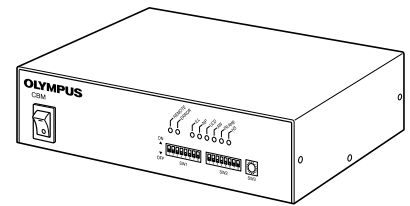


***BX3-CBM***  
***U-HSCBM***  
***BX3M-HSRE***



# Instructions

# BX3-CBM

## Control box

### Notes

This instruction manual is for the motorized control box and hand switch.

To ensure safety, obtain optimum performance and to familiarize yourself fully with the use of the motorized units, 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.

Optical Microscope Accessory

AX 8954

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.



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.

**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.

**For Korea only**

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

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# Introduction

The control box (BX3-CBM) is used to control the operations of the motorized units attached to BX53 frame (BX53F2). Connecting this control box (BX3-CBM) with motorized units allows you to operate motorized units from the hand switch (U-HSCBM), hand switch motorized nosepiece (BX3M-HSRE) or computer.

## Configuration of instruction manuals

Read all the instruction manuals provided with the units you purchased.


The following instruction manuals are available for this product or the units to be used with this product.


Instruction manuals	Main contents
Control box BX3-CBM (this instruction manual)	Connection procedures of cables from motorized units to the control box (BX3-CBM); information of factory default settings of the control box (BX3-CBM).
System Microscope BX53	Operation procedures of the microscope
Discussion system	Simultaneous observation procedures by 10 to 26 persons
Discussion attachment U-DO3, U-SDO3 or U-MDOB3	Simultaneous observation procedures by 2, 5 or 10 persons
Coded function system U-CBS	Connection of cables from units that have the information to the coded function system; procedures to readout the information
Coded 7-position nosepiece / coded 6-position nosepiece U-D7RES / U-D6RES	Operation procedures of the revolving nosepiece
Motorized universal condenser BX3-UCD8A	Operation procedures of the condenser
Motorized reflected fluorescence system	Reflected fluorescence observation procedures using the motorized fluorescence illuminator (BX3-RFAA)
Reflected fluorescence system	Reflected light fluorescence observation procedures using the coded fluorescence illuminator (BX3-RFAS) and universal reflected illuminator (BX3-URA)
Light guide illumination system U-HGLGPS	Operation procedures of the light source used for reflected light observation
Mechanical stages with right-hand (left- hand) control U-SVRB-4 / U-SVLB-4	Operation procedures of the stage


# 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.

The following symbols are used in this instruction manual.

 **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.

## **CAUTION - Installation of the product -**

Make sure to install the control box (BX3-CBM) in landscape orientation with the space of 10 cm or more around it.

## **CAUTION - Electric safety -**

### **Always use the power cord provided by Evident.**

If the proper AC adapter and the power cord are not used, the electric safety and the EMC (Electro-Magnetic Compatibility) performance of the product 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, our intended electric safety and EMC performance of the product 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 a location where you can reach the power cord connector or the power outlet at hand to disconnect the power cord quickly.

### **Do not connect or disconnect the power cord, cables and units during the power is on.**

Be sure to set the main switch of the control box (BX3-CBM) to  (OFF) before connecting or disconnecting the power cord or cables.

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

**⚠ CAUTION - Prevention of electric shock -**

**Keep the power cord and cables well away from the lamp housing.**

If the power cord and cables contact a hot area of the lamp housing, they could melt and cause electric shock.

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

It could cause electric shock or failure of the product.




**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.

**⚠ CAUTION - 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 the type of switch that ON or OFF is selected by pressing it to ON or OFF side.)
	Indicates that the seesaw type main switch is OFF.

**Handling Precautions**

- NOTE**
- This product is a precision instrument. Handle it with care and avoid subjecting it to a sudden or severe impact.
  - Never disassemble any part of the product. Otherwise, failure could be caused.
  - Do not use the product in areas where it may be subjected to direct sunlight, high temperature and/or humidity, dust or vibrations.  
(For conditions of operating environments, see “4 Specifications” (p.18).)

**Disposing of the product**

Before disposing of this product, be sure to follow the regulations and rules of your local government. Contact Evident for any questions.

# 1 Nomenclature and functions

Control box (BX3-CBM)

REMOTE indicator LED

Turns ON in blue : Controlled by computer  
OFF : Controlled by hand switch

ERROR indicator LED

Blinks in red : Error  
OFF : No error

Main switch

I : ON    O : OFF  
DIP switch (p. 6)

For setting operations

Rotary switch (p. 8)

For selecting set types

Connected unit indicator LED

Turns ON in green when the unit is connected. (Blinks when an error occurs.)

ILL : Motorized fluorescence illuminator (BX3-RFAA)

NP : Motorized 7-position nosepiece (U-D7REA)

UCD : Motorized universal condenser (BX3-UCD8A)

AW : Motorized attenuator wheel (U-AW)

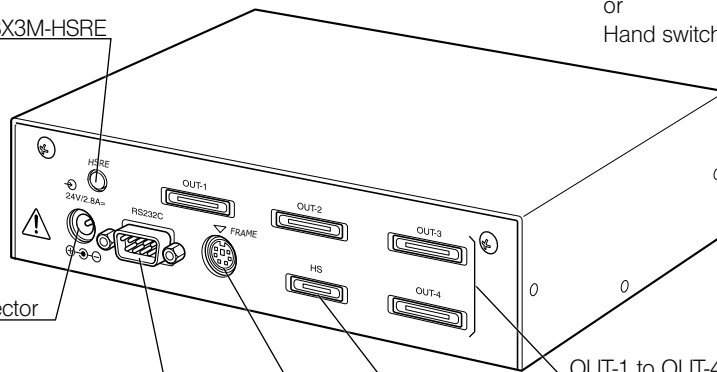
FRAME : BX53 frame (BX53F2)

HS : Hand switch for CBM (U-HSCBM)

or

Hand switch motorized nosepiece (BX3M-HSRE)

Connector for BX3M-HSRE



DC input connector  
24V / 2.8A

RS-232C connector

Output connector to the computer  
or DP21 control box

OUT-1 to OUT-4 connectors

Universal output connectors to units

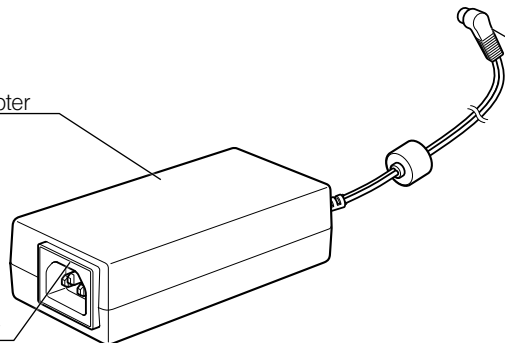
Connector for U-HSCBM

Connector for BX53F2

AC adapter

Power output plug

Power cord connector



Hand switch for CBM  
U-HSCBM

ATTENUATOR selection button  
For selecting the ND filter

ATTENUATOR selection button\*\*  
For selecting the mirror unit

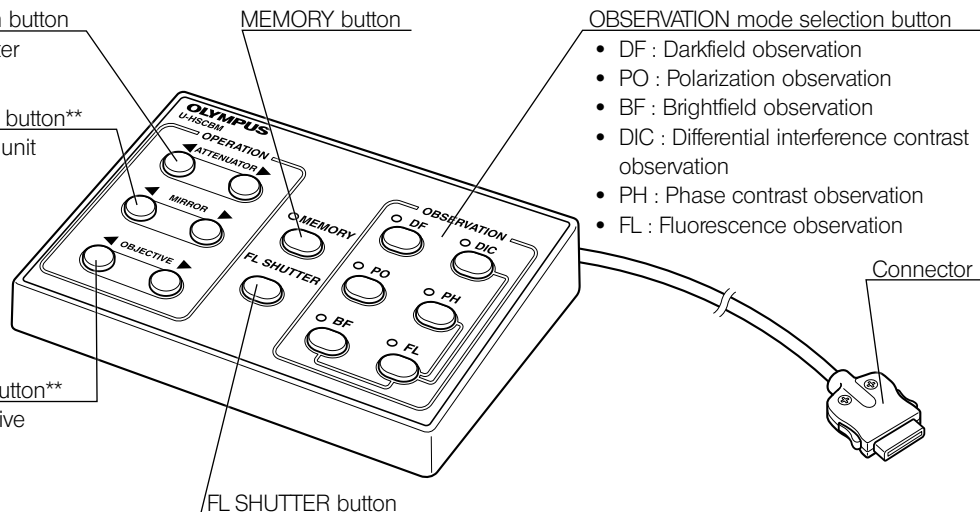
OBJECTIVE selection button\*\*  
For selecting the objective

MEMORY button

OBSERVATION mode selection button

- DF : Darkfield observation
- PO : Polarization observation
- BF : Brightfield observation
- DIC : Differential interference contrast observation
- PH : Phase contrast observation
- FL : Fluorescence observation

Connector



When using the coded 7-position nosepiece (U-D7RES) or the coded 6-position nosepiece (U-D6RES), the OBJECTIVE selection button is not available.

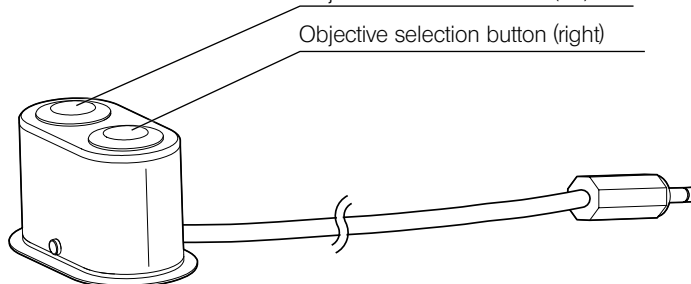
When using the coded fluorescence illuminator (BX3-RFAS), the MIRROR selection button is not available.

**TIP** When the motorized unit is working, the button for that motorized unit is not available.

Hand switch motorized nosepiece  
BX3M-HSRE

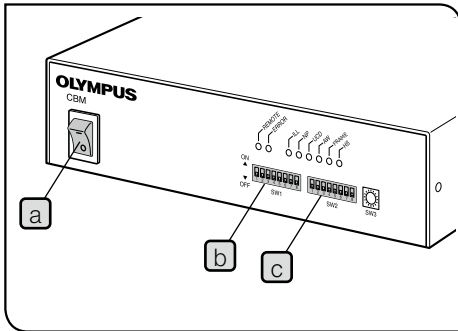
Objective selection button (left)

Objective selection button (right)



## 2 Operation

### 2-1 Operating the control box (BX3-CBM)



#### 1 Setting the DIP switch

The DIP switches of the control box (BX3-CBM) are covered with blindfold stickers. Peel off the blindfold stickers before setting DIP switches. Use a commercially available flathead screwdriver to set DIP switches (See tables on the next page for details). After setting DIP switches, attach the blindfold stickers. (The blindfold stickers are provided with the control box (BX3-CBM).)

**TIP** Be sure to set the main switch **a** to **●** (OFF) before setting the DIP switches (ON or OFF). Even though the DIP switch setting is changed when the main switch is **■** (ON), it is not reflected in the control box (BX3-CBM).

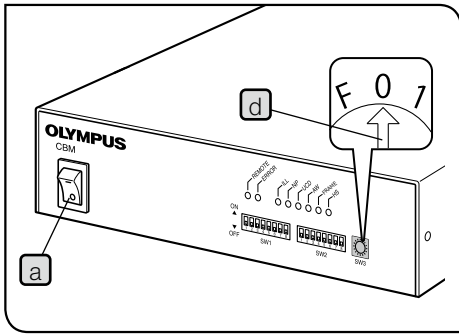
**NOTE** Be careful not to touch the internal circuit boards while setting the DIP switches. Otherwise, the control box (BX3-CBM) may be damaged due to static electricity. As the human body is slightly charged with static electricity, be sure to discharge the static electricity from your body before setting the DIP switches. The static electricity in your body can be discharged by simply touching a metallic object in your proximity.

: Factory default setting

Function / Unit	SW1 <input type="checkbox"/>								Setting
	1	2	3	4	5	6	7	8	
Initialization	ON								When the power is turned ON, the motorized unit connected to the control box (BX3-CBM) is not initialized.
	OFF								When the power is turned ON, the motorized unit connected to the control box (BX3-CBM) is initialized.
Confirmation sound		ON							The confirmation sound is not heard.
		OFF							The confirmation sound is heard. (One short beep if normal)
Hand switch motorized nosepiece (BX3M-HSRE)			ON						When the objective selection button (right) is pressed, the motorized revolving nosepiece rotates counterclockwise when viewed from above.
			OFF						When the objective selection button (right) is pressed, the motorized revolving nosepiece rotates clockwise when viewed from above.
Reserved by maker				ON					This switch is always kept OFF.
Reserved by maker				OFF					This switch is always kept OFF.
Reserved by maker					ON				This switch is always kept OFF.
Reserved by maker					OFF				This switch is always kept OFF.
Reserved by maker						ON			This switch is always kept OFF.
Reserved by maker						OFF			This switch is always kept OFF.
Reserved by maker							ON		This switch is always kept OFF.
Reserved by maker							OFF		This switch is always kept OFF.

: Factory default setting

Function / Unit	SW2 <input type="checkbox"/>								Setting
	1	2	3	4	5	6	7	8	
Reserved by maker	ON								This switch is always kept OFF.
Reserved by maker	OFF								This switch is always kept OFF.
Reserved by maker		ON							This switch is always kept OFF.
Reserved by maker		OFF							This switch is always kept OFF.
Reserved by maker			ON						This switch is always kept OFF.
Reserved by maker			OFF						This switch is always kept OFF.
Reserved by maker				ON					This switch is always kept OFF.
Reserved by maker				OFF					This switch is always kept OFF.
Reserved by maker					ON				This switch is always kept OFF.
Reserved by maker					OFF				This switch is always kept OFF.
Reserved by maker						ON			This switch is always kept OFF.
Reserved by maker						OFF			This switch is always kept OFF.



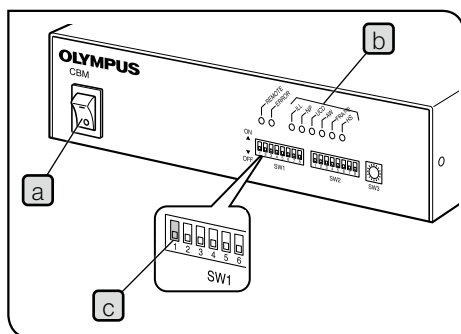
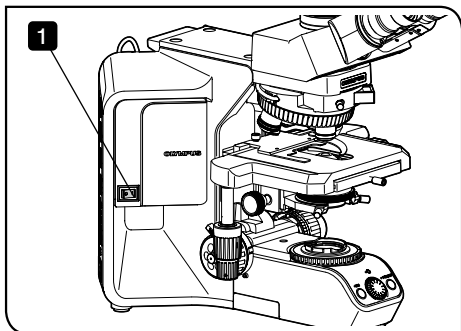
## 2 Setting the rotary switch

Rotate the rotary switch **d** of the control box (BX3-CBM) using a commercially available Phillips screwdriver to select the set type. With the rotary switch, 16 positions from 0 to F are selectable, but the following set types from 0 to 8 are prepared as an Evident factory default. Select the set type suitable for the microscope in use. For the set type, see "3-2 Motorized unit status when changing the objective" (p.15).

**TIP** Be sure to set the main switch **a** to **●** (OFF) before setting the rotary switch (selection of set type). Even though the rotary switch setting is changed when the main switch is **■** (ON), it is not reflected in the control box (BX3-CBM).

: Factory default setting

Set type	SW3 <b>d</b>									
	0	1	2	3	4	5	6	7	8	9 to F
Empty	■									
BF Plan Semi Apo set		■								
BF Plan Apo set			■							
BF No-cover set				■						
BF Plan set					■					
DIC Plan Apo set						■				
DIC Plan Semi Apo							■			
PH Plan Semi Apo set								■		
PH Plan set									■	
Empty										■



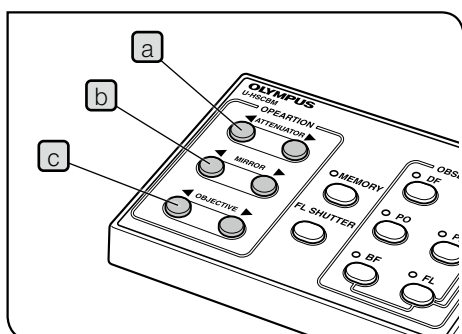
### 3 Turning ON the power

**NOTE** Make sure that each unit to be used is connected properly before turning ON the power of the control box (BX3-CBM). (p. 20)

- 1 Set the main switch of the microscope frame (BX53F2) to **I** (ON).
- 2 Set the main switch **a** of the control box (BX3-CBM) to **I** (ON).
- 3 Make sure that all LED indicators **b** of the connected units are turned ON properly.
- 4 The motorized units connected to the control box (BX3-CBM) are initialized (approx. 5 seconds). (If the setting of 1 **c** of DIP SW1 is set to ON, the motorized units are not initialized.)
  - The revolving nosepiece does not work.
  - After the aperture diaphragm (AS), top lens, turret and polarizer of the motorized universal condenser (BX3-UCD8A) are initialized, their statuses will be changed according to the observation method used last and the objective currently in the light path.
  - The light intensity of the reflected fluorescence light source adjusted using the motorized attenuator wheel (U-AW) is the same as the light intensity when the main switch **a** was last set to **O** (OFF).

## 2-2 Using the hand switch for CBM (U-HSCBM)

### 1 Using the OPERATION button



When the motorized unit is working, the button for that motorized unit is not available.

ATTENUATOR selection button **a**

This button selects the ND filter of the motorized attenuator wheel (U-AW).

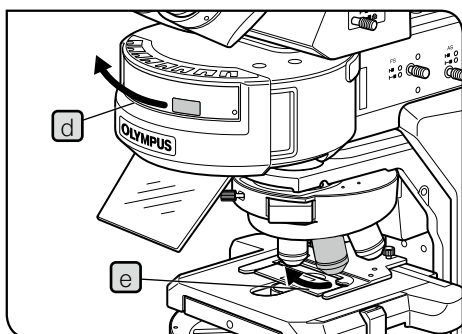
When the ND filter is changed, the light intensity which irradiates the specimen changes as well.

Button	Function
◀ direction	Becomes darker (Decreases the light intensity)
▶ direction	Becomes brighter (Increases the light intensity)

MIRROR selection button **b**

This button selects the mirror unit of the motorized fluorescence illuminator (BX3-RFAA).

Button	Function
◀ direction	Moves the display board shown in the mirror unit display window of the motorized fluorescence illuminator (BX3-RFAA) in clockwise direction (arrow <b>d</b> direction) by one position, and the turret number displayed increases by one.
▶ direction	Moves the display board shown in the mirror unit display window of the motorized fluorescence illuminator (BX3-RFAA) in counterclockwise direction (opposite to arrow <b>d</b> direction) by one position, and the turret number displayed decreases by one.



OBJECTIVE selection button **c**

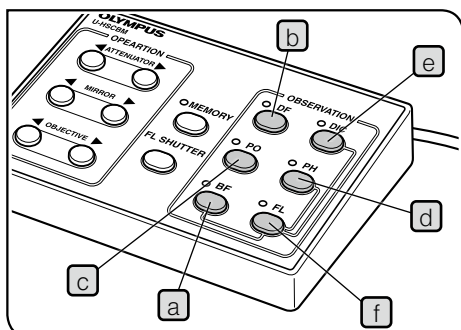
This button selects the objective.

When the objective is selected, the light intensity of the transmitted light illumination\* and the motorized unit\*\* will be changed to those specified in advance according to the observation method.

\* For procedures to specify the light intensity in advance (LIM function), refer to the instruction manual (system microscope BX53) provided separately.

\*\*For procedures to specify the motorized unit in advance, see "Using the MEMORY button" (p. 12).

Button	Function
◀ direction	Rotates the revolving nosepiece in clockwise direction (arrow <b>e</b> direction) to change to the next objective.
▶ direction	Rotates the revolving nosepiece in counterclockwise direction (opposite to arrow <b>e</b> direction) to change to the next objective.



## 2 Using the OBSERVATION button

The OBSERVATION button functions become available when using the motorized revolving nosepiece and coded revolving nosepiece.

When the motorized unit is working, the button for that motorized unit is not available.

The position and the setting value of each motorized unit are determined according to the observation method and the objective position to be selected. This position and the setting value are called the preset information.

The preset information can be changed arbitrarily by pressing the MEMORY button.

Press the following button to select the observation method. Pressing the button engages the optical element which is pre-registered per each objective according to the objective in the light path at that time. (The LED on the upper left of the button of the selected observation method turns ON.)

BF button **a** (Brightfield observation)

DF button **b** (Darkfield observation)

PO button **c** (Polarization observation)

PH button **d** (Phase Contrast observation)

DIC button **e** (Differential Interference Contrast observation)

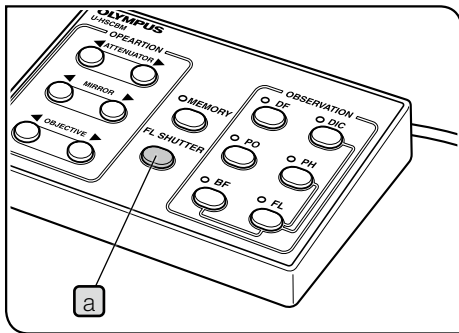
FL button **f** (Fluorescence observation)

Regarding the button operation for the simultaneous observation, i.e. fluorescence and brightfield observation, fluorescence and phase contrast observation or fluorescence and differential interference contrast observation, press the [FL] button first and then press the [BF], [PH] or [DIC] button.

**TIP** When the simultaneous observation is selected, the mirror unit position is moved to the position set in the last fluorescence observation.

When performing the simultaneous observation, place the ND filter (recommended to use two 45-ND6 filters) on the filter mount of the base of the BX53 frame (BX53F2).

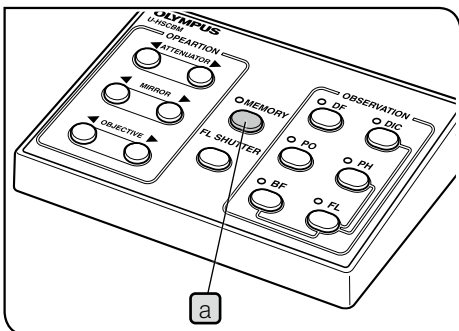
**TIP** During fluorescence observation, all buttons of the motorized universal condenser (BX3-UCD8A) are disabled and the aperture diaphragm (AS), turret, top lens and polarizer cannot be operated.



### 3 Using the FL SHUTTER button

This button opens or closes the shutter of the motorized fluorescence illuminator (BX3-RFAA) or the shutter of the motorized attenuator wheel (U-AW). When the observation is not taking place, press this [FL SHUTTER] button **a** to close the shutter to prevent the specimen from photobleaching. Press this button again to open the shutter.

**TIP** When the motorized fluorescence illuminator (BX3-RFAA) and the motorized attenuator wheel (U-AW) are connected, the shutter of the motorized fluorescence illuminator (BX3-RFAA) opens or closes.



### 4 Using the MEMORY button

This button changes the preset information registered in advance according to the objective in the light path and the selected observation method.

The preset information of the following motorized units are registered as factory default.

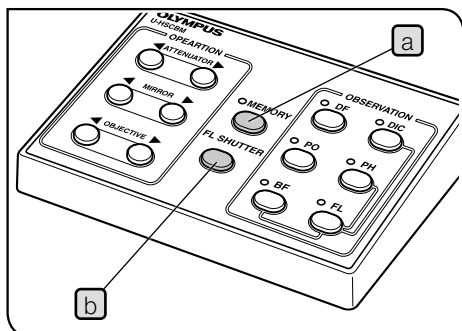
- Motorized universal condenser (BX3-UCD8A) : aperture diaphragm (AS), turret, top lens and polarizer
- Motorized fluorescence illuminator (BX3-RFAA) : mirror unit and shutter

For details, see "3 List of preset information" (p.14).

#### Changing the preset information

- 1** Select the objective and the observation method of which preset information will be changed.
- 2** Change the motorized unit status from the preset status and press the MEMORY button **a** for one second or longer. When a short beep is heard, the registration is completed.

**TIP** The preset information can also be registered by pressing the LIM switch and the PRESET switch of the BX53 frame (BX53F2) simultaneously for one second or longer instead of the MEMORY button **a**. When a short beep is heard, the registration is completed.



Restoring the preset information to the factory default setting

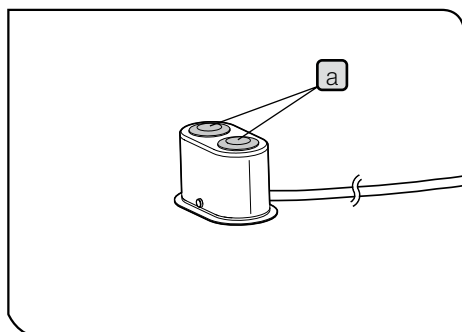
- 1 Set the main switch of the control box (BX3-CBM) to **●** (OFF).
- 2 While pressing the MEMORY button **a** and the FL SHUTTER button **b**, set the main switch of the control box (BX3-CBM) to **I** (ON). When the setting is restored to the factory default setting, a short beep is heard and the motorized units start initializing. (If the setting of 1 of DIP SW1 is changed to ON, the motorized units are not initialized.)

**TIP** You can also restore the setting to the factory default setting by setting the main switch of the control box (BX3-CBM) to **I** (ON) while pressing the LIM set switch and the PRESET switch of the BX53 frame (BX53F2) instead of the MEMORY button **a** and the FL SHUTTER button **b**. A short beep is heard and the motorized units start initializing.

**NOTE** If the preset data is not restored, a short beep is heard five times continuously and the LED on the upper left of the MEMORY button **a** blinks. This is a malfunction. Contact Evident for assistance.

## 2-3 Using the hand switch motorized nosepiece (BX3M-HSRE)

**TIP** When the hand switch for CBM (U-HSCBM) is connected to the control box (BX3-CBM), disconnect the hand switch for CBM (U-HSCBM) from the control box (BX3-CBM).



### 1 Using the objective selection button

- 1 Press the objective selection button **a** to select the objective.

When the objective is selected, the light intensity of the transmitted light illumination \* and the motorized unit\*\* will be changed to those specified in advance.

\* For procedures to specify the light intensity in advance (LIM function), refer to the instruction manual (system microscope BX53) provided separately.

\*\*For procedures to specify the motorized unit in advance, see "Using the MEMORY button" (p. 12).

**TIP** The rotation direction of the revolving nosepiece when the objective selection button **a** is pressed can be changed by setting the DIP switch of the control box (BX3-CBM). For details, see "Setting the DIP switch" (p. 6).

**NOTE** Be sure to set the main switch to **●** (OFF) before setting the DIP switches.

# 3 List of preset information

## 3-1 Motorized unit status when changing the observation method

The motorized unit status when changing the observation method is set as follows as factory default. This setting is called the preset information.

Observation method	Motorized unit status					
	Motorized universal condenser (BX3-UCD8A)				Motorized fluorescence illuminator (BX3-RFAA)	
	Aperture diaphragm (AF)	Turret	Top lens	Polarizer	Shutter	Mirror unit
Fluorescence observation [FL]	Close to minimum	Position between holes (shutter status)	OUT position	OUT position	OPEN position	Mirror unit position in last fluorescence observation
Phase contrast observation [PH]	Open to maximum	The turret position moves according to the objective in the light path. See tables shown later.	The unit status changes according to the objective in the light path. See tables shown later.	OUT position	CLOSE position	No.7 Empty hole position
Differential interference contrast observation [DIC]	The aperture diaphragm diameter changes according to the objective in the light path.	The turret position moves according to the objective in the light path. See tables shown later.	The unit status changes according to the objective in the light path. See tables shown later.	IN position	CLOSE position	No.8 U-FDICT
Brightfield observation [BF]	The aperture diaphragm diameter changes according to the objective in the light path.	No.8 Empty hole position	The unit status changes according to the objective in the light path. See tables shown later.	OUT position	CLOSE position	No.7 Empty hole position
Polarization observation [PO]	The aperture diaphragm diameter changes according to the objective in the light path.	No.8 Empty hole position	The unit status changes according to the objective in the light path. See tables shown later.	IN position	CLOSE position	No.8 U-FDICT
Darkfield observation [DF]	Open to maximum	The turret position moves according to the objective in the light path. See tables shown later.	The unit status changes according to the objective in the light path. See tables shown later.	OUT position	CLOSE position	No.7 Empty hole position

The unit status during the simultaneous observation, i.e. fluorescence and brightfield observation, fluorescence and phase contrast observation, or fluorescence and differential interference contrast observation, is the same as the status during observation method excluding fluorescence observation.

Example : The unit status during the simultaneous observation of fluorescence and brightfield is the same as during brightfield observation.

When performing the simultaneous observation, place the ND filter (recommended to use two 45-ND6 filters) on the filter mount of the base of the BX53 frame (BX53F2).

### 3-2 Motorized unit status when changing the objective

The following set types from 1 to 8 are prepared as factory default. The following tables show the preset information per each set type and indicate how the turret of the motorized universal condenser (BX3-UCD8A) and the turret of the motorized fluorescence illuminator (BX3-RFAA) work when the objective is changed.

To select the proper optical element according to the observation method and the objective, set the optical element on the turret in advance according to the following table.

1. BF Plan Semi Apo set

Applicable observation method : <input type="checkbox"/> BF / <input type="checkbox"/> PO / <input type="checkbox"/> FL		Motorized universal condenser (BX3-UCD8A)										Motorized fluorescence illuminator (BX3-RFAA)	
		Top lens	Turret No.										Turret No.
Nosepiece hole No.	Objective	U-TLD	1	2	3	4	5	6	7	8	No action	7	8
1	UPLFLN4X	OUT								<input type="checkbox"/> BF / <input type="checkbox"/> PO Empty hole	<input type="checkbox"/> PH / <input type="checkbox"/> DIC / <input type="checkbox"/> DF	<input type="checkbox"/> PH / <input type="checkbox"/> DF / <input type="checkbox"/> BF Empty hole	<input type="checkbox"/> DIC / <input type="checkbox"/> PO U-FDICT
2	UPLFLN10X2	IN											
3	UPLFLN20X	IN											
4	UPLFLN40X	IN											
5	UPLFLN100XO2	IN											
6	PLAPON1.25X	OUT											
7	PLAPON2X	OUT											

2. BF Plan Apo set

Applicable observation method : <input type="checkbox"/> BF / <input type="checkbox"/> PO / <input type="checkbox"/> FL		Motorized universal condenser (BX3-UCD8A)										Motorized fluorescence illuminator (BX3-RFAA)	
		Top lens	Turret No.										Turret No.
Nosepiece hole No.	Objective	U-TLD	1	2	3	4	5	6	7	8	No action	7	8
1	PLAPON1.25X	OUT								<input type="checkbox"/> BF / <input type="checkbox"/> PO Empty hole	<input type="checkbox"/> PH / <input type="checkbox"/> DIC / <input type="checkbox"/> DF	<input type="checkbox"/> PH / <input type="checkbox"/> DF / <input type="checkbox"/> BF Empty hole	<input type="checkbox"/> DIC / <input type="checkbox"/> PO U-FDICT
2	PLAPON2X	OUT											
3	UPLSAPO4X	OUT											
4	UPLSAPO10X2	IN											
5	UPLSAPO20X	IN											
6	UPLSAPO40X2	IN											
7	UPLSAPO100XO	IN											

3. BF No-cover set

Applicable observation method : <input type="checkbox"/> BF / <input type="checkbox"/> PO / <input type="checkbox"/> FL		Motorized universal condenser (BX3-UCD8A)										Motorized fluorescence illuminator (BX3-RFAA)	
		Top lens	Turret No.										Turret No.
Nosepiece hole No.	Objective	U-TLD	1	2	3	4	5	6	7	8	No action	7	8
1	PLAPON1.25X	OUT								<input type="checkbox"/> BF / <input type="checkbox"/> PO Empty hole	<input type="checkbox"/> PH / <input type="checkbox"/> DIC / <input type="checkbox"/> DF	<input type="checkbox"/> PH / <input type="checkbox"/> DF / <input type="checkbox"/> BF Empty hole	<input type="checkbox"/> DIC / <input type="checkbox"/> PO U-FDICT
2	PLAPON2X	OUT											
3	UPLFLN4X	OUT											
4	UPLFLN10X2 (MPLFLN10X)	IN											
5	MPLFLN20X	IN											
6	MPLFLN40X	IN											
7	MPLFLN100XO	IN											

4. BF Plan set

		Motorized universal condenser (BX3-UCD8A)										Motorized fluorescence illuminator (BX3-RFAA)	
Applicable observation method : BF/PO/FL		Top lens	Turret No.									Turret No.	
Nosepiece hole No.	Objective	U-TLD	1	2	3	4	5	6	7	8	No action	7	8
1	PLN2X(PLCN2X)	OUT											
2	PLN4X(PLCN4X)	OUT											
3	PLN10X(PLCN10X)	IN								BF/PO Empty hole	PH/DF DIC/DF	PH/DF BF	DIC/PO U-FDICT
4	PLN20X(PLCN20X)	IN											
5	PLN40X(PLCN40X)	IN											
6	PLN100X(PLCN100X)	IN											

5. DIC Plan Apo set

		Motorized universal condenser (BX3-UCD8A)										Motorized fluorescence illuminator (BX3-RFAA)	
Applicable observation method : BF/DIC/FL		Top lens	Turret No.									Turret No.	
Nosepiece hole No.	Objective	U-TLD	1	2	3	4	5	6	7	8	No action	7	8
1	UPLSAPO10X2	IN	DIC U-DIC10S										
2	UPLSAPO20X	IN				DIC U-DIC20							
3	UPLSAPO40X2	IN					DIC U-DIC40			BF/PO Empty hole	PH/DF	PH/DF BF	DIC/PO U-FDICT
4	UPLSAPO60XO	IN					DIC U-DIC60						
5	UPLSAPO100XO	IN						DIC U-DIC100					

6. DIC Plan Semi Apo set

		Motorized universal condenser (BX3-UCD8A)										Motorized fluorescence illuminator (BX3-RFAA)	
Applicable observation method : BF/DIC/FL		Top lens	Turret No.									Turret No.	
Nosepiece hole No.	Objective	U-TLD	1	2	3	4	5	6	7	8	No action	7	8
1	UPLFLN10X2	IN	DIC U-DIC10S										
2	UPLFLN20X	IN				DIC U-DIC20							
3	UPLFLN40X	IN					DIC U-DIC40			BF/PO Empty hole	PH/DF	PH/DF BF	DIC/PO U-FDICT
4	UPLFLN60XOI	IN					DIC U-DIC60						
5	UPLFLN100XO2	IN						DIC U-DIC100					

7. PH Plan Semi Apo set

Applicable observation method : BF PH DF FL

		Motorized universal condenser (BX3-UCD8A)										Motorized fluorescence illuminator (BX3-RFAA)	
		Top lens	Turret No.									Turret No.	
Nosepiece hole No.	Objective	U-TLD	1	2	3	4	5	6	7	8	No action	7	8
1	UPLFLN4X	OUT								Empty hole	DIC	Empty hole	U-FDICT
2	UPLFLN10X2PH	IN	<input type="checkbox"/> PH U-PH1-S			<input type="checkbox"/> DF U-DFA							
3	UPLFLN20XPH	IN	<input type="checkbox"/> PH U-PH1-S			<input type="checkbox"/> DF U-DFA							
4	UPLFLN40XPH	IN		<input type="checkbox"/> PH U-PH2-S		<input type="checkbox"/> DF U-DFA							
5	UPLFLN100X02PH	IN			<input type="checkbox"/> PH U-PH3-S								

8. PH Plan set

Applicable observation method : BF PH DF FL

		Motorized universal condenser (BX3-UCD8A)										Motorized fluorescence illuminator (BX3-RFAA)	
		Top lens	Turret No.									Turret No.	
Nosepiece hole No.	Objective	U-TLD	1	2	3	4	5	6	7	8	No action	7	8
1	PLN4X	OUT								Empty hole	DIC	Empty hole	U-FDICT
2	PLN10XPH	IN	<input type="checkbox"/> PH U-PH1-S			<input type="checkbox"/> DF U-DFA							
3	PLN20XPH	IN	<input type="checkbox"/> PH U-PH1-S			<input type="checkbox"/> DF U-DFA							
4	PLN40XPH	IN		<input type="checkbox"/> PH U-PH2-S		<input type="checkbox"/> DF U-DFA							
5	PLN100XOPH	IN			<input type="checkbox"/> PH U-PH3-S								

**TIP** Attach the low magnification conversion lens for UCD U-CO1.25X to one of the turret positions from 4 to 7 of the motorized universal condenser (BX3-UCD8A) and press the MEMORY button of the hand switch (U-HSCBM) to register it.

# 4 Specifications

Item	Specification
Control box (BX3-CBM)	
Power supply	Control box Input : 24 V / 2.8 A $\overline{\text{---}}$ AC adapter Input : 100-240 V $\sim$ 50-60 Hz 1.4 A Output : 24 V $\overline{\text{---}}$ 2.71 A
Indicator LED	<ul style="list-style-type: none"> <li>• REMOTE LED</li> <li>• ERROR LED</li> <li>• Connected unit LED</li> </ul> ILL / NP / UCD / AW / FRAME / HS
DIP switch	<ul style="list-style-type: none"> <li>• DIP switch for setting operations</li> <li>• Rotary switch for selecting observation method (16 positions from 0 to 9 and A to F)</li> </ul>
Dimensions / Weight	185(W) x 48(H) x 120(D) mm; approx. 0.82 kg
Hand switch for CBM (U-HSCBM)	
Button functions	<ul style="list-style-type: none"> <li>• OBSERVATION mode selection button DF / PO / BF / DIC / PH / FL</li> <li>• ATTENUATOR selection button ◀▶</li> <li>• MIRROR selection button ◀▶</li> <li>• OBJECTIVE selection button ◀▶</li> <li>• MEMORY button</li> <li>• FL SHUTTER button</li> </ul>
Dimensions / Weight	147(W) x 32(H) x 108(D) mm; approx. 0.3 kg
Operating environment	
<ul style="list-style-type: none"> <li>• Indoor use</li> <li>• Altitude : Max. 2000 meters</li> <li>• Ambient temperature : 5 to 40 °C (41 to 104 °F)</li> <li>• Humidity : Max. 80 % (31 °C or less) (without condensation) In case of over 31 °C (88 °F), the humidity in operating environment 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 : <math>\pm 10</math> %</li> <li>• Pollution degree : 2 (in accordance with IEC60664-1)</li> <li>• Installation (overvoltage) category : II (in accordance with IEC60664-1)</li> </ul>	

# 5 Troubleshooting

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

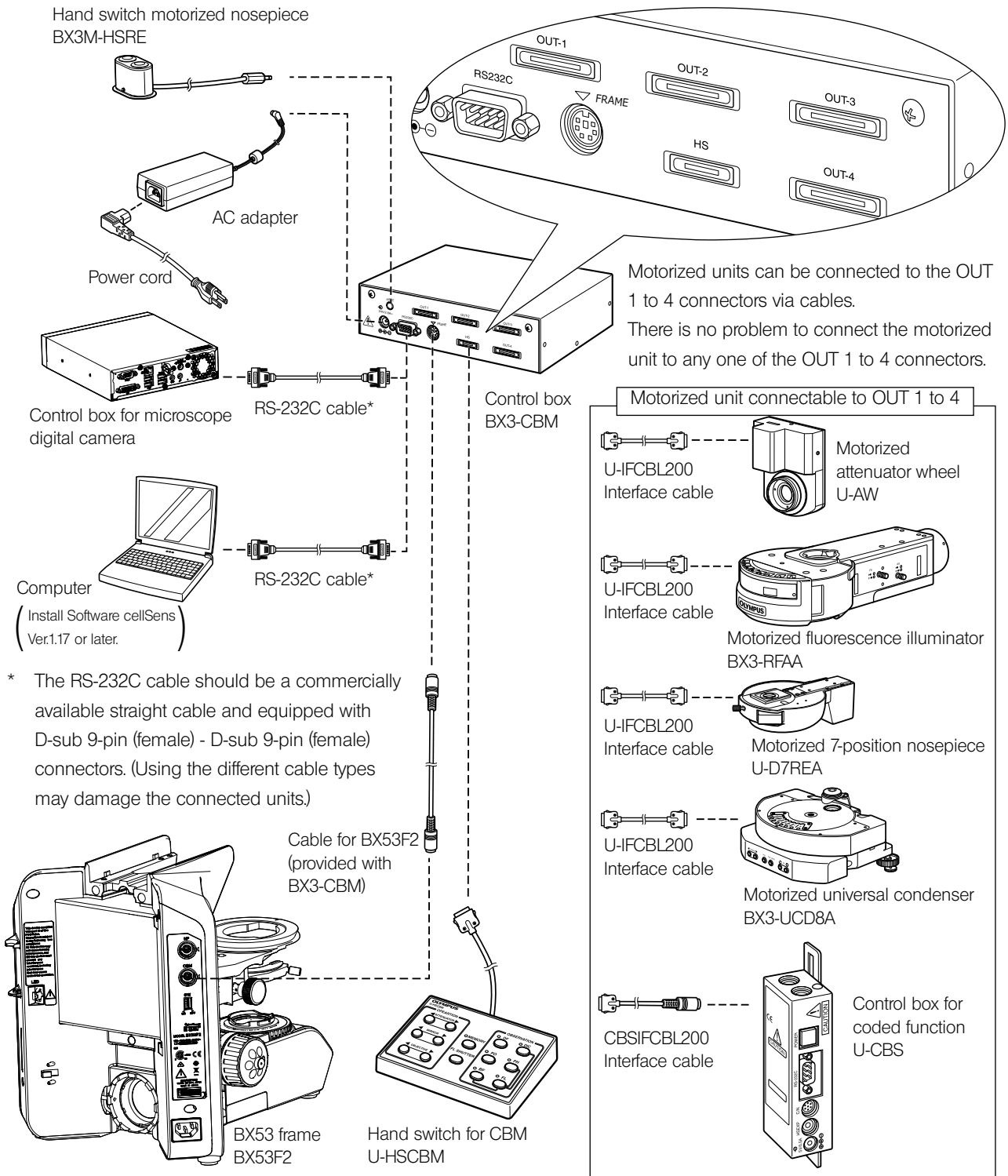
If you cannot solve the problem after checking the entire list, please contact Evident for assistance.

Problem	Cause	Remedy	Page
The ERROR indicator LED blinks.	The unit indicated by the connected unit indicator LED blinking at the same time is not connected properly.	Connect the unit indicated by the connected unit indicator LED blinking properly.	20
The power does not turn ON even though the main switch is set to I (ON).	The power cord is unplugged.	Connect the power cord properly.	21
The RS-232C communication is not available.	An inappropriate RS-232C cable is used.	Replace with the specified RS-232C cable.	20
	The RS-232C cable is not connected properly.	Connect the RS-233C cable properly.	20
The hand switch buttons are disabled or the LED does not turn ON.	The cable of the hand switch is not connected properly.	Connect the cable of the hand switch properly.	20
The motorized unit does not work. The connected unit indicator LED is not turned ON.	The cable of the motorized unit is not connected properly.	Connect the cable of the motorized unit properly.	20
Even though the objective selection button of the hand switch motorized nosepiece (BX3M-HSRE) is pressed, the motorized nosepiece does not rotate.	The hand switch for CBM (U-HSCBM) is connected to the control box (BX3-CBM).	Disconnect the hand switch for CBM (U-HSCBM) from the control box (BX3-CBM).	20
Even though the button of the motorized universal condenser (BX3-UCD8A) is operated, the motorized universal condenser (BX3-UCD8A) does not work.	The FL button is selected on the hand switch for CBM (U-HSCBM).	Select any other OBSERVATION mode selection button except the FL button.	11

# 6 Connecting cables

**NOTE** • Be sure to set the main switch of the control box (BX3-CBM), the main switch of the control box for coded function (U-CBS) and the main switch of the BX53 frame (BX53F2) to **● (OFF)** before connecting the cables of each unit. The following diagram shows only the cable connections associated with the control box (BX3-CBM).

- Be sure to connect only cables specified by Evident to the connectors. Connect the connectors in the correct orientation paying attention to the shape of the connector. If a connector is equipped with clamping screws, be sure to tighten them firmly.
- Use the computer which satisfies the requirements of IEC 60950.



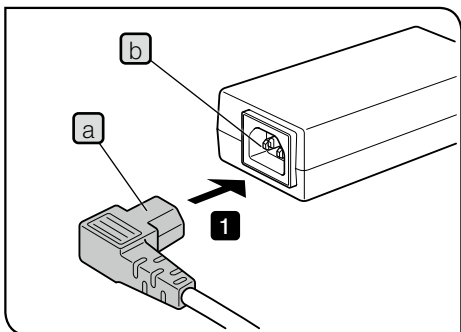
### Connecting the AC adapter and the power cord

**CAUTION** • Always use the AC adapter and the power cord provided by Evident. If the proper AC adapter and the power cord are not used, the electric safety and the EMC (Electro-Magnetic Compatibility) performance of the product 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.

- Connect the power cord plug to the grounded triplex outlet. If the outlet is not grounded, the electric safety performance intended by Evident cannot be assured.
- If the power cord contacts a hot area of the devices, such as a lamp housing of the microscope, etc., the cord could melt and cause electric shock. Be sure to route the power cord sufficiently away from the hot area of the device.

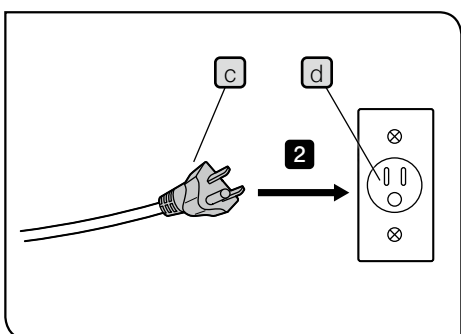
**NOTE** • Set the main switch of the control box (BX3-CBN) to **○** (OFF) before connecting the power cord.

- Cables are vulnerable when bent or twisted. Never subject them to excessive force.



**1** Connect the connector **a** of the power cord to the connector **b** of the AC adapter.

**2** Connect the power cord's plug **c** to the power outlet **d** on the wall.



**3** Use the Velcro tape (3 pcs.) and the cable holder (4 pcs.) provided with BX3-CBM to bundle the connection cables.

## ■ Proper selection of the power supply cord

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




















**Caution : In case you use a non-approved power supply 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 supply 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 supply 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, JQA	
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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Service Center



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