

# Instructions

# CMP-CB

## Microscope Control Box for OEM Component

### Notes

This instruction manual is for the Microscope Control Box for OEM Component.

To ensure the safety, obtain optimum performance and to familiarize yourself fully with the use of this product, we recommend that you study this manual thoroughly before operating this product, and always keep this manual at hand when operating this product.

Retain this instruction manual in an easily accessible place near the work desk for future reference. For units connectable to this product, see page 13.

Optical Microscope Accessory

This product is applied with the requirements of standard IEC/EN61326-1 concerning electromagnetic compatibility.

- Emission            Class A
- Immunity            Industrial electromagnetic environment

Emissions exceeding the level required by aforementioned standards may occur if this product is electrically connected to other equipment.

Some interference may occur if this product is used in residential environments.

**NOTE:** This product 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 product is operated in a commercial environment. This product 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 product 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 expense.

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

**FCC Supplier's Declaration of Conformity**

Hereby declares that the product

Product name: Optical Microscope Accessory  
Model Number: CMP-CB

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107 and Section 15.109

Supplementary Information:

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.

Responsible Party Name: Evident Scientific, Inc.

Address:                    48 Woerd Ave Waltham, MA 02453, USA

Phone Number:         781-419-3900



In accordance with European Directive on Waste Electrical and Electronic Equipment, this symbol indicates that the product must not be disposed of as unsorted municipal waste, but should be collected separately.

Refer to your local Evident distributor in EU for return and/or collection systems available in your country.

**For Korea only**

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

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## Concept of this instruction manual

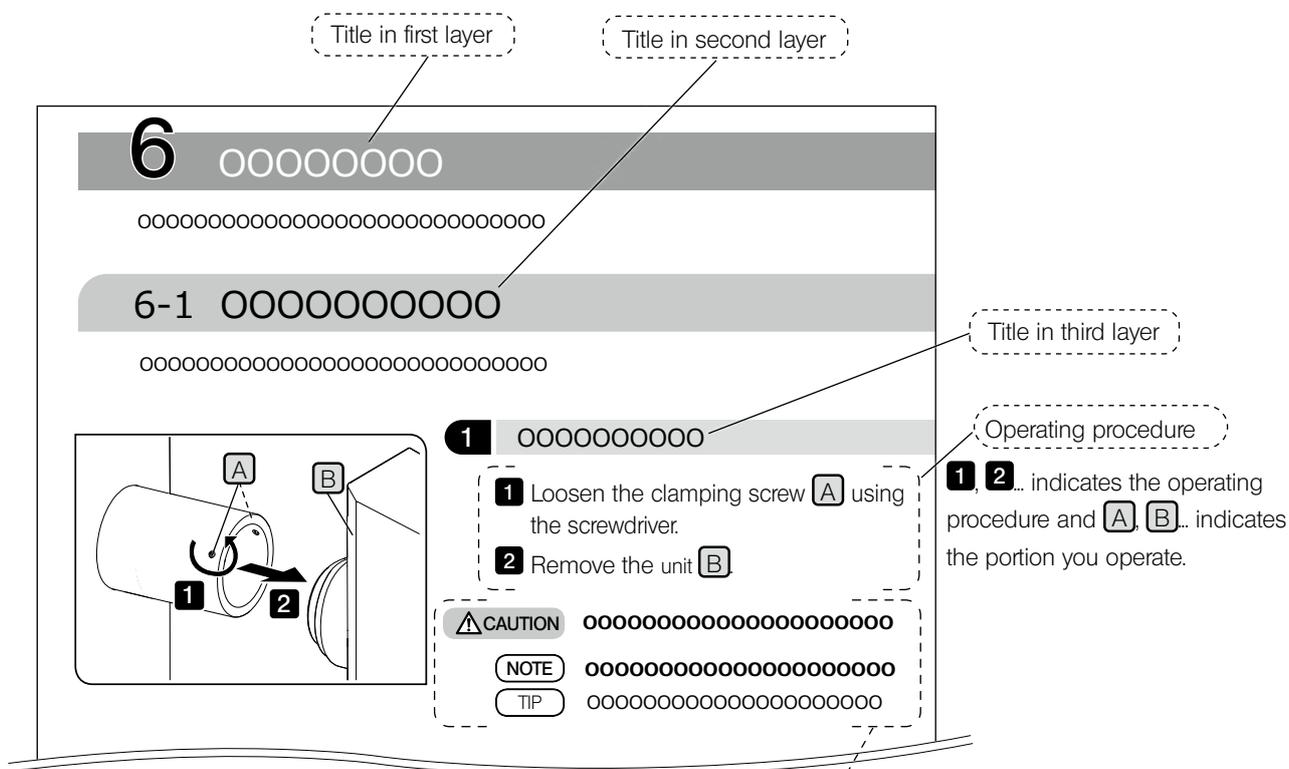
This instruction manual describes only the contents related to CMP-CB (Microscope Control Box for OEM Component). When using this product, read all the instruction manuals supplied with the units you purchased together with this manual.

## Applicable user of this instruction manual

This instruction manual applies to users who use this product according to "Intended use" and Evident distributors.

## How to read this instruction manual

This instruction manual is created as follows.



The following symbols are used in this instruction manual.

- ⚠ WARNING** : Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
- ⚠ CAUTION** : Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
- NOTE** : Indicates a potentially hazardous situation which, if not avoided, may result in damage to the product or other property and/or may cause problems.
- TIP** : Indicates the useful knowledge or information for use.

# Product concept

## Product outline

CMP-CB is a product that controls the motorized microscope units.

All operations of the microscope units (motorized units) are controlled by communication commands from PC via CMP-CB.

For the specifications of communication commands, contact Evident.

## Intended use

This product is designed as a controller of a motorized microscope unit built in semiconductor inspection equipment, etc. for industrial applications. Industrial applications include observation, inspection or measurements.

Do not use this product for any purpose other than its intended use.

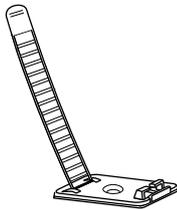
## Cautions and confirmation before use

This product includes the following items. If any item is missing or damaged, contact Evident.

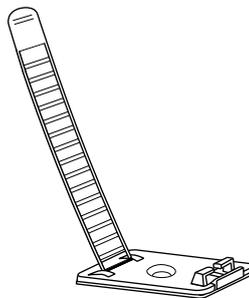
- Band (5 pcs)



- Binder (small) (4 pcs.)



- Binder (large) (2 pcs.)



- Instruction manual (AX9413)

## Safety precautions

If the product is used in a manner not specified by this manual, the safety of the user may be imperiled. In addition, the product may also be damaged. Always use the product according to this instruction manual.

### Installation



**Install the product on a sturdy, level table or bench.**

If you install this product on an unstable table or a tilted table, the product may overturn and you may get injured.

For safety purpose, do not place a mat, etc. under the product.



**Secure the space of 10 cm or more around the air vents.**

If the air vents on the side of the product are blocked, the temperature inside of the product may rise to cause the system failure.

### Electric safety



**• Always use the power cord specified by Evident.**

If the proper power cord is not used, the electric safety and the EMC (Electromagnetic Compatibility) performance of the product intended by Evident cannot be assured. If no power cord is provided, please select the proper power cord by referring to the section "Proper selection of the power cord" at the end of this instruction manual.

**• Always connect the ground terminal.**

Connect the ground terminal of the power cord and that of the power outlet.

If the product is not grounded, the electric safety and EMC performance intended by Evident cannot be assured.

**• Do not use the product in close proximity to the sources of strong electromagnetic radiation.**

Proper operation may be interfered. The electromagnetic environment should be evaluated prior to operation of the product.

**• Disconnect the power cord in case of emergency.**

In case of emergency, disconnect the power cord from the power cord connector on the product or from the power outlet.

Install the product at the location where you can reach the power cord connector or the power outlet at hand to disconnect the power cord quickly.

This product is designed with intention to be used in the industrial environment for the EMC performance. Using this product in the residential environment may affect other equipment.

### LED (Light Emitting Diode)



**• Do not look directly at the light from the LED light source for a long time.**

If you feel that the light from LED light source is too bright during observation, adjust the light intensity using the control command before continuing the observation. The LED built in this product is basically eye-safe. However, do not look directly at the light from the LED light source for a long time in the state you are feeling the light is too bright, since it may cause damage to your eyes.

**• Do not look directly at the light coming out from the objective or the specular reflection light from the sample.**

Do not look directly at the light coming out from the objective for a long time, since it may cause damage to your eyes.

**• Do not expose your skin to the light coming out from the objective for a long time.**

If your skin is exposed to the light coming out from the objective for a long time, you may get burns.

## Prevention of electric shock



- **Never insert any tools or metal fragments in the air vents of the product.**

It could cause the electric shock or failure of the product.

- **Do not bend, pull or bundle the power cord and cables.**

Otherwise, they could be damaged, causing a fire or an electric shock.

- **Do not touch the product with wet hands.**

In particular, if you touch the main switch of the power unit or the power cord with wet hands, electric shock, ignition or failure of the product may be caused.

- **Do not repair, disassemble or remodel this product.**

It could cause the electric shock, failure of the product or fire.

## Safety symbols

The following symbols are placed on this product.

Study the meaning of the symbols and always use the product in the safest possible manner.

Symbol	Meaning
	Indicates a non-specific general hazard. Follow the description given after this symbol or in the instruction manual.
	Indicates that the seesaw type main switch is ON. (Seesaw type is a type of switch where ON or OFF is selected by pressing it to ON or OFF side.)
	Indicates that the seesaw type main switch is OFF.

### Label position and instructions

The caution labels are placed on the portions which particularly require special cautions when using or operating this product. Be sure to follow the instructions.

Label position	Label	Instructions in the instruction manual	Page
Center on the front of CMP-CB Lower back of CMP-CB		Electric safety	page 3
		Prevention of electric shock	page 4

When caution labels are dirty or peeled off, contact Evident for replacement or inquiries.

## Transportation



- **When carrying this product, hold the product firmly to prevent the product from slipping from your hands.**

If the product is dropped on your foot, you may get injured.

## Handling precautions

### Lifetime

The lifetime of this product is approximately 8 years after purchase if the product is used properly according to this instruction manual.

### General

- NOTE** • This product is a precision instrument. Handle it with care and avoid subjecting it to a sudden or severe impact.
- Do not use the product in areas where it may be subjected to direct sunlight, high temperature and/or humidity, dust or vibrations.  
(For the conditions of operating environments, see page 12.)
  - For units attachable to this product, see page 13.

### Maintenance and storage

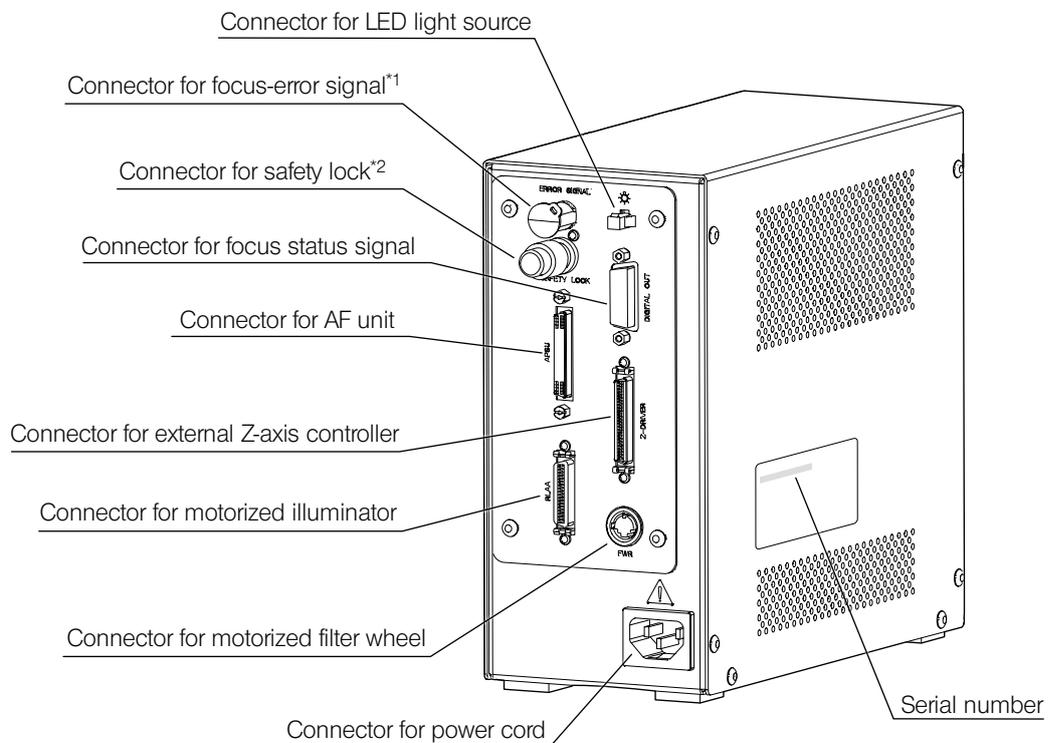
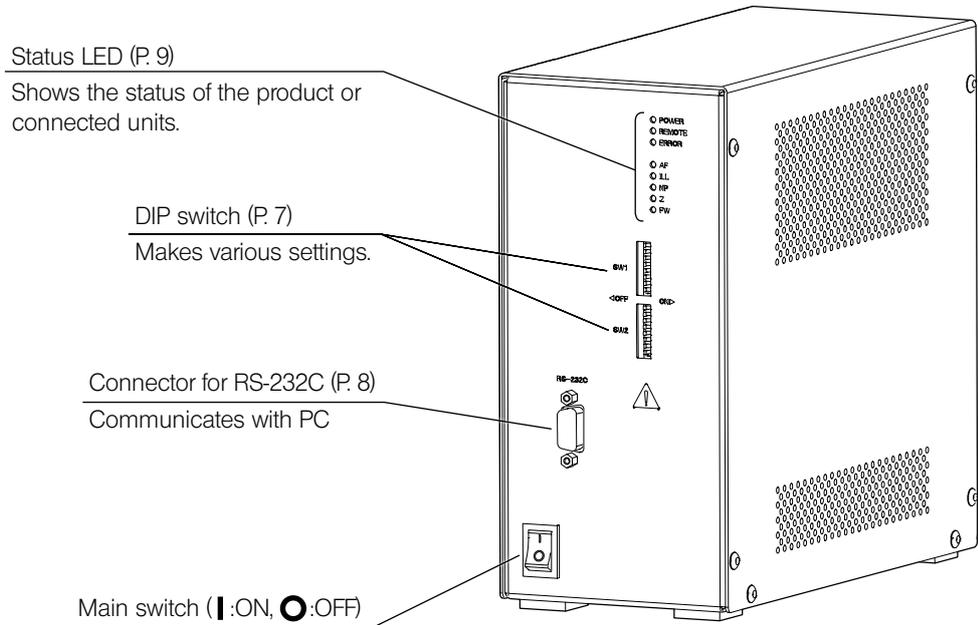
- When cleaning this product, wipe it with a dry soft cloth. If dirt/dust cannot be removed by dry-wiping, moisten a cloth with diluted neutral detergent and wipe off dirt/dust with it.
- NOTE** Do not use organic solvents because they may deteriorate the coated surface or plastic parts.
- If you use this product in the clean room, use pure water to clean this product.
  - Before disposing of this product, be sure to follow the regulations and rules of your local government.

# 1 Nomenclature of main operation portions

This section describes the nomenclature of main operation portions of this product.

**NOTE** • Always connect the unit specified by Evident to each connector.

• Be sure to use the PC that satisfies the requirements defined by IEC60950-1. If you use the PC that does not satisfy the requirements defined by IEC60950-1, all the performances are not ensured.



\*1 The protection cap is attached. Remove this cap when you use this connector.

\*2 The short plug is attached. In order to activate the AF unit, this short plug should be attached or connected to the cable prepared by users.

## 2 Operation method of each portion

This section describes the basic operation method of each portion.

### 2-1 Setting the DIP switch

The allocated functions of the DIP switches are shown in the table below.

**NOTE** Before setting the DIP switch, set the main switch to **○ (OFF)**. The switch settings are read and defined when the power is turned ON.  
All DIP switches (white knob) are OFF by factory default.

: Factory default setting

DIP switch		Function	Note	
SW1 (Upper)	OFF ON  8	System lock	OFF	Locks the system when 'Fatal-Error' occurs.
	ON		Does not lock the system when 'Fatal-Error' occurs.	
	 7	Reserved by maker	This switch is always kept OFF.	
	 6	Reserved by maker	This switch is always kept OFF.	
	 5	Initialization	OFF	Initializes, the control target and restore to the last position and light intensity when the power is turned ON. (excluding Z-axis and AF unit)
	ON		Does not initialize the control target and restore to the last position and light intensity when the power is turned ON. (The drive parts are initialized at the time of initial control.)	
	 4	AS Control	OFF	Normal
	ON		High precision (Backlash reduction)	
 3	Auto-LOG IN	OFF	Automatically switches to the remote state when the power is ON	
ON		Local state when the power is ON		
 2	Nosepiece (NP)	OFF	5 Position-NP	
ON		6 Position-NP		
 1	Buzzer sound	OFF	The buzzer sound is heard.	
ON		The buzzer sound is not heard.		
SW2 (Lower)	 8 -----  1	Reserved by maker	These switches are always kept OFF	

## 2-2 Connecting the RS-232C cable

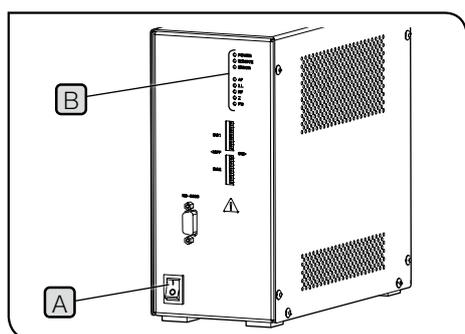
Connect CMP-CB to the PC with the RS-232C cable.

- NOTE**
- Before connecting the cable, be sure to set the main switch of CMP-CB to **○** (OFF).
  - Be sure to use the straight RS-232C cable. (If you use an incorrect cable, the product may be damaged.)
  - Use the D-Sub9 pin (female)-D-Sub9 pin(female) RS-232C cable.
  - The following table shows the settings for communication. (Fixed value)

Communication speed	19200 [bps]
Data bit	8 [bits]
Parity	Even
Stop bit	2 [bits]
Terminator	CR+LF
Flow control	None

## 2-3 Turning ON the power

**CAUTION** Before turning ON the power, make sure that all units are connected properly.



**1** Set the main switch **A** to **I** (ON).

**2** Among the status LED **B**, make sure that the LED indicating the connected unit is ON.

**TIP** The following table shows the information indicated by each status LED **B**.

Name	Color	OFF	ON	Blink
POWER	Green	Power OFF	Power ON	-
REMOTE	Blue	Local (logout) status* <sup>1</sup>	Remote (login) status* <sup>2</sup>	-
ERROR	Red	No error	Error	-
AF (AF unit)	Green	Not connected	Connected (Normal)	Error in control
ILL (Motorized illuminator)		Not connected	Connected (Normal)	Error in control
NP (Motorized nosepiece)		Not connected	Connected (Normal)	Error in control
Z (External Z-axis controller)		Not connected* <sup>3</sup>	Connected (Normal)* <sup>3</sup>	Error in control
FW (Motorized filter wheel)		Not connected	Connected (Normal)	Error in control

\*<sup>1</sup> In local (logout) status, you cannot control motorized units with communication commands from PC. (You can acquire the status only.)

\*<sup>2</sup> In remote (login) status, all communication commands, e.g. control of motorized units, acquisition of status, can be accepted.

\*<sup>3</sup> Depending on your signal processing method, even if the external Z-axis controller is connected, the status LED of Z may not turn ON.

# 3 Troubleshooting

This section describes the problems assumed with this product and their remedies.

If problems occur, please review the following list and take remedial action as needed.

If you cannot solve the problem after checking the entire list, please contact Evident for assistance.

Problem	Cause	Remedy	Page
The power does not turn ON even though the main switch is set to <b>I</b> (ON).	The power cord is disconnected.	Connect the cable properly.	14
CMP-CB cannot be controlled from PC.	The RS-232C cable is not connected properly.	Connect the cable properly.	13
	The RS-232C cable type is incorrect.	Use the RS-232C cable with correct specifications.	8
	The communication is not set properly.	Set the communication properly.	8
The connected unit does not work. The status LED of the unit that does not work is OFF.	The unit is not connected properly.	Connect the unit properly.	13
When the motorized nosepiece is rotated, the ERROR status LED turns ON and the NP status LED blinks.	The number of holes specified by the DIP switch is different from the number of holes of the motorized nosepiece you connected.	Set the DIP switch correctly.	7
AF does not work. The focusing error signal is not outputted.	The short plug is disconnected.	Connect the provided short plug.	6
	The cable prepared by users is disconnected.	Connect the cable.	6
The ERROR status LED is ON. There is a unit whose status LED is blinking.	The fatal error occurs with the unit. (Various causes are assumed: The unit is disconnected while the power is ON, or the control failures of drive part, etc.)	Set the main switch to <b>O</b> (OFF) and make sure that the units are connected properly. Then, set the main switch to <b>I</b> (ON) again, and check whether this problem occurs or not.	9

### Repair request

If you cannot solve the problems even though taking actions described in Troubleshooting, please contact Evident for assistance. At that time, please tell them the following information as well.

- Product name and abbreviation (Example: Microscope Control Box for OEM Component CMP-CB)
- Serial number (See page 6)
- Problem

# 4 Specifications

This section describes the detail specifications of this product, such as shape, functions, performances, etc.

## ■ CMP-CB (Microscope Control Box for OEM Component)

Item	Specifications
Rating	Input rating: AC100 – 120V/AC220 – 240V ~ 50/60Hz Consumption Current: 0.5A/0.3A
LED Indicator	POWER (Power status) / Green REMOTE (Login status) / Blue ERROR (Error status) / Red Connected unit status indicator / Green (5 pcs.)
Communication I/F	External I/F: RS-232C Communication setting (Fixed value): Baud rate: 19200 [bps] Data bit: 8 [bits] Parity: Even Stop bit: 2 [bits] Terminator: CR+LF Flow Control: None
External Connectors	
Connector for RS-232C	D-Sub 9pin connector (on front panel) P/N: HDEB-9PF (HIROSE ELECTRIC CO., LTD.) With shield
Connector for focus-error signal	BNC Connector (on back panel) P/N: BCJ-BPLH2PA (Canare Electric Co., Ltd.) With shield With cover
Connector for safety lock	BNC Connector (on back panel) P/N: BCJ-BPLH2PA (Canare Electric Co., Ltd.) With shield With short plug
Connector for AF unit	50pin square shaped connector (on back panel) P/N: PCS-XE50SLFDUN+ (HONDA TSUSHIN KOGYO CO., LTD.) With shield
Connector for motorized illuminator	50pin square shaped connector (on back panel) P/N: 5917738-5 (TE Connectivity Ltd.) With shield
Connector for LED light source	2pin square shaped connector (on back panel) P/N: SMR-02V-B (J.S.T.MFG.CO.,LTD.) Without shield
Connector for focus status signal	D-Sub 15pin connector (on back panel) P/N: HDAB-15S (05) (HIROSE ELECTRIC CO., LTD.) With shield
Connector for external Z-axis controller	50pin square shaped connector (on back panel) P/N: DX10G1M-50SE (50) (HIROSE ELECTRIC CO., LTD.) With shield
Connector for motorized filter wheel	8pin round shaped connector (on back panel) P/N: HR12-10R-8SC (71) (HIROSE ELECTRIC CO., LTD.) With shield

Item	Specifications
Connectable units (Enable to control via RS-232C command)	
AF unit	U-AFA2M-VIS (Auto Focusing Sensor for Visible Observation) U-AFA2M-VISH (High-Power type Auto Focusing Sensor for Visible Observation) U-AFA2M-CBL2M (2m Cable Unit for Auto Focus) U-AFA2M-CBL3M (3m Cable Unit for Auto Focus)
Motorized illuminator	BX-RLAA (Motorized Reflected Light BF/DF Illuminator) Dedicated cable included
Motorized nosepiece (Via motorized illuminator)	< for brightfield observation > U-D6REMC (6 holes, for brightfield and DIC observations) U-P5REMC (5 holes, for brightfield and DIC observations, equipped with centering mechanism) < for darkfield observation > U-D6BDREMC (6 holes, for brightfield and DIC observations) U-D5BDREMC (5 holes, for brightfield and DIC observations) U-P5BDREMC (5 holes, for brightfield and DIC observations, equipped with centering mechanism)
Motorized filter wheel	U-FWR (Reflected Light Filter Wheel)
LED light source	BX3M-LEDR (Reflected LED Lamp Housing)
Dimension / Weight	100(W) x 214(H) x 220(D) mm (excluding protrusions) / Approx. 2.7 kg
Operating environment	<ul style="list-style-type: none"> <li>• Indoor use</li> <li>• Altitude: Max. 2000 meters</li> <li>• Ambient temperature: 10 to 35 °C (50 to 95 °F)</li> <li>• Maximum relative humidity: 80% for temperatures up to 31 °C (88 °F) (without condensation) In case of over 31 °C (88 °F), the relative humidity is decreased linearly through 70% at 34 °C (93 °F), 60% at 37 °C (99 °F), and to 50% at 40 °C (104 °F).</li> <li>• Supply voltage fluctuation: ± 10%</li> <li>• Pollution degree 2 (in accordance with IEC60664-1)</li> <li>• Installation/Overvoltage category: II (in accordance with IEC60664-1)</li> </ul>

# 5 Connection with each unit

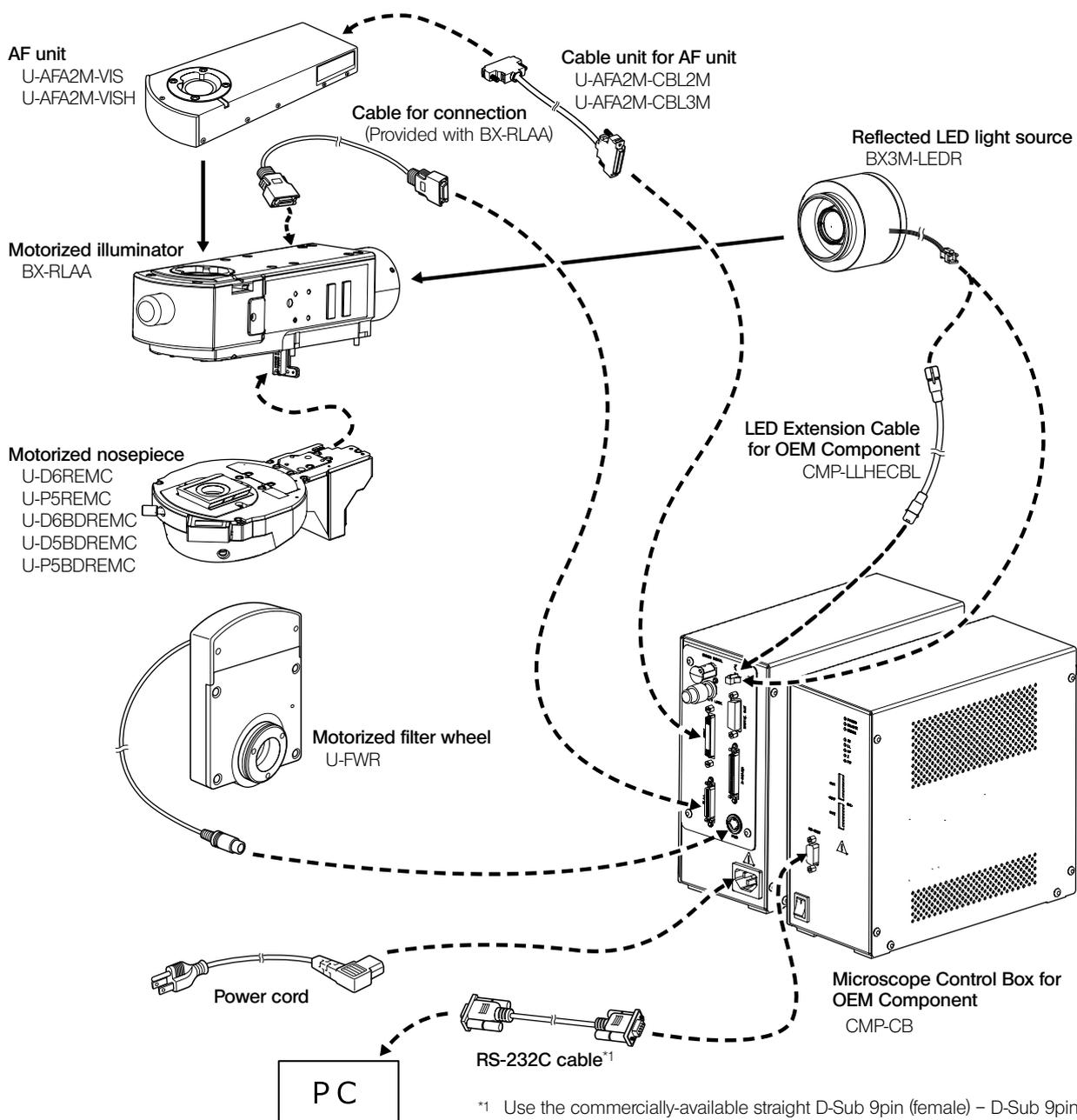
This section describes the connection methods between CMP-CB and each unit.

## 5-1 Connection diagram

The units connectable to CMP-CB are shown below.



Be sure to set the main switch to **○ (OFF)** before connecting units to CMP-CB.



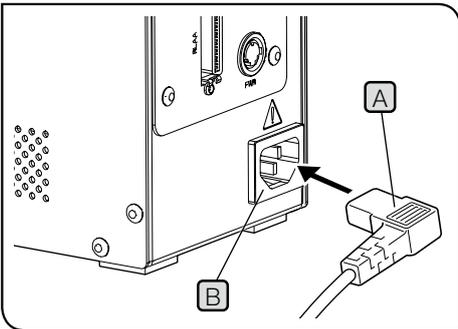
\*1 Use the commercially-available straight D-Sub 9pin (female) – D-Sub 9pin (female) RS-232C cable.

**TIP** • By referring to page 6, connect cables prepared by users to the connectors where no information about the unit to be connected is described.

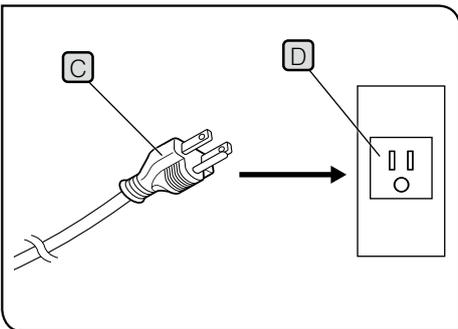
• For other connectable units (e.g. special order unit), contact Evident.

## 5-2 Connecting the power cord

- NOTE**
- Never apply excessive force to the power cord.
  - Be sure to set the main switch to **○** (OFF) before connecting the power cord.



- 1** Insert the power cord connector **A** in the connector **B** of CMP-CB.



- 2** Connect the power cord plug **C** to the power outlet **D** on the wall.

## ■ Proper selection of the power cord

If no power cord is provided, please select the proper power cord for the equipment by referring to “Specifications” and “Certified Cord” below:

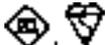
**Caution : In case you use a non-approved power cord for Evident products, Evident can no longer warrant the electrical safety of the equipment.**

### Specifications

Voltage rating	125 V AC (for 100-120 V AC area) or, 250 V AC (for 220-240 V AC area)
Current rating	6 A minimum
Temperature rating	60 °C minimum
Length	3.05 m maximum
Fittings configuration	Grounding type attachment plug cap. Opposite terminates in molded-on IEC configuration appliance coupling.

**Table 1 Certified cord**

A power cord should be certified by one of the agencies listed in Table 1 , or comprised of cordage marked with an agency marking per Table 1 or marked per Table 2. The fittings are to be marked with at least one of the agencies listed in Table 1. In case you are unable to buy locally the power cord which is approved by one of the agencies mentioned in Table 1, please use replacements approved by any other equivalent and authorized agencies in your country.

Country	Agency	Certification mark	Country	Agency	Certification mark
Argentina	IRAM		Italy	IMQ	
Australia	SAA		Japan	JET	
Austria	ÖVE		Netherlands	KEMA	
Belgium	CEBEC		Norway	NEMKO	
Canada	CSA		Spain	AEE	
Denmark	DEMKO		Sweden	SEMKO	
Finland	FEI		Switzerland	SEV	
France	UTE		United Kingdom	ASTA BSI	
Germany	VDE		USA	UL	
Ireland	NSAI				

**Table 2 HAR flexible cord**

Approval organizations and cordage harmonization marking methods

Approval organization	Printed or embossed harmonization marking (May be located on jacket or insulation of internal wiring)	Alternative marking utilizing black-red-yellow thread (Length of color section in mm)		
		Black	Red	Yellow
Comite Electrotechnique Belge (CEBEC)	CEBEC <HAR>	10	30	10
Verband Deutscher Elektrotechniker (VDE) e.V. Prüfstelle	<VDE> <HAR>	30	10	10
Union Technique de l'Electricite' (UTE)	USE <HAR>	30	10	30
Instituto Italiano del Marchio di Qualita' (IMQ)	IEMMEQU <HAR>	10	30	50
British Approvals Service for Electric Cables (BASEC)	BASEC <HAR>	10	10	30
N.V. KEMA	KEMA-KEUR <HAR>	10	30	30
SEMKO AB Svenska Elektriska Materielkontrollanstalter	SEMKO <HAR>	10	10	50
Österreichischer Verband für Elektrotechnik (ÖVE)	<ÖVE> <HAR>	30	10	50
Danmarks Elektriske Materialkontroll (DEMKO)	<DEMKO> <HAR>	30	10	30
National Standards Authority of Ireland (NSAI)	<NSAI> <HAR>	30	30	50
Norges Elektriske Materielkontroll (NEMKO)	NEMKO <HAR>	10	10	70
Asociacion Electrotecnica Y Electronica Espanola (AEE)	<UNED> <HAR>	30	10	70
Hellenic Organization for Standardization (ELOT)	ELOT <HAR>	30	30	70
Instituto Portages da Qualidade (IPQ)	np <HAR>	10	10	90
Schweizerischer Elektro Technischer Verein (SEV)	SEV <HAR>	10	30	90
Elektriska Inspektoratet	SETI <HAR>	10	30	90

Underwriters Laboratories Inc. (UL)  
Canadian Standards Association (CSA)

SV, SVT, SJ or SJT, 3 X 18AWG  
SV, SVT, SJ or SJT, 3 X 18AWG



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**Life science solutions**

Service Center



<https://www.olympus-lifescience.com/support/service/>

Official website



<https://www.olympus-lifescience.com>

**Industrial solutions**

Service Center



<https://www.olympus-ims.com/service-and-support/service-centers/>

Official website



<https://www.olympus-ims.com>