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**F150-3**

**Vision Sensor**

**Manual 1:  
SETUP MANUAL**

**OMRON**

# **F150-3**

# **Vision Sensor**

# **Setup Manual**

*Revised July 2006*

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- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.  
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The following conventions are used to indicate and classify precautions in this manual. Always heed the information provided with them. Failure to heed precautions can result in injury to people or damage to property.

 **Caution** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.

	Indicates the possibility of injury by high temperature under specific conditions.
---	--

## Visual Aids

The following headings will help you locate different types of information.

**Note** Indicates information of particular interest for efficient and convenient operation of the product.

→ Indicates pages where additional information can be found.

1. Indicates a procedure. The step numbers in the procedure correspond to the numbers in any related illustrations.

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# About this Manual:

This manual describes the hardware for the F150 Vision Sensor and how to install the components, and it includes the sections described below. This is one of two manuals used to operate the F150. Refer to the following table for the contents of each manual.

Manual	Contents	Cat. No.
<b>1: Setup Manual</b>	Provides information on system hardware and installation. <b>Be sure to read this manual first.</b>	Z141
<b>2: Expert Menu Operation Manual</b>	Describes operation of the F150 using the Expert Menu. The Expert Menu enables application of all F150 capabilities, including setting region images and criteria.	Z142

Please read the above manuals carefully and be sure you understand the information provided before attempting to install or operate the F150.

**Section 1 Before Installing** describes the precautions that must be taken when installing and operating the F150 Vision Sensor.

**Section 2 Product Introduction** provides an overview of F150 application and describes the wiring, Cameras, optical lenses, lighting modes, and light guides used in the F150 System. It also describes how to mount the Vision Mate Controller to DIN Track or to a flat surface.

**Section 3 Terminal Blocks** describes how to connect the terminal blocks.

**Section 4 RS-232C Connection** describes how to connect the RS-232C port.

**Section 5 CompoBus/D Connections** describes how to connect the F150-C10E-3-DRT Vision Sensor as a CompoBus/D Slave and provides information such as connector pin allocations, node number settings, and baud rate settings.

**Section 6 Troubleshooting** lists the errors that may occur, along with their probable causes and remedies.

**Section 7 Maintenance** provides information on maintenance and inspection.

**Section 8 Specifications** provides the specifications of the F150 components.



## WARNING

Failure to read and understand the information provided in this manual may result in personal injury or death, damage to the product, or product failure. Please read each section in its entirety and be sure you understand the information provided in the section and related sections before attempting any of the procedures or operations given.




# PRECAUTIONS

This section provides general precautions for using the F150 Vision Sensor.


**The information contained in this section is important for the safe and reliable application of the F150 Vision Sensor. You must read this section and understand the information contained before attempting to set up or operate a F150 Vision Sensor.**


1	Safety Precautions . . . . .	xii
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# 1 Safety Precautions


 **Caution** Do not touch fluorescent or halogen lights while the power is ON or immediately after the power is turned OFF. These lights generate heat and can cause burns.





 **Caution** Do not use the F150 in environments with flammable or explosive gases.

 **Caution** Install the F150 away from high-voltage equipment or motors to ensure safety during operation and maintenance.


 **Caution** Use crimp terminals for wiring. Do not connect bare stranded wires directly to terminals.

 **Caution** Cover the terminal blocks with the Terminal Block Protection Covers after wiring.


 **Caution** Use DC power supplies with safe extra low-voltage circuits that prevent occurrences of high voltages in the main F150 power supply and power supplies for the terminal blocks.

 **Caution** Use the power supply cables and crimp terminals of specified sizes.

 **Caution** Use at the power supply voltages specified in this manual.

 **Caution** Be sure to securely tighten the screws when mounting F150 components.

 **Caution** Do not dismantle, repair or modify any F150 components.

 **Caution** Dispose of F150 components as industrial waste.

---

## **2 General Precautions**

The user must operate the product according to the performance specifications described in the setup manual.

Before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems, machines, and equipment that may have a serious influence on lives and property if used improperly, consult your OMRON representative.

Make sure that the ratings and performance characteristics of the product are sufficient for the systems, machines, and equipment, and be sure to provide the systems, machines, and equipment with double safety mechanisms.





# SECTION 1

## Before Installing

This section describes the precautions that must be taken when installing and operating the F150 Vision Sensor.

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## 1-1 Installation Precautions

The F150 is highly reliable and resistant to most environmental factors. The following guidelines, however, must be followed to ensure reliability and optimum use of the F150.

### 1-1-1 F150 Components

Be sure to use the Camera, Camera Cable, and Console designed for the F150.

1. F150-S1A Camera
2. F150-VS Camera Cable
3. F150-KP Console

### 1-1-2 Installation Site

Do not install the F150 in locations subject to the following conditions:

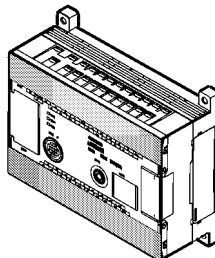
1. Ambient temperatures outside of 0 to 40°C for the F300-M09 Video Monitor (recommended monitor) or outside of 0 to 50°C for all other F150 components
2. Condensation due to rapid temperature fluctuations
3. Relative humidities outside 35% to 85%
4. Corrosive or flammable gases
5. Dust, salt, or iron particles
6. Direct vibration or shock
7. Direct sunlight
8. Water, oil, or chemical fumes or spray

### 1-1-3 Installation

#### Orientation of Controller

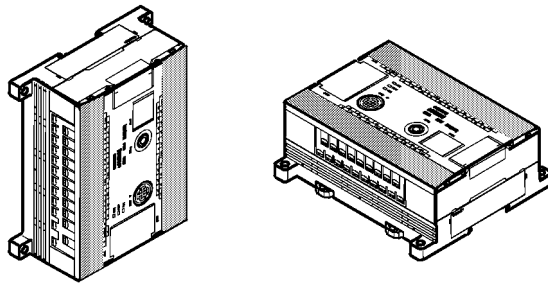
To improve heat dissipation, install the Controller in the following orientation only:

**CORRECT**



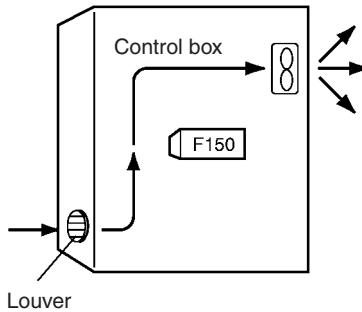
Do not install the Controller in the orientations shown in the following diagram.

**INCORRECT**



**Ambient Temperature**

1. Maintain a minimum clearance of 50 mm above and below F150 components to improve air circulation.
2. Do not install F150 components immediately above strong heat sources, such as heaters, transformers, or large-capacity resistors.
3. Do not let the ambient operating temperature exceed 50°C.
4. Provide a forced-air fan or air conditioning if the ambient temperature might exceed 50°C.

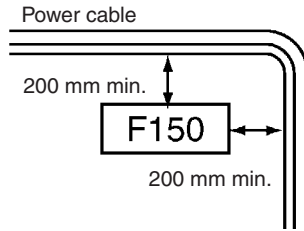


**Noise Resistance**

Use the following measures to help increase noise resistance.

1. Do not install F150 components in a cabinet containing high-voltage equipment.

2. Do not install the F150 components within 200 mm of power cables.



### F150-C10E-3-DRT (CompoBus/D Model)

1. Since the product is defined as built-in type, install the product inside the control panel.
2. Do not apply external forces exceeding 50 N to CompoBus/D connectors. When wiring communications cables, remove the connectors from the F150.
3. Before setting the DIP switch or connecting cables, turn OFF the Programmable Controller, F150, and the communications power supply.
4. Observe the following precautions when wiring communications cables.
  - a) Separate communications cables from power lines or high-tension lines.
  - b) Do not bend communications cables.
  - c) Do not pull on communications cables with excessive force.
  - d) Do not place heavy objects on communications cables.
  - e) Be sure to route communications cables within ducts.

## 1-1-4 Cables

Always turn OFF the power before connecting or disconnecting cables.

## 1-1-5 Camera

The Camera's case is connected to the 0V line in the internal circuits. Heed the following precautions to prevent noise interference.

1. Do not ground the Camera.
2. Do not remove the base attached to the Camera.

3. Do not remove the core attached to the F150-VS Camera Cable.

### **1-1-6 Video Monitor**

(When using the recommended F300-M09)

Heed the following precautions to prevent noise interference if the video monitor case is metallic, because it is connected to the 0V line in the internal circuits.

1. Do not ground the video monitor.
2. Do not ground the metallic part of the connector.
3. Secure the video monitor with plastic screws if it is being mounted to a metallic surface.

### **1-1-7 Prevention of Electrostatic Discharge**

To prevent damage from static electricity, use a wrist strap or another device for preventing electrostatic discharge when touching terminals or connector signal lines.

### **1-1-8 Turning OFF the Power**

Do not turn OFF the power while a message is being displayed indicating that processing is being performed. Data in memory will be destroyed, and the F150 may not operate correctly the next time it is started.

### **1-1-9 RESET Terminal**

Do not use RESET input immediately after power is turned ON. When using RESET input to synchronize execution timing, wait at least 1 s after turning ON the F150 power supply before turning ON the RESET terminal.

### **1-1-10 Power ON Sequence for Two-camera Unit (F150-A20)**

If the F150 and the Two-camera Unit need to be started sequentially, turn ON the Two-camera Unit first and then turn ON the F150. If they are turned ON in the reverse order, image data may not be read correctly.

## 1-2 Confirming Package Contents

Check the contents of the package as soon as you receive the F150. Contact the nearest OMRON representative if any of the following items are missing.

### F150-C10E-3

### F150-C15E-3

- |    |                              |   |
|----|------------------------------|---|
| 1. | F150 Vision Mate Controller  | 1 |
| 2. | Setup Manual (this manual)   | 1 |
| 3. | Expert Menu Operation Manual | 1 |

### F150-C10E-3-DRT

- |    |  |   |
|----|--|---|
| 1. | F150 Vision Mate Controller                                    | 1 |
| 2. | Setup Manual (this manual)                                     | 1 |
| 3. | Expert Menu Operation Manual                                   | 1 |
| 4. | CompoBus/D Connector (MSTB2.5/5-STF-5.08AU by Phoenix Contact) | 1 |

## 1-3 Product Availability

Some of the products listed may not be available in some countries. Please contact your nearest OMRON sales office by referring to the addresses provided at the back of this manual.

# SECTION 2

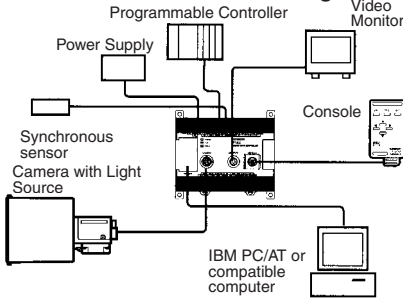
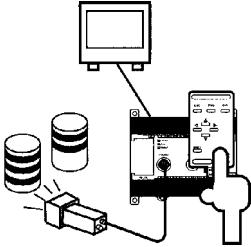
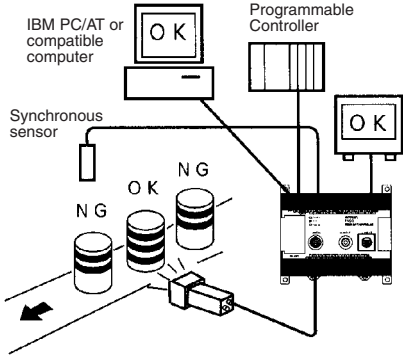
## Product Introduction

This section provides an overview of F150 application and describes the wiring, Cameras, optical lenses, lighting modes, and light guides used in the F150. It also describes how to mount the Vision Mate Controller to DIN Track or to a flat surface.

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# 2-1 Overview of F150 Application

The following table shows the basic steps that must be performed to use the F150.

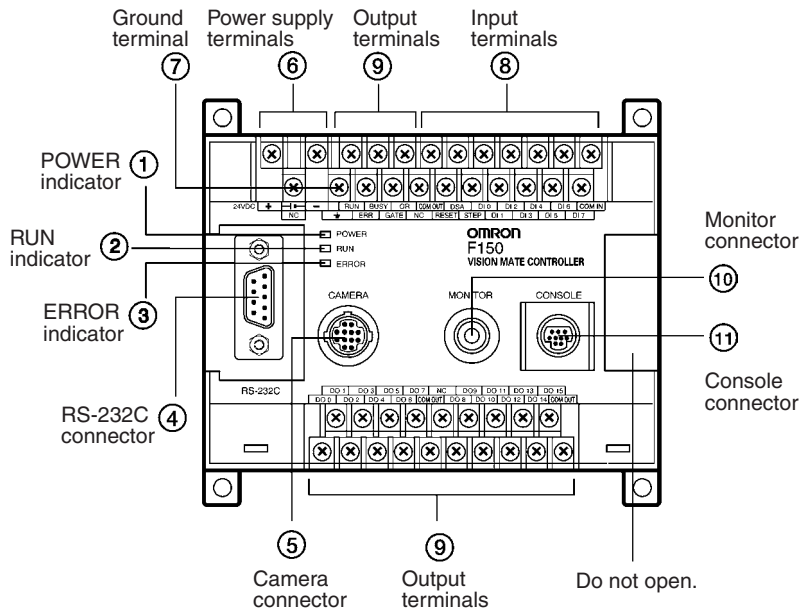
Step	Manual
<p><b>1: Unit Connections and Wiring</b></p>  <p>Programmable Controller</p> <p>Video Monitor</p> <p>Power Supply</p> <p>Console</p> <p>Synchronous sensor</p> <p>Camera with Light Source</p> <p>IBM PC/AT or compatible computer</p>	<p>Setup Manual</p>
<p><b>2: Setting Measurement Conditions</b></p> 	<p>Expert Menu Operation Manual</p>
<p><b>3: Confirming Operation, Measuring Objects, and Outputting Results</b></p>  <p>IBM PC/AT or compatible computer</p> <p>Programmable Controller</p> <p>Synchronous sensor</p> <p>NG</p> <p>OK</p> <p>NG</p> <p>OK</p>	



## 2-2 Component Names and Functions

The following diagram shows the terminals, connectors, and indicators on the F150-C10E-3 and F150-C15E-3 Vision Mate Controller.

### **F150-C10E-3** **F150-C15E-3**



- ① **POWER Indicator**  
Lit while power is ON.
- ② **RUN Indicator**  
Lit in RUN mode.
- ③ **ERROR Indicator**  
Lit when an error occurs.
- ④ **RS-232C Connector**  
Connects the F150 to a computer, Programmable Controller, or other external device.
- ⑤ **Camera Connector**  
Connects to the Camera.
- ⑥ **Power Supply Terminals**  
Wired to the power supply.
- ⑦ **Ground Terminal**  
Wired to the ground.
- ⑧ **Input Terminals**  
Wired to external devices, such as synchronous sensors or inputs from a Programmable Controller.
- ⑨ **Output Terminals**  
Wired to external devices, such as synchronous sensors or outputs to a Programmable Controller.
- ⑩ **Monitor Connector**  
Connects to the video monitor.
- ⑪ **Console Connector**  
Connects to the Console.

**F150-C10E3DRT**

The F150-C10E-3-DRT can operate as a CompoBus/D Slave.

