

CS1 90F Installation and Commissioning Guide



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v2.1

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Introduction

This guide describes the CS190F series fixed-mount barcode readers, including product overview, installation, configuration, communication, operation, and maintenance tasks.

Supplementary Documents

This document provides basic information about the CS190F series barcode readers.

- The Fixed_Mount_WebUI_Reference_Manual demonstrates how to configure various scanner parameters via the web interface.
- The Cognex Barcode Reader Discovery Tool is used to quickly connect devices.

Introduction

Installation Requirements

- Do not place the equipment in direct sunlight or near heating devices, and ensure the ambient temperature is below 50°C and above 0°C.
- Do not install the equipment in damp, dusty, or dirty areas. If the barcode reader is not connected, be sure to attach the lens cap to prevent dust from entering.
- Install the device in a stable location and take care to prevent it from falling.
- Avoid dripping or splashing liquids onto the device surface, and do not place containers holding liquids on the device to prevent liquid from seeping inside.
- Install the device in a well-ventilated location and do not block the ventilation openings.
- This device may only be used within the rated input and output ranges.
- Do not disassemble the device without authorization.
- Transport, use, and store the device within the permitted humidity and temperature ranges.
- Connect Class I products to a power outlet with a protective ground.

Power Requirements

- The product must be used with the cable assembly (power cord) recommended for this region and within the rated specifications!
- Be sure to use the power adapter supplied with the equipment; otherwise, the user assumes full responsibility for any personal injury or equipment damage that may result.
- Use a power supply that complies with SELV (Safety Extra-Low Voltage) requirements and power products rated as limited-power supplies (limited power sources) according to the rated voltage specified in the IEC 62368-1 standard; refer to the device label for specific power requirements.
- Connect Class I products to a mains power outlet with a protective earth connection.

Scanner Installation Precautions

During installation, in addition to considering electrostatic discharge, electromagnetic interference, lightning strikes, and power surges, heat dissipation must also be taken into account.

Safety Protection Requirements

Although the barcode reader is designed to protect against lightning, surges, electromagnetic interference (EMI), and electrostatic discharge (ESD), from a safety perspective, it is still necessary to avoid or mitigate these effects through the installation environment and method.

The following are basic protective measures for users to reference; it is recommended to implement them whenever possible:

- Use SSTP shielded network cables. To achieve good flexibility, most network cables involve compromises regarding copper wire thickness, shielding foil thickness, shielding mesh density, and PVC outer jacket protection.

Introduction

- Network cables should be kept as short as possible. If cables are excessively long and have significant excess length, use a serpentine routing method to avoid coiling the cables into loops; this reduces the coupling effects of electromagnetic interference.
- Use shielded cables for power control lines and avoid forming loops. Power cables and network cables may be laid in parallel but must be kept separate.
- Power cables and network cables should be kept away from equipment that generates high currents, high voltages, or experiences frequent start-stop cycles (such as stepper motors), and should especially avoid being laid parallel to the cables of such equipment. Such equipment emits strong electromagnetic radiation, which can easily couple into the camera's transmission lines.
- The protective grounding of all equipment should be interconnected and then connected to a single protective grounding point to avoid multi-point grounding. Multi-point grounding can easily lead to voltage differences between devices forming loops, which can easily couple electromagnetic interference.
- The AC power supply for the barcode reader and the PC should be connected to the same AC outlet to allow for the connection of their protective grounding, thereby avoiding multi-point grounding. Do not use this AC power supply directly for high-power electromechanical equipment.
- A ferrite bead can be installed on the barcode reader's power control line to absorb electromagnetic interference signals.
- Ensure moderate ambient humidity, and take measures such as wearing anti-static clothing and footwear during operation to reduce the generation of electrostatic discharge (ESD).

Temperature and Humidity

- The ambient temperature should be between 0°C and 50°C; operation in an air-conditioned environment is recommended.
- Operating humidity: 20%–80% (non-condensing).
- Storage temperature: -30°C to +70°C.
- Storage humidity: 20%–80%.
- During transportation and assembly, take care to avoid bumping the buttons to prevent damage to the dome cover.

Product Overview

COGNEX

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Product Overview

CS190F SERIES INSTALL GUIDE

SECTION OVERVIEW

This section covers the product specifications and operating window.

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Product Overview

1. Product Overview



This product is a highly reliable, cost-effective fixed-mount barcode reader with the following key features:

- Quick connection via browser WebUI; no software installation required; simple and easy to use.
- Integrated lighting design allows for independent control of multiple light sources.
- Built-in deep-learning algorithms and multi-parameter polling support ensure reliable recognition in complex scenarios.

Product Overview

1.1 CS190F Series

Product illustration	Product ID, system only	Resolution	Lighting	Lens	Front Cover
	CS190F-05-LM	1.6MP	Integrated lighting	5 mm	ON
	CS190F-12-LM	1.6MP	Integrated lighting	12 mm	ON

Recommended Accessories List:

- Matching power and I/O interface cable (5-meter power and I/O cable)
- Matching Ethernet Cable (5-meter Ethernet cable)



Note: Cables should be purchased separately

Accessories	Product Number	Illustration
100 Mbps Network Cable M12-4 to RJ45	CSC-FM-ENET-xx (straight-through, available lengths: 5 m, 10 m, 15 m)	
Power and I/O Interface Cables	CSC-FM-PWR-xx (Straight, available lengths: 5 m, 10 m, 15 m)	

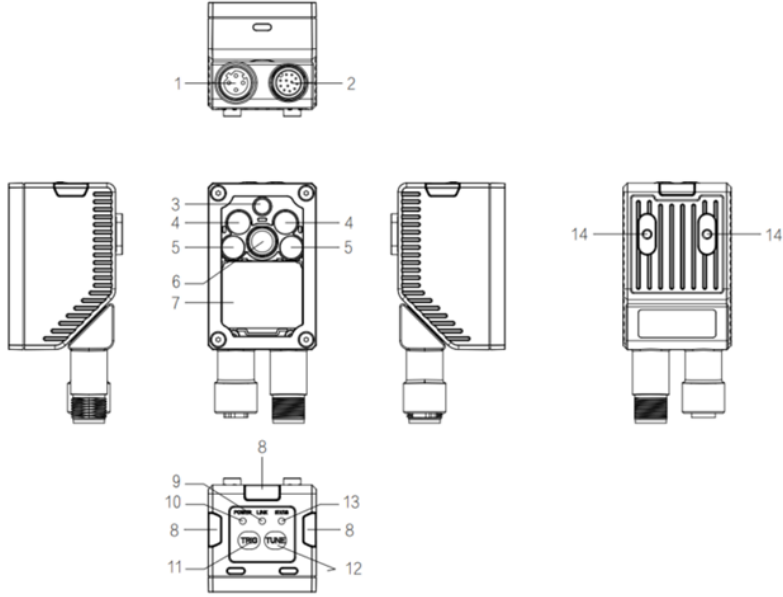
Product Overview

1.2 Mechanical and Optical Characteristics

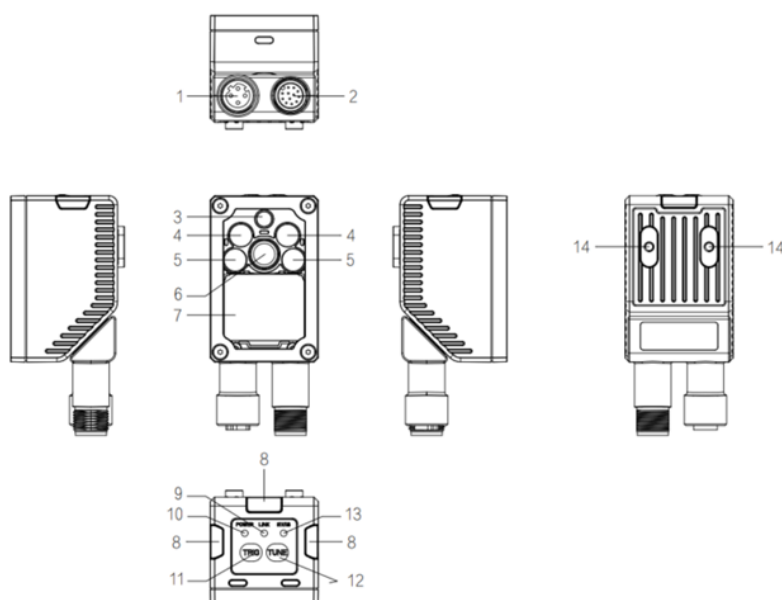
Read this section to learn how to select and install this reader.

Scanner Appearance

See the table below for a schematic diagram and component list of the scanner.

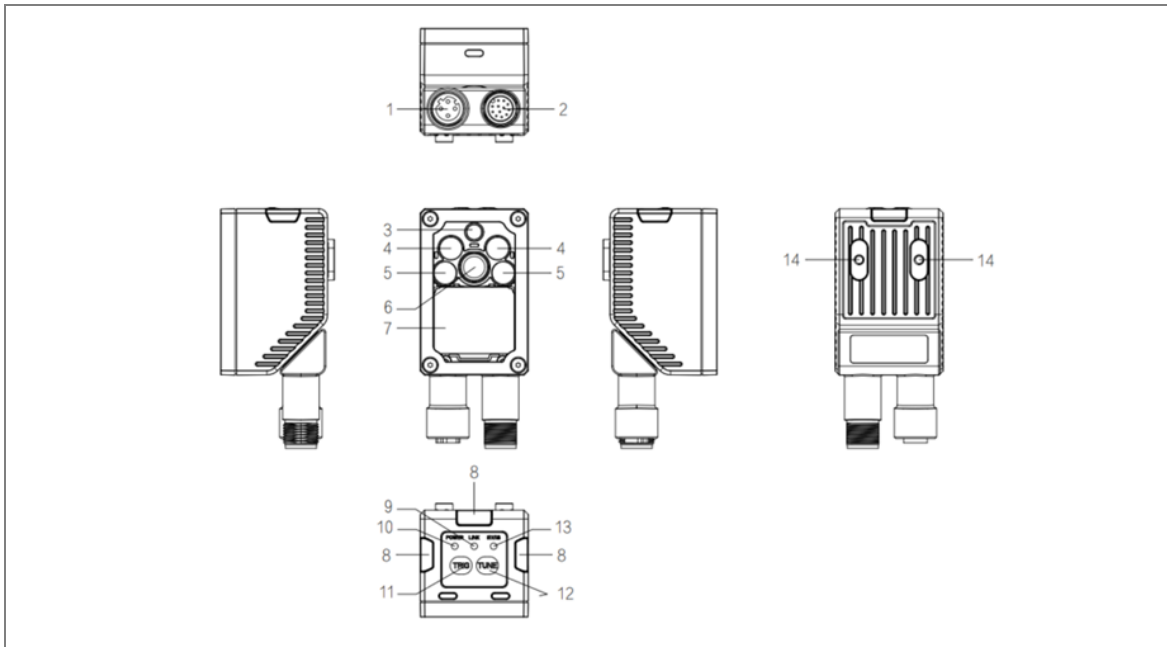
		
Serial Number	Name	Description
1	Network Interface	100 Mbps network port
2	Power Interface	12-pin I/O connector, including power, I/O, RS232 serial port, etc.
3	Aimer	Barcode Positioning
4	Direct Illumination	Enable or disable non-polarized illumination based on the actual scenario
5	Polarized Illumination	Polarized illumination that can be turned on or off depending on the actual scenario
6	Image Sensor	User captures image data
7	Diffuse lighting	Diffused lighting that can be turned on or off depending on the actual scene

Product Overview



Serial Number	Name	Description
8	Decoding result indicator	Decoding indicator: The green light turns on and the red light turns off when decoding is successful; the red light turns on and the green light turns off when decoding fails.
9	LINK indicator	Network Connection Indicator: The indicator remains solid green when the network is active; it flashes green during data transmission.
10	Power Indicator	Power Indicator: The indicator light is green when the power is normal; it remains off when there is an abnormality.
11	Trigger Button	When the device is in trigger mode, pressing the button triggers a single operation.
12	Smart Tuning Button	Hold the button for 3 seconds, then quickly tap it once after hearing a beep to activate Smart Tuning.

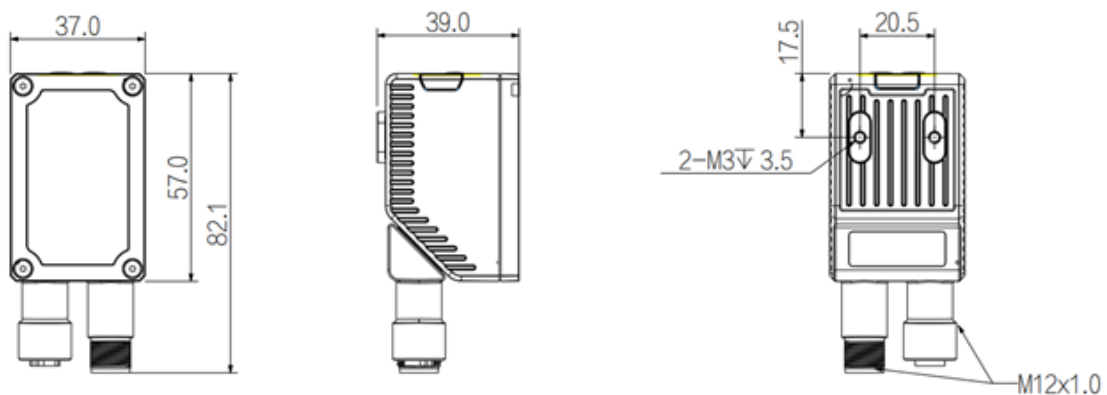
Product Overview



Serial Number	Name	Description
13	Status Indicator	On: Sensor has been triggered and is capturing Off: The scanner has not yet captured an image
14	Mounting Holes	Use the M3 screws included in the package to secure the device.

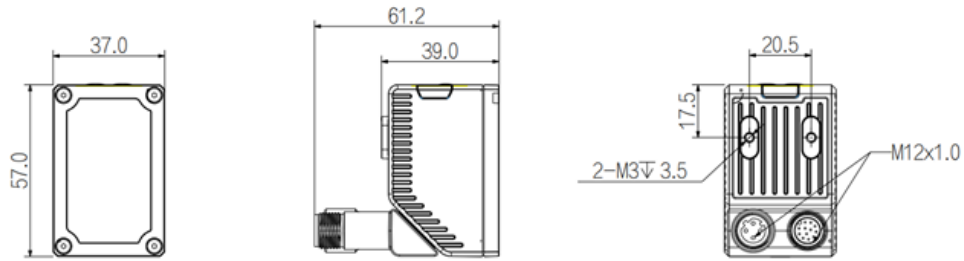
Product Dimensions

Interface in Vertical Position



Product Overview

Interface Rotation



1.3 Field of View and Working Distance

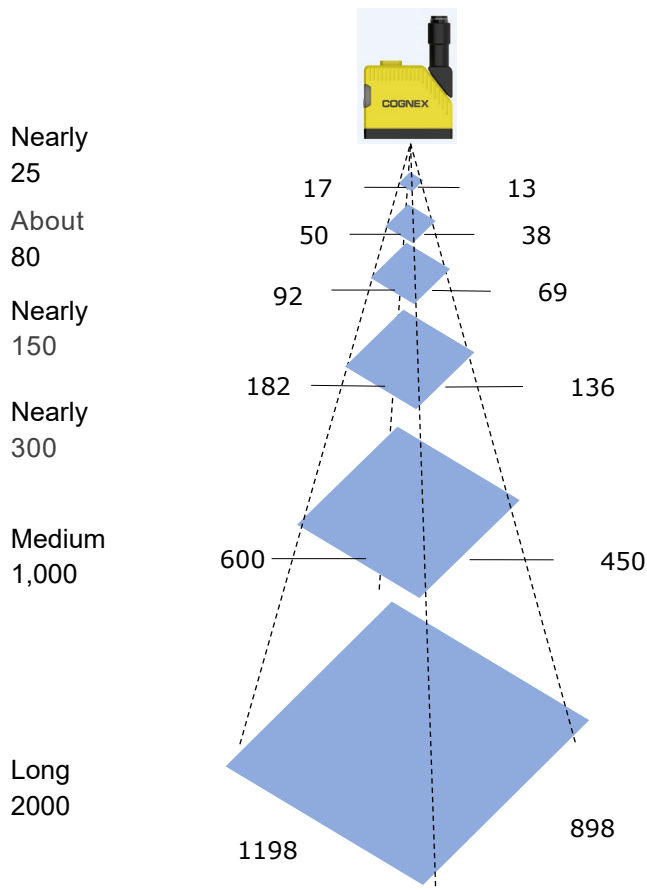
This section provides the field of view and working distance for 5 mm and 12 mm lenses.

CS190F-05-LM

The table below shows the field of view for the 5 mm lens at various distances.

Working
Distance
Unit: mm

5 mm lens



Product Overview

Working distance	Field of View X*Y		Minimum resolution 1D	Minimum resolution 2D
25 mm	17 mm	13 mm	0.02 mm	0.037 mm
80 mm	50 mm	38 mm	0.06 mm	0.106 mm
150 mm	92 mm	69 mm	0.11 mm	0.19 mm
300 mm	182 mm	136 mm	0.21 mm	0.38 mm
1,000 mm	600 mm	450 mm	0.69 mm	1.25 mm
2000 mm	1,198 mm	898 mm	1.37 mm	2.50 mm

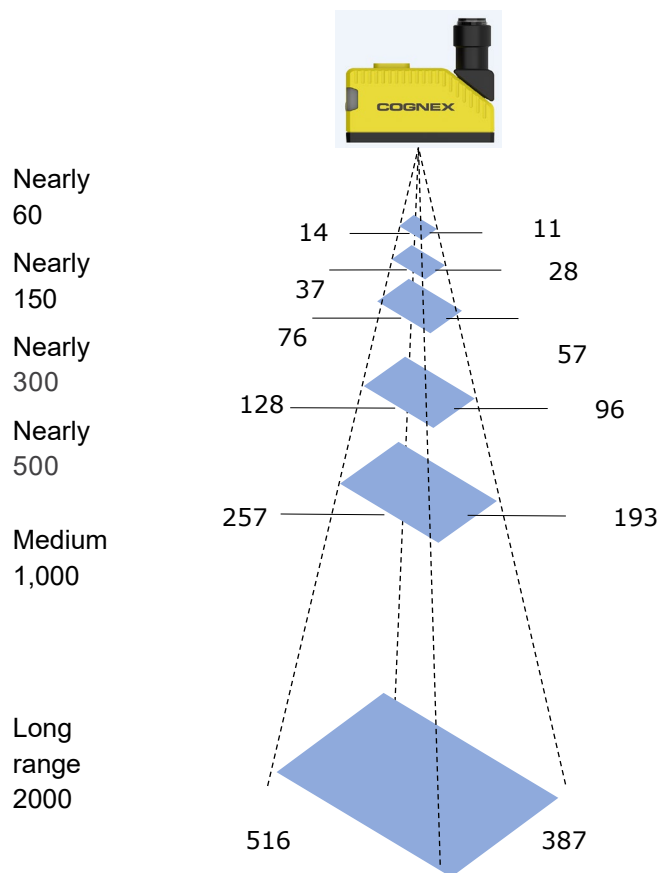
CS190F-12-LM

The table below shows the field of view of the 12 mm lens at various distances.

Working
Distance

12 mm lens

Unit: mm



Product Overview

Working distance	Field of View X*Y		Minimum resolution 1D	Minimum resolution 2D
60 mm	14 mm	11 mm	0.017 mm	0.03 mm
150 mm	38 mm	28 mm	0.04 mm	0.08 mm
300 mm	76 mm	57 mm	0.09 mm	0.16 mm
500 mm	128 mm	96 mm	0.15 mm	0.27 mm
1,000 mm	257 mm	193 mm	0.30 mm	0.54 mm
2000 mm	516 mm	387 mm	0.59 mm	1.1 mm

1.4 Specifications

The specifications for the barcode reader and image sensor are as follows.

Barcode Reader Specifications

Parameters	CS190F
Image Capture	60 fps
Illumination	Integrated illumination: red polarized light, red direct light, white diffuse light
Status Output	3 status LEDs, buzzer, 2 indicator lights
Isolated Input	Isolated via bidirectional optocouplers
Isolated Output	Three optocoupler-isolated outputs
Power supply	16–26 V DC
Power consumption	≤ 6 W
Weight	<160 g
Operating temperature	0°C – 50°C
Storage temperature	-30°C – 70°C
Operating and storage humidity	20% – 80% (non-condensing)

Product Overview

Parameters	CS190F
Vibration	Sine wave vibration (3M7): Frequency range: 5–9 Hz, displacement 10 mm; 9–200 Hz, acceleration 30 m/s ² Sweep rate: 1 octave per minute; 100 minutes per axis for all three axes
Communication	RS232, Ethernet
Ethernet	10/100 BASE-T
RS-232	RS-232
Industrial communication protocols	TCP Client, TCP Server, FTP, RS232, Profinet, Modbus, EtherNet/IP, MC (SLMP), FINS/UDP, FINS/TCP
Features	Extensive barcode reading capabilities (1D barcodes: Code 39, Code 93, Code 128, CodaBar, EAN-8, EAN-13, UPC-A, UPC-E, ITF-25, 2of5 (Industrial 2of5), GS1-128, etc.; 2D barcodes: QR, Data Matrix, MQR, GS1 DM, GS1QR, PDF417, etc.); Barcode quality evaluation (ISO/IEC 29158 (AIM-DPM), ISO/IEC 15415, ISO/IEC 15416)
Protection Rating	IP67

Image Sensor Specifications

Specifications	CS190F
Image Sensor	CMOS, Global Shutter
Image Sensor Specifications	Pixel size: 2.2 µm (H)
Image Resolution	1440 x 1080 pixels
Lens Options	5 mm or 12 mm mechanical auto-focus lens
Electronic shutter speed	Minimum exposure time: 20 microseconds Maximum exposure time: 50 milliseconds (when the built-in light source is off)

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Installation and Setup

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Installation and Setup

CS190F SERIES INSTALL GUIDE

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This section covers installation and I/O specifications.

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Installation and Setup

2. Installation and Setup

2.1 Getting Started

Before You Begin:

- Check the packaging dimensions, including height and width
- Ensure the work area is clean and free of debris
- Open the shipping carton and verify the system components (refer to the Bill of Materials)
- Gather all necessary tools and equipment
- Carefully read the installation instructions



Note: If any components required for installation are missing from the shipping crate, please contact the on-site project manager or control supervisor/engineer.

2.2 Reader Installation

When unpacking the box, inspect the device for any visible damage and verify that the included parts match the list below:

Serial Number	Name	Quantity
1	Code reader	1
2	M3×6 Phillips-head screw	4

Installation Kit

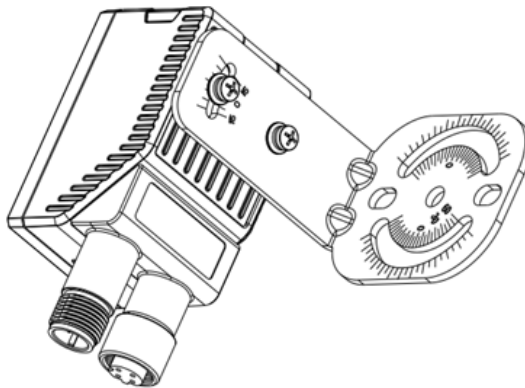
To ensure proper operation of the equipment, please prepare the items listed in the table below before installation.

Part Number	Part Name	Quantity	Description
1	Complete barcode scanner	1	Equipment Referred to in This Manual.
2	Power Cord and I/O Interface Cable	1	Must be purchased separately.
3	Network cable	1	Must be purchased separately.

Installation and Setup

Part Number	Part Name	Quantity	Description
4	Switching power supply or power adapter	1	Select a power adapter or switching power supply that matches the device's power requirements and power consumption. Refer to the technical specifications for the specific model for detailed parameters. Must be purchased separately.
5	Mounting Bracket	1	Used to secure the device; see the figure below for the installation result. The bracket should be prepared by customer, Cognex doesn't supply it.

Align the holes on the mounting bracket with the mounting holes on the barcode reader, then insert the M3x6 screws into the mounting holes.



Note: The mounting bracket must be prepared by the customer. This image shows a schematic illustration of the installation.

Connecting the Scanner

1. Follow the steps to connect the scanner's network cable:
2. Connect the M12 connector port of the 100 Mbps Ethernet cable to the device's M12 D-CODE female connector.
3. Connect the RJ45 port on the 100 Mbps Ethernet cable to a PC or switch.

Power Cable Connection.

1. Ensure the 24V DC power supply is disconnected.
2. Connect the power connector to the DC power supply end of the power cable.

Installation and Setup

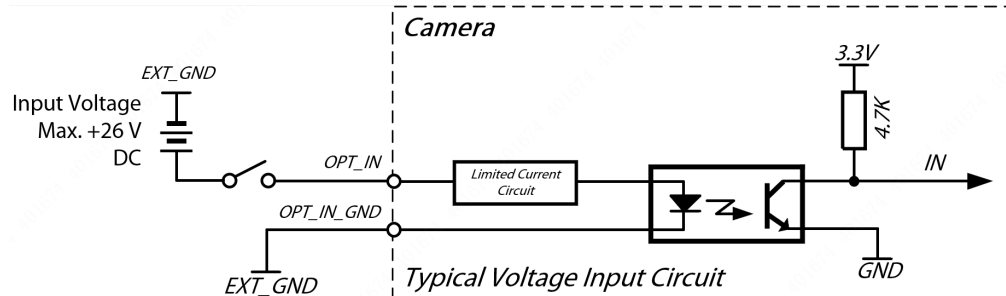
3. Connect the M12 connector port on the power cable to the device's M12 A-CODE male connector.
4. Restore power from the 24V DC power supply.

I/O Electrical Specifications

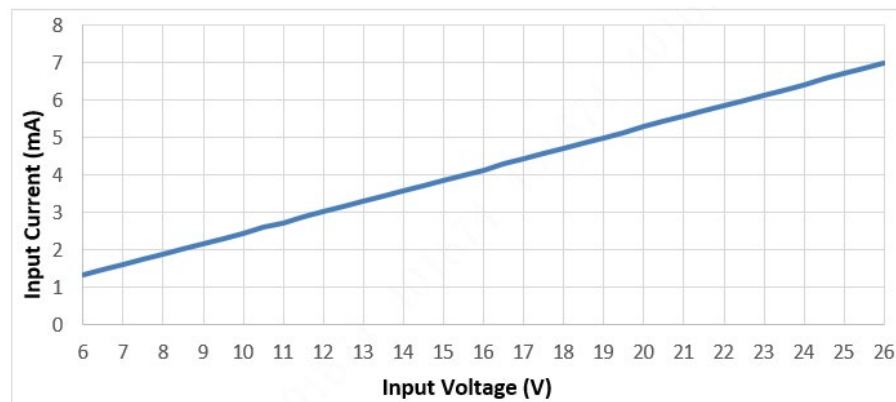
Optocoupler-Isolated Input Voltage Parameters

Input Voltage	Description
+26 VDC	The voltage must not exceed this limit, otherwise the device will be damaged
+0 to +24 VDC	I/O input safe operating voltage range
+0 to +6 VDC	Represents logic 0
+6 to +9 VDC	The input state inverts here; the logic state changes with the voltage
>+9 VDC	Indicates logic 1

The figure below shows a typical circuit using an optocoupler for input isolation.



The relationship between the drain current of the optocoupler isolation input and the input voltage is shown in the figure.



Installation and Setup

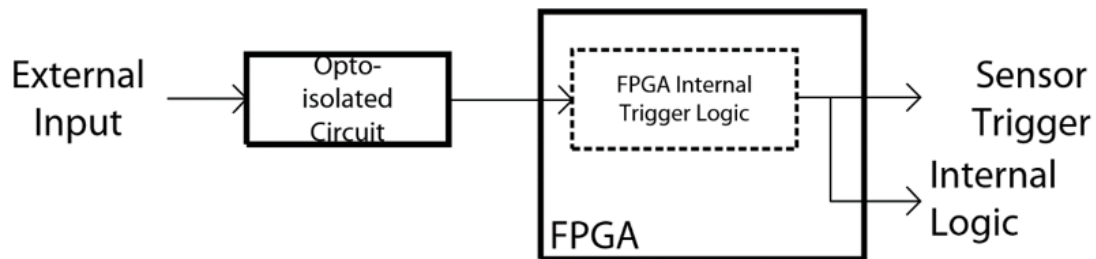
	Note: • The maximum drain current for the optocoupler-isolated input is 7 mA. • The above values are typical measurements taken at an ambient temperature of 25°C; individual variations may exist among different readers.
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The table below shows the relationship between the amplitude of the optocoupler input signal and the trigger delay.

Input Signal Amplitude (Vp-p)	Rising-edge trigger delay tDR	Trigger delay on falling edge tDF
9	18.80 microseconds	23.70 microseconds
12	7.20 microseconds	31.30 microseconds
20	3.00 microseconds	38.40 microseconds
24	2.40 microseconds	40.10 microseconds
26	2.20 microseconds	41.40 microseconds

	Note: The trigger input delay measures the delay from the external optocoupler input port to the FPGA input pin, excluding internal FPGA logic delay.
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The logic for trigger input delay is shown in the figure.



The minimum pulse width requirements for the trigger input signal are as follows:

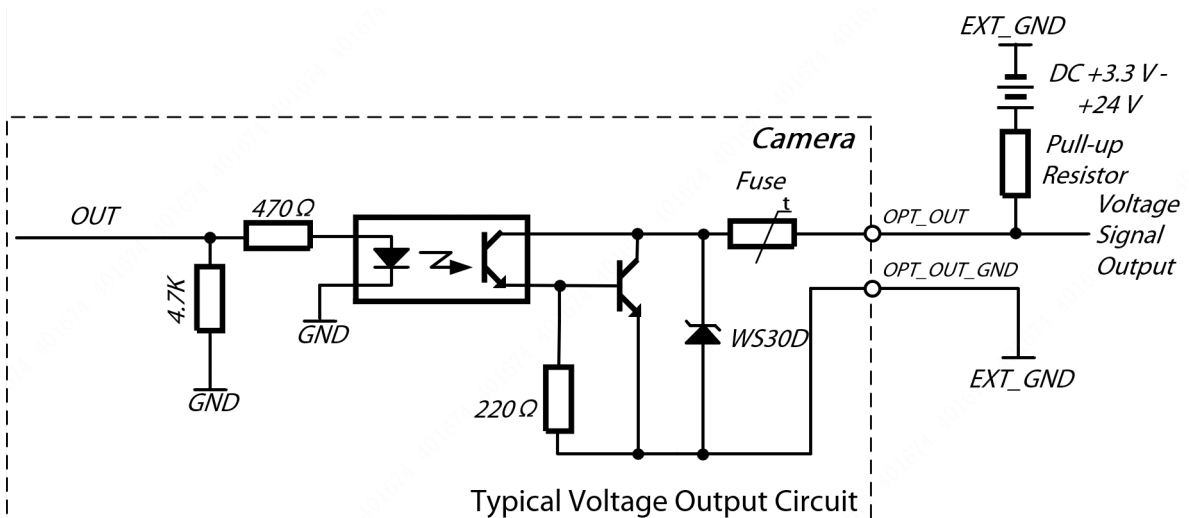
Input Signal Amplitude (Vp-p)	Minimum Positive Pulse Width	Minimum negative pulse width
9	36.00 microseconds	90.00 microseconds
12	10.10 microseconds	90.00 microseconds
20	3.10 microseconds	90.00 microseconds
24	2.40 microseconds	90.00 microseconds
26	2.10 microseconds	90.00 microseconds

Installation and Setup

Optocoupler-Isolated Output Voltage Parameters

Voltage	Description
+26 VDC	The voltage must not exceed this limit, otherwise the device will be damaged
<+3.3 VDC	I/O output may be incorrect
+3.3 to +24 VDC	I/O output safe operating range

The figure below shows a typical circuit for optocoupler isolated output.

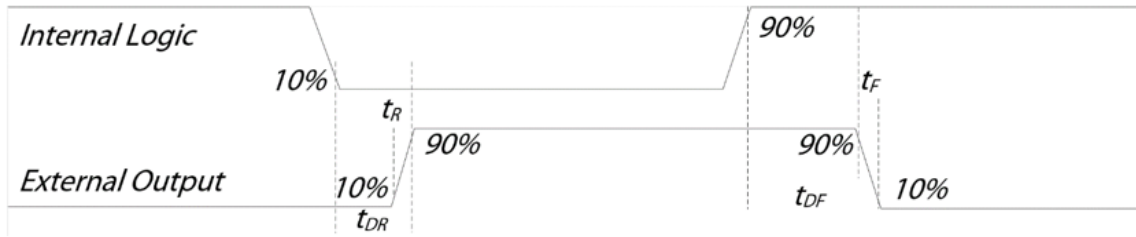


The table below shows the relationship between the amplitude of the optocoupler output signal and the trigger delay.

External supply voltage	Rise time tR	Fall time tF	Rise-edge trigger delay tDR	Fall-edge trigger delay tDF
5 V	19.70 microseconds	3.20 microseconds	39.9 microseconds	8.06 microseconds
12 V	24.06 microseconds	5.22 microseconds	44.8 microseconds	11.8 microseconds
24 V	30.11 microseconds	8.10 microseconds	44.8 microseconds	53.2 microseconds

As shown in the table above, when the rise/fall times and rise/fall edge delays of the output under different external supply voltages are as shown in the figure, the relationship between the amplitude of the optocoupler output signal and the trigger delay is as shown in the figure.

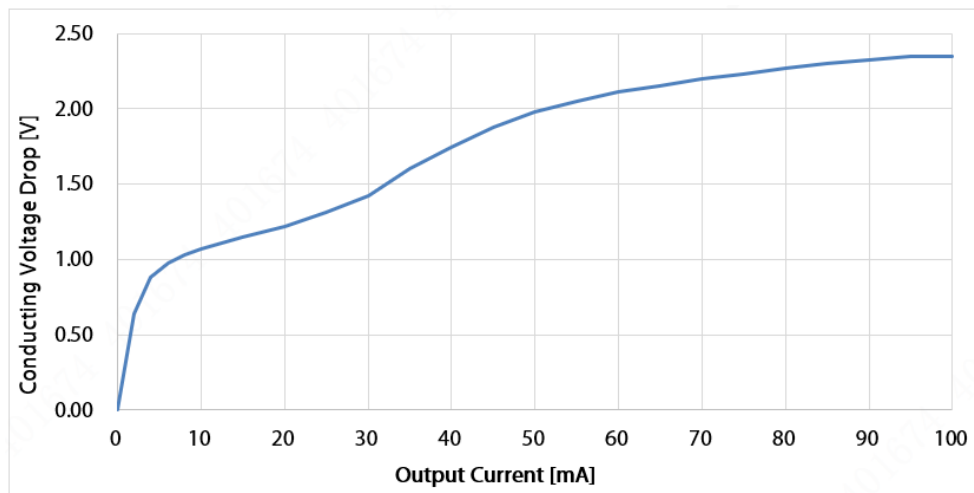
Installation and Setup



Note:

- Output delay measures the delay from the FPGA's internal logic output to the external optocoupler's isolated output pin, excluding FPGA internal logic delay.
- The above values are typical measurements taken at an ambient temperature of 25°C; individual variations may exist among different readers.

The relationship between the optocoupler's on-state voltage drop and output current is shown in the figure:



Note:

- The maximum on-state voltage drop at the optocoupler output is 2.35 V (measured at a maximum output current of 100 mA).
- The above values are typical measurements taken at an ambient temperature of 25°C; individual variations may exist among different readers.

External I/O Wiring

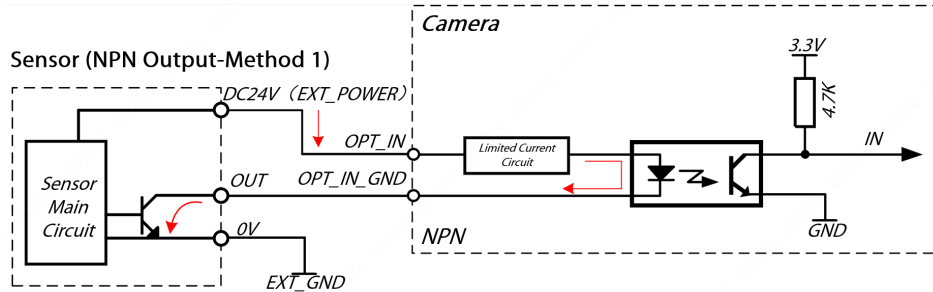
Optocoupler-Isolated Input

Optocoupler-isolated input sensors supporting NPN, PNP, and push-pull outputs.

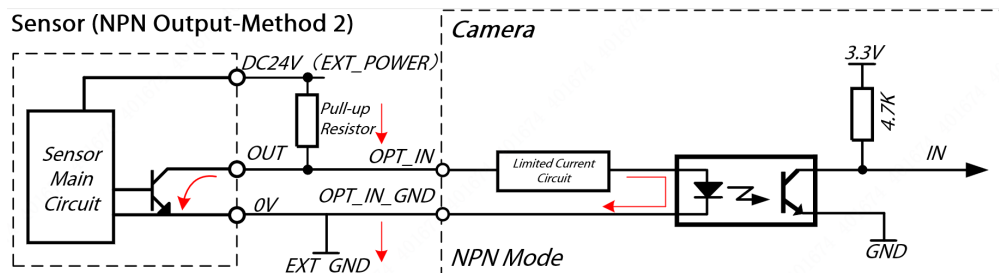
Installation and Setup

NPN Output Sensors

- Method 1 (Recommended): The diagram below shows the wiring method that does not require a pull-up resistor.



- Method 2: Connect the pull-up resistor as shown in the figure below.



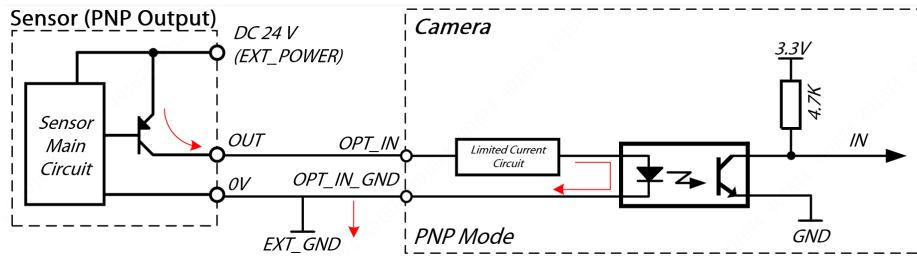
Note:

- EXT_POWER refers to the user's external power supply, and EXT_GND refers to the user's external power supply ground; power can be supplied by an independent switching power supply or the sensor's power supply.
- This wiring method is suitable for sensors with an NPN open-drain output configuration.
- Recommended pull-up resistor values: 1 k Ω for 3.3 V supply, 1 k Ω for 5 V supply, 2.4 k Ω for 12 V supply, and 4.7 k Ω for 24 V supply. When higher output current capacity is required, the resistor value may be lower than 1 k Ω , but ensure the rated power is greater than 1 W.
- In some models, OPT_IN_GND and OPT_OUT_GND share the OPT_GND ground terminal.

PNP Output Sensor

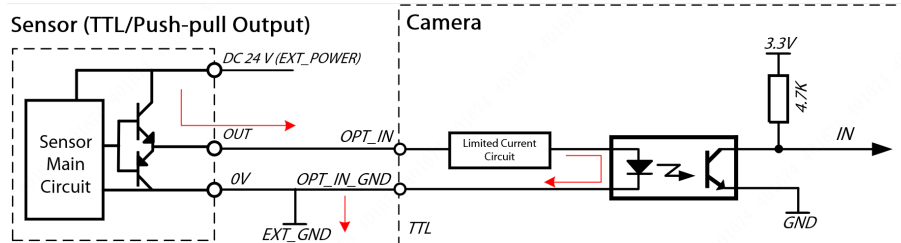
The PNP wiring configuration is shown in the figure.

Installation and Setup



TTL Output or Push-Pull Output Sensors

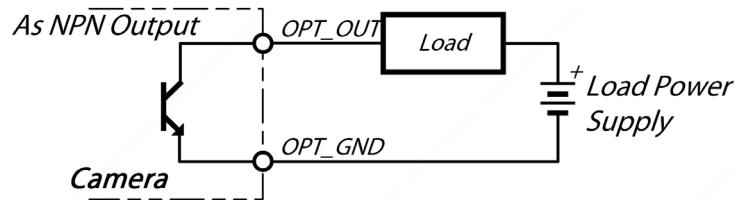
The TTL/push-pull wiring configuration is shown in the figure.



Optocoupler-Isolated Output

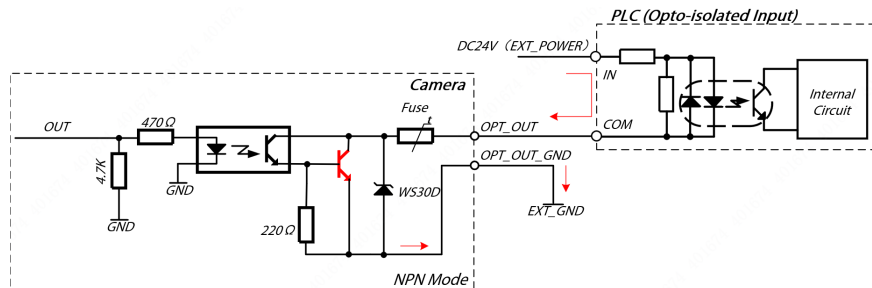
The decoder's transistor output is isolated from the internal circuitry via an optocoupler, allowing the transistor output to function as either an NPN or PNP output.

The optocoupler output topology is shown in the figure



NPN Output Wiring

The NPN output wiring configuration is shown in the figure.



Installation and Setup

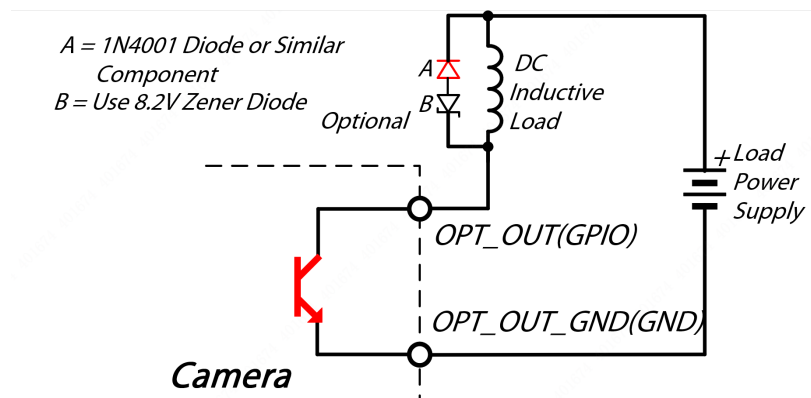
	Note: • Do not apply voltages exceeding the maximum switching capacity to the output terminals or connect loads to them. • Users must not replace the interface fuse themselves. If the fuse blows due to a short circuit or other overcurrent condition, please contact after-sales service. • As shown in the typical circuit, if an external pull-up resistor is used, the recommended values are: 1kΩ for 3.3V power supply, 1kΩ for 5V power supply, 2.4kΩ for 12V power supply, and 4.7kΩ for 24V power supply. When higher output current capacity is required, the resistor value may be lower than 1kΩ, but ensure its rated power is greater than 1W.
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Inductive Loads (for example, relays)

When using the barcode reader's output to drive inductive loads (such as relays), you must select a relay model with a built-in free-wheeling diode or connect an external free-wheeling diode; otherwise, the output interface will be damaged due to overvoltage.

The figure below shows an example of a suppression circuit for directly driving inductive loads. In most applications, simply adding diode A is sufficient; however, if faster turn-off speed is required, Zener diode B is recommended. Ensure that the Zener diode can meet the current requirements of the output circuit.

The wiring configuration for inductive loads is shown in the figure.



EMI and ESD Best Practices

Barcode readers installed in industrial environments often coexist with equipment that generates EMI (electromagnetic interference), and the readers themselves are susceptible to ESD (electrostatic discharge). Severe EMI/ESD interference can cause malfunctions such as false triggers and sudden production shutdowns, while also degrading image quality and compromising the reliability of data transmission between the barcode reader and the PC.

To mitigate these EMI and ESD issues, we recommend that customers implement the following protective measures:

- Use high-quality shielded cables. These cables provide effective shielding against EMI and ESD.

Installation and Setup

- Select cables of appropriate length to avoid coiling excessively long camera cables into loops; if cables are indeed too long, they should be folded rather than coiled for storage.
- Route the barcode reader's power cable parallel to the data cable.
- Avoid running the barcode reader cables in parallel with other high-current or high-voltage switching cables (such as stepper motor drive cables or solenoid valve cables); Do not place the barcode reader cables near the aforementioned interference-generating devices.
- It is recommended to consolidate all ground (GND) connections to a single point for single-point grounding. For example, use a power strip to connect the entire system to a single point and route the ground wire from there. This is intended to prevent the formation of large-area ground loops (which are the primary source of electromagnetic interference issues).
- Install a line filter on the barcode reader's main power supply, or use a dedicated power source.
- Keep the barcode reader and cables as far away as possible from equipment that generates sparks (such as brushed motors, relays, etc.); install a metal shielding enclosure if necessary.
- The following measures can be taken to reduce the risk of electrostatic discharge:
- Use conductive materials for installation surfaces.
- Control the humidity of the installation environment, as dry air can easily cause electrostatic discharge.

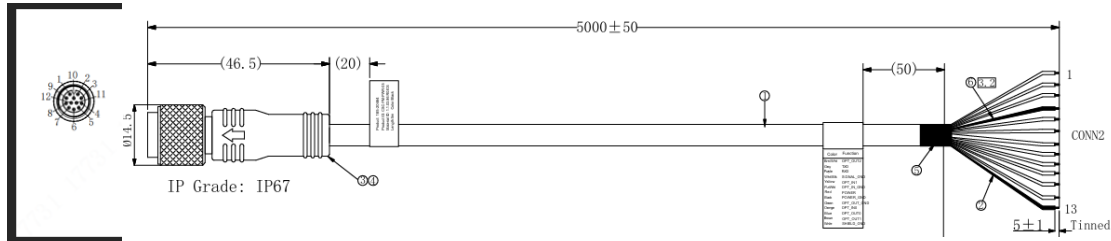
100 Mbps Network Cables



tubing	Signal	Match cable colors	
1	ETHTX+		Orange-white
2	ETHRX+		Green and white
3	ETHTX-		Orange
4	ETHRX-		Green

Installation and Setup

Matching I/O Cable



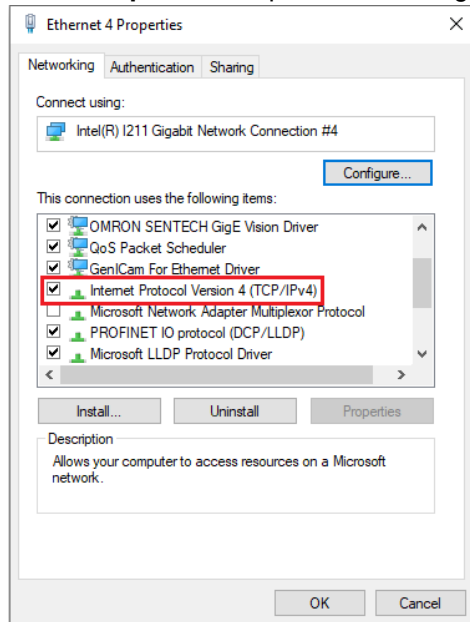
Pin Signal Definition

Pin	Signal	Description	Matching Cable Colors	
1	OPT_OUT2	Optocoupler-isolated output 2		Brown-White
2	RS232_TXD	RS232 Serial Port Transmit		Light gray
3	RS232_RXD	RS232 serial port receive		Purple
4	Signal Ground	RS232 Serial Port Ground		Black and white (card type)
5	OPT_IN1	Optocoupler Isolated Input 1		Yellow
6	OPT_IN_GND	Optocoupler-isolated input ground		Purple-White
7	Power Supply	Reader Power Supply		Red
8	Power Supply_Ground	Decoder Power Ground		Black
9	OPT_OUT_GND	Optocoupler Isolated Output Pin		Green
10	OPT_IN0	Optocoupler isolated input 0		Orange
11	OPT_OUT0	Optocoupler-isolated output 0		Blue
12	OPT_OUT1	Optocoupler isolated output 1		Brown

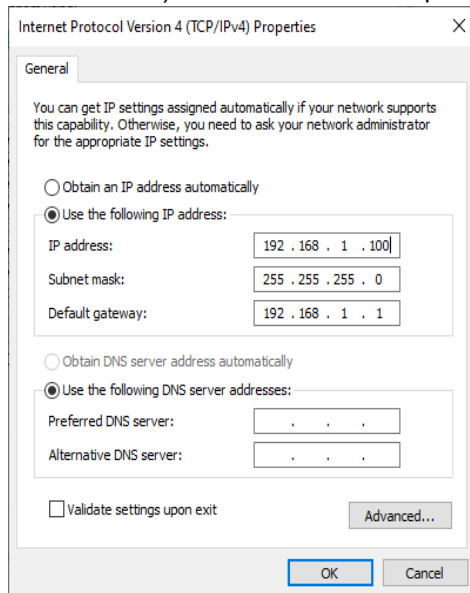
Installation and Setup

PC Network Settings

1. On your computer, open the Control Panel > Network and Internet > Network and Sharing Center > Change adapter settings. Select the corresponding network port, right-click it, and select **Properties** to open the following interface:



2. Double-click **Internet Protocol Version 4** to open the IP address settings page. Configure a static IP address for the network port and an IP address block starting with 192.168.1 (as shown below). Ensure that the computer and the device are on the same local area network.



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Using the Barcode Reader

COGNEX

3

Using the Barcode Reader

CS190F SERIES INSTALL GUIDE

SECTION OVERVIEW

This section covers connecting to devices with the WebUI.

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	Set the IP Address	32
3.2	Install the Cognex Barcode Reader Discovery Tool	32
3.3	WebUI Overview	33
3.4	WebUI Connection and Setup	34
	IP Address	34
	Restore Default IP	34
	Setup Steps	35

Using the Barcode Reader

3. Using the Barcode Reader

This section covers WebUI connection functionality and how to use the Cognex Barcode Reader Discovery Tool.

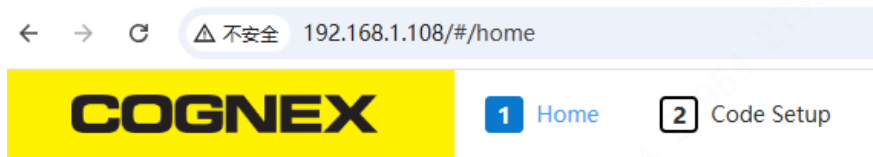
3.1 Connecting to the WebUI

Follow the steps below to connect the CS190F reader to the WebUI. These steps apply to Ethernet-enabled readers.

Turn on the barcode reader and connect it to the computer. To connect the reader to the WebUI, use the IP address.

Set the IP Address

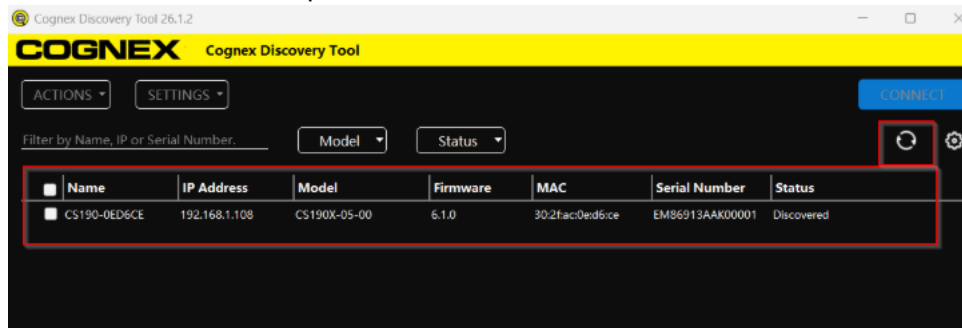
1. Locate the reader's IP address in the Cognex Reader Discovery Tool:
2. Download the Cognex Barcode Reader Discovery Tool.
For more information, contact Cognex.
3. Use the Cognex Barcode Reader Discovery Tool to view and locate the IP addresses of all Cognex devices on the network.
4. To connect to a specific reader, select the device and click **Connect**.
The WebUI interface will open automatically in your browser.
5. Enter your IP address in the web browser.
For example: 192.168.1.108.



3.2 Install the Cognex Barcode Reader Discovery Tool

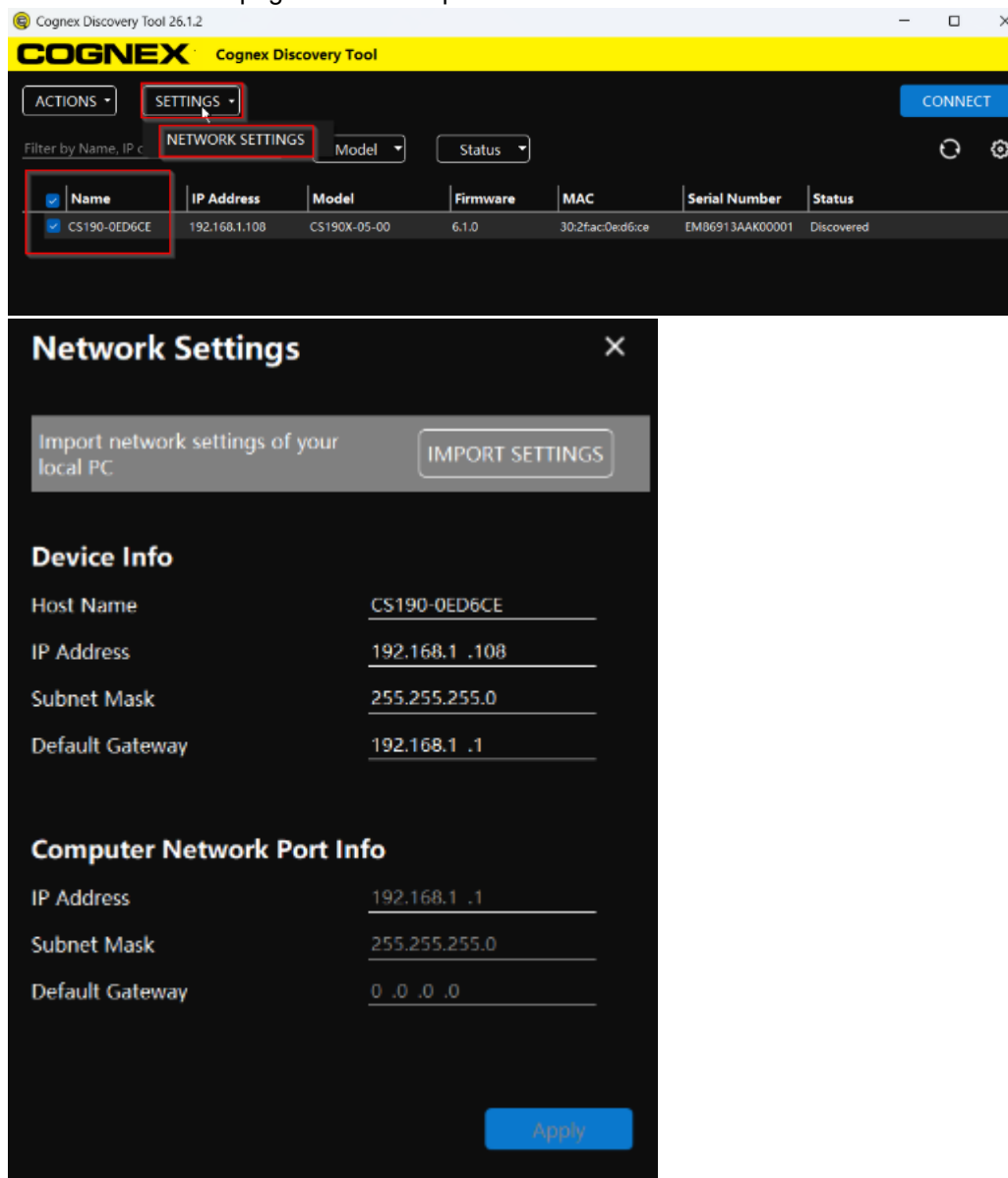
Please follow these steps to install the tool and connect to the barcode reader.

1. Connect the barcode reader to your computer.
2. Open the tool to view all currently connected Cognex barcode readers. When a new device is added, click **Refresh** to update the list.



Using the Barcode Reader

3. Select the device whose IP you wish to change, then click **Settings > Network Settings** to access the network configuration page, where you can set the barcode reader's IP address and host name.
4. Once configured, click **Apply Network Settings** to apply the changes.
5. Return to the home page to see the updated device's IP address.



3.3 WebUI Overview

The CS190 WebUI provides an intuitive interface for managing your CS190 scanner. The WebUI simplifies configuration and monitoring tasks. Key features include:

- **Real-time Viewing:** View real-time images of barcodes scanned by the CS190 scanner directly in the WebUI.
- **Unified Platform:** The CS190 WebUI is consistent across all models, simplifying the deployment process by integrating common control functions into a single page.

Using the Barcode Reader

- Live Preview: Instantly see the actual impact of different settings on the scanner.
- No Additional Downloads: No need to download or install any additional software.
- Quick Setup: By eliminating the need for software downloads and installation, the system can be deployed in just a few minutes.
- Program Features: The program provides a convenient way to group and store various scan settings and device-level parameters, supporting easy switching between different application scenarios.

CS190 Supported Browsers:

- Google Chrome
- Microsoft Edge
- Firefox

The following CS190 barcode reader models are compatible with WebUI:

- CS190 Series

3.4 WebUI Connection and Setup

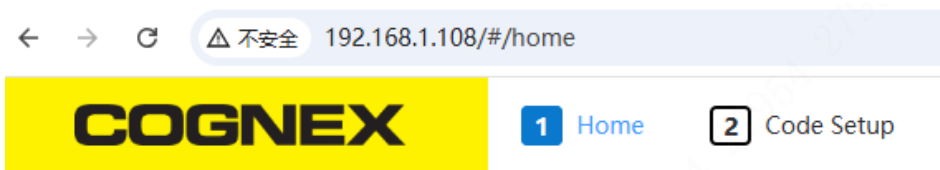
Please follow the instructions below to connect your CS190 scanner to WebUI. These steps apply to Ethernet scanners.

Turn on the scanner and connect it to your computer. How to connect the scanner to the WebUI:

- IP address

IP Address

1. Find the barcode reader's IP address using the Cognex Barcode Reader Discovery Tool.
2. Download the Cognex Barcode Reader Discovery Tool.
For more information, contact Cognex.
3. Use the Cognex Barcode Reader Discovery Tool to view and locate the IP addresses of all Cognex devices on the network.
4. To connect to a specific barcode reader, select the device and click **Connect**.
The WebUI interface will open automatically in your browser.
5. Enter your IP address in a web browser.
For example: 192.168.1.108.



Restore Default IP

If you forgot the barcode reader's IP address, you can reset it to the default IP 192.168.1.108 using the following method:

Using the Barcode Reader

- Press and hold the trigger button on the side of the reader to power it on until the indicator light flashes red and green alternately.
- Continue holding until the red and green flashing stops.
The default IP has now been successfully restored.
Note: This operation will not reset the reader's configuration and data.



Setup Steps

The WebUI provides a workflow that guides you through a series of steps to help you set up the reader.

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Configuration (WebUI Setup)

COGNEX

4

Configuration (WebUI Setup)

CS190F SERIES INSTALL GUIDE

SECTION OVERVIEW

This section covers the WebUI setup and configuration.

IN THIS SECTION

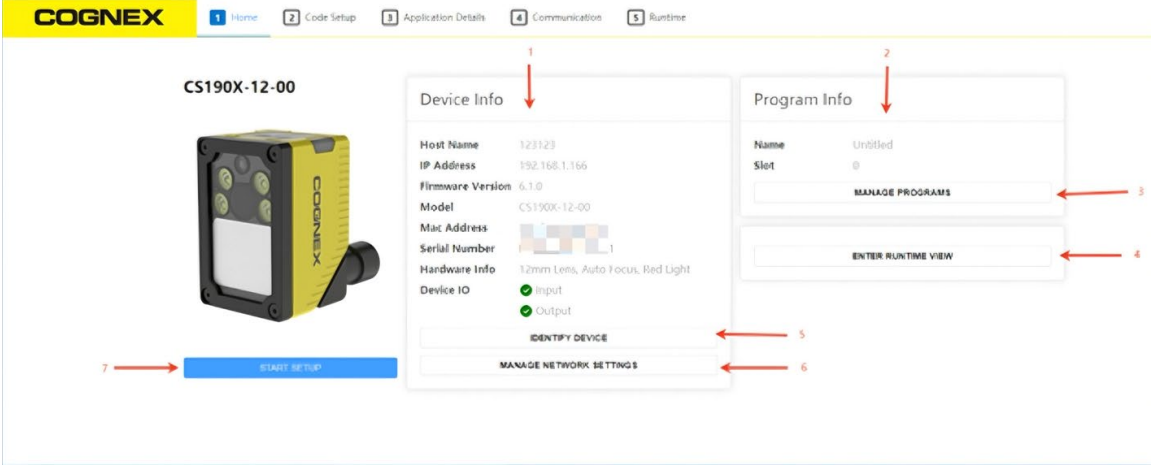
4.1	Home	37
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	Alignment	38
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Configuration (WebUI Setup)

4. Configuration (WebUI Setup)

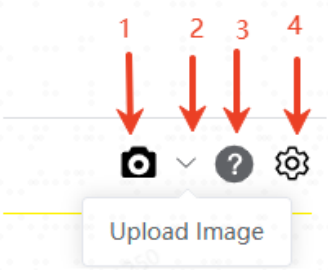
4.1 Home

The **Home** step provides an overview of the reader and serves as the central hub for reader management and configuration.

	
Number	Element
1	Displays information about the scanner.
2	Displays information about the program currently running on the reader.
3	Program Management button: Click to go to the Program Management window, where you can manage the programs on the scanner. For more information, see Program Management.
4	Run View button: Click to enter the Run Steps interface, where you can view in real time how the scanner reads barcodes.
5	Device Recognition Button: Pressing this button opens the "Device Recognition" window, and the scanner's indicator light will flash alternately. Click "Stop Recognition" in the "Device Recognition" window, and the scanner's indicator light will stop flashing alternately. Identifying device The Decoding Indicator LED lights on the reader are now flashing alternately in red and green. The LEDs continue flashing until you stop identifying. STOP IDENTIFYING
6	Click the Manage Network Settings button to open the network settings in the Connection Settings panel.
7	Click the "Start Setup" button to enter the code setup steps, where you can configure the initial parameters for the application.

Configuration (WebUI Setup)

The following options are available:

	
Number	Elements
1	Trigger button: Manually trigger the scanner. In continuous trigger mode, press the button to start triggering and release the button to stop triggering.
2	The drop-down menu provides additional image options: Click "Upload Image" to open the file browser and select the image to be uploaded for processing.
3	Help information is available, including on-page help and documentation: - Click Page Help to view detailed instructions for the current steps. - Click the Getting Started Guide to open an external website for additional help resources. - Click "Start Help Demo" to get an interactive overview of the steps provided.
4	Settings panel. Learn more.

4.2 Code Setup Workflow

The Code Setup steps allow you to configure, test, and view the reader's alignment and tuning to ensure the reader is optimally configured for the target code. Complete the reading configuration by following the steps.

Alignment

Alignment guidance is an optional assistive feature for complex part markings, designed to help find the optimal decoding speed and consistency. You can ignore the current alignment suggestions and proceed with code setup. The Alignment sub-step displays the reader's view in real time with the algorithm automatically adjusting image brightness.

Configuration (WebUI Setup)

You can manually start the reader by pressing the trigger button, or click **Start Live Mode** to automatically adjust lighting, focus, and exposure for optimal results.



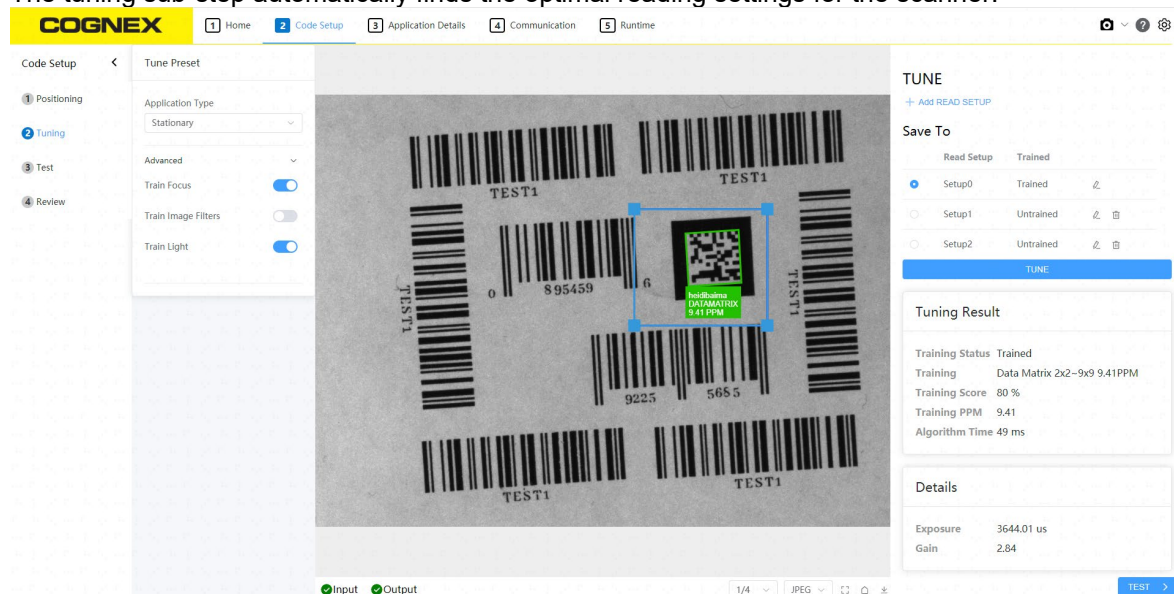
Click **Start Live View** to view a live image from the scanner and automatically optimize lighting, focus, and brightness.

Click **Edit Reader ROI**, position the area around the barcode, and then click **Confirm Position**. This action will change the scanner ROI for the selected read settings.

Click the scanner image and select a light source group to configure the lighting settings; the scanner will pause the current operation and automatically re-adjust for optimal lighting, focus, and brightness.

Tuning

The tuning sub-step automatically finds the optimal reading settings for the scanner.



Configuration (WebUI Setup)

Drag the blue rectangle to define the reader's region of interest (ROI). The reader will decode only symbols that appear within the ROI. Click the Tune button to begin tuning the reader.

The tuning process optimizes the following image acquisition parameters to achieve optimal decoding speed and reading performance:

- Exposure
- Gain
- Light Source
- Enable image filtering
- Focus
- Code Parameters

You can also configure tuning settings in the Tuning Presets section. Open the Advanced dropdown menu to access advanced parameters.

Select from the preset options to optimize the tuning process:

- Application Type: Select Static or Dynamic mode. If the application type is Dynamic, motion blur can be reduced by calculating the maximum exposure value.
- Advanced Options:
- Adjust Focus: If you need to adjust the focus during the calibration process, check the Calibrate Focus option
- Tuning Image Preprocessing: If the barcode reading environment is challenging, you can optimize reading performance by adjusting image preprocessing parameters to make barcode features more distinct, thereby improving read success rates. Preprocessing operations typically include median filtering (), anti-aliasing, and other methods that help eliminate noise, enhance image contrast, and make barcodes or QR codes easier to recognize
- Light Source Adjustment: Supports adjusting the scanner's illumination type.
- Whether to Train Code: Enable this option if the barcode symbols you are going to decode have a consistent symbology type and similar characteristics. Training the reader using a tuned symbology and its associated characteristics can reduce the time required to decode subsequent symbols.

You can select a target reading configuration in the **Save To** column to apply the debugging results to an existing reading configuration. You can also click **Add Reading Configuration** to create a new configuration for the current debugging scenario. When parts vary significantly, multiple reading configurations can be used.

When creating a new reading configuration, you can copy parameters from an existing reading configuration or adjust the parameters and save them to the reading configuration library.

Configuration (WebUI Setup)

Test Mode

The test step allows you to verify debugging results without configuring a real-time trigger.

COGNEX

1 Home2 Code Setup3 Application Details4 Communication5 Runtime

Code Setup

1 Positioning2 Tuning3 Test4 Review



InputOutput

1/4 JPEG

REVIEW

Test

STOP TEST MODE

Automatic Trigger Mode

TRIGGER

Status	Arrival Time	Trigger Index	Read Setup	# Codes	Result	Modul Size
⊖	1970-01-01 07:55:22	229		0	FA052...	
⊕	1970-01-01 07:55:22	230	Setup0	1	FA052...	9.36
⊖	1970-01-01 07:55:22	231		0	FA052...	
⊖	1970-01-01 07:55:22	226		0	FA052...	

Statistics

Full Result

Trigger Count 233 Min/Max Decode (ms) 50/51

Read Rate 29.61% Average Decode (ms) 50

RESET COUNTS

REVIEW

You can trigger the reader by manually clicking the button or switching to automatic mode. In automatic trigger mode, the reader will start at the fastest speed.

Test mode automatically uses all enabled read settings. You can select the read settings to use during runtime in the **Review** sub-step.

Use the results history and statistics to determine whether the current reader settings are suitable for your application.

Parameter View

The Parameter View sub-step allows you to view and modify tuning settings, select read settings to enable, and delete read settings.

The Parameter View sub-step provides an advanced overview of tuning parameters, such as symbol, gain, and exposure parameters for each read setup. You can also edit the current read setup and configure multi-code settings.

A read setup is a set of image acquisition and decoding configurations. The reader cycles through all enabled read setups until the trigger ends or the read results are complete. You can enable or disable read setups in the **Read Setups** panel.

Manage all configured read settings in the Parameter View sub-step. A checkmark next to a read setting indicates that it is currently enabled.

Read Setup

StartTrigger Order

✓

Setup0

Setup1

Setup2

Configuration (WebUI Setup)

Click the **Settings** button to the right of the read settings to rename, enable/disable, or delete read settings, and configure the starting group settings.

You can review and configure each read setting individually. The settings displayed in the Read Settings Details pane are based on the results of the debug sub-step.

The following information applies to each read setting. Click the pencil icon to modify specific settings:

- **Name:** The name of the currently selected read setting.
- **Training:** The code type and size trained during the tuning step. Click Cancel Training to reset the training code.
- **Symbol Types:** A list of enabled symbol types recognized by the reader. Modifying this setting will automatically reset the training code.
- **Reader ROI:** The region of interest (ROI) for the reader's operation.

Image Acquisition:

- **Exposure and gain** affect image brightness. Click Optimize to automatically determine the optimal values.
- **Focal Length** affects the distance at which the image is sharpest. Click Optimize to automatically determine the best value.
- **HDR Mode** determines whether the high dynamic range feature is enabled. This setting affects all reading parameters.
- **LED High Brightness Mode** prevents the barcode reader from flashing rapidly. When combined with the Enable option, the Always On setting will activate LED High Brightness Mode upon the initial trigger and remain active after the trigger ends.
- Configure the scanner's lighting by clicking on the scanner image and selecting a light source combination.

Configure the reading rules for multiple barcodes in a single frame via the Multi-Barcode Settings panel. Set the total number of barcodes to read and the number of barcodes per symbol type. When **Allow partial result output** is disabled, the reader will not return any results if the number of barcodes in the image is less than the set value (including images with a single barcode). When this option is enabled, the scanner will return a successful read result even if there are very few barcodes. The Sort Order list determines how the scanner arranges multiple results in its report:

- Use drag-and-drop to adjust the priority.
- Both the Position (Top to Bottom) and Position (Left to Right) options are based on the center of the symbol.

The image sorting feature applies to burst or continuous trigger modes, where symbols decoded in earlier images are sorted alongside those decoded in later images.

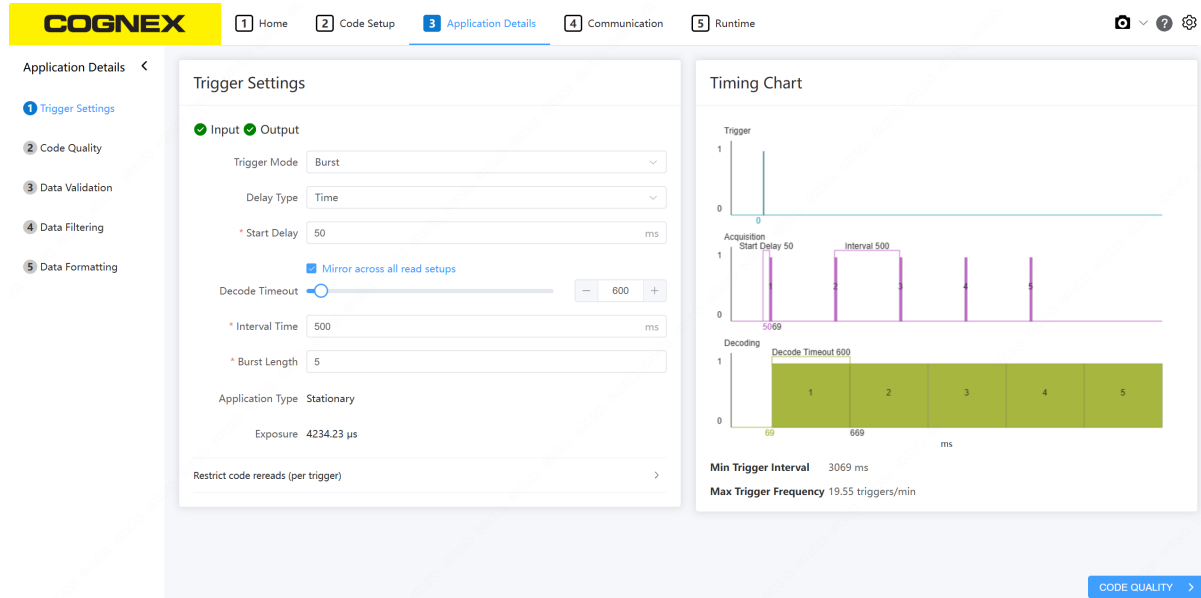
4.3 Application Configuration

The Application Details steps are used to configure application settings. Please configure the application according to the sub-steps in the left-hand menu.

Configuration (WebUI Setup)

Trigger Settings

The Trigger Settings sub-step is used to configure runtime processing and scanner timeout settings. This sub-step includes a timeline reflecting the trigger settings, providing feedback on the current application configuration.



The signal that triggers decoding can originate from outside the reader or be generated internally by the reader.

When the reader is configured to respond to an external trigger, any of the following events will trigger the reader to perform an action:

- Pressing a physical button on the reader.
- The control trigger sends data to the reader via a serial or Ethernet connection for management.
- Receiving a digital input signal via the I/O trigger line.
- Clicking the manual trigger button in the WebUI.

Trigger Types

The barcode reader supports the following trigger modes.

Note: There may be between the actual decoding timeout of the barcode reader and the set timeout deviation of no more than 35 ms.

Internal Auto-Trigger Mode

- **Automatic Interval Detection:** At set intervals, the scanner automatically scans and decodes barcodes within its field of view.
- **Duplicate Code Filtering:** When this feature is enabled, duplicate barcodes will be filtered and output according to the configuration.
- **Duplicate Suppression:** If the currently read barcode matches the decoded result from the previous frame, it will not be output. Output occurs only when the barcode content differs.

Configuration (WebUI Setup)

- Delayed Re-read (X milliseconds): Timing starts from the first recognition of the barcode; the barcode will not be re-read within the set X milliseconds.

External Single-Trigger Mode

- Single-shot Acquisition and Decoding: Captures a single frame of image and decodes the barcode upon receiving a trigger signal.
- Trigger Method: Supports triggering via IO signals, external commands, or industrial protocols.
- Trigger Delay: The delay time (X milliseconds) from receiving the trigger signal to starting acquisition can be set.
- Decoding timeout: The maximum decoding time can be set; the decoding process will automatically terminate upon timeout.

Burst Mode (External Trigger)

- Continuous Multiple Captures: Upon receiving a trigger signal, continuously captures and decodes multiple images according to the set number of times.
- Configurable Parameters:
- Trigger Delay: The delay time from signal reception to the start of acquisition.
- Decoding Timeout: The maximum allowed duration for a single decoding operation.
- Capture Interval: The time interval between the capture of two consecutive frames.
- Burst Length: The total number of images to be captured.

Continuous Mode (External Trigger)

- Continuous Acquisition and Decoding: Upon receiving an external trigger signal, the system begins continuous image acquisition and decoding until a stop signal is received or the successful decoding conditions are met.
- Duplicate Code Filtering: Supports the same duplicate barcode filtering functionality as the internal self-trigger mode.
- Configurable Parameters:
- Start Delay: The delay time between the trigger signal and the start of acquisition.
- End Delay: The duration (in X milliseconds) for which acquisition continues after a stop signal is received.
- Acquisition Interval: The time interval between consecutive image acquisitions.

External Trigger

- External triggering can be implemented in the following ways
- By sending a pulse signal via the I/O cable
- Trigger the reader by sending a specific string via the host computer.

Configuration (WebUI Setup)

- Triggered by the reader's TRIG button
- Triggering via the trigger button in the WebUI



Code Quality

The Code Quality sub-step verifies whether the symbols used comply with the quality criteria specified in the code quality standards supported by Cognex. When code quality standards are enabled, all scoring items appear on the page. Customers can select all or some of the items for scoring based on their needs to generate a comprehensive rating for the code. Disabled inspection items are not included in the calculation and will not be output to the results.

The screenshot shows the Cognex WebUI interface. The top navigation bar includes 'COGNEX' and tabs for 'Home', 'Code Setup', 'Application Details' (selected), 'Communication', and 'Runtime'. On the left, a sidebar lists 'Application Details' with sub-items: '1 Trigger Settings', '2 Code Quality' (selected), '3 Data Validation', '4 Data Filtering', and '5 Data Formatting'. The main content area is titled 'Code Quality' and contains a table for configuring metrics. The table has columns for 'Metrics Type', 'Minimum Pass Grade', and 'Sub-Item Output Delimiter'. Three rows are shown: 'ISO/IEC 15415 (2D Code)' with 'Enable', 'B', and '.'; 'ISO/IEC 15416 (1D Code)' with 'Disable', 'B', and '.'; and 'AIM-DPM / ISO/IEC TR29158 (2D Code)' with 'Disable', 'B', and '.'. Below the table, a section for 'ISO/IEC 15415 (2D Code)' lists various metrics with toggle switches: 'Symbol Contrast' (off), 'Modulation' (off), 'Reflectance Margin' (off), 'Fixed Pattern Damage' (on), 'Axial Nonuniformity' (on), 'Grad Nonuniformity' (on), 'Print Growth Horizontal' (on), 'Print Growth Vertical' (on), 'Unused Error Correction' (on), 'Format Information Damage' (on), and 'Version Information Damage' (on). A 'DATA VALIDATION' button is at the bottom right.

For detailed information on specific code quality standards and their metrics, please refer to the corresponding ISO standard documents at www.iso.org.

Use the **Minimum Passing Grade** toggle button to configure the acceptable code quality grade threshold.

Data Validation

Data Validation allows you to verify whether the data encoded in the symbol conforms to the expected format. The settings displayed on this page depend on the validation type you select.

Configuration (WebUI Setup)

The screenshot shows the COGNEX WebUI Setup Configuration page. The top navigation bar includes the COGNEX logo and tabs for Home, Code Setup, Application Details (selected), Communication, and Runtime. On the left, under 'Application Details', there are sub-tabs: Trigger Settings, Code Quality, Data Validation (selected), Data Filtering, and Data Formatting. The main content area is divided into two panels. The left panel, titled 'Code Type', has two buttons: '1D Code' (highlighted in blue) and '2D Code'. The right panel, titled 'Data Validation', contains the following settings: 'Validation Type' with radio buttons for 'None', 'Match String' (selected), and 'Regular Expression'; a 'Match String' text field with the value '123456780' and a character count '9 / 64'; a toggle switch for 'Increment/Decrement Numerical Component' which is turned on; a visual representation of a code string '12345678 0' with the '8' highlighted in blue; 'Start Position' set to 7, 'Length' set to 2, and 'Step Size' set to 2, each with up/down arrows; two checkboxes for 'Update on No Read' and 'Update on Validation Fail' which are both unchecked; 'Validation OK String' set to 'ValidateOK' with a character count '10 / 64'; and 'Validation NG String' set to 'ValidateNG' with a character count '10 / 64'. At the bottom right of the configuration area is a blue button labeled 'DATA FILTERING >'.

Select a **symbology type** and specify a **validation method** for it.

Use the **Match String** option to define an exact string to compare against the string encoded in the symbol. A **Pass** result is generated only when the symbol contains a string that exactly matches the specified value.

Use the **Regular Expression** option to enter a regular expression and verify whether the data string contains a specific character sequence or conforms to a desired pattern.

The **Validation Pass String** and **Validation Fail String** fields allow you to define the strings returned when validation succeeds or fails. These strings can be referenced in the **Data Formatting** sub-step using <ValidateStr> to determine whether the validation result is included in the output.

Data Filtering

Data Filtering allows you to filter out symbols that do not meet the specified requirements. The settings displayed on this page depend on the validation type you select.

Configuration (WebUI Setup)

The screenshot shows the COGNEX WebUI Configuration interface. The top navigation bar includes tabs for Home, Code Setup, Application Details (selected), Communication, and Runtime. The left sidebar lists the configuration steps: Trigger Settings, Code Quality, Data Validation, Data Filtering (selected), and Data Formatting. The main content area is divided into two panels: 'Code Type' and 'Data Filtering'. In the 'Code Type' panel, '1D Code' is selected. In the 'Data Filtering' panel, 'Filter Type' is set to 'Normal'. Below this, there are several filter options: 'Numeric Only', 'Length Filter', 'Contains', 'Starts With' (set to 'ABC'), 'Ends With', and 'Not Contains'. A 'DATA FORMATTING' button is located at the bottom right of the configuration area.

Select a **symbology type** and specify a **filter type** for it.

Use the **Standard** option to define filtering rules. A symbol is retained only if it contains a string that matches the specified value; otherwise, it is discarded.

Use the **Regular Expression** option to enter a regular expression and verify whether the data string contains a specific character sequence or matches a desired pattern.

Data Formatting

In the data formatting step, you can use metacharacters to construct custom output strings. You can also test the output results before proceeding to the next step.

The screenshot shows the COGNEX WebUI Configuration interface, specifically the 'Data Formatting' section. The top navigation bar and left sidebar are the same as in the previous screenshot. The main content area is divided into two panels: 'Formatting' and 'Example Output'. In the 'Formatting' panel, 'Full String' is set to 'heidibaima'. Below this, there are fields for 'Multicode Delimiter', 'Data Result' (set to '<CodeContent>'), 'Leading Characters', 'Tailing Characters', and 'No Read String'. The 'Example Output' panel shows the result 'heidibaima'. A 'COMMUNICATIONS' button is located at the bottom right of the configuration area.

Configuration (WebUI Setup)

The Data Formatting tab contains the following settings:

- **Multi-Code Delimiter:** Specifies the delimiter between code results when reading multiple codes. Keyboard input is supported.
- **Data Result:** Specifies how the result of a single barcode is output. Keyboard input is supported.
- **Prefix:** Specifies the prefix for the entire result data. Keyboard input is supported.
- **End Character:** Specifies the end character for the entire result data. Keyboard input is supported.
- **No-Read String:** Specifies the output format for result data when no barcode is read.

Settings that support keyboard input can be customized using metastrings in the keyboard. The meanings of metastrings supported by the keyboard are as follows:

metastring	Meaning
<SN>	Reader serial number
<Device Name>	Scanner device name
<IP Address>	Scanner IP address
<CodeStatus>	Code reading status; outputs "OK" for successful reading and "NG" for failure
<CodeContent>	Barcode content
<ValidateStr >	Outputs the string specified in the Data Validation sub-step based on the symbol's data validation result. If the Data Validation Type is set to None, the output is ValidateNone.
<CodeSubStr:startPos-Num>	Extracts and outputs a portion of the decoded barcode data. startPos: The starting position for extraction. If startPos is specified as a negative value, extraction begins from the end of the string and proceeds backward. Num: The number of characters to extract.
<TriggerId>	Trigger ID
<Timestamp>	Scan timestamp; output is the timestamp
<CodeNum>	Number of codes read
<STX>	Text start character
<ETX>	Text end-of-
<TAB>	Horizontal tab
<CR>	Carriage return

Configuration (WebUI Setup)

metastring	Meaning
<LF>	Line feed

You can check the sample output to see if the settings meet your requirements.

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Communication and Integration

COGNEX

5

Communication and Integration

CS190F SERIES INSTALL GUIDE

SECTION OVERVIEW

This section covers the Communications settings and Electrical specifications.

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Communication and Integration

5. Communication and Integration

5.1 Communication Overview

The Communication step is used to configure the reader's network, I/O, and file transfer settings. Complete the communication configuration by following the sub-steps in the left-hand menu.



Note: Any changes made in the Communication step will apply to all programs on the card reader.

The Communication step allows you to configure the reader's communication protocol.

The screenshot displays the COGNEX software interface for configuring communication settings. The top navigation bar includes tabs for Home, Code Setup, Application Details, Communication (selected), and Runtime. The left sidebar lists Communication, Inputs, Outputs, and File Transfer. The main content area is titled 'Communication' and features a warning banner: 'Any changes to this page will affect the settings for all programs on this device'. Below this, the 'Industrial Ethernet' protocol is selected in the left-hand menu. The central panel shows the 'Industrial Communication Protocol' settings with radio buttons for 'None' (selected), 'PROFINET', 'EtherNet/IP', 'Modbus TCP', 'MC UDP', and 'MC TCP'. An 'Apply' button is located at the bottom right of this panel. To the right, the 'Network Information' panel displays fields for Host Name (CS190-09DF36), IP Address (192.168.1.243), Subnet Mask (255.255.255.0), Default (192.168.1.243), and Gateway. A 'Network Management Settings' button is also present. An 'INPUTS' button is visible at the bottom right of the interface.

Industrial Ethernet

Industrial protocols support the exchange of I/O data with a PLC. Please configure the required industrial protocol:

Protocol	PLC
PROFINET	Siemens S7
EtherNet/IP	Rockwell ControlLogix
Mitsubishi MC	Mitsubishi Q Series and FX Series

To select a protocol, click **Apply**. To disable a protocol, select **None** and click **Restore**. This will revert the settings to their previous state.

For more information, refer to the Industrial Protocols Manual.

Communication and Integration

Telnet and Web Client

Any changes to this page will affect the settings for all programs on this device

Protocol	Telnet and Network Client Settings	Network Info
Industrial Ethernet		
Telnet & Network Client		
Serial Port		

* Telnet Port

Network Client ☐

* Host Address

* Port

Host Name CS190-0ED6CE

IP Address 192.168.1.108

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

Configure the Telnet port to enable Telnet communication.

The network client mode allows the reader to actively establish an Ethernet connection to other devices on the network. The basic operation of this connection is the same as a Telnet connection: the reader can transmit results to external devices.

To use the reader as a network client, enable the network client switch and provide a host port number.

Serial Settings

Any changes to this page will affect the settings for all programs on this device

Protocol	Serial Port Settings
Industrial Ethernet	
Telnet & Network Client	
Serial Port	

Baudrate

Data Bits

Stop Bits

Parity

Set this value to match the serial settings of the connected device:

- Baud Rate
- Data Bits
- Stop Bits

Communication and Integration

- Parity

Multi-Serial Port Daisy Chain Function

The CS190F also supports multi-serial daisy-chain functionality. The specific settings are shown in the figure below:

Baudrate: 115200

Data Bits: 8

Stop Bits: 1

Parity: None

Enable Multi-Port: ☒

Daisy Chain End: ☒

Station

Forward Filter: Length Filter

Length Range: 0 - 0

Reset Apply

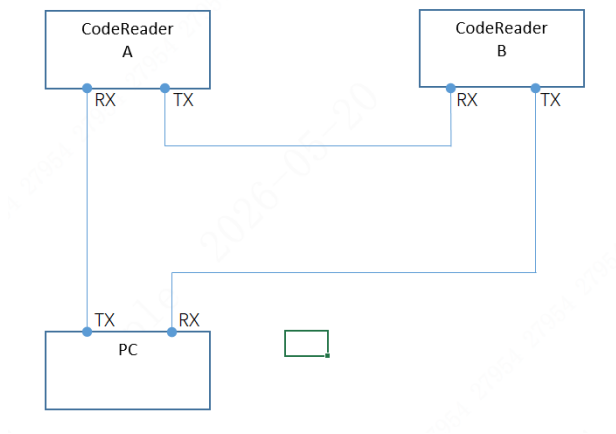
Setting Description:

Setting	Description
Enable Multi-Port	Enable Multi-Port Daisy Chain
Data Forwarding Filtering	Whether to enable data filtering. This is typically configured on the last device in the daisy chain to prevent erroneous data from being uploaded to the host computer. The available options are as follows: - Disabled: No filtering will be performed. If the trigger command sent by the source does not match any of the readers, the reader will return the original trigger command to the source. - Length Filtering: The valid data length must be set on the last reader in the chain. When the last reader receives data (including trigger commands), it evaluates the data. If the data length falls outside the specified range, the reader will not forward the data or execute any action. If the data length is within the specified range, the reader will execute the action (e.g., trigger) or forward the data to the terminal. - : Only data that matches the specified string pattern will be forwarded.

Communication and Integration

Setting	Description
Regular Expressions	Common syntax: . : Matches any character *: Matches the preceding character zero or more times + : Matches the preceding character one or more times \d: Matches a digit [abc]: Matches any character within the square brackets ^...\$: Matches the beginning and end of a line Example: ^\d{4}\$: Matches a string consisting of 4 digits ^[a-zA-Z]{3}\$: Matches a string consisting of 3 letters ^\d{2}:\d{2}:\d{2}\$: Matches a string in the HH:MM:SS format ^N\d{3}[a-zA-Z]{3}\$: Matches a serial number starting with "N" followed by 3 digits and 3 characters

Daisy Chain Cable Description:



Daisy-chain communication example:

Parameter Settings: Reader A

Trigger Source Settings

Trigger Source

Trigger Source	ExternalCmd
Trigger on command	AAA+ I:
Trigger off command	AAA- I:

Serial Port Settings Enable multiple serial ports; do not enable data forwarding filtering

Communication and Integration

Serial Port Settings

Baudrate	115200
Data Bits	8
Stop Bits	1
Parity	None
Enable Multi-Port	☒
Daisy Chain End	☒
Station	
Forward Filter	Disabled

Reset Apply

Parameter Settings: Reader B (Reader B has been confirmed as the last station)

Trigger Source Settings

Trigger Source

Trigger Source	ExternalCmd
Trigger on command	BBB+ ☐
Trigger off command	BBB- ☐

Serial Port Settings (Enable multiple serial ports and enable data forwarding filtering)

Serial Port Settings

Baudrate	115200
Data Bits	8
Stop Bits	1
Parity	None
Enable Multi-Port	☒
Daisy Chain End	☒
Station	
Forward Filter	Length Filter
Length Range	5 - 255

Reset Apply

Wire according to the wiring diagram.

Process Example

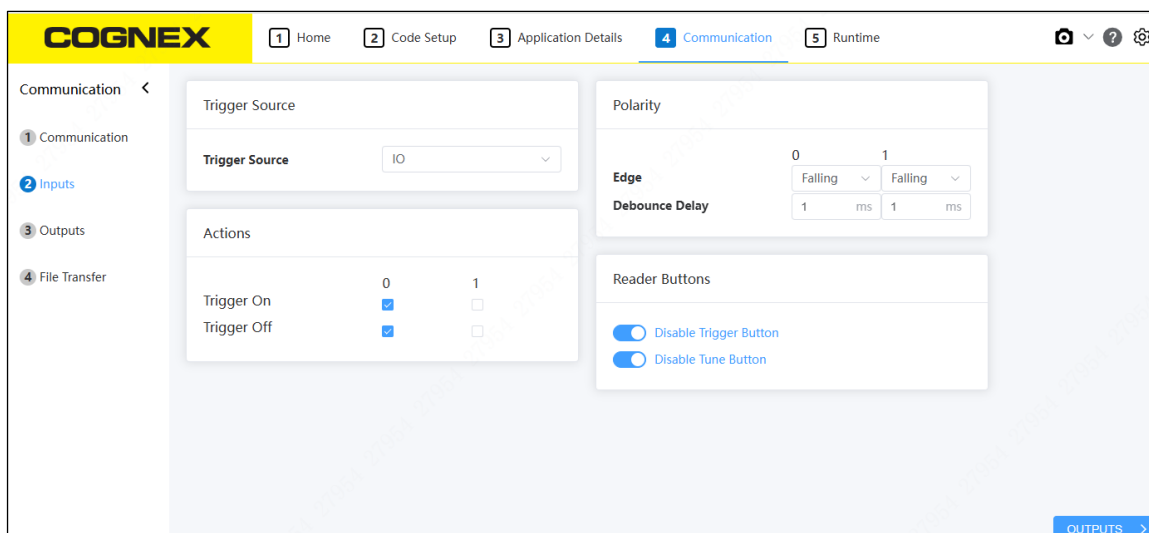
PC sends AAA+	AAA+ is the trigger command, which triggers Code Reader A to read the code
PC sends AAA-	AAA- is a trigger command that causes Reader A to stop reading
	Reader A sends the results to Reader B
	After receiving the data from A, Reader B determines whether to forward it based on data forwarding filters; if forwarding is required, it sends the data to the PC
The PC sends out BBB+	Reader A receives the data. Since A has not enabled data filtering, it forwards BBB+ to Reader B
	BBB+ is a trigger command that prompts Reader B to read the code

Communication and Integration

PC sends AAA+	AAA+ is the trigger command, which triggers Code Reader A to read the code
The PC sends BBB-	Reader A receives the data. Since A has not enabled data filtering, it forwards BBB- to Reader B
	BBB- is a trigger command that causes Reader B to stop reading
	Reader B sends the results to the PC
The PC sends CCC+	Reader A receives the data. Since A has not enabled data filtering, it forwards the CCC+ to Reader B
	After Reader B receives the data from A, since it is not a trigger command and CCC+ has been filtered out, it will not be forwarded to the PC

Input Configuration

The Input module allows you to configure the actions the reader takes when it receives an input signal.



Currently, only inputs In0 and In1 are supported for IO triggering, and the same IO line must be used for both triggering and disabling.

You can also configure the following signal detection options for each input line:

- The Polarity option is used to set the conditions for input signal changes that trigger image capture.
- The Debounce Delay text box is used to define the duration for which a trigger signal must be detected before it is recognized as valid. Shorter values compensate for electrostatic discharge (ESD) line noise, while longer values compensate for electromechanical relay noise. Please test different debounce delay values experimentally to determine the setting best suited for your production environment.

You can also configure the activation status of the reader buttons. Enabling the **Disable Trigger Button** or **Disable Tuning Button** switch prevents the reader from initiating read, train, or tuning operations when the physical buttons are pressed.

Communication and Integration

Output Configuration

The Output module allows you to configure the output signals generated by the reader in response to different events.

You can set output delay times and update the reader's buzzer, indicator lights, and I/O behavior in response to different events (such as valid reads or errors).

The screenshot displays the COGNEX software interface for the Communication tab. The navigation menu on the left lists: 1 Communication, 2 Inputs, 3 Outputs, and 4 File Transfer. The main content area is divided into four panels:

- Event:** A table with checkboxes for Good Read and Bad Read across three event types (0, 1, 2).
- Action:** A table with dropdown menus for Idle State and Pulse Width across three event types (0, 1, 2).
- Output Delay:** Settings for Delay Type (Time), Relative To (TriggerEnd), and Delay Time (1 ms).
- Reader Behavior:** A Beeper section with a toggle for "Enable Beeper on Good Read" and a slider for "Beeper Length".

A "FILE TRANSFER" button is located at the bottom right of the interface.

Valid Reads and Errors

If Data Validation is enabled, the reader generates a read event only when a barcode is successfully read and passes validation. When Good Read and No Read events are assigned to two separate outputs, the following logic applies:

- Good Read, Validation Passed: Generate a Good Read output.
- Good Read, Validation Failed: No output is generated, or a Validation Failed output is generated if that option is enabled.
- Bad Read: Generate a Bad Read output.

Data Validation Failed

When barcode data validation fails, the reader generates a Validation Failed event and outputs the error string configured in the Data Validation sub-step.

File Transfer

The File Transfer feature allows you to configure the transfer of images and results to an FTP server.

The File Transfer tab contains the following settings:

- Server Address: The address of the FTP server
- Server Port: The port number of the FTP server
- Username: The account used to access the FTP server
- Password: You can use the code reader to retrieve the FTP server's user password.

Communication and Integration

- Image Transfer Settings:
- Image Transfer: Select the conditions for image transfer
- File Path: The path for uploading images; keyboard input is supported.
- Filename: The name of the uploaded image; keyboard input is supported.
- File Type: Image format; supports BMP and JPEG.
- Image Dimensions: The dimensions of the image.
- Result Transmission Settings:
- Result Transfer: Enable or disable the result transfer feature
- File Path: The path for the uploaded result file; keyboard input is supported.
- File Name: The name of the uploaded result file; supports keyboard input.

Settings that support keyboard input can be configured with different content using metastrings in the keyboard. The meanings of the metastrings supported by the keyboard are as follows:

metastring	Meaning
<SN>	Reader serial number
<Device Name>	Reader device name
<IP Address>	Reader IP address
<CodeStatus>	Reading status
<CodeQuality>	Barcode quality
<YYYYMMDD>	Barcode read timestamp - Year, Month, Day
<HHmmss>	Code Read Timestamp - Hour, Minute, Second
<Year>	Timestamp - Year
<Month>	Timestamp read by the code - Month
<Day>	Timestamp when the code was read - Day
<Hour>	Timestamp of code read - Hour
<Minute>	Timestamp of code read - Minutes
<Seconds>	Code reads the timestamp - seconds

Communication and Integration

metastring	Meaning
<Millisec>	Timestamp when the code was read - milliseconds

Example:

Image Transfer

Image Transfer

File Path 

Example: <IPAddr>/<Year>

* File Name 

File Type

Image Size

Result Transfer

Configure the result transfer to the server

Result Transfer ☒

File Path 

Example: <IPAddr>/<Year>

* File Name 

The above settings will create a directory named after the barcode reader's IP address in the server's FTP root directory and upload files such as 20251216_200134_SF123456789.bmp and result.txt to that directory.



Note: The reader cannot guarantee that all images will be sent via FTP. When the reader is operating at a high frequency, it may not be able to schedule image transfers.

5.2 Electrical Interfaces

Power and Network Port Specifications

Parameters	Description
Reader power specifications	DC +16V to +26V, ripple <1%, powered via the 12-pin M12 connector on the reader

Communication and Integration

Parameters	Description
Data Output Interface	100 Mbps Ethernet
Input/Output Interfaces	1 RS232 serial port (non-isolated) 2 optocoupler-isolated inputs (LINE0–LINE1) 3 optocoupler-isolated output ports (LINE2–LINE4)

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Operation and Monitoring

COGNEX

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Operation and Monitoring

CS190F SERIES INSTALL GUIDE

SECTION OVERVIEW

This section covers the Runtime viewer and Settings overview.

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Operation and Monitoring

6. Operation and Monitoring

6.1 Runtime Operation

The runtime steps allow you to monitor read results and the decoder's performance in production.

The Runtime step provides a summary table displaying trigger counts, current read rates, and decoding time statistics.

The screenshot shows the COGNEX runtime interface. On the left, a camera view displays a barcode with a green overlay indicating a successful read: "heidaima DM 4.55 PPM". The interface includes a "PAUSED" button, a "COGNEX" logo, and a "PAUSE" button. On the right, a table displays read results:

Status	Arrival Time	Trigger Index	Read Setup	# Codes	Re:
✓	1970-01-01 08:02:24	2	Setup0	1	hei
✓	1970-01-01 08:02:23	1	Setup0	1	hei

Below the table, there are tabs for "Statistics" and "Full Result". At the bottom, it shows "Trigger Count 2" and "Min/Max Decode 21/21 (ms)".

The results table lists the codes that have been read. It can display the full result string or provide statistics on the reader's performance. Click **"Show Configuration"** to customize the data displayed for individual reads and overall statistics.

You can filter, pause, or clear incoming result data.

Click a result with an image icon to display the image on the screen.

The screen displays the scanner's latest image or the image captured during the selected read operation. You can drag the image to move it on the screen and use the mouse wheel to zoom.

Enable the **Result Status** option in the Display Configuration tab to view more detailed status information. The Status column displays different read results using the following icons:

Icon	Meaning
✓	Read successful
✗	Not read/Read failed
!	Read successful, but validation failed

Use the buttons at the bottom of the screen to configure the image display:

- Select the image resolution and format.

Operation and Monitoring

- Fit the image to the screen.
- Turn the tab on or off.

Download the latest full-resolution image.

6.2 Settings

Overview

On the Overview tab of the Settings page, you can configure the Web UI language and theme.

The supported languages are Chinese, English, and Korean. When the Web UI is opened for the first time, the language is automatically selected based on the browser's language settings.

The available themes are Dark and Light. By default, the Dark theme is used when the Web UI is opened for the first time.

Settings

Overview

Date and Time

Password Protection

Program Management

Network Setting

Firmware Upgrade

Factory Reset

Device Log

Field Diagnostics

Reboot Device

Host Name: CS190-0EE018

IP Address: 192.168.1.166

Language: ☐ 中文 ☒ English ☐ 한국어

Theme: ☐ DARK ☒ LIGHT

Codepage: UTF-8

Buffers num used for capture: - 100 +

Note: A higher number of Buffers will increase memory usage and may cause system slowdown. Please adjust this setting according to your computer's actual performance.

Help: ☒ Show walkthrough content on first visit

RESET SEEN WALKTROUGHs

Use the **Image Cache Node Count** setting to control the maximum number of data records retained on the **Runtime** page. Setting the node count too high may cause the computer to become sluggish or unresponsive due to increased memory usage. It is recommended to configure an appropriate node count based on your system performance and application requirements.

You can choose whether to display help steps on the first visit by enabling or disabling the **Show help steps on first visit** feature. After the first visit, the steps that have been displayed will no longer be shown again; you can display these steps again using the **Reset viewed help steps** feature.

Date and Time

On the **Date & Time** tab in **Settings**, you can configure the date and time settings for the scanner by clicking **Enable Date and Time Settings**.

Operation and Monitoring

Settings

Overview

Date and Time

Password Protection

Program Management

Network Setting

Firmware Upgrade

Factory Reset

Device Log

Field Diagnostics

Reboot Device

Configure device date and time settings

NTP Enabled ☒

Current Time 1971-01-01 01:22:13

Time Zone

* SNTP Server IP

* SNTP Server Port

* NTP synchronization interval second

If you select the SNTP service, you can configure the clock time source between servers. Please select a time zone and enter the server's IP address.

Program Management

In the Program Management tab under Settings, you can view program information and perform related operations. A blue checkmark will appear next to the currently active program.

A program is a set of device configuration settings that includes one or more reader settings, application details, and communication settings.

Overview

Date and Time

Modify Password

Program Management

Network Setting

Firmware Upgrade

Factory Reset

Device Log

Reboot Device

	Name	Action
0	Untitled	... More
1	⬆ PROGRAM	
2	⬆ PROGRAM	
3	⬆ PROGRAM	
4	⬆ PROGRAM	
5	⬆ PROGRAM	
6	⬆ PROGRAM	
7	⬆ PROGRAM	

Click **More** next to each program to perform the following actions:

- Enable
- Rename
- Reset
- Export

Operation and Monitoring

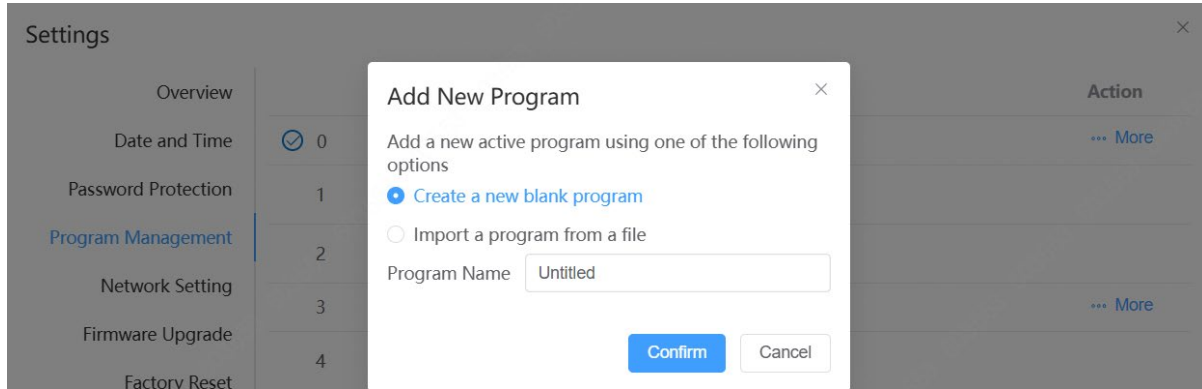
- Delete



Note: If the card reader is performing a "Locate" or "Tune" operation, the "Enable" operation will fail. Multiple programs can have the same name. Programs are listed in ascending order by slot number.

Add New Program

Click **Programs** and select the **Add New Program** option to create a new program:



The following options are available when adding a new program:

- Create a new blank program: The new program uses all default settings and has no program name. You can enter a custom name in the Program Name field.
- Import a program file: Select and import a previously exported program file. The new program will copy all settings (except for communication settings).
- Note: If the reader is currently performing a Positioning or Tuning| operation, the newly added process sequence cannot be automatically Enabled. Note: If the reader is currently performing a Positioning or Tuning| operation, the newly added process sequence cannot be automatically Enabled. Click Add New Program to create the program; once successfully added, the new program will start automatically.

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Maintenance and Troubleshooting

COGNEX

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Maintenance and
Troubleshooting

CS190F SERIES INSTALL GUIDE

SECTION OVERVIEW

This section covers cleaning and maintenance requirements and troubleshooting help.

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Maintenance and Troubleshooting

7. Maintenance and Troubleshooting

7.1 Cleaning and Maintenance

Housing Cleaning

When cleaning the reader housing, work in a closed environment whenever possible and avoid environments with high levels of dust or particulate matter. Be sure to follow these guidelines when cleaning:

- Ensure the scanner is powered off.
- Do not use any solvents or thinners that may damage the scanner housing; we recommend using plain water or other mild, neutral cleaning agents.
- It is recommended to use a soft, dry cleaning cloth (such as a cotton cloth) to prevent static electricity.
- Dip the cleaning cloth in the solution, wring it out, and gently wipe away any stains on the scanner housing. After cleaning, dry the surface with a dry cloth.
- Ensure the cleaning solvent has completely evaporated before turning the scanner back on.
- Do not use compressed air to accelerate solvent evaporation during cleaning, as this can easily contaminate optical components (especially the image sensor).

7.2 Change Password

On the **Change Password** tab in Settings, you can modify the reader's password. If you forget your password, please contact the manufacturer.

The screenshot shows a settings application with a sidebar on the left containing the following menu items: Overview, Date and Time, Password Protection (highlighted in blue), Program Management, Network Setting, Firmware Upgrade, Factory Reset, Device Log, Field Diagnostics, and Reboot Device. The main content area is titled 'Settings' and features a close button (X) in the top right corner. Under the 'Password Protection' section, there is a toggle switch for 'Enable Password Protection' which is currently turned on. Below this, the 'Set a password' section contains two input fields: '* New Password' with the placeholder text 'Please enter new password' and '* Confirm Password' with the placeholder text 'Please enter confirm password'. At the bottom of this section are two buttons: 'Reset' and 'Apply'.



Note: The default username/password for the reader is **admin/admin123**. After changing the password, please manage it carefully to prevent loss.

Maintenance and Troubleshooting

7.3 Network Settings

In the **Network Settings** tab under **Settings**, you can configure the reader's network settings. To save the network settings, click **Apply**.

Settings ×

Overview

Date and Time

Password Protection

Program Management

Network Setting

Firmware Upgrade

Factory Reset

Device Log

Field Diagnostics

Reboot Device

Configure device network settings

* Host Name CS190-0EE018 12 / 16

* IP Address 192.168.1.166

* Subnet Mask 255.255.255.0

* Default Gateway 192.168.1.1

Apply Network Settings

If you forget the scanner's IP address, you can restore it to the default IP address as follows: The default IP address is 192.168.1.108.

Restore the Default IP Address

- Press and hold the trigger button on the side of the scanner to turn it on until the indicator light flashes alternately red and green. Continue holding until the flashing stops; the default IP address has now been successfully restored. This operation will not reset the scanner's configuration parameters.



7.4 Firmware Update

In the Firmware Update tab of the settings, you can update the reader's firmware by uploading a firmware file from your computer, then clicking **Update Firmware**. If you find that some features are still unavailable after updating the firmware, please reset the reader once.

Maintenance and Troubleshooting

Settings

- Overview
- Date and Time
- Password Protection
- Program Management
- Network Setting
- Firmware Upgrade
- Factory Reset
- Device Log
- Field Diagnostics
- Reboot Device

Update Device Firmware

Build Date 2026-06-15
Firmware Version 6.1.1

Select Firmware File

7.5 Restore Factory Settings

On the Factory Reset tab in the settings, click **Factory Reset** to restore the scanner to its factory settings.

Settings

- Overview
- Date and Time
- Password Protection
- Program Management
- Network Setting
- Firmware Upgrade
- Factory Reset
- Device Log
- Field Diagnostics
- Reboot Device

Reset the device to factory settings.

Factory Reset



Note: The reset will change the readers IP address, and your connection to the reader will be interrupted after the reset is complete. The device's default IP address is 192.168.1.108. You can use the Cognex Scanner Discovery Tool to find the barcode reader's new IP address.

7.6 Device Log

You can view the barcode reader's device logs on the **Device Logs** tab in the settings.

Maintenance and Troubleshooting

Settings

Overview

Date and Time

Password Protection

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Reboot Device

🕒 1970-01-01 08:00:00 To 2026-06-22 19:30:23

Info × Warn × Error ×

Level	Time	Details
Info	1971-01-01 02:51:57	connect FTP server success. server:192.168.1.254 port:8021
Info	1971-01-01 02:50:48	connect FTP server success. server:192.168.1.254 port:8021
Error	1971-01-01 02:28:29	upload fail. file:FA05217DAK00003/heidibaima_002.jpg
Error	1971-01-01 02:28:29	upload fail. file:FA05217DAK00003/heidibaima_001.jpg
Info	1971-01-01 02:28:29	connect FTP server success. server:192.168.1.254 port:7021
		upload fail.

Total 9 10/page < 1 > Go to 1

Clear Log Export Log

The reader generates timestamped log events. The WebUI displays these events in the device log.

When you open the Device Logs tab, the barcode reader automatically fetches the device logs. Click Refresh to manually fetch updates, or click **Play** to start automatically receiving updates.

The device log contains the following message types:

- Information: General information about the scanner.
- Warnings: Non-critical issues.
- Error: Issues that require attention.

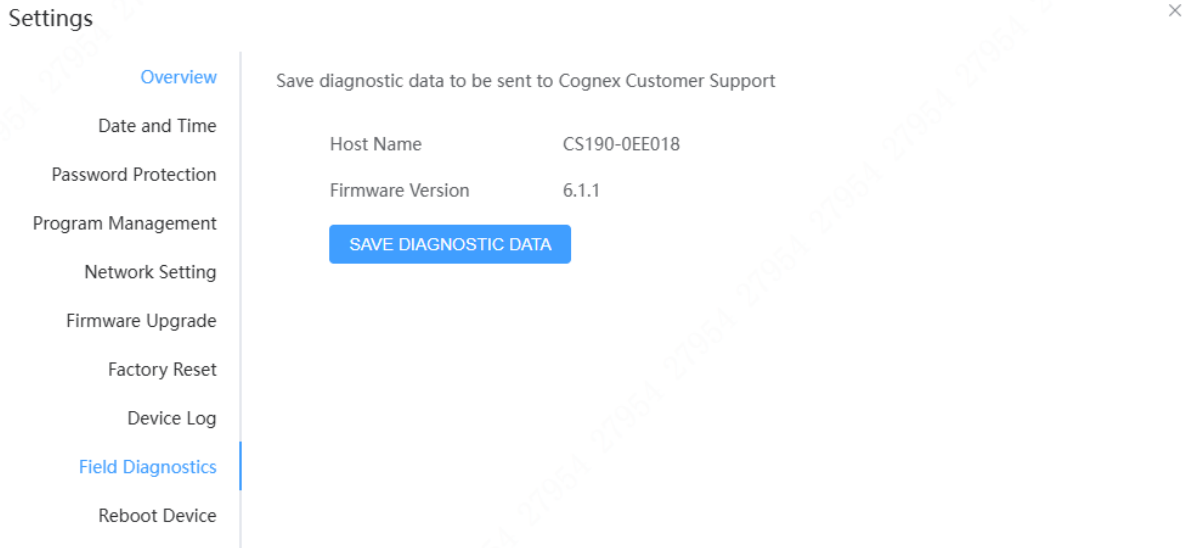
In the Device Log tab, you can perform the following actions:

- Download: Download the log file.
- Clear: Delete all entries from the log.

7.7 On-site Diagnostics

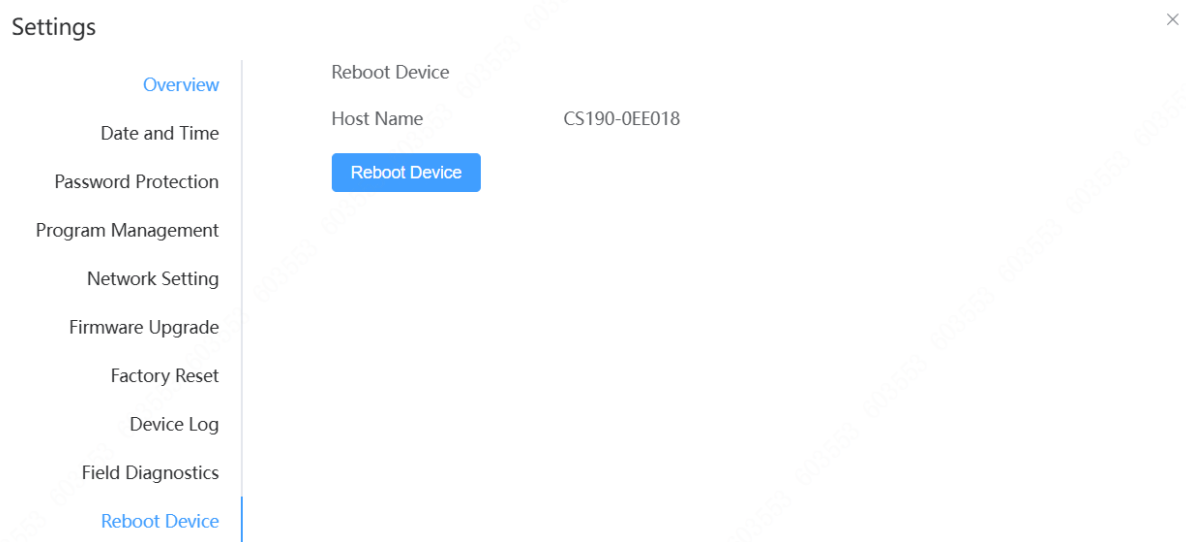
On the On-Site Diagnostics tab in Settings, you can save diagnostic data by clicking Save Diagnostic Data. If necessary, this data can be sent to Cognex Customer Support to assist with troubleshooting and technical support.

Maintenance and Troubleshooting



7.8 Restart

You can restart the device in the **Reboot Device** tab in **Settings**.



After clicking **Reboot Device**, a screen will confirm that the scanner has initiated the restart process. The restart process takes a few seconds to complete.

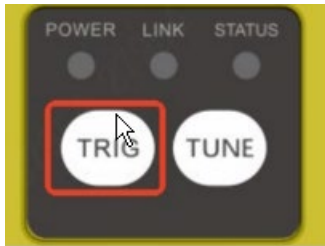
Maintenance and Troubleshooting

7.9 Troubleshooting

I forgot the IP address of the CS190F. How do I reset it?

Press and hold the trigger button on the side of the scanner to turn it on until the indicator light flashes red and green alternately. Continue holding until the flashing stops.

At this point, the default IP address has been successfully restored. The default IP address is 192.168.1.108.



I forgot the CS190F login password. How do I reset it?

If you have enabled password protection on your scanner but have forgotten the password, you can restore the scanner's default settings to disable password protection using the following method.

Power on the scanner while holding down the TRIG button on the side and the TUNE button simultaneously until the scanner beeps. Continue holding both buttons until the scanner reboots; the default configuration will then be successfully restored. By default, password protection is disabled.



The CS190F is connected to the computer, the hardware connection is normal, and it is detected by the Cognex Discovery Tool software, but I cannot connect via the web interface. What is the cause?

Check if the computer is currently connected to a wireless network. If there is a device on the wireless network with the same IP address as the reader, this issue may occur. To resolve this, disconnect from the wireless network and attempt to connect to the device. If the connection is successful, simply assign a new IP address.

The barcode reader always displays a failed to update message when updating the firmware. How should this be handled?

If the firmware update fails, please wait for the device to reboot, reconnect, enter the settings menu, reset the device to factory settings, and then try the firmware update again.

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