KC4AF
Instruction Manual

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Ver.1.4

LMZ1000AMPDC-XF
LMZ20750AMPDC-XF
LMZ20550AMPDC-XF
LMZ1236AMPDC-XF
LMZ0824AMPDC-XF
LMZ7527AMPDC-XF
LMZ2200AMPDC-XF
LMZ25300AMPDC-IR
LMZ16160AMPDC-IR
LMZ11176AMPDC-IR
LMZ1177AMPDC-IR
LMZ10360AMPDC-IR
LMZ14500AMPDC-IR
LMZ0812AMPDC-IR
LMZ300AMPDC

Kowa **Kowa Optical Products Co., Ltd.**

1. Precautions

• Warning and caution labels

 This instruction manual uses the following labels. Understand the meaning of the labels before reading the instructions.

| ⚠ **Warning** | Failure to follow the instructions on this label may lead to a fatal accident or serious injury. |
| ⚠ **Caution** | Improper handling of the product without following the instructions on this label may lead to personal injury or property damage. |

• Understanding the pictorial indications

 For safe use of this product, this manual uses pictures that represent warnings and cautions. Understand these pictorial indications before using the product.

⚠	The ▲ picture indicates that you should pay attention it.
🚫	The ◌ picture indicates that you MUST NOT do something. For example, the left picture means "do not disassemble."
●	The ● picture indicates that you MUST do something. For example, the left picture indicates that you must remove the cable from the connector.

⚠ **Warning**

♦ In case any of the following irregularities occurs, stop using the product.

* Continuing to use the product causes a fire, electric shock, burn, or failure.

   • An abnormal condition is encountered such as smoke and a strange smell.

   • Water or a material has entered the product.

   • The product has been dropped or become damaged.

   • A cable is damaged (e.g., the core is exposed or broken).

In any of these cases, immediately turn off the product and disconnect the cables. Then, contact your distributor or KOWA OPTICAL PRODUCTS CO.,LTD. for repair.

♦ Do not repair, disassemble, or alter the product.

* Doing so causes a fire, electric shock, burn, or failure.

♦ When the product must be connected to a different device, follow the instructions for that device to connect the product in the correct procedure.

* Failure to do so may cause an unexpected problem.

♦ Do not place the product on an unstable surface.

* Doing so may cause the product to drop or fall causing personal injury or a product failure.

♦ Do not connect the product in any manner not specified in this instruction manual.

* Doing so may cause a fire, electric shock, burn, or failure.

♦ Ensure that the cables are seated all the way in.

* Failure to do so may cause a short circuit, fire, electric shock, burn, or failure.

♦ Do not insert a object into the product.

* Doing so may cause a fire, electric shock, burn, and failure.

♦ Do not wet the product or use or store in wet locations.

* Doing so may cause a fire, electric shock, burn, and failure.

♦ Do not handle the product with wet hands.

* Doing so may cause a fire, electric shock, burn, and failure.

♦ When thunder is heard, disconnect the cables or turn off the device connected to the product.

* Failure to do so may cause a failure or electric shock.

♦ Do not keep any containers containing a liquid or small metal objects on or near the product.

* They may enter the product for some reason, causing a fire, electric shock, burn, or failure.

♦ For this product, use a UL-complaint power supply with a nominal output of 12V DC and a maximum rated short-circuit current of 2 A or a power supply bearing an LPS (Limited Power Source) label.

* Failure to do so may cause a failure or electric shock.

⚠ Caution

♦ We will not be liable for any damage caused by loss or corruption of data saved on your computer during the use of the product. You must be responsible for backing up your data.

♦ Slowly insert or disconnect each cable into/from the corresponding connector straight and in the correct direction. Do not apply undue force or squeeze a cable into a connector.

* Doing so may cause a failure.

♦ Do not apply stress on cables or connectors.

* Doing so may cause a failure.

♦ Do not use or store the product at any of the following places.

* Doing so may cause a failure.
  • Places exposed to high temperatures or high humidity beyond the specified temperature range or places with much dust
  • Places near a heat source (e.g., stove and heater)
  • Wet place
  • Places exposed to significant temperature or humidity changes
  • Places exposed to vibration and/or impact
  • Places exposed to direct sunlight

♦ Do not drop the product or apply an impact to the product.

* Doing so may cause a failure.

♦ Do not place a heavy object on the product.

* Doing so may cause the product to lose its balance and drop or fall, leading to personal injury or a product failure.

♦ Do not connect or disconnect cables to/from the product without turning off the device connected with the product.

* Doing so may cause an electric shock or failure.

♦ Do not strongly hold down or strike cables or connectors or do not try to route them with undue force.

* Doing so may cause a failure or damage parts, leading to personal injury.

♦ When moving the product, ensure that the connected cables are removed.

* Moving the product with the cables connected may cause a fire, electric shock, or failure.

♦ When the product will not be used for long periods, disconnect the cables.

* Failure to do so may cause a fire or failure.

♦ When disconnecting a cable, do not pull on the cable itself but hold the connector.

* Pulling the cable alone may cause it to be damaged, leading to a fire, electric shock, or failure.

♦ Do not use the product with condensation in it.
* Doing so may cause a fire, electric shock, or failure.

♦ Do not use a mobile phone or other devices that emit radio waves near the product.
* Doing so may cause the product to malfunction.

♦ To remove stains from the product, use a dry, soft cloth to wipe the product. To use detergent to remove stains, be sure to disconnect the cables and dilute the neutral detergent with water.

* Do not use a detergent that contains benzene, thinner, alcohol, or the like. Using such a detergent may discolor or deteriorate the product.

1. Scope

   This document is the instruction manual for KC4AF.

2. Overview

   KC4AF is a zoom lens control unit. This unit has motor control ports and serial communication port.

   Serial communication is RS232, RS422 or RS485 and supports PELCO-D protocol command.

   And, this unit can perform AF operation using analogue video signal from a camera.

3. Contents

   ・KC4AF   1

   ・Ferrite core   2

   ・8pin connector   1

   ・7pin connector   1

   ・5pin connector   1

   ・This document   1

※ **Caution**

   KC4AF must set the zoom lens model with OSD menu (P25) or PELCO-D protocol command (P22,P23).

   If the set zoom lens model and the using zoom lens model are different, it will not work properly.

   After zoom lens selected, it is necessary to restart the power supply of KC4AF. (The setting will be reflected by restart)

   The corresponding zoom lens models are as follows.

      ・ LMZ1000AMPDC-XF

      ・ LMZ20750AMPDC-XF

      ・ LMZ20550AMPDC-XF

      ・ LMZ1236AMPDC-XF

      ・ LMZ0824AMPDC-XF

      ・ LMZ7527AMPDC-XF

      ・ LMZ2200AMPDC-XF

      ・ LMZ25300AMPDC-IR

      ・ LMZ16160AMPDC-IR

      ・ LMZ11176AMPDC-IR

      ・ LMZ1177AMPDC-IR

      ・ LMZ10360AMPDC-IR

      ・ LMZ14500AMPDC-IR

      ・ LMZ0812AMPDC-IR

      ・ LMZ300AMPDC

4. Specifications

The specifications of KC4AF are as follows.

Table 1：Specifications

Video input	Analogue video signal NTSC/PAL
Video output	Analogue video signal NTSC/PAL
Video connector	2 BNC(in and out)
Power	DC+12V±10%
Power consumption	3.5W
I/O Ports	7 pins connector (MC1.5/7-ST-3,5-0) 　　For power and serial control 8 pins connector (MC1.5/8-ST-3,5-0) 　　For zoom and focus control 5 pins connector (MC1.5/8-ST-3,5-0) 　　For iris control
Operation temperature and humidity	-10 - + 50 degrees Celsius / 20 - 80 % (without condensation)
Storage temperature and humidity	-20 - + 60 degrees Celsius / 20 - 90 % (without condensation)
Supported standards	CE (EN55032, EN50130-4) FCC part-15 class B RoHS

5. Out drawing

The out drawing is shown in Fig.1.
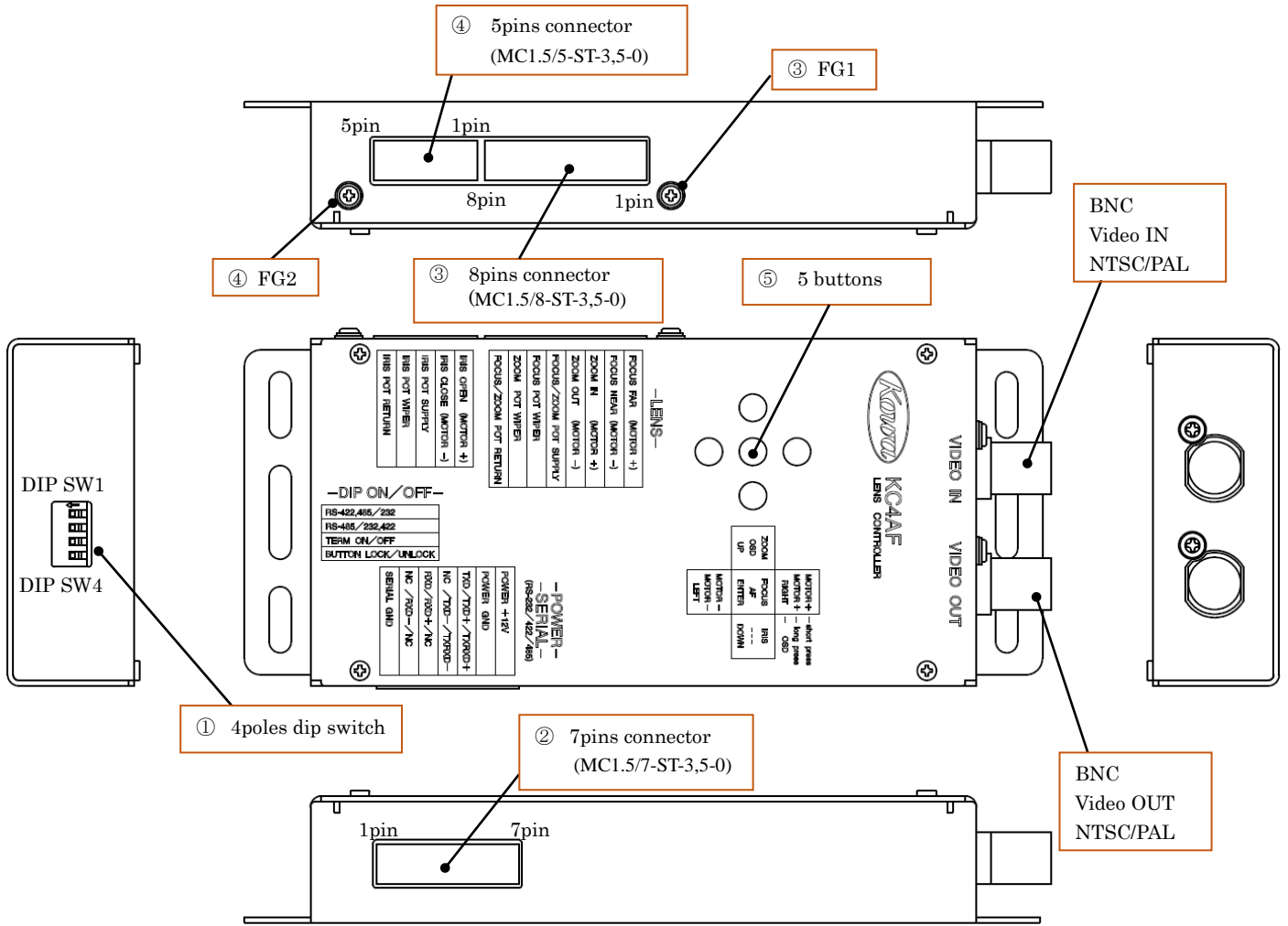
Fig.1：The out drawing

① 4poles dip switch

The dip switch settings are shown in Table 2 and Table 3.

Table 2：The dip switch setting 1

		DIP SW2	
		ON	OFF
DIP	ON	RS-485	RS-422
SW1	OFF	-	RS-232

DIP SW1 and DIP SW2 are select switches of RS-232/422/485.

Table 3：The dip switch setting 2

	Description	ON	OFF
DIP SW3	RS-422/485 termination resistor	enable	disable
DIP SW4	Button lock	enable	disable

The termination resistors are 120 ohm.

All dip switch default settings are OFF.

9

② 7pins connector(MC1.5/7-ST-3,5-0)

Table 4：7pins connector's assign

Pin	Description	Note
1	Serial GND	
2	RS-422 RXD-	
3	RS-232 RXD　/　RS-422 RXD+	
4	RS-422 TXD-　/　RS-485 B(-)	
5	RS-232 TXD　/　RS-422 TXD+　/　RS-485 A(+)	
6	Power GND	DC+12V　±10%
7	Power DC+12V	(max 3.5W)

③ 8pins connector(MC1.5/8-ST-3,5-0) &FG1

Table 5：8pins connector's assign

Pin	Description	Note
1	FOCUS FAR	
2	FOCUS NEAR	
3	ZOOM IN	
4	ZOOM OUT	
5	FOCUS / ZOOM POT POWER	Connect to the lines of the zoom lens.
6	FOCUS WIPER	
7	ZOOM WIPER	
8	FOCUS / ZOOM POT GND	

FG1	FOCUS / ZOOM FG	FG exists beside 8pins connector. Connect to the shield cable of zoom lens.

④ 5pins connector(MC1.5/5-ST-3,5-0) & FG2

Table 6：5pins connector's assign

Pin	Description	Note
1	IRIS OPEN	
2	IRIS CLOSE	
3	IRIS POT SUPPLY	Connect to the lines of the zoom lens.
4	IRIS POT WIPER	
5	IRIS POT RETURN	

FG2	IRIS FG	FG exists beside 5pins connector. Connect to the shield cable of zoom lens.

⑤ 5 buttons

The 5 buttons function is shown in Fig.2 and Table 7.
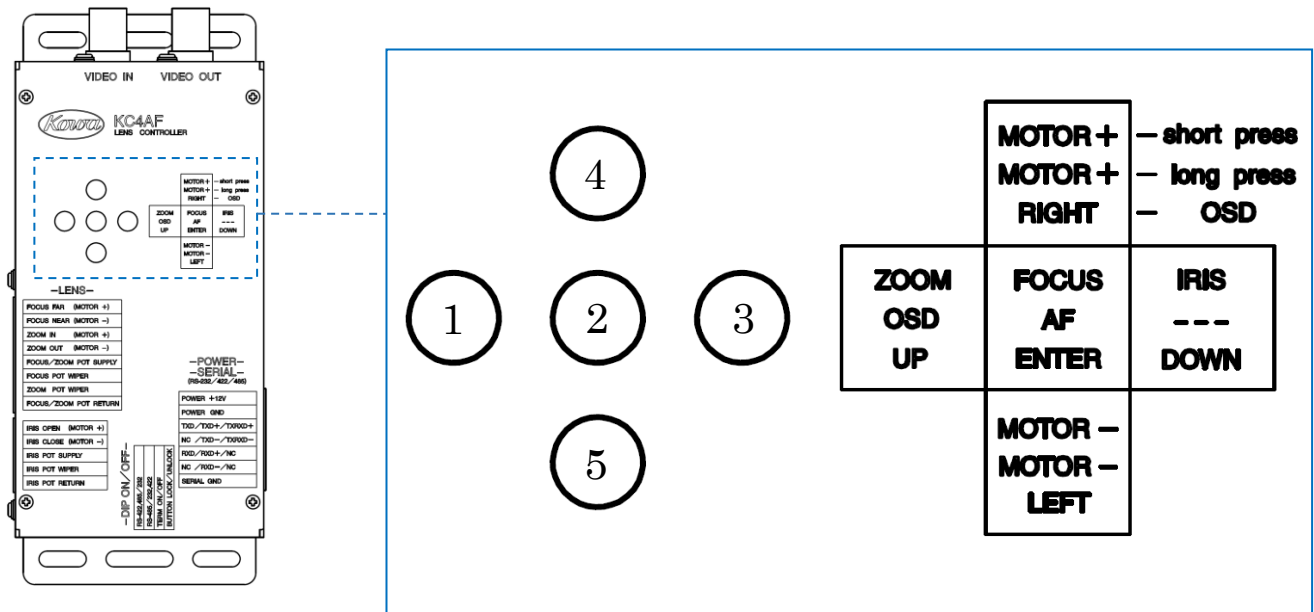
Fig.2：The 5buttons drawing

Table 7：5buttons function

	Function by short press	Function by long press	Function at OSD menu
Button 1	Select zoom motor control mode	Open OSD menu	up
Button 2	Select focus motor control mode	Start AF	
Button 3	Select iris motor control mode		down
Button 4	Motor control at each control mode 　Move focus to Far 　Move zoom to Tele 　Move iris to Open	Motor control at each control mode 　Continue focus to Far 　Continue zoom to Tele 　Continue iris to Open	right
Button 5	Motor control at each control mode 　Move focus to Near 　Move zoom to Wide 　Move iris to Close	Motor control at each control mode 　Continue focus to Near 　Continue zoom to Wide 　Continue iris to Close	left

6. Connections

The connection diagram is shown in Fig.3.
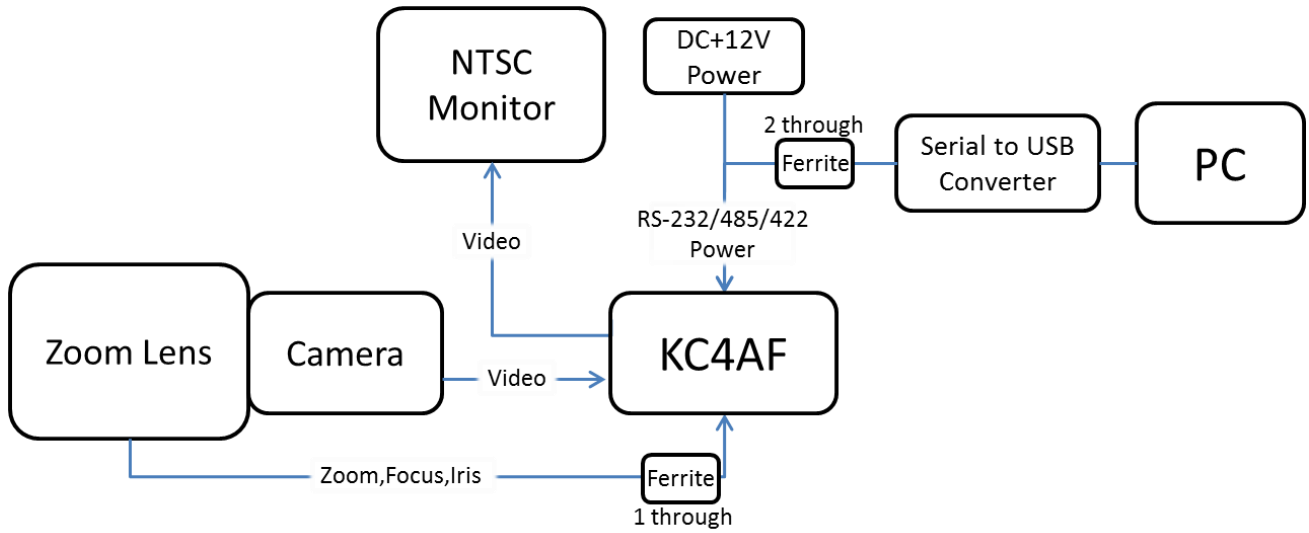
Fig.3：Connection diagram

Connect to the peripheral devices before turning on the power of KC4AF. As shown Fig.3, attach a ferrite core to KC4AF side of the Zoom, Focus, Iris cables and RS-232/485/422 lines.

7. Control commands

The zoom lens can be controlled by PELCO-D protocol commands. The Serial communication specification is shown below.

Table 8：Serial communication specification

Baud rate	2400 / 4800 / 9600(default) / 19200 / 38400
Data-bit	8 bit
Parity	None
Stop bit	1 bit

Supported PELCO-D protocol commands are shown in Table 9.

Table 9：Supported PELCO-D protocol commands

Command	Description
Move Focus To Near	Moving to Near side. The motor stops by the stop command.
Move Focus To Far	Moving to Focus side. The motor stops by the stop command.
Move Zoom To Wide	Moving to Wide side. The motor stops by the stop command.
Move Zoom To Tele	Moving to Tele side. The motor stops by the stop command.
Move Iris To Close	Moving to Close side. The motor stops by the stop command.
Move Iris To Open	Moving to Open side. The motor stops by the stop command.
Stop	Stop the motor.
Execute AF	Executing AF one time.
Set Focus position	Preset the focus position. (0x0000～0xFFFF)
Set Zoom position	Preset the zoom position. (0x0000～0xFFFF)
Set Iris position	Preset the iris position. (0x0000～0xFFFF)
Inquiry Focus position	Inquiring the focus position. (0x0000～0xFFFF)
Inquiry Zoom position	Inquiring the zoom position. (0x0000～0xFFFF)
Inquiry Iris position	Inquiring the iris position. (0x0000～0xFFFF)
Set Continuously Focus Speed	Set the zoom motor speed for each 4 levels.
Set Continuously Zoom Speed	Set the focus motor speed for each 4 levels.
Set Continuously Iris Speed	Set the iris motor speed for each 4 levels.
Set Focus Speed	Set the focus motor speed. (from 4 levels)
Set Zoom Speed	Set the zoom motor speed. (from 4 levels)
Set Iris Speed	Set the iris motor speed. (from 4 levels)
Inquiry Focus speed	Inquiring the focus motor speed for each 4 levels.
Inquiry Zoom speed	Inquiring the zoom motor speed for each 4 levels.
Inquiry Iris speed	Inquiring the iris motor speed for each 4 levels.
Set Preset	Store the current position into the memory.
Call Preset	Change the current position to the stored preset position.
Clear Preset	Clear the stored preset position.
Set AF Search limit position	Set AF search limit range.
Set OSD Setting Value	Set the OSD setting value.
Inquiry OSD Setting Value	Inquiring the OSD setting value.

The command structure is shown below.

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum

The Sync Byte (synchronization byte) is always 0xFF. The address is the logical address of the receiver/driver being controlled. The check sum is a 8-bits value calculated by modulo256 of the payload data that consists of 5 bytes (from "Address" to "Data2"). After sending a command, you should basically wait for the reply from the lens.

Move Focus to Near

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**01h**	**00h**	**00h**	**00h**	00h-FFh

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Move Focus to Far

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**80h**	**00h**	**00h**	00h-FFh

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Move Zoom to Wide

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**40h**	**00h**	**00h**	00h-FFh

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Move Zoom to Tele

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**20h**	**00h**	**00h**	00h-FFh

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Move Iris to Close

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**04h**	**00h**	**00h**	**00h**	00h-FFh

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Move Iris to Open

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**02h**	**00h**	**00h**	**00h**	00h-FFh

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Stop

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**00h**	**00h**	**00h**	00h-FFh

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Execute AF

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**2Bh**	**00h**	**00h**	00h-FFh

Duaring performing this command, some commands can be queued in the queueing memory. The queueing memory is 128 bytes. You can set to on/off the queueing in the OSD menu. The auto-focusing could be interrupted to quit by Move Focus commands and Stop command.

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Set Focus position

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**87h**	**MSB**	**LSB**	00h-FFh

The position is described in Data1 and Data2 as 16bits value (0000h-FFFFh). While performing this command, some commands can be queued in the queueing memory. The queueing memory is 128 bytes. You can set to on/off the queueing in the OSD menu.

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Set Zoom position

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**4Fh**	**MSB**	**LSB**	00h-FFh

The position is described in Data1 and Data2 as 16bits value (0000h-FFFFh). While performing this command, some commands can be queued in the queueing memory. The queueing memory is 128 bytes. You can set to on/off the queueing in the OSD menu.

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Set Iris position

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**89h**	**MSB**	**LSB**	00h-FFh

The position is described in Data1 and Data2 as 16bits value (0000h-FFFFh). While performing this command, some commands can be queued in the queueing memory. The queueing memory is 128 bytes. You can set to on/off the queueing in the OSD menu.

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Inquiry Focus position

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**8Bh**	**00h**	**00h**	00h-FFh

Reply

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**8Dh**	**MSB**	**LSB**	00h-FFh

The position is described in Data1 and Data2 as 16bits value(0000h-FFFFh)

Inquiry Zoom position

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**55h**	**00h**	**00h**	00h-FFh

Reply

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**5Dh**	**MSB**	**LSB**	00h-FFh

The position is described in Data1 and Data2 as 16bits value(0000h-FFFFh)

Inquiry Iris position

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**8Fh**	**00h**	**00h**	00h-FFh

Reply

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**91h**	**MSB**	**LSB**	00h-FFh

The position is described in Data1 and Data2 as 16bits value(0000h-FFFFh)

Set Continuously Focus Speed

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**83h**	**kinds**	**speed**	00h-FFh

kinds:

00h	SLOWEST SPEED
01h	LOW MEDIUM SPEED
02h	HIGH MEDIUM SPEED
03h	HIGHEST SPEED

The speed is described in Data2 as 8 bits value(00h-FFh).The speed is stored in the non volatile memory in the lens.

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Set Continuously Zoom Speed

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**81h**	**kinds**	**speed**	00h-FFh

kinds:

00h	SLOWEST SPEED
01h	LOW MEDIUM SPEED
02h	HIGH MEDIUM SPEED
03h	HIGHEST SPEED

The speed is described in Data2 as 8 bits value(00h-FFh). The speed is stored in the non volatile memory in the lens.

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Set Continuously Iris Speed

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**85h**	**kinds**	**speed**	00h-FFh

kinds:

00h	SLOWEST SPEED
01h	LOW MEDIUM SPEED
02h	HIGH MEDIUM SPEED
03h	HIGHEST SPEED

The speed is described in Data2 as 8 bits value(00h-FFh). The speed is stored in the non volatile memory in the lens.

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Set Focus Speed

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**27h**	**00h**	**kinds**	00h-FFh

kinds:

00h	SLOWEST SPEED
01h	LOW MEDIUM SPEED
02h	HIGH MEDIUM SPEED
03h	HIGHEST SPEED

*The focus speed can be set to one of them.

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Set Zoom Speed

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**25h**	**00h**	**kinds**	00h-FFh

kinds:

00h	SLOWEST SPEED
01h	LOW MEDIUM SPEED
02h	HIGH MEDIUM SPEED
03h	HIGHEST SPEED

*The zoom speed can be set to one of them.

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Set Iris Speed

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**93h**	**00h**	**kinds**	00h-FFh

kinds:

00h	SLOWEST SPEED
01h	LOW MEDIUM SPEED
02h	HIGH MEDIUM SPEED
03h	HIGHEST SPEED

*The iris speed can be set to one of them.

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Inquiry Focus speed

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**95h**	**00h**	**kinds**	00h-FFh

Reply

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**97h**	**kinds**	**speed**	00h-FFh

kinds:

00h	SLOWEST SPEED
01h	LOW MEDIUM SPEED
02h	HIGH MEDIUM SPEED
03h	HIGHEST SPEED

The speed is described in Data2 as 8 bits value(00h-FFh).

Inquiry Zoom speed

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**99h**	**00h**	**kinds**	00h-FFh

Reply

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**9Bh**	**kinds**	**speed**	00h-FFh

kinds:

00h	SLOWEST SPEED
01h	LOW MEDIUM SPEED
02h	HIGH MEDIUM SPEED
03h	HIGHEST SPEED

The speed is described in Data2 as 8 bits value(00h-FFh).

Inquiry Iris speed

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**9Dh**	**00h**	**kinds**	00h-FFh

Reply

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**9Fh**	**kinds**	**speed**	00h-FFh

kinds:

00h	SLOWEST SPEED
01h	LOW MEDIUM SPEED
02h	HIGH MEDIUM SPEED
03h	HIGHEST SPEED

The speed is described in Data2 as 8 bits value(00h-FFh).

Set Preset

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**03h**	**00h**	**preset_id**	00h-FFh

"preset_id" is described in Data2 as 8 bits value(01h-7Fh). The lens has 127 zoom and focus and iris position memories. The lens can storage the current zoom and focus and iris positions into the memory.

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Call Preset

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**07h**	**00h**	**preset_id**	00h-FFh

"preset_id" is described in Data2 as 8 bits value(01h-7Fh). The zoom and focus and iris preset positions is called from the preset memory, and the zoom and focus and iris positions are changed as the preset positions.

Reply

Sync Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Clear Preset

Send

Synch Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**05h**	**00h**	**preset_id**	00h-FFh

"preset_id" is described in Data2 as 8 bits value(01h-7Fh). The preset position stored in the memory is cleared.

Reply

Synch Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Set AF Search limit position

The maximum area of AF Search can be limited between "A" position and "B" position.

Send

Synch Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**A1h**	**00h**	**kinds**	00h-FFh

kinds:

00h	Both A and B position are cleared.
01h	The current focus position is stored as the A position.
02h	The current focus position is stored as the B position.

Reply

Synch Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Set OSD Setting Value

You can change the OSD setting value. It is necessary to send two consecutive commands as shown below.

Send

Synch Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**E1h**	**OSD ADDRES－01h**	**OSD DATA MSB**	00h-FFh

Reply

Synch Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Send

Synch Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**E1h**	**OSD ADDRES**	**OSD DATA LSB**	00h-FFh

Reply

Synch Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

※OSD ADDRESS and OSD DATA are as shown in Table 10.

・For example. [How to set BAUDRATE 9600(OSD ADDRESS=05h)]

Send

Synch Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**E1h**	**04h**	**00h**	00h-FFh

Reply

Synch Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Send

Synch Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**E1h**	**05h**	**02h**	00h-FFh

Reply

Synch Byte	Address	Data	Checksum
FFh	ID	**00h**	00h-FFh

Inquiry OSD Setting Value

Send

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**E5h**	**00h**	**OSD ADDRES**	00h-FFh

Reply

Sync Byte	Address	Command1	Command2	Data1	Data2	Checksum
FFh	ID	**00h**	**E7h**	**OSD DATA MSB**	**OSD DATA LSB**	00h-FFh

※OSD ADDRESS and OSD DATA are as shown in Table 10.

Table 10：OSD ADDRESS and OSD DATA

OSD Menu Name	OSD ADDRESS	OSD DATA	Note
MODEL	01h	LMZ1000:0000h LMZ20750:0001h LMZ20550:0002h LMZ1236:0003h LMZ0824:0004h LMZ25300:0005h LMZ10360:0006h LMZ14500:0007h LMZ16160:0008h LMZ11176:0009h LMZ7527:000Ah LMZ1177:000Dh LMZ0812:000Eh LMZ300:000Fh LMZ2200:0010h USER_LENS:0020h	Needs to reboot.
BAUDRATE	05h	2400:0000h 4800:0001h 9600:0002h 19200:0003h 38400:0004h	Needs to reboot.
AMPGAIN	07h	LOW:0000h HIGH:0001h	
ZOOM AF	09h	OFF:0000h ON:0001h	
ZOOMAF DELAY	0Bh	0000h～2710h	
PT AF	0Dh	OFF:0000h ON:0001h	
PTAF DELAY	0Fh	0000h～2710h	
PT ID	15h	0001h～00FFh	
AFAREASIZE	19h	SMALL:0000h MEDIUM:0001h LARGE:0002h	
AFAREAFRAME	1Bh	OFF:0000h RECT:0001h FILL:0002h	
AFSEARCH	1Dh	FULL:0000h HALF:0001h	
ZOOM POS INV	25h	OFF:0000h ON:0001h	

FOCUS POS INV	27h	OFF:0000h ON:0001h	
IRIS POS INV	29h	OFF:0000h ON:0001h	
AF TIMEOUT	33h	000Ah～0078h	
CMDQING AF	35h	OFF:0000h ON:0001h	
CMDQING PRST	37h	OFF:0000h ON:0001h	
PWM FREQ	39h	0001h～0064h	
ZOOM LS POS	3Bh	0000h～03E8h	
USER AF SPD	43h	000Ah～03E8h	
USER AF RANGE	45h	000Ah～03E8h	
USER AF ST SPD	47h	000Ah～03E8h	
USER AF ST POS1	49h	0000h～0064h	
USER M FOCUS L	4Dh	000Ah～03E8h	
USER M FOCUS M	4Fh	000Ah～03E8h	
USER M FOCUS H	51h	000Ah～03E8h	
G.RESPONSE	61h	OFF:0000h ON:0001h	

8. OSD menu.

You can change the setting using the buttons. Hold down the button 1 for longer than 3 seconds to display the OSD menu.

Table 11：OSD menu

PAGE	Menu	Description	Range	Default	Note
PAGE1	MODEL	Lens model	LMZ1000/LMZ20750/ LMZ20550/LMZ1236/ LMZ0824/LMZ25300/ LMZ10360/LMZ14500/ LMZ16160/LMZ11176/ LMZ7527/LMZ1177/ LMZ0812/LMZ300/ LMZ2200/ USERLENS	LMZ7527	Needs to reboot.
	UARTDUPLEX	The duplex information of UART	HALF/FULL		change at dipsw
	BAUDRATE	The baud rate of UART	2400/4800/9600/ 19200/38400	9600	Needs to reboot.
	MY ID	PELCO-D ID of this lens	01-FF	01	
	FSPEED0	Focus motor speed (slowest)	10-100	31	
	FSPEED1	Focus motor speed (slow)	10-100	47	
	FSPEED2	Focus motor speed (high)	10-100	78	
	FSPEED3	Focus motor speed (highest)	10-100	100	
PAGE2	ISPEED0	Iris motor speed (slowest)	10-100	10	
	ISPEED1	Iris motor speed (slow)	10-100	25	
	ISPEED2	Iris motor speed (high)	10-100	50	
	ISPEED3	Iris motor speed (highest)	10-100	100	
	ZSPEED0	Zoom motor speed (slowest)	10-100	19	
	ZSPEED1	Zoom motor speed (slow)	10-100	39	
	ZSPEED2	Zoom motor speed (high)	10-100	78	
	ZSPEED3	Zoom motor speed (highest)	10-100	100	
	AMPGAIN	Gain of the focus amplifier	Low/High	High	Do not change
PAGE3	PT ID	The ID of the Pan-Tilt	01-FF	02	
	AFAREASIZE	AF area size	S/M/L	M	
	AFAREAFRAME	AF area display	OFF/RECT/FILL	OFF	
	AF SEARCH	The range of AF searching	FULL/HALF	FULL	Do not change
	ZOOM AF	Automatic AF after zoom stopped	OFF/ON	OFF	
	ZOOMAF DELAY	The delay of ZOOM AF (msec)	0-10000	1000	
	PT AF	Automatic AF after Pan-Tilt stopped	OFF/ON	OFF	
	PTAF DELAY	The delay of PT AF (msec)	0-10000	1000	
	AFDEMO	Test function	OFF/ON	OFF	Do not change
PAGE4	ZOOM POS INV	Inverse of the zoom potentiometer value direction	OFF/ON	OFF	Needs to reboot.

	FOCUS POS INV	Inverse of the focus potentiometer value direction	OFF/ON	OFF	Needs to reboot.
	IRIS POS INV	Inverse of the iris potentiometer value direction	OFF/ON	OFF	Needs to reboot.
	H FREQ(HZ)	The frequency of horizontal synchronization signal	-	-	
	V FREQ	The frequency of vertical synchronization signal	-	-	
	FW VERSION	The Firmware version	-	-	
	BUILD	The Firmware build version	-	-	
	FPGA VERSION	The FPGA version	-	-	
PAGE5	DEBUG	Test function	OFF/ON	OFF	Do not change
	AF TIMEOUT	AF Timeout	10-120	30	
	CMD QING AF	Command queueing while AF performing	OFF/ON	ON	
	CMD QING PRST	Command queueing while preset command performing	OFF/ON	ON	
	PWM FREQ	The frequency of PWM signal for the motor in kHz	1-100	100	Do not change
	ZOOM LS POS	The position of the software limit switch for Move Zoom Command	1-1000	50	
	G.RESPONSE	General response command ON/OFF	OFF/ON	ON	
	RESET SETTING	Resetting all setting to the default	OFF/RESET	OFF	Do not change *After reset all setting, MODEL should be configured as collect lens modelname.
PAGE6	USER AF SPD	AF Focus motor speed. (When "USERLENS" is selected.)	10-1000	60	
	USER AF RANGE	AF Focus motor range. (When "USERLENS" is selected.)	10-1000	100	
	USER AF ST SPD	AF Focus motor stop speed. (When "USERLENS" is selected.)	10-1000	60	
	USER AF ST POS1	Adjustment value of AF focus stop position. (When "USERLENS" is selected.)	0-100	10	
	USER M FOCUS L	Manual low focus speed when button is pushed. (When "USERLENS" is selected.)	10-1000	50	

	USER M FOCUS M	Manual medium focus speed when button is pushed. (When "USERLENS" is selected.)	10-1000	300	
	USER M FOCUS H	Manual high focus speed when button is pushed. (When "USERLENS" is selected.)	10-1000	1000	
	AF LIMIT POS A	Position A of search limit range for AF.			Read Only(Information)
	AF LIMIT POS B	Position B of search limit range for AF.			Read Only(Information)

9. Disclaimer

・ KOWA OPTICAL PRODUCTS CO., LTD. shall not be liable for any failure, physical damage, or loss caused by a fire, an earthquake, flood damage, lightening, a conduct of a third party, any other accident, your intentional or unintentional improper handling and/or use of the product, or any other abnormal use condition (even if it is ascribable to a third party).

・ KOWA OPTICAL PRODUCTS CO., LTD. shall not be liable for any loss (including a loss of operating profits, a loss due to business interruption, and changes to a loss of stored data) caused by the use of the product or inability to use the product.

・ KOWA OPTICAL PRODUCTS CO., LTD. shall not be liable for any loss caused by failure to follow any instruction in this instruction manual.

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・ Do not disassemble or alter the product. Doing so voids the warranty even if one year has not passed since the delivery date.

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・ Even after the warranty period, KOWA OPTICAL PRODUCTS CO., LTD. will repair the product at cost upon your request if the repair enables the product to maintain its intended functions.

・ KOWA OPTICAL PRODUCTS CO., LTD. shall not warrant the product against any problem caused by a factor not mentioned in this instruction manual and therefore shall not be liable for it.

10. Federal Communications Commission

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.

Note: 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 expense.