



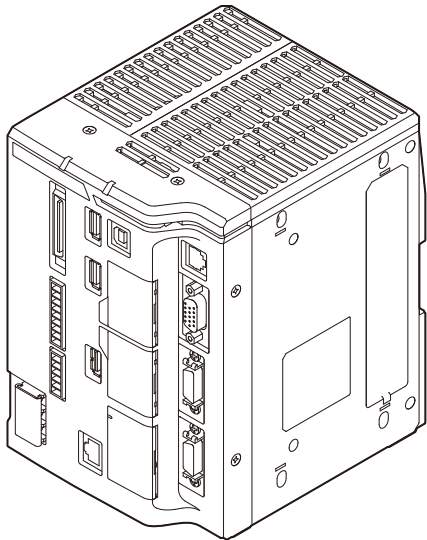
Intuitive Vision System

CV-X400/X300 Series

Controller Instruction Manual

Read this manual thoroughly before using the CV-X400/X300 Series.

Always keep this manual in a safe place for future reference.



Introduction

This manual describes the hardware information. Read this manual thoroughly to understand how the CV-X400/X300 Series works in order to maximize the performance of the system.

- This manual is for the CV-X400/X300 Series. All references however, unless otherwise noted, pertain to the CV-X472. For more details about the differences between the models, see "Main Specifications" (page 12) and the "CV-X Series User's Manual".
- Always keep this manual in a safe location for future reference.
- Please ensure that the manual is passed to the end user of the controller.

Symbols

The following warning symbols are used to ensure safety and to prevent human injury and/or damage to property when using the system.

| | |
|--|---|
| | Indicates a hazardous situation which, if not avoided, will result in death or serious injury. |
| | Indicates a hazardous situation which, if not avoided, could result in death or serious injury. |
| | Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. |
| | Indicates a situation which, if not avoided, could result in product damage as well as property damage. |
| | Indicates cautions and limitations that must be followed during operation. |
| | Indicates additional information on proper operation. |
| | Indicates tips for better understanding or useful information. |

Trademarks

- "SD Memory Card" is a registered trademark of the SD association.
- EtherCAT® is a patented technology and registered trademark licensed by Beckhoff Automation GmbH, Germany.
- Other company names and product names are registered trademarks or trademarks of their respective companies. The TM mark and ® mark are omitted in this manual.

Software information

This product incorporates the software files developed independently by or for Keyence Corporation, software files owned and licensed by a third party, and software files subject to certain open source license agreements.

- The open source software files are subject to the notices and additional terms and conditions. For information about such open source software files, please refer to the "License Information" in the "System Information" menu option under "Global".
- Such open source software files are provided on an "AS IS" basis to the maximum extent permitted by applicable law.
- If there is any discrepancy between the terms and conditions of the applicable open source license agreement and the "License", the terms and conditions of the applicable open source license agreement prevail with respect to the applicable open source software.
- You may obtain a copy of the source code corresponding to the binaries for GPL/LGPL-licensed file by sending a request to Keyence customer service at "soft-license@keyence.co.jp". There will be a charge to cover the costs of providing the source code.

Documentation for the installation and configuration methods of the controller, software, and CAD data can be downloaded from the following URL.

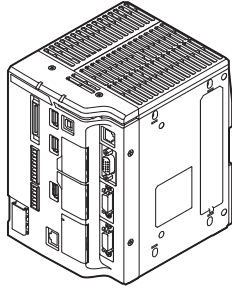
www.keyence.com/cvxus

Package Contents

The equipment and accessories listed below are included in the package when shipped. After opening the carton, check that you have received all of the equipment and accessories listed below.

Standard Package

- Controller Unit × 1
(CV-X402/X422/X452/X472/X482/
X480LJ/X492/X302/X322/X352)
- SD Card × 1
(OP-87133(512MB): CV-X402/X422/
X302/X322, CA-SD1G(1GB):
CV-X452/X472/X482/X480LJ/X352,
CV-SD4G(4GB): CV-X492
(pre-installed in SD1 slot))
- Dedicated mouse (OP-87506) × 1
- Controller instruction manual
(this manual)



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| NOTICE | <ul style="list-style-type: none"> • Keep this unit and cables away from high-tension cables and power lines. Otherwise, noise may cause malfunction or accidents. • Bundle cables with a camera cable protector (OP-88208) or with spiral tubing material. Direct bundling will concentrate the cable load on the bindings, which can result in cable damage or short circuit. • The controller and optional devices are precision components. To maintain performance do not subject them to vibration or shock. |
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Measures to be taken when an abnormality occurs

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| CAUTION | <p>In the following cases, turn the power OFF immediately. Using the unit in an abnormal condition may cause fire, electric shock, or product malfunction. Contact your local Keyence office for repair.</p> <ul style="list-style-type: none"> • If water or debris enters the system • If the system is dropped or the case is damaged • If smoke or a burning smell emits from the controller |
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Usage

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| NOTICE | <ul style="list-style-type: none"> • Before making any connections/disconnections, be sure to turn off the power of this unit and connected devices. Failure to do so may result in a malfunction of the controller or connected devices. • Do not turn the power off while you are programming. Otherwise, all or part of the program settings may be lost. • Do not block the ventilation holes. Otherwise, the inside temperature may rise and a malfunction may occur. • Do not allow an excessive amount of sunlight or bright indoor light to enter the camera for a long period of time. Doing so may cause damage to the image capture surface inside the camera. |
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Maintenance

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| NOTICE | <ul style="list-style-type: none"> • Do not clean with benzene, thinner, or alcohol. Doing so may cause discoloration or deformation of the unit. • If the unit has any dirt on it, wipe it off with a cloth moistened with a mild detergent, then wipe with a dry cloth. |
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Safety Precautions

General Precautions

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| DANGER | <ul style="list-style-type: none"> • Do not use this product for the purpose to protect a human body or a part of human body. • This product is not intended for use as explosion-proof product. Do not use this product in a hazardous location and/or potentially explosive atmosphere. • Do not use this product in an application that may cause death, serious injury or serious property damage due to a failure with this product should occur, such as nuclear power plants, on aircraft, trains, ships, or vehicles, used within medical equipment, playground equipment, roller coasters and other rides, etc. |
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| WARNING | <p>You must perform a sufficient risk assessment and confirm that risks have been reduced for the machine where this product is to be installed prior to installing this product. Provide appropriate protective failsafe measures on the machine independent from this product to ensure this machine operates safely in case a failure with this product should occur.</p> |
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| CAUTION | <p>You must verify that this product is operating correctly in terms of functionality and performance before the start and the operation of this product.</p> |
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| | |
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| NOTICE | <ul style="list-style-type: none"> • If the system is operated beyond its published specifications or if the system is modified, its functions and performance cannot be guaranteed. • When this product is used in combination with other instruments, functions and performance may be degraded, depending on the operating conditions and surrounding environment. • Do not subject the controller or connected devices to a sudden change in temperature. There is the risk of condensation occurring. |
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General cautions for the controller

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| WARNING | <ul style="list-style-type: none"> • Do not use with any power voltage other than 24 VDC. Doing so may cause fire, electric shock, or product malfunction. • Do not disassemble or modify the unit. Doing so may cause fire or electric shock. |
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Operating environment and conditions

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| CAUTION | <p>To use this product properly and safely, avoid installing it in the following locations. Doing so may cause fire, electric shock, or product malfunction.</p> <ul style="list-style-type: none"> • Locations that contain moisture or dust, or that are poorly ventilated. • Locations where the system is exposed to direct sunlight or temperature increases. • Locations where there are flammable or corrosive gases. • Locations where the unit may be directly subjected to vibration or impact. • Locations where water, oil or chemicals may splash onto the unit. • Locations where static electricity is present or electric discharge may occur. |
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Precautions on Regulations and Standards

CE and UKCA Marking

Keyence Corporation has confirmed that this product complies with the essential requirements of the applicable EU Directive(s) and UK regulations, based on the following specifications. Be sure to consider the following specifications when using this product in the Member States of European Union and United Kingdom.

EMC Directive (CE) and Electromagnetic Compatibility Regulations (UKCA)

- Applicable standard (BS)EN61326-1, Class A
- This product is intended to be used in an industrial electromagnetic environment.
- Use cables shorter than or equal to 30 m to connect this product and its external devices.
- Be sure to connect the ground terminal to a grounding.
- When connecting the LJ-V input unit CA-E100LJ/CA-E110LJ, for the head cables, attach the following ferrite core (furnished accessory CA-E100LJ/CA-E110LJ) at a position 200 mm or less from the controller's head connector.
Model: ZCAT2035-0930A-BK (manufactured by TDK)

Remarks: These specifications do not give any guarantee that the end-product with this product incorporated complies with the essential requirements of EMC Directive and Electromagnetic Compatibility Regulations. The manufacturer of the end-product is solely responsible for the compliance on the end-product itself according to EMC Directive and Electromagnetic Compatibility Regulations.

FCC Regulations

This product complies with the following regulations specified by the FCC.

- Applicable regulation FCC Part 15 Subpart B Class A
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- FCC CAUTION

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

KC mark (Republic of Korea)

사용자안내문

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

Safety precautions on laser product

The LJ-V7000 series head laser classes which are to be connected to the CA-E100LJ/E110LJ are classified as per the following.

| Models | LJ-V7020K/ LJ-V7020KB | LJ-V7020/ LJ-V7020B | LJ-V7060K/ LJ-V7060KB | LJ-V7060/ LJ-V7060B | LJ-V7080/ LJ-V7080B | LJ-V7200/ LJ-V7200B | LJ-V7300/ LJ-V7300B |
|--------------------------------|--------------------------|------------------------|--------------------------|------------------------|------------------------|------------------------|------------------------|
| Wavelength | 405nm | | | | | | |
| IEC60825-1, Output | 10mW | 10mW | 4.8mW | 10mW | 4.8mW | 4.8mW | 4.8mW |
| FDA(CDRH) Part 1040.10 * class | Laser Class 2M | Class 2M | Class 2 | Class 2M | Class 2 | Class 2 | Class 2 |

* The laser classification for FDA(CDRH) is implemented based on IEC60825-1 in accordance with the requirements of Laser Notice No. 56.

• Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. Follow the instructions mentioned in this manual. Otherwise, injury to the human body (eyes and skin) may result.

Precautions on Class 2M Laser Product

- Do not stare into the direct or specularly reflected beam.
- Do not direct the beam at other people or into areas where other people might be present.
- Be careful of the path of the laser beam. If there is a possibility that the operator may be exposed to the specular or diffuse reflections, block the beam by installing a protective enclosure.
- Install this product so that the path of the laser beam is not as the same height as that of human eye.
- Do not direct the beam into an area where telescopic optical instruments (for example, telescopes and binoculars) are likely to be used. Viewing the laser output with the telescopic optical instruments may pose an eye hazard.

Precautions on Class 2 Laser Product

- Do not stare into the direct or specularly reflected beam.
- Do not direct the beam at people or into areas where people might be present.
- Be careful of the path of the laser beam. If there is a possibility that the operator may be exposed to the specular or diffuse reflections, block the beam by installing a protective enclosure.
- Install this product so that the path of the laser beam is not as the same height as that of human eye.

• Do not disassemble this product. Laser emission from this product is not automatically stopped when it is disassembled.

Warning labels

The contents of warning indications and locations for attaching warning labels are described below.

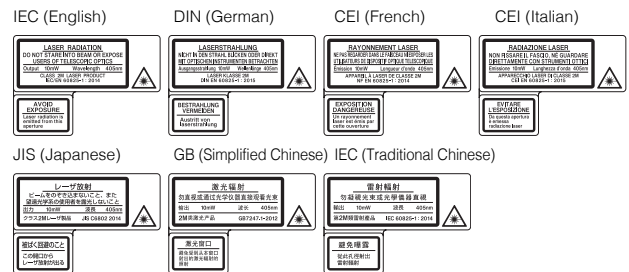
The IEC (English) warning labels are attached to the unit when shipped from the factory. Use the suitable warning label included in the package of this product according to the countries and/or regions where this product is used. In this case, it can be affixed on the IEC (English) warning label, which has already been affixed to this product.

• Warning label display content

LJ-V7060K/LJ-V7060KB/LJ-V7080/LJ-V7080B/LJ-V7200/LJ-V7200B/LJ-V7300/LJ-V7300B

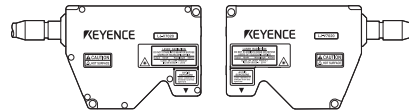


LJ-V7020/LJ-V7020B/LJ-V7020K/LJ-V7020KB/LJ-V7060/LJ-V7060B

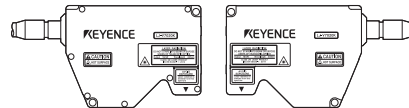


• Warning label attachment positions

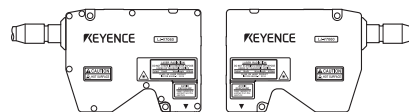
LJ-V7020/LJ-V7020B



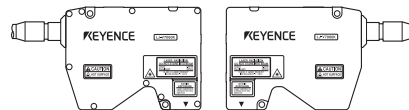
LJ-V7020K/LJ-V7020KB



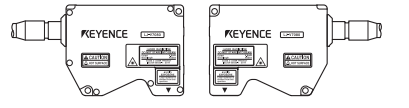
LJ-V7060/LJ-V7060B



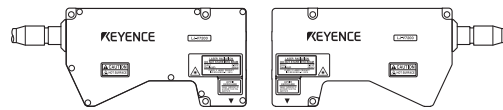
LJ-V7060K/LJ-V7060KB



LJ-V7080/LJ-V7080B



LJ-V7200/LJ-V7200B



LJ-V7300/LJ-V7300B

