

Motorized Lens Control Board Manual

Model : AFC-01 (Rev 2.00)

Features:

- ❖ For 2.7-12mm or 2.7-13.5mm motorized zoom Lenses.
- ❖ Zoom range divided to 20 fixed points.
- ❖ Manually adjust focus required. **NOT support** auto focus.
- ❖ User defines 18 preset of focus position.
- ❖ Support save focus position at each of 18 fixed zoom point (position).
- ❖ Support PELCO-D protocol for Zoom & Focus operation.
- ❖ Support PELCO-D command GO and SET to access special functions of the control board.
- ❖ For driving stepping motor Lens, not able to driving DC motor Lens.
- ❖ Default address is 1 , default baud rate is 9600.

Specification:

| Model Number | AFC-01 |
|--|--|
| Product Name | Motorized Lens Control Board. |
| Control Protocol | Only support PELCO-D : Zoom +/- , Focus +/- , GOTO , SET commands. |
| Ports | RS485 / UART (TTL 3.2V voltage signal) |
| Operating Temperature | -0°C ~ +85°C (approximate) |
| Operating Humidity | 10% ~ 90% |
| Power Supply | DC12V (lower then 6.5V not work , higher than 15V will great heat or damage) |
| Power Consumption | Standby Mode : < 10mA , Operating Mode : 220mA (average) / 350mA (peak) |
| • Specification subject to change without prior notification. | |

Operation :

The motorized Lens control board partially supports PELCO-D protocol, response following PELCO-D commands, a controlling keyboard or devices or panel usually will have following functions / keys or buttons.

| | |
|---------------------------------|---|
| Zoom + / - | control the zoom optics of a Lens. |
| Focus + / - | control the focus optics of a Lens. |
| GO TO , CALL | go to a specific number of preset, following mention as GO . |
| SETUP | set up a specific number, following mention as SET . |
| UP , DOWN , LEFT , RIGHT | arrow keys usually for pan & tilt operations. |

(1) GO 1 ~ GO 21 , Go to a fixed zoom position.

For example, a 2.7-12mm zoom Lens separate to 20 fixed segments between 2.7mm to 12mm range, the point (position) number from 1 to 21, if execute GO 1 , the lens will zoom to the beginning (first) position, zoom optics will at about 2.7mm , if execute GO 21, the zoom optics will come to the bottom (last) position. **By default, this function disabled**, should use GO 133 to enable this function, after power ON, this function will disable again.

(2) GO 126 : Lens initialization.

This command use at the first time that install the Lens, after execute this command, zoom & focus optics will go to bottom, then come back to top, means two optics at the beginning position, install the Lens into the adapter / holder, adjust the Lens vertical height with holder, lets picture clear, then fasten the Lens with the holder.

(3) GO 127 + SET 127 : Define power ON zoom position.

There are two commands, execute GO 127, then execute SET 127, to define the Lens zoom to a fixed position after power ON or when power supply recovery.

(4) GO 128 + SET 1 ~ 16 : Define address. (Default address is 1)

Available address are 1 to 16 numbers, new address will work at once after execute these commands, should change the controlling device address at the same time to work with this control board. New address will save to internal memory permanently.

(5) GO 129 + SET 1 ~ 8 : Define baud rate. (Default number is 3 , baud rate is 9600)

Available baud rates and numbers :

| | | | |
|-----------|-----------|-----------|------------|
| 1 = 2400 | 2 = 4800 | 3 = 9600 | 4 = 19200 |
| 5 = 38400 | 6 = 56000 | 7 = 57600 | 8 = 115200 |

New baud rate will work at once after setup, should change the controlling device new baud rate at the same time. New baud rate will save to internal memory permanently. Before setup to new baud rate, should make sure the controlling devices support it, otherwise will get a lot of trouble to recover it.

(6) GO 130 + SET 130 : Save focus position.

Manually adjust focus position, let picture clear enough, then save it. There are two focus position relate to a fixed zoom point, they are forward position & backward position, this function gives a way that no matter zoom in or zoom out, focus will almost come to a correct position to make picture clear. This function will save new focus position (one direction) to internal memory permanently.

(7) **GO 131 : Zoom speed**, a toggle switch, change zoom speed fast or slow. After power ON will return to default fast speed.

(8) **GO 132 : Focus speed**, a toggle switch, change focus speed fast or slow. After power ON will return to default slow speed.

(9) **GO 133 : Enable / Disable GO 1 ~ 19 function**. After power ON will return to default Disabled.

(10) **GO 134 : Enable / Disable arrow keys for zoom & focus operation**.

Arrow keys are UP / DOWN / LEFT / RIGHT, usually for pan & tilt control, if have PT bracket or devices connect with the control board at the same time, should disable this function. After power ON will return to default Disabled.

UP = Zoom + DOWN = Zoom - LEFT = Focus + RIGHT = Focus -

About Installation :

- (1) This motorized zoom & focus Lens control board not support auto focus, not has auto focus function, required manually adjust focus to get clear picture. After manually adjust focus well, can save current focus position to internal memory of main chip, next time will almost zoom & focus to this saved position.

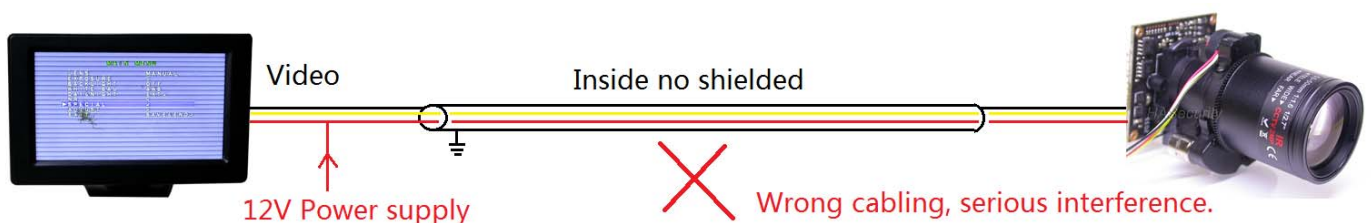
- (2) About motorized zoom & focus Lens, this kind of Lens consisted with small stepping motors and simply gears mechanism, teeth's pitch of a gear about 0.5mm to 1mm, not enough precision to guarantee optics move to the same point each time, this kind of Lens not have sensor to detect movement distance or location, as time go on, focus will become worse, can execute GO 126 command, lets the control board counting from the beginning, this is for calibration, power ON the control board will execute GO 126 for calibration. Please be well noted of this situation.
- (3) Status LED indicator
 - **Slow speed blinking**, awaiting input next command, after 5 seconds, if not have any input or input wrong command, will stop.
 - **Fast speed blinking 3 times**, means input wrong commands.
 - **Turn ON about 3 seconds**, (no blinking), means save setting to memory.
 - **Turn ON about 1 seconds**, (no blinking), means the command execute successful.
- (4) The control board support 8 types of baud rate, default baud rate is 9600, not suggest change baud rate, at least, should make sure the controlling devices (PC or camera etc.) support relative baud rate, otherwise, will get a lot of trouble to recover it.
- (5) The control board can setup address from 1 to 16, in case forget the address number, if baud rate is correct, press Zoom+/- or Focus+/-, the LED will fast speed blinking 3 times, means address was wrong, can try address numbers from 1 to 16 to figure out it. If LED not display any lights, means baud rate also incorrect, firstly, should consider the problem caused by baud rate not match.
- (6) Some image sensor very thin, for example SONY IMX323 / IMX335 or SmartSens SCxxxx sensors are no more than 0.5mm thickness. A common using Lens holder (Lens adapter / IRCut) usually has 5mm or higher between the Lens (bottom) with image sensor. In this case, if install a 2.8-12mm or 2.7-12mm Lens, will not able to capture clear (focus well) an object at a distance that above 5 meters, when zoom optics locate at 2.8mm or 2.7mm position, due to the Lens holder too high to focus good.



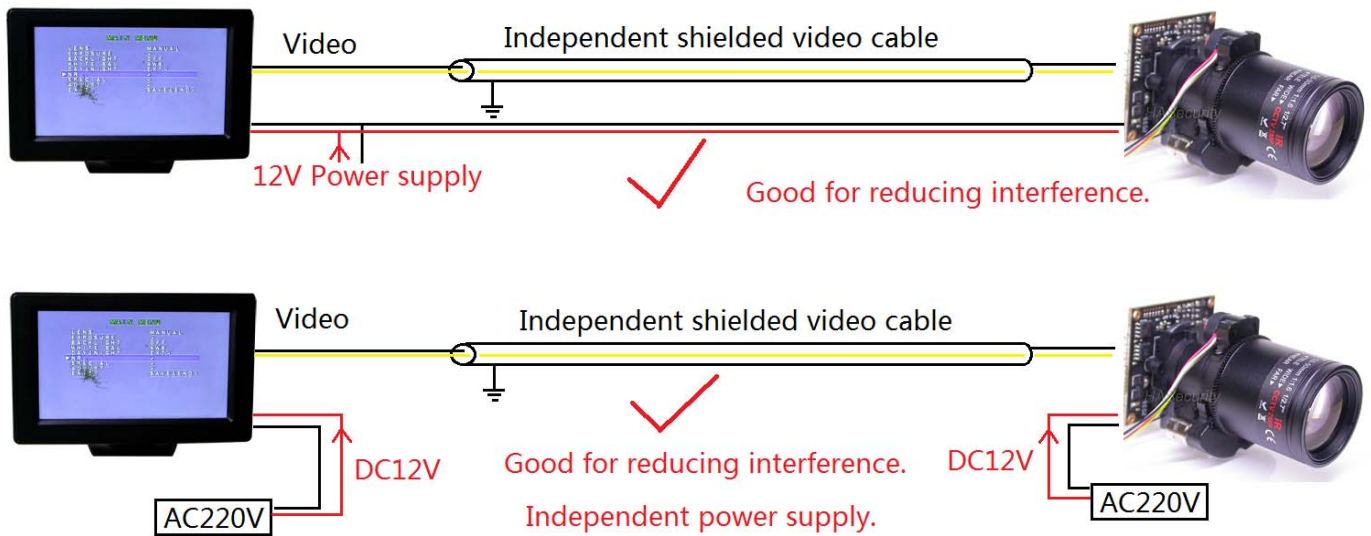
SONY IMX323 image sensor, very thin, thickness (height) no more than 0.5mm.

This kind of thin image sensors required lower height holder to work at 2.7mm , 2.8mm Lens.

- (7) The control board pre-setup 18 focus position according to one type of Lens, reference objects at about 10 meters distance, these saved data (pre-setup) may not fully satisfy of different applications, required user to setup them again according to their actual projects. NOT WORK at short distance, if distances lower than 1 meter, may not able to focus well, required specially make the firmware at factory.
- (8) If video cable not good shielded will make interference or noise straps when driving motors.



Following two ways are help to reducing interference noise straps.



- (9) RS485 and UART ports are connecting to the same UART port at main chip, if connect different devices to these two ports at the same time will cause unpredictable problem. The UART port direct wiring to main chip, only accept TTL 3.3V voltage signal, do not connect to any RS232 port, as RS232 port usually has +12V to -12V voltage signal (total 24V voltage difference), will damage the UART port or main chip.

- **Specifications are subject to change without prior notice.**