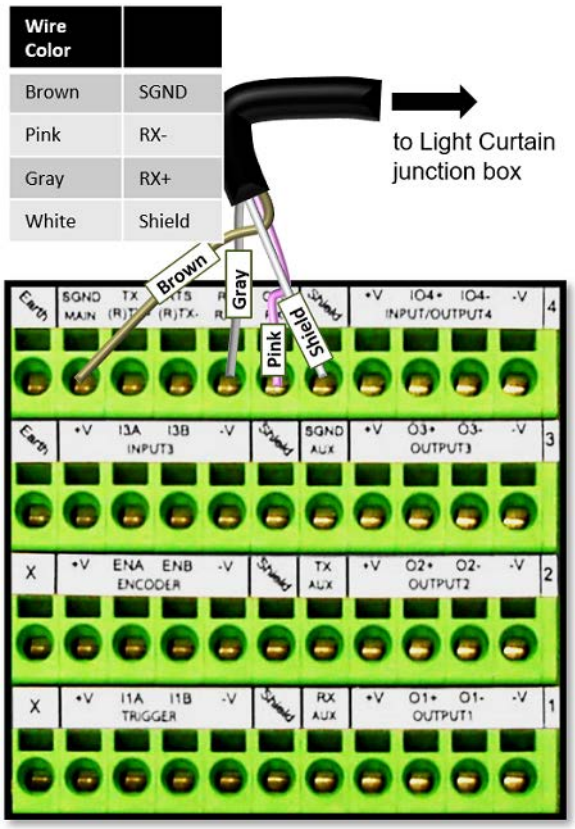
When using the S-85 for focusing, it must be wired to the CBX510 connected to the M830/930 using the cable included in the kit (95ACC1620).

Wire Color	
Brown	+V
Pink	RX+
Blue	-V
White	RX-



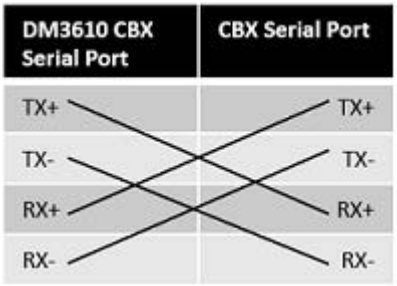
LCC 75XX Light Curtain

When using the Datalogic Light Curtain for focusing, it must be wired to the CBX510 connected to the M830/930 using the M12 cable that is part of the cable assembly in the kit. (FOCUS CONTROL SMT CABLE) (93A201203). Cut off the M12 5-pin B-code connector and strip back the wires to go into the CBX box as follows:



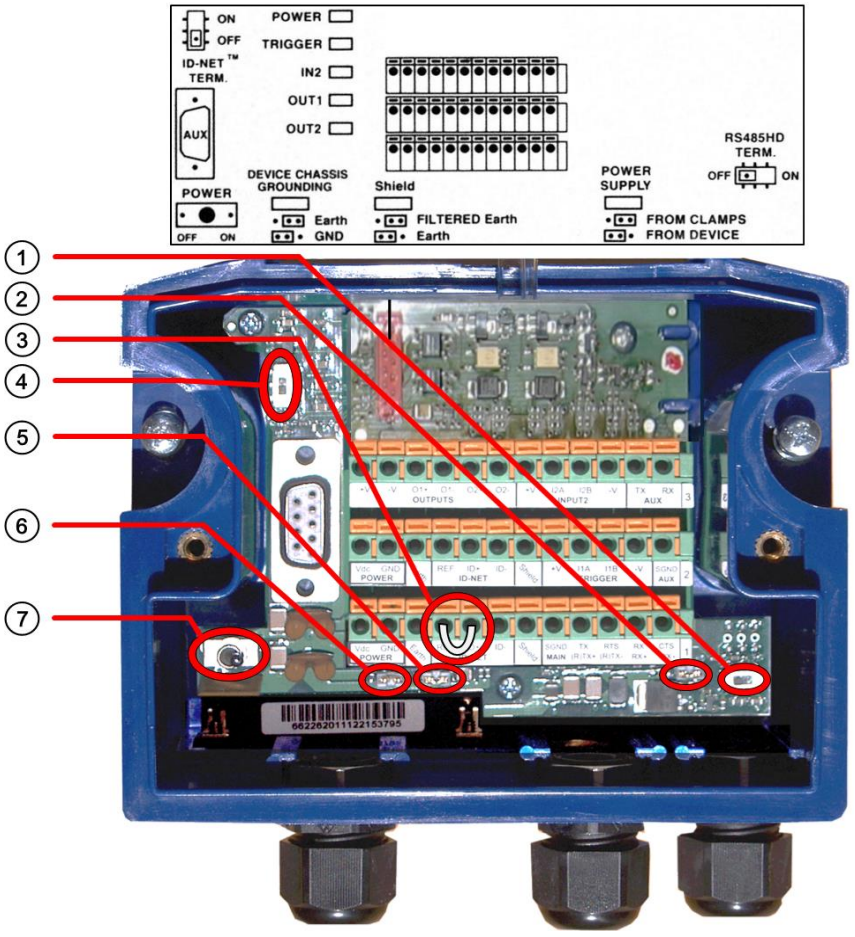
Wiring from DM3610 CBX to M830/930 CBX

When using a DM3610 dimensioner for focusing, the DM3610's CBX box must be wired to the CBX box connected to the camera. Since each of the different CBX boxes may be used, we will just show the connections necessary as follows:



CBX100 CONNECTION BOX

Please verify that the CBX100 connection box is configured for the M830/930 application as follows:



Reference the image and diagram above:

1. Set RS422HD TERM switch to OFF.
2. Set POWER SUPPLY jumper to FROM DEVICE.
3. Insert jumper wire in pin block from REF to ID+ (one jumper in either block is sufficient).

NOTE: In order for a standalone or Master M830/930 to initialize properly, it must be connected to a CBX100. On power-up the M830/930 looks for the jumper (item number 3 in the image above) and will assume the responsibility of the provided SYNC Network IP addresses. Slave units in an array/tunnel will receive their SYNC Network IP addresses from the Master.

WARNING: Although multiple M830/930 cameras can have a CBX box, only one of the CBX boxes in a multi-camera system can have the jumper to make it the Master.

4. Set ID-NET TERM switch to OFF.
5. Set Shield jumper to FILTERED Earth.
6. Set DEVICE CHASSIS GROUNDING to Earth.
7. Set POWER Switch to ON.

Photoelectric Sensor Connections to CBX100

Barcode scanning applications may use a Datalogic photoelectric sensor as a trigger device. The photoelectric sensor is wired directly into the CBX100 terminal block.

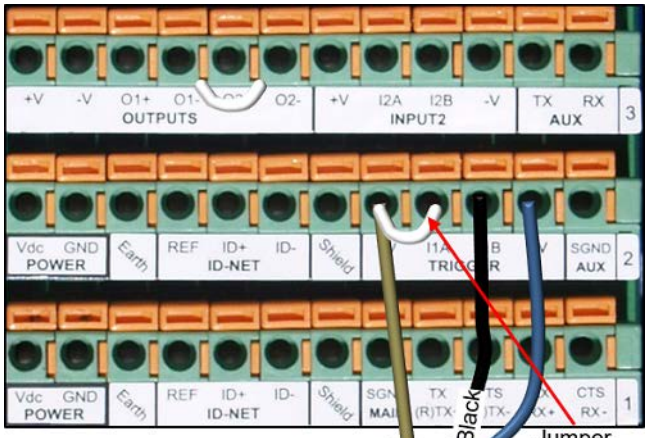
If your application uses a trigger other than the one specified by Datalogic, follow the appropriate wiring diagram to assure proper wiring.

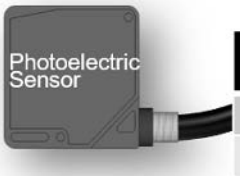
WARNING: You must use shielded interface cables with this product. To maintain FCC compliance, the cable shield must make a 360-degree connection to the shielded mating connector.

NOTE: To confirm the photoelectric sensor is functioning properly, watch the TRIGGER LED first in the CBX and also on the camera while the photoelectric sensor's beam is blocked. The Datalogic photoelectric sensor also includes a status LED.

The following diagrams illustrate standard recommended wiring of the Photoelectric Sensor to the CBX100 terminal block.

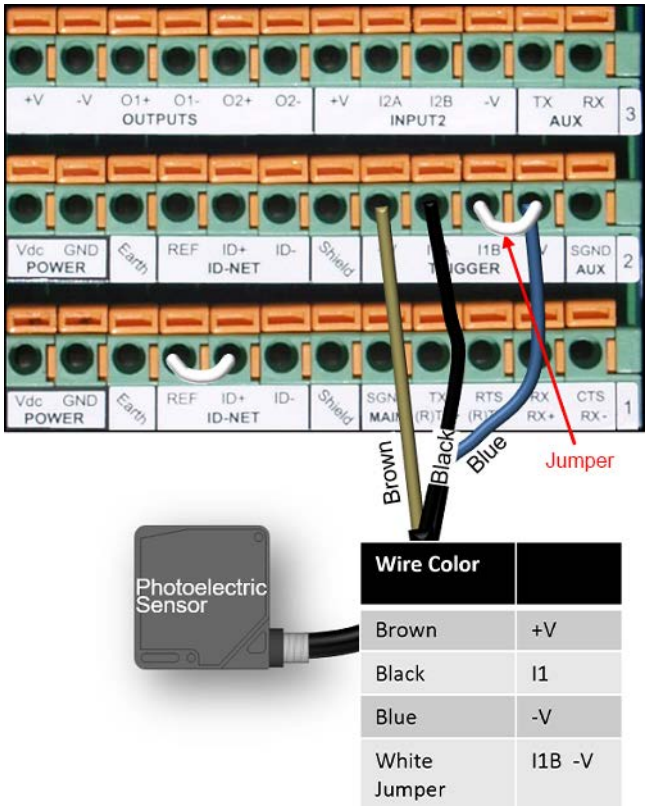
Photoelectric Sensor to CBX100 (NPN)





Wire Color	
Brown	+V
Black	I1B
Blue	-V
White Jumper	+V I1A

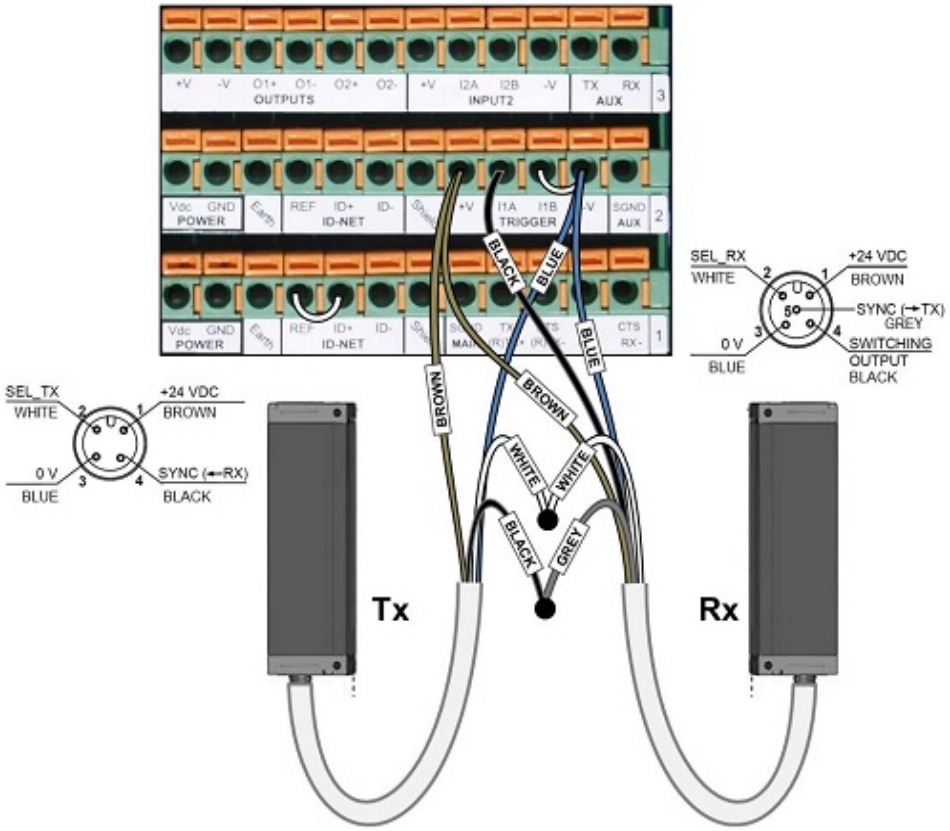
Photoelectric Sensor to CBX100 (PNP)



Wire Color	
Brown	+V
Black	I1
Blue	-V
White Jumper	I1B -V

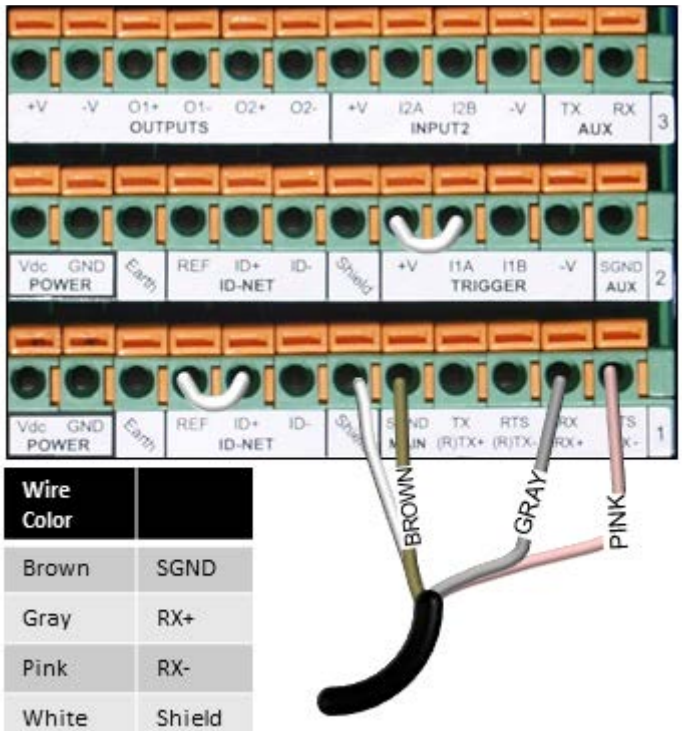
AS1 Area Sensor to CBX100 Connections

The **AS1** area sensors can detect and provide trigger for very small or irregularly shaped objects. PNP Output.



Light Curtain to CBX100 Connections

The Light Curtain may be connected to the CBX100 if there is more than one M830/930.

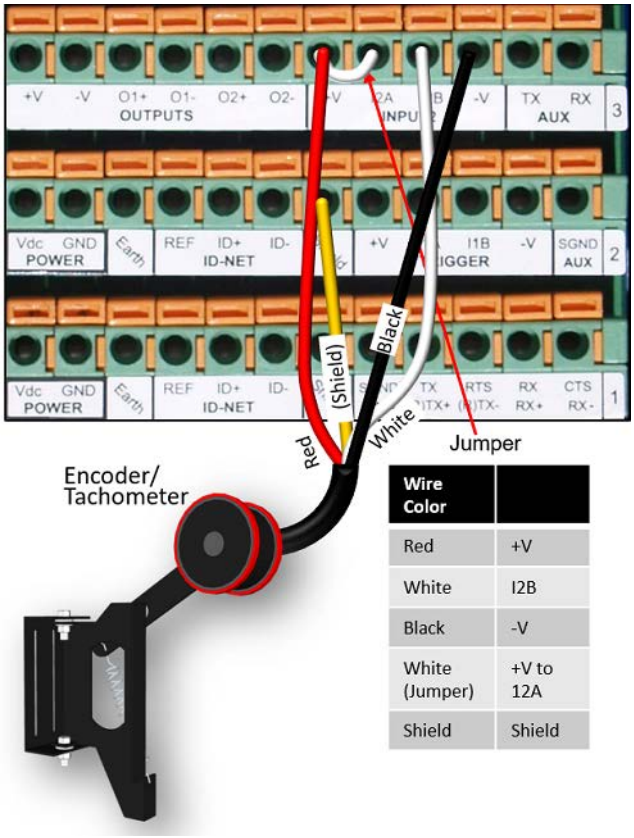


Wire Color	
Brown	SGND
Gray	RX+
Pink	RX-
White	Shield

Encoder/Tachometer Wiring to CBX100

Encoder/Tachometer Wiring for NPN Output to CBX100

NOTE: Some Photocraft tachometers may have a different color coding:
(+V) Red or White/Orange
(Signal) White or White/Blue
(Ground) Black or **Orange/White**

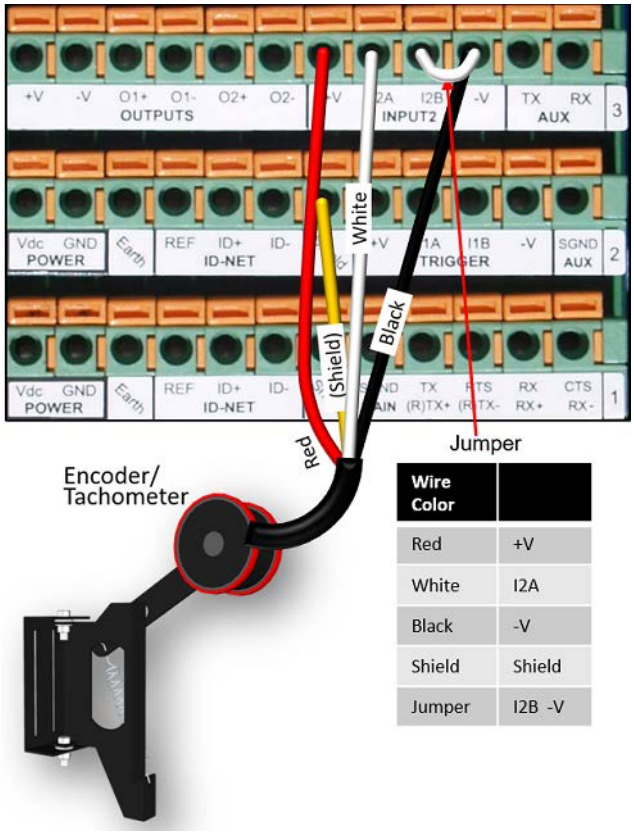


Wire Color	
Red	+V
White	I2B
Black	-V
White (Jumper)	+V to 12A
Shield	Shield

OEK-2/OEK-3

Encoder/Tachometer Wiring for PNP Output to CBX100

NOTE: Some Photocraft tachometers may have a different color coding:
(+V) Red or White/Orange
(Signal) White or White/Blue
(Ground) Black or **Orange/White**



Wire Color	
Red	+V
White	I2A
Black	-V
Shield	Shield
Jumper	I2B -V

OEK-2

Serial Communication Wiring to CBX100

The M830/930 provides serial RS232/RS422 communications to other devices through the CBX100.

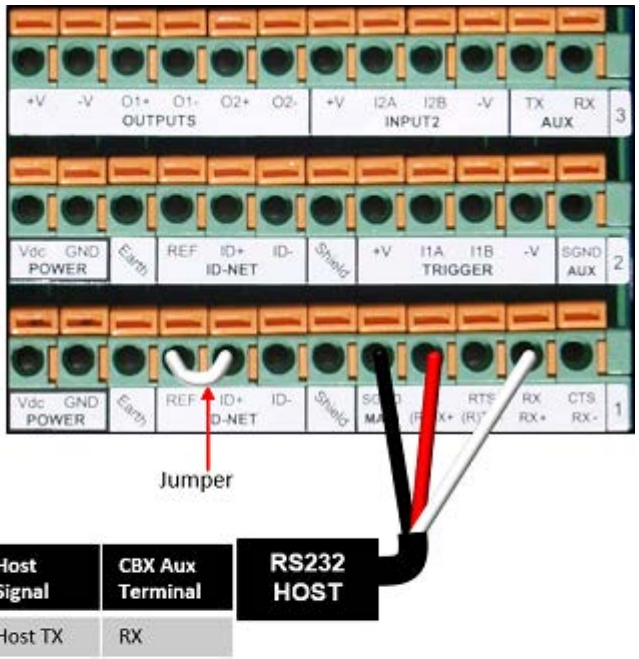
- RS232 provides point-to-point communications at distances up to 15 M [50 ft].
- RS422 provides point-to-point communications at distances up to 1200 M [3940 ft]

The following wiring diagrams illustrate the different types of serial communications available via the CBX100 pin block. It is very important that you make the proper pin connections.

RS232 with No Handshaking

Use RS232 for a direct connection to a controller, personal computer, or other device. RS232 provides point-to-point communications at distances up to 15 M [50 ft]. If longer cable lengths are needed, use RS422.

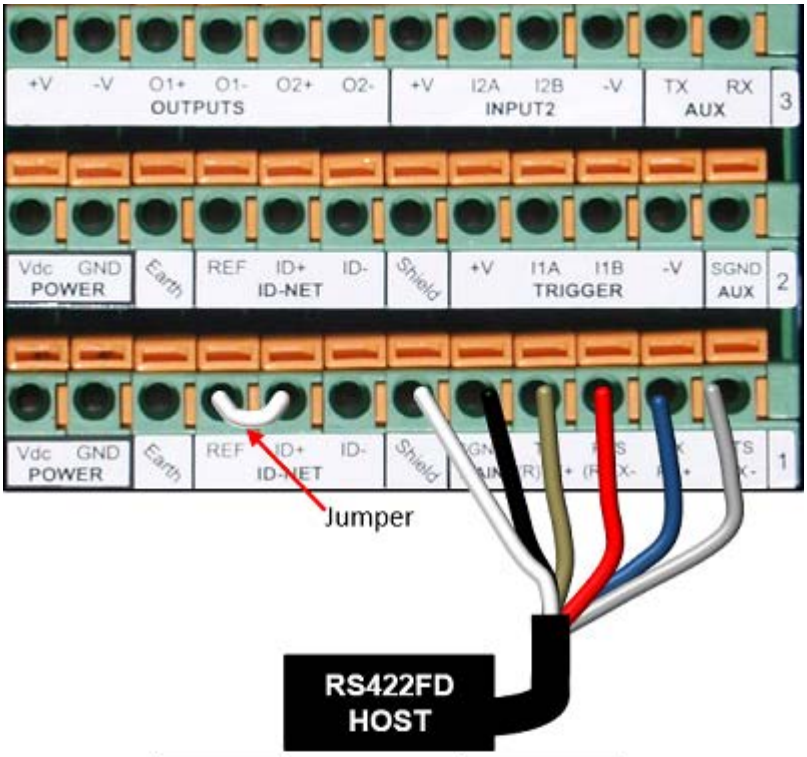
Use the following illustration as a guide when you want to connect your system to a device using RS232 communication with no handshaking.



Wire Color	Host Signal	CBX Aux Terminal
White	Host TX	RX
Red	Host RX	TX
Black	Signal GND	SGND
Jumper	NA	REF to ID+

RS422FD HOST (Full Duplex)

Use RS422 for a direct connection to a controller, personal computer, or other device. RS422 provides point-to-point communications at distances up to 1200 M [3940 ft]. Full duplex wiring supports a four wire, double twisted pair RxD/TxD. The Signal GND and shield cables are also required as shown.



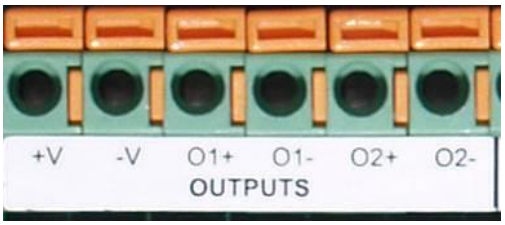
Wire Color	Host Signal	CBX Main Terminal
White	Cable Shield	Shield
Black	Signal GND	SGND
Brown	Host RX+	TX+
Red	Host RX-	TX-
Blue	Host TX+	RX+
Gray	Host TX-	RX-
Jumper	NA	REF to ID+

Relay Configuration for CBX100

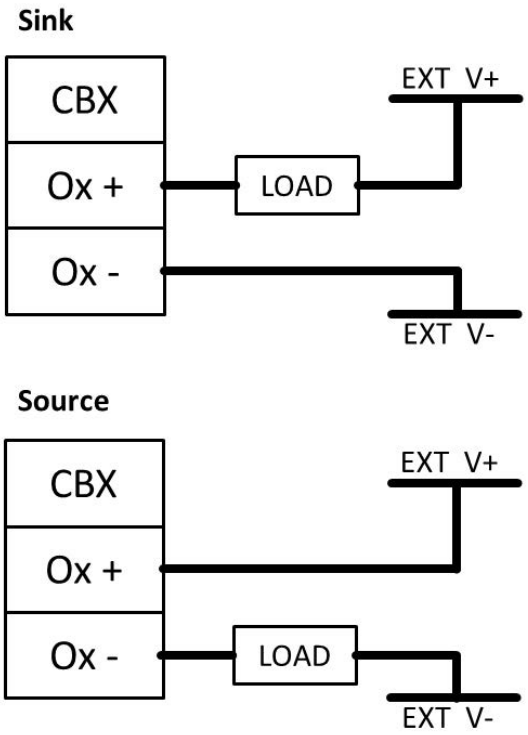
The CBX100 includes an OUTPUTS block for wiring relays as needed for external accessories. e-Genius Modify | Relays window includes options for outputs 1 and 2 including Life Light, Trigger Output, Error Light, Ready Light, Good Dim, and No Dim.

Schematics for Isolated and Non-Isolated relays are provided below.

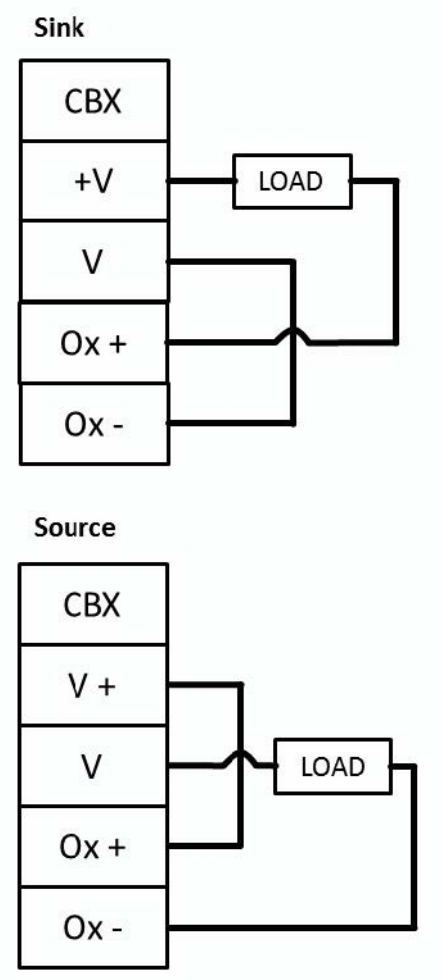
Outputs 1 and 2
Maximum Voltage 30V
Collector Current (pulse) 130 mA Max.
Collector Current (continuous) 40 mA Max.
Saturation Voltage (VCE) 1 V at 10 mA Max.
Max Power Dissipation 90 mW at 50 degrees C (Ambient temperature)



Unpowered Outputs



Powered Outputs



GROUNDING

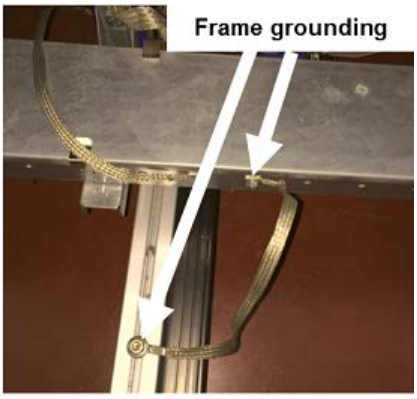
To avoid any problems with electrical noise that could negatively affect system function, make sure that:

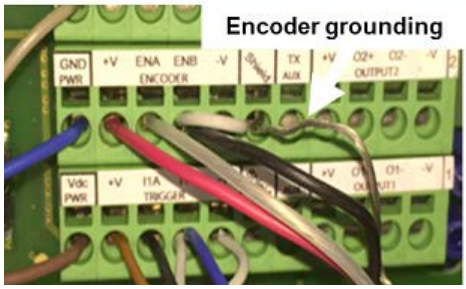
1. The AC power cable coming into the PWR box is always provided with a Ground and connected to the proper connector (Protective Earth - PE).

2. The structure where the readers, controllers, encoders/tachometers, and photo-electric sensors are mounted is grounded to the conveyor or to the PE terminal inside the PWR.

3. The Shield wires from the Encoder/Tachometer and photoelectric sensor cables are connected to the proper *Shield* terminal in the CBX box.

4. Normally, steps 1 through 3 will guarantee proper function. In case of problems such as transmission of strange or wrong characters, devices stop working without any reason, or other unexpected behavior, try connecting the CBX or Controller Earth terminal to the PE terminal inside the PWR box.





CHECK M830/930 INSTALLATION

After completing the installation, confirm that the M830/930 reader(s) and CBX connection box have been properly installed mechanically and electrically. Use the Installation Sequence at the beginning of this chapter and your application specifications to check your installation.

CHAPTER 4
FIRST-TIME STARTUP

On initial power-up, the M830 / 930 Camera performs a series of self-diagnostic and LED tests. When the **STATUS** LED turns a steady green the power-up sequence is complete, and the camera is operational.

NOTE: Before connecting the camera to the tunnel, make sure it is in default status. If you have any doubts about its status, please run the "Reset all parameters" procedure (see "Resetting the Camera to Factory Default" on page 137**) before connecting it to the tunnel.**

WHAT YOU WILL NEED

NOTE: The list below includes all tools required for the various procedures described in Chapter 5, Focusing device Setup **and** Chapter 6, Calibration**. Not all tools are needed for every step; specific tools apply only to the relevant sections.**

- Application Drawing (for structure, camera, mirror, sensor and focusing device positioning)
- Application Specifications
- Laptop PC
- Tape Measure
- Sync Ethernet Cable Adapter
- Installation Kit (Test Boxes) (included with M830 / 930 Camera)
- Dynamic Focus Target (included with M830 / 930 Camera)
- Picket Fence/Step Ladder Test Chart

REVIEW MOUNTING DRAWING AND APPLICATION SPECIFICATIONS

Make sure all equipment is mounted correctly based on the application drawings and specifications.

Photoelectric Sensor (if applicable) - Mount the photoelectric sensor according to the application drawing, and with the following recommendations:

- Make sure the Photoelectric Sensor (PS) is square to the conveyor
- Make sure the PS is high enough off of the conveyor surface that it will not get false triggers from any part of the conveyor
- Make sure the PS is aligned properly to the reflector. (In a sender receiver application, make sure the two components are aligned correctly)
- Make sure the PS is positioned correctly upstream from the nearest point of the camera view area.
- If using any one of the additional focusing devices, see“Focusing device Setup” on page 79.

E-GENIUS CONNECTION

e-Genius is the camera web interface to help you easily and efficiently setup for operation.

The e-Genius interface is accessible via the Eth2 Host or Eth3 Ethernet ports using any web browser as explained in the manual.

The first time you connect to a camera these ports will have a default address:

ETH2 HOST -192.168.3.10

ETH3 - 10.0.40.20

The default user and password are:

Default User ID: setup (case sensitive)

Default Password: DLAset (case sensitive)

NOTE: Your PC’s IP address needs to match the camera system’s IP Address range. See e-Genius Online help for information on connecting a laptop to the system. The Host and Image port IP addresses may have been changed for your application. Contact your system administrator for changes.

SOFTWARE UPDATE

Before starting, a camera SW update is usually suggested. This must only be done by, or under the guidance of, a trained Datalogic technician using e-Genius.

NOTE: DO NOT use a parameter file from any previous installations.

CHAPTER 5
FOCUSING DEVICE SETUP

The M830 / 930 Camera focusing position is computed by the camera based on the position of the parcel triggered and/or measured by a focusing device.

This section provides detailed procedures on the necessary focusing devices installed for your system:

- Range Sensor. "Setting up The Range Sensor" on page 80
- DM3610. "Setting Up the DM3610 Dimensioner" on page 82
- DS2 Light Curtain. "Setting Up the DS2 Light Curtain" on page 92
- S85. "Setting Up the S85 Distance Sensor" on page 93

For more information on the devices' characteristics see "Focusing Devices" on page 11.

WARNING: The procedures outlined in this chapter should only be performed by a Datalogic trained technician. For further information on training, contact us through the Datalogic website at www.datalogic.com.

SETTING UP THE RANGE SENSOR

The Range Sensor provides focus data for Datalogic cameras and can be used to detect the presence of products as they enter the scanning area.

Make sure the Range Sensor is mounted at the correct height and centered on the conveyor belt.

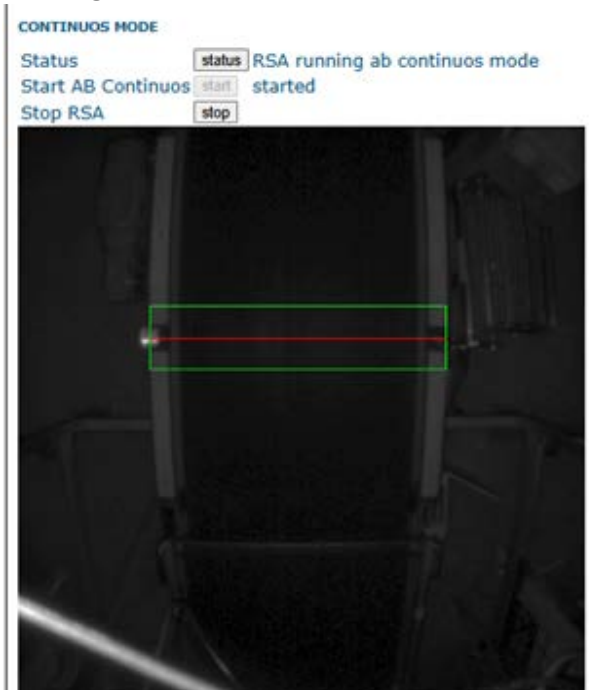
The setup is done connecting directly the camera to the Range Sensor via the Ethernet port and using the e-Genius web interface.

The default IP address is 192.168.3.100

Follow these steps to setup the Range Sensor:

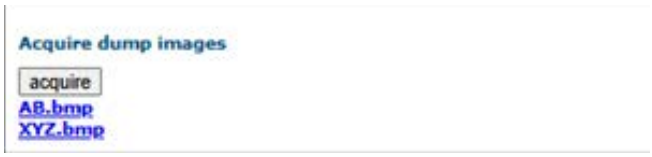
1. Connect a cable from your PC to the Range Sensor Ethernet port and run the e-Genius interface. Then select the “Modify Settings/Status” page to display the following:

2. Go to the calibration page by clicking on the Go to Calibration page button or by selecting “Utilities/Calibration” in the menu.



3. Stop the RS.

4. Start the “AB Continuous” mode. The displayed image should show the conveyor surface. In this mode, Brightness and Depth images can also be acquired and downloaded.



NOTE: To ensure the best calibration results:

- the conveyor must be clear of objects that might disturb the auto-calibration procedure.

- the borders of the conveyor near the orthogonal line must not contain asymmetric elements (oblique rails, holes, etc.).

5. Stop the RS.

6. Start the calibration by clicking "Run calibration run " button. The calibration requires about 10 seconds. After calibration is completed, a red line in the picture will show the measurement line on the conveyor from one conveyor border to the other. The green square shows the area processed at runtime. The interface will also show the sensor distance Z from the conveyor and min/max X of the range (X=0 is the center of the conveyor).

7. Reboot the system by selecting the "Utilities/Upgrade" page and clicking on the reboot button. The system will be up and running in about 30 seconds.

8. Disconnect the Ethernet cable as it is not necessary at runtime.

SETTING UP THE DM3610 DIMENSIONER

The **DM3610 Dimensioner** is used to detect the presence of products and report the package position, heights and sequence number to all cameras in the system as parcels enter the scanning area.

DM3610 Dimensioners provide focus data for Datalogic cameras, such as M830/930, AV7000, AV500/900.

Refer to the **DM3610 Dimensioner Reference Manual** (or Two-Head Dimensioner Reference Manual) for complete information on installation and calibration of the DM3610. It is available for download from www.datalogic.com.

NOTE: For single Dimensioner applications, the DM3610 must be running software version 1.8.11 or greater. For multi-head applications, the DM3610's must be running 1.8.1 and the DC3000 must be version 1.3.60 or greater.

The Dimensioner scan line must be installed at least 500 mm [20 in] upstream from the nearest camera scan line.

The examples used in this guide use Imperial units i.e. inches. If the system is configured for metric, the unit of measure will be in mm.

Remember to reset these parameters to the application specifications after the calibration is complete.

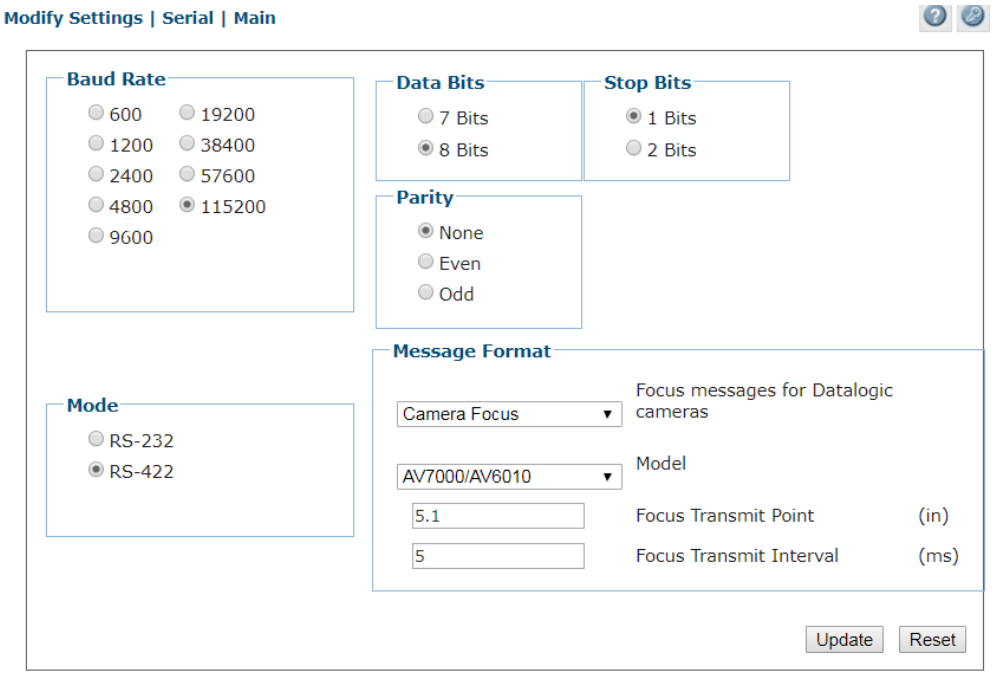
Also **see e-Genius Online help**.

Preparation

Before beginning the DM3610 focusing process, a few preliminary settings are required.

NOTE: When working with a multi-head Dimensioning system, the focus setup steps apply to the unit designated as the "Tach Master" by the DC3000.

1. In the DM3610 e-Genius under **Modify Settings**, navigate to **Serial | Main** or **Aux** depending on the port wired to the M830/M930 (typically **Main,** consult your application interconnect diagrams for details). The **Serial | Main** window opens.



2. Make sure the selected **Baud Rate** matches that of the M830/M930 (uses the main port, RS485 (RS422), at 115200).

3. Under **Message Format**, select **Camera Focus** from the **Focus messages for Datalogic cameras** drop-down list.

4. Select the **Model** of camera for which you are focusing.

5. Enter the **Focus Transmit Point**. This is the distance the DM3610 waits until after the M830/M930 scan line has read, to transmit the message. This value correlates to a value in the M830/M930 settings. Default is 8 inches.

6. **Leave at the default unless otherwise instructed!** Enter the **Focus Transmit Interval**. This is the amount of milliseconds between data transmissions. It defines the frequency of the data transmissions from the DM3610(s).

7. Click **Update** to save the changes.

8. The distance between the far working distances of the cameras is considered the "Conveyor Width" and must also be entered in the **Conveyor Width** field in M830/M930 **Global Settings | Operating Mode.**

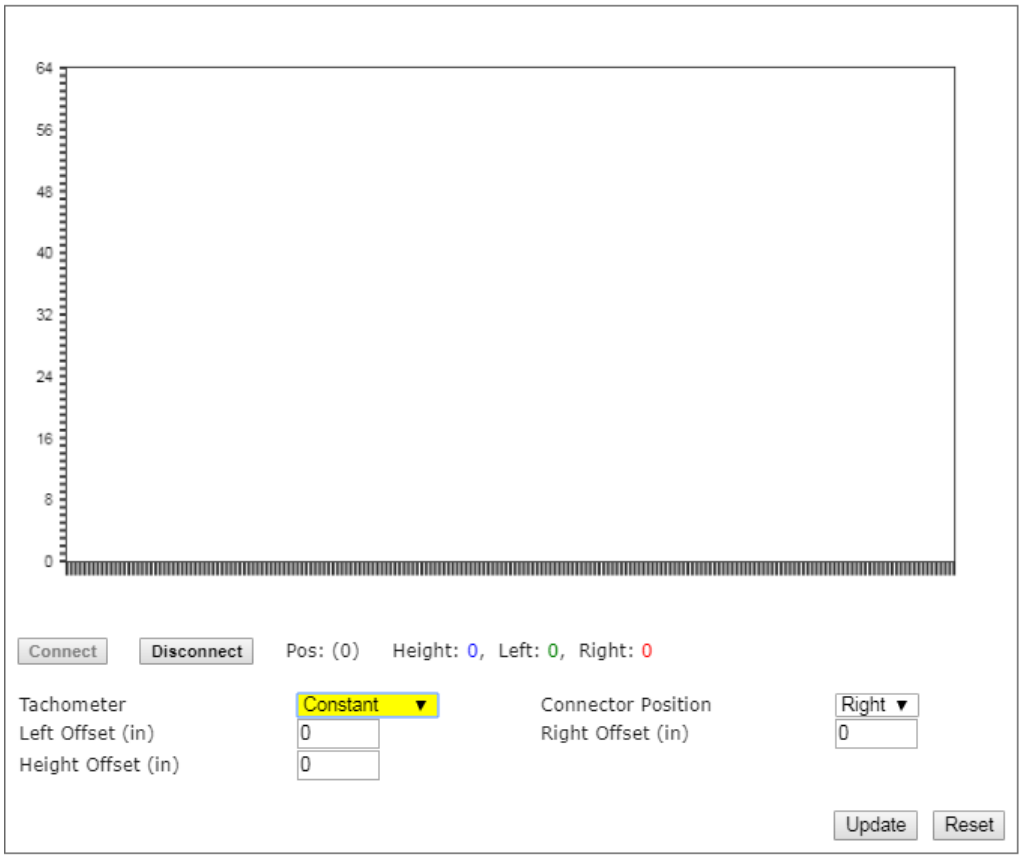
Understanding DM3610 Focusing and M830/M930 System Orientation

The goal of this focusing process is to correlate the DM3610 zero reference points to the far working distances of the cameras.

The DM3610 Left and Right Offsets will focus the DM3610 at the **Far Working Distances (Left and Right)** of the side M830/M930 cameras. These values are not necessarily the same. M830/M930 Reference the system application drawings for the exact prescribed Far Working Distances of each camera.

1. Navigate to **Diagnostics | Focus Setup**. The **Focus Setup** window opens,

NOTE: If you navigate away from the Focus Setup page, the Constant Tach setting will automatically reset to Hardware Tach. M830/M930. Reset it, to continue the focus setup process.



2. From the **Tachometer** drop-down list, select **Constant**.
3. Verify that the values displayed for **Left Offset, Right Offset,** and **Height Offset** are all set to 0.
4. Referencing the direction of conveyor travel, view the Dimensioner from an upstream position. Determine if the connectors located on the side of the unit face left or right, see the image below.

5. From the **Connector Position** drop-down, select **Left** or **Right**.
6. Click **Update** to save the changes.

WARNING: When working with a DC3000 multi-head system, you must select a focus data source on the DC3000 Tach/Trigger/Transmit page. In applications involving side read cameras, select Head 1 and Head 2. For top read only applications, selecting a single head will suffice.

Adjusting DM3610 Left Focus Offset

1. Position a test box with a known width in the dimensioner line(s) so the side of the box is at the RIGHT side M830/M930 far working distance as specified by the application's installation drawing. In this example we will be using a box with a 3" width.

WARNING: When working with a DC3000 multi-head system, the text box must intercept all dimensioning lines

NOTE: When working with a DC3000 based Dimensioning system, please allow time for the constant tach signal to synchronize between the Master and Slave units.

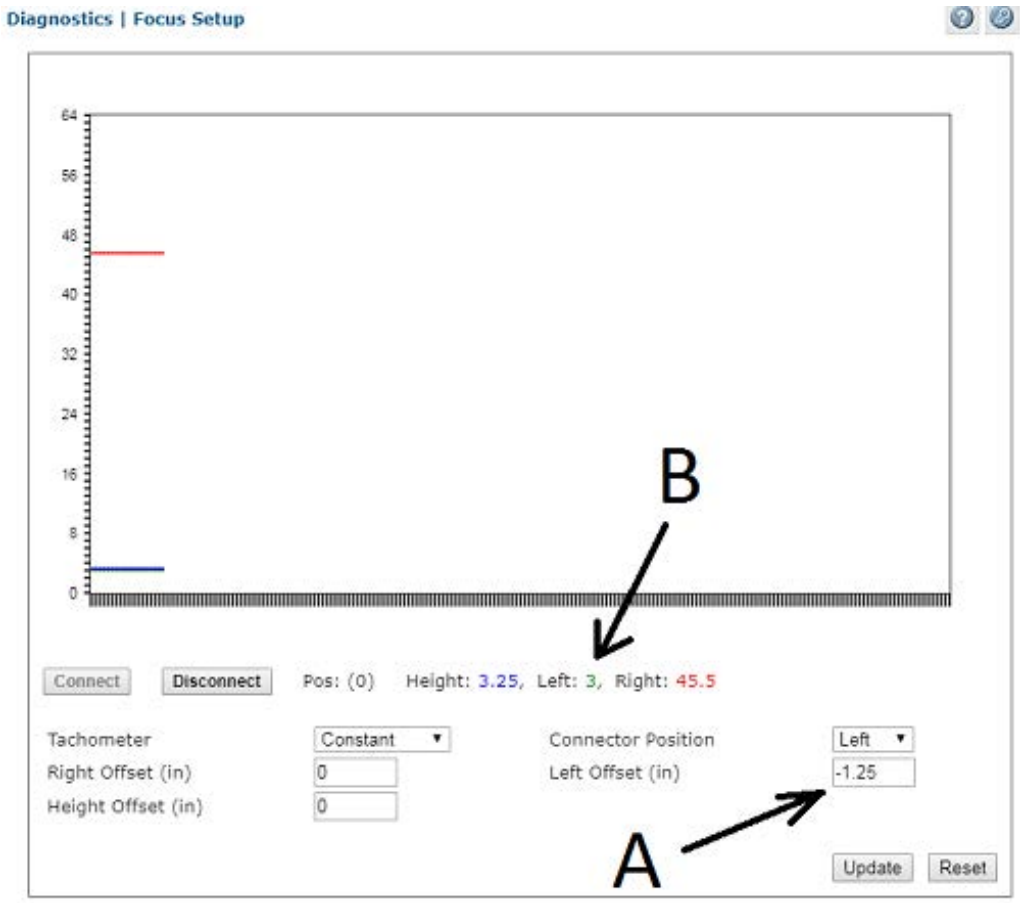
2. In the menu tree under **Diagnostics**, click **Focus Setup**. The **Focus Setup** Windows opens.

3. View the displayed data and determine what the left value is. In the displayed example above, the value is 4.25".

4. Subtract the width of the test box, in our example it is 3", from the value displayed for Left.

   4.25 – 3 = 1.25

5. Enter the result as a NEGATIVE value in the Left Offset field. In this case you will enter -1.25.



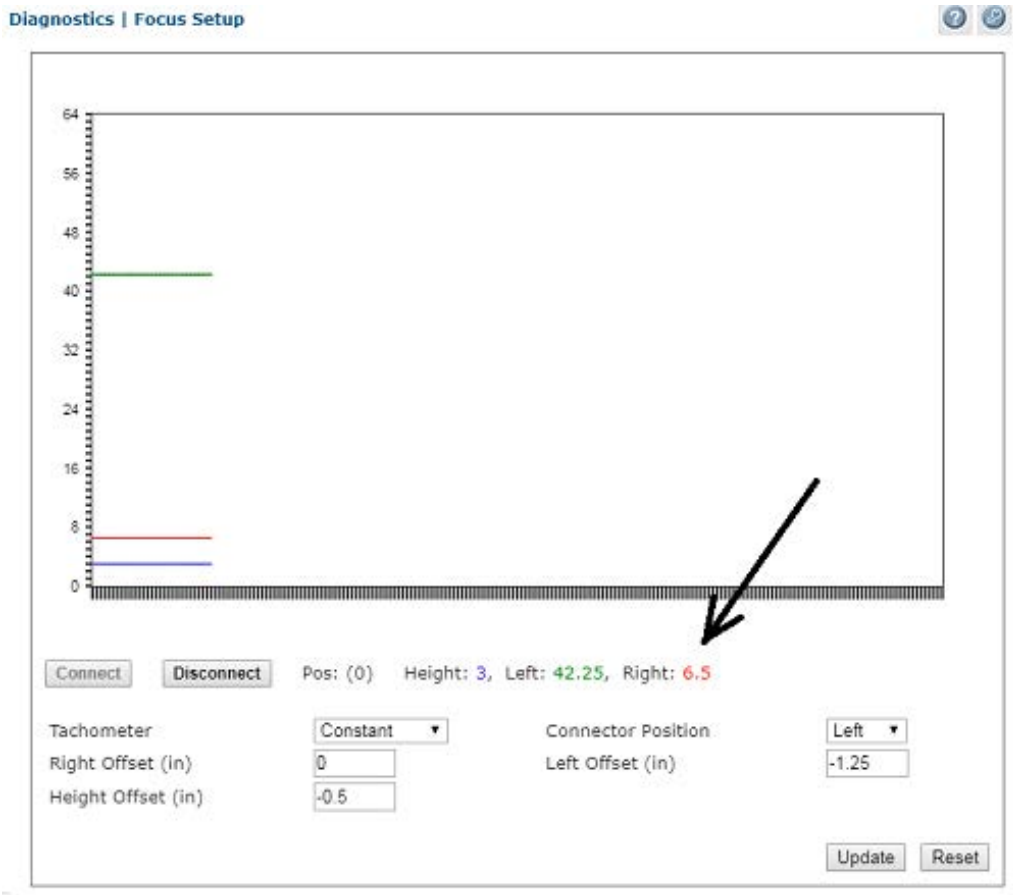
6. The position value displayed for the Left is now 3.
7. Click **Update** to save your changes.

Adjusting Right Focus Offset

NOTE: When working with a DC3000 multi-head based Dimensioning system, the text box must intercept all dimensioning lines.

1. Position the test box with a known width in the dimensioning line so the LEFT side of the box is at the RIGHT far working distance as specified by the application installation drawing.

2. View the displayed data and determine what the **RIGHT** value is. In our example the value is 6.5”.



3. Subtract the width of the test box from the value displayed for RIGHT.

   6.5 – 3 = 3.5

4. Enter the result into the RIGHT OFFSET field as a negative value, in our example it is -3.5.

5. Note the position value displayed for RIGHT is now 3.

6. Click **Update** to save the changes.
7. Test the system by inducting a series of application objects and bar codes. Use the M830/M930 imaging utility to verify that the cameras are focusing properly over the width and height of the conveyor.
8. Under **Tachometer**, select **Hardware/External** from the **Tach Source** drop-down list.
9. Click **Update**.

Adjusting Height Offset

NOTE: When working with a DC3000 multi-head based Dimensioning system, the text box must intercept all dimensioning lines.

1. Place the same test box in the center of the dimensioning line so the known distance side is facing up.

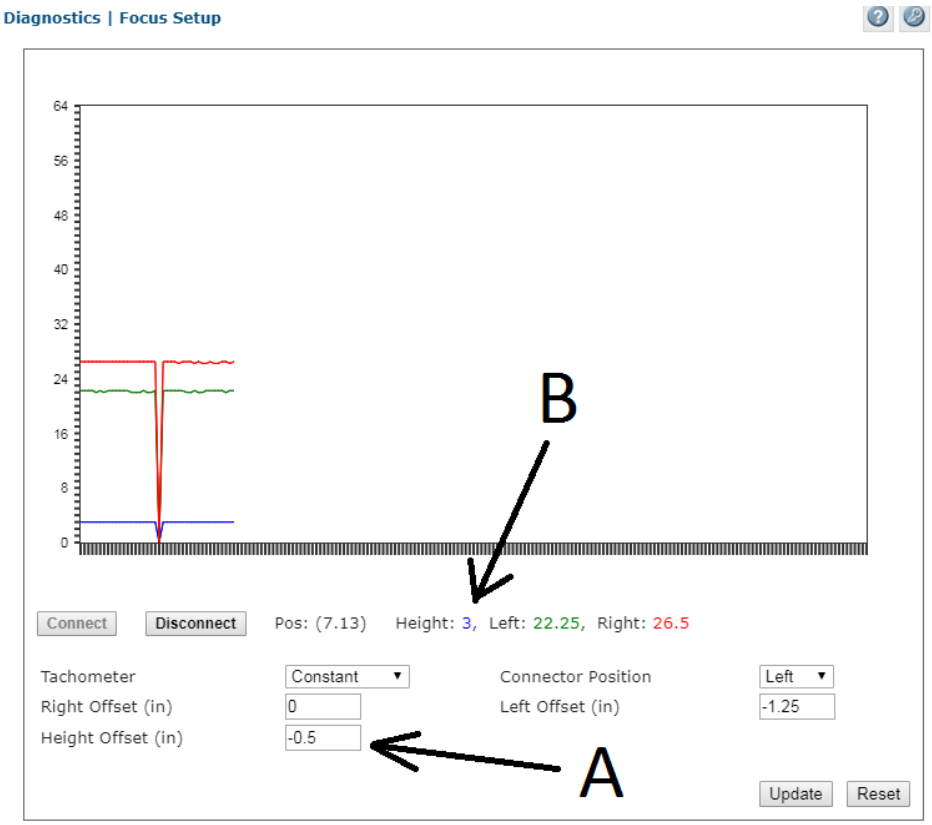
2. Determine the Height value as displayed by the DM3610. In the image below the 3” test box displays a height of 3.5.

3. Subtract the test box height from the displayed height.

3.5 – 3 = 0.5

4. Enter the result as a NEGATIVE value in the Height Offset field. In this case you will enter -.5.

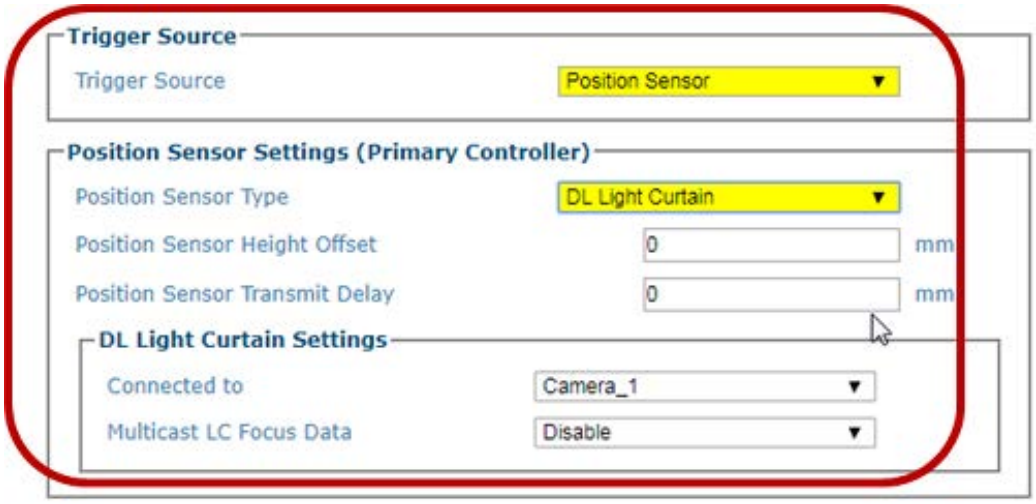
5. The Height Offset is now reflected in the Height value.



6. Click **Update** to save your changes.
7. Click on the **"Tachometer"** pull down menu and select "Hardware", then click "Update".
8. Test the system by induct a series of application objects and barcodes.
9. Use the M830/M930 imaging utility to verify that the cameras are focusing properly over the width and height of the conveyor.

SETTING UP THE DS2 LIGHT CURTAIN

Reference the DS2 Instruction Manual available at www.datalogic.com for complete information on connecting and aligning the Light Curtain. Make the following selections in the M830/M930 e-Genius application Operating Mode.



Make sure to connect the correct Light Curtain to the correct camera.

SETTING UP THE S85 DISTANCE SENSOR

Reference the S85 Instruction Manual available at www.datasensing.com for complete information on connecting and aligning the Distance Sensor

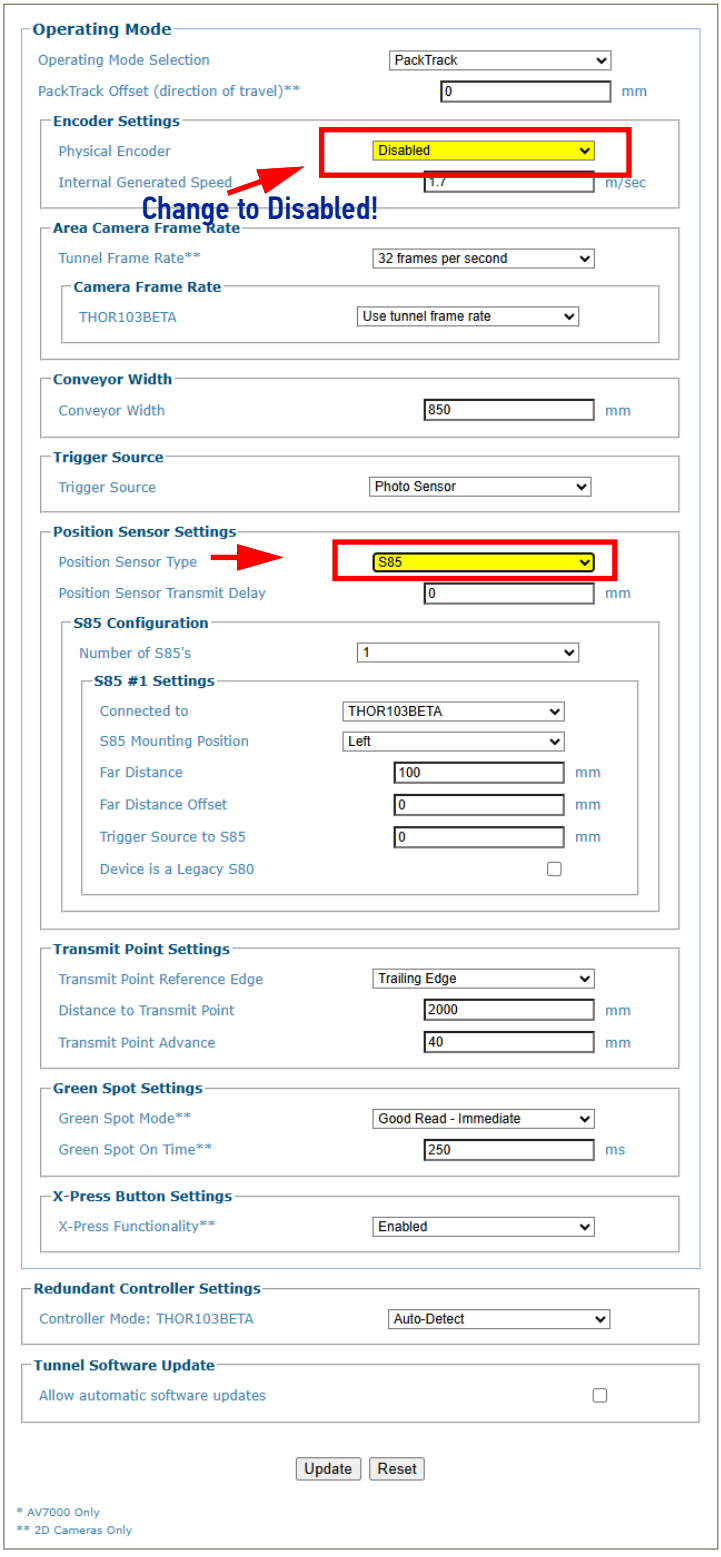
There may be more than one S85 used in the system. Normally for a side read camera two S85's may be used, one for each side read camera. Make the following selections in the M830/M930 e-Genius application Operating Mode.

You must first temporarily change the camera connected to the S85 to internal tach mode. This allows you to see the S85 input coming into the serial port of the camera when the conveyor belt is not moving.

To do this follow these steps:

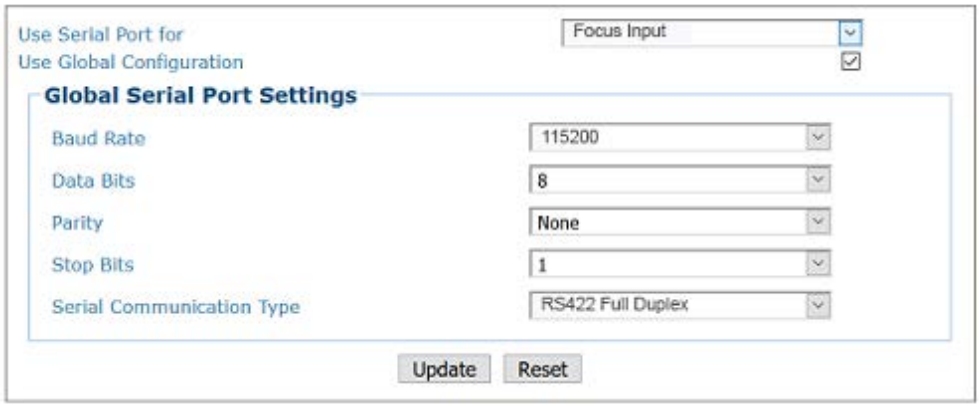
1. In the menu tree under **Modify Settings**, click **Operating Mode**. The **Operating Mode** window opens.

2. Under **Encoder Settings**, click **Disabled** at the **Physical Encoder** drop-down.



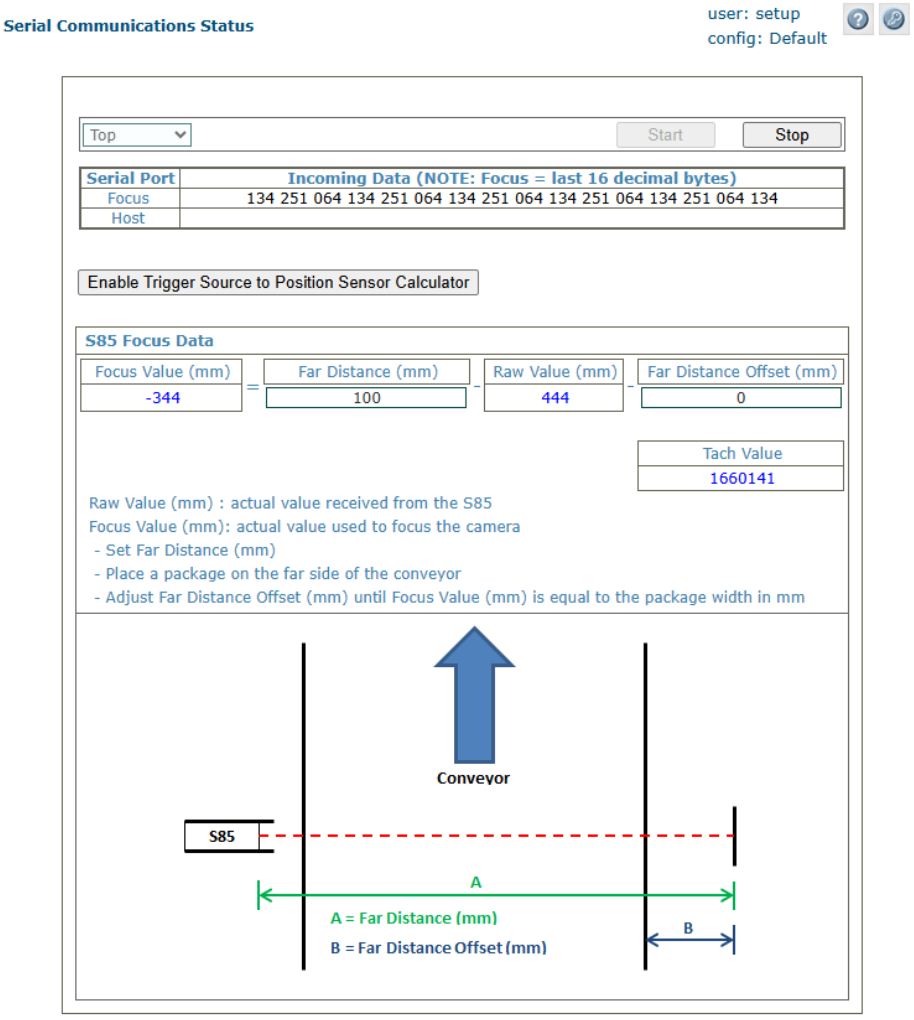
3. In the menu tree under **Device Settings**, click **Serial > Focus/Host Port**. The **Focus/Host Port** window opens.

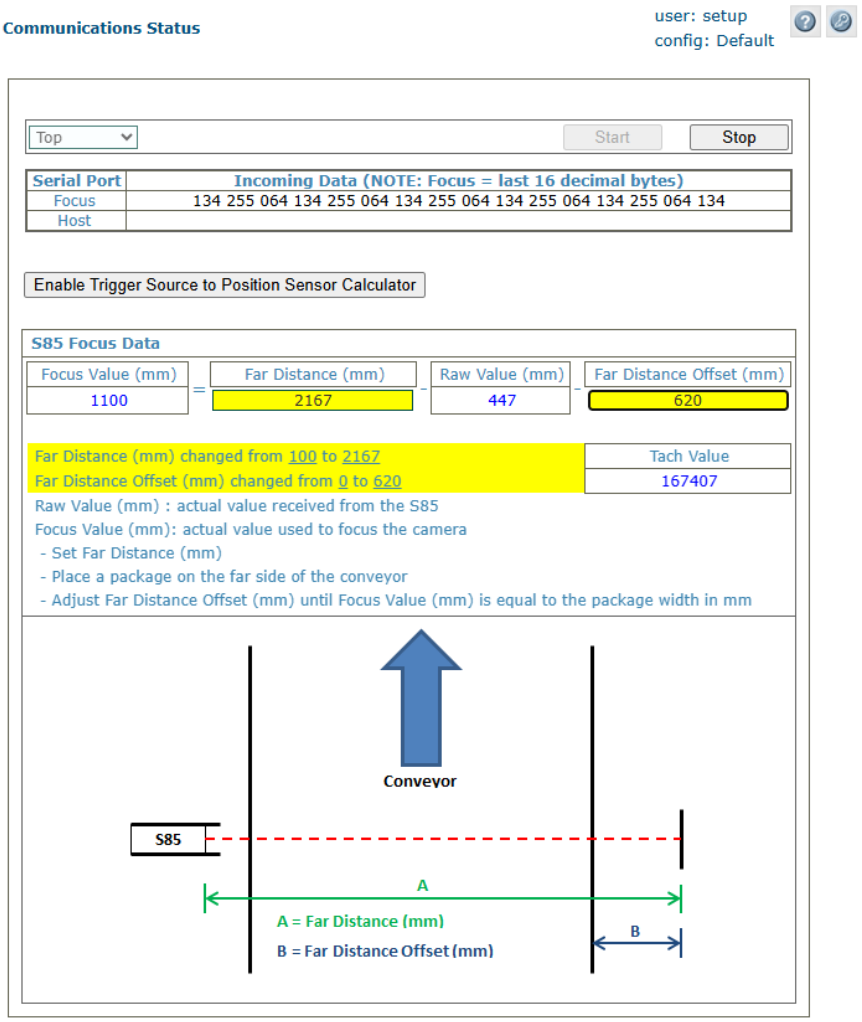
4. Set the **Focus/Host Port** parameters as shown below: This will need to be done for each camera an S85 is connected to.



5. Click **Update** to save your changes.

6. In the menu tree under **Diagnostics**, click **Serial Comm Status**. The **Serial Communications Status** window opens. Follow the steps described below (set the Far Distance displayed on the sensor and find Far Distance Offset).





7. Once you have determined the appropriate **Far Distance Offset**, go back to the **Operating Mode** window and enter it.

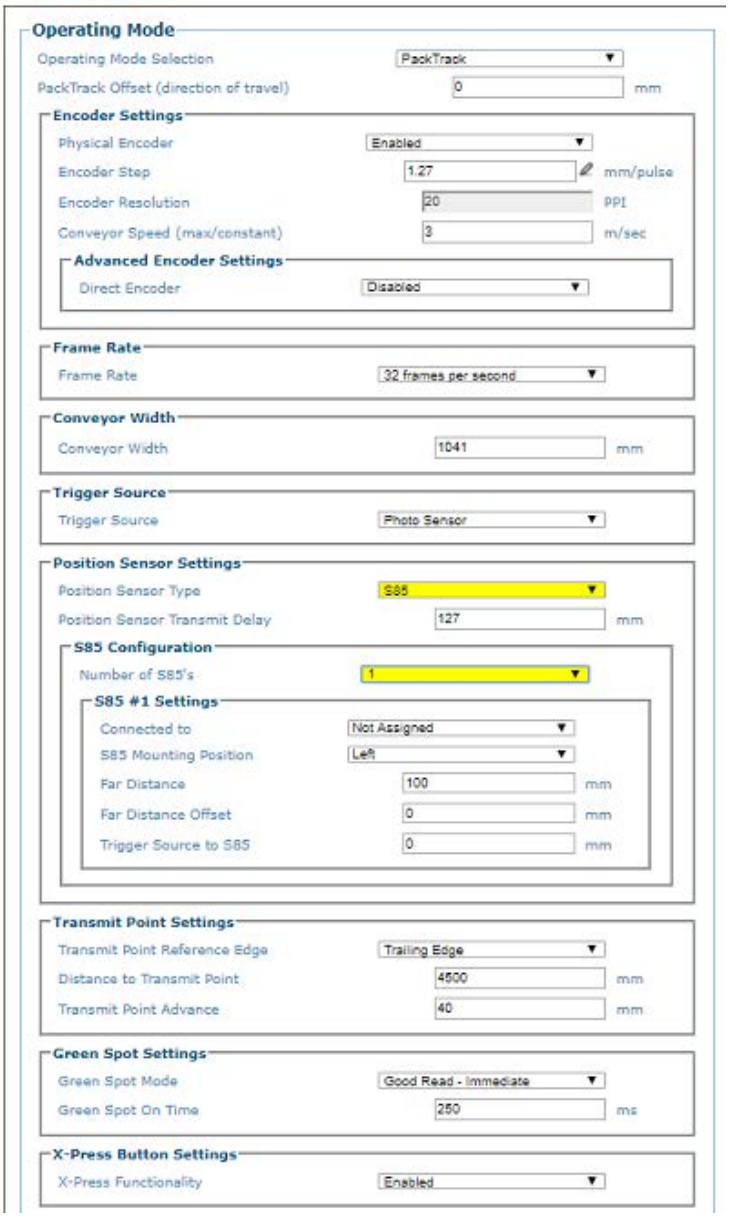
8. Re-enable your S85 and Click **Update** to save your changes.

Setup and Calibration

NOTE: Make sure to connect the correct S85 to the correct camera.

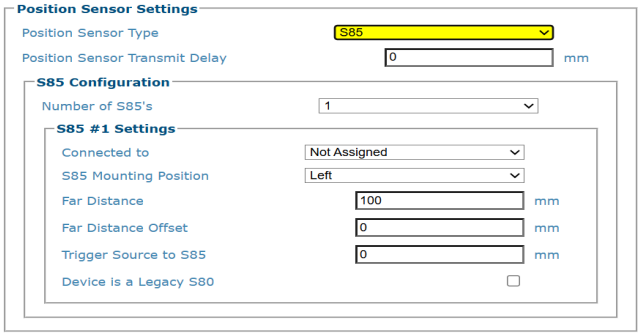
To calibrate the S85 Distance Sensors, follow these steps:

1. In e-Genius under Modify Settings, navigate to **Global Settings / Operating Mode.** The Operating Mode window opens.



2. Select the **Photo Sensor** as **Trigger Source** from the drop-down.

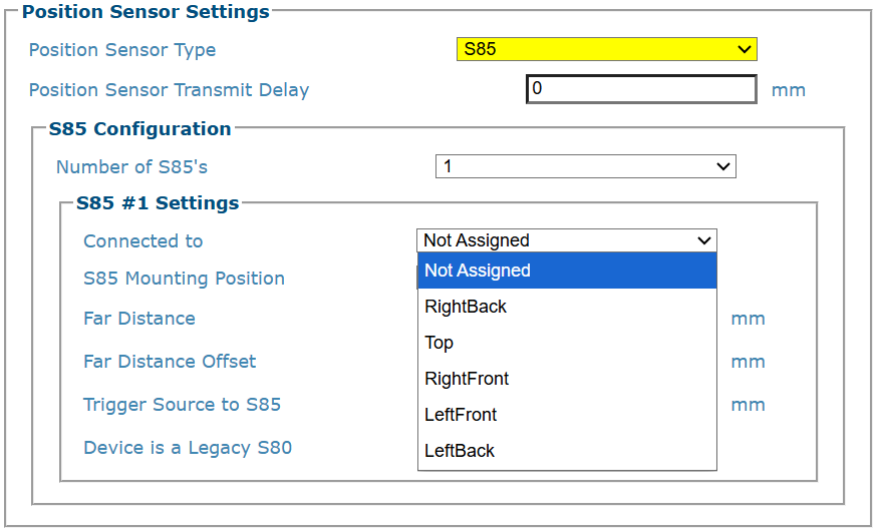
3. Select the **Position Sensor Type** from the drop-down. Select S85 or S85 with DL Light Curtain.



4. Enter the **Position Sensor Transmit Delay** as 0 mm.

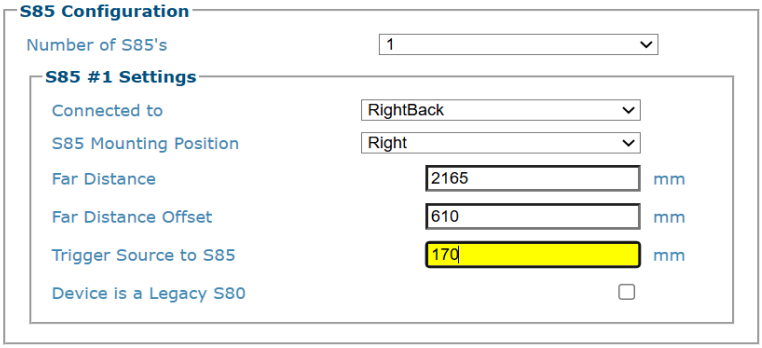
5. Select None or 1 from the **Number of S85's** drop-down.

6. For each S85 used, select the correct camera from the **Connected to** drop-down.



7. Measure the distance from the trigger source to the first S85.

8. Enter this value into the **Trigger Source to S85** field. In this example 170 has been entered.

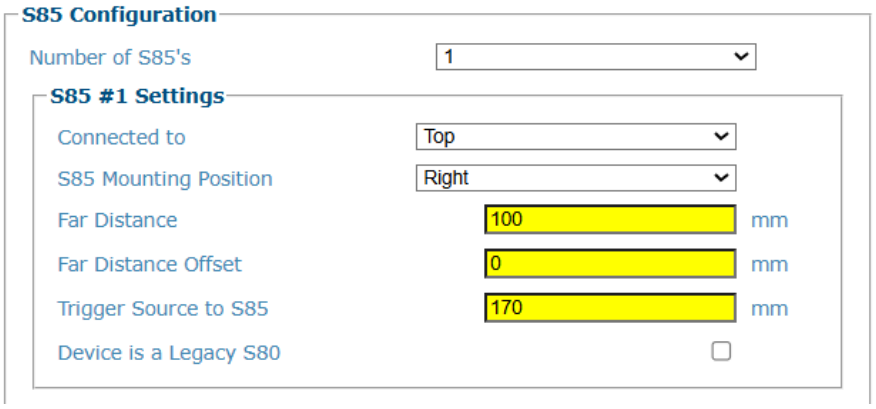


9. Click **Update** to save your changes.

10. In **e-Genius** under Diagnostics, navigate to **Serial Comm Status**. The Serial Communications Status window opens.

11. Determine the Far Distance (A).

12. Enter the displayed distance in the **Operating Mode > Far Distance** field. Click U**pdate** to save your changes.



13. Remove all objects from the conveyor belt and click the **Start** button.
14. Place an object of known width on the far edge of the conveyor and adjust the Far Distance Offset (B) until the focus value equals the object width.
15. To adjust the distance, press enter each time you make an adjustment.
16. Enter this displayed value in the **Operating Mode > Far Distance Offset** field.
17. Click **Update** to save your changes.

CHAPTER 6
CALIBRATION

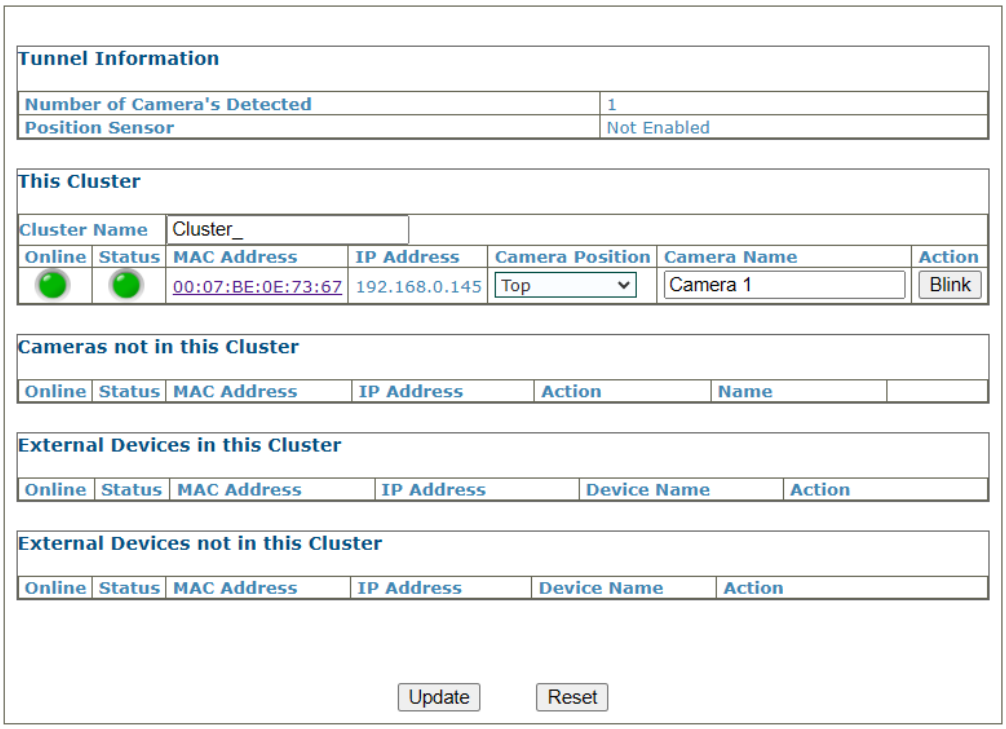
The M830 / 930 Camera can be set up as a single unit or with multiple units in a scanning array (tunnel). The camera system is a high-precision imaging system, and requires careful and accurate setup and calibration to function at its full potential.

E-GENIUS CALIBRATION PRESETS

Before physical calibration is begun, a few settings need to be confirmed or modified in e-Genius. Your PC's IP address needs to match the camera system's IP Address range. You must bring each camera into the network.

When power is applied to the cameras for the first time each camera will need to be brought into the network using e-Genius.

1. From the menu tree, navigate to the **Modify Settings | System Info.** The **System Info** Page opens.



2. From the **Action** drop-down list, select the **Add to Cluster as new.**

3. Click **Update** to add the camera to the **This Cluster** table.

4. Once each M830/930 has been added under **This Cluster,** its mounting positions will need to be identified. Click **Blink** in a camera's row in the table. That camera's illumination will light.

5. Once the camera has been identified, select its mounting position from the **Camera** Position drop-down list.

6. Click **Update** to save the configuration.

PackTrack Calibration

The following procedure is for **PackTrack Mode** only.

Operating Mode

In the menu tree under **Modify Settings**, navigate to **Global Settings | Operating Mode**. The Operating Mode window opens. See Online Help for more information. The following parameters must be set to match the application:

1. Navigate to **Encoder Step Settings: Modify Settings | Global Settings | Operating Mode > Encoder Step. Conveyor speed:** Enter the conveyor speed (Formula: Max conveyor speed x 1.05).

2. Make sure the Trigger Active State is set correctly. To test this, navigate to **Diagnostics | Device Tracking.** Run two boxes through the system. Confirm that the start and end trigger corresponds to the correct **Seq Number.**

3. Transmit Point Settings

4. Other Important Application Dependent Parameters:
   - **Modify Settings | Global Settings | Object Detection**
   - **Modify Settings | Global Settings | Barcode Settings**
   - **Modify Settings | Global Settings | Communications**
   - **Modify Settings | Global Settings | Output Format**
   - **Modify Settings | Global Settings | Image Saving**

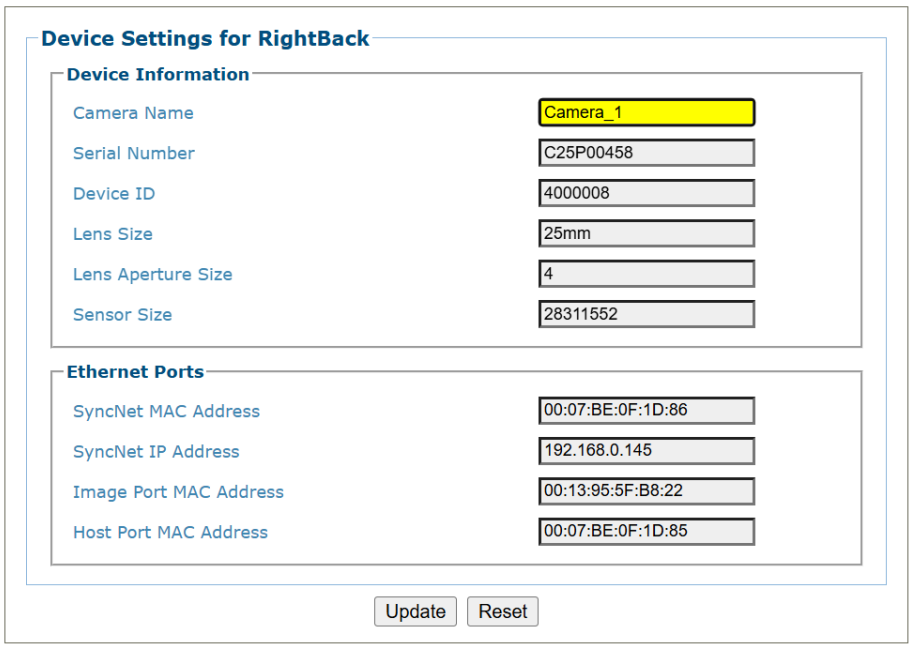
Device Settings

In the menu tree under **Modify Settings**, navigate to **Device Settings**. Since each camera is mounted separately, each M830/930 camera in a system must be calibrated separately.

There will be a different Device Settings branch in the menu tree for each camera in an array. See Online Help for an explanation of the Device Settings options.

1. In the menu tree, navigate to **Modify Settings | Device Settings | Camera N | Device Info**. The **Device Info** window opens.

2. Enter a unique name for the camera; such as top left, front right, etc. The new name will appear in the **Name** column on the **System Info** window, and also in the menu tree under **Device Settings.**



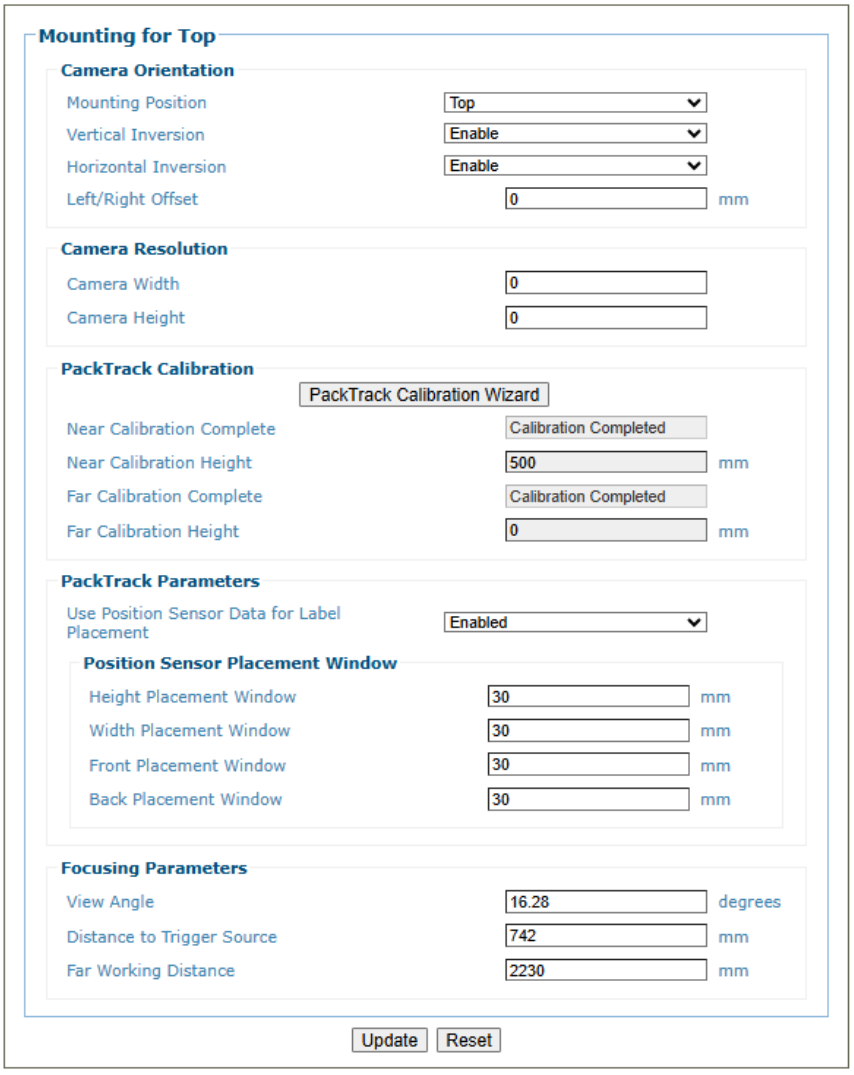
3. Click **Update** to save the new name. Repeat this for each camera in the system.

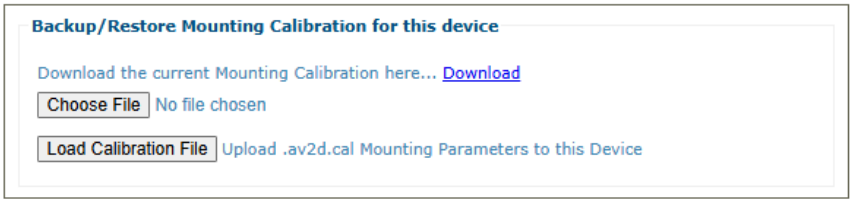
NOTE: If there are several cameras in your array, you may want to label them appropriately.

Static Calibration

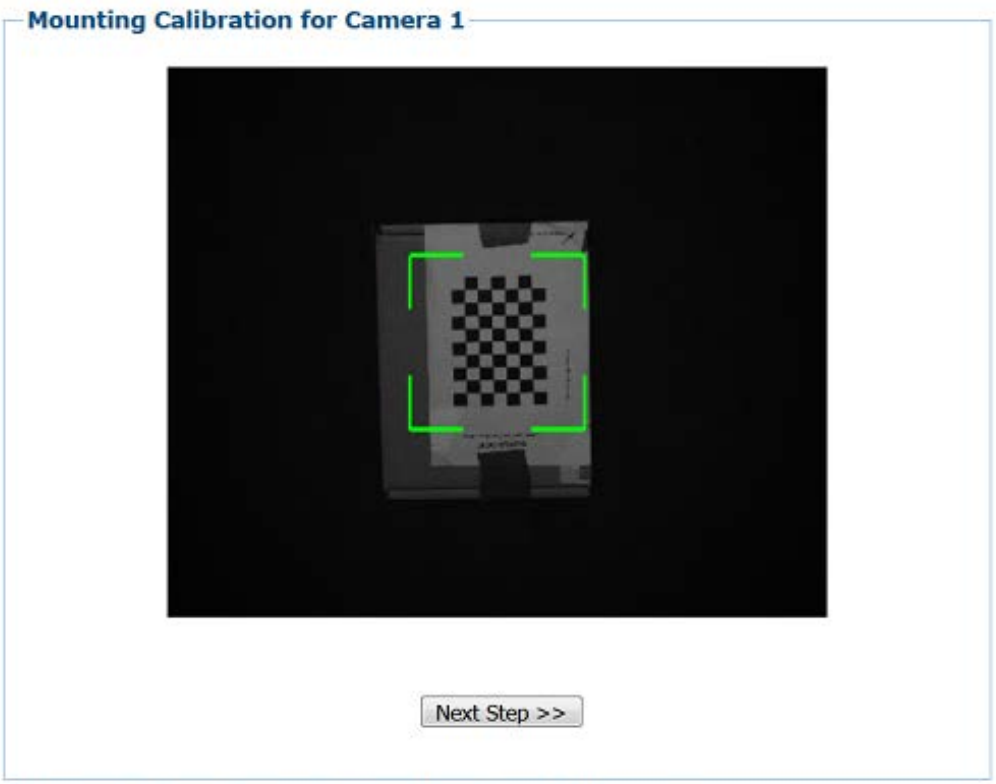
Static calibration is used to set up and calibrate the camera while the conveyor is sitting still.

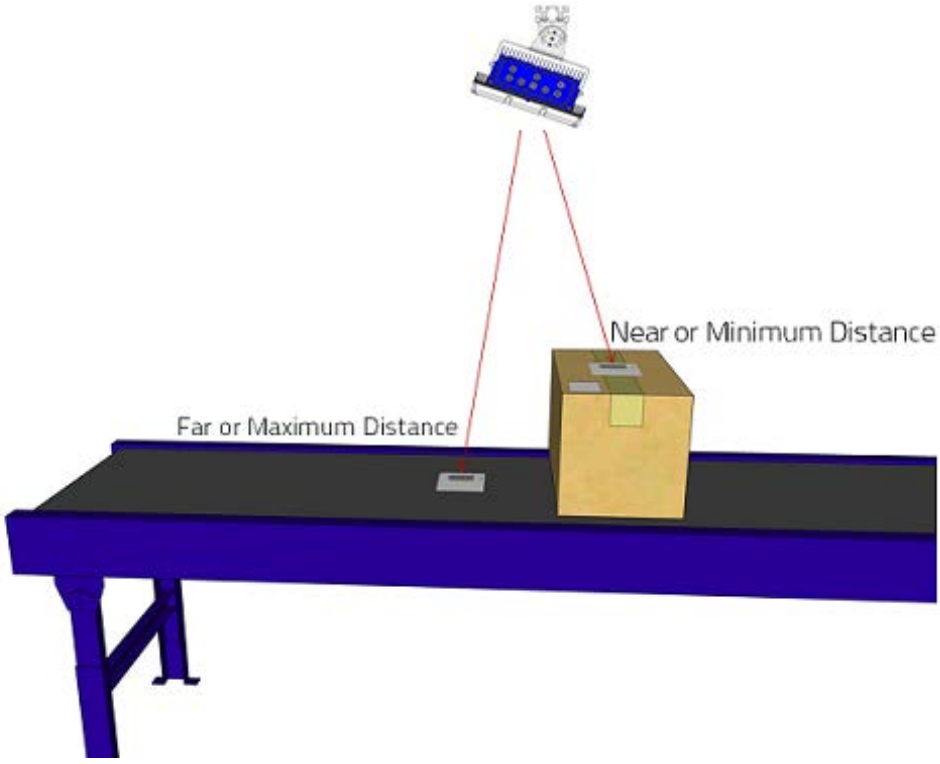
1. Navigate to **Modify Settings | Device Settings | Camera N | Mounting.** The **Mounting** window opens.



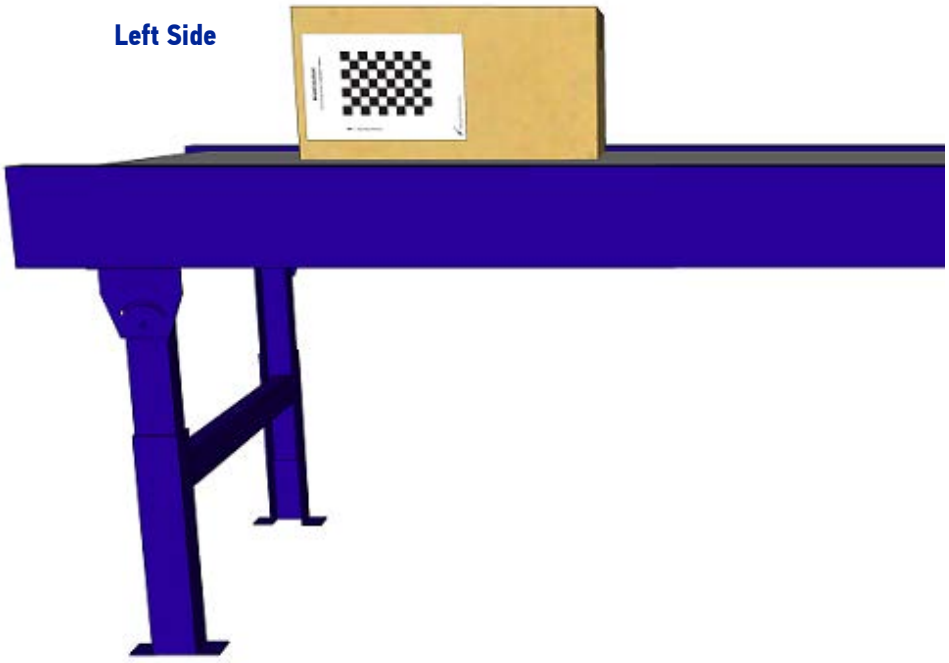


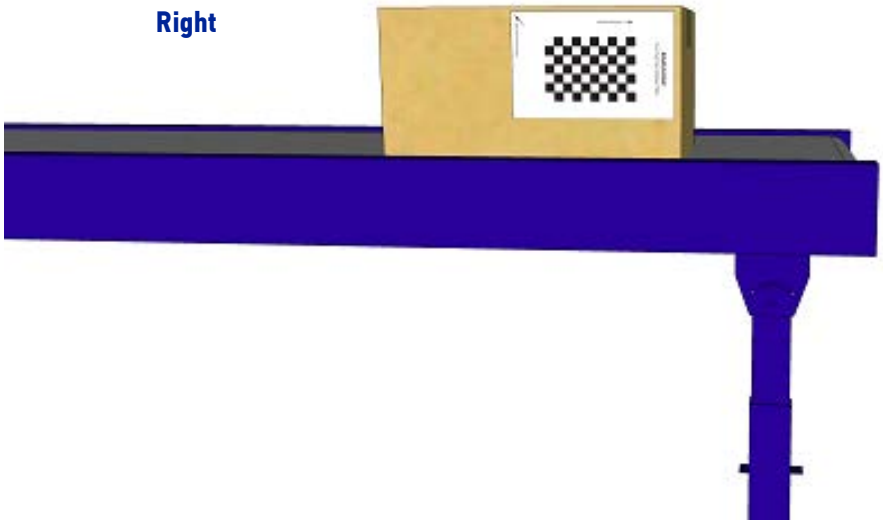
2. Click **PackTrack Calibration Wizard** button and Mounting Calibration for Camera n and **Step 1/5: Far Distance Calibration Target Alignment** appears.





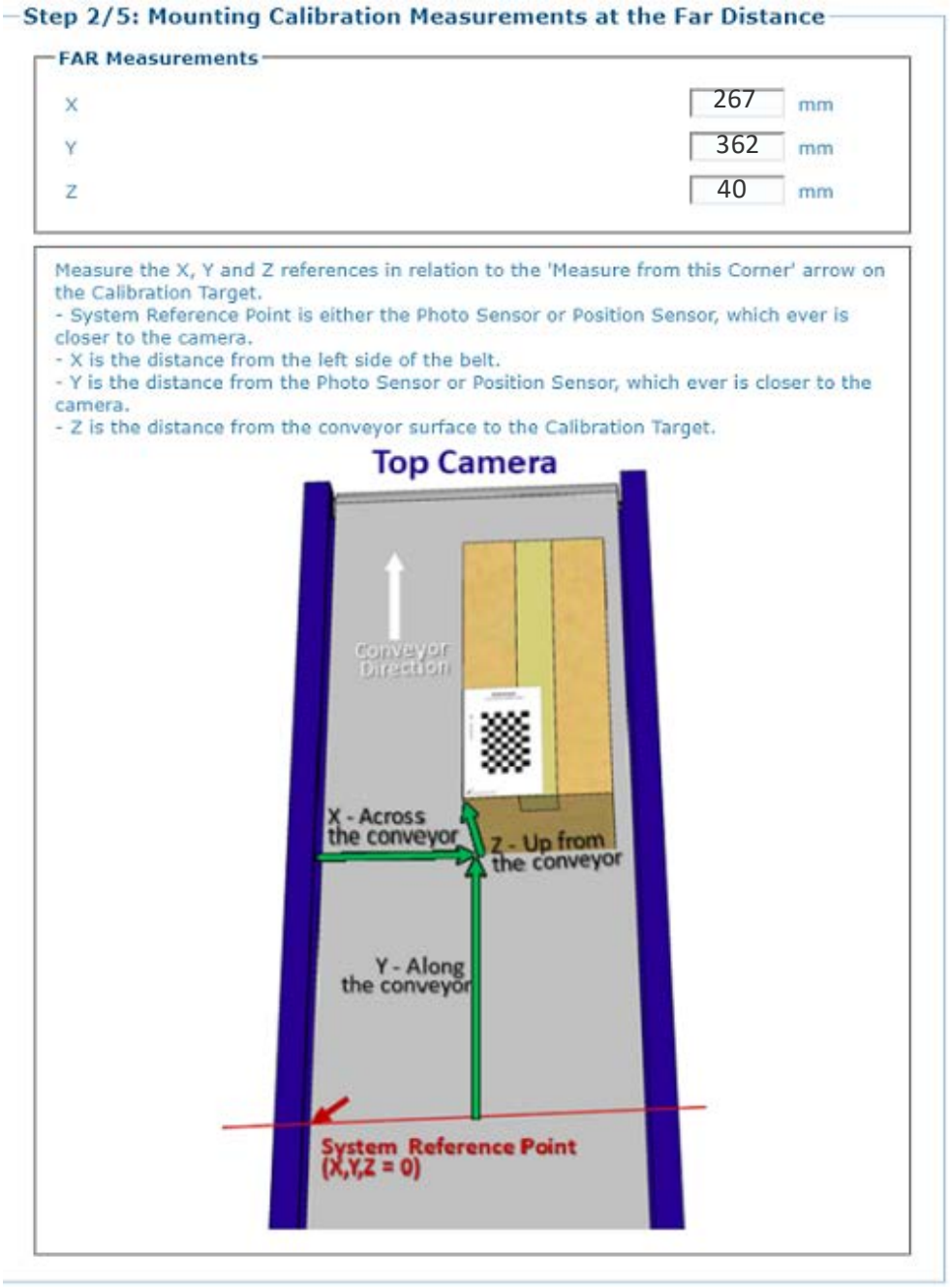
If you are calibrating side read cameras place your calibration target as show in the diagrams below.





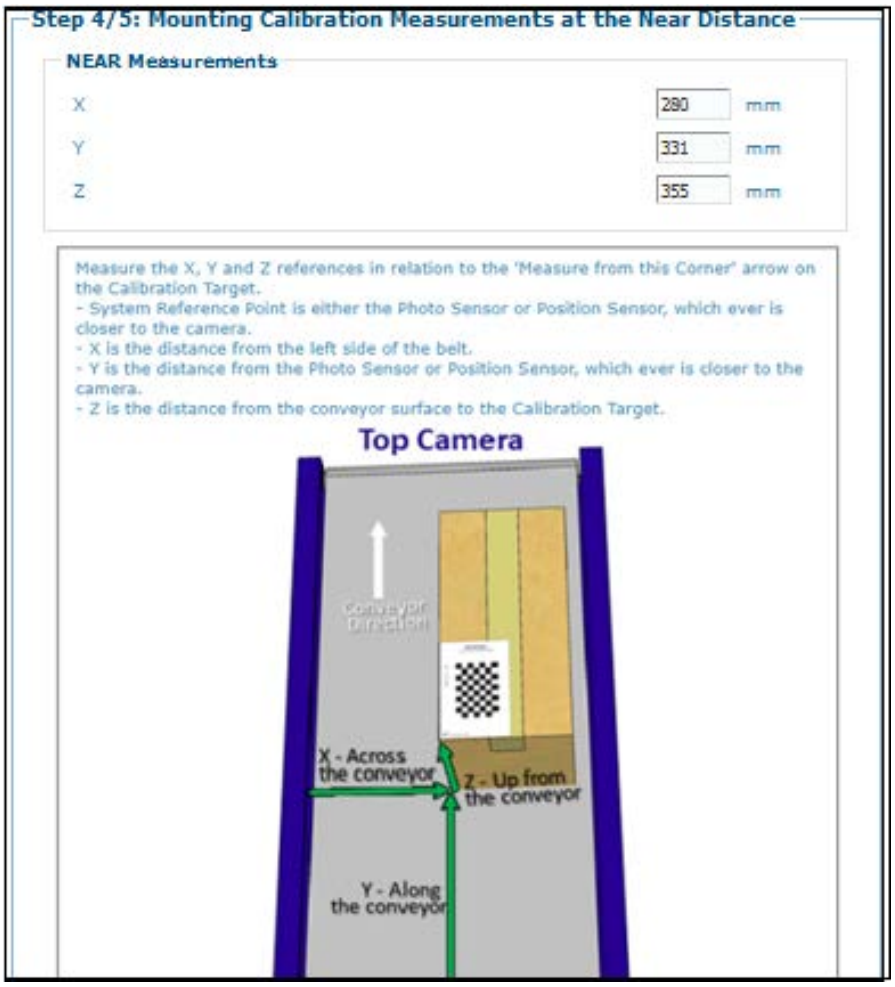
3. Place a calibration target at the maximum distance from the camera. Make sure the checker board grid is centered within the green alignment area. Make sure the Conveyor Direction arrow is pointing in the direction in which the conveyor is traveling. Leave the target under the camera and press **Next Step >>**.

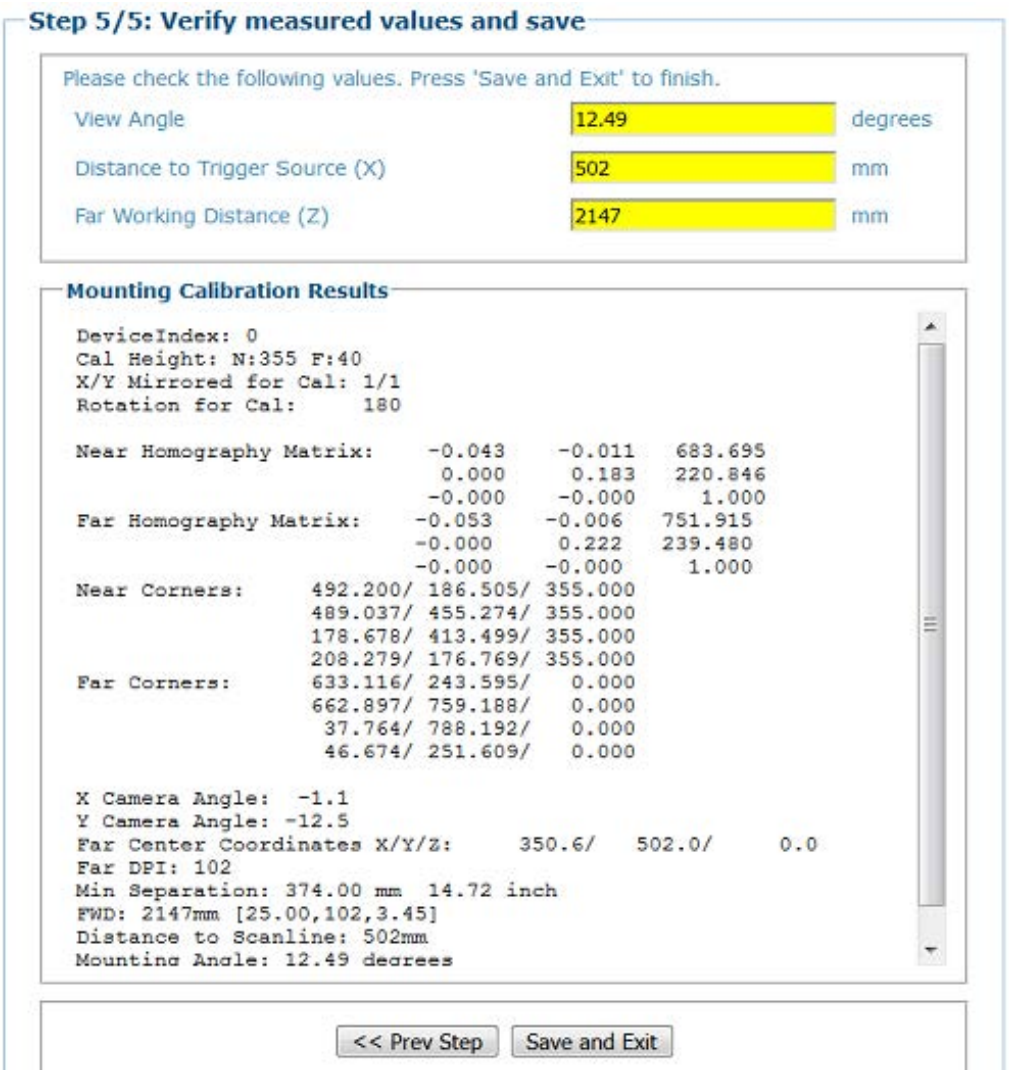
4. Step 2/5: **Mounting Calibration Measurements at the Far Distance** appears:



5. Measure the distance from the side of the belt to the Calibration Target.
6. Measure the distance from the Photoelectric Sensor or Position Sensor, whichever is closer to the camera, to the Calibration Target.
7. Measure the distance from the conveyor surface to the Calibration Target. Z=0
8. Enter those measurements into the Far Measurements fields.
9. Click **Next Steps >>.**
10. Step 3/5: Near Distance Calibration Target Alignment appears:

11. Place a target at the minimum distance and measure X, Y, and Z references
    - •X is the distance from the side of the belt to the Calibration Target.
    - •Y is the distance from the Photoelectric Sensor or Position Sensor, which ever is closer to the camera, to the Calibration Target.
    - •Z is the distance from the conveyor surface to the Calibration Target.
12. Enter those measurements into the Near Measurements fields.
13. Click **Next Steps >>.**


Step 4/5: Mounting Calibration Measurements at the Near Distance
NEAR Measurements
X
280
mm
Y
331
mm
Z
355
mm
Measure the X, Y and Z references in relation to the 'Measure from this Corner' arrow on the Calibration Target.
- System Reference Point is either the Photo Sensor or Position Sensor, which ever is closer to the camera.
- X is the distance from the left side of the belt.
- Y is the distance from the Photo Sensor or Position Sensor, which ever is closer to the camera.
- Z is the distance from the conveyor surface to the Calibration Target.
Top Camera
Conveyor Direction
X - Across the conveyor
Z - Up from the conveyor
Y - Along the conveyor



14. Check the values for far distance and near distance.
15. Click **Save** and **Exit** button.
16. Verify!

Online Calibration

The following procedure is for Online Mode.

Operating Mode

In the menu tree under **Modify Settings**, navigate to **Global Settings | Operating Mode**. The Operating Mode window opens. See the Online Help for an explanation of the Operating Mode options.

The following parameters must be set to match the application:

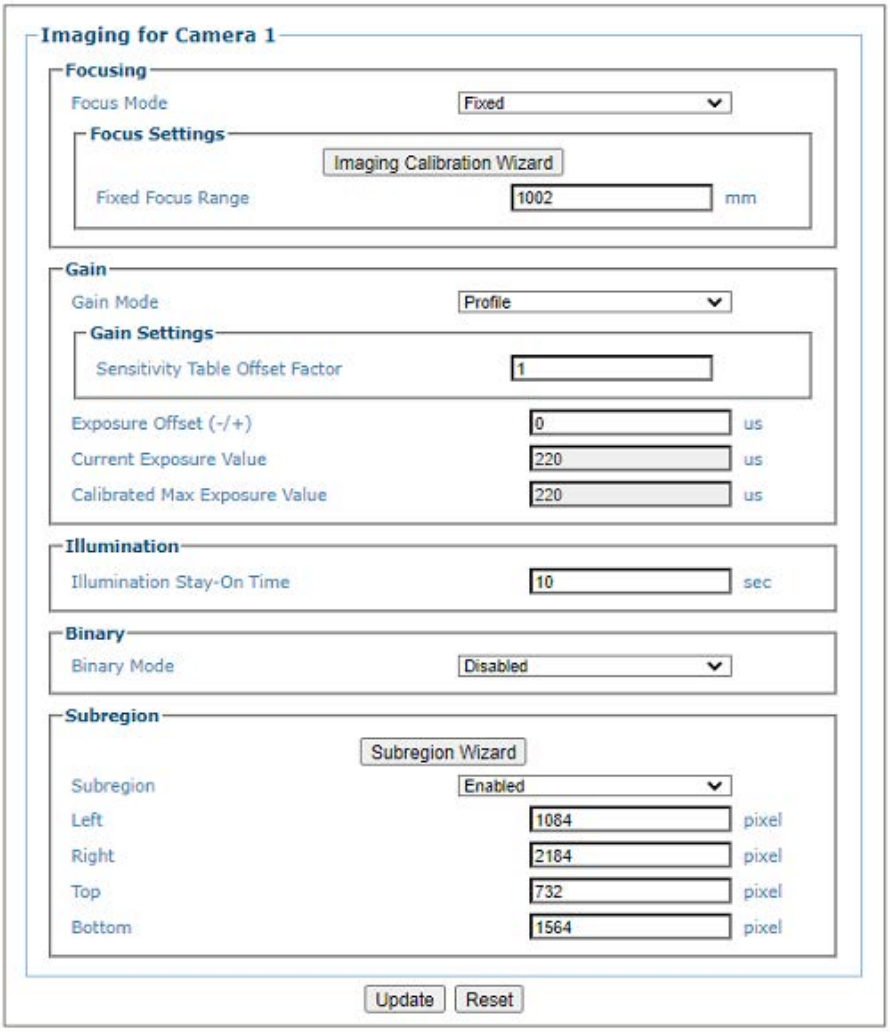
1. Set to **Online Mode** in **Modify Settings | Global Settings | Operating Mode**.
2. Make sure the Trigger Source and Transmit Point Settings are correct.
3. Check other Important Application Dependent Parameters:

- **Modify Settings | Global Settings | Object Detection**
- **Modify Settings | Global Settings | Barcode Settings**
- **Modify Settings | Global Settings | Communications**
- **Modify Settings | Global Settings | Output Format**
- **Modify Settings | Global Settings | Image Saving**

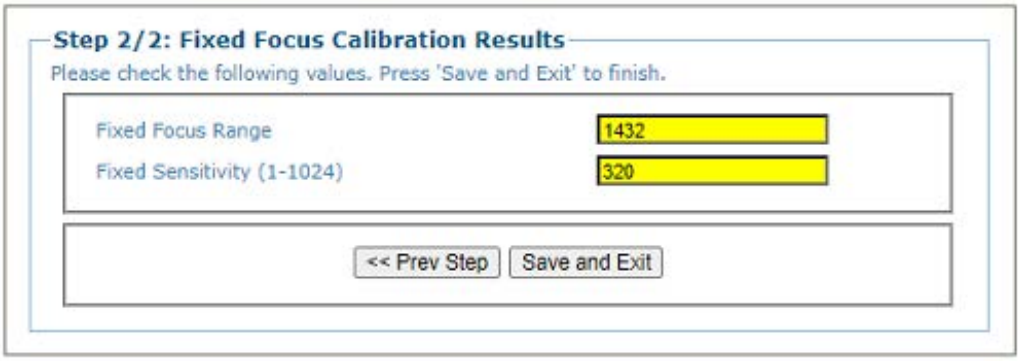
Set Camera Focusing

Set the camera focusing parameters to match the application:

1. Go to **Device Settings | Camera and Imaging** and Select Fixed, Dynamic, Dual or Sequential focusing.
2. Then click **Imaging Calibration Wizard** and follow the instructions.

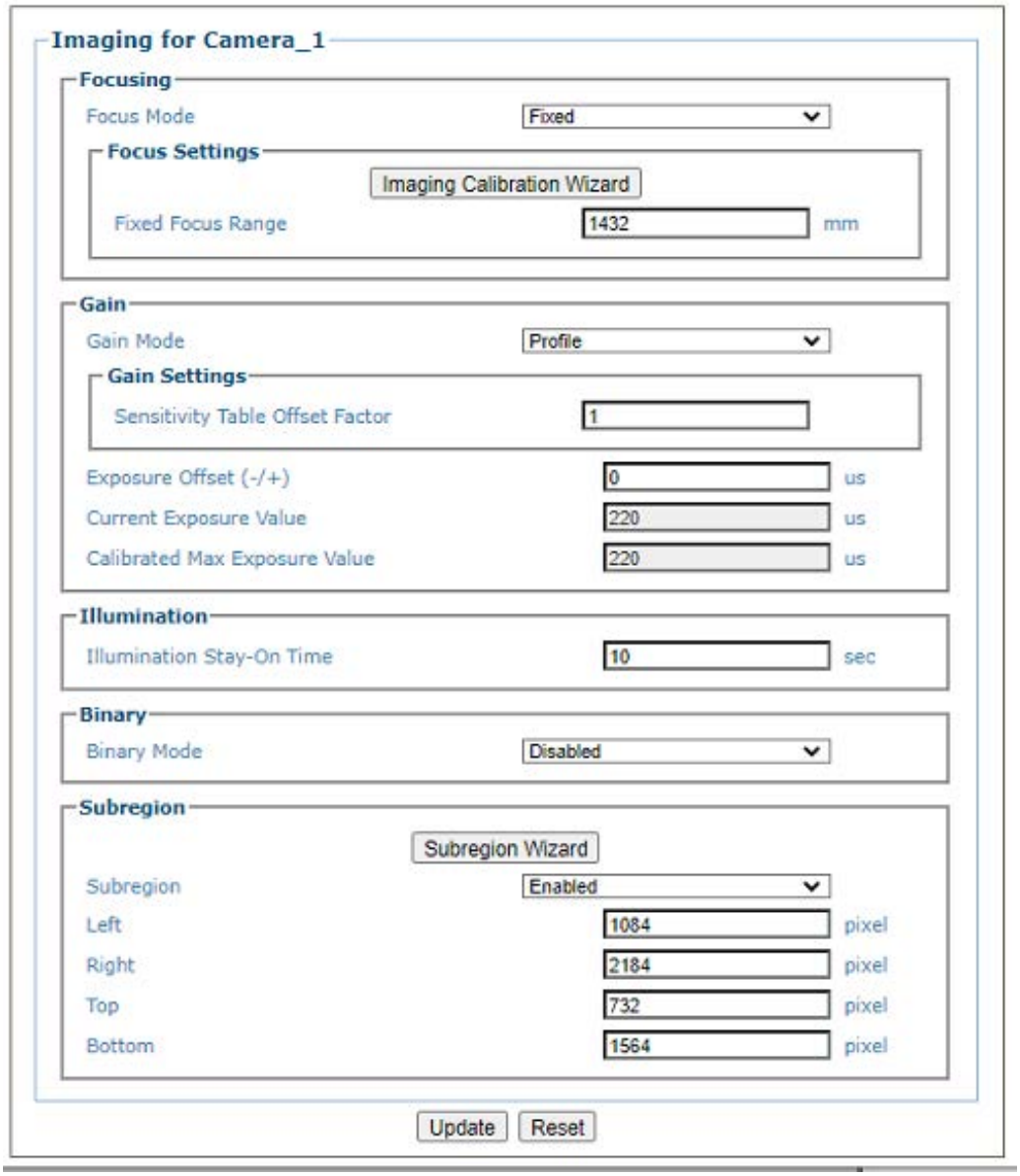


3. Place a target at the desired focusing distance and click **>>Next Step.** The camera will begin to find the correct focusing distance as shown below.



4. When the camera has completed this step it will show the Fixed Focus Range and Fixed Sensitivity values.

5. Click **Save and Exit** to complete the calibration process and the values will be transferred to the Imaging window.



6. Click **Update** to complete the process.

Other Camera Checks

Perform these additional camera checks:

1. Confirm communication with host.
- **Serial** (if applicable)
- **Ethernet** (if applicable)
- **Confirm Protocol Index** (if applicable)

2. Observe the System in Action.

3. Confirm that all cameras are reading the barcode correctly and that the scan point is communicating to the host.

SETTING THE M830/M930 TO COMMUNICATE WITH WEBSENTINEL PLUS

Follow the steps below to set up your camera to communicate with WebSentinel PLUS:

1. Set-up your Image Destination
2. Set-up the Image Saving Options
3. Define Transport Settings

NOTE: Set the parameters for you camera in the order specified here!

Set Up Your Image Destination

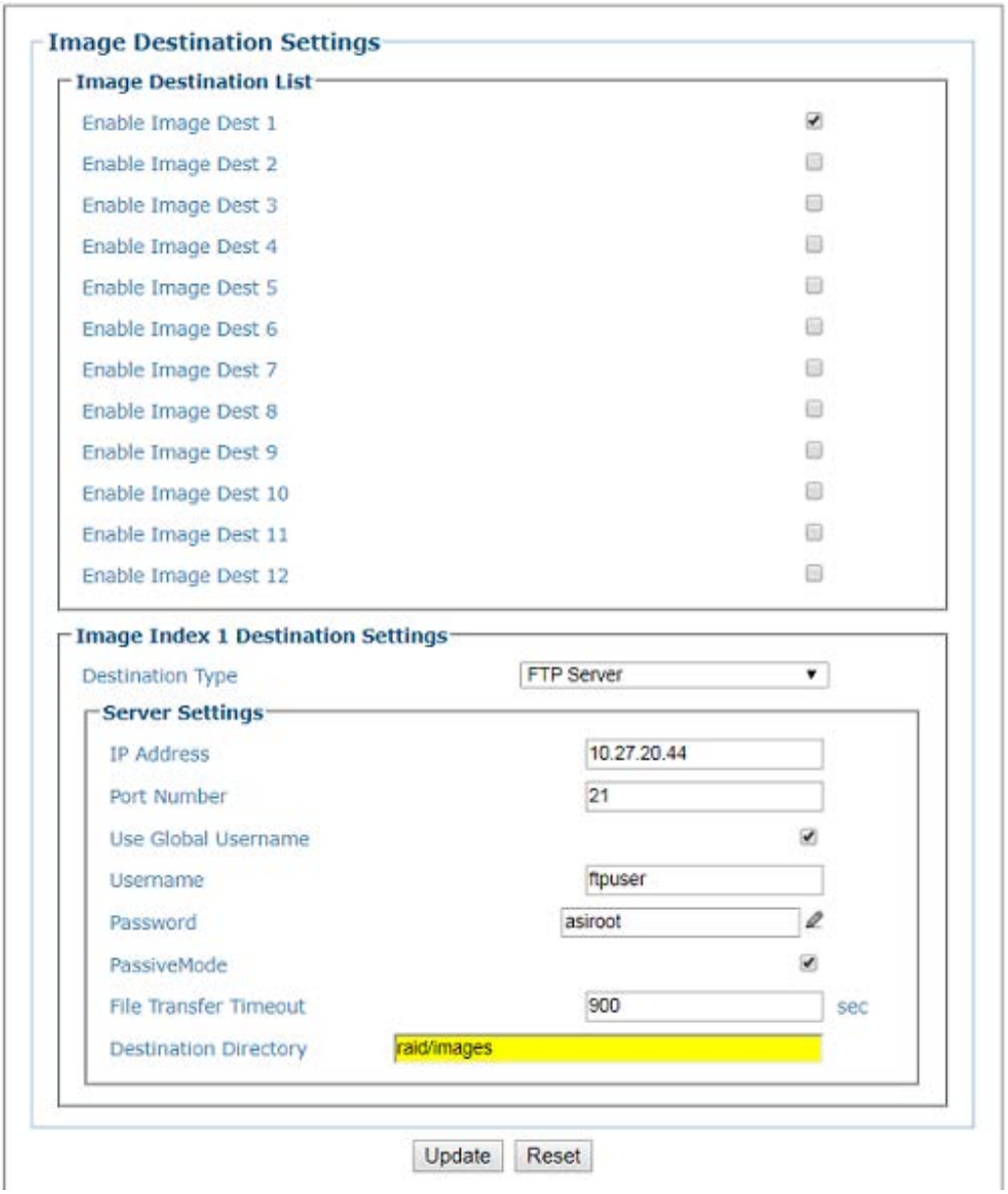
The camera saves image files to an FTP Server, CIFS network file share, or in volatile on-board storage inside the camera. The preferred network for transferring images is the Image network interface FTP. The Image network interface supports a 1 Gb connection speed for the operation of the M830/930.

This process explains how to save images to the FTP Server. If you wish to save images to CIFS network file share or in volatile on-board storage.

NOTE: These settings pertain to connecting to the Datalogic WebSentinel PLUS server. The Destination Directory - raid/images is the file location used by the Datalogic WebSentinal server. If the WebSentinal software is mounted on a customers server the destination directory may be different.

One of the greatest advantages of using WebSentinel PLUS with the M830 is the ability to save all of your camera images.

1. In the e-Genius menu under **Modify Settings,** select **Global Settings >Image Saving > Destination Settings,** the **Image Destination Settings** window opens.



2. Enable Image Destination 1 or the next available.
3. Select the destination type **FTP Server** from the drop-down.
4. Enter the **IP Address. Port Number, Username, Password and File Transfer Timeout** as indicated above.
5. Enter your Destination Directory as **raidimages.**
6. Click **Update** to save the changes.

Set Up the Image Saving Options

1. In the menu tree under **Modify Settings,** select **Global Settings >Image Saving > Image Settings**. The **Image Saving Settings** window opens.
2. Set the **Image Saving** options as shown below.

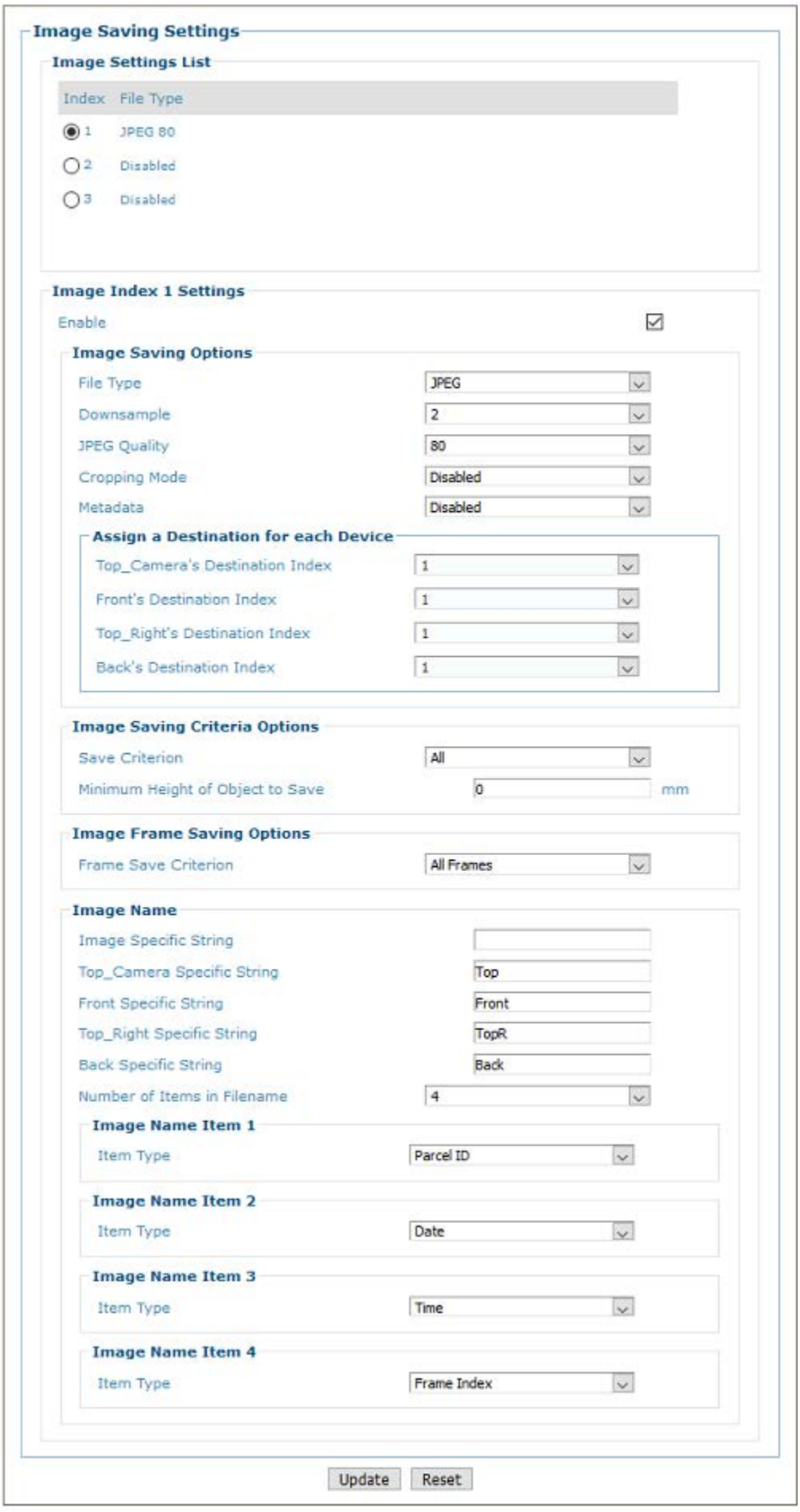
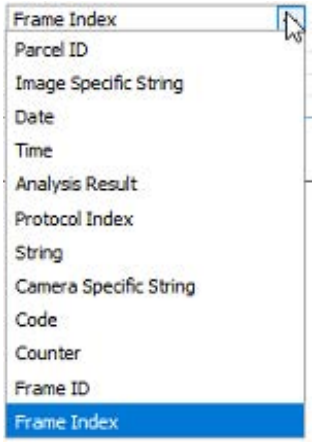


Image Saving Settings
Image Settings List
Index File Type
1 JPEG 80
2 Disabled
3 Disabled
Image Index 1 Settings
Enable
Image Saving Options
File Type JPEG
Downsample 2
JPEG Quality 80
Cropping Mode Disabled
Metadata Disabled
Assign a Destination for each Device
Top_Camera's Destination Index 1
Front's Destination Index 1
Top_Right's Destination Index 1
Back's Destination Index 1
Image Saving Criteria Options
Save Criterion All
Minimum Height of Object to Save 0 mm
Image Frame Saving Options
Frame Save Criterion All Frames
Image Name
Image Specific String
Top_Camera Specific String Top
Front Specific String Front
Top_Right Specific String TopR
Back Specific String Back
Number of Items in Filename 4
Image Name Item 1
Item Type Parcel ID
Image Name Item 2
Item Type Date
Image Name Item 3
Item Type Time
Image Name Item 4
Item Type Frame Index
Update
Reset

NOTE: This information is an example only. Your application may require different parameters.

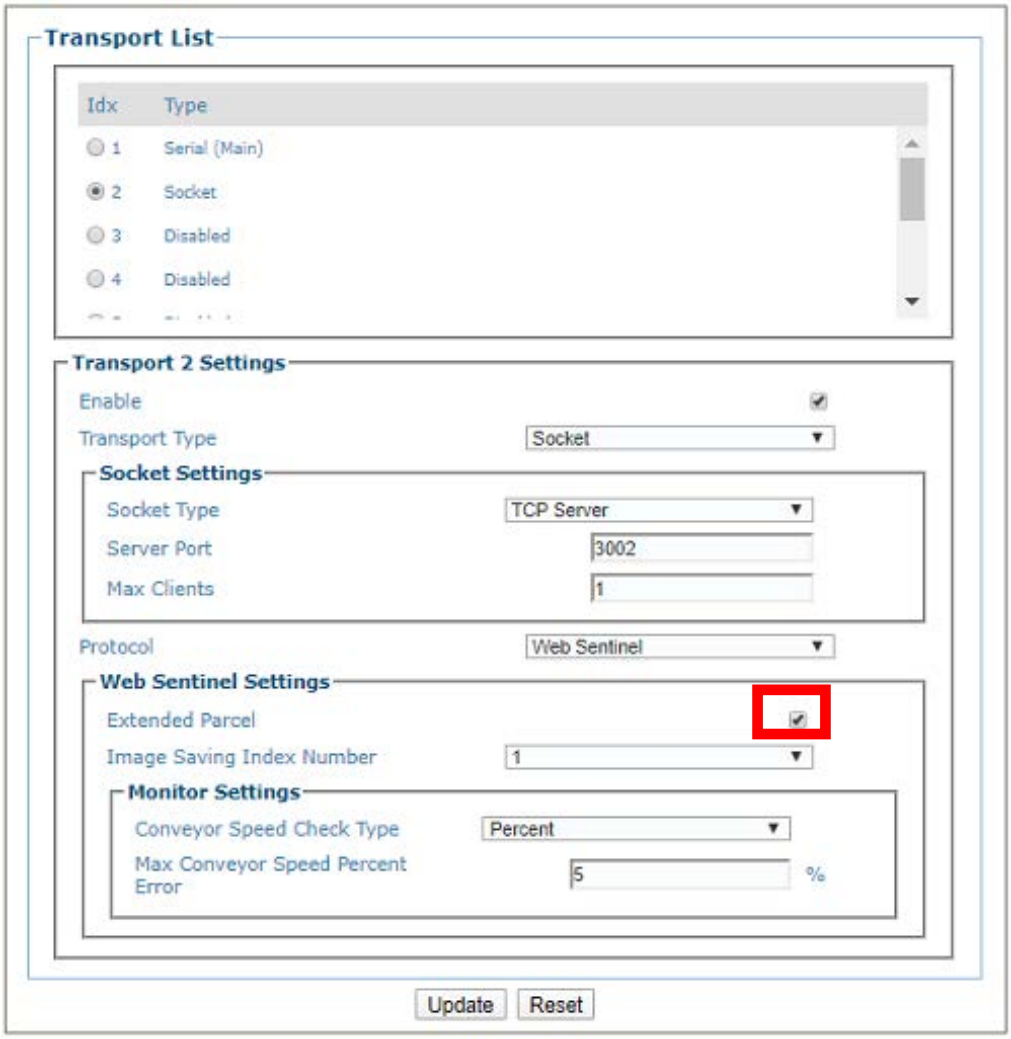
One of your Image Name Item > Item Types must be set to Frame Index as show above. This is required so that each frame is saved as a unique image with a unique filename, therefore assuring that frames are not saved over-top of one another.



3. Click **Update** to save the changes.

Define Transport Settings

1. In the menu tree under **Modify Settings,** select **Global Settings > Communications > Transports.** The **Transport List Settings** window opens.
2. Set the **Transport List** options as shown below.
3. **The Extended Parcel check-box must be selected,** if you are to receive image and dimension information.



4. Click **Update** to save the changes.

CHAPTER 7
MAINTENANCE

OVERVIEW

This chapter provides instructions for maintaining optimal performance and life for your M830 / 930 Cameras. It provides specific information on:

- Maintenance Procedures
- Exterior Cleaning
- Mounting Hardware Checks
- Wiring Connection Checks

Item	Description
Soft-bristle brush	For cleaning the unit's exterior
Clean, soft cloths	For cleaning the unit's exterior
Cleaning solutions	Mild detergent solution for cleaning the unit's exterior. 70% denatured alcohol, 30% de-ionized water solution for cleaning
Soft cotton swabs or	Use to clean illumination exit window

NOTE: Due to the complex and application-specific nature of these installations, M830 / 930 Camera systems must be setup and serviced by authorized technicians trained by Datalogic.

The maintenance procedures in this chapter may be performed by an end user technician. Training is recommended if the end user intends to do more than the maintenance procedures provided in this chapter.

THERE ARE NO USER SERVICEABLE PARTS WITHIN THE M830 / 930 Camera.

DO NOT OPEN THE UNIT. OPENING THE M830 / 930 Camera MAY VOID ITS WARRANTY.

CAUTION: Proceeding with any setup, calibration, or service procedures without proper training may void the warranty.

For further information on training, contact us through our website at www.datalogic.com.

RECOMMENDED MAINTENANCE FREQUENCY

The M830 / 930 Camera Barcode Reading System is designed for industrial environments. The recommended frequency for performing these maintenance tasks will depend on the application's environment. In general, these procedures are recommended only if it is noticed that the environment is dirty enough that deposits are appearing on the equipment or when performance is degraded by accumulation of dust or dirt on the exit windows or deflection mirrors. By monitoring normal operations and performing weekly visual checks, you can establish a maintenance schedule that fits your application.

MAINTENANCE TASKS

Perform the maintenance tasks on an "as needed" basis to assure proper operation of the camera.

Task schedule frequency depends upon the application environment conditions. Harsh environments that expose the equipment to more heat, dust, and dirt will require these procedures be performed more frequently.

It only requires a few minutes to complete each maintenance task.

Exterior Cleaning

NOTE: Do not use any chemical on the barcode reader that is unsafe for plastics, such as benzene, acetone, or similar products. Before performing this maintenance task, be sure to shut down the unit.

The exterior cleaning procedure may be performed without removing the barcode reader from the mounting structure.

1. Switch off the conveyor.
2. Switch off the camera system by disconnecting the power source.
3. Clean the exterior (except the windows) with a clean, soft-bristle brush. Be sure not to brush any dust, dirt, or debris onto the windows.
4. Carefully remove any dirt or debris in or around the connector panel and cooling fans. If necessary, clean under the fans by removing them from the camera and illumination. Unscrew the knurled knobs at the sides of the fan and lift it free.
5. Wipe the exterior with a clean, soft cloth dampened slightly with a mild detergent solution.

Cleaning the Illumination and Camera Window

NOTE: Shut down the camera system before performing this maintenance task. Do not stare into the camera's window at the LED light. Avoid direct eye exposure. The LED light level does not constitute a health hazard, however staring at the LED light for prolonged periods could result in eye damage.

Never apply cleaning solution directly to the camera window. Always apply the solution to a cloth, and then the cloth to the window. Do not use any chemical on the camera that is unsafe for plastics, such as benzene, acetone, or similar products.

This procedure is recommended only if it is noticed that the environment is dirty enough that deposits are appearing on the deflection mirrors. The window cleaning procedure should be performed without removing the camera from the mounting structure.

1. Switch off the conveyor.
2. Switch off the camera system.
3. Follow the exterior cleaning procedure before cleaning the window.
4. Check the window surface for any dust, dirt, or smudges. If the window needs to be cleaned, proceed to Step 5.
5. Make a solution of seven parts denatured alcohol and three parts water. (Many over-the-counter solutions will leave deposits/smudges that can affect performance.)
6. Apply the cleaning solution to a lint-free cotton cloth.
7. Apply the cloth with cleaning solution to the camera and illumination window.
8. Remove any streaks or remaining moisture from the window with a dry, soft, lint-free cloth or lens paper.
9. Verify camera operation.

Cleaning the Range Sensor

NOTE: Shut down the camera system before performing this maintenance task. Do not stare into the camera's window at the LED light. Avoid direct eye exposure. The LED light level does not constitute a health hazard, however staring at the LED light for prolonged periods could result in eye damage.

Use care when cleaning the RangeFinder to assure the windows are not scratched or damaged in any way. Never apply cleaning solution directly to the windows. Always apply the solution to a cloth, and then the cloth to the windows.

This procedure is recommended only if it is noticed that the environment is dirty enough that deposits are appearing on the RangeFinder windows. The cleaning procedure should be performed without removing the RangeFinder from the mounting structure.

1. Switch off the conveyor.
2. Switch off the camera system.
3. Review the exterior cleaning procedure before cleaning the three windows.
4. Check the windows for any dust, dirt, or smudges. If the window needs to be cleaned.
5. Use a dry, soft, lint-free cloth to remove accumulated dust.
6. If the windows are particularly dirty or smudged, make a solution of seven parts denatured alcohol and three parts water. (Many over-the-counter solutions will leave deposits/smudges that can affect performance.)
7. Apply the cleaning solution to a cotton swab or lint-free cloth.
8. Apply the cleaning solution to the windows.
9. Remove any streaks or remaining moisture with a dry, soft, lint-free cloth or lens paper.
10. Verify RangeFinder operation.

Cleaning the Tachometer

If your application uses the tachometer option for tracking purposes, be sure to clean the tachometer wheels periodically as outlined below.

1. Turn off the product transport.
2. Turn off the barcode reader by disconnecting the power source.
3. Using a clean, soft cloth, wipe the wheels of the tachometer clean using a mild detergent solution.
4. Before restarting the system, be sure the tachometer is making good contact with the product transport.
5. Verify tachometer operation.

Tighten Mounting Hardware

1. Check all M830 / 930 Camera, Deflection Mirrors, CBX connection boxes, and power supply mounting hardware as applicable. Tighten as necessary. Do not over-tighten. Be sure not to disturb the equipment's alignment as it relates to the product transport.
2. Check the mounting hardware of the Photoelectric Sensor (if this option is being used). Tighten as necessary. Do not over-tighten.
3. Check the mounting hardware of the tachometer (if this option is being used). Tighten as necessary. Do not over-tighten.

Checking Barcode Reading System Connections

This is a safety check recommended for harsh environments where vibration may be a problem. See **"Electrical Installation" on page 40**.

1. Check all wiring connections to the camera and illumination connector panels. Tighten any loose connections as necessary. Do not over-tighten.
2. Check all wiring connections to the CBX connection box. Tighten any loose connections as necessary. Do not over-tighten.

3. Check all cabling/conduit for signs of wear/damage. Repair/replace any damaged cable connections as necessary.

Verify Barcode Reader Operation

If after performing maintenance, the imaging system continues to perform below the normal operations experienced with the system under normal daily conditions, contact Datalogic through our website at www.datalogic.com.

Verify Tachometer Operation

1. Rotate the tachometer wheel slowly.
2. The **TACH** LED on camera's connector panel should flash indicating the tachometer is operational.

CHAPTER 8
TROUBLESHOOTING

NOTE: Due to the complex and application-specific nature of these installations, operational deficiencies of the barcode reader must be diagnosed and serviced by a trained and authorized Datalogic technician.

There are no user serviceable components or field replaceable units (FRUs) inside the barcode reader.

For further information on training, contact us through the Datalogic website at www.datalogic.com.

When contacting Datalogic for help with an M830 / 930 Camera, please be ready to share the unit serial number with the Datalogic technician. The unit's serial number tag is located on the bottom of the device, as shown below. Help desk contact information is available at www.datalogic.com.

ERROR CODES AND RESOLUTIONS

Decoder Errors

Alphabetical by type: Error / Warning / Info.

Description	Type	Explanation	Possible Cause	Solution
Application failed to shutdown	Info	The application was in a state were it could not shut down properly.	If software was recently loaded, an error occurred during the load.	Power cycle the unit. If software was recently loaded, try to reload the new software. If the error persists, contact Datalogic Support.
Decoder load warning	Info	Decode engine CPU usage is high	Background is noisy. Multiple 2D codes are enabled. Camera gain is too low or too high or the camera is out of focus.	Make sure gain and focus are set properly. Otherwise this error will not cause any problems
Decoder overload error	Info	Decode engine is being killed before the package is complete	Background is noisy. Multiple 2D codes are enabled. Camera gain is too low or too high or the camera is out of focus. Transmit point distance is too close	Make sure gain and focus are set properly. Increase the transmit point distance if possible.
Driver returned an error	Info	PCIe driver returned an error	HW issue with the PCIe bus or the FPGA	Contact Datalogic Support if this error persists
Configuration not synchronized with cluster	Info	XML does not match the XML in other cameras.	XML from a custom version of software was loaded into a camera running STD software.	Default the camera and reboot, which will force the camera to load the appropriate XML.
Decoder load exceeds 200%	Info			
Decoder load exceeds 80%	Info	PCIe driver returned an error.	HW issue with the PCIe bus or the FPGA.	Contact Datalogic Support if this error persists.
Dimensioner IP address not valid for Sync Network	Info	In some applications the Dimmer will connect directly to the AV. In that situation the AV will identify the dimmer is connected and process the data accordingly. If the application doesn't require the Dimmer to be connected directly to the AV, the AV will still monitor the connection and post this message.	Dimmer is not connected directly to the AV.	This is just an Information message and requires no action
Dimensioner is not Online	Info	Once the Dimmer is connected the AV will monitor the connection and post this message if the dimmer connection is missing	This will only be an issue if the Dimmer is intended to be connected. Dimmer is disconnected or failed.	Check to see that the Dimmer is still connected and functioning.

Description	Type	Explanation	Possible Cause	Solution
Bad scanline data detected	Error	Raw data from the image buffer is corrupt.	RAM is corrupt or bad.	Contact Datalogic Support.
Camera status not understood	Error	Received camera status was not understood.	Make sure all of the cameras in the tunnel contain the same software.	Load the same software into all of the cameras in the tunnel.
Camera with different SW version detected	Error	The camera will compare it's version of software to the other cameras in the Cluster. This message is posted when there is a conflict	Often this is caused when a spare camera is installed, but does not have the same software as the other cameras in the cluster.	Install the correct software version
Configuration not synchronized with cluster	Error	XML does not match the XML in other cameras	XML from a custom version of software was loaded into a camera running STD software.	Default the camera and reboot. That will force the camera to load the appropriate XML
Could Not Save JPEG - Compression Failed	Error	JPEG compression failed.	Image was too big or too small. Compression was interrupted.	Contact Datalogic Support if this error persists.
Could Not Save JPEG - Job Queue is Full	Error	Internal JPEG queue is full.	JPEG compression is taking too long.	Contact Datalogic Support if this error persists.
Could Not Save JPEG - Queue is Full	Error	Internal JPEG queue is full.	JPEG compression is taking too long.	Contact Datalogic Support if this error persists.
Could Not Save JPEG - Waiting for FPGA	Error	Attempt to compress a JPEG while another compression is taking place.	JPEG compression is taking too long.	Contact Datalogic Support if this error persists.
Decoder CPU over temperature	Error	The AV camera will monitor the internal temperature. If the temperature goes above a preset value this error will appear.	Internal Fan failure Faulty CPU processor	Replace Camera
Dimensioner Beacon not understood	Error	Status received from the Dimensioner was not understood.	The dimensioner is not running a version of software that is compatible with the camera.	Load the correct software into the dimensioner.
Error Configuring the Decode Engine	Error	Parameter settings used to configure the decode engine were rejected	A decode engine parameter is out of range	Make sure all decode engine settings are correct. Contact Datalogic Support
Expected Camera is Offline	Error	A camera in the tunnel configuration is not online.	The offline camera has lost power or restarted. The offline camera failed to start properly. The SyncNet cables are not connected properly to the camera listed offline.	Verify the offline camera has power. Verify the SyncNet cables are connected properly between the offline camera and the next camera. Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Expected External Device is Offline	Error	All AV cameras communicate through the Sync network. When one of the cameras stops communicating the other cameras in the system will post this message.	Camera failure	Replace failed camera

Description	Type	Explanation	Possible Cause	Solution
Factory Reset Performed. Power Cycle Required	Error	If the cameras are set to factory default they must be power cycled in order for all the internal applications to run correctly.	Cameras were factory defaulted	Reboot the cameras
Failed to set space notification	Error	Camera could not set a delayed encoder/ tachometer event.	Encoder/tachometer resolution is set too high.	Check the encoder/tachometer resolution. Contact Datalogic Support, if the encoder/ tachometer resolution is set properly.
Failed to Allocate Memory for Image Transfer	Error	Requested image could not be loaded into memory.	RAM is bad or corrupt .	Contact Datalogic Support.
Failed to Login to FTP Server	Error	The camera was unable to log into the specified FTP server to save images.	The log in credentials are incorrect. The external FTP server is offline. The camera Image port is not connected to the network to get to the FTP server.	Verify the login credentials are correct. Verify the external FTP server is up and running. Verify the camera image port is correctly connected to the appropriate network.
Failed to Read Image from Ramdisk	Error	Requested Image no longer available in Ramdisk.	Parameter updated performed while sorting packages. Image transfer taking too long.	Check the network connection speed.
Failed to Write Image to File System	Error	The camera was unable to save the image file to the specified File System Location.	The file system location is incorrect or full.	Verify that the Image saving settings for the file system are correct. Verify the location is not full or set up the file maintenance to remove old files automatically.
Failed to Write Image to FTP Server	Error	The camera was unable to write the image to the FTP server.	The external FTP server is offline. The camera Image port is not connected to the network to get to the FTP server.	Verify the external FTP server is up and running. Verify the camera image port is connected to the appropriate network correctly.
Failed to Write Image to Offline Viewer	Error	The camera was unable to send an image to the external viewer.	External viewer is not running or it's not a version meant for the Parameters required to send images to the external viewer are not set properly.	Make sure the external viewer is running. Make sure the external viewer was downloaded from the camera. Make sure the external viewer network parameters on the Modify Settings | Global Settings | Image Saving Destination Settings window are properly set
Far Working Distance Out of Range	Error	The far working distance is set to a distance beyond the focus range of the camera.	The far working distance is set incorrectly. The camera being used is incorrect for the application.	Verify the camera model is correct for the application. Re-run the calibration wizard on this camera.
Fixed Focus Value Out of Range	Error	The fixed focus setting is set to a distance beyond the focus range of the camera.	The fixed focus value is set incorrectly. The camera being used is incorrect for the application.	Verify the fixed focus value is correct. Verify the camera model is correct for the application.
Image Transfer Falling Behind. Check Connection Speed	Error	The volume of images to be saved is exceeding the hardware capabilities of the Image port connection.	The ethernet hardware connected to the camera Image port (cables, switches, etc.) is not Gigabit capable.	Verify the switches are Gigabit capable and the cables are at least Cat5e. Verify the LED's of the camera Image port is indicating a Gigabit connection. Verify the ethernet cables are not routed with AC wiring and are not excessively long.

Description	Type	Explanation	Possible Cause	Solution
Image Saving Queue is Full. Check Connection Speed	Error	Requested package is no longer available to save.	Image transfer is taking too long, resulting in lost packages.	Check the network connection speed.
IV Monitor failed to get an image buffer	Error	Camera could find the raw image buffer	RAM is corrupt or bad.	Contact Datalogic Support
LogManager can't open a log file	Error	Log Manager was unable to open the log file on the media device.	Log file media device is unavailable or full.	Verify logging options.
LogManager can't write to the log file	Error	Log Manager was unable to write to the log file on the media device.	Log file media device is unavailable or full.	Verify logging options.
Maximum Application restarts	Error	An application was restarted multiple times due to an error	If software was recently loaded, an error occurred during the load. An internal hardware failure exists.	Power cycle the unit. If software was recently loaded, try to reload the new software. If the error persists, contact Datalogic Support.
Maximum system resets in one day	Error	The system became unresponsive multiple times within a 24 hour period and was reset.	If software was recently loaded, an error occurred during the load. An internal hardware failure exists.	Power cycle the unit. If software was recently loaded, try to reload the new software. If the error persists, replace the camera and/or contact Datalogic Support.
More than one camera setup to multicast LC data	Error	There should only be one camera transmitting the focusing data from the Light Curtain.	Camera is not configured correctly.	Change configuration
No ACK from Rangefinder after Parameter Update	Error	RangeFinder did not Ack the last parameter update.	Communication with the RangeFinder is compromised.	Check the Ethernet connection with the RangeFinder.
Not Saving Image. Request Too Late	Error	Requested package is no longer available to save.	Image transfer is taking too long, resulting in lost packages.	Check the network connection speed.
Primary Controller Photoelectric Sensor Issue Detected	Error	The cameras can be set in a redundant configuration. When configured as such, there is a Primary and Secondary controller. This message is posted by the Secondary controller and indicates that there is a problem with the Primary's Photoelectric sensors signal.	Photoelectric sensor malfunction Primary unit failure	Determine if the problem is associated with either the Photoelectric sensor or the Primary unit
Primary Controller Tachometer Issue Detected	Error	The cameras can be set in a redundant configuration. When configured as such there is a Primary and Secondary controller. This message is posted by the Secondary controller and indicates that there is a problem with the Primary's Tachometer's signal.	Tachometer malfunction Primary unit failure	Determine if the problem is associated with either the Tachometer or the Primary unit

Description	Type	Explanation	Possible Cause	Solution
RangeFinder is not Online	Error	The RangeFinder is selected as the position sensor but is not detected as being online.	The RangeFinder is powered off or not connected. The Rangefinder is not the position sensor being used.	If the RangeFinder is not the position sensor being used, select the appropriate position sensor. Verify the RangeFinder has power. Verify the network port of the RangeFinder is connected to the Focus Eth port of one of the cameras. Power cycle the RangeFinder. If the error persists, replace the RangeFinder and/or contact Datalogic Support.
RangeFinder status not understood	Error	The status message received from the RangeFinder was not understood by the camera	The RangeFinder software is too old	Load the appropriate SW into the RangeFinder
Real-Time Processor has Errors	Error	The Real-Time Processor is reporting an error.	Check the Real-Time Processor section of the System Info > Device Details window for detailed error information.	Check the Real-Time Processor section of the status page for detailed error information. Refer to the Real-Time Processor error list for more information.
Real-Time Processor is not Online	Error	The Real-Time Processor is unable to communicate with the Decoder.	Real-Time Processor has stopped functioning. Internal hardware failure.	Cycle the unit's power. If the error persists, replace the camera and/or contact Datalogic Support.
Real-Time Processor status not understood	Error	Status received from the Real-Time Processor was not understood.	Make sure the Real-Time Processor software version is compatible with the Application software.	Load a compatible version of Real-Time Processor software.
Reboot Required to finish configuring redundancy	Error	In the redundant configuration the units need to be rebooted in order to complete the configuration	Redundant configuration has been completed and units need to be rebooted	Reboot units
Secondary Controller PhotoSensor Issue Detected	Error	The cameras can be set in a redundant configuration. When configured as such there is a Primary and Secondary controller. This message is posted by the Secondary controller and indicates that there is a problem with the Primary's Photoelectric sensor's signal	Photoelectric sensor malfunction Primary unit failure	Determine if the problem is associated with either the Photoelectric sensor or the Primary unit
Secondary Controller Tachometer Issue Detected	Error	The cameras can be set in a redundant configuration. When configured as such there is a Primary and Secondary controller. This message is posted by the Secondary controller and indicates that there is a problem with the Primary's Tachometer's signal	Tachometer malfunction Primary unit failure	Determine if the problem is associated with either the Tachometer or the Primary unit
Software upgrade failed	Error	An attempt to load upgraded software failed.	There is a type mismatch with the existing software and the new software being loaded. An error occurred while loading software.	Verify the software type being loaded matches that of the existing software. If you are intentionally changing the software type, check the box to skip software type compatibility check when loading the new software file. Cycle the unit's power, and re-attempt to load software.

Description	Type	Explanation	Possible Cause	Solution
Application failed to start	Error	One of the applications failed to properly start and is not functioning.	The application was unable to initialize its interfaces properly and failed. If software was recently loaded, an error occurred during the load.	Cycle the unit's power. If software was recently loaded, try to reload the new software. If the error persists, contact Datalogic Support.
Unable to read Combo Angle Sensor Temp	Error	A request to the Angle Temp sensor for the current temperature did not respond.	Internal Communication error	Reboot the Camera. If the error persists, contact Datalogic or send unit for repair.
Unable to read Combo LED Temperature	Error	A request to the LED Temp sensor for the current temperature did not respond.	Internal Communication error	Reboot the Camera. If the error persists, contact Datalogic or send unit for repair.
Bottom Camera Distance to Scanline too Small	Warning	The distance from the position sensor scan line to the bottom camera scan line is too small.	The position sensor is mounted incorrectly, too close to the camera. The bottom camera is mounted incorrectly.	Verify and move the position sensor further upstream if needed. Verify and move the camera further downstream if needed.
Could Not Save JPEG - Image Too Large	Warning	Requested image is too large to compress	Photoelectric sensor or Position sensor obstructed or a package jam resulting in an extremely long package	Eliminate package jams. Make sure the Photoelectric sensor and/or position sensor are not obstructed
Could Not Save JPEG - Image Too Small	Warning	Requested image is too small to compress	Junk on the conveyor	Check for junk on the conveyor resulting in extremely small packages
Decoder board over temperature	Warning	The Decoder board exceeding the maximum temperature	Ambient temperature has exceeded the maximum 50 degrees C operating temperature. There is a fan failure or airflow blockage.	Verify the ambient temperature is less than or equal to 50 C. Check the fan operation and for any airflow obstructions. Replace fans if necessary.
Decoder CPU over temperature	Warning	The Decoder CPU exceeding the maximum temperature	Ambient temperature has exceeded the maximum 50 degrees C operating temperature. There is a fan failure or airflow blockage.	Verify the ambient temperature is less than or equal to 50 C. Check the fan operation and for any airflow obstructions. Replace fans if necessary.
Distance to Scanline too small	Warning	The distance from the position sensor scan line to the closest point of the camera line of sight is too small.	The position sensor is mounted incorrectly, too close to the camera. The camera is mounted incorrectly or the angle is wrong.	Verify and move the position sensor further upstream if needed. Verify and move the camera further downstream if needed. Verify and correct the camera angle if needed.
IV State Not Sent - Pkg Not Found	Warning	A trigger message for a package was received but the package was never found in the image data	This can occur during boot up if packages are running through the tunnel or if a package is completely shadowed	Contact Datalogic Support if this error persists
RangeFinder is not Expected	Warning	A RangeFinder is detected in the system but is not selected as the position sensor.	Wrong position sensor is selected in the configuration.	Select the RangeFinder as the position sensor in the configuration.

Description	Type	Explanation	Possible Cause	Solution
RangeFinder is not OK	Warning	The RangeFinder is online but reporting an error.	Check the RangeFinder GUI page for error details.	Check the RangeFinder GUI page for error details. Refer the RangeFinder error list for more information.
Real-time Processor has Warnings	Warning	The Real-Time Processor is reporting at least one warning.	Check the Real-Time Processor section of the status page for detailed warning information.	Check the Real-Time Processor section of the status page for detailed warning information. Refer to the Real-Time Processor warning list for more information.
Software upgrade in progress	Warning	The camera is in the process of updating software.	A software update was loaded on this camera or one of the cameras in the tunnel and auto-update is enabled.	Wait for the update to complete.
Bottom Camera Distance to Scanline too Small	Warning	The distance from the position sensor scan line to the bottom camera scan line is too small.	The position sensor is mounted incorrectly, too close to the camera. The bottom camera is mounted incorrectly.	Verify and move the position sensor further upstream if needed. Verify and move the camera further downstream if needed.
Camera calibration has not been completed	Warning			
Could Not Save JPEG - Image Too Large	Warning	Requested image is too large to compress.	Photoelectric sensor or Position sensor obstructed or a package jam resulting in an extremely long package.	Eliminate package jams. Make sure the Photoelectric sensor and/or position sensor are not obstructed.
Could Not Save JPEG - Image Too Small	Warning	Requested image is too small to compress.	Debris on the conveyor.	Check for junk on the conveyor resulting in extremely small packages.
Decoder frame(s) discarded	Warning			
Decoder board over temperature	Warning	The Decoder board has exceeded the maximum temperature.	Ambient temperature has exceeded the maximum 50 degrees C operating temperature. There is a fan failure or airflow blockage.	Verify the ambient temperature is less than or equal to 50 C. Check the fan operation and for any airflow obstructions. Replace fans if necessary.
Distance to Scanline too small	Warning	The distance from the position sensor scan line to the closest point of the camera line of sight is too small.	The position sensor is mounted incorrectly, too close to the camera. The camera is mounted incorrectly or the angle is wrong.	Verify and move the position sensor further upstream if needed. Verify and move the camera further downstream if needed. Verify and correct the camera angle if needed.
IV State Not Sent - Pkg Not Found	Warning	A trigger message for a package was received but the package was never found in the image data.	This can occur during boot up if packages are running through the tunnel or if a package is completely shadowed.	Contact Datalogic Support if this error persists.
RangeFinder is not Expected	Warning	A RangeFinder is detected in the system but is not selected as the position sensor.	A different Position Sensors is selected in the Operationg Mode other then the RangeFinder	Select the RangeFinder as the position sensor in the configuration.
RangeFinder is not OK	Warning	A RangeFinder is selected but has an error	A component within the RangeFinder has failed	Replace RangeFinder

Description	Type	Explanation	Possible Cause	Solution
Real-time Processor has Warnings	Warning	The Real-Time Processor is reporting at least one warning.	Check the Real-Time Processor section of the Modify Settings | System Info > Device Details window for detailed warning information (See section	
Software upgrade in progress	Warning	The AV is in the process of upgrading the software.	The AV camera is ith the process of upgrading it's software. It will inform the user and not do any other activity until this process is complete	Wait until the software upgrade is complete. The AV will reboot itself once this process is complete.
Unable to mount SMB/ CIFS file share for image saving	Warning	The camera was unable to mount the SMB/CIFS file share on the external device	File System parameters on the Destination Settings page are not correct. External device is not available. The Server Path is set to a path local to the camera	Make sure the File System parameters on the Destination Settings page are setting properly. Make sure the Server Path is not local to the camera
Unexpected Camera is Online	Warning	A camera is detected in the tunnel that was not part of the tunnel configuration.	A new camera was added to the tunnel or an existing camera was replaced.	Add the camera to the configuration and proceed with the set up if it is a new camera. If an existing camera was replaced, there should be an offline camera. From the Modify Settings | System Info, replace the offline camera with one listed outside the cluster
Unexpected External Device is Online	Warning	The AV will identify any device that is set for DHCP. The controller camera will give the device an IP address. It the device is not an AV camera it will post this message.	Another device set to DHCP is connected to the AV Sync network	Disconnect the device.
Controller Camera is Offline	Warning	This message is posted by the Clients in the cluster. Since the Controller Camera provides the tach and trigger to the other cameras the cluster will not trigger	Controller camera failed	Determine that the camera is in fact not working and there are no other conditions as a cable unplugged. If the issue is a failed camera then replace the Controller camera

BYPASSING AN M830/M930 IN AN ARRAY (TUNNEL)

If for any reason, an M830/M930 needs to be removed from an array (tunnel), it can be bypassed to allow the array to continue functioning in a redundant loop, minimizing down time. To bypass a non-working, Disconnect the Link1 and Link2 cables of the non-working unit and connect them to one another.

REPLACING A M830 / 930 CAMERA

Use the following procedure to replace a M830 / 930 Camera, either a stand-alone unit, a Master in a tunnel/array, or a Slave unit in a tunnel/array.

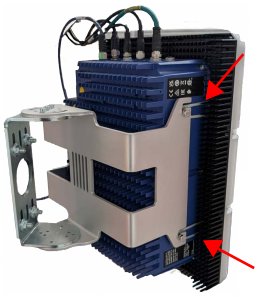
The procedure allows to replace the camera without the need to re-position or re-calibrate the new device.

Requested tools:

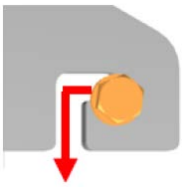
- 10 mm wrench

ESD WARNING: Observe precautions to prevent Electrostatic Discharge (ESD). Use an ESD grounding wrist strap and avoid direct contact with circuit boards, which could be damaged by ESD.

1. Disconnect the power source from the camera.
2. Disconnect all the cables.
3. Remove the camera from the mounting brackets.



4. Do not fully remove the mounting screws. Simply loosen them and slid them along the dedicated mounting slot as shown in the image on the side.



WARNING: When performing a fast camera replacement, the mounting brackets must not be removed. Removing the brackets will require a complete recalibration of the system.

5. Place the old camera on a flat surface and remove the rubber protection of the SD card.
6. Remove the memory card from the camera.
7. Place the replacement camera on a flat surface, and remove the rubber protection of the SD card.
8. Insert the memory card firmly into the card slot in the replacement camera.

9. Close the rubber protection of the SD card in the replacement camera.
10. Attach the replacement camera assembly to the mounting bracket.
11. Screw the mounting bolts in place to secure the camera
12. Reattach the cables to the camera in their original locations.
13. Apply power to the Camera.

REPLACING THE RANGE SENSOR

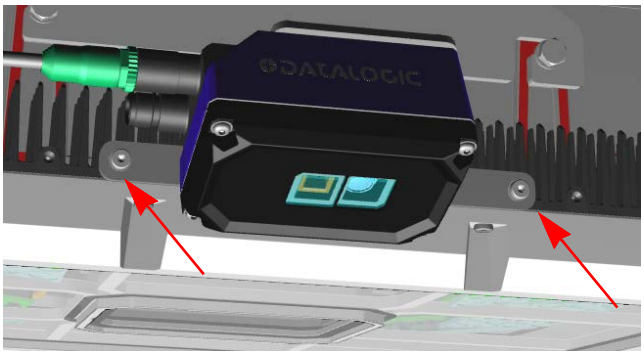
The Range Sensor can be substituted without the need of any recalibration.

Requested tools:

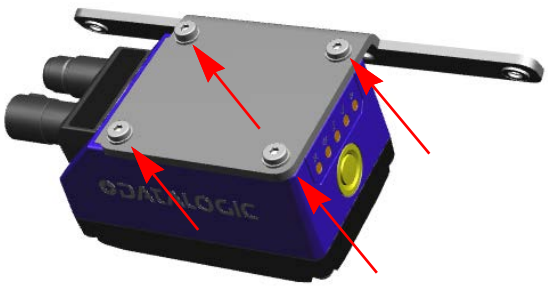
- 3 mm Allen key.

To replace the range sensor:

1. Disconnect the power source from the camera
2. Disconnect the cable from the sensor
3. Remove the old sensor from the camera by unscrewing the two highlighted bolts (see picture)



4. Unmount the bracket from the old sensor by unscrewing the four highlighted bolts



5. Unbox the new sensor
6. Fix the bracket on the new sensor
7. Remount the new sensor on the camera

8. Reconnect the cable
9. Power on the camera

All the Range Sensor parameters are backed-up in the camera and restored automatically at the first power-on after the replacement.

RESETTING THE CAMERA TO FACTORY DEFAULT

Using a camera already set for another installation might be a problem as the IP addresses of the Ethernet ports might be unknown. Additionally, a corrupted configuration may cause continuous camera resets before the e-Genius web interface is available.

In all these cases a factory reset of all the parameters is needed:

1. Switch the camera off and disconnect it from the network (when restoring a camera's default settings, it must be physically disconnected from the cluster).
2. Connect a CBX510 or a Controller Key to the I/O connector.
3. Switch the camera on while holding the X-press button pressed.
4. The unit will recognize the button press within around one minute and blink all five LEDs three times (once per second).
5. Release the X-press button before the third blink and press shortly the button again after the third blink. The camera will reset and the parameters will be set to the factory default.

CHAPTER 9
TECHNICAL FEATURES

This chapter provides detailed specifications for the M830 / 930 Camera Code Reading Systems. It provides specific information on:

- Electrical Features
- Optical Features
- Reading Features
- Human Machine Interface
- Software Features
- Environmental Features
- Physical Features

ELECTRICAL FEATURES	
Power	
Supply Voltage	24 VDC +/- 10% at power supply connector
Power Consumption	8 amp maximum Typical: - Base 5.5A - CBX or Range Sensor connected: +1.0A - USB-C: +0.5A
Common Communication Interfaces	
Main: RS232/RS422 up to 115.2 Kbit/s	Baud Rate: 1200 to 115200 bit/s
Auxiliary: RS232 up to 115.2 Kbit/s	1200 to 115200
Ethernet	1 Ethernet Gigabit typically used to send decoding data to Host and for setup 1 Ethernet Gigabit typically used for high traffic image file transfer to Host 1 Ethernet Gigabit for low traffic image file transfer to Host
Internal Communication System	
	2 Tunnel communication and synchronization ports (SyncNet ring)

Digital Inputs	
	3 x Inputs (2 + 1 x "Encoder"), optocoupled, NPN/PNP (5-30 Vdc) 1 Presence Sensor opto-isolated (polarity insensitive) 1 Optical Encoder opto-isolated (polarity insensitive) 1 General Purpose opto-isolated (polarity insensitive)
Output Inputs	
	2 x Outputs SW programmable, optocoupled, event driven, NPN 2 General Purpose opto-isolated open collector or open emitter
Optional Setup Interface	
Optional back panel with:	- USB-C with Display Port - HDMI® - USB 2.0

OPTICAL FEATURES	
Frame Rate	Up to 30 frames/sec. at full frame resolution
Sensor Type	CMOS, 16.0 or 28 M Pixels 16 MPixel - 6144 x 2624 pixels 28 MPixel - 8192 x 3456 pixels
Optical Lens	16 mm, 25 mm, 35 mm Lens
Focus	Fixed, Adjustable, Dual Zone and Dynamic
Illumination	Integrated White

HARDWARE AND SOFTWARE FEATURES	
Hardware	
	Real time clock with battery backup Removable SD card for fast application and parameter restore during replacement
Software	
Device Programming	Multilanguage, browser-based, on board web server interface
Operating System	Linux
Readable Barcodes	All Standard 1D and 2D Symbologies

ENVIRONMENTAL FEATURES	
Operating Temperature	0° to 50° C [32° to 122° F]
Storage Temperature	-20° to 70° C [-4° to 158° F]
Relative Humidity	95% non condensing
Vibration Resistance SINE vibration as per EN60068-2-6	5-9Hz : 1.5 mm / 9-150Hz :0.5g 2h on the primary axis (perpendicular to the face of the camera)
Shock Resistance As per EN60068-2-27	15g / 11ms / 3 times up and 3 times down on the primary axis.
Protection Class	IP65

PHYSICAL FEATURES	
Mechanical Dimensions	H x W x L 163 x 317 x 419 mm (6.41 x 12.48 x 16.49 in)
Weight	9.7 kg
Enclosure	Die Cast Aluminium

OTHER	
Service Options	Installation services and on-site training
Warranty	Two years

DATALOGIC

www.datalogic.com

Datalogic S.r.l.
Via S. Vitalino, 13 | 40012 Calderara di Reno | Bologna - Italy
Tel. +39 051 3147011 | Fax +39 051 3147205

801000630 (Rev A) March 2026