

COGNEX

DataMan[®] 150

Quick Reference Guide

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Symbols

The following symbols indicate safety precautions and supplemental information.

 **WARNING:** This symbol indicates the presence of a hazard that could result in death, serious personal injury or electrical shock.

 **CAUTION:** This symbol indicates the presence of a hazard that could result in property damage.

 **Note:** Notes provide supplemental information about a subject.

 **Tip:** Tips provide helpful suggestions and shortcuts that may not otherwise be apparent.

Getting Started

About DataMan 150



The DataMan 150 readers are best in class ID readers, offering superior performance with the latest ID tools, flexibility to configure the reader in terms of lighting and optics to optimize the application, and an ease-of-use giving the user the ability to setup and deploy an application quickly and efficiently all without the need for PC:

- Superior performance, 1-D and 2-D code reading, including HotBars2™ and patent-pending PowerGrid™
- Flexible optics/lighting, including field upgrades, allowing for the protection of your investment
- Ease-of-use, including an auto-tune and trigger button on the reader, the ability to configure the reader in a straight or right-angle orientation and auto-focus capability utilizing a liquid lens

The DataMan 150 readers provide support for USB and RS-232 communications.

Key highlights:

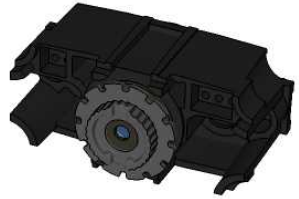


- 1DMax with HotBars2™, best in class 1-D reading, 2DMax with PowerGrid™, best in class 2-D reading. Reading codes no other ID reader on the market can.
- Multiple options for LED lighting, along with optical filters and polarizing filters. Options for different powered lens, with autofocus capabilities for each.
- Intelligent tuning and dynamic configuration of the reader combined to make the installation and setup of the application a snap.

This document provides basic information about how to configure and use DataMan 150 readers. Additional information is available through the Windows **Start** menu or the DataMan Setup Tool **Help** menu after you install the DataMan software on your PC:

- The **DataMan Communications & Programming Guide** shows how to integrate your DataMan reader with your automation software and factory network.
Cognex->DataMan Software v x.x.x->Documentation->Communications And Programming
- The **DataMan Reader Configuration Codes** document provides printable 2-D codes that you can use to configure the DataMan reader.
Cognex->DataMan Software v x.x.x->Documentation->English->Reader Configuration Codes
- The **DataMan Fixed Mount Readers Reference** is a complete online hardware reference for the DataMan fixed-mount ID readers.
Cognex->DataMan Software v x.x.x->Documentation->English->DM150 ->Fixed Mount Reference Manual
- The **DataMan Questions and Answers** document provides context-sensitive information. You can view this help inside the DataMan Setup Tool or as a stand-alone help file.
Cognex->DataMan Software v x.x.x->Documentation->DM150->Questions and Answers
- The **Release Notes** list detailed system requirements and additional information about this DataMan software release.
Cognex->DataMan Software v x.x.x->Documentation->DataMan v x.x.x Release Notes

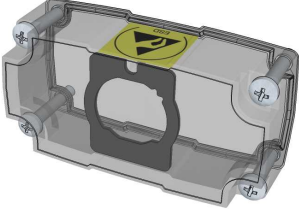


DataMan 150 Accessories

LENS OPTIONS

<p>6.2 mm lens kit (DM150-LENS-62)</p> <ul style="list-style-type: none"> • 6.2 mm optics mount • 6.2 mm lens • manual lens cap (not assembled) • long range lens cap (not assembled) • screws 	
<p>16 mm lens with extended optics mount (requires the use of an extended front cover and high-powered red LED) (DM260-LENS-16)</p> <ul style="list-style-type: none"> • 16 mm optics mount • 16 mm lens • manual lens cap (assembled) • screws 	
<p>Liquid Lens Module (LLM) to be used with 6.2 mm lens or 16 mm lens (DMA-LLM-150-260)</p>	
<p>16 mm lens with Liquid Lens kit (DM260-KIT-16LL)</p> <ul style="list-style-type: none"> • 16 mm optics mount • 16 mm lens • Liquid Lens Module (DMA-LLM-150-260) • High Powered red LED illumination (DM260-LED-RED-HP) • 2-LED half-polarized extended cover (DM260-LENS-16CVR-P) <p>Note: Power with 24V.</p>	

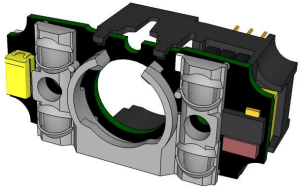
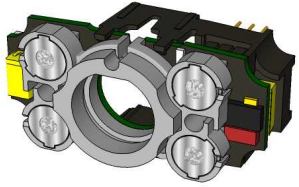
LENS COVERS

<p>Clear lens cover (DM150-CVR-CLR)*</p>	
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<p>Clear lens cover, ESD safe (DM150-CVR-ESD)*</p>	
<p>Extended lens cover (DM260-LENS-16CVR)**</p>	
<p>Extended lens cover, polarized (DM260-LENS-16CVR-P)**</p>	

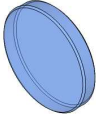
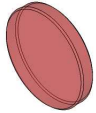
Note: *Use with a 6.2 mm lens only!
**Use with a 16 mm lens only!

LIGHT OPTIONS








<p>Red LED illumination (DM150-LED-RED)*</p>	
<p>White LED illumination (DM150-LED-WHT) *</p>	
<p>Blue LED illumination (DM150-LED-BLU)*</p>	
<p>High Powered red LED illumination (DM260-LED-RED-HP)**</p>	

Note: *Use with a 6.2 mm lens only!
**Use with a 16 mm lens only! The HP red LED can only be used when powering with 24V.

FILTERS

<p>Blue bandpass filter (DM150-BP470)</p>	
<p>Red bandpass filter (DM150-BP635)</p>	

CABLES

5-meter extension cable* (DM100-EXTCBL-000)	
RS-232/USB adapter for Expansion I/O Module (DM100-PATCH-000)	
USB adapter cable with power tap (DM100-USB-000)	
USB adapter cable with power tap (DM100-USB-030)	
USB & Flying Leads I/O Cable, 2.0 m (DM-USBIO-00)	
RS-232 & Flying Leads I/O Cable, 2.5 m (DM-RS232IO-00)	
RS-232 adapter cable with power tap (DM100-RS232-000)	
Flying Leads Connection Cable, 5 m (DM50-PWRIO-05)	

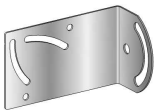
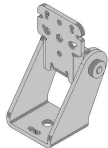
Note: *USB/RS-232 extension connection is possible with the following limitations:

- i**
1. The USB connection is shorter than 5m.
 2. Serial connection is shorter than 15m.


POWER SUPPLIES

Power supply, 6V (DM100-PWR-000)	
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MOUNTING BRACKETS

Mounting bracket (DM100-UBRK-000)	
Pivot mounting bracket (DM100-PIVOTM-00)	

IO MODULES

DataMan Basic I/O Module (DM100-IOBOX-000)	
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DataMan 150 Systems

	Omni-directional 1-D Code Reading	1DMax™ — Best-In-Class 1-D Reading	IDQuick™ — High-Speed 2-D Reading	2DMax™ — for hard to read DPM and damaged 2-D codes	Resolution
DataMan 150S*	√	√	√		752x480 Global shutter
DataMan 150QL	√	√			752x480 Global shutter
DataMan 150Q	√	√	√		752x480 Global shutter
DataMan 150X	√	√	√	√	752x480 Global shutter
DataMan 152S*	√	√	√		1280x960 Global shutter
DataMan 152QL	√	√			1280x960 Global shutter
DataMan 152Q	√	√	√		1280x960 Global shutter
DataMan 152X	√	√	√	√	1280x960 Global shutter

*Maximum decode rate of 2 codes/sec

Communication Modules

The DataMan 150 is available with the following communication options:

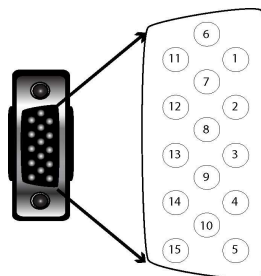
- USB/RS-232

DataMan 150 Cable Pinouts



The I/O module with USB has all signals on a SUB-D 15 connector with the following pinouts:

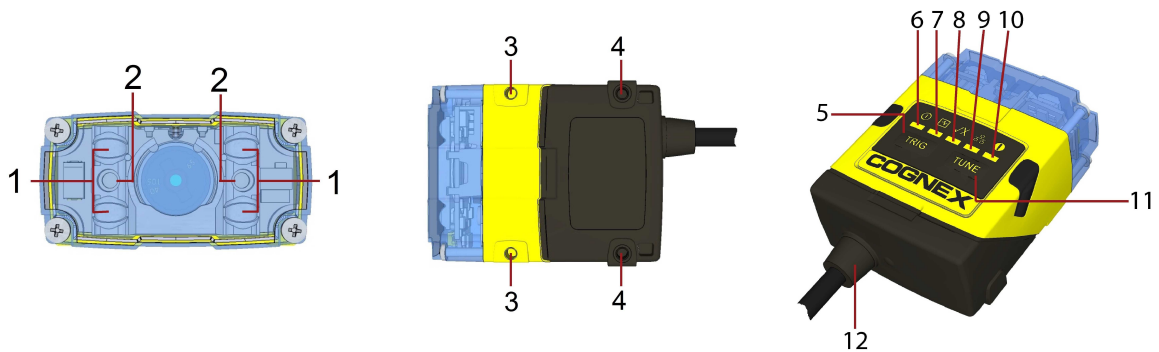
PIN	Color	Signal
1	Brown	Reserved
2	Green	TxD (RS-232)
3	Green/Black	RxD (RS-232)
4	Red & Red/Black	GND
5	Brown/White	DC+ (system power, 5-24 VDC)
6	Blue	RTS
7	Blue/White	Output-0
8	White	Input-0
9	White/Black	Input-1
10	Light Blue	CTS
11	Light Blue/Black	Output-1
12	Light Blue/Yellow	Output-Common
13	Light Blue/Green	Input-Common
14	Yellow	Reserved
15	Yellow/Black	Reserved



Note: Pin numbers are shown for cable connector, not I/O module.

Reader Layout

The following images show the built-in lighting system and other features of the DataMan 150 reader.



1	Illumination LEDs
2	LED aimers
3-4*	Mounting holes (M3 x 3.5mm)
5	Trigger button
6	Power
7	Train status/Trigger status
8	Good/bad read
9	Communication
10	Error
11	Tune button
12	Power, I/O and RS-232

Note: *Use only one set of mounting holes (either 3 OR 4) for mounting.

Note: The five status LEDs together also function as a peak meter using an orange light.

Indicator LEDs

Type	Signal	Color	Meaning
Status	Power	GREEN	Power ON
	Train status	GREEN	Trained
		YELLOW	Untrained
	Error	RED	Error - check device log
Action	Good/bad read	GREEN	Good read
		RED	Bad read
	Communication	YELLOW	Link up
		<i>blink</i>	Data transfer
	Peak meter	Yellow	Tune Focus

Changing Orientation

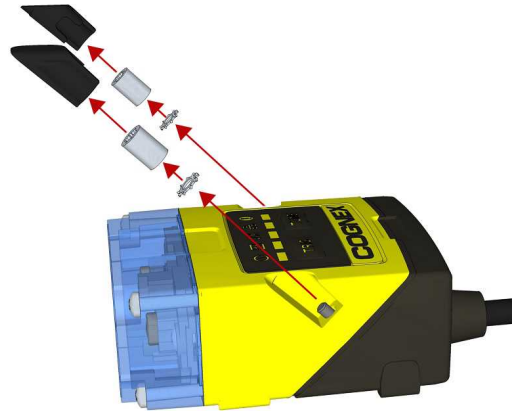
Perform the following steps to change between straight and angled configuration.

Note: Switching between straight and right angle configuration is recommended only up to 10 times in the lifetime of the reader.

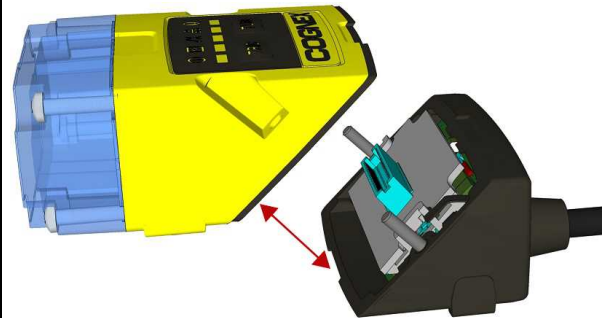
Note: Disconnect the DataMan 150 reader from power before changing the orientation.

WARNING: Make sure that no electrostatic charges are applied to the PCB. (E.g. wear ESD shoes.) If the main module is separated from the I/O module, take care to assemble them correctly. Otherwise, IP rating can be lost.

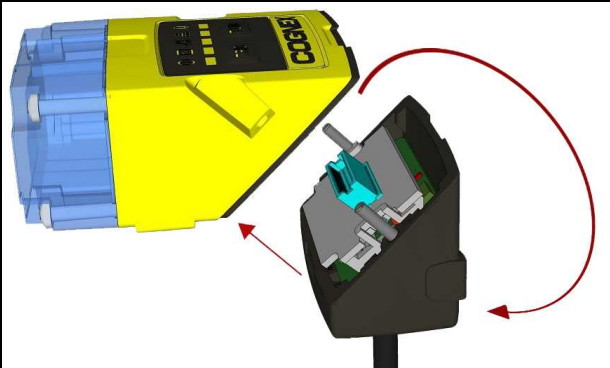
1. Remove the screw covers and unscrew the screws.



2. Disconnect the main module and the I/O module by firmly pulling them apart.

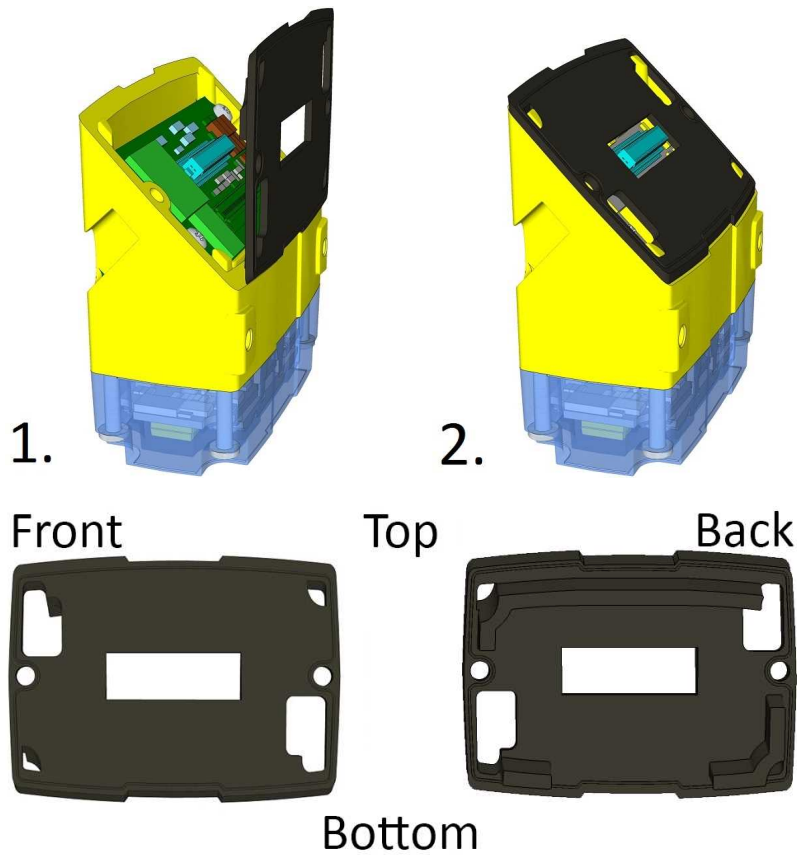


3. Change the orientation.



Note: Make sure that the gasket is properly seated on the main module. Ensure that the flat gasket side is facing away from the module.

Place the bottom edge of the gasket onto the underside of the main module. Press on the top edge to fully seat the gasket:



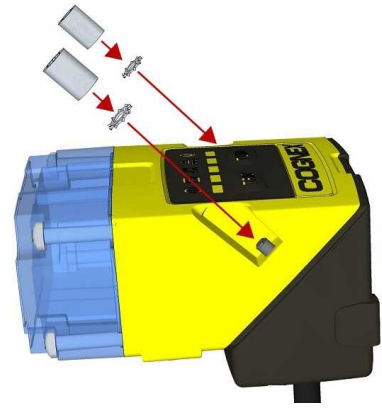
Note: The flat side of the gasket (marked as "Front" in the image above) has to face outside.

WARNING: Do not touch any electrical component.

4. Connect the I/O module to the main module.

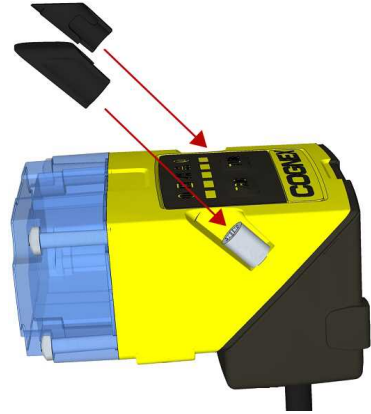


5. Loosely fasten the modules together with the two T10 cap nut screws until they attach to the housing surface, but do not torque.



6. After each cap nut has been fastened, torque them to 0.12 Nm and place back the screw covers.

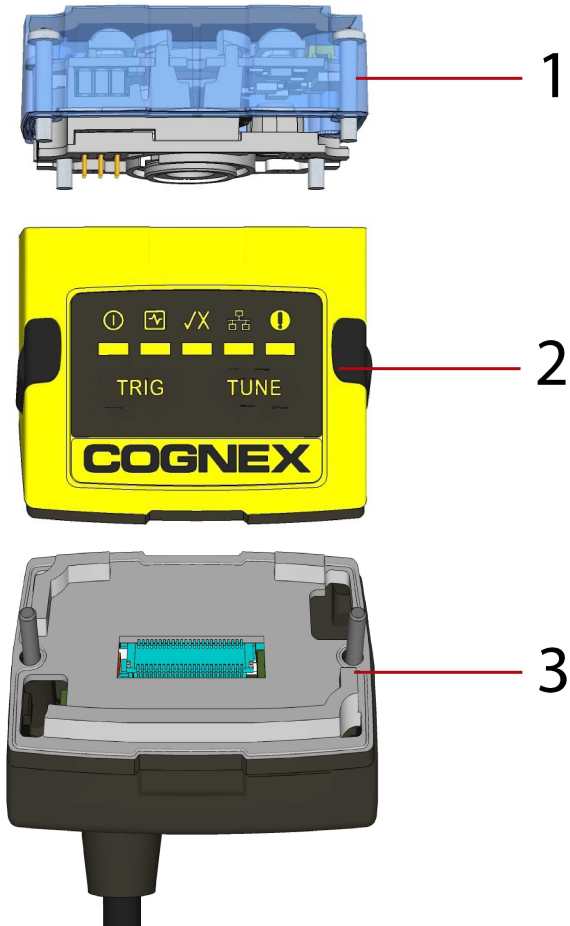
Note: There are unique left and right screw covers. Take care to attach them correctly.



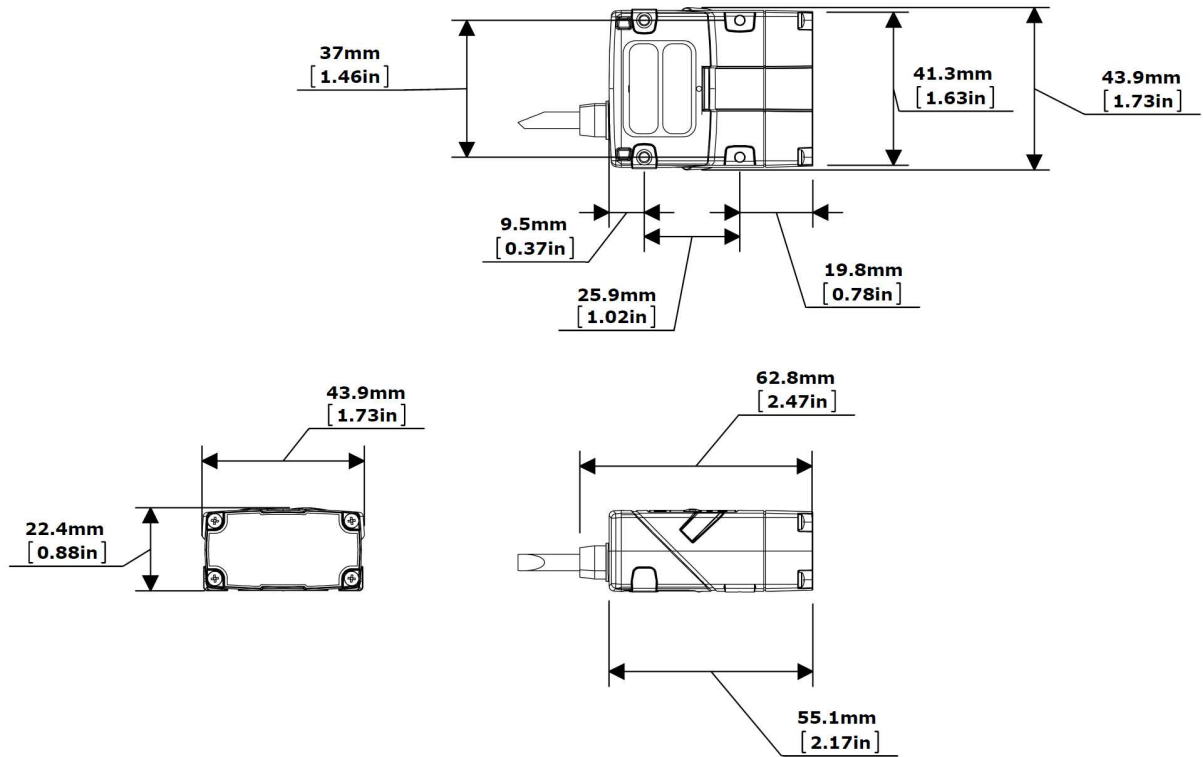
Dimensions

The DataMan 150 consists of three main parts:

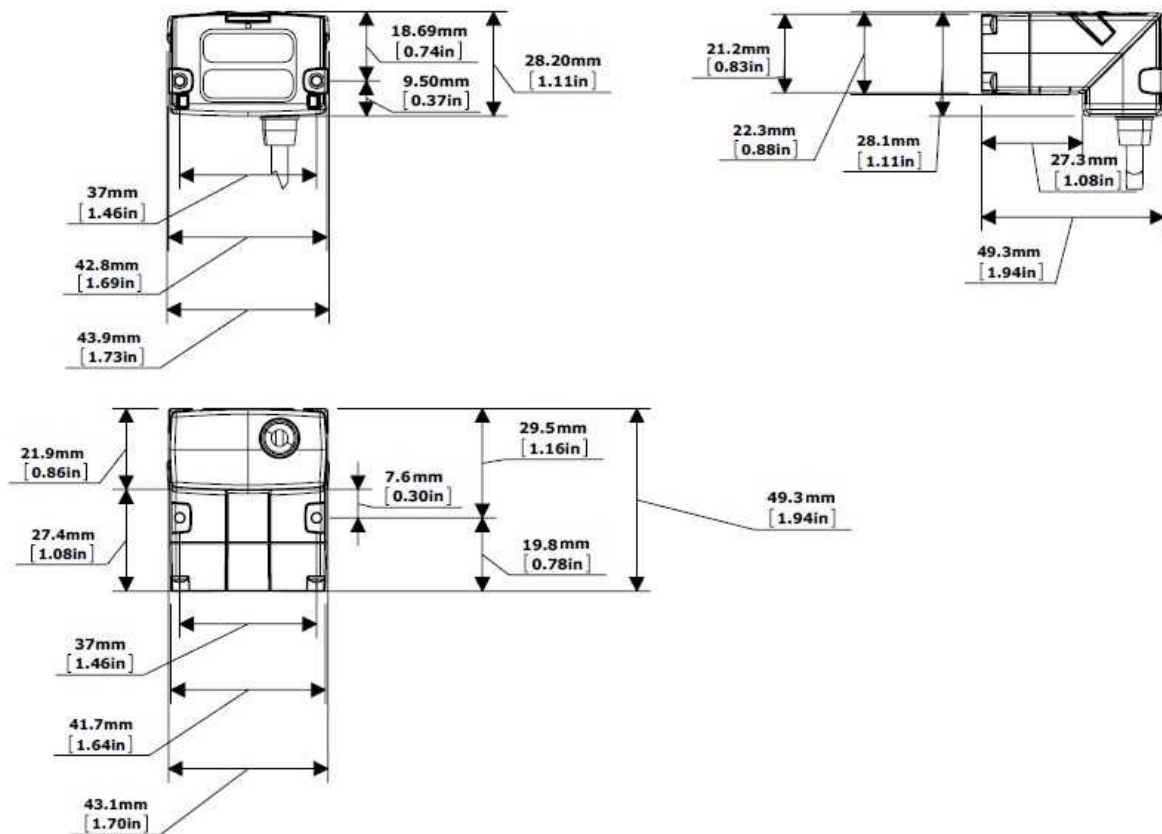
1. Optics module (lens including lens mount, illumination and front cover including filter mounting option for a Diameter (\varnothing): $12.3\text{mm} < \varnothing < 12.7\text{mm}$, Thickness (t): $1.6\text{mm} < t < 2\text{mm}$ filter)
2. Main module, including sensor and CPU
3. I/O module



The size of the DataMan 150 in the straight configuration is shown in the following figure:



The size of the DataMan 150 in the angled configuration is shown in the following figure:



Installing an Optical Filter

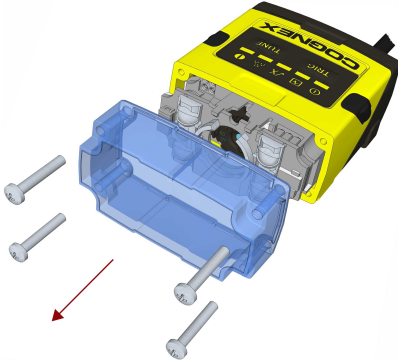
Perform the following steps to install an optical filter in the optics module of the DataMan 150 reader.

Note: Disconnect the DataMan 150 reader from power before installing an optical filter.

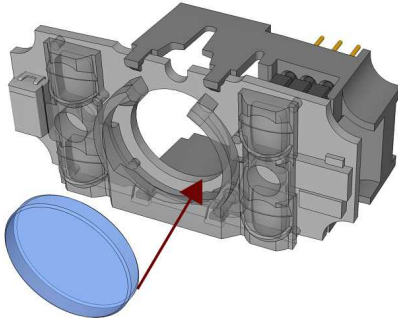
Observe the following constraints on the filter:

- Diameter (\varnothing): $12.3\text{mm} < \varnothing < 12.7\text{mm}$
- Thickness (t): $1.6\text{mm} < t < 2\text{mm}$ filter

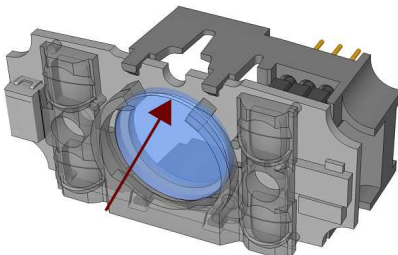
1. First, remove the front cover: unscrew the four screws and take off the LED cover.



2. Insert the filter at the bottom side of the round opening in the transparent plastic part.

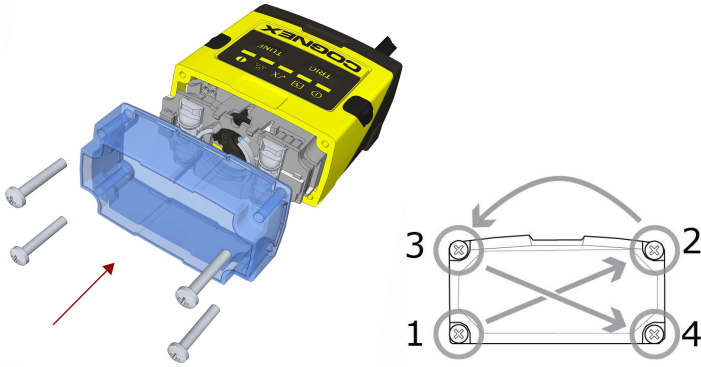


3. Push the top side of the filter firmly until it is sitting flat against the PCB.



Note: Use your finger to push the filter in and then a q-tip to clean the filter, or use a q-tip to push the filter into place.

- Attach the front cover. Observing the tightening sequence below, tighten all four screws to 9 Ncm using a torque wrench.



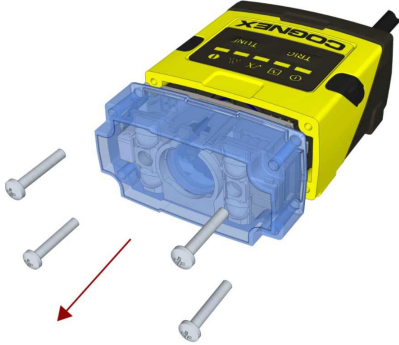
Note: The rib in the front cover must be oriented to the top side.

Installing a Liquid Lens

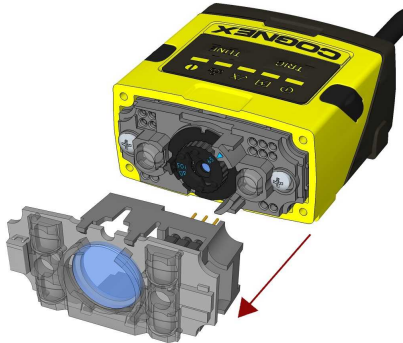
Perform the following steps to install a liquid lens on your DataMan 150 reader.

Note: Disconnect the DataMan 150 reader from power before installing the liquid lens.

1. Remove the front cover: unscrew the four screws and take off the LED cover.



2. Remove the illumination module.



3. Turn the lens cap to the 105 mm position.



4. Remove the lens cap from the imager lens by pulling it.



Note: Do not rotate the imager lens while the lens cap is removed. Otherwise, focus calibration will be lost.

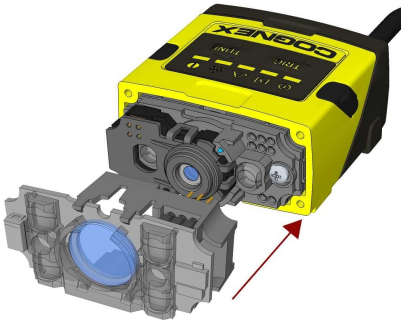
5. Attach the liquid lens accessory by aligning the 2x2 connectors of the liquid lens with the 2x2 sockets on the optics mount.



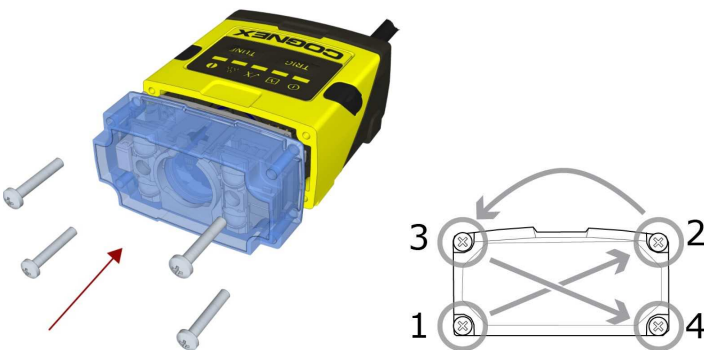
6. Press the liquid lens onto the imager lens until you reach the stop.



7. Reattach the illumination.



8. Attach the front cover. Observing the tightening sequence below, tighten all four screws to 9 Ncm using a torque wrench.



Note: The rib in the front cover must be oriented to the top side.

Note: The DataMan 150 liquid lens must be calibrated after field exchange. This can be done under **Focus Settings** in the DataMan Setup Tool. For more information, see the *DataMan Questions and Answers* document.

A reboot is required for the lens to operate with the new settings.

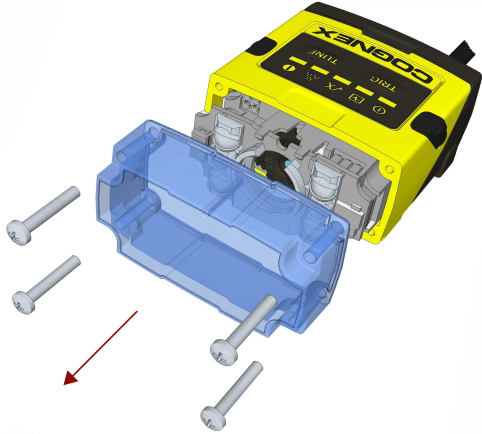
Changing from a 6.2 mm Lens to a 16 mm Lens

Perform the following steps to change a 6.2 mm lens to a 16 mm lens on your DataMan 150 reader.

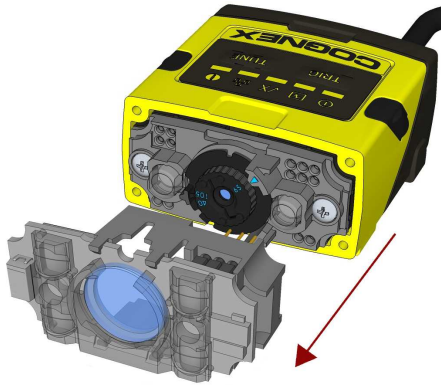
Note: Disconnect the DataMan 150 reader from power before changing lenses.

WARNING: This modification must be made in a dust-free and ESD safe area.

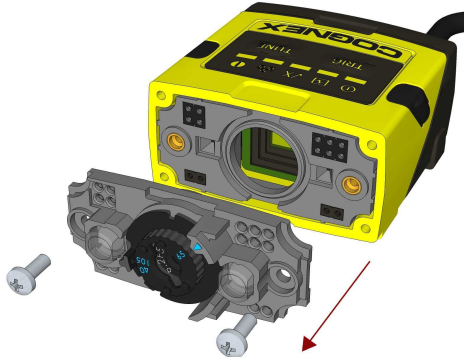
1. Remove the front cover: unscrew the four screws and take off the LED cover.



2. Remove the illumination module.



3. Unscrew the two Phillips head screws and remove the 6.2 mm lens mount.



4. Attach the 16 mm lens mount.

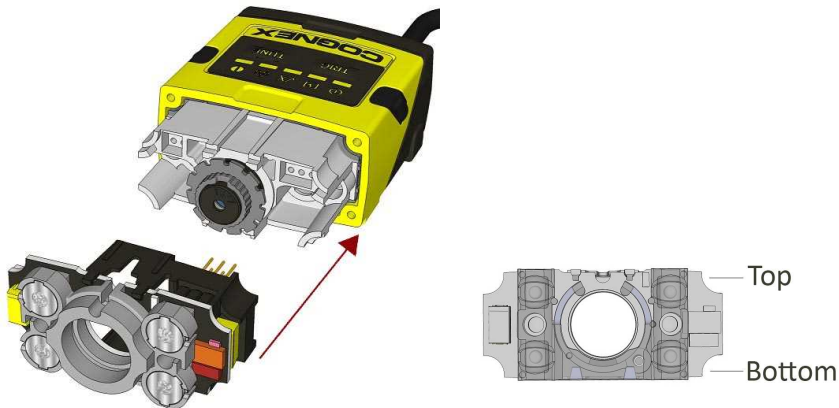


5. Fasten the two Phillips head screws to 0.06 Nm using a torque wrench.
6. In the case of a manual focus lens, press the 16 mm lens cap onto the lens. The lens has 12 cutouts so it can be locked in steps of 30 degrees.



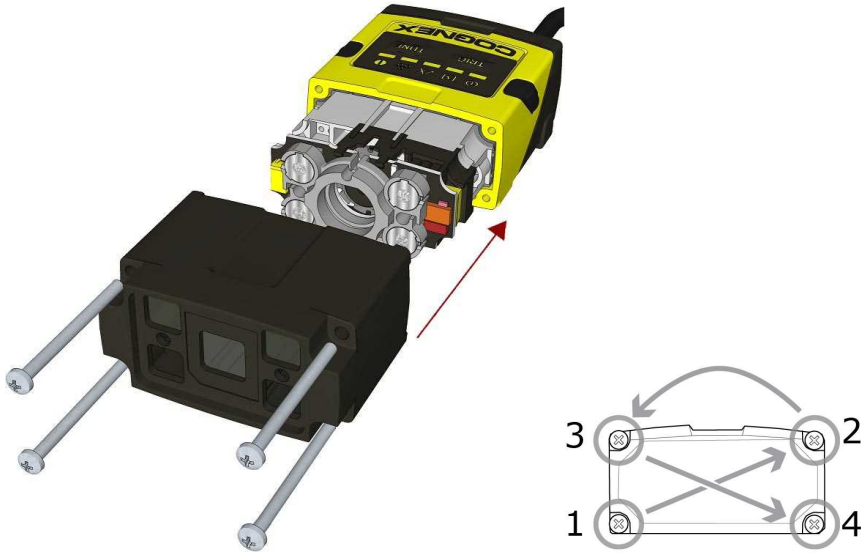
In the case of a liquid lens, mount the liquid lens cap onto the 16 mm lens. (See [Installing a Liquid Lens](#).)

7. Attach the illumination board.



Note: Take care to attach the illumination with the right orientation.

8. Attach the extended front cover. Observing the tightening sequence below, tighten all four screws to 9 Ncm using a torque wrench.



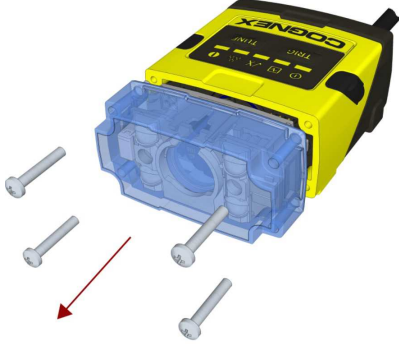
Note: The rib in the front cover must be oriented to the top side.

Changing to an Illumination with a Different Color

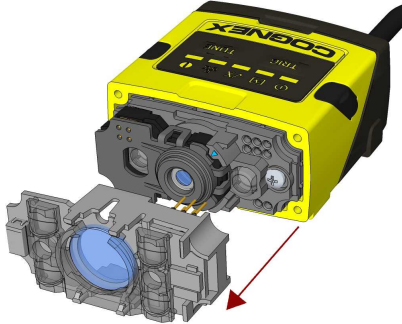
Perform the following steps to change the illumination.

Note: Disconnect the DataMan 150 reader from power before changing to an illumination with a different color.

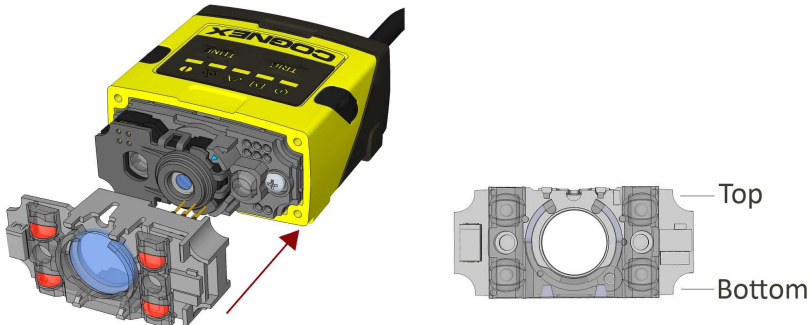
1. Remove the front cover: unscrew the four screws and take off the LED cover.



2. Remove the illumination module.

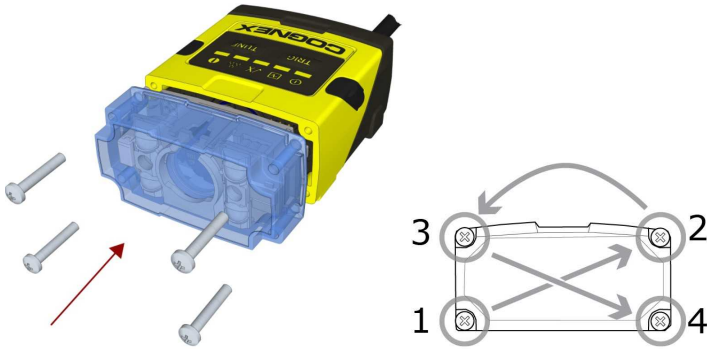


3. Attach a new color illumination module.



Note: Take care to attach the illumination with the right orientation.

4. Attach the front cover. Observing the tightening sequence below, tighten all four screws to 9 Ncm using a torque wrench.

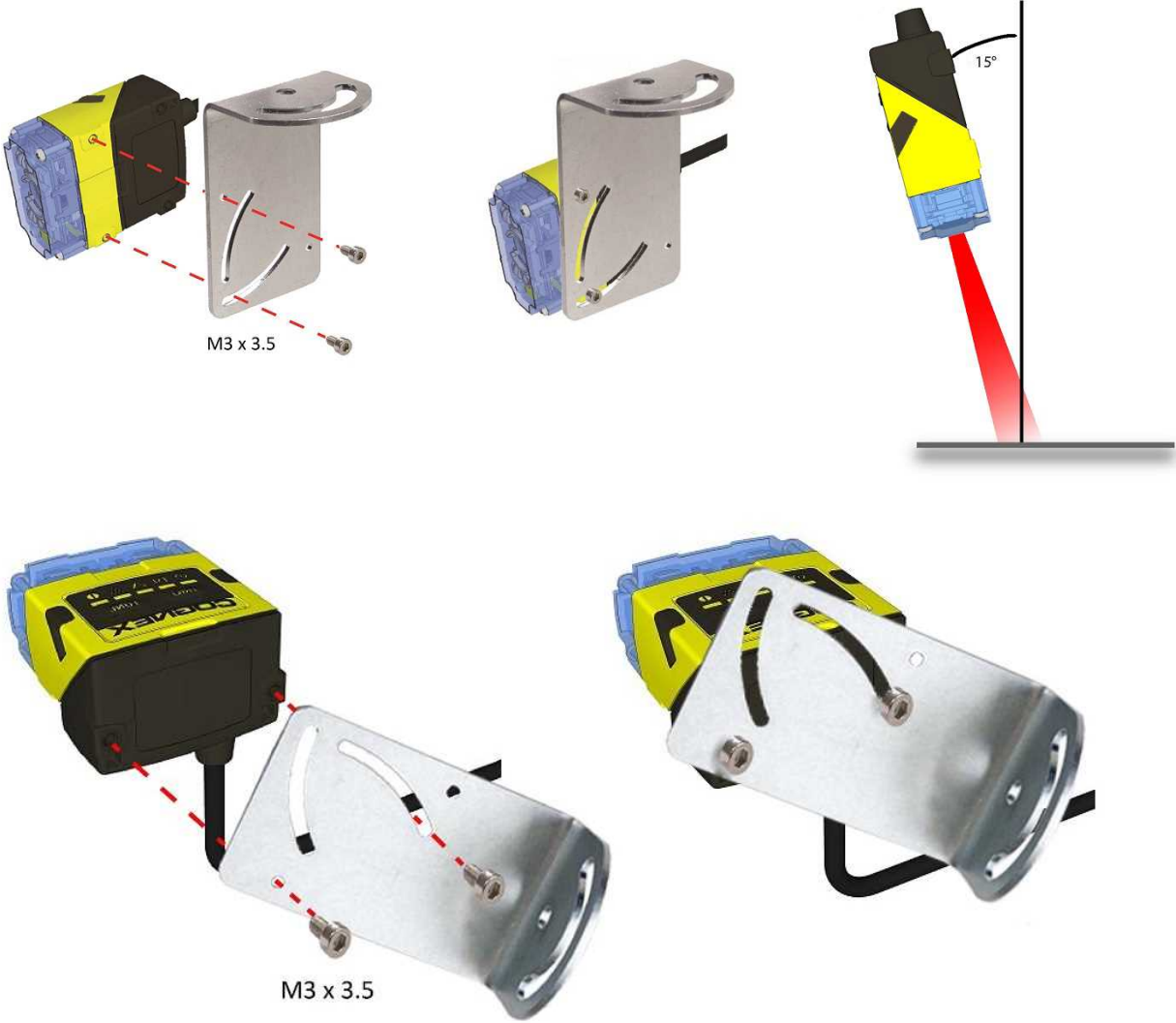


Note: The rib in the front cover must be oriented to the top side.

Setting Up Your DataMan

Mounting

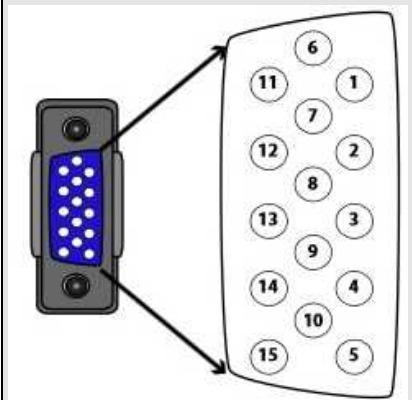
Mounting the DataMan 150 at a slight angle (15°) can reduce reflections and improve reader performance.



I/O Cable

You can connect a cable with USB & flying leads (DM-USBIO-00) to the cable that is attached to the device. The following table shows the pinout and color description of the flying leads.

Note: GND (Pin 4) is connected to the reader housing, cable shield, and DB15 shell.

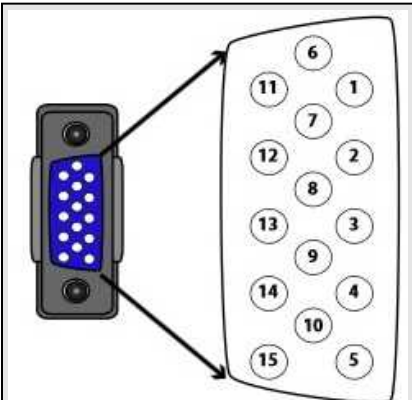


This is a female socket/connector.

PIN	Color	Signal
4	Black	GND
7	Blue/White	Output-0
8	White	Input-0
9	White/Black	Input-1
11	Light Blue/Black	Output-1
12	Light Blue/Yellow	Output-Common
13	Light Blue/Green	Input-Common

RS-232 Cable

You can connect a cable with RS-232 & flying leads (DM-RS232IO-00) to the cable that is attached to the device. The following table shows the pinout and color description of the flying leads.



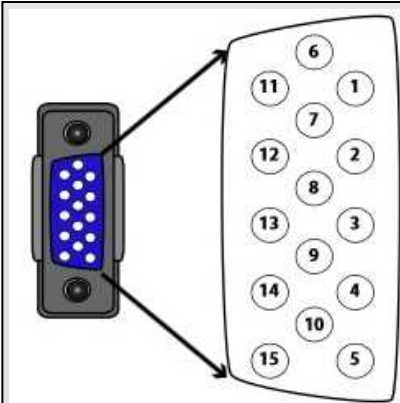
This is a female socket/connector.

PIN	Color	Signal
4	Black	GND
5	Brown/White	VDC
7	Blue/White	Output-0
8	White	Input-0
9	White/Black	Input-1
11	Light Blue/Black	Output-1
12	Light Blue/Yellow	Output-Common
13	Light Blue/Green	Input-Common

Flying Leads Cable

You can connect a cable with flying leads (DM50-PWRIO-05) to the cable that is attached to the device. The following table shows the pinout and color description of the flying leads.

PIN	Color	Signal
2	Green	TxD
3	Green/Black	RxD
4	Red	GND
5	Brown/White	DC+ (system power, 5-24 VDC)
6	Blue	RTS
7	Blue/White	Output-0
8	White	Input-0
9	White/Black	Input-1
10	Light Blue	CTS
11	Light Blue/Black	Output-1
12	Light Blue/Yellow	Output-Common
13	Light Blue/Green	Input-Common

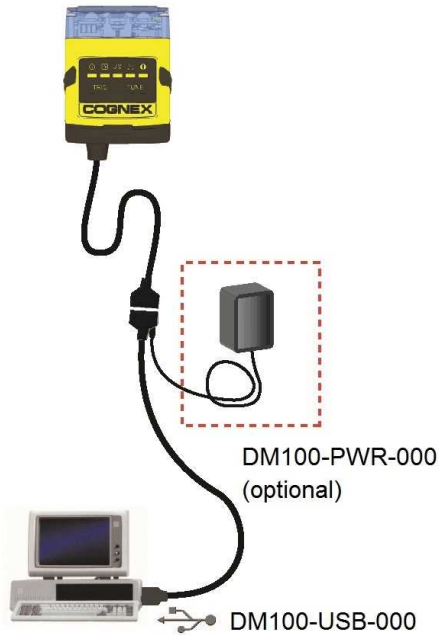


This is a female socket/connector.

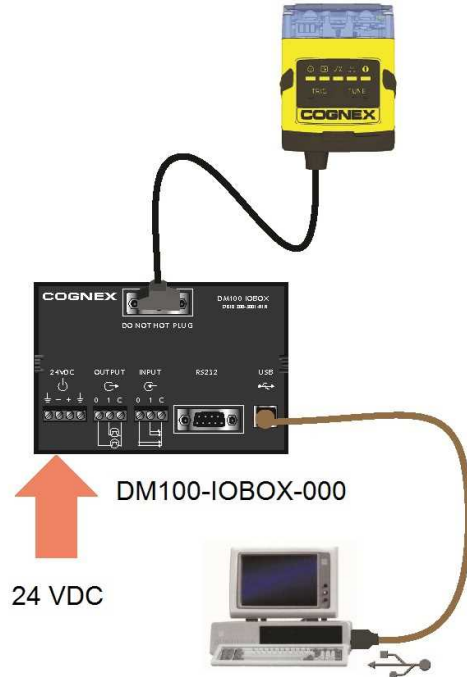
USB Connections

When connected to a PC over USB, the DataMan 150 appears as a COM port. You can connect your device to the computer in the following ways:

1. Connect directly to the PC:



2. Connect to the PC through a basic I/O module:



If the reader is configured as an HID device and you want to return to USB serial, scan the USB serial connection code:



Note: The DataMan PC software must be installed for this connection type!

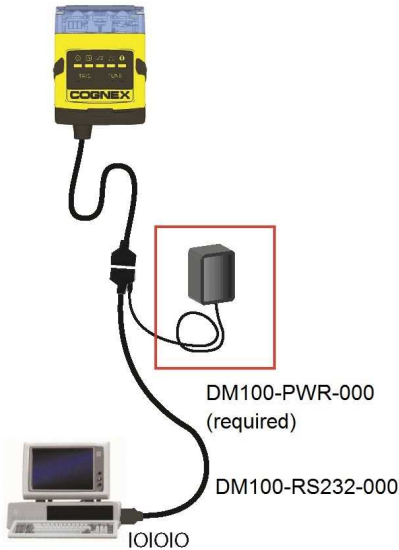
RS-232 Connections

You can connect the DataMan 150 reader to a PC or other device over a standard RS-232 serial connection.

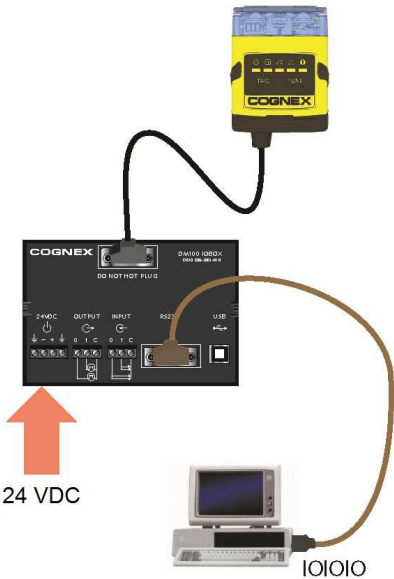
Note: You must supply external power to use this connection type.

You can make a connection in the following ways:

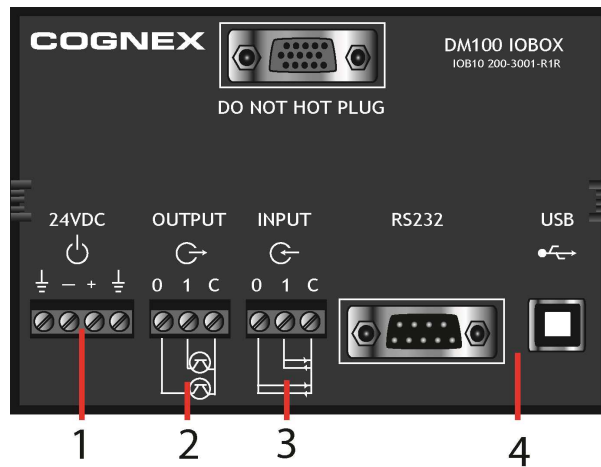
1. Connect directly to the PC:



2. Connect to the PC through a basic I/O module:



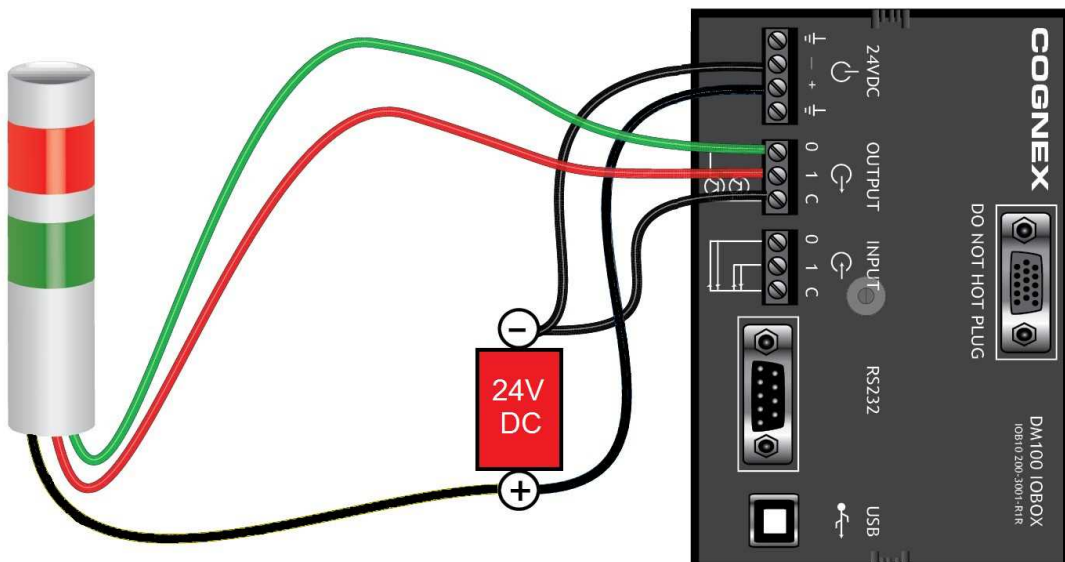
Wiring the Basic I/O Module



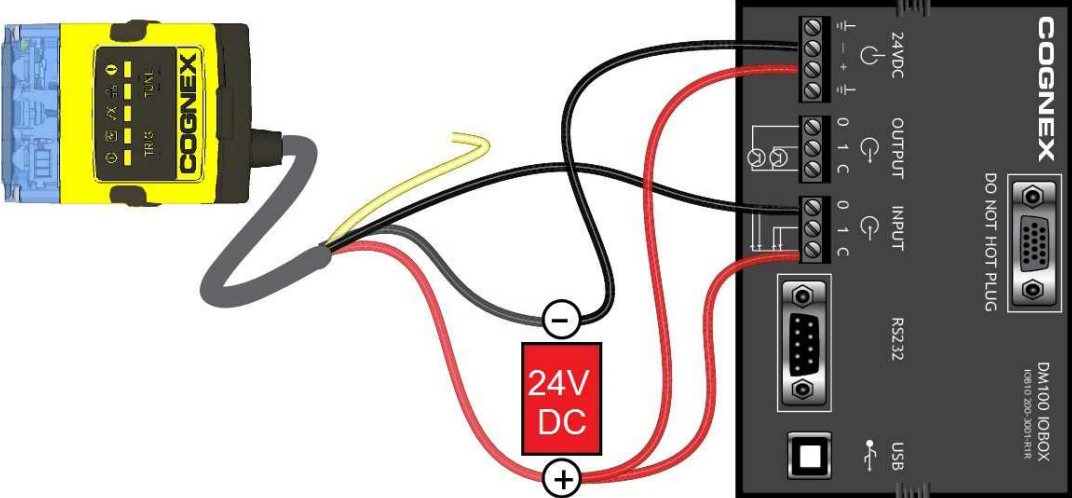
1. **Power:** 5-24 VDC, 2.5W peak. Connect either ground pin to chassis ground.
2. **Discrete output:** Opto-isolated, current source or sink, depending on wiring; must connect logical ground to common. Outputs are opto-isolated and protected against reverse polarity. Max current 50 mA @ 24 VDC. Output 1 used for external illumination control by default.
3. **Trigger input:** Opto-isolated, polarity-independent, current source or sink; have reference to a separated common signal. Work with ± 15 -30V. Input 0 is dedicated trigger line.

Note: You must use a null modem cable when connecting the Basic I/O Module to a PC's RS-232 serial port.

Output Wiring Example

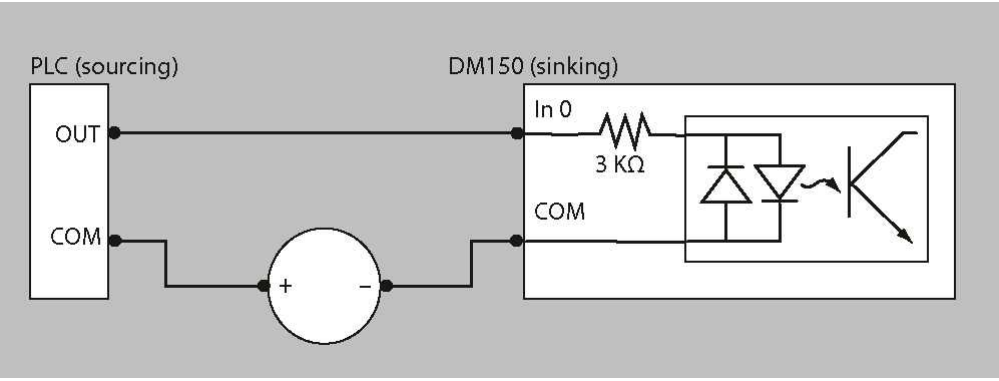


Input Wiring Example

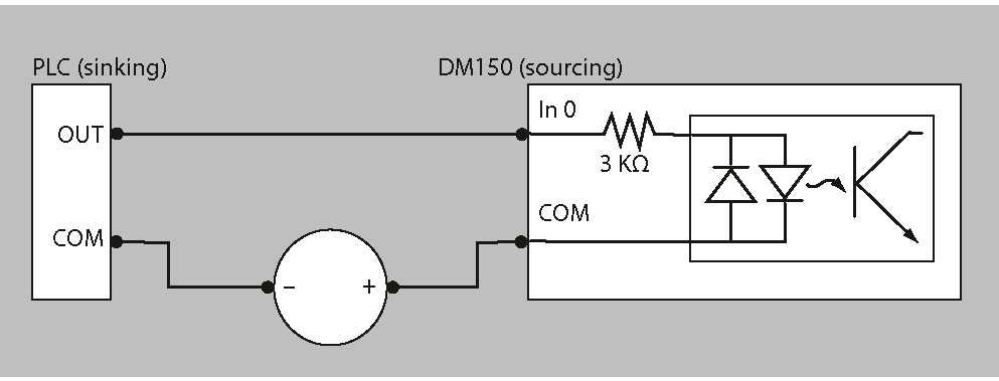


Digital Input Wiring Diagrams

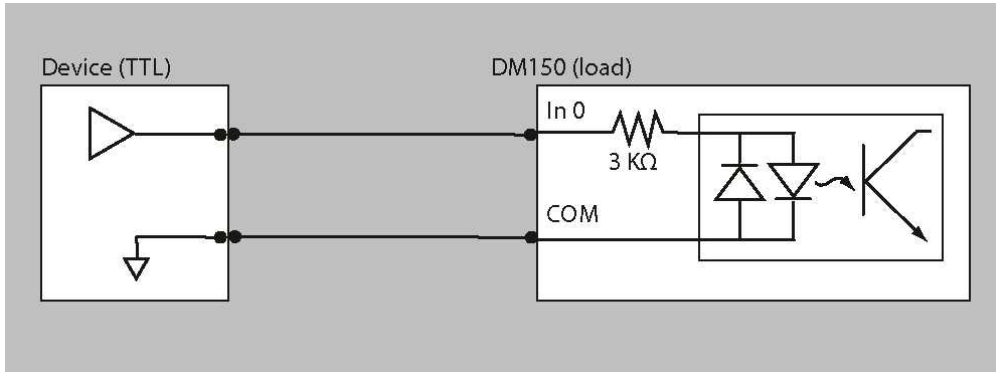
Current Sink Configuration



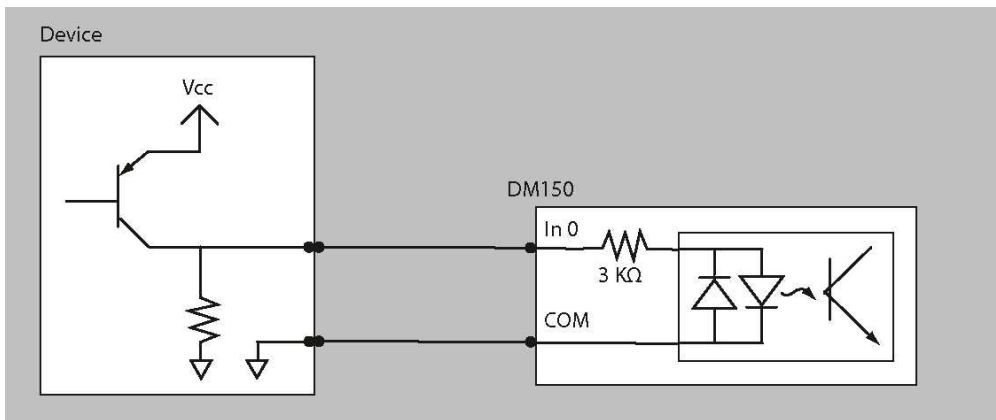
Current Source Configuration



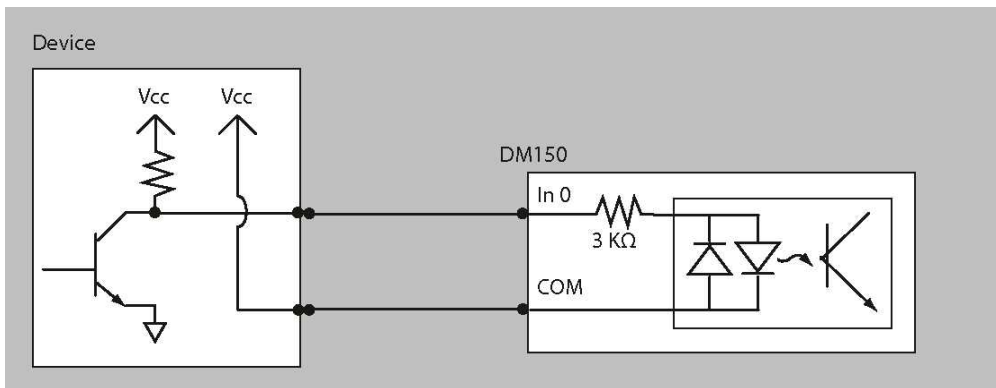
Load to a TTL Buffer



PNP Configuration



NPN Configuration



Digital Output Wiring Diagrams

The digital outputs can be used as either NPN (pull-down) or PNP (pull-up) lines. For NPN lines, the external load should be connected between the output and the positive supply voltage (<26V). The outputs pull down to less than 3V when ON, which causes current to flow through the load. When the outputs are OFF, no current flows through the load.

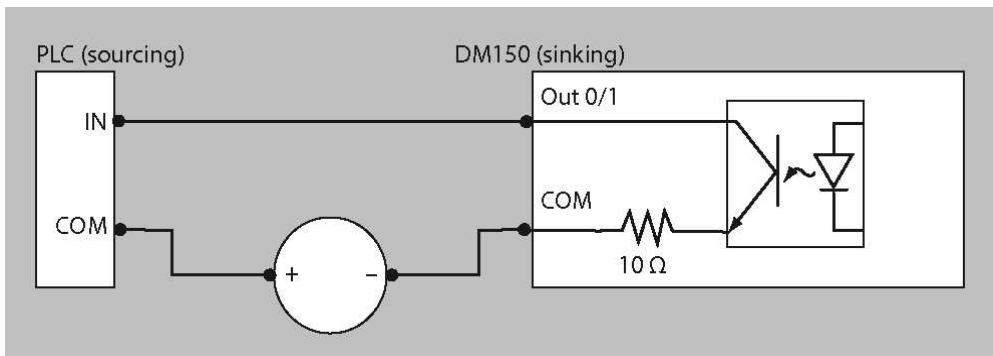
NPN (pull down) output type characteristics are the following:

Applied voltage	26 VDC or less
Residual voltage	0.85 V or less
Maximum sink current	100 mA
Overcurrent protection	multifuse - 160 mA

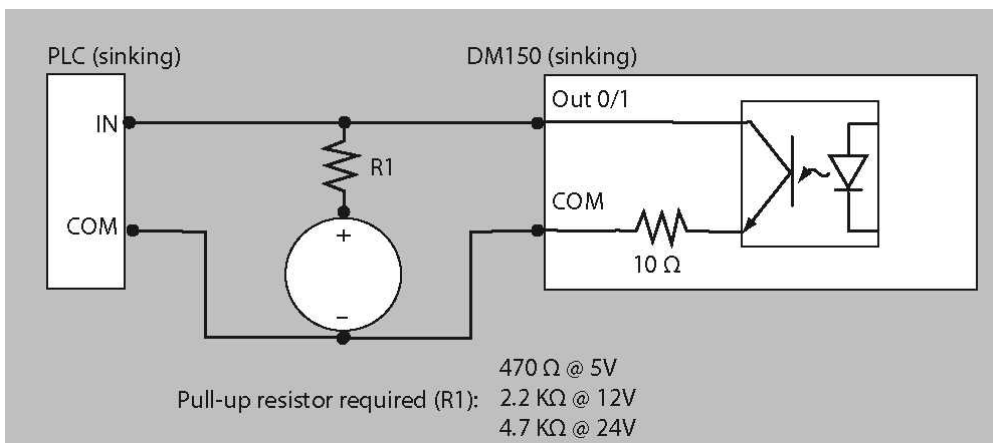
PNP (pull up) output type characteristics are the following:

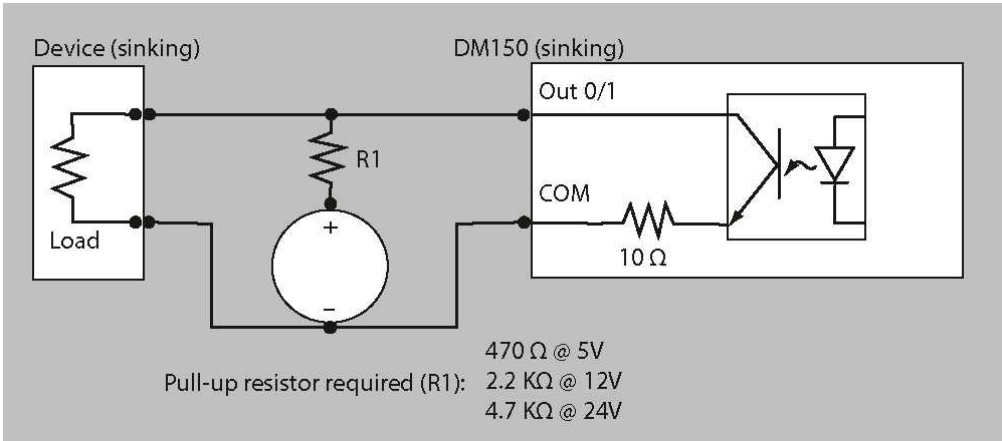
Output voltage range	26 V or less
Residual voltage	0.8 V or less
Maximum source current	100 mA
Overcurrent protection	multifuse - 160 mA

Sinking Outputs, Sourcing Inputs



Sinking Outputs, Sinking Inputs





Installing the DataMan Software

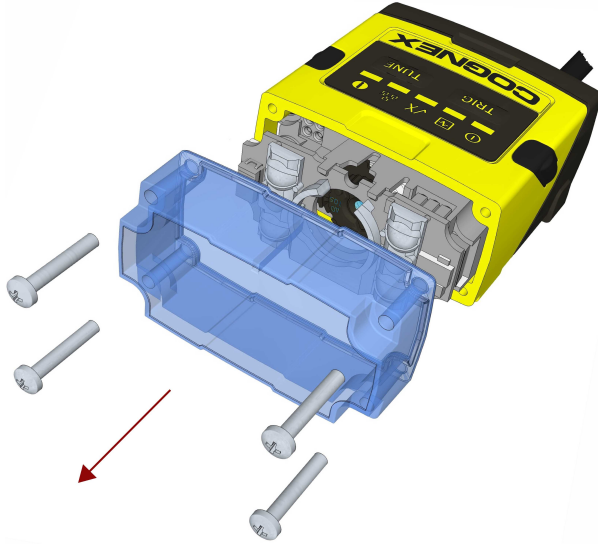
Perform the following steps to install DataMan Setup Tool:

1. Check the **DataMan Release Notes** for a full list of system requirements.
2. Download the DataMan Setup Tool from <http://www.cognex.com/support/dataman> and follow the on-screen steps.
3. Connect the DataMan 150 to your PC.
4. Choose **Start->Programs->Cognex->DataMan Software vx.x.x->Setup Tool** to launch Setup Tool. Detected readers will appear under **COM ports**.
5. Click **Refresh** to update the list of connected devices.
6. Select a COM port that lists DataMan 150 and click **Connect**.

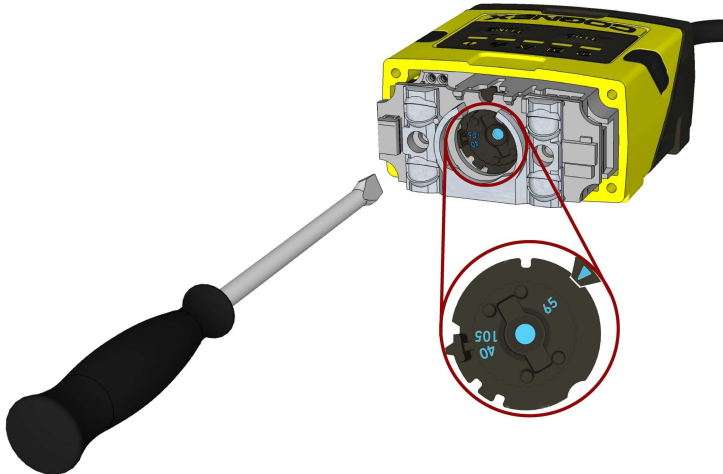
Setting the Focus Position

DataMan 150 can operate in one of three distance ranges. Follow the steps below to set the focus position.

1. Remove the screws and the front cover.

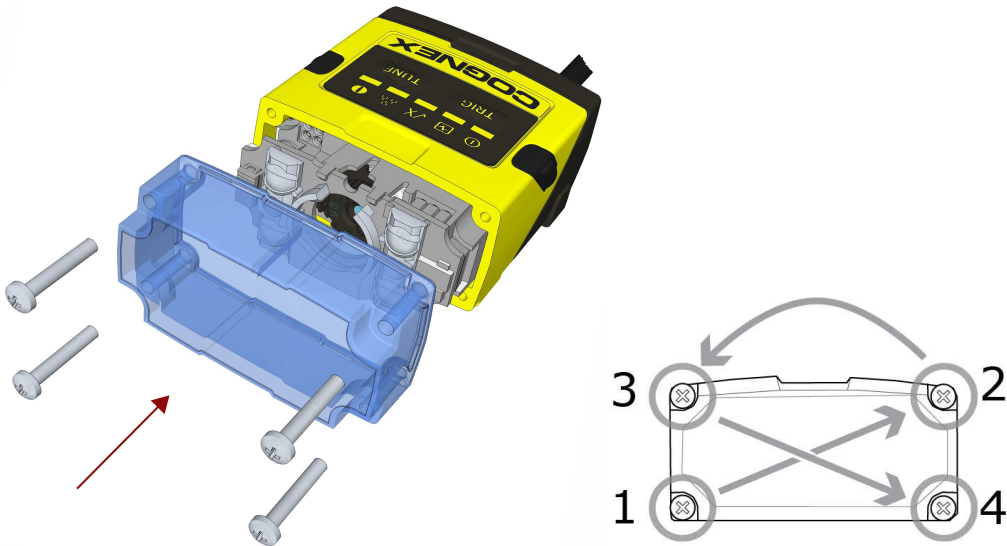


2. Using a flathead screwdriver, set the focus position from the front. Always turn clockwise to focus to a larger distance and counterclockwise to focus to a shorter distance.



Note: If an optical filter has been mounted, first disconnect the DataMan 150 reader from power and remove the illumination module with the filter before adjusting the focus.

3. Remount the front cover. Observing the tightening sequence below, tighten all four screws to 9 Ncm using a torque wrench.



Note: If you use an optical filter and the illumination was removed, remount the illumination module first and then remount the front cover.

Note: The rib in the front cover must be oriented to the top side.

Field of View and Reading Distances

DataMan 150 Readers with a 6.2 mm Lens

Short Range (Focused to 105 mm)

The following tables show the field of view (FoV) widths of the 6.2 mm lens focused to 105 mm at various distances.

VGA

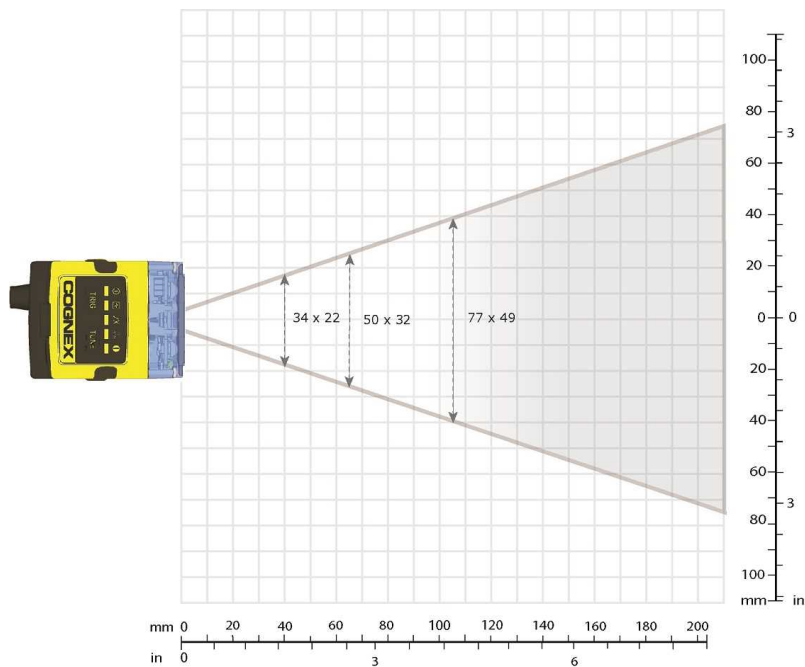
Distances in mm	2D min. code	1D min. code
40	4 MIL	4 MIL
65	5 MIL	4 MIL
105	10 MIL	6 MIL

1.2 Mp

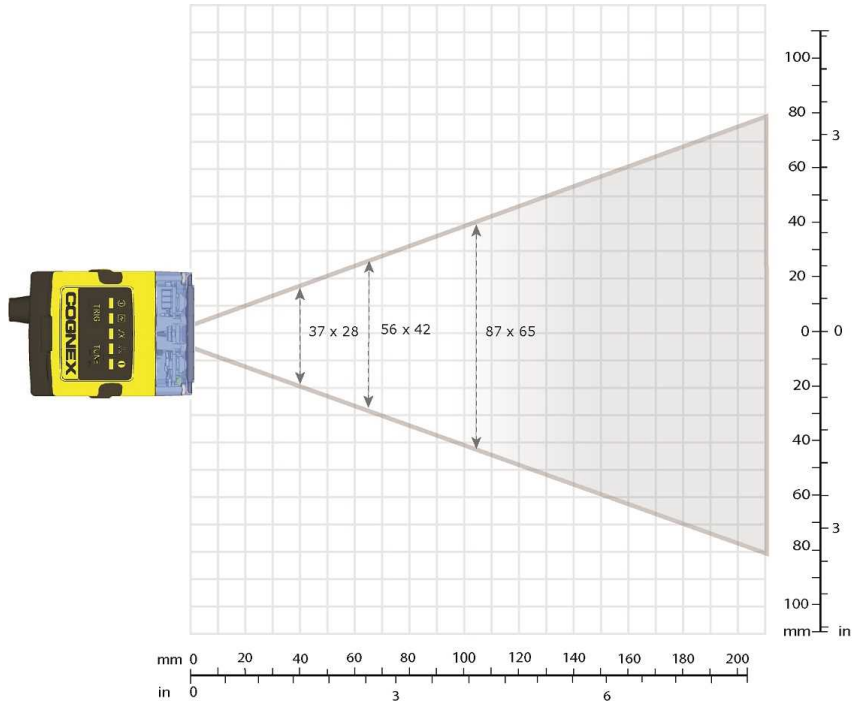
Distances in mm	2D min. code	1D min. code
40	3 MIL	2 MIL
65	4 MIL	2 MIL
105	7 MIL	5 MIL

The following maps show the field of view (FoV) of the DataMan 150 readers with a 6.2 mm lens. The horizontal and vertical field of view is shown for working distances of 40 mm, 65 mm and 105 mm.

VGA + 6.2 mm Lens



1.2 Mp + 6.2 mm Lens



Long Range (Focused to 190 mm)

The following tables show the FoV widths of the 6.2 mm lens focused to 190 mm at various distances.

VGA

Distances in mm	2D min. code	1D min. code
150	12 MIL	6 MIL
190	15 MIL	10 MIL
225	18 MIL	10 MIL
375	30 MIL	15 MIL
500	35 MIL	20 MIL
1 m	-	35 MIL

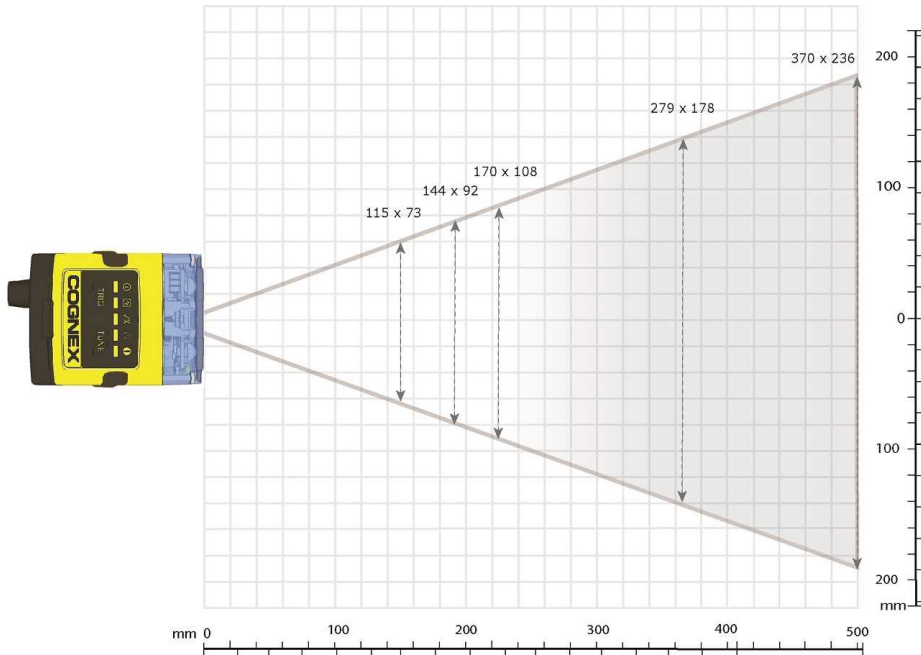
1.2 Mp

Distances in mm	2D min. code	1D min. code
150	12 MIL	5 MIL
190	10 MIL	6 MIL
225	15 MIL	6 MIL
375	20 MIL	10 MIL
500	25 MIL	15 MIL
1 m	-	30 MIL

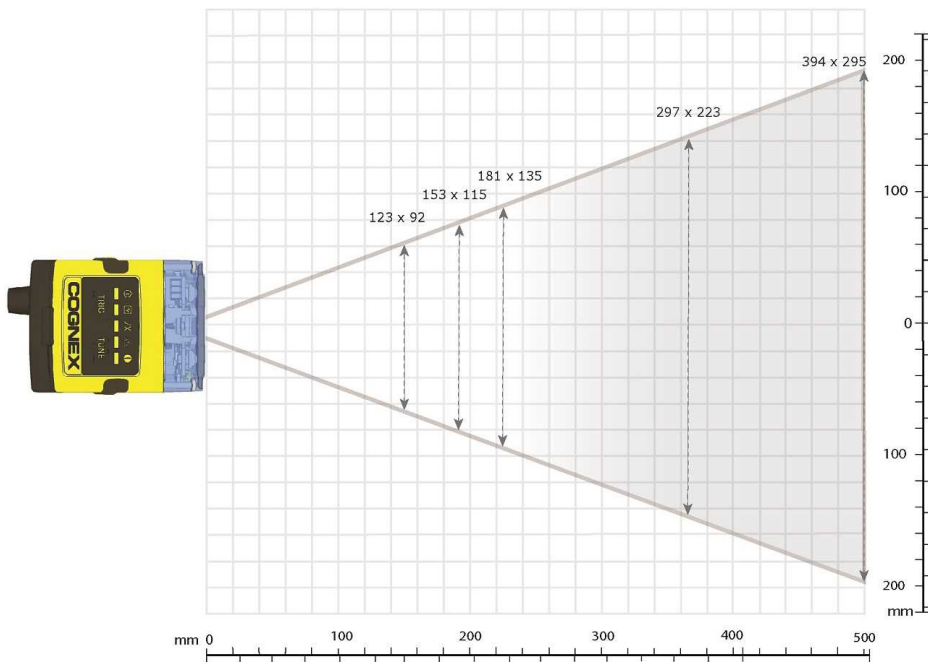
The following maps show the field of view (FoV) of the DataMan 150 readers with a 6.2 mm lens.

The horizontal and vertical field of view is shown for working distances of 150 mm, 190 mm, 225 mm, 375 mm and 500 mm.

VGA + 6.2 mm Lens



1.2 Mp + 6.2 mm Lens



DataMan 150 Readers with a 16 mm Lens

The following tables show the field of view (FoV) widths of the 16 mm lens at various distances.

VGA

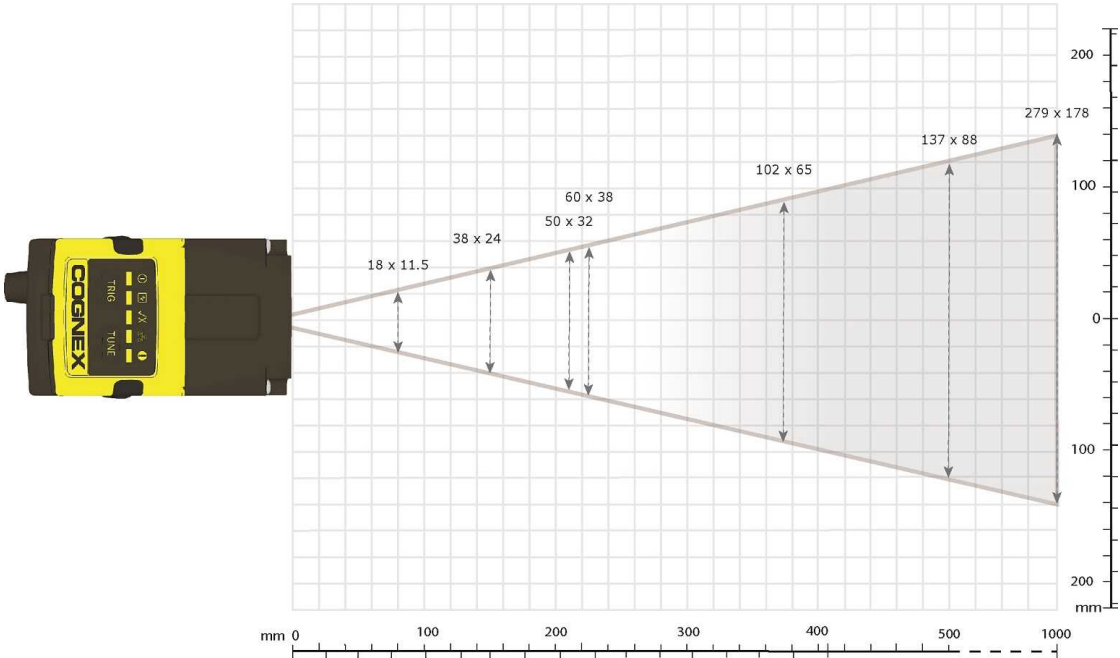
Distances in mm	2D min. code	1D min. code
80	3 MIL	2 MIL
150	5 MIL	3 MIL
190	6 MIL	4 MIL
225	7 MIL	4 MIL
375	12 MIL	5 MIL
500	15 MIL	10 MIL
1 m	25 MIL	15 MIL

1.2 Mp

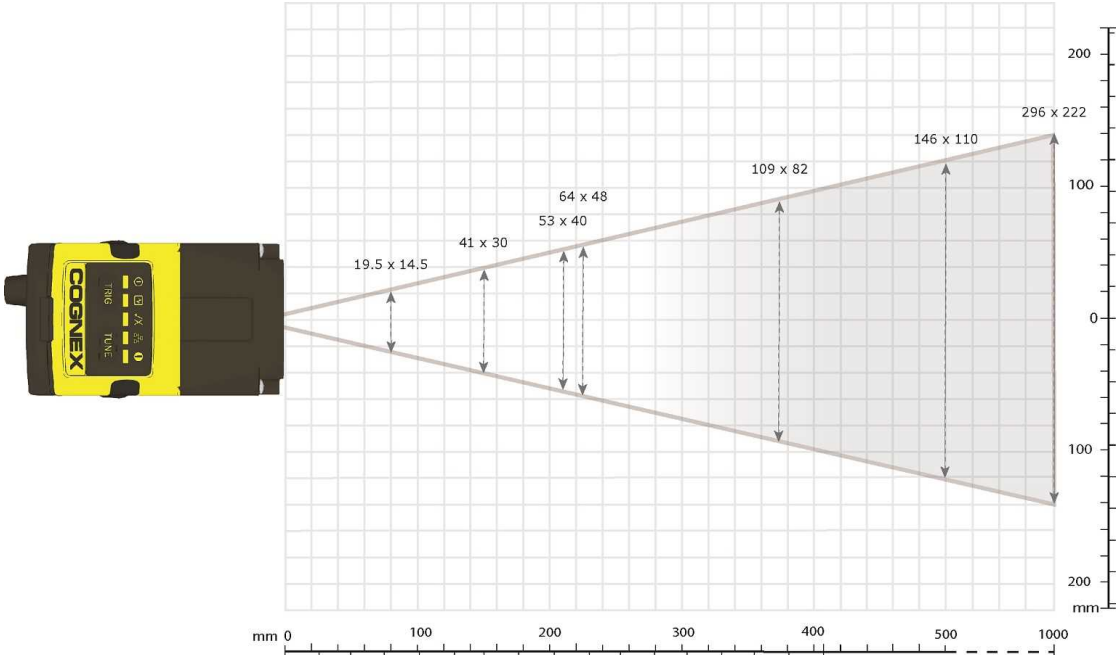
Distances in mm	2D min. code	1D min. code
80	2 MIL	2 MIL
150	3 MIL	2 MIL
190	4 MIL	2 MIL
225	4 MIL	3 MIL
375	7 MIL	4 MIL
500	10 MIL	6 MIL
1 m	20 MIL	15 MIL

The following maps show the FoV of the DataMan 150 and DataMan 152 readers with a 16 mm lens. The horizontal and vertical field of view is shown for working distances of 80 mm, 150 mm, 225 mm, 375 mm, 500 mm and 1000 mm.

DataMan 150 with a 16 mm Lens





DataMan 152 with a 16 mm Lens



External Triggering and Trigger Modes

If you are using external triggering, you can use any of the following methods to trigger your DataMan 150 reader:

1. Press the Trigger button () on the reader.
2. Send a pulse on Input-0 line.
3. Send a serial trigger command over the serial line. (You must use RS-232 or USB communications type.)
4. Click the Trigger button () or press **<Ctrl>-T** in DataMan Setup Tool.

DataMan 150 supports a variety of trigger modes:

- **Single:** Acquires a single image and attempts to decode any symbol it contains or more than one symbol in cases where multicode is enabled. The reader relies on an external trigger source.
- **Presentation:** Repeatedly scans for a symbol and decodes it whenever one is detected. The reader relies on an internal timing mechanism to acquire images.
- **Manual** (default): Begins acquiring images when you press the trigger button on the reader or the discrete trigger input is activated, and continues acquiring images until a symbol is found and decoded or you release the button or the discrete trigger input is deactivated.
- **Burst:** Performs multiple image acquisitions based on an external trigger and decodes one or multiple symbols appearing in the sequence of images.
- **Self:** Similar to *Presentation* mode in that the reader perpetually scans for symbols and decodes them each time one is detected. Unlike *Presentation* mode, however, *Self* mode supports multicode results and a decode attempt occurs with every image. The main difference between *Self* and *Presentation* is the fixed and exact interval for image acquisitions in *Self*.
- **Continuous:** Begins acquiring images based on a single external trigger and continues to acquire images until a symbol is found and decoded, or until multiple images containing as many codes as specified in multicode mode are located, or until the trigger is released.

Training and Trigger Modes



Training is supported for the following trigger modes:

- Single trigger
- Burst mode
- Self trigger
- Continuous mode

Training

Training your reader with the expected symbology may help increase decode yield.

To train your reader, place a code in front of the reader and do one of the following:

- Press and hold the trigger button () for at least 3 seconds and then release it.
- Click and hold the trigger button in Setup Tool () for at least 3 seconds and then release it.
- Click **Train Code** in the **Action** ribbon of DataMan Setup Tool.

If using Single trigger mode, upload the code through **File** -> **Train Image**.

Note: You can use training in *Single*, *Burst*, *Continuous* or *Self* trigger modes. Only a single symbol of each kind of symbology can be trained per read setup.

DataMan 150 reports the status of the training and brightness optimization operations using its signaling LEDs. The second LED from left on the reader flashes green to indicate that the reader is currently trained, or yellow to indicate that it is not trained.



Connect the reader to the Setup Tool to untrain it and allow it to recognize other enabled symbologies.

Incremental Training for Multiple Symbologies

If you want to train the reader to recognize multiple symbologies, you can present a single image showing all the desired symbologies and perform the training procedure described in the previous section.

If you cannot present a single image showing all the necessary symbologies, you can enable incremental training on the **Training** tab of the **Symbology Settings** pane:

The screenshot shows the DataMan SetupTool interface for device DM150-1C6FF8. The **Symbology Settings** pane is active, with the **Training** tab selected. The **Incremental Training** checkbox is checked and highlighted with a red box. Other settings include **Disable Untrained Symbologies** (checked), **Data Matrix** (18x18 10.0ppm), **QR Code / MaxiCode / Aztec Code** (Untrained), and **1D / Stacked / Postal** (Untrained). The **Result History** pane shows a successful read of a Data Matrix code: 010599907520024... with a status of 'Read', arrival time of 11:45:37.131, and a decode time of 16ms. The **Image** pane displays the scanned image of the Data Matrix code.

Result	Result Status	Arrival Time	Decode Time	Tri
010599907520024...	✓ Read	11:45:37.131	16ms	244

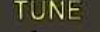
Time Stamp: 11:45:37.131 Data: 010599907520024610016<-0x1d>21096099 Data Matrix 18x18 10.0ppm

With incremental training enabled, you can train the reader using multiple images showing the symbologies you expect to decode. The reader will train each new symbology while retaining the existing trained symbologies.

Tuning

By tuning, your DataMan 150 reader automatically selects the best settings for the given reading situation, based on parameters of illumination, camera and decoder properties, and focal distance. Tuning autodiscriminates all enabled symbologies (both 1-D and 2-D). If multiple symbols are found in the field of view, tuning locks on the first one found. Use this feature to create an optimum setting to read your codes.

You can use any of the following methods to tune your reader:

Press the Tune button () at least for 3 seconds on your reader. The first press starts the tuning and the second press cancels the tuning, if it is still ongoing.



Turn on tuning in the DataMan Setup Tool ().

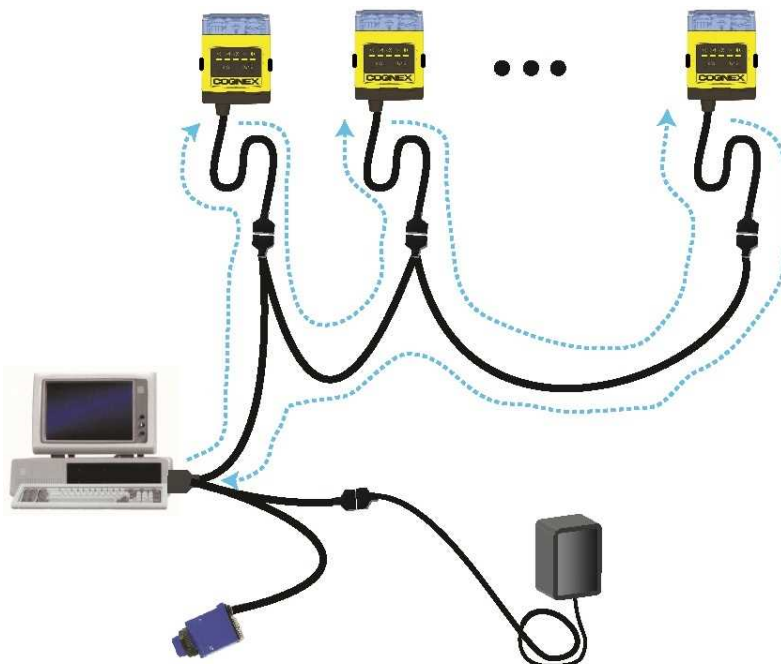
Start tuning by sending a DMCC, for more information, see the **Command Reference**, available through the Windows **Start** menu or the Setup Tool **Help** menu.

Use Input line 1 for tuning. Go to the **System Settings** pane in Setup Tool and check **Tune**. You can also use the **In1** button on the toolbar.

Multi-port Connections

You can connect multiple DataMan 150 readers to a single PC (or other device equipped with a serial port) using a multi-port connection.

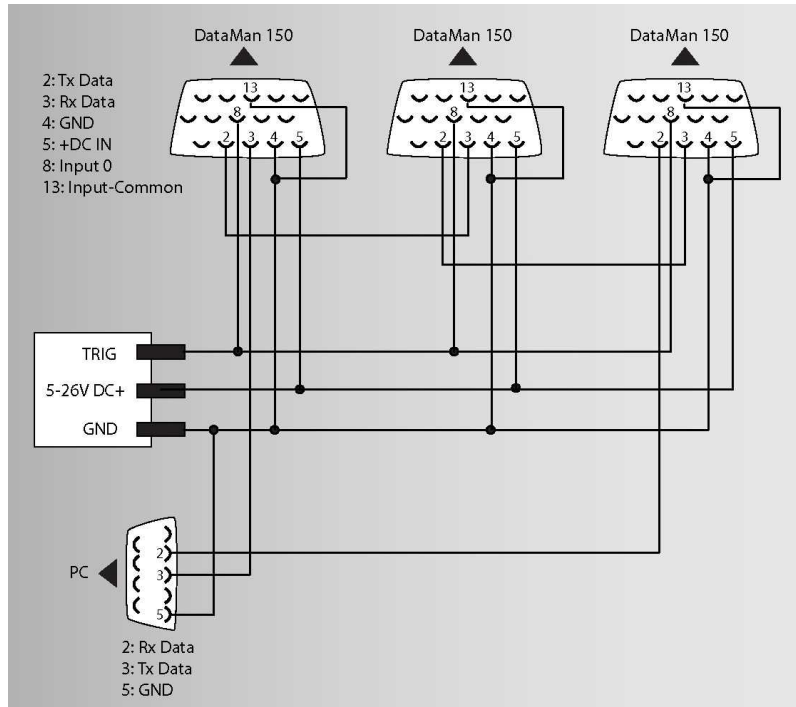
A multi-port connection creates a daisy-chain of readers. Each reader receives serial data from the previous reader and transmits it to the next reader. When a reader transmits data, it is passed through each of the readers in the chain between it and the PC.



You must construct your own cable that meets the requirements of your system configuration.

The cable must provide a DB-15 connector for each DataMan 150 and a DB-9 connector for the PC serial port. Each DB-15 connector must provide Tx Data, Rx Data, Trigger (Input 0), ground, and DC power. The Tx Data and Rx Data pins on adjacent connectors must be connected to provide the multi-port connection.

The following diagram shows how to create a multi-port cable for a 3-reader system. In the example, all the readers share a common trigger. It is also possible to wire individual triggers for each reader.



You must connect each DataMan 150 to DataMan Setup Tool using a USB connection and set the DataMan for multi-port operation. To configure a DataMan 150 for multi-port operation, click on the **Enable Multi-Port (RS-232 Sharing)** check box in **Communication Settings**.

There is no guaranteed delivery order when multiple readers transmit data using a multi-port connection; read results may arrive at the PC in any order. You can configure each DataMan 150 reader in a multi-port connection to add identifying data to each read result. Your PC application can then determine which reader produced a specific read result.

To do this, check the **Standard Formatting Enabled** box (for each symbology that you are using) in **Data Formatting**, and enter text in the **Leading Text** field. (You can also add trailing text by entering text in the **Trailing Text** field.)

You can obtain the best results when using multi-port connections by keeping the following usage guidelines in mind as you design your system:

- The maximum cable length between any two DataMan 150 readers or between the PC and any DataMan reader should be no greater than 15 meters.
- There is no fixed limit to the number of DataMan 150 readers that you can connect to a single PC. Each reader introduces a delay of about 100 ms when it retransmits received serial data. If you have 5 readers, this means that there will be a 400 ms delay between the time the first reader in the chain transmits data and the PC receives it.
- Each DataMan 150 reader must receive a hardware trigger signal on its Input 0 line. You can wire the input ports to a common trigger signal or you can provide individual triggers for each reader.

- Each DataMan 150 reader must be individually configured for multi-port operation, and you must perform this configuration using a USB connection.
- If *any* reader in the multi-port chain loses power or becomes disconnected, then no data from any other reader will be transmitted.
- If a DataMan 150 is transmitting its own read result, it will buffer any data received from another reader until it has finished its own data transmission. If a DataMan 150 is transmitting another reader's data, it will buffer its own data if it receives a trigger signal while it is processing the other reader's data.
- If you use a single power supply for multiple readers, make sure that the power supply can provide enough power for all of the readers.



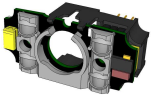


DataMan 150 Specifications

Weight	128 g		
Operating Temperature	0°C — 40°C (32°F — 104°F)		
Storage Temperature	-10°C — 60°C (-14°F — 140°F)		
Maximum Humidity	<95% (non-condensing)		
Environmental	IP65		
Shock and Vibration	<ul style="list-style-type: none"> • IEC 60068-2-27: 1000 shocks, semi-sinusoidal, 11g, 10ms • IEC 60068-2-6: vibration test in each of the three main axis for 2 hours @ 10 Gs (10 to 500 Hz at 100m/s² / 15mm) 		
RS-232	RxD, TxD according to TIA/EIA-232-F		
Codes	Data Matrix™ (IDMax: ECC 0, 50, 80, 100, 140, and 200; IDQuick: ECC200) QR Code and microQR Code UPC/EAN/JAN Codabar, Interleaved 2 of 5, Code 25, Code 39, Code 128, and Code 93, Pharma, Postal, RSS/CS, PDF 417, MicroPDF 417, AztecCode, DotCode, MaxiCode, MSI		
Discrete I/O operating Limits	HS Output 0,1	IMAX	@ 24 VDC 100 mA
		RMAX	@ 12 VDC 200 Ω
			@ 24 VDC 500 Ω
	Input 0 (Trigger)	VIH	±15 — ±25 V
	Input 1	VIL	0 — ±5 V
		ITYP	@ 12 VDC 3.6 mA
			@ 24 VDC 7.5 mA
Power Supply Requirements	5 VDC (2.5 W maximum) when powered over USB 5 VDC (3 W maximum) with external power supply		
	Supplied by LPS or NEC class 2 only		


Imager Specifications


Specification	DataMan 150 Imager	DataMan 152 Imager
Image Sensor	1/3 inch CMOS	1/3 inch CMOS
Image Sensor Properties	4.51 mm x 2.88 mm (W x H), 6.0 μm square pixels	4.8 mm x 3.6 mm (W x H), 3.75 μm square pixels
Image Resolution (pixels)	752 x 480	1280 x 960
Lens Type	S-mount 6.2 mm F:5 (with optional liquid lens) S-mount 16 mm F:7 (with optional liquid lens)	S-mount 6.2 mm F:5 (with optional liquid lens) S-mount 16 mm F:7 (with optional liquid lens)

Illumination Options

Illumination Board	USB Powered		PoE Powered		24V Externally Powered	
	Max. exposure time	Max. duty cycle	Max. exposure time	Max. duty cycle	Max. exposure time	Max. duty cycle
Standard Red 	500 μ s	3%	500 μ s	3%	1 ms	6%
High power red 	Not supported		Not supported		10 ms	10%
Standard White 	500 μ s	3%	500 μ s	3%	1 ms	6%
Standard Blue 	500 μ s	3%	500 μ s	3%	1 ms	6%
IR 	500 μ s	3%	500 μ s	3%	1 ms	6%

Precautions

 **CAUTION:** This device requires the use of an LPS or NEC class 2 power supply.

 **CAUTION:** Do not connect or disconnect this device from the I/O module or 15-pin USB adapter cable while the I/O module or adapter cable is connected to a PC .

 **Note:** For product support, contact <http://support.cognex.com>

Observe these precautions when installing the Cognex product, to reduce the risk of injury or equipment damage:




- To reduce the risk of damage or malfunction due to over-voltage, line noise, electrostatic discharge (ESD), power surges, or other irregularities in the power supply, route all cables and wires away from high-voltage power sources.
- Changes or modifications not expressly approved by the party responsible for regulatory compliance could void the user's authority to operate the equipment.
- Cable shielding can be degraded or cables can be damaged or wear out more quickly if a service loop or bend radius is tighter than 10X the cable diameter. The bend radius must be at least six inches from the connector.
- Class A Equipment (broadcasting and communication equipment for office work): Seller and user shall be notified that this equipment is suitable for electromagnetic equipment for office work (Class A) and can be used outside the home.
- This device should be used in accordance with the instructions in this manual.
- All specifications are for reference purpose only and may be changed without notice.

Regulations/Conformity

The DataMan 150 has Regulatory Model 1AA3 and meets or exceeds the requirements of all applicable standards organizations for safe operation. However, as with any electrical equipment, the best way to ensure safe operation is to operate them according to the agency guidelines that follow. Please read these guidelines carefully before using your device.

Regulator	Specification
USA	FCC 47 CFR Part 15 Subpart B, Class A
Canada	ICES-003
European Community	EN55022 (CISPR 22) Class A
	EN55024:1998 +A1:2001 +A2: 2003
	EN60950
Australia	C-TICK, AS/NZS CISPR 22 / EN 55022 for Class A Equipment
Japan	J55022, Class A

Note: For the most up-to-date regulations and conformity information, please refer to the Cognex online support site: <http://www.cognex.com/Support>.

Safety and Regulatory	
European Compliance 	The CE mark on the product indicates that the system has been tested to and conforms with the provisions noted within the 2004/108/EC Electromagnetic Compatibility Directive and the 2006/95/EC Low Voltage Directive. For further information please contact: Cognex Corporation, One Vision Drive Natick, MA 01760 USA. Cognex Corporation shall not be liable for use of our product with equipment (i.e., power supplies, personal computers, etc.) that is not CE marked and does not comply with the Low Voltage Directive.
FCC Class A Compliance Statement 	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 instructions, 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 personal expense.
Canadian Compliance	This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.
C-Tick Statement 	Conforms to AS/NZS CISPR 22/ EN 55022 for Class A Equipment.
UL and cUL Statement	UL and cUL listed: UL60950-1 1st ed. and CSA C22.2 No.60950-1 1st ed. Certified to CB scheme IEC 60950-1:2001 1st ed.

For European Community Users

Cognex complies with Directive 2002/96/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on waste electrical and electronic equipment (WEEE).

This product has required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment, if not properly disposed.

In order to avoid the dissemination of those substances in our environment and to diminish the pressure on the natural resources, we encourage you to use the appropriate take-back systems for product disposal. Those systems will reuse or recycle most of the materials of the product you are disposing in a sound way.



The crossed out wheeled bin symbol informs you that the product should not be disposed of along with municipal waste and invites you to use the appropriate separate take-back systems for product disposal.

If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You may also contact your supplier for more information on the environmental performance of this product.



Reset Scanner to
Factory Defaults



Reboot Scanner

