

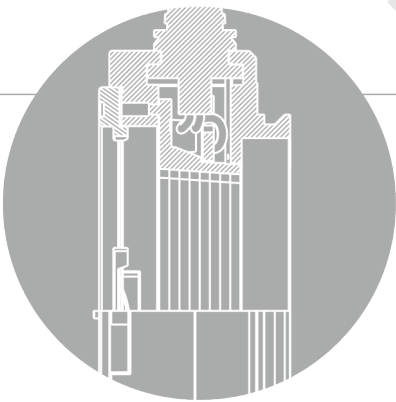
EF Lens Controller Module User Manual



English

EF Lens
Controller
Module

SVT 北京赛维特视觉
010-82817225



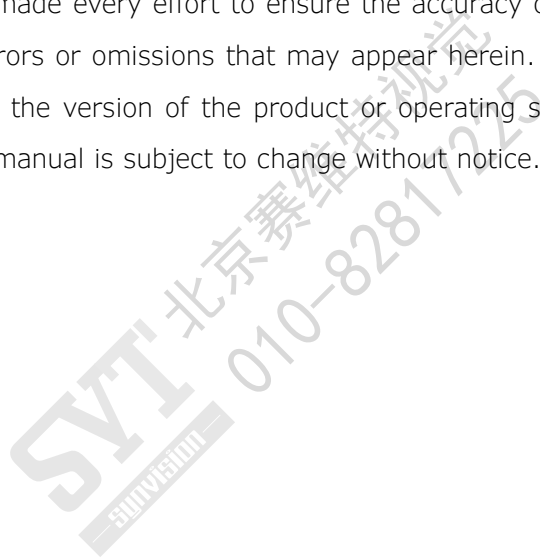
VIEWWORKS

Preface

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Although Viewworks made every effort to ensure the accuracy of this document, it assumes no responsibility for errors or omissions that may appear herein. The figures in this manual may differ depending on the version of the product or operating system, or the way how it runs. Information in this manual is subject to change without notice.



Before Using This Product

Thank you for choosing EF Lens Controller Module™.

- Make sure to read this manual before using the product.
- Make sure to check whatever a professional engineer has finished installation and configuration.
- Make sure to keep this manual at hand as a reference while using the product.
- This manual assumes that you have expertise in how to use an industrial camera.

The Series

This manual is intended for users of the following products:

- EF Lens Controller Module™

About This Manual

This manual is intended for users of EF Lens Controller Module™ for EF-standard cameras and lenses. About how to make it compatible, consultation with your seller is recommended before using the product if your lens and camera are non-EF. It is recommended to refer to the camera's User Manual of yours, with this manual.

Convention in This Manual

For better understanding, the following conventions are used throughout the manual.

Names and Fonts

The names and fonts of user interfaces are used as follows:

- The menu and icon names in this manual are used as displayed in the product.
- The menu and icon names are marked in **this font**.
- Button or keyboard key names are marked in **this font**.

Warning, Caution, and Note

This manual shows warnings, cautions, and notes with the following figures:

**Warning!**

This indicates that you need to follow this message for your safety and to prevent the product from damage.

**Caution!**

This indicates that you need to follow this message to prevent data from being lost or corrupted.

**Note:**

This indicates that this message provides additional information.

Definition of Terms

Term	Definition
Preface	The introductory part preceding the Table of Contents in this manual
Product	Indicates EF Lens Controller Module™ produced by Vieworks
EF Adapter Interface	Indicates the Windows GUI(Graphic User Interface) provided together with the product from Vieworks, which controls lens focus remotely from a PC via the product

This document has the revision history as follows:

Version	Date	Description
1.0	2021-11-19	Initial Release

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Chapter 1. Precautions

General



- Do not drop, disassemble, repair or alter the device. Doing so may damage the product and cause an electric shock.
- Do not let children touch the product without supervision.
- Stop using the product and contact the nearest dealer or manufacturer for technical assistance if liquid such as water, drinks or chemicals gets into the product.
- Do not touch the product with wet hands. Doing so may cause an electric shock.

Installation and Maintenance



- Do not install in dusty or dirty areas - or near an air conditioner or heater to reduce the risk of damage to the product.
- Avoid installing and operating in an extreme environment where vibration, heat, humidity, dust, strong magnetic fields, explosive/corrosive mists or gases are present.
- Do not apply excessive vibration and shock to the product. This may damage the product.
- Avoid direct exposure to a high intensity light source. This may damage the product.
- Do not use solvents or thinners to clean the surface of the product. This may damage the product.

Power Supply



- Applying incorrect power can damage the product. If the voltage applied to the product is greater or less than the product's nominal voltage, the product may be damaged or operate erratically. Please refer to **5.2 Specifications** for the product's nominal voltage.
※ Vieworks Co., Ltd. does NOT provide power supplies with the devices.
- Make sure the camera's power is turned off before connecting the power cord to the product. Otherwise, damage to the camera or product may result.

Chapter 2. Warranty

Do not open the housing of the camera. The warranty becomes void if the housing is opened.
For information about the warranty, please contact your local dealer or factory representative.

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Chapter 3. Compliance & Certifications

3.1 FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expenses.

3.2 CE : DoC

EMC Directive 2014/30/EU

EN 55032:2012 (Class A), EN 55024:2010

Class A

3.3 KC

KCC Statement

Type	Description
Class A (Broadcasting Communication Device for Office Use)	This device obtained EMC registration for office use (Class A), and may be used in places other than home. Sellers and/or users need to take note of this.

Chapter 4. Package Components

Package Components



EF Lens Controller Module

Chapter 5. Product Specifications

5.1 Overview

With improvement of technology and rapid increase in demand of advanced products, corporations are rushing to adopt machine vision systems. An industrial camera is a beginning and a key component of such machine vision system. It has been proved by accelerated increase of production efficiency in the production lines for the cutting-edge industry, especially, such as flat panel display, PCB, automotive, and many other areas.

From such trends, the camera's functionality to acquire images quicker and more accurate is becoming key to maximize production efficiency from the machine vision system. So the industry had researched for the way to acquire clear images in a time-efficient manner by focusing a lens mounted to a camera quicker and easier, finally it concludes that adoption of a lens adapter is the solution. A lens adapter allows a user to adjust focus of a lens very quick and easy for acquiring clear images from cameras, therefore, efficiency gets improved marvelously. EF Lens Controller Module developed by Vieworks is an EF-lens adapter specialized in an industrial camera, by this product, a user enables to control clarity of a lens simply just by entering command or controlling UI on displays.

Main features

- Easy remote control of an EF lens via electrical signals
- All parts in one compact body
- Rigid and reliable aluminum construction without plastic parts
- Wide range of supported cameras with various mounts
- Easy-to-use interface functioning on PC regardless of OS types

5.2 Specifications

Technical specifications for EF Lens Controller Module are as follows.

Item	Description
Power Supply	DC 12V, 500 mA (6 W)
Temperature	Operating: -20 ~ 70 °C Storage: -30 ~ 80 °C
Interface	RS-232 serial port (Default communication speed: 115200 baud, 8 data, no parity 1 stop) RS-232 Tx typical +-5V 6, RS-232 Rx min swing 0.8V/2.4V, max swing -25V/+25V
Compatible Lens	Cameras with EF Lenses
Lens Input	1
Lens Mount	Vieworks V-mount (Available to customize with M42, T, M58)
Compliance	KC, FCC, CE
Software	Windows GUI

Table 5-1 Specifications of EF Lens Controller Module

5.3 Mechanical Specification

The product dimensions in millimeters are shown in the following figure:

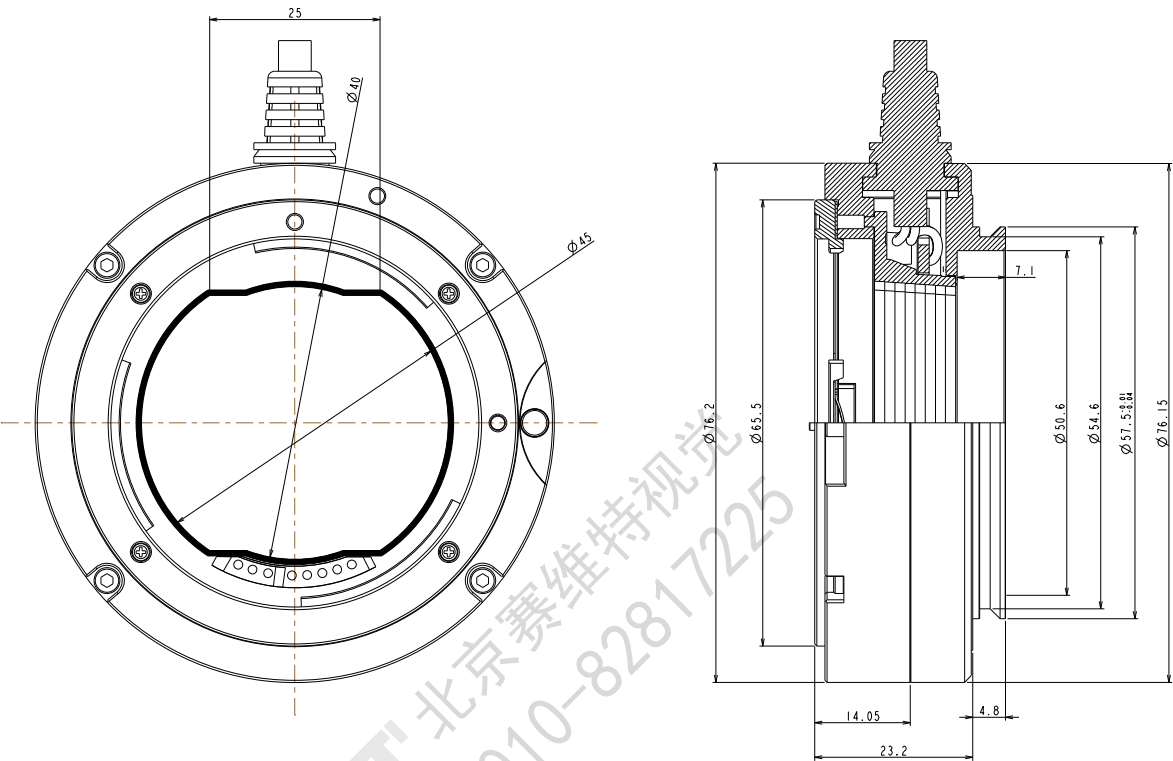


Figure 5-1 Product mechanical dimension

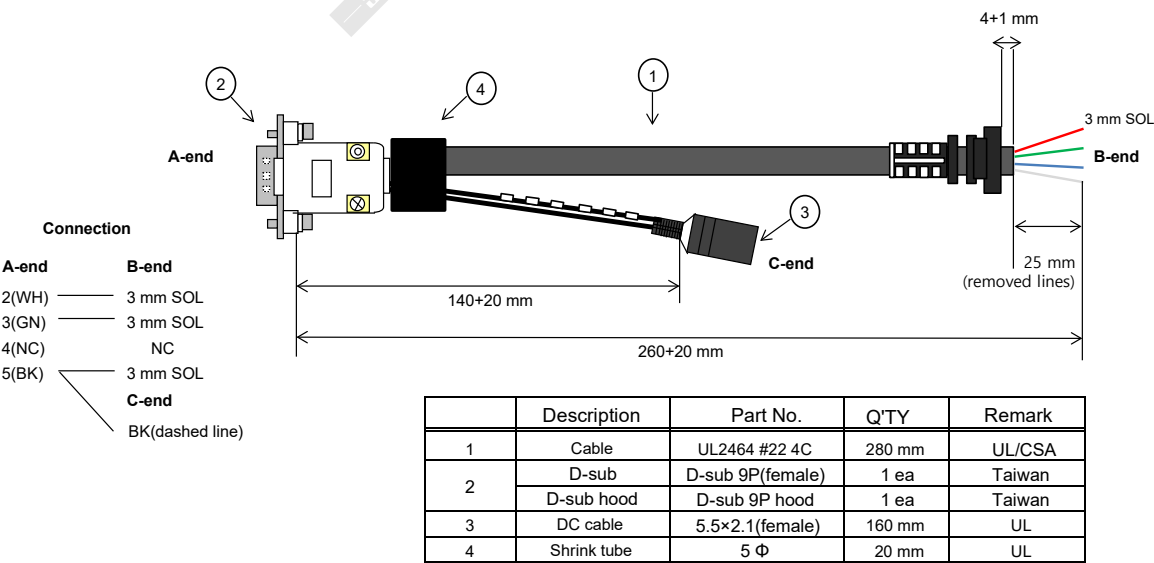


Figure 5-2 Dimension of the cable of the product

Chapter 6. Installation on a Camera and a Lens

This chapter describes how to assemble the product with a camera and a lens, and describes what to prepare before using function to focus a lens remotely in the following order:

1. How to assemble the product (6.1)
2. How to check connection status between the product and a lens (6.2)
3. How to check the remote control (6.3)

Although this product is specialized for the EF-standard devices, there are various ways to make it compatible with other standard devices, if needed.



About checking standards of a camera and a lens:

This product is an adapter for EF-standard devices. Make sure to check if your lens and camera are specialized in the EF-standard before installing the product. If they are different from EF, it is recommended to consult your seller about how to make it completable according to the specification of your camera and lens.

6.1 How to Assemble the Product

It is recommended to check first if your camera and lens are for EF-standard or not, because the product is designed for use with a camera and a lens basically. The following figure describes the complete product after finishing assembling, for your easy understand to use:



Figure 6-1 Positioning of an EF-mount camera, the product, and an EF lens

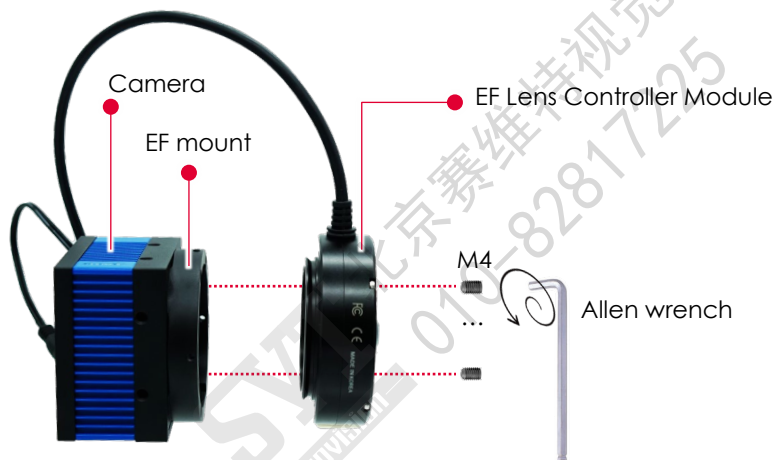
This section describes how to assemble the product with a lens and a camera, and preliminary work to use the product, in the following order:

1. Installing the product on a camera(the ① part in Figure 6-1 above)
2. Installing a lens on the product(the ② part in Figure 6-1 above)
3. Connecting a D-sub cable of the product
4. Supplying power to the product and camera

6.1.1 Installing the Product on a Camera

To install the product and a camera, follow the steps below:

1. Prepare necessary tools to connect the product to a camera before installation. The tools to be ready for the connection are as follows:
 - EF-mount camera, 4 pcs of M3 screws, an Allen wrench
2. After checking the tools above, make sure that the power supply is not connected to the product and the camera, and your computer is turned off.
3. Fix the product to the camera with the 4 screws as the following figure below. Tighten the mounting screws to fix the product to the camera with the suitable size of the Allen wrench:



If the parts to assemble doesn't fit in each other:

If your work to assemble the product and the camera above is not easy because of different sizes or standards to be fit in each other, it is recommended not to assemble it forcibly and recommended to consult to your seller.

4. Make sure that the product and the camera are tighten well as follows:



6.1.2 Installing a Lens on the Product

After finishing assembling the product and the camera, do the following, to install a lens on the product:

1. Make sure that the power supply is not connected to the product and the camera, and your computer is turned off.
2. Equip your EF lens with another side of the product. In the case of an EF lens, it is easy to fix without any other tool. If your lens is non-EF, consult to your seller to find out the way to make it compatible.
3. The following figure describes the complete product after finishing the assembling:



6.1.3 Connecting a D-sub Cable of the Product

Once assembling a camera, the product, and a lens is finished, the D-sub cable and the power cable on the product need to be connected as the next step. The D-sub cable has been mounted on the product as follows, it needs to be connected to either a camera or a PC depending on your status.



Figure 6-2 D-sub cable of the product

How to connect the D-sub cable may differ depending on the way to control the product. For more information on the interfaces below, refer to 6.3 in this manual. This chapter describes two ways of how to connect the D-sub cable of the product in the following order:

- Control via the Windows GUI of the product or CLI:
 - The D-sub cable of the product needs to be connected to a PC. The suitable converter is necessary unless the PC has a D-sub port.
- Control via an application to control a camera:
 - The D-sub cable needs to be connected to the control receptacle on the camera as the following figure describes if the camera is VX-25MG. The D-sub to Hirose 6-pin cable is necessary to convert.

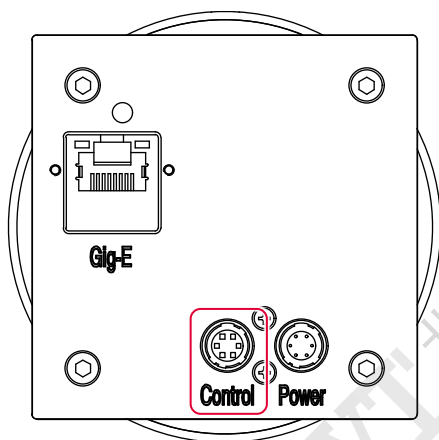


Figure 6-3 Control receptacle in camera's back panel



About a control receptacle in camera's back panel:

For more information on this, refer to the manual of the camera.

6.1.4 Supplying Power to the Product and Camera

Once connecting the D-sub cable to either the PC or the camera depending on your need after assembling the camera, the product, the lens, do the following to supply electric power to the product:

1. Plug the power jack on the product to supply electrical power. To do this, the 12V 1A power adapter with DC connector jack(5.5 mm × 2.1-2.5 mm) is necessary. Need to connect the product to this kind of a power adapter.



About a power supply of the product:

Make sure to supply power to the product in advance of doing it to the camera, because native initialization occurs automatically inside as soon as supplying power to the product.

2. Make sure that the product is connected to the D-sub port and the power adapter well, and connect the PC to use and the camera correctly.



About how to connect a camera to a PC:

For more information on this, refer to the manual of the camera.

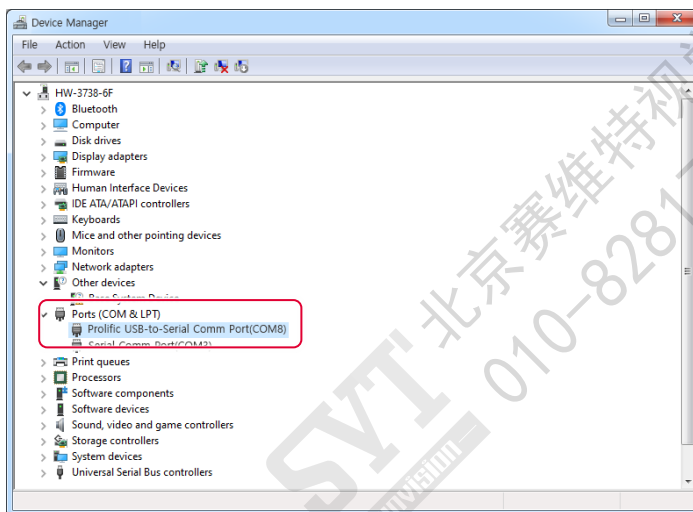
3. Supply power to a camera.
4. Make sure that all the current cables are connected correctly.

After doing above, refer to the description of the next section to make sure that the product and the lens are operated well.

6.2 How to Check Connection Status between the Product and a Lens

Following the previous section which described how to assemble a camera, the product, and a lens, to connect to a PC and to supply power, continually, this section describes how to operate EF Adapter Interface, the application specialized in the product, to check connection status of the communication for remote control, in the following order:

Open the device manager on Windows and make sure that the port information to make sure that the system recognizes the product and the lens well. If it works well, the device manager shows the information on the port as the follows:



In the case that the connection information does not appear:

Unlike the figure above, information on the port does not appear if a PC is connected to the D-sub cable, the communication port, of the product directly. It appears only when connecting the product to the PC with the D-sub to USB converter cable. The port information does not appear when connecting it directly via the control receptacle of a camera on the display above, either. To control the product remotely via either EF Adapter Interface provided by the manufacturer or a CLI, re-try to connect correctly to the PC by referring to the description of the previous section if the port information does not appear on the display above. In the case of using via a camera's control application, no need to do something although the information is not shown on the display, therefore, do the step described from the next section.

6.3 How to Check the Remote Control

After assembling the product and connection to the system, the system needs to be checked if it works well for remote control. This section describes how to check preliminarily for remote control via 3 of the following interfaces:

- EF Adapter Interface: An Windows GUI that is also an application specialized for the product and provided by the manufacturer
- CLI(Command Line Interface): An interface that functions in the way of inputting and executing a command
- Camera Control Application: a software for remote control of a camera, which is embedded to the camera

You can choose one of three interfaces above to do what you need. This section describes all the ways of three in order of the sequence above. Choose corresponding section to what you need and refer to it in consideration of your situation.



About difference between the interfaces depending the communication control ways:

To use an interface, the product's communication cable, the D-sub cable, should be connected to the communication port on either the PC or the camera correctly. To control lenses remotely, both EF Adapter Interface and a CLI need to be connected to the PC unlike a camera control application should be connected to a camera.

About remote control of the product via a camera control application:

This function is supported only for the cameras in Viewworks VX series. In the case of other cameras except for those, the user is able to control the product remotely by using either EF Adapter Interface or a CLI, on the PC.

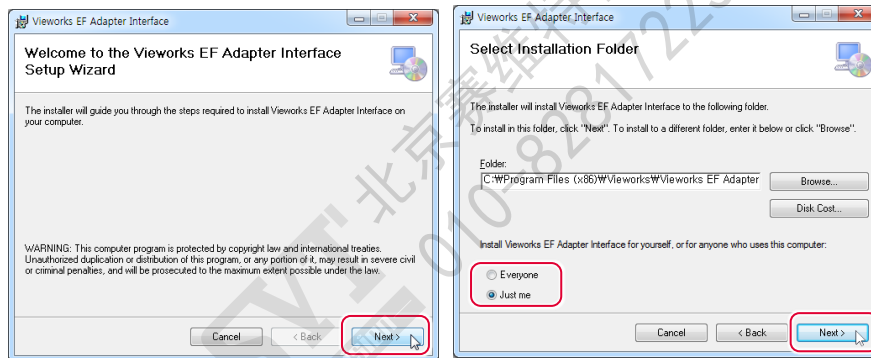
6.3.1 EF Adapter Interface

This section describes how to install EF Adapter Interface and how to configure communication connection on it for remote control of the product.

Installation after downloading

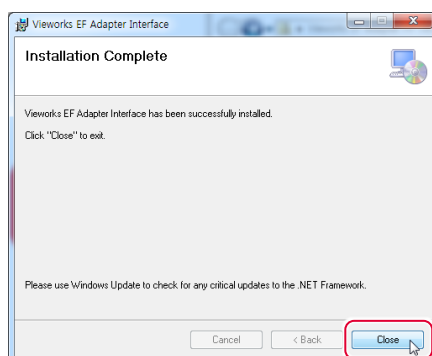
To install EF Adapter Interface, do the following:

1. Ask your seller for the EF Adapter Interface installation file, or download on the download center(<https://vision.viewworks.com/kr/support/download>) of the Vieworks Machine Vision web site.
2. Execute the installation file on Windows and install it. The **Setup Wizard** window appears as soon as you double-click the file and makes the installation easy as follows:



When choosing a folder to install, setting authority to use the GUI is available, choosing the **Everyone** item allows all the users of the PC to use and choosing the **Just Me** item permits only the current account to handle the GUI.

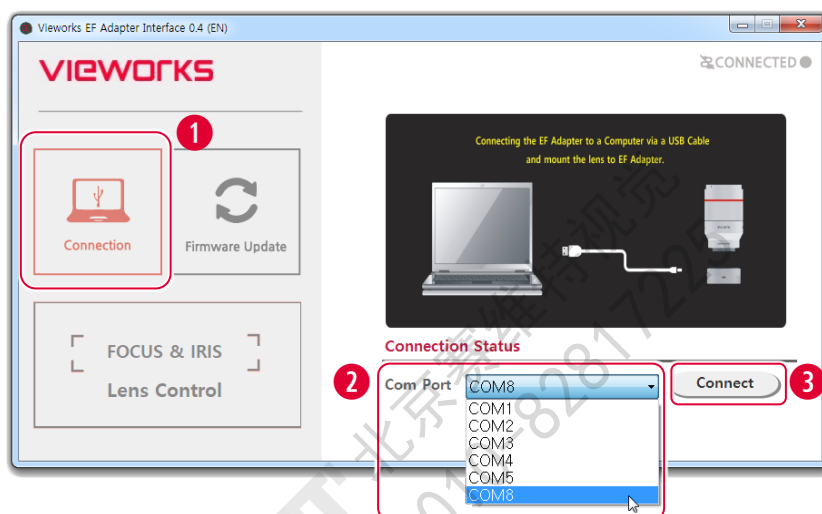
3. The following window appears when finishing the installation. Click the **Close** button to close the window:



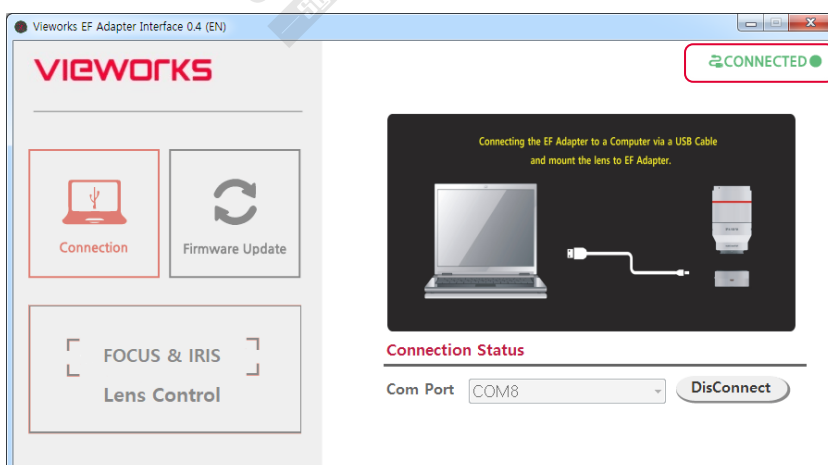
Operating and connecting for remote control

To execute EF Adapter Interface and use on your PC, do the following:

1. Execute the installed EF Adapter Interface GUI. Execute the **EF Adapter Lens Interface.exe** file in the folder you've designated when installation if it is hard to find in the list of the installed application such as the **Apps & features** item.
2. After the following window appears, choose the port connected to the product(refer to 6.2) on the **Com Port** combo box and then click the **Connect** button:



3. The **CONNECTED** upper right text of the window turns to green one as follows, and it means that this GUI is ready to control a lens remotely:



6.3.2 Command Line Interface

No need to install an additional application if you want to remote control by commands. Open your command prompt and input and execute the command that functions what you need.



About remote control of the product via commands:

This manual does not offer the detailed information on the command to control. Contact your seller if needed.

6.3.3 Camera Control Application

Some cameras support a software interface embedded on inside of the cameras, and the interface controls the camera remotely from a PC. The special software interface from Vieworks allows a user of the product with the VX-25MG camera by Vieworks to control those remotely. This manual describes how to use a camera control application under the premise that you use VIS, Vieworks Imaging Solution, as the camera control application. How to use the other control applications is similar to those of VIS.



For other cameras than the VX-25MG camera:

To control the product remotely in the case of other cameras than the VX-25MG camera, refer to **6.3.1** or **6.3.2** in this manual.

Installation of a camera control application

Refer to the camera's manual about how to download and install a camera control application.

Display of a camera control application

Execute the camera control application on the PC, and then, the items performing functions of the product appear as follows:

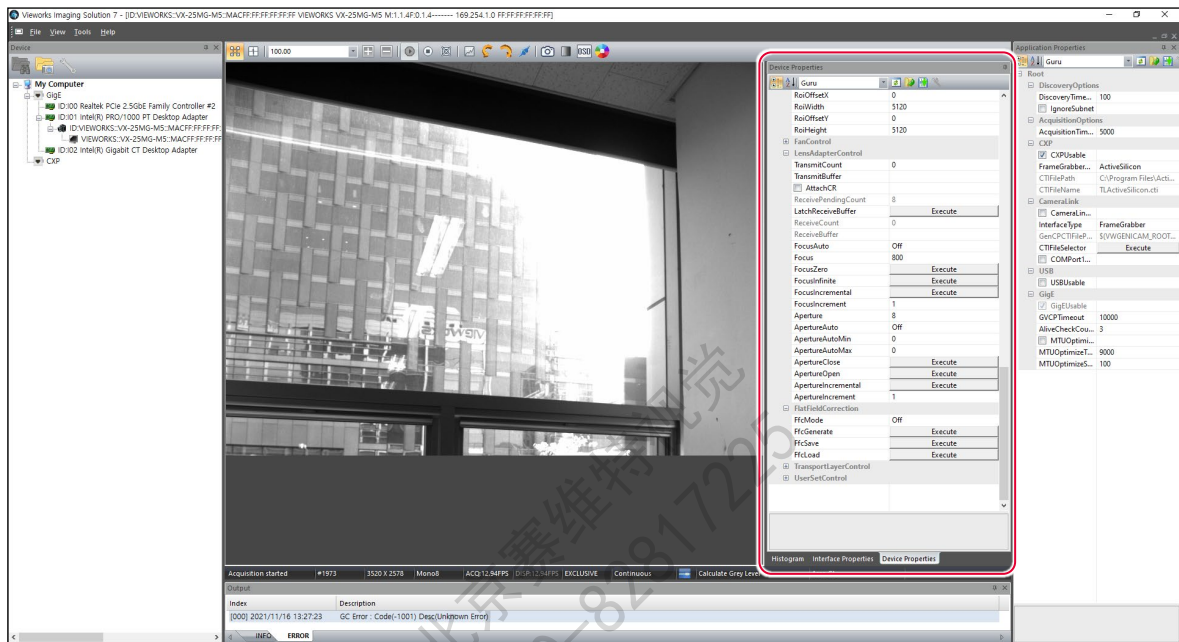


Figure 6-4 Camera control application display

Those are shown as the **LensAdapterControl** group on the **Device Properties** display in the VIS application. By using the items of the group, the product is available to be controlled remotely. These items are described as follows:

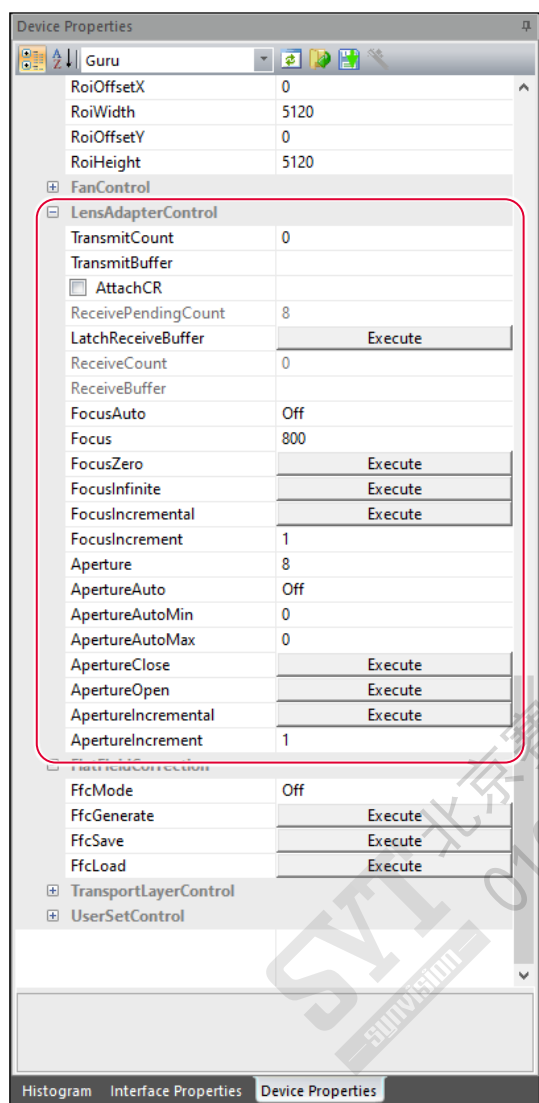


Figure 6-5 Control panel for the product

Item	Value	Description
TransmitCount	-	Input a character size of the string input on TransmitBuffer for serial transmission, unit is byte
TransmitBuffer	-	Input a command related to data transmission, and then execute by clicking the LatchReceiveBuffer's button
AttachCR	-	Choose whether applying the Carriage Return value or not
ReceivePendingCount	-	See total number of data in waiting for receive among the data to receive
LatchReceiveBuffer	-	Execute the command input on TransmitBuffer
ReceiveCount	-	See total number of received data successfully
ReceiveBuffer	-	See information on received data
FocusZero	-	Move focus position of a lens to minimum
FocusInfinite	-	Move focus position of a lens to maximum
Focus	-	See the current focus position numerically and precisely, or move to the precise position of your need by inputting numerical position
FocusIncremental	-	Move the focus position to the position added the current value to the FocusIncrement value
FocusIncrement	-	Set the amount of a value how much increase or decrease from the current focus value
FocusAuto	Off	Deactivate auto-focus function
	Once	Try auto-focus function once and turn back to the Off status
ApertureClose	-	Close an aperture maximum
ApertureOpen	-	Open an aperture fully
Aperture	-	See numerically and precisely how much an aperture is opened currently, or open as much as what you want by inputting a numerical value
ApertureIncremental	-	Open an aperture as much as the value added the ApertureIncremental value to the current value
ApertureIncrement	-	Set the amount of a value how much increase or decrease from the current value indicating how much an aperture is opened
ApertureAuto	Off	Deactivate the function controlling aperture open automatically
	Once	By this control function to open an aperture automatically, try to adjust once to reach the grey level set on ExposureAutoTargetLevel of camera's control item and turn back to the Off status
	Continuous	By this control function to open an aperture automatically, enable the aperture to continue adjusting to keep the grey level set on ExposureAutoTargetLevel of camera's control item
ApertureAutoMin	-	Set a minimum value how much an aperture opens
ApertureAutoMax	-	Set a maximum value how much an aperture opens

Table 6-1 Description of the product features

Among the functions described in the table above, the **ApertureAuto** function controlling how much an aperture open automatically is available to operate together with **ExposureAuto** and **GainAuto** of camera's function. The priority to apply by the camera is as follows when these three functions work at the same time:

1. ApertureAuto
2. ExposureAuto
3. GainAuto

For more information, refer to 7.7 in this manual.



About FocusAbsolute and ApertureAbsolute:

The **Focus**, **Aperture** items in the table above appear as **FocusAbsolute**, **ApertureAbsolute** each, in the case of the Vieworks VX-29MG camera. About those, refer to the item of **Focus** or **Aperture** each in the table above.

ApertureAutoMax:

The value of this item may differ depending on a type of a lens.

Chapter 7. Product Features

This chapter describes how to use the functions by remote control. The product supports user interfaces to control a lens and an aperture remotely on a PC so that the user does not have to control those in person. There are three of the user interfaces allowing the user to control focus remotely on a PC as follows:

- EF Adapter Interface
- CLI(Command Line Interface)
- Application to control a camera



About remote control of the product via a camera control application:

This function is supported only for the cameras in Viewworks VX series. In the case of other cameras except for those, the user is able to control the product remotely by using either EF Adapter Interface or a CLI, on the PC.

About remote control of the product via commands:

This manual is intended for users of EF Lens Adapter Interface basically. This manual does not offer the detailed information on the command to control via a CLI. Contact your seller if the information is needed.

There are seven functions allowing the user to control remotely on the PC as follows:

- How to check information on the product(7.1)
- How to update the firmware(7.2)
- How to control the connection(7.3)
- How to control data communication(7.4)
- How to control a focus and an aperture(7.5)
- How to control precisely by numeric values(7.6)
- How to auto-control a focus and an aperture(7.7)

This chapter describes each how-to in detail in the order above.

7.1 How to Check Information of the Product

To check the specific information on the product such as a serial number, a firmware version, or lens specification, execute EF Adapter Interface and then choose the **Firmware Update** menu on the left of the window. The information appears on the right of the window as follows:

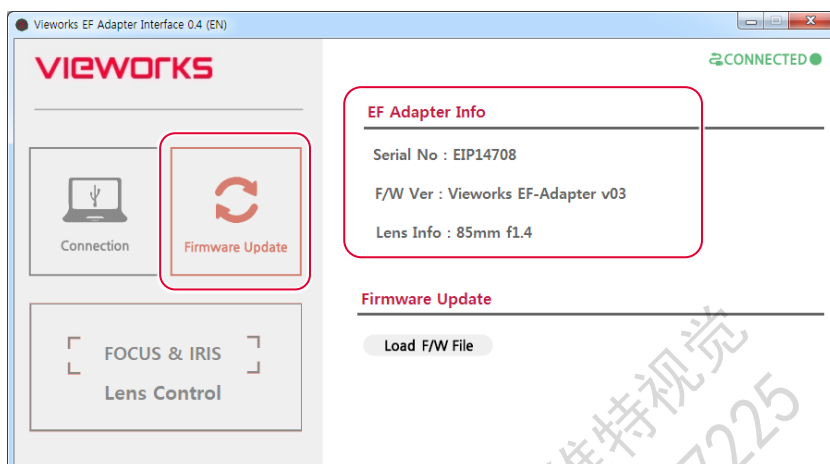
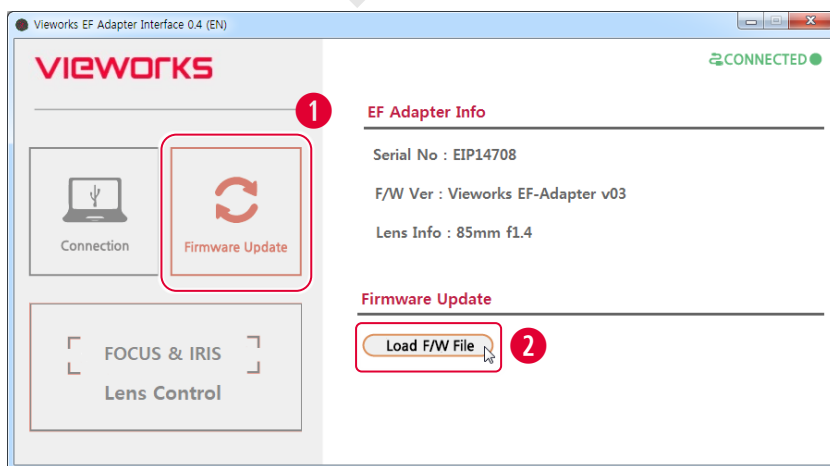


Figure 7-1 Product information window

7.2 How to Update the Firmware

To update a firmware of the product, execute EF Adapter Interface and choose the **Firmware Update** menu on the left of the window. And on the page appearing in the right part of the window, click the **Load F/W File** button under the **Firmware Update** menu as follows:



The pop-up window to choose the firmware file to use appears, then choose the file and proceed the update.

7.3 How to Control the Connection

To connect or disconnect between a PC and the product, execute EF Adapter Interface and choose the **Connection** menu on the left of the window. And its page appears on the right of the window, then, choose the communication port connected to the product on the page, and click the **Connect** button or the **DisConnect** button as follows:



Figure 7-2 Control window of connection status



In the case that the user needs to find out the port information, or the port item doesn't appear:

Refer to 6.2 in this manual. This manual does not offer the detailed information on the command to control, therefore, contact your seller if needed.

7.4 How to Control Data Communication

To check or control communication for data transmission between the product and a PC in detail, it is recommended to work via a CLI or a camera control application.

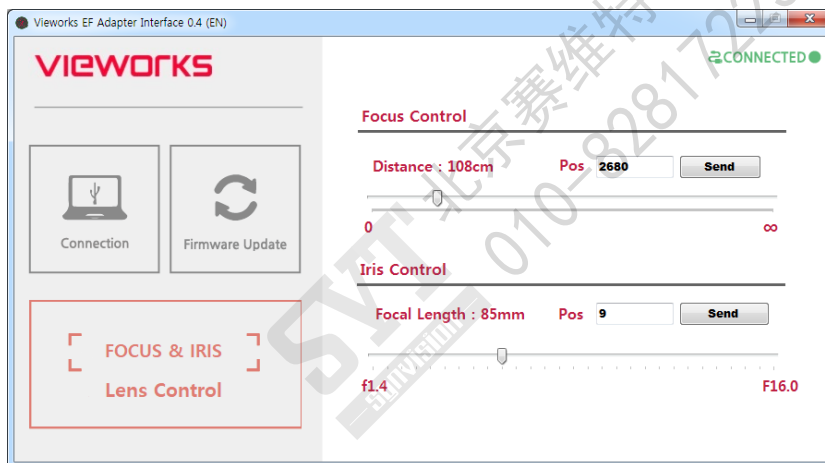


To control communication for data transmission related to the product:

CLI users are recommended to contact sellers. Refer to [Table 6-1](#) in this manual if using a camera control interface such as VIS.

7.5 How to Control a Focus and an Aperture

To focus a lens via the product on a PC, execute EF Adapter Interface and choose the **AF & IRIS Lens Control** menu on the left of the window. And its page appears on the right of the window, then, adjust the items and the values on the page as you need.



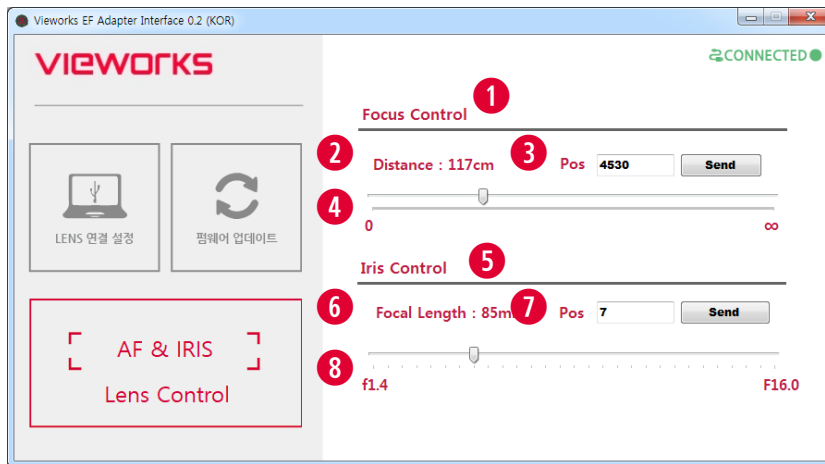


Figure 7-3 Lens and aperture control window

The following describes the page in detail:

- | | | |
|---|---------------|--|
| 1 | Focus Control | Features to control focus clearly |
| 2 | Distance | Item showing the current focus position numerically and precisely |
| 3 | Pos | Item to control the focus position as the user wants by inputting the precise value |
| 4 | Bar | Item to control lens focus by letting the product move the lens simultaneously as the user manipulates the bar |
| 5 | Iris Control | Features to control how much aperture opens |
| 6 | Focus Length | Item showing the current length of the focus numerically and precisely |
| 7 | Pos | Item to control how much an aperture opens as the user wants by inputting the precise value |
| 8 | Bar | Item to control how much an aperture opens by letting the product move the aperture simultaneously as the user manipulates the bar |

7.6 How to control precisely by numeric values

To control focus position and how much an aperture opens numerically and precisely, it is available in the **AF & IRIS Lens Control** menu on EF Adapter Interface, however, working via a CLI or a camera control application would be better choice for your convenience.



To control communication for data transmission related to the product:

CLI users are recommended to contact sellers. Refer to **Table 6-1** in this manual if using a camera control interface such as VIS.

7.7 How to auto-control a focus and an aperture

With the **ApertureAuto** function on a camera control application, it is available for lens focus to control its clarity automatically in consideration of the value set of the grey level for the pixels in the given ROI. To use this function, it is recommended to work via a CLI or a camera control application.



EF Adapter Interface:

The product offers this function via a CLI or a camera control application. CLI users are recommended to contact sellers. Refer to **Table 6-1** in this manual if using a camera control interface such as VIS.

Chapter 8. Troubleshooting

When you have a problem with a Vieworks camera, please check the followings:

- If no image is displayed on your computer,
 - Ensure that all cable connections are secure.
 - Ensure that the power supply is properly connected.
 - Ensure that trigger signals are applied correctly when you operate the camera with trigger signals.

- If images are not clear,
 - Ensure the camera lens or glass is clean.
 - Check the lens aperture is adjusted properly.

- If images are dark,
 - Ensure the camera lens is not blocked.
 - Check the exposure time is set properly.

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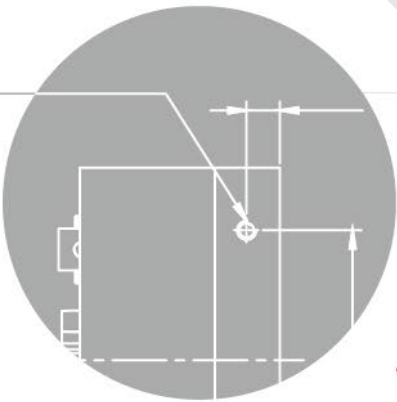
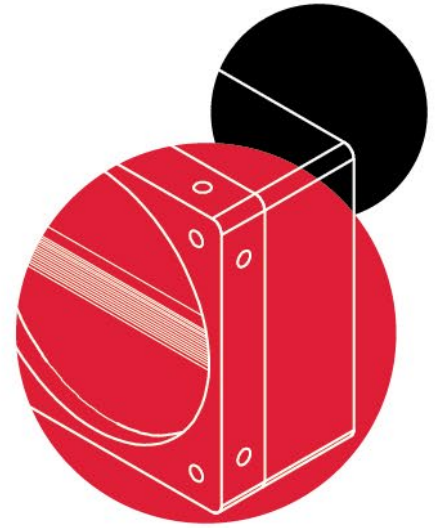
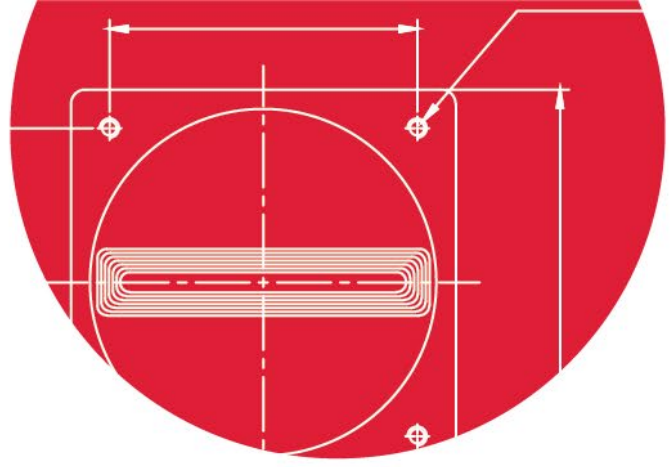
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