

**OPTICON**

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# Code Reader 2.0™

# Statement of Agency Compliance



The CR2 has been tested for compliance with FCC regulations and was found to be compliant with all applicable FCC Rules and Regulations.

**IMPORTANT NOTE:** To comply with FCC RF exposure compliance requirements, this device must not be co-located or operate in conjunction with any other antenna or transmitter.

**CAUTION:** Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



The CR2 has been tested for compliance to CE standards and guidelines and was found to conform to applicable CE standards, specifically the EMC requirements EN 55024, ESD EN 61000-4-2, Radiated RF Immunity EN 61000-4-3, ENV 50204, EFT EN 61000-4-4, Conducted RF Immunity EN 61000-4-6, EN 55022, Class B Radiated Emissions, and Class B Conducted Emissions.

The CR2 can be set to use targeting lasers. The CR2's targeting laser emits Class 2M radiation outside of the product per IEC 60825-1. Class 2M Laser/LED product. Do not stare into beam or view directly with optical instruments.

The CR2 has been tested by an independent electromagnetic compatibility laboratory in accordance with the applicable specifications and instructions.



### Laser/LED Radiation

Wavelength: <math><1\text{mW}</math>  
 Maximum Output: 650-700 nm  
 Laser Pulse Duration: 0.977 mSec.  
 LED Pulse Duration: 0.255 uSec.

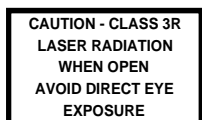


Laser aperture



Enlarged for readability

A Warning Label (see left) is located on the underside of the CR2 near the battery locking mechanism as pictured (see right).



Enlarged for readability

Opticon voids product warranty if the hard case has been opened or tampered with in any way. Opening the case may put the user at risk of laser radiation exposure (Class 3R). A second Warning Label (see left) is placed within the casing structure as pictured (see right).

Caution – Use of controls or adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure.



In addition, a CB Test Certificate has been issued by the National Certification Board (NCB) indicating CR 2.0 (CR2) meets all safety and quality standards in accordance to IEC 60950-1:2001, First Edition.

## CR 2.0 User Manual

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# **Chapter 1 - Getting Started**



## 1.1 - Introduction

---

CR2 is a revolutionary barcode and 2-dimensional code reader. Developed to be the first universal reader, no other single device performs as many functions. With a cost of ownership far less than comparable systems, the CR2 incorporates a unique dual path optical system, a 1.3 million pixel CMOS sensor, and a 400 MHz processor. This combination has created a reading system that supports:

- **High density matrix codes and larger low density linear codes**
- **Superior working range**
- **High-speed omni-directional decoding**
- **Cordless and cabled interfaces**
- **Unsurpassed data read rates**



The CR2 sets a new benchmark for size and weight. It is smaller and lighter than comparable systems yet can withstand multiple drops to concrete. It is the only product available in batch, cabled or wireless formats; handheld, ruggedized cabled or battery handle use-case scenarios; and lanyard hook attachment or reader stand form factors. The cordless version utilizes the latest Bluetooth™ class 1 radio with a 300 foot operating range. The CR2 is rugged and lightweight and the cordless version will operate for more than a complete shift at the highest use rate. The CR2 performs more than 11,000 reads and transmits from a single battery charge. The CR2 will automatically discriminate between all major 2D matrix and linear barcode symbologies and features a timestamp feature for logging data.



Whether you need a small, palm-held device or a traditional gun, CR2 was specifically developed so users may easily choose the device that best meets their needs. The CR2 is available in three basic configurations:

1. **CR2 Cabled** - USB, RS232 or PS/2 interfaces
2. **CR2 Batch** - Store and forward device with memory and long-life battery
3. **CR2 Cordless** - Long life battery and Bluetooth radio



## 1.2 - Unpacking

Remove the imager from its packing and inspect it for damage. If the scanner was damaged during shipping, please call Opticon at (800) 636-0090.

The standard CR2 unit is shipped with a USB cable interface. The unit also features a battery blank which must be installed when using the reader (except when attached to the H2, BH1 or BH2 handle).

Various accessories are available for the CR2.

- 4 cable options (USB 6ft., USB 12 ft., RS232 or PS/2)
- 1950 mAH long-life Lithium-Ion battery
- Class 1 Bluetooth radio with 300 foot operating range (shorter ranges available)
- Clip-on pistol grip handle
- Ruggedized Cabled Handle
- Battery Handle (in two battery sizes)
- External two-bay battery charger
- CodeXML Bluetooth modem
- Protective Elastomer Boot
- Protective Case Cover or Holster
- Power Supplies: US/Europe/SA/UK/Asia
- Reader Stand
- Lanyard Hook attachment option

Please keep your packing materials. The CR2 is shipped in an approved shipping container and should be used if you ever need to return your equipment for servicing.

## 1.3 - Reader Battery Installation

### *Attaching and Detaching the Lithium Ion Battery*

The CR2 has an option to include a 1950 mAh Lithium Ion battery. To install battery, make sure the battery is in the correct position (figure 1.22). Place the plastic tab of the battery into the reader (figure 1.23). Push the battery in and slide the locking mechanism down (figures 1.24 & 1.25)

### *Charging the Lithium Ion Battery*

The battery automatically charges everytime a USB or Powered RS232 cable interface is attached to the unit and the host is powered up.

**Note:** The RS232 interface power adapter must be plugged into a wall socket for the unit to charge.

If you power-up the CR2 with a completely discharged battery it will take up to 10 minutes before the unit will become operational.



Figure 1.22



Figure 1.23



Figure 1.24



Figure 1.25



## 1.4 - Attaching Handles

### H1 - Handle

1. Place the CR2 in the cradle of the handle and slide the unit back (Figure 1.18). Be careful not to place fingerprints on the front glass when attaching handle.
2. Once the 8-pin DIN connector of the handle begins to enter the opening in the back of the unit, firmly press the unit back until the unit is flush against the handle (Figure 1.19).

Figure 1.18



Figure 1.19



### H2 - Ruggedized Cabled Handle

1. Make sure the reader has no battery or battery blank installed.
2. Insert the reader's 8-pin DIN connector into the flexible connector at the back of the H2 handle (Figure 1.20).
3. The reader 'snaps' onto the H2 handle utilizing the battery compartment.
4. The reader can be further secured to the handle with two threaded screws through the flexible connector and two more threaded screws on the underside of the reader and handle (Figure 1.21).



Figure 1.20

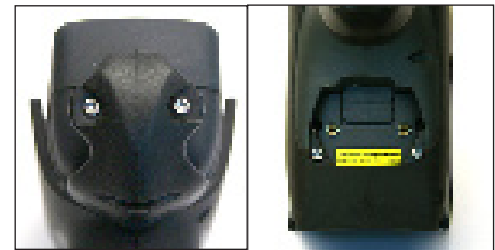


Figure 1.21

### BH1 or BH2 Battery Handle

1. Make sure the reader has no battery or battery blank installed.
2. Insert the tab on the back of the BH1 or BH2 Handle into the reader's recessed slot typically utilized to secure the battery in place on the reader (Figure 1.22).
3. The reader 'snaps' to the handle utilizing the battery compartment (Figure 1.20 above). The reader will 'quick release' from the handle to accommodate quick and easy battery charging.
4. Optionally, the reader can be further secured to the handle with two threaded screws on the underside of the reader and handle (Figure 1.21 above left).



Figure 1.22



## 1.5 - Batch Operation

---

The CR2 unit features a batch mode for applications requiring a portable reader. Batch mode allows a user to store scanned data to the reader's non-volatile memory. The user may transfer the data to a host computer when needed. To utilize batch functionality you will need to purchase the 1950 mAH Lithium Ion battery from an Opticon representative.

The CR2 may be programmed to operate in three different batch modes:

1. *Send & Buffer Mode (Default)* - In Send and Buffer Mode, the CR2 unit will automatically detect when the USB or RS232 cable is detached, or the Bluetooth® radio is out of range, and will switch into batch mode (see note in Section 1.5.4) and buffer the data in non-volatile memory. When the reader is reconnected to your host computer, or when the Bluetooth Radio is back in range, the reader will auto transfer the buffered data. Once transferred, the data is automatically erased from the reader's memory.

**Note:** Once a unit is reattached to a cable or enters within radio range, any data scanned WILL NOT be saved to the non-volatile memory. For RS232, a power supply connection is used to detect when a reader is attached to a host computer.

2. *Log Only Mode* - In Log Only Mode, the reader will only store data into non-volatile memory. You can only retrieve the data by scanning the Transfer All Stored Data in Memory code (see explanation next page). Once the reader's memory has been transferred to a host computer, all of the data will still reside in memory. A user must scan the Delete Scanned Data from Memory code to clear memory.
3. *Send & Log Mode* - In Send and Log Mode the reader will save a copy in non-volatile memory as well as send the data if the reader is connected. The data can be retrieved by scanning the Transfer All Stored Data in Memory code or the Transfer Only Unsent Data in Memory code (see explanations next page). Once the reader's memory has been transferred to a host computer, all of the data will still reside in memory. A user must scan the Delete Scanned Data from Memory code to clear memory.

**Note:** The reader can be defined as connected if:

- 1) The Bluetooth radio is in range;
- 2) The USB cable is attached to a host and the reader is enumerated;
- 3) The reader is in RS232 Cabled - No Power mode; or
- 4) The RS232 cable is attached to host with power supply and the reader is in RS232 Batch-Cable Detect (Default) mode.

The CR2's dedicated batch memory is a minimum of 1MB. To determine the number of reads that may be stored, divide the average bytes of a scan into the total minimum memory.

## Feedback

After a successful decode in batch mode, the unit will beep once and the memory LED will flash either red or amber depending on memory level, and every 15 seconds the battery LED will flash green, amber or red depending on the battery level. This feedback behavior is accurate when a reader is cabled or uncabled. For more information on CR2 feedback see table in Section 1.8.

## Transferring and Deleting Data

There are three different codes to transfer and delete data in memory.

1. *Transfer All Data in Memory* - This code will send all data in memory everytime the code is scanned.
2. *Transfer Only Unsent Data in Memory* - This code will send only the data in memory that hasn't already been sent when the code is scanned (ONLY works in Send & Buffer and Send & Log modes).
3. *Delete Scanned Data from Memory* - Scanning this code will erase all data in the reader's non-volatile memory.

## Auto Transfer Buffer Memory

By default, when reconnected, the CR2 will automatically transfer any data in memory once a connection to a host is established. If your application is not ready, the reader will send the data anyway and the data could be lost. If you do not wish for the reader to immediately send data upon connection, please scan the Disable Auto Transfer Buffer Memory code (see next page).

### Send & Buffer Mode (Default)



M075\_01

### Log Only Mode



M072\_01

### Send & Log Mode



M076\_01

### Transfer All Data in Memory



M077\_02



Save Settings

M188\_02

### Transfer Only Unsent Data in Memory



**Note:** Not applicable in “Log Only Mode”  
use “Transfer All Data In Memory.”

### Delete Scanned Data from Memory



### Enable Auto Transfer Buffer Memory (Default)



### Disable Auto Transfer Buffer Memory



## RS232 Considerations

In RS-233 Cabled-No Power mode, the CR2 will behave as if it is always connected even though the serial cable is disconnected or the power adapter is unplugged. Data scanned will be sent, regardless of connection status. Data scanned in Cabled-No Power mode will be lost if the CR2 is not connected to the serial cable - it will not buffer the data, unless Send & Log or Log Only mode has been enabled.

In RS232 Batch-Cable Detect (Default) mode, the CR2 will detect if it is connected to a powered serial cable, if it is , it will then send the data. If a powered serial cable is not connected or if the power adapter is not connected to the serial cable, the CR2 will buffer the data. When the CR2 is then connected to a powered serial cable, the data will automatically upload.

**IMPORTANT NOTE:** If you are in RS232 Batch-Cable Detect mode, when you place a unit in a charger the reader will behave as if it is being cabled, and download the data. THE DATA WILL BE ERASED FROM MEMORY. To disable this feature, scan the Log Only mode code.

### RS232 Batch-Cable Detect (Default)



### RS232 Cabled-No Power



# 1.6 - Cabled Operation

## 1.6.1 - Introduction

The CR2 is available with USB, RS232 and PS2 cables. All of the cables are connected to the CR2 with a 8-pin DIN connector. Different cables may be required for different hosts.

**Hand Held CR2** - To install a cable on the standard palm-held unit, correctly line up the 8-pin DIN connector into back end of the unit. The arrows on the connector should be facing down (Figure 1.2). When they are lined up, firmly push the cable in. The cable has a locking mechanism that will firmly hold the cable in place (Figure 1.3). To detach the cable from the reader, **YOU MUST** grip the plastic on the 8-pin din (Figure 1.4) and pull back to disengage the connector.

**CR2 with Handle** - If you purchased one of Opticon's cabled handle accessories, the 8-pin DIN connector is on the bottom of the handle (Figure 1.4). Insert the 8-pin connector and firmly push the cable into the handle. The cable has a locking mechanism that will firmly hold the cable in place. To detach the cable from the reader, **YOU MUST** grip the plastic on the 8-pin DIN (Figure 1.5) and pull back to disengage the connector.

When using the H2 ruggedized handle, an extra clip is available to attach the cable to the handle with two threaded screws (Figure 1.6).



Figure 1.2



Figure 1.3



Figure 1.4



Figure 1.5



Figure 1.6





## 1.6.2 - USB Cable Installation Guide

To connect the CR2 to your host computer via USB interface:

1. Make sure the USB cable is sufficiently attached to your CR2 unit (Figure 1.7).
2. You **DO NOT** need to power off your host computer (Figure 1.8). The CR2 with USB interface can be plugged into any host while the computer is powered up.
3. Connect the USB interface cable to the host (Figure 1.9). If you are unsure of the proper location to connect the USB cable please consult the manual of your host computer.
4. The USB interface does not require additional power supply. If you are using 1950 mAH battery for batch mode, the CR2 will automatically recharge the battery whenever the unit is attached to a host that is powered up.
5. The CR2 will power on automatically.
6. Scan the USB Keyboard Mode code then the Save Setting code to configure reader:

### USB Keyboard Mode



### Save Settings



7. Your CR2 Reader should be ready for use. Open the application on your host computer to which you wish to send data and begin scanning.



Figure 1.7



Figure 1.8



Figure 1.9

## 1.6.2.1 - USB Communication Settings

**USB Keyboard Mode** - Data is sent from the Reader and interpreted by the host just as if a US keyboard was being used to enter data.

**USB Downloader** - This mode is used when downloading firmware.

**USB Native Two Way Mode** - This mode is utilized when there is a need for error-corrected communication between the CR2 and an application through the USB port.

**USB Virtual COM 1 Way Mode** - This mode allows a USB-cabled CR2 to function as a virtual COM port. To use the CR2 in this mode, download the driver at <http://www.opticonUSA.com>.

**USB HID POS (Terminal ID 131)** - This mode allows a USB-cabled CR2 to communicate as a USB HID POS (Terminal ID 131) device.

Scan the following codes to set the appropriate USB communication setting:

### USB Keyboard



M134\_02

### USB Downloader



M133\_01

### USB Native Two Way Mode



M135\_04

### USB Virtual COM 1 Way Mode



M668\_01

*You must first install the virtual com port driver before utilizing this mode.*

### Reset to USB Factory Defaults



M049\_03

### USB HID POS (Terminal ID 131)



M736\_01

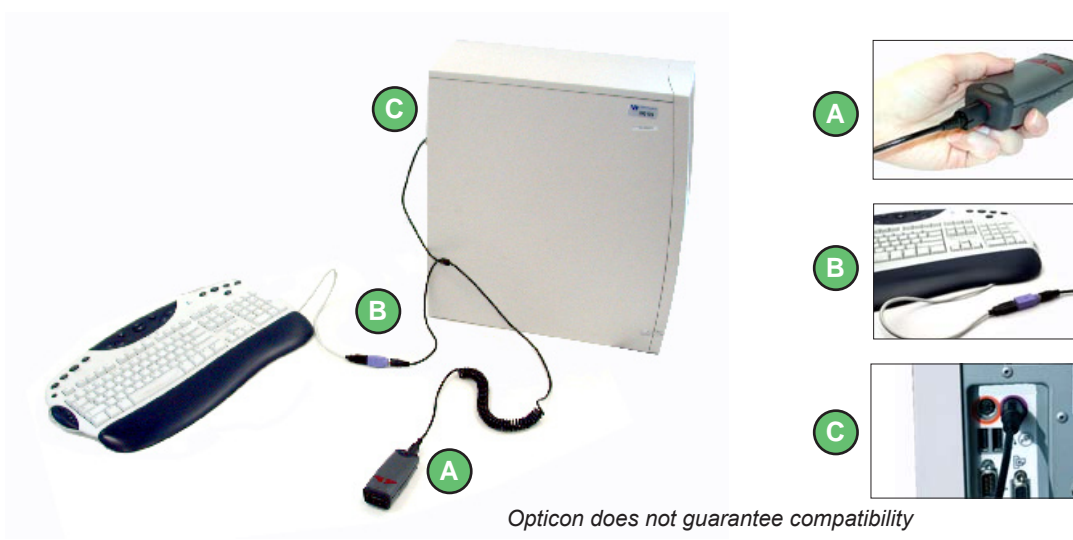


Save Settings

M188\_02

### 1.6.3 - PS2 Cable Installation Guide

1. Power off the host computer.
2. Attach the end of the PS2 cable with the single connector **A** to the CR2.
3. Detach your keyboard from the host and connect the appropriate connector to the PS2 cable **B**.
4. Connect the other connector to host computer into keyboard port **C**. Power on the host computer. The CR2 is powered by the PS2 port and does not require a power supply.



*Opticon does not guarantee compatibility with all models of laptops.*

5. Set the CR2 to PS2 mode by scanning the PS2 Mode code below.
6. Scan the Save Settings code.
7. Your CR2 Reader is now ready. Open the appropriate application and begin scanning data.

**Upgrade Note:** CR2012 can only be upgraded using either RS-232 or USB cable.

**WARNING:** Using PS2 in conjunction with Batch or Bluetooth Radio mode is not recommended. You may need to disconnect the CR2 and the keyboard which may result in the host computer freezing.

*Opticon does not guarantee compatibility with all models of laptops.*

#### 1.6.3.1 - PS2 Communication Settings

Scan the following codes to set the reader to the PS2 communication setting:

##### PS2 Mode



M126\_01

##### Save Settings



M188\_02

##### Reset to PS2 Factory Defaults



M060\_03



Save Settings

M188\_02

## 1.6.4 - RS232 Cable Installation Guide

To connect the CR2 to your host computer via RS232 interface:

1. Make sure the RS232 cable is sufficiently attached to your unit (Figure 1.8).
2. Connect the RS232 interface cable to your host computer (Figure 1.9). If you are unsure of the proper location to connect the RS232 cable please consult the manual of your host computer.
3. The RS232 interface can be purchased with a power supply. Plug the power supply adapter into the RS232 interface cable (Figure 1.10) and then plug the power adapter into a wall socket (Figure 1.11). The RS232 interface does not require additional power. However, if you are using the RS232 interface and utilizing Batch functionality, please read the Important Note in batch section. If you are using the 1950 mAH battery for batch mode, the CR2 will recharge the battery whenever the unit is attached to a RS232 cable that is plugged into a wall socket.



Figure 1.8



Figure 1.9



Figure 1.10



Figure 1.11

4. The CR2 will power on automatically.
5. Scan the RS232 One Way Mode code then the Save Settings code to configure reader:

### RS232 One Way Mode



M131\_01

### Save Settings



M188\_02

### RS232 Factory Default Settings

**Mode:** RS232 One Way Mode

**Baud Rate:** 57600

**Stop Bits:** 2

**Data Bits:** 8

**Parity:** None

6. Your CR2 Reader should be ready for use. Open the application on your host computer that will receive scanned data and begin scanning.

### 1.6.4.1 - RS232 Communication Data Bit Settings

Scan the following codes to set the appropriate data bit:

#### 7 Data Bits



#### 8 Data Bits (Default)



### 1.6.4.2 - RS232 Communication Baud Rate Settings

Scan the following codes to set the appropriate baud rate:

#### 1200



#### 2400



#### 4800



#### 9600



#### 19200



#### 38400



#### 57600 (Default)



#### 115200



### 1.6.4.3 - RS232 Communication Parity Settings

Scan the following codes to set parity:

#### Even



#### Odd



#### None (Default)



Save Settings

## 1.6.5 - Cabled Reader - Time Out Settings

Scan one of the codes below to set the amount of time a cabled CR2 will be enumerated before entering sleep mode in order to more quickly charge the battery:

**Note:** These settings will only work in versions 2098 and above.

**Cabled Reader Time Out: 2 hours**



M136\_01

**Cabled Reader Time Out: Never (Default)**



M137\_01



Save Settings

M188\_02

# 1.7 - Bluetooth Radio Operation

## 1.7.1 - Introduction

Wireless CR2 units features a Bluetooth® wireless radio. The radio allows for point-to-point wireless communication with other Bluetooth devices that support serial port protocol (SPP). The following guide will give you general instructions on connecting your CR2 to a desktop or laptop computer with a Bluetooth radio.

### Connecting With A QuickConnect Code

The easiest way to connect to a Bluetooth device is to visit the Opticon website and create a *QuickConnect Code* that is specific to your device (Figure 1.12). This code will link your CR2 directly to the desired Bluetooth device. To create a *QuickConnect Code*, you will need to know the Bluetooth address (often referred to as the BD\_ADDR) of that device. You can usually find the 12-character Bluetooth address somewhere on the device near the device's serial number (see Figure 1.13).



Figure 1.12



Figure 1.13

If you purchased a CodeXML Bluetooth Modem or a Belkin® Bluetooth adapter from Opticon or from an authorized distributor, a QuickConnect Code was included. If you bought a Bluetooth adapter separately and wish to create a QuickConnect Code, please visit Opticon web site at:

<http://www.opticonUSA.com>.

**Important Note:** While installing the Bluetooth Configuration Manager software that was included with your Bluetooth adapter, make sure to note the Communication Port number the software assigned for the adapter (e.g. COM 10). This is the COM Port your CR2 will connect through.

To connect your reader, scan the Reset to Factory Defaults below then the *QuickConnect Code* and your CR2 will automatically connect. You should also scan the Save Settings code if you want to save these settings. (**Note:** If the CR2 unit powers off without scanning the Save Settings code, you will lose your settings).

### Reset to RF Factory Defaults



### EXAMPLE

### QuickConnect



### Save Settings





## Radio Range and Transferring Data

The CR2 radio is a Class 1 device. If connected to another Class 1 device the unit has roughly a 300 foot line of sight operating range. If connecting to a Class 2 or Class 3 device, the operating range may drop to match the lower range. Once a unit is connected, the application software on the host must be open to receive data.

When the CR2 detects the radio is out of range, the CR2 will store data on the reader's non-volatile memory. The reader will continue to try and send data until radio is back in range. Once the data is sent the data will be erased from the unit's memory. The reader will continue to try and connect until it has reached the programmable radio time out setting.

The CR2 Bluetooth protocol allows for two (2) forms of communication:

1. **One Way Mode** - Communication between the reader and host that does not require host acknowledgement. One Way mode is only recommended when connecting to a device well within its specified range or if connecting to a device without an operating system (e.g., printer). There are two settings in this mode:

- Max Range (Default) - Greater range but data reliability is lower
- Max Reliability - Limits range but reliability is improved

### RF One Way Mode (Max Range)



### RF One Way Mode (Max Reliability)



**Note:** One Way Mode doesn't guarantee data integrity and you may have data loss when operating in the fringes of radio range or in the presence of radio interference.

2. **RF Two Way Mode** - This mode allows for two way communication between the host and reader. This mode requires the implementation of software on the host PC.\* The reader receives confirmation via packet protocol verification and is 100% reliable. Data will be automatically retransmitted if necessary.

### RF Two Way Mode



\* **Note:** You will need to install application software that supports packet communication to operate in RF Two Way Mode. Opticon offers the CodeXML Bluetooth Modem and a Windows or Pocket PC version of software called CodeXML Router - Bluetooth Edition (BE) that provides for end-to-end Bluetooth handshakes that eliminate out-of-range data loss. CodeXML Router - BE also offers Bluetooth to keyboard wedge communication for applications that require keyboard port input.

## Save Settings

Scan the code below to make the RF settings permanent on the reader:

### Save Settings



### Disconnecting from the Device

You may force disconnection by reading the disconnect code below (The CR2 may not appear disconnected in the slave Bluetooth connection manager for 10 – 15 seconds after the command is issued). The CR2 will also disconnect after 90 seconds of inactivity (**Note:** You may change the radio time out setting; however, it may reduce battery life. See Section 1.7.4.)

### Bluetooth Disconnect



### Reconnecting to the Device

If the device is saved in RF mode, and has a saved connection, it will automatically reconnect when:

1. CR2 is powered up
2. CR2 wakes from sleep mode
3. CR2 reads another code

**Note:** To set up more than one device, please consult Appendix F: “QuickConnect Codes”

## 1.7.2 - Bluetooth Radio Auto Connect

**Auto Connect:** After coming out of sleep mode or after powering up, the CR2 tries to auto connect with the last Bluetooth radio with which it was connected. You may always connect by scanning a QuickConnect code.

Scan the following codes to enable or disable Auto Connect feature for the Bluetooth radio:

### Bluetooth Radio Auto Connect On (Default)



### Bluetooth Radio Auto Connect Off



### 1.7.3 - Bluetooth Radio Auto Disconnect

**Auto Disconnect:** This feature is used when multiple CR2 units are connecting to the same Bluetooth Radio. By enabling Auto Disconnect the CR2 radio disconnects after each data transmission, allowing other radios to connect.

Scan the following codes to enable or disable Auto Disconnect feature for the Bluetooth radio:

#### Bluetooth Radio Auto Disconnect On



#### Bluetooth Radio Auto Disconnect Off (Default)



**Note:** You should also set auto connect to 'On' if setting auto disconnect is 'On', otherwise you would have to scan a QuickConnect code everytime you wish to transfer data.

### 1.7.4 - Bluetooth Radio Time Out Settings (Uncabled Operations)

Scan the following codes to set the period of time before the Bluetooth Radio will go into sleep mode due to inactivity:

**Note:** Increasing the time before the unit will time out, will decrease battery life.

**Note:** If the unit has power (cabled unit or cable with power supply combination), it will disconnect based on cable time-out settings.

#### 90 Seconds (Default)



#### 5 Minutes



#### 10 Minutes



#### 15 Minutes



#### 30 Minutes



#### 1 Hour



#### 2 Hours



### 1.7.5 - Bluetooth Radio Out of Range Notification Settings

Scan the following codes to enable a beep or vibrate notification when the radio goes out of range:

#### Bluetooth - Out of Range Beep: On



#### Bluetooth - Out of Range Notify with Vibrate: On



#### Bluetooth - Out of Range Vibrate & Beep: On



#### Bluetooth - Out of Range Vibrate and/or Beep: Off (Default)



Save Settings

## 1.7.6 - Auto Save Last Bluetooth Address

If the reader is saved in the proper RF communication mode, enabling this setting will allow the reader to automatically save the last device to which it was connected, removing the need to scan the save setting after scanning the QuickConnect code.

### Enable Auto Save



M746\_01

### Disable Auto Save (Default)



M747\_01



## 1.8 - CR2 Feedback Guide

The CR2 features two (2) LED's on the front of the unit. These LED's give feedback based on various functions of the CR2 unit. Each LED has a small icon just underneath it that represents the following:



**Memory / Connection Icon**





**Battery or Power Icon**

The CR2 unit will automatically flash battery or power status every 15 seconds. Each LED can show three (3) colors; Green, Amber, or Red. The colors will vary depending on the message the unit is sending.

- **Green** = 50% - 100% capacity of battery
- **Amber** = 20% - 50% capacity of battery or 10% - 99% of memory available
- **Red** = 0% - 20% capacity of battery or no memory available



The CR2 also emits beeps or vibrates for user feedback. Please follow the table below to better understand your unit's feedback.

### Normal Operation Feedback



	 <b>Memory/Connection LED</b>	 <b>Battery LED</b>	<b>Sound</b>
<b>CR2 Successfully Powers Up</b>	Flash Green	Flash Green	1 Beep
<b>CR2 Successfully Enumerates with Host via USB Cable</b>	None	Solid Green	1 Beep
<b>Attempting to Decode</b>	None	Battery Status	None



## Normal Operation Feedback (con't)

	 Memory/Connection LED	 Battery LED	Sound
<b>Successful Decode and Data Transfer via cable</b>	None	Solid Green	1 Beep
<b>Successful Decode and Data Store</b>	Memory Status	None	1 Beep
<b>Batch Mode memory full</b>	Solid Red	None	3 Beeps
<b>Configuration Code Successfully Decoded and Processed</b>	None	None	1 Beep slight pause then 1 Beep
<b>Configuration Code Successfully Decoded But Was Not Successfully Processed</b>	None	None	6 Beeps

## Bluetooth Radio Feedback

	 Memory/Connection LED	 Battery LED	Sound
<b>Attempting to Connect</b>	Flashes Blue	Solid Green	None
<b>Failed to Connect</b>	None	None	4 Beeps
<b>Connected</b>	Flashes Blue Every 15 seconds	Flash Battery Status Every 15 seconds	None
<b>Sending Data</b>	Flashes Memory Status	None	None



## 1.9 - Targeting and Reading Techniques

The CR2 utilizes digital camera technology to take a picture of a symbol. Once an image is captured, the CR2 utilizes advanced decoding algorithms to extract data from the captured image.

The CR2 is available as a palm-held unit or users may purchase a handle (available in various types).

The palm held unit features left and right triggers. These triggers may be programmed to perform various features. The reader is shipped with the left trigger and right trigger functioning as a decode symbol command.

Each handle has a trigger on the grip. The two triggers on the top of the unit also work when the handle is attached.



*To read a symbol with the CR2:*

1. The CR2 features omnidirectional decoding. Center the symbol in any orientation within the laser dot aiming pattern (Figure 1.14).



Figure 1.14

**Note:** The CR2 can read a symbol that is not centered; however the CR2 performs best when a code is centered. If two (2) bar codes are within the imager's decode zone, the CR2 will decode the symbol closest to the center of the aiming dot.

2. The CR2 was developed to decode both very small 2-dimensional symbols and larger 1-dimensional symbols. The unit has an innovative dual field decode zone. The CR2 **DECODES BOTH ZONES SIMULTANEOUSLY**. The unit has a lens focused on a near-field for smaller codes (optimal focal point is 4 inches) and one lens focused on a far-field for larger codes (optimal focal point 9 inches). To read smaller symbols move the CR2 closer to the symbol. To read larger symbols move the unit farther away from the symbol. The entire CR2 decode zone varies between two (2") and twenty (20+) or more inches.





3. Hold the CR2 still - **DO NOT SWIPE OR MOVE THE READER.** Press the trigger until the CR2 beeps, indicating the code has been successfully decoded.
4. The reader may be optimized to your specific environment by scanning codes in Chapter 2.

## 1.10 - Imager Field of View and Resolution

The CR2's dual field optical system may be modified based on your scanning environment. The CR2's megapixel imager may be set to the following three modes:

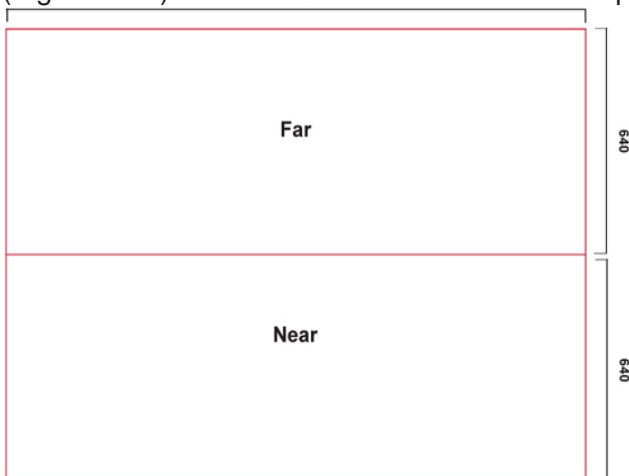
*DOT Mode (Dynamic Optimization Technology):* DOT dynamically changes the resolution mode of the reader between VGA and SXGA. DOT adapts the resolution based on varying environmental criteria and types of symbologies being scanned. This mode works best if you are working with multiple types of symbologies of varying sizes.

**Note:** If you are scanning mostly medium to low density codes, you may want to choose VGA. If you are scanning high density codes, SXGA may be the better choice. It is recommended to experiment with all three modes to determine the best reading performance for your application.

*SXGA Mode (Default Mode):* In standard SXGA mode (default), the 1.3 Million Pixel imager is divided into near field and far field decode zones. In each zone the resolution is 1024 x 640 pixels (see Figure 1.15). In this mode of operation the reader utilizes the highest resolution creating the widest working range on bar code and 2-dimensional symbols of all densities. The trade-off is the amount of time the reader spends processing the image. This time can be reduced by optimization functions:

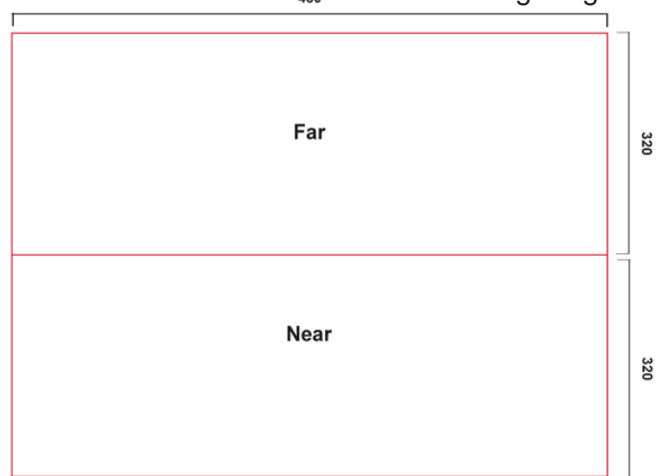
If only the near field is used (small symbols), the far field image can be ignored. If only the far field is used (large symbols), the near field can be ignored. Further optimization may be obtained by "windowing" the field to a smaller area. Each focal area may be narrowed by enabling the windowing feature found in section 5.2.

*VGA Mode:* In VGA mode, the 1.3 Million Pixels are sampled on a 4-to-1 basis. This greatly reduces the amount of time necessary for the transfer of the image to the CPU and the resulting processing time (Figure 1.16). The trade-off for this increased speed is a reduction in resolution and working range.



**SXGA Imaging Area**

Figure 1.15



**VGA Imaging Area**

Figure 1.16

# 1.11 - Decode Zone

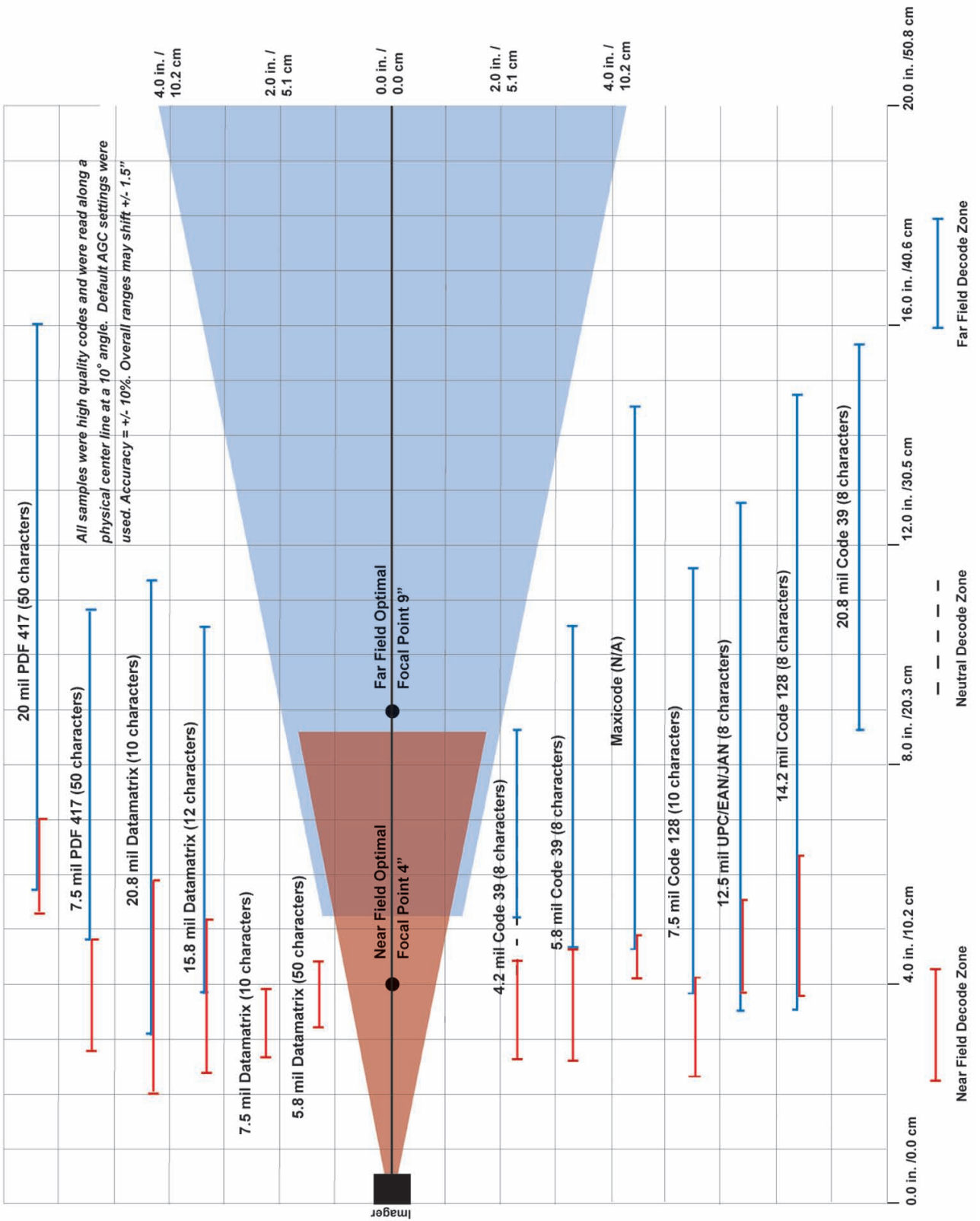


Figure 1.19



# Chapter 2 - Optimization and Trigger Programming

---



## 2.1 - Introduction

The CR2 comes pre-configured with Dynamic Optimization Technology (DOT) a revolutionary adaptive read technique that eliminates the need to manually set most individual parameters. From the moment you turn on your CR2, you are taking full advantage of the dual path 1.3 megapixel imager, the 400 MHz processor and DOT.

DOT continuously adapts the illumination and image field for optimized decoding. Because of DOT, CR2 units achieve decoding speeds with 2D codes similar to speeds usually only seen in 1D readers. CR2 units are able to read a wide range of symbology types and sizes, as well as a variety of printed media, within a wide range of environmental factors including light (natural or ambient lighting).

By defining if you are scanning large, small, high density or low density types of symbology(s), the CR2 has options that will maximize decoding speed.

The chart below shows options that will improve performance based on parameters listed in each box.

	<b>SXGA</b>	<b>VGA</b>
<b>Both Fields</b>	<p><b>SB</b></p> <p>High density codes Medium to Small size 2D</p>	<p><b>VB</b></p> <p>Medium/low density codes Medium to large size 1D or 2D</p>
<b>Near Field</b>	<p><b>SN</b></p> <p>High density codes Small size 2D</p>	<p><b>VN</b></p> <p>Medium/low density codes Medium size 1D or 2D</p>
<b>Far Field</b>	<p><b>SF</b></p> <p>High density codes Medium size 2D</p>	<p><b>VF</b></p> <p>Medium/low density codes Large size 1D</p>







The CR2 is easily customizable; each trigger can be independently programmed for different behavior.

*Near Field (NF)*: The closest optimal focal point of the CR2's two image fields. The Near Field can decode the highest density barcode. It has an optimal focal point of 4" (101.6 mm) away from the lens of the reader. See Figure 1.19 for optimal read distances.







*Far Field (FF)*: The farthest field of the CR2's two image fields. It has an optimal focal point of 9" (228.6 mm) away from the lens of the reader with a 4" wide field of view at this point.

The following tables provide readable codes to program all or individual triggers to perform within different parameters. See Figure 1.19 for optimal read distances.

## 2.2 - Global Trigger Optimization Matrix

	SXGA	VGA
Both Fields	 M613_02	 M616_02
Near Field	 M614_02	 M617_02
Far Field	 M615_02	 M618_02

# 2.3 - Left Trigger Optimization Matrix

	SXGA	VGA
Both Fields	 M631_02	 M634_02
Near Field	 M632_02	 M635_02
Far Field	 M633_02	 M636_02




# 2.4 - Left Trigger Programming

## Left Trigger Take Picture



**Note:** If you program a trigger to another function, you will need to reset any performance code settings.

# 2.5 - Right Trigger Optimization Matrix

	SXGA	VGA
Both Fields	 M640_02	 M643_02
Near Field	 M641_02	 M644_02
Far Field	 M642_02	 M645_02

# 2.6 - Right Trigger Programming







## Right Trigger Take Picture



**Note:** If you program a trigger to another function, you will need to reset any performance code settings.



# 2.7 - Handle Optimization Matrix

	SXGA	VGA
Both Fields	 M622_03	 M625_03
Near Field	 M623_03	 M626_03
Far Field	 M624_03	 M627_03

# 2.8 - Handle Trigger Programming

## Handle Trigger Take Picture









**Note:** If you program a trigger to another function, you will need to reset any performance code settings.

## 2.9 - Continuous Trigger Optimization

---

Scanning codes in the matrix puts the reader into Continuous scan.

	SXGA	VGA
Both Fields	 M649_02	 M652_02
Near Field	 M650_02	 M653_02
Far Field	 M651_02	 M654_02

## 2.10 - Continuous Scan

---

Scan the following codes to turn continuous scanning off:

Off (Default)



**Note:** This function is only recommended for cabled or short term use if battery is the only power supply. See section 2.11.1 for Sleep Time Out Settings.



## 2.11 - Continuous Scan Settings

### 2.11.1 - Continuous Scan - Sleep Time Out

Scan one of the codes below to set the amount of time a cabled CR2 will operate in continuous scan mode before entering sleep mode:

#### Cabled - 2 hours



M136\_01

#### Cabled - Always (Default)



M137\_01

Scan one of the codes below to set the amount of time an uncabled CR2 will operate in continuous scan mode before entering sleep mode:

#### Uncabled - 5 minutes (Default)



M145\_01

#### Uncabled - 15 Minutes



M146\_01

#### Uncabled - 30 Minutes



M147\_01

**Note:** This function is only recommended for short term use because of battery consumption.

### 2.11.2 - Continuous Scan - Trigger Delays

Scan the following codes to set delay time between scans:

#### 0 Seconds (Default)



M142\_01

#### 1 Second



M143\_01

#### 3 Seconds



M144\_01

### 2.11.3 - Continuous Scan - Duplicate Scan Delay

Scan the following codes to set the delay time for reading duplicate codes:

#### 0 Seconds (Default)



M222\_01

#### 1 Second



M223\_01

#### 3 Seconds



M224\_01

## 2.12 - Motion Detection Scan Settings

Scan the following codes to set the reader to read when it detects motion in its scanning zone.

On



M701\_01

Off (Default)



M702\_01



M188\_02

Save Settings

## Chapter 3 - CR2 Programming: Symbology Settings

---

## 3.1 - Aztec Symbology

---

Scan the following codes to enable/disable Aztec symbology settings:

Aztec On



Aztec Off (Default)



Sample Aztec Code



## 3.2 - Codabar Symbology

---

Scan the following codes to enable/disable Codabar symbology settings:

Codabar On (Default)



Codabar Off



Sample Codabar



## 3.3 - Codablock F Symbology

---

Scan the following codes to enable/disable Codablock F symbology settings:

Codablock F On



Codablock F Off (Default)



Sample Codablock F Code



**Note:** When Codablock F and Code 128 decoding are enabled, there is some danger of mistakenly decoding a damaged Codablock F symbol as a Code 128 symbol. Therefore, Code 128 decoding should be disabled when Codablock F decoding is enabled.

## 3.4 - Code 11 Symbology

Scan the following codes to enable/disable Code 11 symbology settings:

**Code 11 On (Default)**



M394\_01

**Code 11 Off**



M393\_01

**Code 11 Checksum 1 digit**



M395\_01

**Code 11 Checksum 2 Digit & Stripped from Result**



M396\_01

**Code 11 Checksum 1 Digit & Stripped from Result**



M397\_01

**Code 11 Sample**



## 3.5 - Code 39 Symbology

Scan the following codes to enable/disable Code 39 symbology settings:

**Code 39 On (Default)**



M235\_01

**Code 39 Off**



M234\_01

**Enable Checksum**



M237\_01

**Disable Checksum (Default)**



M236\_01

**Enable Checksum and Strip From Result**



M238\_01

**Code 39 Extended Full ASCII On**



M233\_01

**Code 39 Extended Full ASCII Off (Default)**



M232\_01



Save Settings

M188\_02

### Code 39 Short Margin On



M390\_01

### Code 39 Short Margin Off (Default)



M389\_01

### Code 39 Trioptic On



M671\_01

### Code 39 Trioptic Off



M670\_01

### Sample Code 39 Code



12345678

### Sample Trioptic Code 39



123456

## 3.6 - Code 93 Symbology

Scan the following codes to enable/disable Code 93 symbology settings:

### Code 93 On (Default)



M281\_02

### Code 93 Off



M280\_01

### Sample Code 93 Code



123456789

## 3.7 - Code 128 Symbology

Scan the following codes to enable/disable Code 128 symbology settings:

### Code 128 On (Default)



M283\_01

### Code 128 Off



M282\_01

### Code 128 Short Margin On



M392\_01

### Code 128 Short Margin Off (Default)



M391\_01

### Sample Code 128 Code



12345678912345

**Note:** When Codablock F and Code 128 decoding are enabled, there is some danger of mistakenly decoding a damaged Codablock F symbol as a Code 128 symbol. Therefore, Code 128 decoding should be disabled when Codablock F decoding is enabled.



M188\_02

Save Settings

## 3.8 - Composite Symbologies

---

Scan the following codes to enable/disable Composite symbology settings:

### Composite On



### Composite Off (Default)



## 3.9 - Data Matrix Symbology

---

Scan the following codes to enable/disable Data Matrix symbology settings:

### Rectangular Data Matrix On



### Rectangular Data Matrix Off (Default)



### Data Matrix Inverse On



### Data Matrix Inverse Off (Default)



Enable improved reading capability for hard to decode datamatrix symbols.

Disable improved reading capability for hard to decode datamatrix symbols. (Default)



### Sample Data Matrix Code



### Sample Rectangular Data Matrix Code



## 3.10 - GoCode Symbology

---

GoCode not supported in Opticon CR2.



Save Settings



## 3.11 - Interleaved 2 of 5 Symbology

---

Scan the following codes to enable/disable Interleaved 2 of 5 symbology settings:

**Int 2 of 5 On (Default)**



**Int 2 of 5 Off**



**Int 2 of 5 Two Digits On**



**Int 2 of 5 Two Digits Off**



**Int 2 of 5 Four Digits On**



**Int 2 of 5 Four Digits Off**



**Sample Int 2 of 5 Code**



## 3.12 - Maxicode Symbology

---

Scan the following codes to enable/disable Maxicode symbology settings:

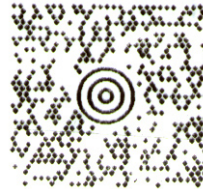
**Maxicode On**



**Maxicode Off (Default)**



**Sample Maxicode**



### 3.13 - Matrix 2 of 5 Symbology

---

Scan the following codes to enable/disable Matrix 2 of 5 symbology settings:

**Matrix 2 of 5 On (Default)**



M675\_01

**Matrix 2 of 5 Off**



M674\_01

**Matrix 2 of 5 Sample**



0 1 2 3 4 5 6 7 8 9

### 3.14 - Micro PDF417 Symbology

---

Scan the following codes to enable/disable micro PDF 417 symbology settings:

**MicroPDF417 On**



M301\_01

**MicroPDF417 Off (Default)**



M300\_01

**Sample MicroPDF417**



### 3.15 - MSI Plessey Symbology

---

Scan the following codes to enable/disable MSI Plessey symbology settings:

**MSI Plessey On**



M291\_01

**MSI Plessey Off (Default)**



M290\_01

**Sample MSI Plessey**



123456789



Save Settings

M188\_02

### 3.16 - NEC 2 of 5 Symbology

---

Scan the following codes to enable/disable NEC 2 of 5 symbology settings:

**NEC 2 of 5 On**



M673\_01

**NEC 2 of 5 Off (Default)**



M672\_01

### 3.17 - Optical Character Recognition (OCR)

---

OCR not supported in Opticon CR2.

### 3.18 - PDF 417 Symbology

---

Scan the following codes to enable/disable PDF 417 symbology settings:

**PDF 417 On (Default)**



M293\_01

**PDF417 Off**



M292\_01

**Sample PDF 417 Code**



Save Settings

M188\_02

## 3.19 - Pharmacode

For an explanation of Pharmacode settings and all programming codes please refer to Appendix G of the CR2 User Manual. You may download the Appendix G at:

<http://www.opticonUSA.com>

## 3.20 - Postal Symbologies

All postal code default settings are OFF. Scan the following codes to enable the appropriate Postal symbology:

**Note:** If you wish to change which Postal code is activated, you MUST first scan the disable all postal codes symbol and then scan your desired symbology.

### Australian Post On



### Japan Post On



### KIX



### Planet On



### Postnet On



### Postnet and Planet On



### Royal Mail On



### Disable All Postal Codes (Default)



### Sample Postnet Code



Save Settings

## 3.21 - QR Code Symbology

---

Scan the following codes to enable/disable QR Code symbology settings:

**QR Code On**



**QR Code Off (Default)**



**Enable Checksum**



**Disable Checksum (Default)**



**QR Code Inverse On**



**Both Inverse and Standard On**



**All QR On (includes Micro QR)**



**Inverse QR and Micro QR On**



**Sample QR Code**



**Sample Micro QR**



## 3.22 - RSS Symbology

---

Scan the following codes to enable/disable RSS symbology settings:

**RSS Limited On**



**RSS 14 and RSS 14 Truncated On**



**RSS 14 Stacked On**



**RSS Expanded On**



**All RSS On**



**All RSS Off (Default)**



### Sample RSS Limited Code



### Sample RSS 14 Code



### Sample RSS 14 Truncated Code



### Sample RSS 14 Stacked Code



## 3.23 - Telepen Symbology

Scan the following codes to enable/disable Telepen symbology settings:

### Telepen On - Default



M677\_01

### Telepen Off



M676\_01

### Sample Telepen



23456781

## 3.24 - UPC/EAN/JAN

Scan the following codes to enable/disable UPC/EAN/JAN symbology settings:

### UPC On (Default)



M295\_01

### UPC Off



M294\_01

### UPC Short Margin Enabled



M299\_01

### UPC Short Margin Disabled (Default)



M298\_01

### UPC Extension On



M297\_01

### UPC Extension Off



M296\_01

### Sample UPC A Code



1 23456 78912 8



Save Settings

M188\_02

# Chapter 4 - Reader Feedback and Special Settings

---

## 4.1 - Volume and Vibration Settings

---

Scan the following codes to set vibration mode:

**Vibrate On / Beep On**



M107\_01

**Vibrate On / Beep Off**



M109\_01

**Vibrate Off / Beep On (Default)**



M108\_01

Scan the following codes to set your reader's volume:

**Beep Off**



M110\_01

**Beep Low**



M111\_01

**Beep High (Default)**



M112\_01

## 4.2 - Code Readability Index

---

The Readability Index provides a measurement of a specific symbol's ease or difficulty to be decoded by the CR2. The Readability Index is specific to the CR2, and should not be confused with a verification quality measurement.

The Readability Index is a blend of information obtained from the internal operations of the decoding algorithm pertaining to contrast, symbology construct, error detection, forward error correction (if applicable), and other symbology-specific characteristics.

The Readability Index is a score on a scale of 01 (very poor) to 100 (very readable). Due to differences based on motion, skew, reflection, focus, and ambient lighting, the Readability Index on the same symbol may vary somewhat from read to read. However, a poor contrast or damaged symbol will score lower than a high contrast undamaged symbol. The Readability Index can be used as a quick check on the reliability of label generation or marking systems. When used in conjunction with the CR2 stand (or fixed mount positioning) which fixes the distance from the reader to the symbol, and constant ambient light, the Readability Index provides a symbol quality assurance tool and check point for feedback to an overall label or marking quality control system.



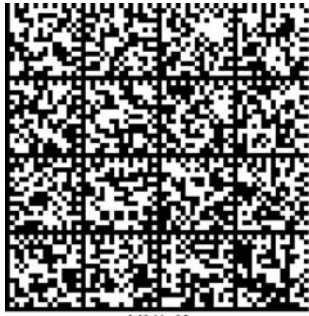
Save Settings

M188\_02



The Readability Index is enabled by first reading an CodeXML rule into the permanent CR2 Memory:

**Code Readability Index Rule:**



M061\_02

The reader will store the rule and reset, but will not output the Readability Index until the Readability Index Output Enable code is read.

**Readability Index Output Enable:**



M062\_02

Each time a data symbol is read, the index will be output, followed by a comma, (,) followed by the decoded data.

The Reader will continue to output the Readability Index upon every read until disabled, either by reset or by reading the Readability Index Output Disable code:

**Readability Index Output Disable:**



M063\_02



## 4.3 - Laser Settings

---

Scan the following codes to turn laser targeting on/off:

**On (Default)**



M055\_01

**Off**



M054\_01

Scan one of the following codes to set the brightness of the CR2 laser.

**High (Default)**



M058\_01

**Medium**



M057\_01

**Low**



M056\_01

## 4.4 - Reader Power Off Settings

---

Scan the following codes to set the amount of time before a reader powers off:

**1 Hour**



M691\_02

**2 Hours - Default**



M688\_02

**4 Hours**



M689\_02



Save Settings

M188\_02

## 4.5 - Reader ID and Firmware Version

To find out the Reader ID and firmware version, open a text editor program (i.e., Notepad, Microsoft Word, etc.) and read the following code:

### Reader ID and Firmware



You will see a text string indicating your firmware version and CR2 ID number (see below):

Xap/iVVVVWWWXXSSSSSSSSSSPXXX-XX+XX

Xap/i - Opticon Internal ID (not applicable)

VVVV is the application firmware version number

WWW is the bootloader firmware version number

XXX is the radio firmware version number

SSSSSSSSSS Reader's serial number (ten digits)

P is "A" if running firmware is the application, "B" if BootLoader

XXX-XX+XX - Internal ID (not applicable)

### Example:

Xap/i3000300006000010002363A06D-SD+SQ

**Note:** Opticon will periodically release new firmware for CR2 units. For information on latest firmware versions, call Opticon at (800) 636-0090. To upgrade firmware, please visit our website at <http://www.opticonUSA.com> and follow instructions provided.

## 4.6 - Reader Settings Lock

To lock or unlock the current settings on your reader please scan the codes below:

### Reader Settings Locked



### Reader Settings Unlocked



**NOTE:** Prefix and Suffix programming codes, memory transfer and delete commands, "Clear All CodeXML Rules" and "Suffix -Erase/None" commands are not locked by this feature.



Save Settings

## 4.7 - Keyboard Support

Scan the following codes to set appropriate keyboard mapping:

**US English (Default)  
No Leading 0**



**US English - Leading 0**



**US English - ctrl + char  
For Non-Printable ASCII**



**French**



**German**



**Japanese**



**Universal Keyboard**



**Custom Keyboard**



*Request that map be installed.*

## 4.8 - Lock-out Link Mode

This mode can be used to establish a permanent connection between the reader and a CodeXML modem,

Prepare the reader to communicate in 'RF Comm Mode' by scanning the QuickConnect code on the paired modem to which you wish to establish a permanent link. Listen for the single beep to verify the connection acknowledgement. Scan the Lockout Link Mode code (see below). Set appropriate timeout settings, if applicable (see Section 1.4.5).

To reassign a permanent connection to a different reader, scan the unlock link code. Using the 'new' reader' follow the directions outlined in the previous paragraph.

**Lockout Link Mode**



**Unlock Link Mode**



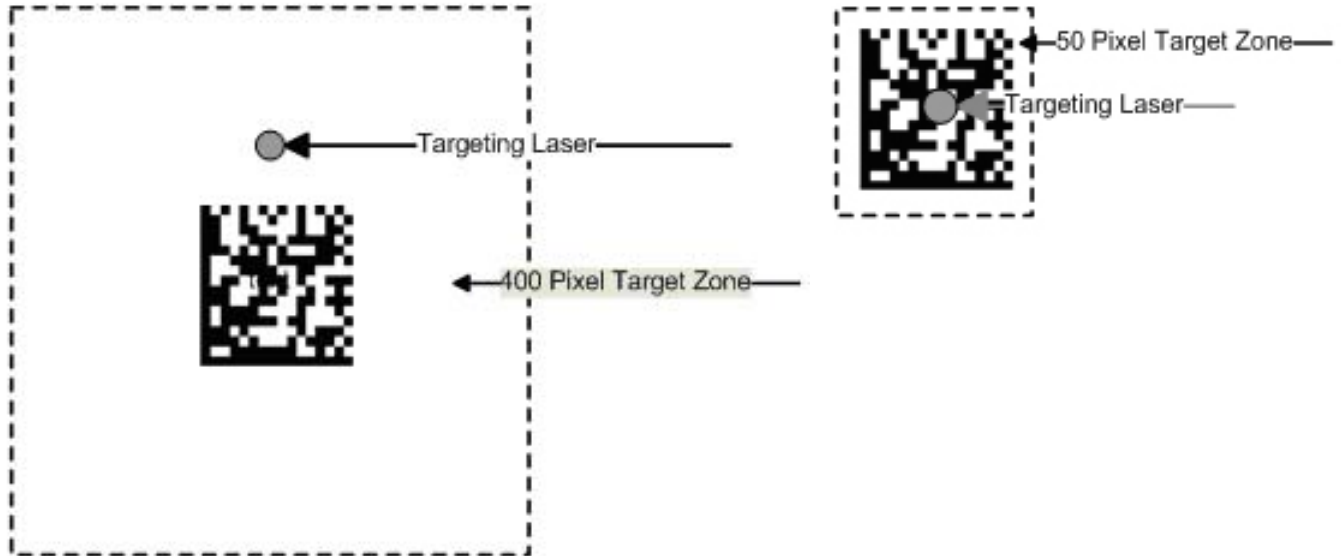
Save Settings

## **Chapter 5 - Advanced Decode Performance**

---

# 5.1 - Set Targeting Tolerances

The targeting tolerance is the zone around the laser which is eligible for decoding. The values of each of the following codes are the percent tolerance based on the size of the barcode. As the targeting tolerance becomes smaller the targeting laser must be more centered in the symbol being read. Conversely, as the targeting tolerance gets larger there is less precision needed with the targeting laser. If there is more than one decodable code in the field of the, the symbol closest to the targeting laser will be decoded.



**50 Most Accurate**



M189\_01

**75**



M190\_01

**100**



M191\_01

**125**



M192\_01

**150**



M193\_01

**200**



M195\_01

**400**



M194\_01

**1600 (Default)  
Least Accurate**



M196\_01

## 5.2 - Windowing

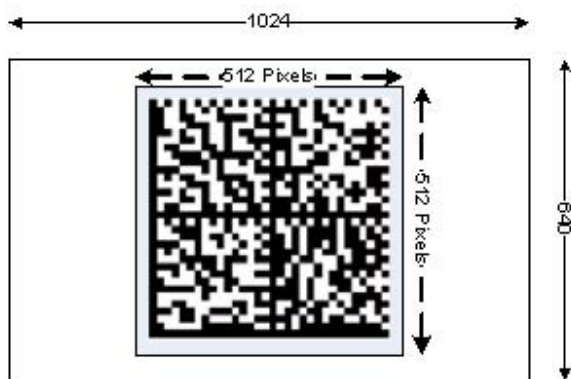
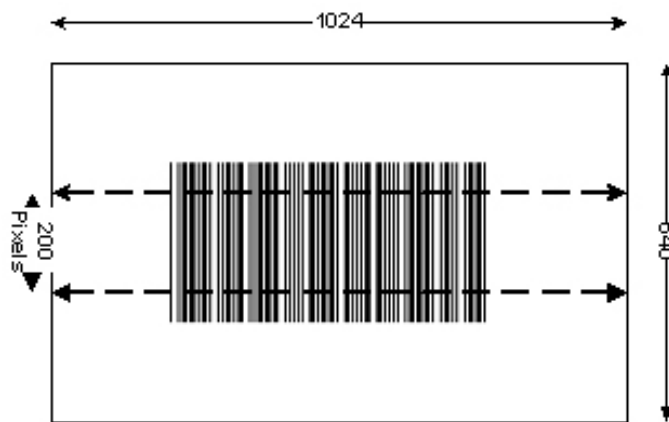
If only one size of barcode is being scanned in an application, the CR2 can be optimized to reduce processing time by adjusting the viewing area within the field of view of the image (ONLY FOR SXGA MODE).

By reducing the vertical window value of the imager to 200 pixels, 1D codes are processed more quickly. Because only a horizontal strip of a 1D code is needed to be decoded, using a narrow strip of the imager is all that is needed. The area above and below the 200 pixels, which is always in the center of the imager, is ignored. This approach reduces the number of pixels that must be processed.

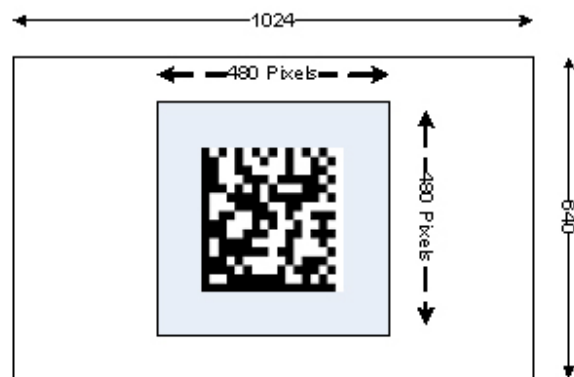
Windowing can also improve the processing time of 2D codes.

You may negatively impact reader performance if the window size is too small. If it is necessary to have the reader farther away than normal to read the code, the window may be too small.

Reading other types of codes, especially large codes, may be difficult while using this setting.



Medium Code Windowing



Small Code Windowing



Users may optimize the CR2 decode zone if their application only requires one barcode format. If the size and density of the barcodes to be scanned are consistent, please select the setting below that best describes your environment (ONLY FOR SXGA MODE).

**1-Dimensional Codes ONLY (1024 x 200 pixels)**



M209\_01

**Caution:** It may be more difficult to read other codes while in this setting. You must have the reader farther away than normal.

**Small 2-Dimensional Codes (480 x 480 pixels)**



M210\_01

**Medium 2-Dimensional Codes (512 x 512 pixels)**



M211\_01

**Large 2-Dimensional Codes (640 x 640 pixels)**



M212\_01

**Reset to Default Setting (1024 x 640 pixels)**



M213\_01



Save Settings

M188\_02



## 5.3 - VGA & Megapixel Settings

---

User's may optimize the CR2's megapixel (SXGA) imager (1280 x 1024) to VGA (640 x 480). This feature is used to decrease the pixel sampling area, which will greatly increase processing speed. This is an advanced feature used for the rapid decoding of 1-dimensional/linear codes and larger module size 2-dimensional codes. Opticon recommends testing this feature, as it will not work well with many high density codes.

**Enable VGA - 640 x 480**



M202\_03

**Enable SXGA - 1280 x 1024**



M201\_03

## 5.4 - Mirror Decoding

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Scan the following codes to enable/disable the mirroring feature:

**On**



M182\_01

**Off (Default)**



M181\_02

**Note:** The Mirroring feature allows the CR2 to read codes as they are seen through a mirror (inversed 180°). If the Mirroring feature is enabled, non-mirrored reading ability will be disabled.

## Chapter 6 - Adding a Prefix or Suffix and Reader Text Commands

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## 6.1 - Prefix Settings

If you scan the following codes, you will lose any unsaved settings. Make sure to save settings on your reader before scanning the prefix codes. If you scan more than one prefix you will receive each scanned prefix in your scanned data; (i.e., if you scan comma prefix twice, you will get two comma prefixes). Scan the following codes to set appropriate prefix:

### Prefix - Comma



M159\_02

### Prefix - Space



M164\_02

### Prefix - Tab (Keyboard Mode)



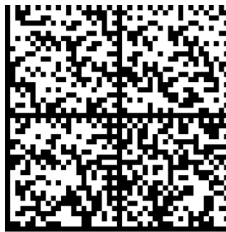
M166\_01

### Prefix - Tab (Serial)



M218\_02

### Prefix - Erase



M404\_01

### Prefix - Carriage Return Line Feed (Serial)



M214\_02

**Note:** If you require a special configuration, please contact Opticon at (800) 636-0090.

## 6.2 - Suffix Settings

If you scan the following codes, you may lose your current settings. Make sure to save settings on your reader before scanning the Suffix codes. If you scan more than one suffix you will receive each scanned suffix in your scanned data; (i.e., if you scan comma suffix twice, you will get two comma suffixes). Scan the following codes to set appropriate suffix:

### Suffix - Carriage Return (Serial)



M168\_04

### Suffix - Comma



M160\_04

### Suffix - Line Feed (Serial)



M169\_04

### Suffix - Carriage Return Line Feed (Serial)



M170\_04

### Suffix - Space



M165\_04

### Suffix - Enter (Keyboard Mode)



M161\_04



Save Settings

M188\_02

### Suffix - Tab (Keyboard Mode)



M167\_04

### Suffix - Tab (Serial)



M219\_04

### Suffix - Erase



M405\_02

## 6.3 - Erase Prefix and Suffix Settings

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Scan the following codes to erase all prefix and suffix data.

### Erase Prefix & Suffix Data



M406\_02

## 6.4 - Reader Text Commands

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Enabling Reader Text Commands allows the CR2 to accept text commands via RS232 or RF communication. Scan the following codes to enable/disable reader text commands:

### Reader Text Commands On



M198\_01

### Reader Text Commands Off - Default



M197\_01

**Note:** Text commands can only be sent to the reader when it is active. Refer to Reader-Host Interface Control Document for more information at <http://www.opticonUSA.com>.



Save Settings

M188\_02

## Chapter 7 - CR2: Maintenance and Troubleshooting

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## 7.1 - Reset Reader to Factory Defaults

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Scan the following codes to reset reader:

### Reset to USB Factory Default Settings



M049\_03

### Reset to PS/2 Factory Default Settings



M060\_03

### Reset to RS232 Factory Default Settings



M418\_02

### Reset to RF One Way Factory Default Settings



M684\_01

### Bootloader Mode



M692\_01

*Bootloader mode is utilized to download new version of bootloader firmware.*

### Clear All CodeXML Rules Prefix & Suffix



M052\_01

### Clear All Stored Data



M071\_01

### Save Settings



M188\_02

## 7.2 - General Safety Information

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**Repairs and Adjustments** - Only those individuals authorized by Opticon should attempt to make repairs or adjustments to CR2 equipment. If the reader casing is opened the warranty is voided.

**Power Supply** - Use only the power supply provided for use with each specific unit when operating Opticon equipment.

**Accessories** - Only those accessories approved by Opticon (see pg. 9) should be utilized with Opticon equipment. Non-compliance with any of the above may result in:

- Injury to individuals handling the equipment;
- Damage to the equipment; and
- Voiding of the maintenance contract.

**Lasers** - The CR2 utilizes a laser **FOR TARGETING PURPOSES ONLY**. If the laser is activated, do not stare into the beam. See pg i for further information regarding laser warnings.



Save Settings

M188\_02

**Lithium Ion Battery - Warning:** Charge the battery with Opticon cables ONLY. Do not open battery, dispose of in fire, or short circuit - it may ignite, explode, leak, or get hot causing personal injury.

## 7.3 - Warranty

Opticon Incorporated CR2 carries a three year limited warranty as described herein.

### Limited Warranty and Disclaimers

PLEASE READ THIS MANUAL CAREFULLY BEFORE INSTALLING OR USING THE PRODUCT.

### Serial Number

A serial number appears on all Opticon products. This official registration number is directly related to the device purchased. Do not remove the serial number from your Opticon device. Removing the serial number voids the warranty.

### Warranty

Unless otherwise agreed in a written contract, all Opticon products are warranted against defects in materials and workmanship for three years after purchase. Opticon will repair or, at its option, replace products that are defective in materials or workmanship with proper use during the warranty period. Opticon is not liable for damages caused by modifications made by a customer. In such cases, standard repair charges will apply. If a product is returned under warranty and no defect is found, standard repair charges will apply. Opticon assumes no liability for any direct, indirect, consequential or incidental damages arising out of use or inability to use both the hardware and software, even if Opticon has been informed about the possibility of such damages.

### Packaging

The packing materials are recyclable. We recommend that you save all packing material to use Should you need to transport your scanner or send it for service. Damage caused by improper packaging during shipment is not covered by the warranty.

## 7.4 - CR2 Accessories

Please visit <http://www.opticonUSA.com> for more information on Opticon accessories.

## 7.5 - Frequently Asked Questions

For a complete list of Frequently Asked Questions, please visit:

<http://www.opticonUSA.com>

## 7.6 - CR2 Maintenance

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The CR2 device operates efficiently and reliably and needs only a minimum of maintenance to operate. A few tips are given below for maintenance suggestions.

### **Cleaning the CR2 Window**

The CR2 window should be clean to allow the best performance of the device. The window is the clear plastic piece inside the head of the reader. Do not touch the window. Your CR2 uses CMOS technology that is much like a digital camera. A dirty window may stop the CR2 from reading codes.

If the window becomes dirty, clean it with a soft, non-abrasive cloth or a facial tissue (no lotions or additives) that has been moistened with water. A mild detergent may be used to clean the window, but the window should be wiped with a water moistened cloth or tissue after using the detergent.

The CR2 display screen and housing may be cleaned in the same way.

For applications that require cleaning with disinfectant, please use products with the following ingredients:

- 1) Isopropyl Alcohol
- 2) Ethyl Alcohol (Denatured Grade)

Opticon does not recommend using bleach.

### **Technical Support and Returns**

For returns or technical support call Opticon Technical Support at (800) 636-0090. For all returns Opticon will issue an RMA number which must be placed on the packing slip when the reader is returned.



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