



Monochrome CCD Camera

# WAT-902DM Series

## Operation Manual

This Operation Manual covers safety, camera functions, installation and the correct operating procedure for the WAT-902DM series. First, we ask you to read this Operation Manual thoroughly, then install and operate the WAT-902DM series as advised. In addition, for future reference, we also advise safe keeping of this manual.

Please contact the distributor or dealer from which the WAT-902DM series 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 definitions of the symbols used in this operation manual are:

**Danger** 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.

**Warning** When you do not adhere to or take notice of the "Warning" sign, it may cause severe damage such as a physical injury.

**Caution** 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-902DM series 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.

**Danger** • Do not disassemble and/or modify the WAT-902DM series.  
• Do not operate the WAT-902DM series with wet hands.

**Warning** • Use only the AD901-120/230 or equivalent power adaptor for the WAT-902DM series.  
The recommended voltage is DC+12V ± 10%

• Do not expose the WAT-902DM series to wetness or high moisture conditions.

The WAT-902DM series is designed and approved for indoor use only. The WAT-902DM series 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-902DM series from condensation. Keep the WAT-902DM series 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.

**Caution** • Avoid the striking of hard objects or dropping the WAT-902DM series.  
The WAT-902DM series 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-902DM series with any monitor using a video/power single transmission terminal. The WAT-902DM series 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-902DM series in a position subject to direct sunlight.

Sunlight shining directly onto the WAT-902DM series lens can cause damage to the CCD.

• Select a stable place for installation of the WAT-902DM series.

Use a support of durable strength around an installation position on a ceiling or wall when a camera stand or tripod is used.

• Do not move the WAT-902DM series with the cables connected.

Before moving the WAT-902DM series, always remove the video cable and power cable from the rear of the camera first.

• Avoid using the WAT-902DM series near any strong electromagnetic field.

After installing into main equipment, if the WAT-902DM series 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-902DM series,

- 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-902DM series.
- An object becomes embedded or a quantity of liquid seeps into the camera housing
- More than the recommended voltage or/and amperage has been applied to the WAT-902DM series by mistake
- Anything unusual occurring to any equipment connected to the WAT-902DM series.

Disconnect the camera immediately according to the following procedures:

- ① Switch off the main power supply to the camera.
- ② Remove the power and video cables connected to the WAT-902DM series.
- ③ Contact the distributor or dealer from which the WAT-902DM series was purchased.

### About EMC

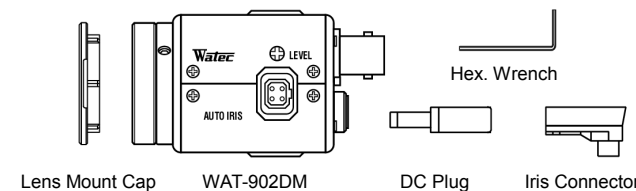
The WAT-902DM series is in conformity with EMC test standards carried out by authorized organizations in Japan.

E I A FCC Part15 class B  
CCIR EN61000-6-3/EN50130-4

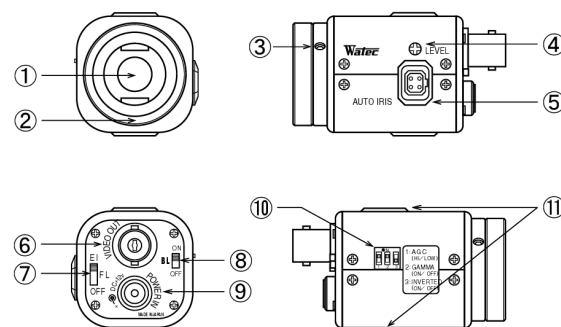
**Danger** Do not modify the WAT-902DM series. A modified camera may not conform to EMC test standards.

### Contents

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



### Description of Parts



#### ① 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.)

#### ② LENS MOUNT

• Mount for the lens (Thread type)

#### ③ FOCUSING ADJUSTMENT SCREWS

• There are 3 hex. adjustment screws each placed at intervals of 120° for fine focusing of the lens.

#### ④ IRIS LEVEL VOLUME

• By controlling the volume, the iris level of a DC iris lens can be adjusted.

#### ⑤ AUTO-IRIS SOCKET

• This socket is for a video or DC auto-iris lens cable connector. (Video/DC: Auto selected by the camera)

#### ⑥ VIDEO OUT (BNC)

• The terminal for composite video signal output

#### ⑦ AE MODE CONTROL

• The switch for the shutter speed mode control according to the object.

#### ⑧ BACK LIGHT

• The switch for back light compensation

#### ⑨ POWER IN

• The terminal designed for connection with the DC-plug of the power adaptor

#### ⑩ FUNCTION SWITCHES

• Functional switches for setting AGC, gamma control and mirror image.

#### ⑪ TRIPOD MOUNTING SCREW HOLES

• Mounting holes for stands. The sizes of these threads are 1/4", 20 threads, 4.5±0.2mm, which is the same as any standard camera tripod (U1/4").

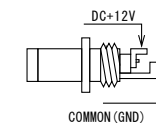
### Power Supply

If any other power adaptor besides the AD901-120/230 is used, please use a stabilized power adaptor designed for DC+12V ± 10%, with a current capacity of more than 250mA.

Use the optional DC plug if the shape or polarity of the DC plug of the power adaptor to be used is not compatible with the camera (See the drawing on the right below).

**Warning** **Caution**

The wiring on the connector must be exact. Be careful not to touch the other terminal while wiring. Protect the wiring portion by using insulation tape after wiring. If the above care and attention is not adhered to, damage to the WAT-902DM series and power adaptor may occur and may also cause fire.



### Auto-iris Lens

Before connecting the auto-iris lens, please make sure that the pin configuration is correct by confirming with the following table. If the configuration of your iris connector is different from the following, the plug and pins will need to be rewired.

Pin No.	EIAJ Video Auto-iris Lens Arrangement	EIAJ DC Auto-iris Lens Arrangement
①	Power	Control -
②	Not used	Control +
③	Iris signals	Drive +
④	Common (GND)	Drive -

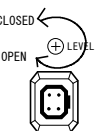
### Set-up and Operation

- 1) Ensure that the power to the WAT-902DM series and the peripheral equipment is turned off before making any connections.
- 2) Remove the lens mount cap from the WAT-902DM series and attach the CS-mount lens. Use the optional C-mount adaptor (30CMA-R) when a C-mount lens is used.
- 3) Connect the iris cable to ⑤/AUTO-IRIS SOCKET on the WAT-902DM series when an auto-iris lens is being used.
- 4) Connect ⑥/VIDEO OUT on the WAT-902DM series with the monitor, using a coaxial cable with 75Ω impedance, such as an RG-58/U or an RG-6/U. Select a monitor with the same television system as the WAT-902DM series: EIA or CCIR. A monitor with more than 600TV lines is recommended.
- 5) Insert the power plug of the power adaptor into ⑨/POWER IN on the back panel of the WAT-902DM series. Confirm that the power adaptor is not connected to the power supply before insertion of the power plug into ⑨/POWER IN.
- 6) Turn on the power to the WAT-902DM series, monitor and all other allied equipment. When a picture cannot be obtained on the monitor, or a problem occurs, check and follow the procedure mentioned in the 【Problems and Trouble Shooting】 section.
- 7) After following the procedure below and the picture is still out of focus, open the iris fully and loosen ③/FOCUSING ADJUSTMENT SCREWS 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. See below.

#### Iris Level Adjustment (for DC auto-iris lenses only)

Adjust ④/IRIS LEVEL VOLUME placed on the side of the unit until an acceptable light level is attained. No change will occur if a video iris lens or manual iris lens is fitted.



- 8) Select any required shutter speed mode by the ⑦/AE MODE CONTROL

AE Mode	Effect
EI	Automatically selects the shutter speed in the range between EIA1/60-1/100000, CCIR1/50-1/100000 according to the lighting condition.
FL	Reduces the flickering phenomena occurring on the monitor screen caused by fluorescent or mercury lamps. (Fixes the shutter speed to EIA1/100, CCIR1/120)
OFF	Fixes the shutter speed to EIA1/60, CCIR1/50.

※In E.I mode, intense light may leave a trail on the screen longitude. This smearing is a natural phenomenon and is not due to equipment failure or fault.

- 9) Set the ⑧/BACK LIGHT according to your requirements.

Mode	Effective condition
ON	When the picture of the monitored object is silhouetted due to strong lighting from above or behind.
OFF	When the illumination differences between the monitored object is narrow.

10) Set the ⑩FUNCTION SWITCHES according to your requirements.



Switch	Setting	Effective Condition	Factory Settings
1. AGC	ON [HI]	• When sensitivity is more important than the SN ratio	✓
	OFF [LO]	• When SN ratio is important and AGC is also required.	
2. Gamma Correction	ON	• Applicable to a general surveillance monitoring system	✓
	OFF	• When gamma correction is not required for image processing	
3. Mirror Image	ON	• When inverted image on the monitor is required (Ex: back monitoring system for vehicles)	
	OFF	• When the standard image is required.	✓

## Options

To purchase these options, please contact the distributor or dealer from which you purchased the WAT-902DM series.



### AC Adaptor (AD901-120/230)

The recommended AC adaptor for the WAT-902DM series for a constant and stable power supply.



### C-mount Adaptor (30CMA-R)

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



### Mini Stand (MS50)

A convenient stand for the WAT-902DM series. With this stand, the camera can be adjusted to any desired angle.

## Specifications

### WAT-902DM2/2S

Model	WAT-902DM2/2S	
	EIA	CCIR
Pick-up Element	1/2 inch interline transfer CCD image sensor	
Unit Cell Size	8.4 μm(H) × 9.8 μm(V)	8.6 μm(H) × 8.3 μm(V)
Minimum Illumination	0.0018 lx. F1.4 (2)	0.0006 lx. F1.4 (2S)

### WAT-902DM3/3S

Model	WAT-902DM3/3S	
	EIA	CCIR
Pick-up Element	1/3 inch interline transfer CCD image sensor	
Unit Cell Size	6.35 μm(H) × 7.4 μm(V)	6.5 μm(H) × 6.25 μm(V)
Minimum Illumination	0.002 lx. F1.4 (3)	0.0012 lx. F1.4 (3S)

### WAT-902DM2/2S/3/3S

System	EIA	CCIR
Number of Total Pixels	811(H) × 508(V)	795(H) × 596(V)
Number of Effective Pixels	768(H) × 494(V)	752(H) × 582(V)
Sync. System	Internal	
Scanning System	2:1 interlace	
Video Output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
S/N	More than 52dB (AGC=8dB, γ=1.0)	
AE mode	OFF	1/60sec.
	FL	1/100sec.
	EI	1/60-1/100000 sec.
AGC	HI: 8-40dB / LO: 8-22dB	
Gamma Characteristics	γ ≈ 0.45(ON) / γ = 1.0(OFF)	
Lens iris	Video / DC (EIAJ arrangement, Auto-select)	
Back Light Compensation	ON / OFF	
Mirror image	ON / OFF	
Power Supply	DC+12V ± 10%	
Power Consumption	1.5W (125mA)	
Operating Temperature	-10 - +40°C (Without condensation)	
Operating Humidity	Less than 95% RH	
Storage Temperature	-30 - +70°C (Without condensation)	
Storage Humidity	Less than 95% RH	
Lens Mount	CS-mount	
Size	36(W) × 36(H) × 63(L) (mm)	
Weight	Approx. 90g	

- 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, misoperation or improper wiring of our equipment.
- If for any reason the WAT-902DM series 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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