



Monochrome Board CCD Camera

WAT-910BD

Operation Manual

This Operation Manual covers safety, camera functions, installation and the correct operating procedure for the WAT-910BD. First, we ask you to read this Operation Manual thoroughly, then install and operate the WAT-910BD as advised. In addition, for future reference, we also advise safekeeping of this manual.

Please contact the distributor or dealer from which the WAT-910BD was purchased, if you do not understand the installation, operation or safety instructions laid out in this manual. Not understanding the contents of the Operation Manual sufficiently may cause damage to the camera.

Guide to the Safety Symbols

The meanings of the symbols used in this operation manual are:

- When you do not adhere to or take notice of the "Danger" sign, it may lead to a serious accident such as death or injury caused by fire or electric shock.
- When you do not adhere to or take notice of the "Warning" sign, it may cause severe damage such as a physical injury.
- When you do not adhere to or take notice of the "Caution" sign, it may incur injury and cause damage to peripheral objects in the immediate surroundings.

Cautions for Safety

The WAT-910BD is designed to be used safely; however, it may lead to a physical accident caused by fire and electric shock if not used correctly. Therefore, please keep and read the "Cautions for safety" below for protection against accidents.

- Do not disassemble and/or modify the WAT-910BD.**
Do not operate the WAT-910BD with wet hands.
- Use a stabilized power adaptor designed for DC+12V±10%, with a current capacity of more than 250mA for the WAT-910BD.**
The recommended voltage is DC+12V±10%.
Do not expose the WAT-910BD to wetness or high moisture conditions.
The WAT-910BD is designed and approved for indoor use only. The WAT-910BD is not water-resistant or waterproof. If the location of the camera is outdoors or in an outdoor like environment, we recommend that you use an outdoor camera housing.
- Protect the WAT-910BD from condensation.**
Keep the WAT-910BD dry at all times during storage and operation.
- Should the camera not work properly, switch off the power immediately. Then, check the camera according to the "Problems and Trouble Shooting" section.

- Avoid the striking of hard objects or dropping the WAT-910BD.**
The WAT-910BD uses high quality electrical parts and precision components.
- Do not connect any power supply directly to the video out terminal of the unit.**
Do not connect the WAT-910BD with any monitor using a video/power single transmission terminal. The WAT-910BD is not designed for use with this type of equipment. We also advise you to read the operation manual of the monitor you plan to use before any connections are made.
- Do not install the WAT-910BD in a position subject to direct sunlight.**
Sunlight shining directly onto the WAT-910BD lens can cause damage to the CCD.

- Select a stable place for installation of the WAT-910BD.**
Always fix the camera securely.
See [Mounting Holes] section.
- Do not move the WAT-910BD with the cables connected.**
Before moving the WAT-910BD, always remove the video cable and power cable from the rear of the camera first.
- Avoid using the WAT-910BD near any strong electromagnetic field.**
After installing into main equipment, if the WAT-910BD is exposed to electromagnetic waves causing the monitored image to become distorted, we recommend the camera be shielded by appropriate protective casing.

Problems and Trouble Shooting

If any of the following problems occur when using the WAT-910BD,

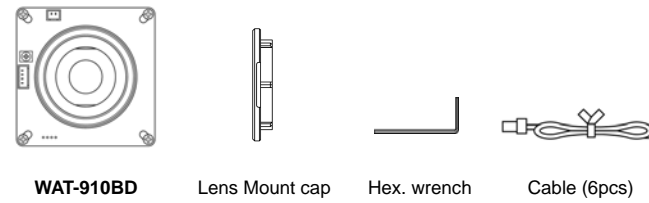
- An optimal picture cannot be obtained, after checking that all the cables and connections are correctly in place
- Smoke or any unusual odor emerges from the WAT-910BD.
- An object becomes embedded or a quantity of liquid seeps into the camera
- More than the recommended voltage or/and amperage has been applied to the WAT-910BD by mistake
- Anything unusual occurring to any equipment connected to the WAT-910BD.

Disconnect the camera immediately according to the following procedures:

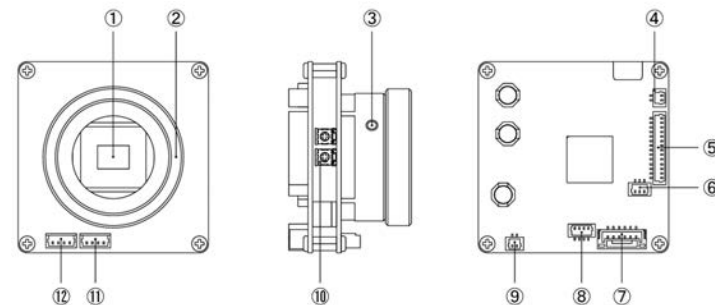
- Switch off the main power supply to the camera.
- Remove the power and video cables connected to the WAT-910BD.
- Contact the distributor or dealer from which the WAT-910BD was purchased.

Contents

Using the contents figures below, check to make sure all parts are present before use.



Description of Parts



- CCD FRONT FACE**
 - The light receiving face of the CCD camera (Dirt, water or oil deposits on the CCD will cause an unclear picture on the monitor. Attach the lens cap to protect the lens and CCD from contamination and damage.)
- LENS MOUNT**
 - Mount for the lens (Thread type)
- FOCUSING ADJUSTMENT SCREWS**
 - There are 3 hex. adjustment screws each placed at intervals of 120° for fine focusing of the lens.
- VIDEO OUT**
 - The terminal for video signal output.

- DIGITAL VIDEO OUTPUT CONNECTOR**
 - Provision for single-ended digital parallel video output.
- GPIO CONNECTOR**
 - General Purpose Input/Output connector.
- REMOTE CONTROL CONNECTOR**
 - Connection for the optional RC-01 remote control for controlling the On Screen Display menu to change camera settings.
- CAMERA CONTROL via SERIAL COMMUNICATION CONNECTOR**
 - Connector for SPI communication interface.
- POWER IN**
 - The terminal for power input.
- IRIS LEVEL VOLUME**
 - By controlling the volume, the iris level of a DC iris lens can be adjusted.
- TERMINAL FOR AUTO-IRIS LENS (VIDEO CONTROL)**
 - The terminal for a Video-driven auto-iris lens. Do not connect a DC-driven auto-iris lens to this terminal.
- TERMINAL FOR AUTO-IRIS LENS (DC CONTROL)**
 - The terminal for a DC-driven auto-iris lens. Do not connect a Video-driven auto-iris lens to this terminal.

About Connector

Please be sure to check the connector pin-outs prior to making your connections. Also, it is necessary for the user to properly connect and dress the wiring and use techniques for the prevention of electric shorts. Please be cautioned that incorrect wiring may cause damage and failure of the WAT-910BD.

④VIDEO OUT (Model/Make : BM02B-SRSS/JST)

PIN No.	Cable color	Function
①	Blue	VIDEO OUTPUT
②	Black	VIDEO GND (COMMON)

⑤DIGITAL VIDEO OUTPUT CONNECTOR (Model/Make : BM14B-SRSS/JST)

PIN No.	Cable color	Function
①	Gray	Vertical Blanking
②	Gray	Horizontal Blanking
③	Black	GND (common)
④	Gray	CLOCK
⑤	Black	GND (common)
⑥	Gray	DATA 7(MSB)
⑦	Gray	DATA 6
⑧	Gray	DATA 5
⑨	Gray	DATA 4
⑩	Gray	DATA 3
⑪	Gray	DATA 2
⑫	Gray	DATA 1
⑬	Gray	DATA 0
⑭	Black	GND (common)

⑥GPIO CONNECTOR (Model/Make : BM03B-SRSS/JST)

PIN No.	Cable color	Function
①	Brown	MOTION DETECT output
②	Black	GND (common)
③	Orange	(reserved)

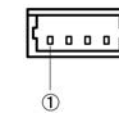
⑧CAMERA CONTROL via SERIAL COMMUNICATION CONNECTOR (Model/Make : BM04B-SRSS/JST)

PIN No.	Cable color	Function
①	Green	SPI SLD (active L)
②	Yellow	SPI SCL (CLOCK input)
③	Blue	SPI SDA (bidirectional)
④	Black	GND (common)

⑨POWER IN (Model/Make : BM02B-SRSS/JST)

PIN No.	Cable color	Function
①	Red	POWER IN (DC+12V)
②	Black	POWER GND (COMMON)

⑪⑫AUTO-IRIS CONNECTOR (Model/Make : 53047-0410/molex)



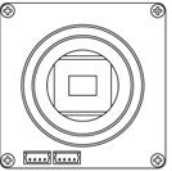
PIN No.	Cable color	DC	Video
①	Yellow	Sense -	Vcc (DC+12V) OUT
②	Orange	Sense +	NC
③	Red	Drive +	IRIS OUT
④	Blown	Drive -	GND (COMMON)

Power Supply

Use a stabilized power adaptor designed for DC+12V±10%, with a current capacity of more than 250mA.

Mounting Holes

As shown in the figure on the right, the WAT-910BD provides four mounting holes, one in each corner of the circuit board. Take the M2 screws from the mounting holes in each corner, then fix the unit securely using the M2 screws again. Once the board is secured proceed with the following steps below.

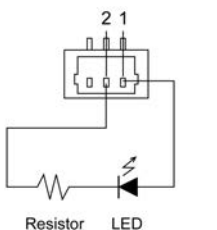


Set-up and Operation

- Ensure that the power to the WAT-910BD and the peripheral equipment is turned off before making any connections.
- Remove the lens mount cap from the WAT-910BD and attach the CS-mount lens. Use the optional C-mount adaptor (30CMA-R) when a C-mount lens is used.
- Connect the iris cable to the WAT-910BD as shown in [About Connector] section, when an auto-iris lens is being used.
- Connect the attached cable to ⑨POWER IN. See the [About Connector] section.
- Connect a coaxial cable with 75Ω impedance, such as an RG-58/U or an RG-6/U to the monitor. Select a monitor with the same television system as the WAT-910BD: EIA or CCIR. A monitor with more than 600TV lines is recommended.
- Turn on the power to the WAT-910BD, monitor and all other allied equipment. When a picture cannot be obtained on the monitor, check and follow the procedure mentioned in the [Problems and Trouble Shooting] section.
- After following the procedure below and the picture is still out of focus, open the iris fully and loosen ③FOCUSING ADJUSTMENT SCREWS with the hex. wrench and move the lens forwards until a clear picture is obtained.

Manual Lens	Adjust the focus and iris to the best position on the lens.
Video Auto-iris Lens	Adjust the focus on the lens.
DC Auto-iris Lens	Adjust the iris level on the camera, then adjust the focus on the lens.

- When the motion detection function is used, the alarm output terminals 1 and 2 are hot during detection of movement in the monitored area. If an LED is connected as shown in the diagram below, the alert turns on the LED by voltage output of 3.3V at maximum current of 6mA.



Options

To purchase these options, please contact the distributor or dealer from which you purchased the WAT-910BD.



Remote Controller (RC-01)

Remote control for controlling the On Screen Display menu to change camera settings.



C-mount Adaptor (30CMA-R)

This lens mount adaptor is used to convert a CS-mount to a C-mount.

Specifications

Model	WAT-910BD (EIA)	WAT-910BD (CCIR)
Pick-up Element	1/2 inch interline transfer CCD image sensor	
Number of Total Pixels	811(H) × 508(V)	795(H) × 596(V)
Number of Effective Pixels	768(H) × 494(V)	752(H) × 582(V)
Unit Cell Size	8.4 μm(H) × 9.8 μm(V)	8.6 μm(H) × 8.3 μm(V)
Sync. System	Internal	
Scanning System	2:1 interlace	
Video Output	Composite video, 1.0 V(p-p) 75 Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum Illumination	0.0000025 lx. F1.4 (Shutter: x256, AGC: HIGH, γ=0.35, 3DNR ON)	
S/N	More than 52dB (AGC=6dB, γ=1.0)	
Function settings	OSD (On Screen Display) operated by 5key interface	
Electronic iris	1/60 - 1/100000 sec. x256(field) ^{*selectable}	1/50 - 1/100000 sec. 1/100000 sec.
Electronic shutter	x2, x4, x8, x16, x32, x64, x128, x256 (field) 1/60, 1/100 sec.	1/50, 1/120 sec. 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec.
AGC	ON OFF	LO: 6 - 30dB / MID: 6 - 34.5dB / HI: 6 - 41dB 6 - 41dB (1dB step) ^{*selectable}
Gamma Characteristics	γ ≒ 0.05-1.00(0.05 step), USER(S-Curve) ^{*selectable}	
Noise reduction	3DNR ON ^{*adjustable} / OFF (Selectable)	
Wide dynamic range	USER1 / USER2 / OFF	
Motion detection	Max. 4 areas selectable (Output terminal available)	
Lens iris	Video/DC	
Back light compensation	OFF/BLC/HSBLC	
White blemish correction	Up to 64 dots correctable by OSD operation	
Power Supply	DC+12V ± 10%	
Power Consumption	1.32W (110mA)	
Operating Temperature	-10 - 50°C	
Operating Humidity	Less than 95% RH (Without condensation)	
Storage Temperature	-30 - 70°C	
Storage Humidity	Less than 95% RH (Without condensation)	
Lens Mount	CS-mount	
Size	42(W) × 42(H) × 27.5(L) (mm)	
Weight	Approx. 40g	

- Design and specifications are subject to change without notice.
- Watec is not responsible for any inconvenience or the attendant damages to the video and monitoring recording equipment caused by misuse, mis-operation or improper wiring of our equipment.
- If for any reason the WAT-910BD does not work properly, or if you have any questions regarding installation or operation, please contact the distributor or dealer from which it was purchased.

Contact information

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