



WATEC CO., LTD.

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WAT-933

1/2.8" Compact High Sensitivity Network B&W Camera

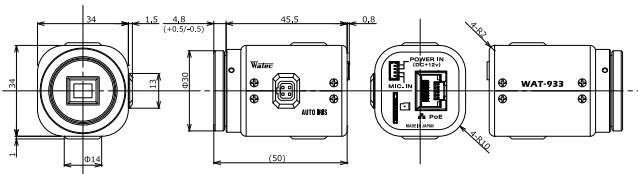
As small as WAT-902 series



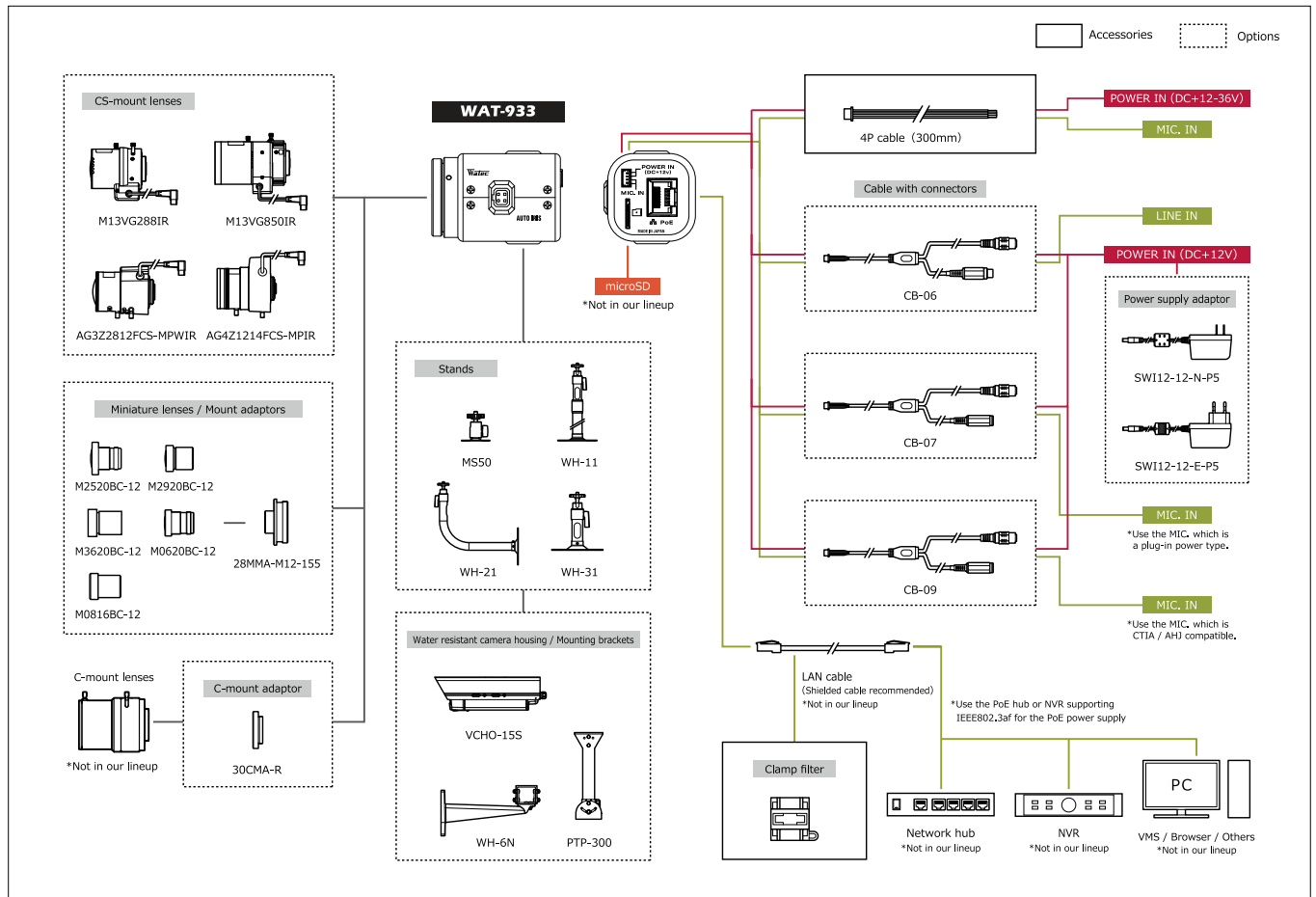
Key features

- Supporting microSD enables stand-alone recording without the network connection
- Video output quick start-up in 6 sec.
- Power-saving PoE : 1.92W/40mA DC+12V : 1.56W/130mA

Dimensions



System diagram



Specifications

Pick-up element	1/2.8 inch BSI CMOS image sensor		
Number of effective pixels	1945(H) × 1097(V)		
Unit cell size	2.9μm(H) × 2.9μm(V)		
Imaging system	—		
Synchronizing system	Internal		
Scanning system	Progressive		
Output size	1920×1080, 1280×720, 800×600, 704×480, 704×400, 640×480, 640×360, 320×240		
Max. frame rate	30 fps		
Video compression	H.264, MJPEG		
Minimum Illumination	0.0001 k F1.4 (AGC HIGH=72dB, Shutter=OFF)		
S/N	—		
Function settings	Browser		
AE mode	Fixed	1/30, 1/60, 1/120, 1/250, 1/500, 1/1000,	1/25, 1/50, 1/100, 1/200, 1/400, 1/800,
		1/2000, 1/4000, 1/8000, 1/15000,	1/1600, 1/3200, 1/6400, 1/12800,
	EI	1/30000 (sec.) *1	1/25600 (sec.) *2
		1/30 - 1/30000 (sec.) *1	1/25 - 1/25600 (sec.) *2
	×32 - 1/30000 (sec.) *1 *3	×32 - 1/25600 (sec.) *2 *3	
White balance	ATW, PWB, MWB, PRESET (3000K, 5000K, 8000K)		
AGC	ON	0 - 72dB	
	OFF	0dB	
MGC	—		
Day/Night	—		
Noise reduction	3DNR OFF/ON (Level adjustable)		
Wide dynamic range	WDR OFF/ON (Level adjustable)		
Lens iris	DC		
Back light compensation	BLC, HSBLIC		
White blemish correction	ON		
Sharpness	Level adjustable		
Defog	OFF/ON (Level adjustable)		
Digital zoom	—		
Privacy mask	16 masks		
Mirror image	OFF, V-FLIP, H-FLIP, HV-FLIP		
Freeze	—		
Motion detection	OFF/ON 4 areas arbitrarily configurable		
Neg_image	—		
ONVIF	profile S		
Supported protocols	TCP/IP, UDP/IP, RTP(RTCP), RTSP, SNTP, HTTP, FTP, DHCP, DNS		
Interface	RJ45 (10BASE-T, 100BASE-TX), 4P Connector (MIC, IN, POWER IN), Auto iris, microSD (Recommended: SDHC / SDXC standard, MLC type, Speed Class CLASS 10 or more, Capacity of 128GB or less)		
Power supply	PoE +48V (IEEE802.3af), DC+12 - 36V +12V is recommended for DC input		
Power consumption	1.92W/40mA (PoE +48V), 1.56W/130mA (DC+12V)		
Operating temperature	0 - +50°C		
Storage temperature	-30 - +70°C		
Operating / Storage humidity	95% RH or less (Without condensation)		
Lens mount	CS mount (Back focus adjustable)		
Weight	Approx. 80g		
Accessories	4P cable, Hex, wrench, Clamp filter		

*1: Frequency=60Hz *2: Frequency=50Hz *3: When using the Slow Shutter *ONVIF is a trademark of Onvif, Inc. *microSD is a trademark of SD Association. SD, SDHC and SDXC (and logos) are trademarks of SD-3C, LLC. *XProtect is a registered trademark of Milestone Systems A/S.

WAT-2400

1/2.8" Full HD Network Camera

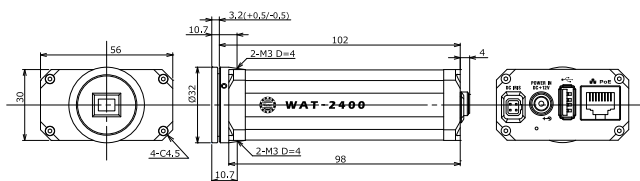
Full HD CMOS sensor



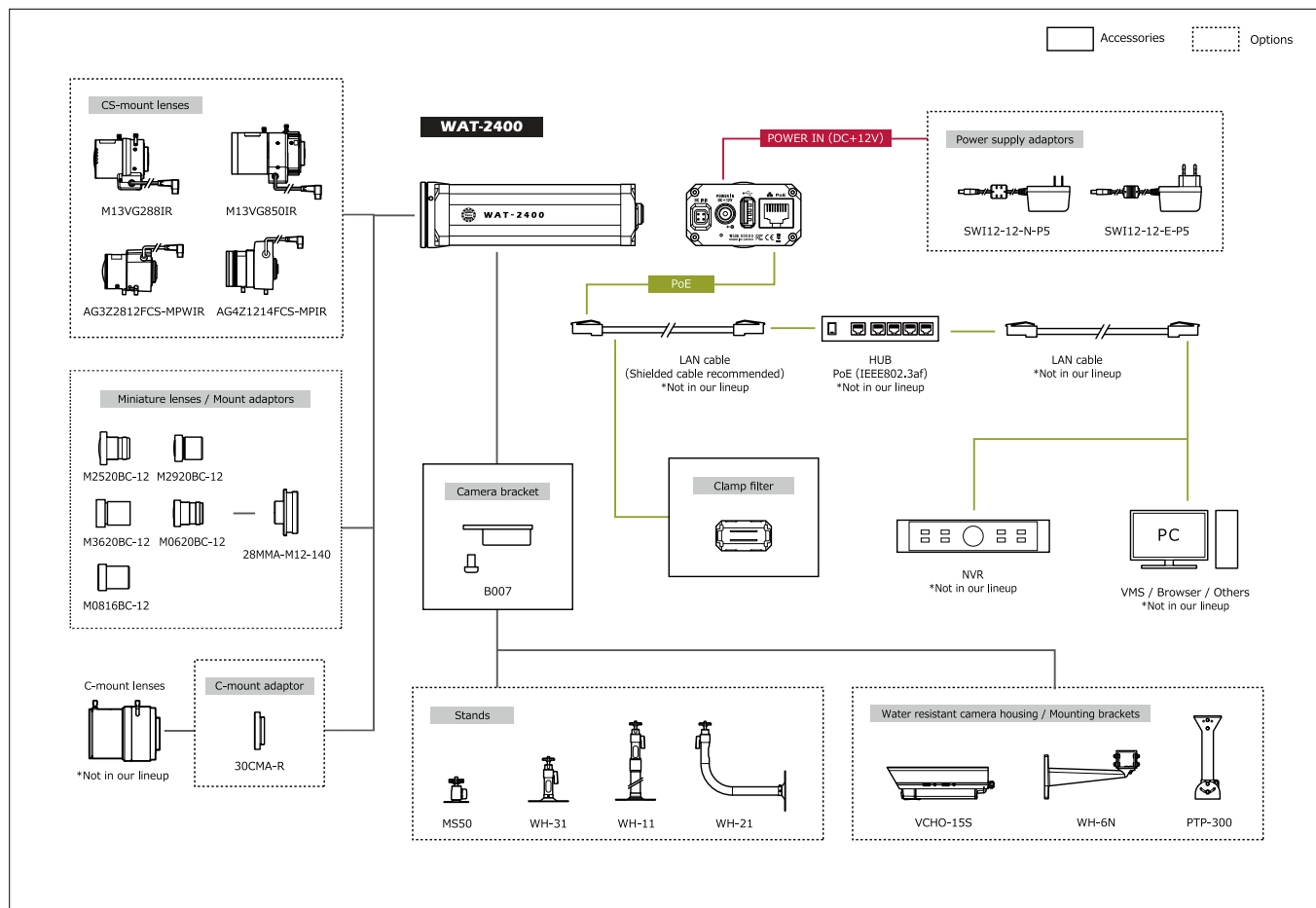
Key features

- Customization flexible firmware (Required software can be included to the camera)
- 1/2.8-inch 2 Mega pixel CMOS image sensor with high sensitivity
- Min. illumination 0.1 lx F1.2 (AGC HIGH=66dB, Shutter=OFF)
- H.264 Video compression format
- PoE (IEEE802.3af) & DC+12V input
- ONVIF® profile S compliant

Dimensions



System diagram



Specifications

Pick-up element	1/2.8 inch CMOS image sensor
Number of effective pixels	1994(H) × 1244(V)
Unit cell size	2.8μm(H) × 2.8μm(V)
Imaging system	RGB+W array mosaic filters on chip
Synchronizing system	Internal
Scanning system	Progressive
Output size	1920×1080, 1280×720
Max. frame rate	30 fps
Video compression	H.264, MJPEG
Minimum illumination	0.1 lx F1.2 (AGC HIGH=66dB, Shutter=OFF)
S/N	More than 50dB (AGC OFF=0dB, γ=1.0)
Function settings	Browser
AE mode	Fixed
White balance	1/5 - 1/10000 sec. (1/10000 sec. step)
AGC	ON
MGC	1/30 - 1/10000 sec.
Day/Night	ATW, PWB, MWB
Noise reduction	0 - 42dB
Wide dynamic range	—
Lens iris	—
Back light compensation	DC
White blemish correction	—
Sharpness	Level adjustable
Defog	—
Digital zoom	—
Privacy mask	—
Mirror image	—
Freeze	—
Motion detection	—
Neg. image	—
ONVIF	profile S
Supported protocols	TCP/IP, UDP/IP, RTP(UDP), RTSP(TCP), RTSP, NTP, HTTP, FTP, DHCP, DNS, TELNET, SSH, SNMP, ARP, ICMP, Bonjour
Interface	RJ45 (10BASE-T, 100BASE-TX), USB (High Speed / Full Speed), Auto iris, Power in
Power supply	PoE +48V, DC+12V±10%
Power consumption	5.4W/450mA (DC+12V), 5.6W/127mA (PoE+48V)
Operating temperature	-10 - +40°C
Storage temperature	-30 - +70°C
Operating / Storage humidity	95% RH or less (Without condensation)
Lens mount	CS mount (Back focus adjustable)
Weight	Approx. 195g
Accessories	WPCD12 (DC plug), Hex. Wrench, B007 (Camera Bracket), Clamp Filter

*ONVIF is a trademark of Onvif, Inc.

WAT-2200 Mk-2

1/2.8" Professional 3G/HD-SDI Camera

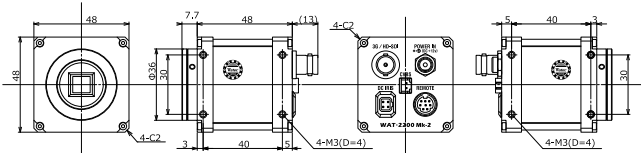
Fully upgraded all performance from WAT-2200



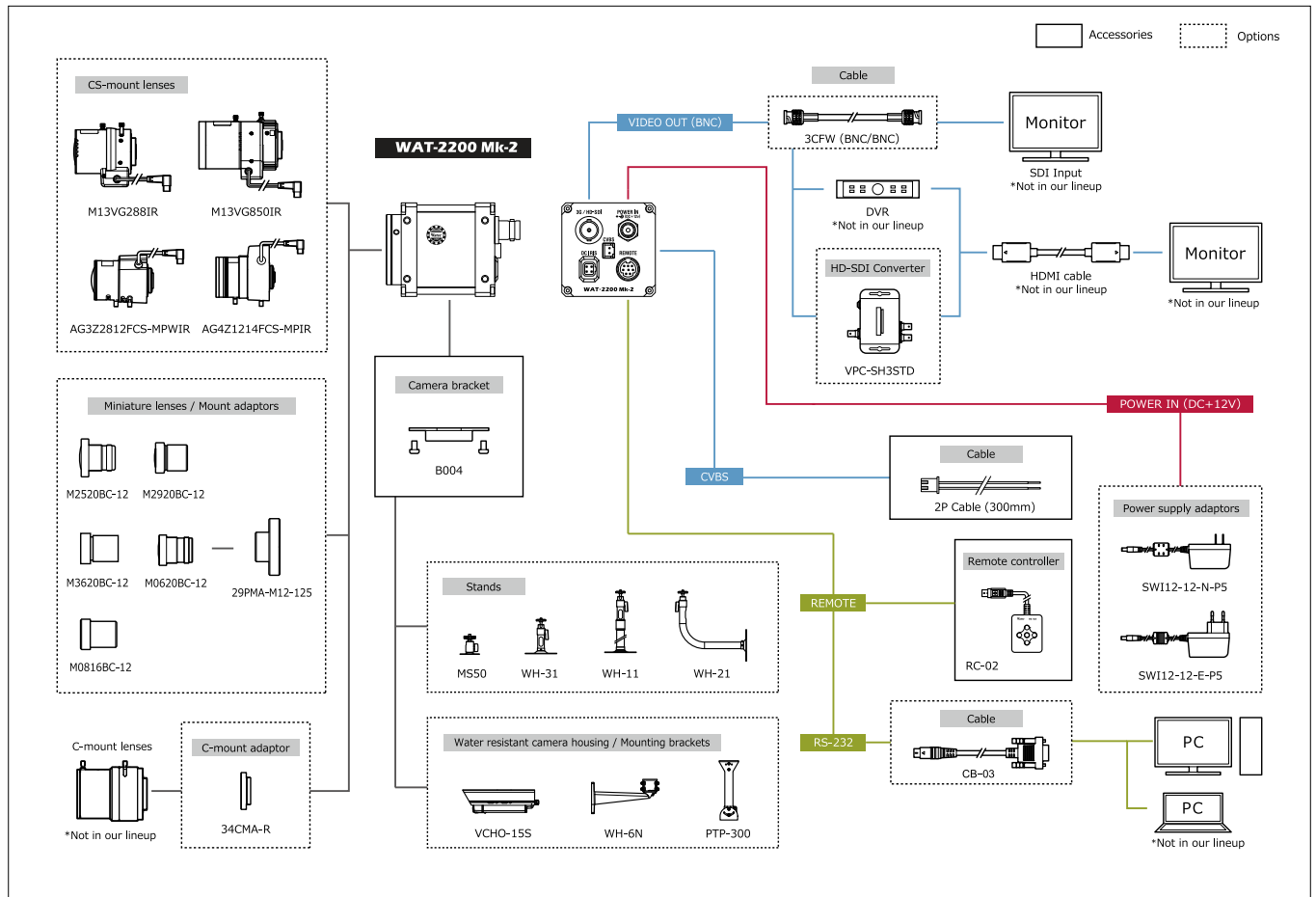
Key features

- 1/2.8-inch BSI CMOS image sensor with high sensitivity
- Min. illumination 0.006 lx F1.2 (AGC HIGH=72dB, Shutter=OFF)
0.0004 lx F1.2 (AGC HIGH=72dB, Shutter=x15)
- Sixteenfold increase in sensitivity than the previous model
- Full HD 1080/60p resolution with 3G-SDI/HD-SDI interface and low latency

Dimensions



System diagram



Specifications

Pick-up Element	1/2.8 inch BSI CMOS image sensor		
Number of Effective Pixels	1945(H) × 1097(V)		
Unit Cell Size	2.9μm(H) × 2.9μm(V)		
Imaging System	RGB primary color bayer arrangement mosaic filter on chip		
Synchronizing System	Internal		
Scanning System	Progressive		
Video Outputs	3G-SDI, HD-SDI		
	Composite video:1.0 V(p-p) 75Ω (Unbalanced)		
Output Format	1080/60p, 1080/59.94p, 1080/50p, 1080/60i, 1080/59.94i, 1080/50i, 1080/30p, 1080/29.97p, 1080/25p,1080/24p, 720/60p, 720/59.94p, 720/50p, NTSC, PAL		
Resolution(H)	More than 1000TVL (Center)		
Min. Illumination	0.006 lx F1.2 (AGC HIGH=72dB, Shutter=OFF) 0.0004 F1.2 (AGC HIGH=72dB, Shutter=x15)		
S/N	More than 55dB (AGC OFF=0dB, γ=1.0)		
Function Setting	OSD : Remote controller, RS-232 (Pelco-D, Pelco-P), Communication: RS-232 (Pelco-D, Pelco-P, Visca)		
AE Mode	Fixed	x2, x3, x4, x5, x6, x7, x8, x9, x10, x12, x15 (frame)	
		1/30, 1/60, 1/120, 1/180, 1/240, 1/300 sec.*1	
	EI	1/500, 1/1000, 1/2000, 1/5000, 1/10000 sec.	
		1/30 - 1/10000 sec.*1	
		1/25 - 1/10000 sec.*2	
		x15 - 1/10000 sec.	
White Balance		ATW, PWB, MWB	
AGC	ON	0 - 36dB(LOW), 0 - 50dB(MID), 0 - 72dB(HIGH)	
	OFF	0dB	
MGC		0 - 72dB (5dB Step)	
Day/Night		—	
Gamma Characteristics		γ=USER (Level adjustable)	
Noise Reduction		3DNR OFF/ON Level adjustable, 2DNR OFF/ON Level adjustable, 3D+2DNR ON Level adjustable	
Wide Dynamic Range		WDR OFF/ON Level adjustable, D-WDR OFF/ON Level adjustable	
Lens Iris		DC	
Back Light Compensation		BLC, HSBLC	
White Blemish Correction		Up to 2046 pixels	
Sharpness		OFF/ON Level adjustable	
Defog		OFF/ON Level adjustable	
Digital Zoom		ZOOM (x1.01 - x6.00), PAN/TILT	
Privacy Mask		8 masks	
Mirror Image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		OFF/ON	
Motion Detection		OFF/ON 4 areas arbitrarily configurable	
Neg. Image		OFF/ON	
Interface		BNC (3G/HD-SDI), 2P connector (Composite video), Power in, Auto iris, mini DIN8P (RC-02, RS-232)	
Power Supply		DC+12V ±10%	
Power Consumption		2.52W (210mA)	
Operating / Storage Temperature		-10 - +50°C / -30 - +70°C	
Operating / Storage Humidity		95%RH or Less (Without condensation)	
Lens Mount		CS mount	
Weight		Approx. 130g	
Accessories		WPDC12-R (DC plug), 2P Cable, Hex, Wrench, B004 (Camera Bracket), RC-02 (Remote control)	

*1 Output Format: 60/59.94/30fps *2 Output Format: 50/25/24fps

WAT-03U2 1/3" Compact High Sensitivity USB2.0 HD Color Camera

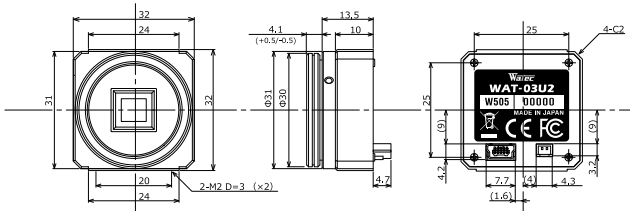
Directly import the captured image to your PC and compact design specializes in the embedded application



Key features

- High sensitivity 1.3 Mega pixel CMOS sensor
- Min. illumination 0.02 lx F1.2 (AGC ON=42dB, Shutter=OFF)
0.005 lx F1.2 (AGC ON=42dB, Shutter=1/7.5 sec.)
- Frame rate : 30fps (HD), 60fps (VGA)
- USB Video Class & USB Bus Power (plug & play)

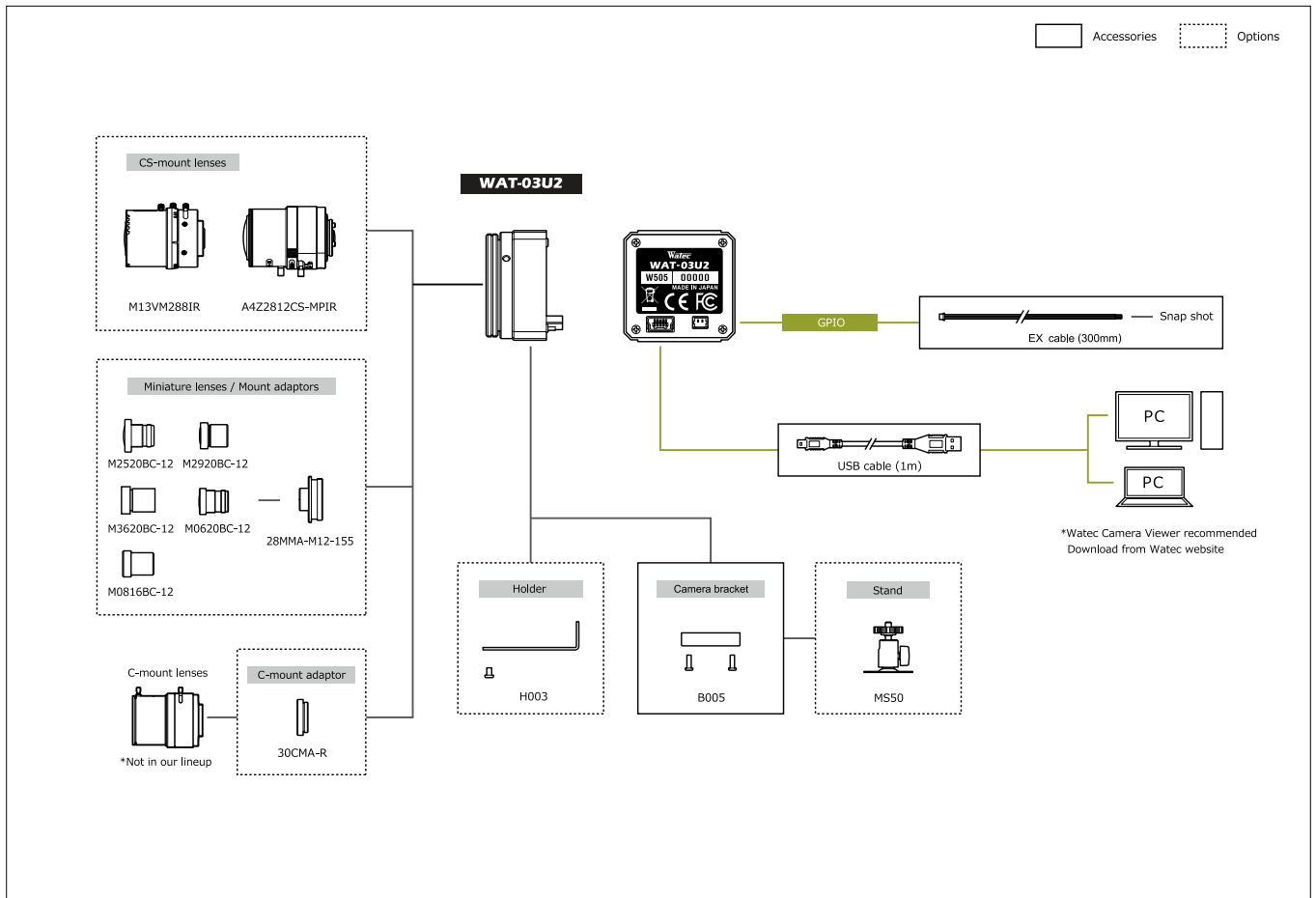
Dimensions



Specifications

Pick-up element	1/3 inch CMOS image sensor	
Number of effective pixels	1305(H) × 977(V)	
Unit cell size	3.75μm(H) × 3.75μm(V)	
Imaging system	RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	Progressive	
Output size	1280×960, 1280×720, 640×480, 320×240	
Max. frame rate	60 fps	
Video compression	MJPEG, YUY2	
Video output	USB Video Class (Compatible)	
Minimum illumination	0.02 lx F1.2 (AGC ON=42dB, Shutter=OFF) 0.005 lx F1.2 (AGC ON=42dB, Shutter=1/7.5 sec.)	
S/N	—	
Function settings	Camera Viewer	
AE mode	Fixed	1/15, 1/7.5, 1/4, 1/2, 1, 2 sec.
		1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.
	EI	1/30 - 1/8000 sec.
		1/7.5 - 1/8000 sec.
White balance		ATW, MWB
AGC	ON	0 - 42dB
	OFF	—
MGC		0 - 72dB (1dB step)
Gamma characteristics		γ=USER (Level adjustable)
Noise reduction		—
Wide dynamic range		—
Lens iris		—
Back light compensation		BLC
White blemish correction		—
Sharpness		Level adjustable
Defog		—
Digital zoom		—
Privacy mask		—
Mirror image		—
Freeze		—
Motion detection		—
Neg.image		—
Interface		USB (High speed), 2P connector (Snap shot)
Power supply		USB +5V
Power consumption		0.75W (150mA)
Operating temperature		-10 - +50°C
Storage temperature		-30 - +70°C
Operating / Storage humidity		95% RH or less (Without condensation)
Lens mount		CS mount (Back focus adjustable)
Cable length		Shorter than 3.0m recommended
Weight		Approx. 35g
Accessories		Hex, Wrench, Camera bracket, EX cable, USB cable
Min. System Requirements	CPU	800MHz or faster
	RAM	512MB or larger
	Others	USB2.0 Port
Recommended System Specifications	CPU	Intel® Core TM i Series
	RAM	2GB or larger
	Others	USB2.0 Port, 1920×1080 or better resolution display
Operation Confirmed OS		Windows 7 32bit/64bit, Windows 8 32bit/64bit, Windows 8.1 32bit/64bit, Windows 10 32bit/64bit

System diagram



WAT-06U2 1/2.8" Compact USB2.0 Full HD Color Camera

Upgraded the performance from WAT-01U2

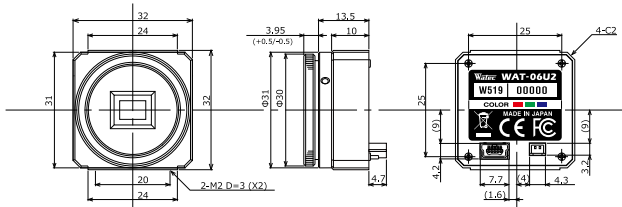
NEW



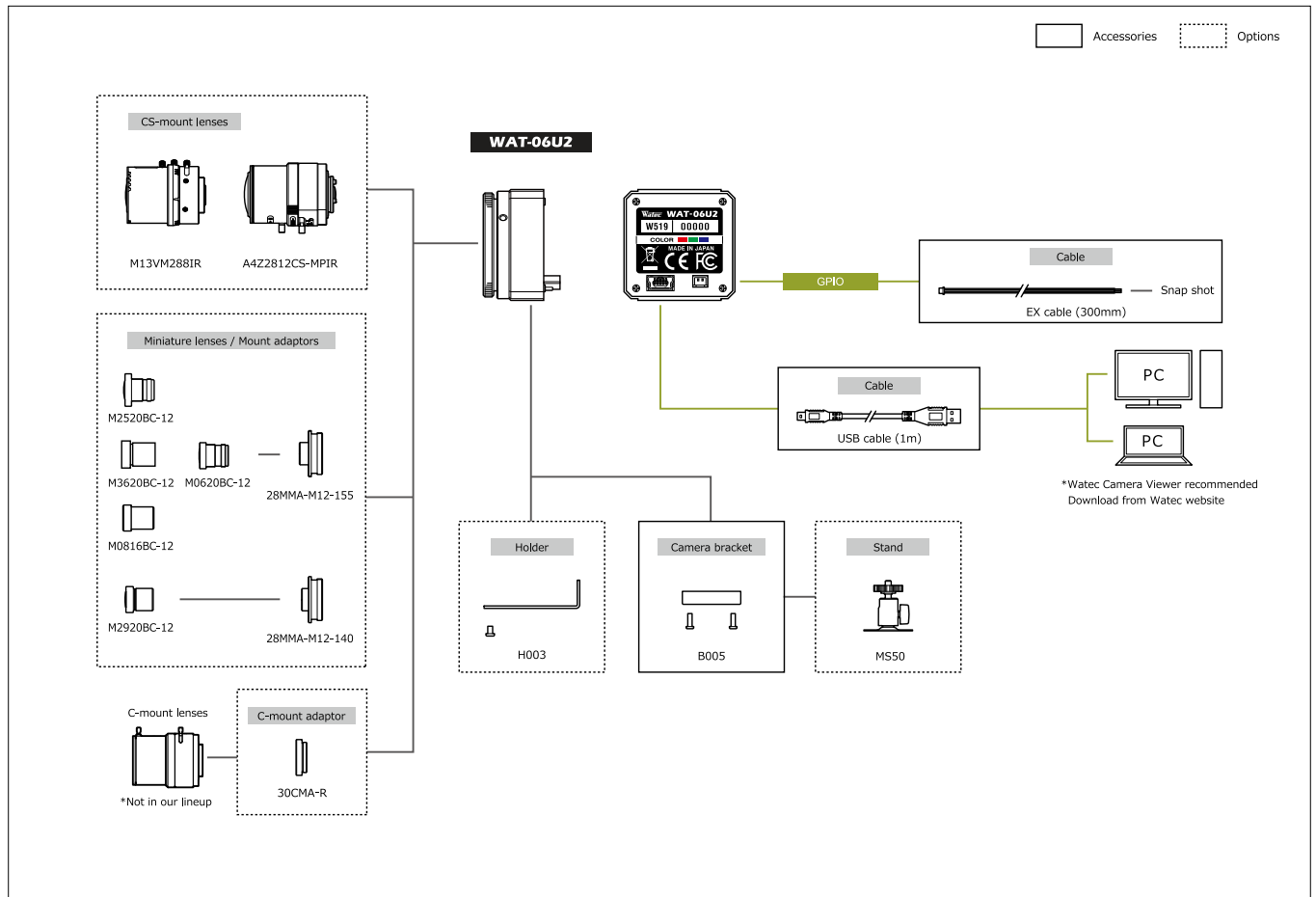
Key features

- Directly import the image to your PC and compact design specializes in the embedded application
- Resolution 1.3 times higher and sensitivity 4 times higher than the previous model
- The internal ISP (Image Signal Processor) enables optimal image quality for your usage
- USB Video Class & USB Bus Power (plug & play)
- Simple viewer software with features to change the camera settings and capture images.

Dimensions



System diagram



Specifications

Pick-up element		1/2.8 Inch CMOS image sensor	
Number of effective pixels		1945(H) × 1097(V)	
Unit cell size		2.9μm(H) × 2.9μm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Output size		1920x1080, 1280x720, 640x480, 320x240	
Max. frame rate		30 fps	
Video compression		MJPEG, YUY2	
Video output		USB Video Class (Compatible)	
Resolution (H)		More than 900TVL (Center)	
Minimum illumination		0.1 lx F1.2 (AGC ON=36dB, Shutter=OFF)	
		0.025 lx F1.2 (AGC ON=36dB, Shutter=1/7.5 sec.)	
S/N		—	
Function settings		Camera Viewer	
AE mode	Fixed	1/15, 1/7.5, 1/4 sec.	
		1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.	
	EI	1/30 - 1/8000 sec.	
		1/7.5 - 1/8000 sec.	
White balance		ATW, MWB	
AGC	ON	0 - 36dB	
	OFF	—	
MGC		0 - 72dB (1dB step)	
Gamma characteristics		γ=USER (Level adjustable)	
Noise reduction		—	
Wide dynamic range		—	
Lens iris		—	
Back light compensation		BLC	
White blemish correction		—	
Sharpness		Level adjustable	
Defog		—	
Digital zoom		x1, x1.38, x2.25 *1	x1, x1.2, x1.5 *2
Privacy mask		—	
Mirror image		—	
Freeze		—	
Motion detection		—	
Neg.image		—	
Interface		USB (High speed), 2P connector (Snap shot)	
Power supply		USB +5V	
Power consumption		0.65W (130mA)	
Operating temperature		-10 ~ +50°C	
Storage temperature		-30 ~ +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		CS mount (Back focus adjustable)	
Cable length		Shorter than 3.0m recommended	
Weight		Approx. 35g	
Accessories		Hex wrench, Camera bracket, EX cable, USB cable	
Recommended System Specifications	CPU	Intel® Core TM i Series	
	RAM	2GB or larger	
	Others	USB2.0 Port, 1920×1080 or better resolution display	
Operation Confirmed OS		Windows 10 32bit/64bit	

*1: Output format: 640x480 *2: Output format: 1280x720

WAT-07U2 1/2.8" Compact High Sensitivity USB2.0 Full HD B&W Camera

Added B&W version to the USB camera series

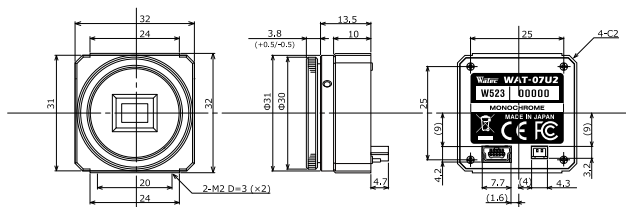
NEW



Key features

- Directly import the image to your PC and compact design specializes in the embedded application
- Min. illumination 0.002 lx F1.4 (AGC ON=36dB, Shutter=OFF)
0.0005 lx F1.2 (AGC ON=36dB, Shutter=1/7.5 sec.)
- The internal ISP (Image Signal Processor) enables optimal image quality for your usage
- Simple viewer software with features to change the camera settings and capture images.

Dimensions

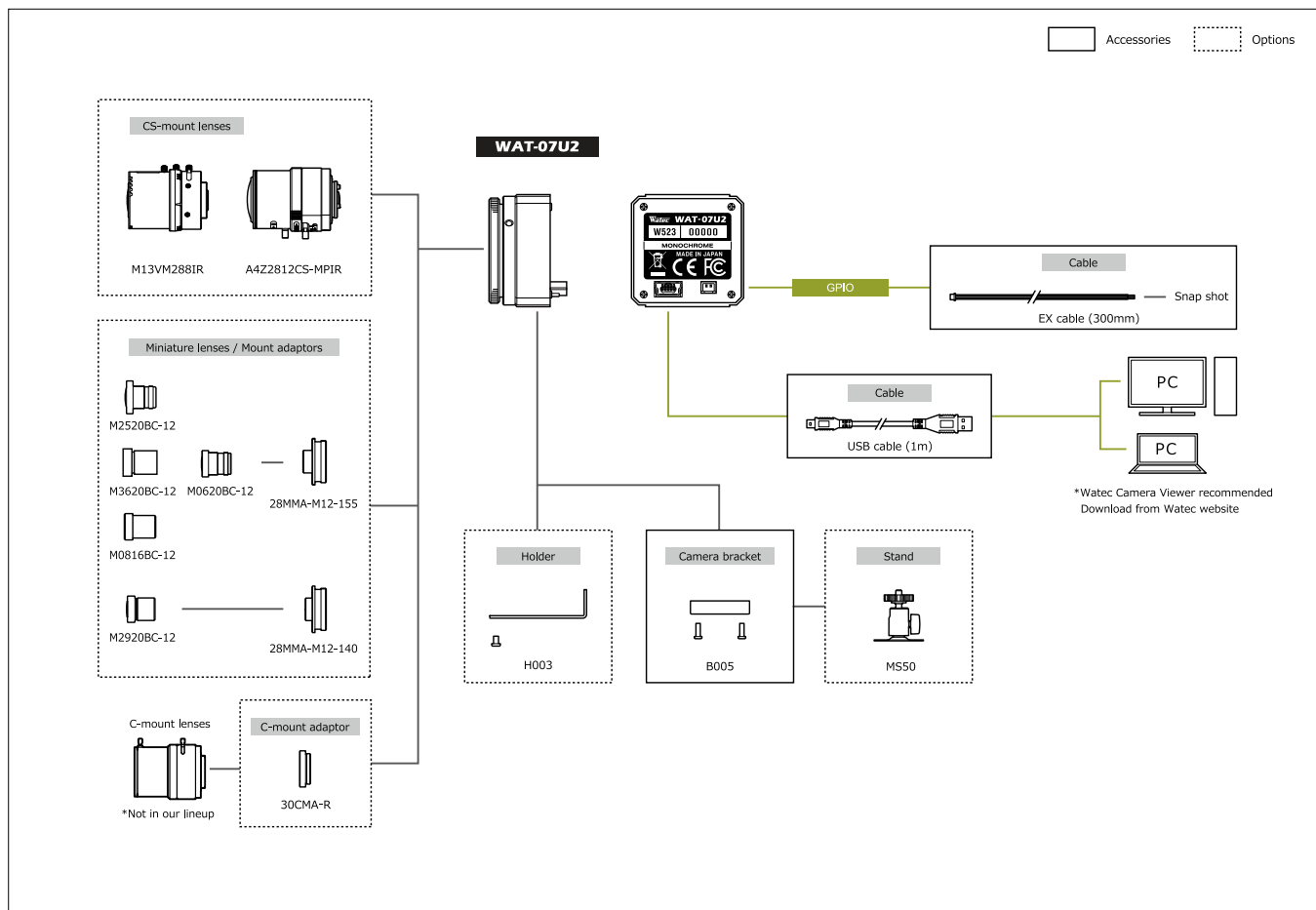


System diagram

Specifications

Pick-up element		1/2.8 inch CMOS image sensor
Number of effective pixels		1945(H) × 1097(V)
Unit cell size		2.9µm(H) × 2.9µm(V)
Imaging system		—
Synchronizing system		Internal
Scanning system		Progressive
Output size		1920x1080, 1280x720, 640x480, 320x240
Max. frame rate		30 fps
Video compression		MJPEG, YUY2
Video output		USB Video Class (Compatible)
Resolution (H)		More than 800TVL (Center)
Minimum illumination		0.002 lx F1.4 (AGC ON=36dB, Shutter=OFF) 0.0005 lx F1.4 (AGC ON=36dB, Shutter=1/7.5 sec.)
S/N		—
Function settings		Camera Viewer
AE mode	Fixed	1/15, 1/7.5, 1/4 sec.
		1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.
	EI	1/30 - 1/8000 sec.
		1/7.5 - 1/8000 sec.
White balance		—
AGC	ON	0 - 36dB
	OFF	—
MGC		0 - 72dB (1dB step)
Gamma characteristics		γ=USER (Level adjustable)
Noise reduction		—
Wide dynamic range		—
Lens iris		—
Back light compensation		BLC
White blemish correction		—
Sharpness		Level adjustable
Defog		—
Digital zoom		x1, x1.38, x2.25 *1
Privacy mask		—
Mirror image		—
Freeze		—
Motion detection		—
Neg.image		—
Interface		USB (High speed), 2P connector (Snap shot)
Power supply		USB +5V
Power consumption		0.65W (130mA)
Operating temperature		-10 ~ +50°C
Storage temperature		-30 ~ +70°C
Operating / Storage humidity		95% RH or less (Without condensation)
Lens mount		CS mount (Back focus adjustable)
Cable length		Shorter than 3.0m recommended
Weight		Approx. 35g
Accessories		Hex wrench, Camera bracket, EX cable, USB cable
Recommended System Specifications	CPU	Intel® Core TM i Series
	RAM	2GB or larger
	Others	USB2.0 Port, 1920×1080 or better resolution display
Operation Confirmed OS		Windows 10 32bit/64bit

*1: Output format: 640x480 *2: Output format: 1280x720



WAT- 05U2M 1/2.8" USB2.0 Full HD Wearable Camera

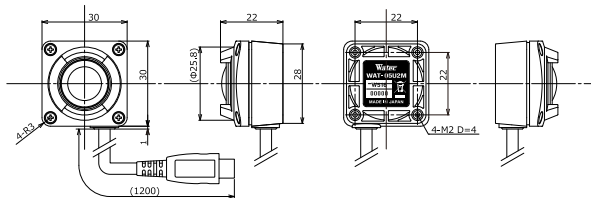
Compact water resistant camera (Dimensions: H30×W30×D22mm)



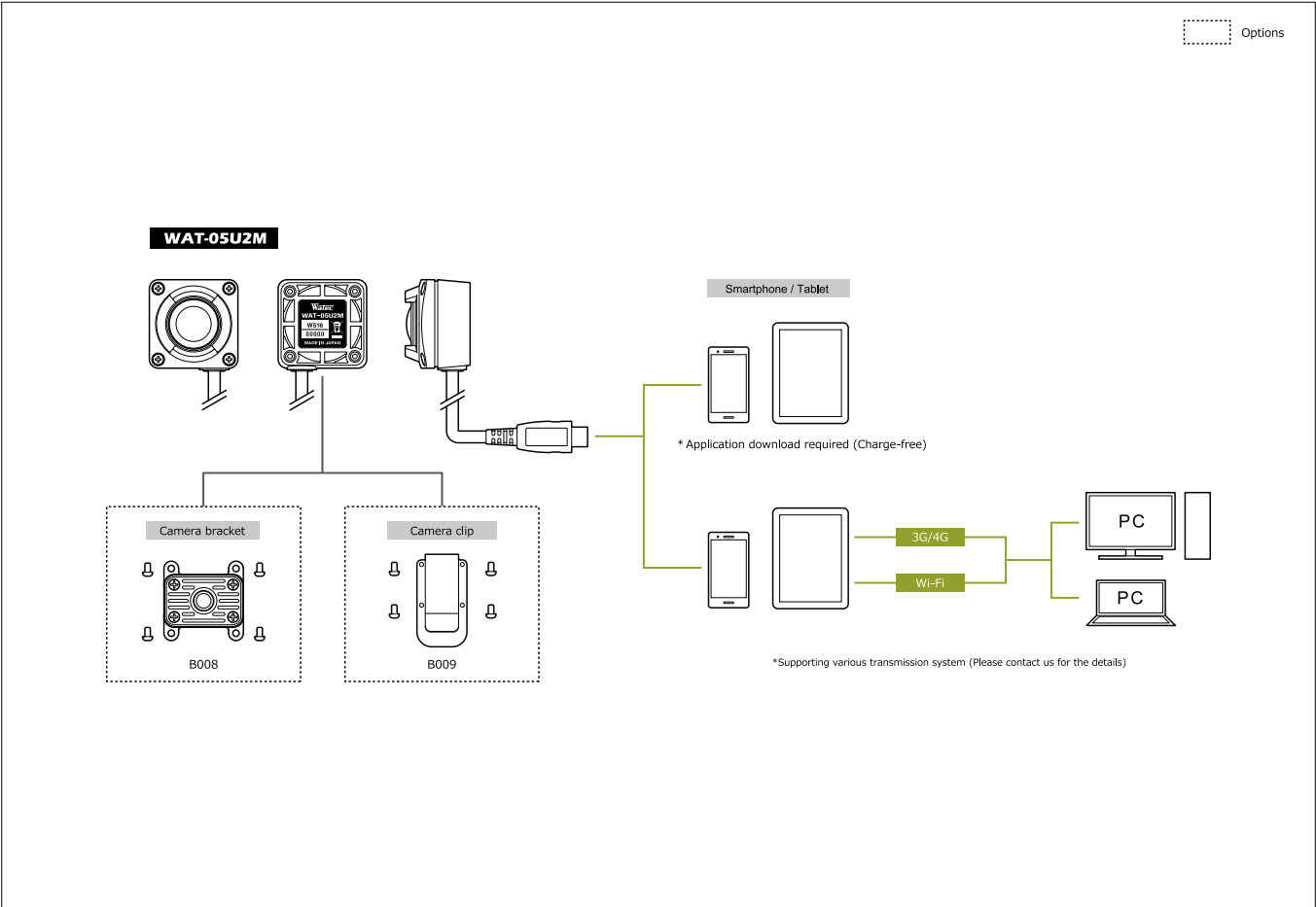
Key features

- Adopted the 180 degree wide angle lens
- The position of the cable is selectable in 4 dimensions (top, bottom, left and right) depends on the application and installation (Std. position: bottom) *The other sides are available on request
- Enable the live video transmission via the smartphone or tablet by its Wi-Fi or 4G/3G
- Water resistant built for outdoor use (IPX7 compliance)

Dimensions



System diagram



Specifications

Pick-up element		1/2.8 inch BSI CMOS image sensor
Number of effective pixels		1945(H) × 1097(V)
Unit cell size		2.9μm(H) × 2.9μm(V)
Imaging system		RGB primary color bayer arrangement mosaic filters on chip
Synchronizing system		Internal
Scanning system		Progressive
Output size		1920×1080, 1280×720, 640×480, 320×240
Max. frame rate		30 fps
Video compression		MJPEG, YUY2
Video output		USB Video Class (Compatible)
Minimum illumination		0.3 lx F2.0 (AGC ON=36dB, Shutter=OFF) 0.07 lx F2.0 (AGC ON=36dB, Shutter=1/7.5 sec.)
S/N		—
Function settings		Camera Viewer
AE mode	Fixed	1/15, 1/7.5, 1/4 sec.
		1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.
	EI	1/30 - 1/8000 sec.
		1/7.5 - 1/8000 sec.
White balance		ATW, MWB
AGC	ON	0 - 36dB
	OFF	—
MGC		0 - 72dB (1dB step)
Gamma characteristics		γ=USER (Level adjustable)
Noise reduction		—
Wide dynamic range		—
Lens iris		—
Back light compensation		BLC
White blemish correction		—
Sharpness		Level adjustable
Defog		—
Digital zoom		—
Privacy mask		—
Mirror image		—
Freeze		—
Motion detection		—
Neg.image		—
Interface		USB (High speed)
Power supply		USB +5V
Power consumption		0.85W (170mA)
Operating temperature		-10 - +50°C
Storage temperature		-30 - +60°C
Operating / Storage humidity		95% RH or less (Without condensation)
Standard lens		M1720BC-12 (f1.7 F2.0)
Cable length		1.2m
Weight		Approx. 45g
Accessories		—
Min. System Requirements	CPU	800MHz or faster
	RAM	512MB or larger
	Others	USB2.0 Port
Recommended System Specifications	CPU	Intel® Core TM i Series
	RAM	2GB or larger
	Others	USB2.0 Port, 1920×1080 or better resolution display
Operation Confirmed OS		Windows 7 32bit/64bit, Windows 8 32bit/64bit, Windows 8.1 32bit/64bit, Windows 10 32bit/64bit, Android 4.0 or newer

WAT-03U2D 1/3" High Sensitivity USB2.0 HD Water Resistant Camera

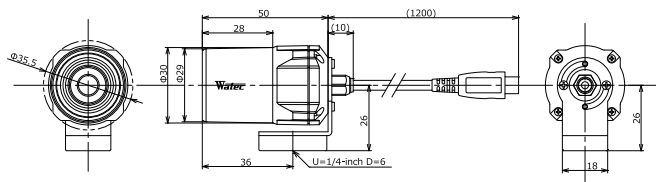
IPX7 Water resistance



Key features

- High Sensitivity 1.3 Mega pixel CMOS sensor
- Min. illumination 0.04 lx F2.0 (AGC ON=42dB, Shutter=OFF)
0.01 lx F2.0 (AGC ON=42dB, Shutter=1/7.5 sec.)
- Frame rate : 30fps (HD), 60fps (VGA)
- Water resistant structure for outdoor use

Dimensions

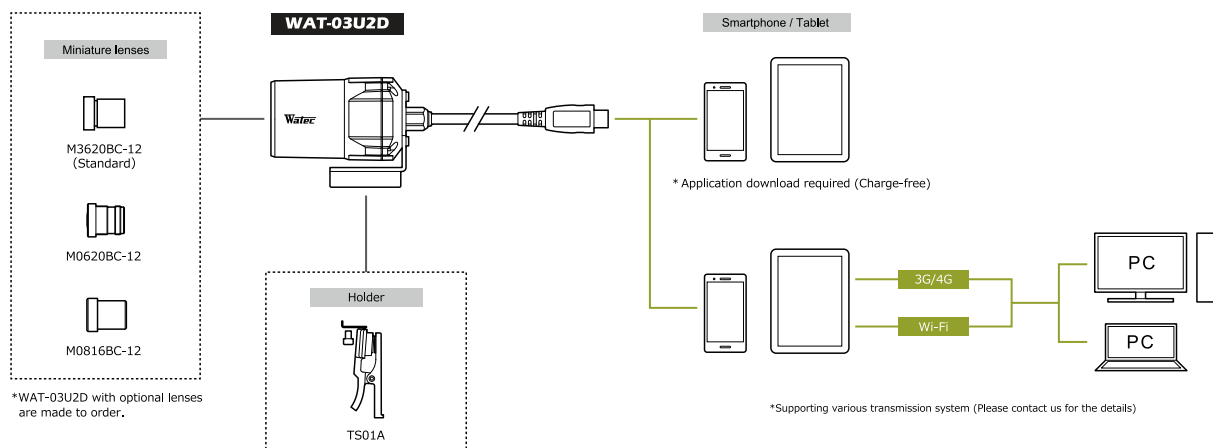


System diagram

Specifications

Pick-up element		1/3 inch CMOS image sensor	
Number of effective pixels		1305(H) × 977(V)	
Unit cell size		3.75μm(H) × 3.75μm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Output size		1280×960, 1280×720, 640×480, 320×240	
Max. frame rate		60 fps	
Video compression		MJPEG, YUY2	
Video output		USB Video Class (Compatible)	
Minimum illumination		0.04 lx F2.0 (AGC ON=42dB, Shutter=OFF) 0.01 lx F2.0 (AGC ON=42dB, Shutter=1/7.5 sec.)	
S/N		—	
Function settings		Camera Viewer	
AE mode	Fixed	1/15, 1/7.5, 1/4, 1/2, 1, 2 sec.	
		1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.	
	EI	1/30 - 1/8000 sec.	
		1/7.5 - 1/8000 sec.	
White balance		ATW, MWB	
AGC	ON	0 - 42dB	
	OFF	—	
MGC		0 - 72dB (1dB step)	
Gamma characteristics		γHUSER (Level adjustable)	
Noise reduction		—	
Wide dynamic range		—	
Lens iris		—	
Back light compensation		BLC	
White blemish correction		—	
Sharpness		Level adjustable	
Defog		—	
Digital zoom		—	
Privacy mask		—	
Mirror image		—	
Freeze		—	
Motion detection		—	
Neg. image		—	
Interface		USB (High speed)	
Power supply		USB +5V	
Power consumption		0.75W (150mA)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Standard lens		M3620BC-12 (f3.6 F2.0)	
Cable length		1.2m (Max. 3.0m)	
Weight		Approx. 85g	
Accessories		—	
Min. System Requirements	CPU	800MHz or faster	
	RAM	512MB or larger	
	Others	USB2.0 Port	
Recommended System Specifications	CPU	Intel® Core TM i Series	
	RAM	2GB or larger	
	Others	USB2.0 Port, 1920×1080 or better resolution display	
Operation Confirmed OS		Windows 7 32bit/64bit, Windows 8 32bit/64bit, Windows 8.1 32bit/64bit, Windows 10 32bit/64bit, Android 4.0 or newer	

Options



1/2.8" USB2.0 Full HD Wearable Color Camera

NEW



- Resolution 1.3 times higher and sensitivity 3.5 times higher than the previous model
- USB Video Class & USB Bus Power (plug & play)
- Full HD (Max. frame rate 30fps)
- Enable the live video transmission via the smartphone or tablet by its Wi-Fi or 4G/3G
- Water resistant structure for outdoor use

[illegible]

Pick-up element		1/2.8 inch CMOS image sensor	
Number of effective pixels		1945(H) × 1097(V)	
Unit cell size		2.9μm(H) × 2.9μm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Output size		1920x1080, 1280x720, 640x480, 320x240	
Max. frame rate		30 fps	
Video compression		MJPEG, YUY2	
Video output		USB Video Class (Compatible)	
Resolution (H)		More than 900TVL (Center)	
Minimum Illumination		0.3 lx F2.0 (AGC ON=36dB, Shutter=OFF) 0.07 lx F2.0 (AGC ON=36dB, Shutter=1/7.5 sec.)	
S/N		—	
Function settings		Camera Viewer	
AE mode	Fixed	1/15, 1/7.5, 1/4 sec.	
		1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.	
	EI	1/30 - 1/8000 sec.	
		1/7.5 - 1/8000 sec.	
White balance		ATW, MWB	
AGC	ON	0 - 36dB	
	OFF	—	
MGC		0 - 72dB (1dB step)	
Gamma characteristics		γ=USER (Level adjustable)	
Noise reduction		—	
Wide dynamic range		—	
Lens iris		—	
Back light compensation		BLC	
White blemish correction		—	
Sharpness		Level adjustable	
Defog		—	
Digital zoom		x1, x1.38, x2.25 *1	x1, x1.2, x1.5 *2
Privacy mask		—	
Mirror image		—	
Freeze		—	
Motion detection		—	
Neg.image		—	
Interface		USB (High speed)	
Power supply		USB +5V	
Power consumption		0.65W (130mA)	
Operating temperature		-10 - +50℃	
Storage temperature		-30 - +70℃	
Operating / Storage humidity		95% RH or less (Without condensation)	
Standard lens		M3620BC-12 (f3.6 F2.0)	
Cable length		1.2m (Max.3.0m)	
Weight		Approx. 85g	
Accessories		—	
Recommended System Specifications	CPU	Intel® Core TM i Series	
	RAM	2GB or larger	
	Others	USB2.0 Port, 1920×1080 or better resolution display	
Operation Confirmed OS		Windows 10 32bit/64bit, Android 4.0 or newer	

*1: Output format: 640x480 *2: Output format: 1280x720

*Supporting various transmission system (Please contact us for the details)

Options

WAT-07U2D

1/2.8" High Sensitivity USB2.0 Full HD Wearable B&W Camera

Added B&W version to the USB camera series

NEW

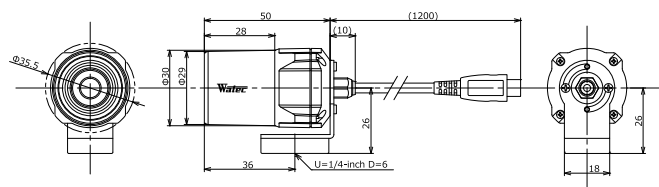


*No CE & FCC

Key features

- Min. illumination 0.004 lx F2.0 (AGC ON=36dB, Shutter=OFF)
0.001 lx F2.0 (AGC ON=36dB, Shutter=1/7.5 sec.)
- Full HD (Max. frame rate 30fps)
- Enable the live video transmission via the smartphone or tablet by its Wi-Fi or 4G/3G
- Water resistant structure for outdoor use

Dimensions



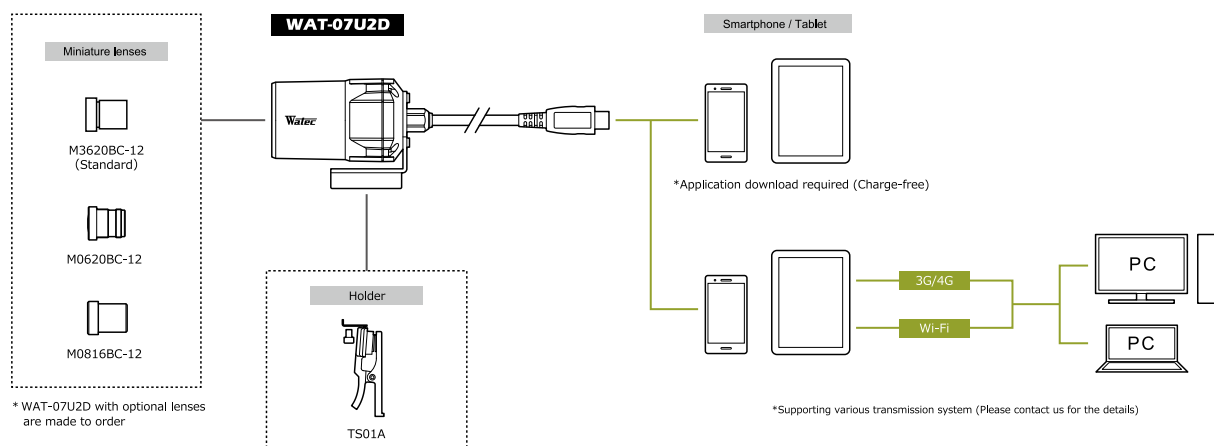
Specifications

Pick-up element		1/2.8 inch CMOS image sensor	
Number of effective pixels		1945(H) × 1097(V)	
Unit cell size		2.9µm(H) × 2.9µm(V)	
Imaging system		—	
Synchronizing system		Internal	
Scanning system		Progressive	
Output size		1920×1080, 1280×720, 640×480, 320×240	
Max. frame rate		30 fps	
Video compression		MJPEG, YUY2	
Video output		USB Video Class (Compatible)	
Resolution (H)		More than 800TVL (Center)	
Minimum illumination		0.004 lx F2.0 (AGC ON=36dB, Shutter=OFF)	
		0.001 lx F2.0 (AGC ON=36dB, Shutter=1/7.5 sec.)	
S/N		—	
Function settings		Camera Viewer	
AE mode	Fixed	1/15, 1/7.5, 1/4 sec.	
		1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.	
	EI	1/30 - 1/8000 sec.	
		1/7.5 - 1/8000 sec.	
White balance		—	
AGC	ON	0 - 36dB	
	OFF	—	
MGC		0 - 72dB (1dB step)	
Gamma characteristics		γ=USER (Level adjustable)	
Noise reduction		—	
Wide dynamic range		—	
Lens iris		—	
Back light compensation		BLC	
White blemish correction		—	
Sharpness		Level adjustable	
Defog		—	
Digital zoom		×1, ×1.38, ×2.25 *1	×1, ×1.2, ×1.5 *2
Privacy mask		—	
Mirror image		—	
Freeze		—	
Motion detection		—	
Neg.image		—	
Interface		USB (High speed)	
Power supply		USB +5V	
Power consumption		0.65W (130mA)	
Operating temperature		-10 ~ +50°C	
Storage temperature		-30 ~ +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Standard lens		M3620BC-12 (f3.6 F2.0)	
Cable length		1.2m (Max.3.0m)	
Weight		Approx. 85g	
Accessories		—	
Recommended System Specifications	CPU	Intel® Core™ i Series	
	RAM	2GB or larger	
	Others	USB2.0 Port, 1920×1080 or better resolution display	
Operation Confirmed OS		Windows 10 32bit/64bit, Android 4.0 or newer	

*1: Output format: 640x480 *2: Output format: 1280x720

System diagram

Options



1/3.2" High Sensitivity Miniature Camera with Day/Night

- High sensitivity min. illumination 0.002 lx F1.2 (AGC ON=54dB, Shutter=OFF)
- Ultra-compact design only 26 x 26 x 30 mm
- Wide dynamic range, ICR Mechaless Day/Night function
- A dual-band pass filter allows the ability to view a scene with 850nm IR illumination at night

*Advanced setting available by OSD (On Screen Display) through an optional remote control

Technical drawing of the VES-010-010-000 module showing front, side, and rear views with dimensions:

- Front View:** Square module with side length 26 mm. Mounting holes are spaced 26 mm apart.
- Side View:** Shows a total height of 9.78 mm. The mounting flange has a thickness of 1.4 mm. The top surface has a 4-R1.5 chamfer. The bottom surface has two 2-M2(D=2.5) mounting holes.
- Rear View:** Shows the module's footprint with dimensions 16 mm (width) and 14 mm (height). It features a DC input connector (DC IN), a VES output connector (VES OUT), a CTL output connector (CTL), and a 2-M2(D=2.5) mounting hole.

The diagram illustrates the WAT-1200CS camera system and its connections to various accessories and options. The central unit is the WAT-1200CS camera, which has a main body and a camera bracket (B005). The camera body has several ports: VIDEO OUT, POWER IN, OSD, IR LIGHT CTL, and BNC CTL.

Accessories (Solid Lines):

- CS-mount lenses:** M13VG288IR, M13VG850IR, AG3Z2812FCS-MPWIR, AG4Z1214FCS-MPIR.
- C-mount lenses:** 30CMA-R (Note: *Not in our lineup).
- Stand:** MS50.
- Camera bracket:** B005.
- OSD:** Remote control (RC-01).
- IR LIGHT CTL:** 2P cable (300mm).
- POWER IN (DC+12V):** 4P cable (300mm).
- POWER IN (DC+5-12V):** Cable with connectors (CB-01).
- Power supply adaptors:** SW112-12-N-P5, SW112-12-E-P5.
- VIDEO OUT (BNC):** 1.5C2V (BNC/BNC), 3C2V (BNC/BNC).
- VIDEO OUT (RCA):** 3C2V (BNC/RCA).

Options (Dashed Lines):

- Remote control:** RC-01.
- 2P cable (300mm):** IR LIGHT CTL.
- 4P cable (300mm):** POWER IN (DC+5-12V).
- Monitor:** *Not in our lineup.

Video standard		NTSC	PAL
Pick-up element		1/3 inch BSI CMOS image sensor	
Number of effective pixels		1280(H) × 960(V)	1280(H) × 924(V)
Unit cell size		3.5µm(H) × 3.5µm(V)	
Imaging system		RGB+W array mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 750TVL (Center)	
Minimum illumination		0.002 lx F1.2 (AGC ON=54dB, Shutter=OFF)	
S/N		More than 55dB (AGC OFF=0dB, γ=1.0)	
Function settings		OSD : Remote controller	
AE mode	Fixed	1/60 sec.	1/50 sec.
		1/100, 1/120, 1/125, 1/250, 1/500, 1/100, 1/2000, 1/4000, 1/8000, 1/10000, 1/20000, 1/50000, 1/100000 sec.	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW, AWB, PWB, MWB, PRESET (5100K, 6300K)	
AGC	ON	0 - 54dB	
	OFF	0dB	
MGC		0 - 54dB (6dB step)	
Day/Night		ICR mechless Auto, Manual	
Gamma characteristics		γ=0.45	
Video level		Adjustable	
Noise reduction		2DNR OFF/ON Level adjustable	
Wide dynamic range		WDR OFF/ON Level adjustable, D-WDR OFF/ON Level adjustable	
Lens iris		DC	
Back light compensation		BLC, HSBLC	
White blemish correction		—	
Sharpness		Level adjustable	
Defog		OFF/ON Level adjustable	
Digital zoom		—	
Privacy mask		16 masks	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		—	
Motion detection		—	
Neg.image		—	
Interface		4P connector (Composite Video, Power in), Auto iris, 2P connector (IR light ctl), Remote control (RC-01)	
Power supply		DC+5V - 12V	
Power consumption		0.6W/120mA (DC+5V), 0.72W/60mA (DC+12V)	
Operating temperature		-10 - +50℃	
Storage temperature		-30 - +70℃	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		CS mount	
Weight		Approx. 22g	
Accessories		AIC-G (Iris plug), 4P cable, 2P cable, Hex. wrench, B005 (Camera bracket)	

WAT-221S2 1/2" Multi-function & High Sensitivity Camera

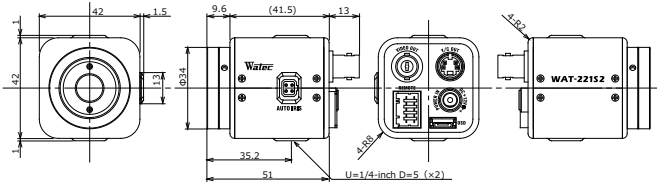
Advanced setting for general surveillance, embedded system and research study



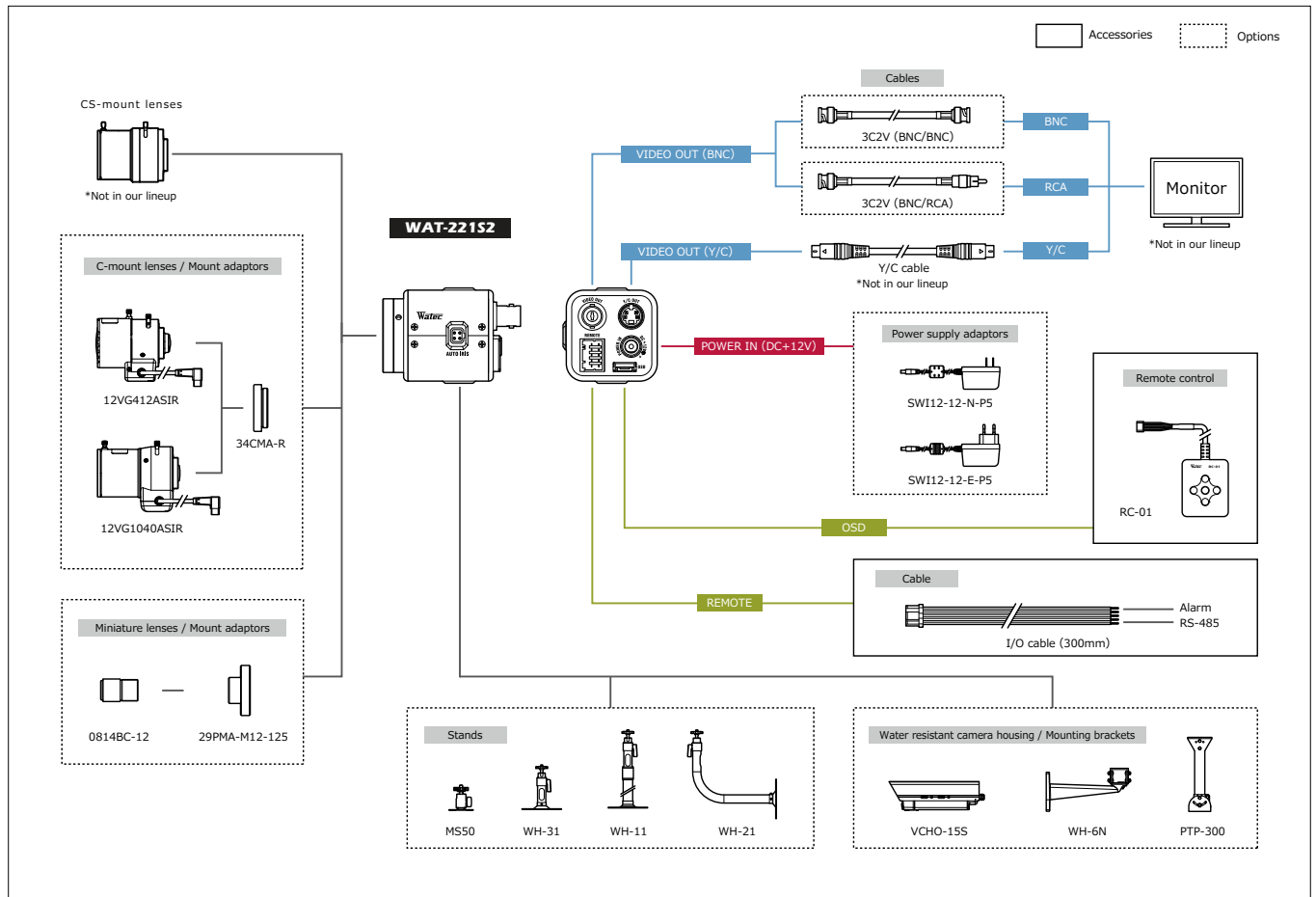
Key features

- 1/2-inch CCD sensor with high sensitivity
- Min. illumination 0.006 lx F1.2 (AGC HIGH=44dB, shutter=OFF, NR=ON)
- 3DNR, wide dynamic range, HSBLC (Highlight Suppression Back Light Compensation)
- White blemish correction, slow-shutter, privacy masking and RS-485 (Pelco-D) compatible
- OSD (On Screen Display) - Easy installation through a remote control provided in kit

Dimensions



System diagram



Specifications

Video standard		PAL	
Pick-up element		1/2 inch interline transfer CCD image sensor	
Number of effective pixels		52(H) × 582(V)	
Unit cell size		8.6μm(H) × 8.3μm(V)	
Imaging system		Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		2:1 interlace	
Video outputs		Composite: 1.0 V(p-p) 75Ω (Unbalanced) Y/C OUT: Y: 1.0V(p-p), C: 0.3V(p-p) 75Ω	
Resolution (H)		More than 550TVL (Center)	
Minimum illumination		0.006 lx F1.2 (AGC HIGH=44dB, Shutter=OFF, NR=ON) 0.0004 lx F1.2 (AGC HIGH=44dB, Shutter=x16, NR=ON)	
S/N		More than 55dB (AGC OFF=-3dB, γ=1.0)	
Function settings		OSD: Remote controller, RS-485 (Pelco-D), Communication: RS-485 (Pelco-D)	
AE mode	Fixed	x2, x4, x8, x16, x32, x64, x128, x256 (field)	
		1/50, 1/120 sec.	
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.	
		1/50 - 1/100000 sec. x16 - 1/100000 sec.	
White balance		ATW, AWB, ACR, PWB, PRESET (3200K, 4300K, 5100K, 6300K)	
AGC	ON	-3 - 32dB (LOW), -3 - 44dB (HIGH)	
	OFF	-3dB	
MGC		-3 - 44dB (1dB step)	
Day/Night		—	
Gamma characteristics		γ=0.35, 0.4, 0.45, 0.5, 0.55, 0.6, 0.7, 0.8, 1.0	
Video level		Adjustable	
Noise reduction		3DNR OFF/ON Level adjustable	
Wide dynamic range		D-WDR OFF/ON Level adjustable	
Lens iris		Video / DC (EIAJ, Auto-select)	
Back light compensation		BLC, HSBLC	
White blemish correction		Up to 64 pixels	
Sharpness		Level adjustable	
Defog		OFF/ON Level adjustable	
Digital zoom		ZOOM (x2 - x256), PAN/TILT	
Privacy mask		4 masks	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		—	
Motion detection		OFF/ON Select from 96 detection areas	
Neg.image		—	
Interface		BNC (Composite Video), Y/C OUT, Power in, Remote control (RC-01), REMOTE (Alarm, RS-485)	
Power supply		DC+12V±10%	
Power consumption		1.32W (110mA)	
Operating temperature		-10 - +50℃	
Storage temperature		-30 - +70℃	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		CS mount	
Weight		Approx. 150g	
Accessories		WPDC12 (DC plug), AIC-G (Iris plug), Hex. wrench, RC-01 (Remote control), I/O cable	

WAT-240E (G3.8) 1/4" Miniature Camera

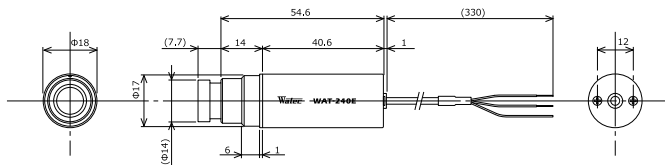
Compact cylindrical camera with Built-in lens



Key features

- Resolution 480TVL
- Versatile use for limited space, general surveillance, embedded system and part of image processing system
- Various Optional M12 lenses available *Glass lenses and pinhole lens are not interchangeable

Dimensions



WAT-240E/CB (G3.8) 1/4" Miniature Camera

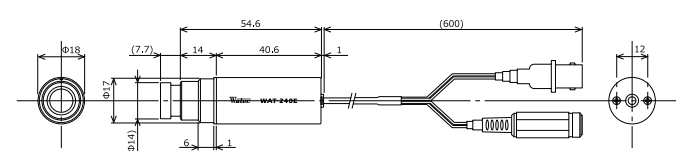
Compact cylindrical camera with Built-in lens & BNC output



Key features

- Resolution 480TVL
- Versatile use for limited space, general surveillance, embedded system and part of image processing system
- Various Optional M12 lenses available *Glass lenses and pinhole lens are not interchangeable

Dimensions



Specifications

		NTSC	PAL
Video standard		NTSC	PAL
Pick-up element		1/4 inch CMOS image sensor	
Number of effective pixels		648(H) × 488(V)	
Unit cell size		5.6μm(H) × 5.6μm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 480TVL (Center)	
Minimum illumination		0.3 lx F2.0 (AGC ON=42dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=0dB, γ=1.0)	
Function settings		—	
AE mode	Fixed	—	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW	
AGC	ON	0 - 42dB	
	OFF	—	
MGC		—	
Day/Night		—	
Gamma characteristics		γ=0.45	
Video level		85IRE	
Noise reduction		—	
Wide dynamic range		—	
Lens iris		—	
Back light compensation		BLC	
White blemish correction		—	
Sharpness		—	
Defog		—	
Digital zoom		—	
Privacy mask		—	
Mirror image		—	
Freeze		—	
Motion detection		—	
Neg.image		—	
Interface		3P cable (Composite Video, Power in)	
Power supply		DC+5V - 6V	
Power consumption		0.66W/110mA (DC+6V)	
Operating temperature		-10 - +50℃	
Storage temperature		-30 - +70℃	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		3820BC-12 (f3.8 F2.0)	
Cable length		330mm	
Weight		Approx. 23g	
Accessories		Ring holder	

Specifications

		NTSC	PAL
Video standard		NTSC	PAL
Pick-up element		1/4 inch CMOS image sensor	
Number of effective pixels		648(H) × 488(V)	
Unit cell size		5.6μm(H) × 5.6μm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 480TVL (Center)	
Minimum illumination		0.3 lx F2.0 (AGC ON=42dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=0dB, γ=1.0)	
Function settings		—	
AE mode	Fixed	—	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW	
AGC	ON	0 - 42dB	
	OFF	—	
MGC		—	
Day/Night		—	
Gamma characteristics		γ=0.45	
Video level		85IRE	
Noise reduction		—	
Wide dynamic range		—	
Lens iris		—	
Back light compensation		BLC	
White blemish correction		—	
Sharpness		—	
Defog		—	
Digital zoom		—	
Privacy mask		—	
Mirror image		—	
Freeze		—	
Motion detection		—	
Neg.image		—	
Interface		BNC (Composite Video), Power in	
Power supply		DC+5V - 6V	
Power consumption		0.66W/110mA (DC+6V)	
Operating temperature		-10 - +50℃	
Storage temperature		-30 - +70℃	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		3820BC-12 (f3.8 F2.0)	
Cable length		600mm	
Weight		Approx. 33g	
Accessories		Ring holder	

WAT-240E (P3.7) 1/4" Miniature Camera

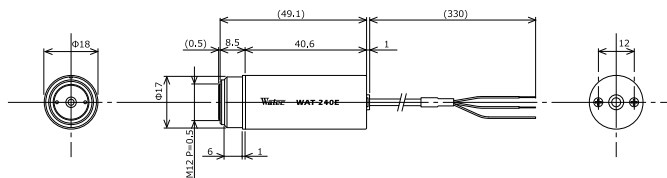
Compact cylindrical camera with Built-in lens



Key features

- Resolution 480TVL
- Versatile use for limited space, general surveillance, embedded system and part of image processing system
- *Glass lenses and pinhole lens are not interchangeable

Dimensions



WAT-240E/CB (P3.7) 1/4" Miniature Camera

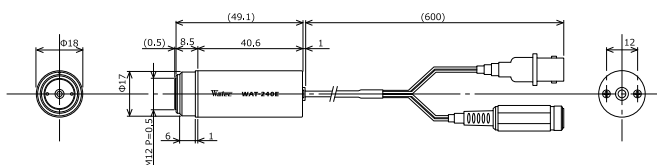
Compact cylindrical camera with Built-in lens & BNC output



Key features

- Resolution 480TVL
- Versatile use for limited space, general surveillance, embedded system and part of image processing system
- *Glass lenses and pinhole lens are not interchangeable

Dimensions



Specifications

		NTSC	PAL
Video standard		NTSC	PAL
Pick-up element		1/4 inch CMOS image sensor	
Number of effective pixels		648(H) × 488(V)	
Unit cell size		5.6μm(H) × 5.6μm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 480TVL (Center)	
Minimum illumination		0.3 lx F2.0 (AGC ON=42dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=0dB, γ=1.0)	
Function settings		—	
AE mode	Fixed	—	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW	
AGC	ON	0 - 42dB	
	OFF	—	
MGC		—	
Day/Night		—	
Gamma characteristics		γ±0.45	
Video level		85IRE	
Noise reduction		—	
Wide dynamic range		—	
Lens iris		—	
Back light compensation		BLC	
White blemish correction		—	
Sharpness		—	
Defog		—	
Digital zoom		—	
Privacy mask		—	
Mirror image		—	
Freeze		—	
Motion detection		—	
Neg.image		—	
Interface		3P cable (Composite Video, Power in)	
Power supply		DC+5V - 6V	
Power consumption		0.66W/110mA (DC+6V)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		3720B-12P(B) (f3.7 F2.0)	
Cable length		330mm	
Weight		Approx. 18g	
Accessories		Ring holder	

Specifications

		NTSC	PAL
Video standard		NTSC	PAL
Pick-up element		1/4 inch CMOS image sensor	
Number of effective pixels		648(H) × 488(V)	
Unit cell size		5.6μm(H) × 5.6μm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 480TVL (Center)	
Minimum illumination		0.3 lx F2.0 (AGC ON=42dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=0dB, γ=1.0)	
Function settings		—	
AE mode	Fixed	—	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW	
AGC	ON	0 - 42dB	
	OFF	—	
MGC		—	
Day/Night		—	
Gamma characteristics		γ±0.45	
Video level		85IRE	
Noise reduction		—	
Wide dynamic range		—	
Lens iris		—	
Back light compensation		BLC	
White blemish correction		—	
Sharpness		—	
Defog		—	
Digital zoom		—	
Privacy mask		—	
Mirror image		—	
Freeze		—	
Motion detection		—	
Neg.image		—	
Interface		BNC (Composite Video), Power in	
Power supply		DC+5V - 6V	
Power consumption		0.66W/110mA (DC+6V)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		3720B-12P(B) (f3.7 F2.0)	
Cable length		600mm	
Weight		Approx. 28g	
Accessories		Ring holder	

WAT-240E/FS (G3.8)
1/4" Miniature Camera

Function setting controllable WAT-240E

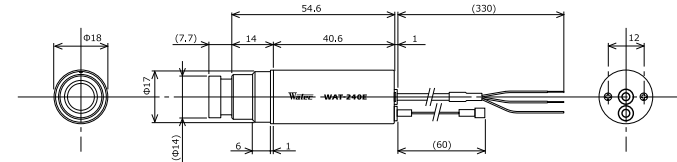


* No CE & FCC

Key features

- Advanced setting available through an optional AVM-USB2
- Versatile application for the miniature size and the shape
- Resolution 480 TVL
- Various lenses available (M12) *Glass lenses and pinhole lens are not interchangeable
- Pinhole lens (P3.7) and BNC output (CB) versions available

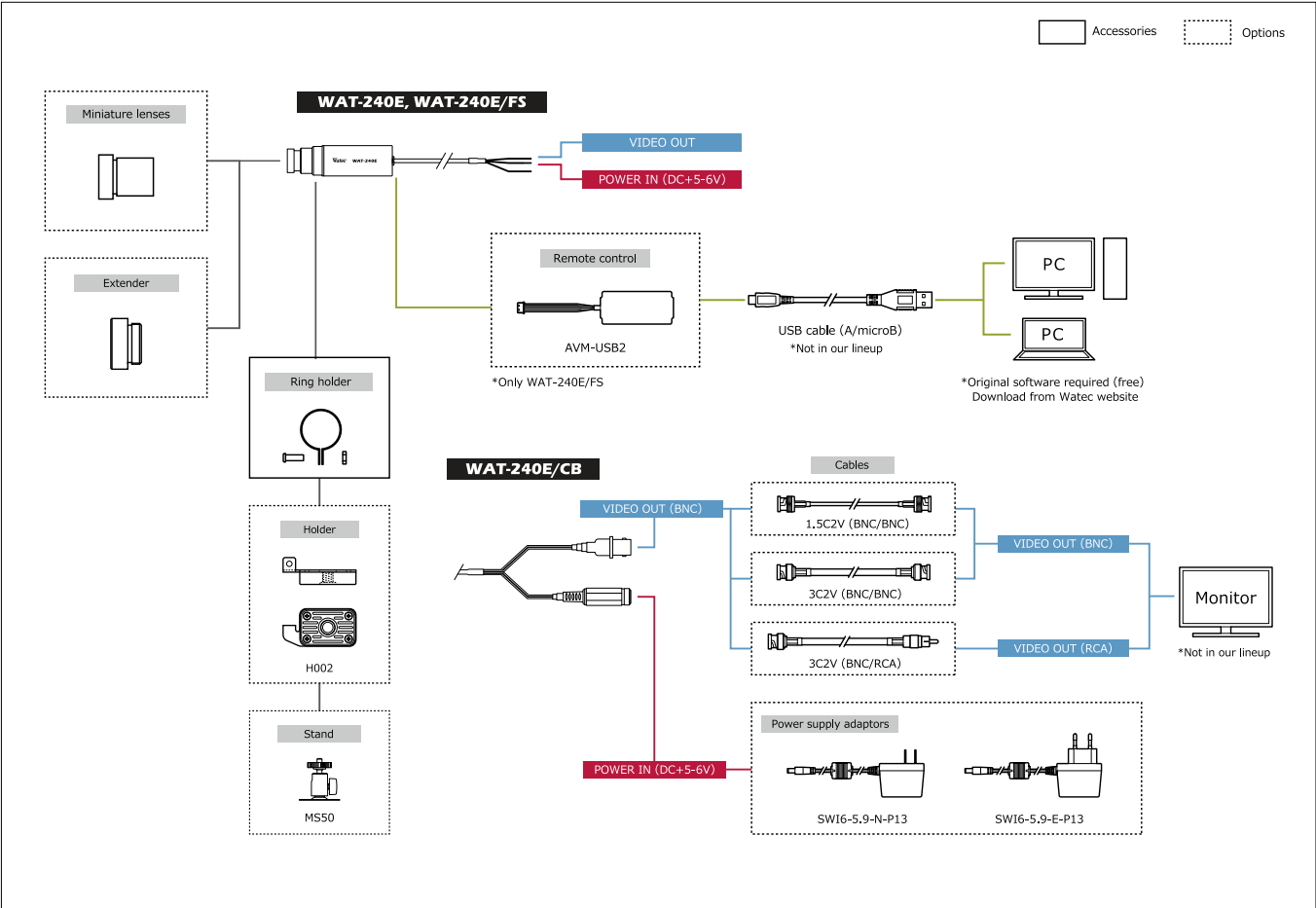
Dimensions



Specifications

		NTSC	PAL
Video standard		NTSC	PAL
Pick-up element		1/4 inch CMOS image sensor	
Number of effective pixels		648(H) × 488(V)	
Unit cell size		5.6μm(H) × 5.6μm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 480TVL (Center)	
Minimum illumination		0.3 lx F2.0 (AGC ON=42dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=0dB, γ=1.0)	
Function settings		Communication : USB (AVM-USB2)	
AE mode	Fixed	1/60, 1/100 sec.	1/50, 1/120 sec.
	ET	1/250, 1/500, 1/1000, 1/2500, 1/5000, 1/10000, 1/20000, 1/50000, 1/100000 sec.	1/60 - 1/100000 (Max.1/60 - 1/100000) sec.
White balance		ATW, MWB, PRESET (3200K, 4400K, 5100K, 8200K)	
AGC	ON	0 - 42dB (Max.0 - 42)	
	OFF	0dB	
MGC		0 - 42dB (1dB step)	
Day/Night		—	
Gamma characteristics		γ=0.45, 0.6, 1.0	
Video level		Adjustable	
Noise reduction		—	
Wide dynamic range		—	
Lens iris		—	
Back light compensation		BLC	
White blemish correction		—	
Sharpness		Level adjustable	
Defog		—	
Digital zoom		—	
Privacy mask		—	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		—	
Motion detection		—	
Neg.image		—	
Interface		3P cable (Composite Video, Power in), 4P connector (Remote control)	
Power supply		DC+5V - 6V	
Power consumption		0.66W/110mA (DC+6V)	
Operating temperature		-10 ~ +50℃	
Storage temperature		-30 ~ +70℃	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		3820BC-12 (F3.8 F2.0)	
Cable length		3P cable : 330mm, 4P cable : 60mm	
Weight		Approx. 26g	
Accessories		Ring holder	

System diagram Representative connection example of the WAT-240E series



WAT-230V2 (G3.6) 1/4" Miniature Camera

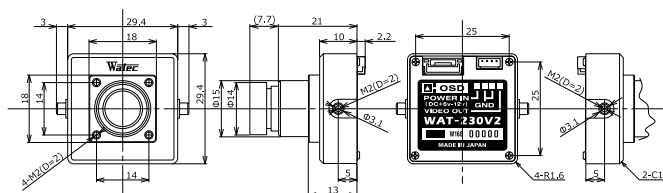
Ultra-compact design for easy installation and limited space



Key features

- High resolution of 650TVL
- Min.illumination 0.1 lx F2.0 (AGC ON=45dB, Shutter=OFF)
- Wide input voltage range (*DC +5V ~ 12V)
- Advanced setting available by OSD (On Screen Display) through an optional remote control
- Various optional M12 lenses available *Glass lenses and pinhole lens are not interchangeable

Dimensions



Specifications

Video standard		PAL
Pick-up element		1/4 inch interline transfer CCD image sensor
Number of effective pixels		976(H) × 582(V)
Unit cell size		3.75μm(H) × 4.69μm(V)
Imaging system		Ye, Cy, Mg, and G complementary color mosaic filters on chip
Synchronizing system		Internal
Scanning system		2:1 interlace
Video outputs		Composite: 1.0 V(p-p) 75Ω (Unbalanced)
Resolution (H)		More than 650TVL (Center)
Minimum illumination		0.1 lx F2.0 (AGC ON=45dB, Shutter=OFF)
S/N		More than 50dB (AGC OFF=0dB, γ=0.45)
Function settings		OSD : Remote controller
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.
		1/50 - 1/100000 sec.
White balance		ATW, AWB, ACR, PWB, MWB, PRESET (5100K, 6300K)
AGC	ON	0 - 45dB
	OFF	0dB
MGC		0 - 42dB (6dB step)
Day/Night		Digital Auto, Manual
Gamma characteristics		γ=0.45
Video level		Adjustable
Noise reduction		2DNR OFF/ON Level adjustable
Wide dynamic range		D-WDR OFF/ON Level adjustable
Lens iris		—
Back light compensation		BLC, HSBLC
White blemish correction		Up to 64 pixels
Sharpness		Level adjustable
Defog		OFF/ON Level adjustable
Digital zoom		—
Privacy mask		8 masks
Mirror image		OFF, H-FLIP
Freeze		—
Motion detection		—
Neg.image		—
Interface		4P connector (Composite Video, Power in), Remote control (RC-01)
Power supply		DC+5V - 12V
Power consumption		0.775W/155mA (DC+5V), 0.78W/65mA (DC+12V)
Operating temperature		-10 - +50℃
Storage temperature		-30 - +70℃
Operating / Storage humidity		95% RH or less (Without condensation)
Lens mount		M12 P=0.5
Standard lens		M3620BC-12 (F3.6 F2.0)
Weight		Approx. 35g
Accessories		4P cable

WAT-230V2 (P3.7) 1/4" Miniature Camera

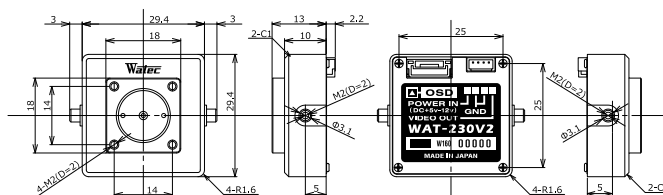
Ultra-compact design for easy installation and limited space



Key features

- Wide input voltage range (*DC +5V ~ 12V)
- Advanced setting available by OSD (On Screen Display) through an optional remote control
- *Glass lenses and pinhole lens are not interchangeable

Dimensions



Specifications

Video standard		PAL
Pick-up element		1/4 inch interline transfer CCD image sensor
Number of effective pixels		976(H) × 582(V)
Unit cell size		3.75μm(H) × 4.69μm(V)
Imaging system		Ye, Cy, Mg, and G complementary color mosaic filters on chip
Synchronizing system		Internal
Scanning system		2:1 interlace
Video outputs		Composite: 1.0 V(p-p) 75Ω (Unbalanced)
Resolution (H)		More than 650TVL (Center)
Minimum illumination		0.6 lx F4.5 (AGC ON=45dB, Shutter=OFF)
S/N		More than 50dB (AGC OFF=0dB, γ=0.45)
Function settings		OSD : Remote controller
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.
		1/50 - 1/100000 sec.
White balance		ATW, AWB, ACR, PWB, MWB, PRESET (5100K, 6300K)
AGC	ON	0 - 45dB
	OFF	0dB
MGC		0 - 42dB (6dB step)
Day/Night		Digital Auto, Manual
Gamma characteristics		γ=0.45
Video level		Adjustable
Noise reduction		2DNR OFF/ON Level adjustable
Wide dynamic range		D-WDR OFF/ON Level adjustable
Lens iris		—
Back light compensation		BLC, HSBLC
White blemish correction		Up to 64 pixels
Sharpness		Level adjustable
Defog		OFF/ON Level adjustable
Digital zoom		—
Privacy mask		8 masks
Mirror image		OFF, H-FLIP
Freeze		—
Motion detection		—
Neg.image		—
Interface		4P connector (Composite Video, Power in), Remote control (RC-01)
Power supply		DC+5V - 12V
Power consumption		0.775W/155mA (DC+5V), 0.78W/65mA (DC+12V)
Operating temperature		-10 - +50℃
Storage temperature		-30 - +70℃
Operating / Storage humidity		95% RH or less (Without condensation)
Lens mount		M13 P=1.0
Standard lens		3745B-13P (f3.7 F4.5)
Weight		Approx. 27g
Accessories		4P cable

Network

SDI



Analog Color

- ### Analog Monochrome

Options



Video standard	PAL	
Pick-up element	1/4 inch interline transfer CCD image sensor	
Number of effective pixels	976(H) × 582(V)	
Unit cell size	3.75μm(H) × 4.69μm(V)	
Imaging system	Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	2:1 interface	
Video outputs	Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 650TVL (Center)	
Minimum illumination	0.05 lx F1.2 (AGC ON=45dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=0dB, γ=0.45)	
Function settings	OSD : Remote controller	
AE mode	Fixed	1/50, 1/120 sec.
		1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.
	EI	1/50 - 1/100000 sec.
White balance	ATW, AWB, ACR, PWB, MWB, PRESET (5100K, 6300K)	
AGC	ON	0 - 45dB
	OFF	0dB
MGC	0 - 42dB (6dB step)	
Day/Night	Digital Auto, Manual	
Gamma characteristics	γ≈0.45	
Video level	Adjustable	
Noise reduction	2DNR OFF/ON Level adjustable	
Wide dynamic range	D-WDR OFF/ON Level adjustable	
Lens iris	—	
Back light compensation	BLC, HSRLC	
White blemish correction	Up to 64 pixels	
Sharpness	Level adjustable	
Defog	OFF/ON Level adjustable	
Digital zoom	—	
Privacy mask	8 masks	
Mirror image	OFF, H-FLIP	
Freeze	—	
Motion detection	—	
Neg. image	—	
Interface	4P connector (Composite Video, Power in), Remote control (RC-01)	
Power supply	DC+5V - 12V	
Power consumption	0.775W/155mA (DC+5V), 0.78W/65mA (DC+12V)	
Operating temperature	-10 - +50°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount	
Weight	Approx. 28g	
Accessories	4P cable	

Representative connection example of the WAT-230V2 series



WAT-1100MBD (G3.6) 1/3.2" High Sensitivity Miniature Board Day/Night Camera

Day/Night board camera for general surveillance

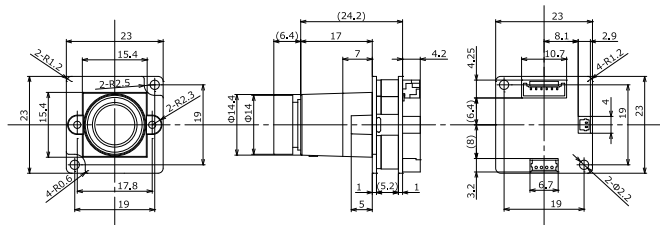


Key features

- High sensitivity min. illumination 0.005 lx F2.0 (AGC ON=54dB, Shutter=OFF)
- Ultra-compact design only 23 x 23 x 35 mm
- Wide dynamic range, ICR Mechaless Day/Night function
- Advanced setting available by OSD (On Screen Display) through an optional remote control
- A dual-band pass filter allows the ability to view a scene with 850nm IR illumination at night

*Glass lenses and pinhole lens are not interchangeable

Dimensions



WAT-1100MBD (P3.3) 1/3.2" High Sensitivity Miniature Board Day/Night Camera

Day/Night board camera for general surveillance

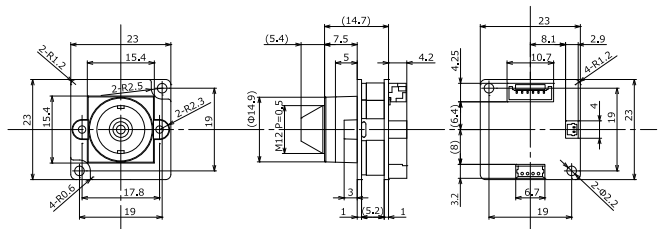


Key features

- Ultra-compact design only 23 x 23 x 25 mm
- Wide dynamic range, ICR Mechaless Day/Night function
- Advanced setting available by OSD (On Screen Display) through an optional remote control
- A dual-band pass filter allows the ability to view a scene with 850nm IR illumination at night

*Glass lenses and pinhole lens are not interchangeable

Dimensions



Specifications

		NTSC	PAL
Video standard		NTSC	PAL
Pick-up element		1/3.2 inch BSI CMOS image sensor	
Number of effective pixels		1280(H) × 960(V)	1280(H) × 924(V)
Unit cell size		3.5μm(H) × 3.5μm(V)	
Imaging system		RGB+W array mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 750TVL (Center)	
Minimum illumination		0.005 lx F2.0 (AGC ON=54dB, Shutter=OFF)	
S/N		More than 55dB (AGC OFF=0dB, γ=1.0)	
Function settings		OSD : Remote controller	
AE mode	Fixed	1/60 sec.	1/50 sec.
	EI	1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/10000, 1/20000, 1/50000, 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW, AWB, PWB, MWB, PRESET (5100K, 6300K)	
AGC	ON	0 - 54dB	
	OFF	0dB	
MGC		0 - 54dB (6dB step)	
Day/Night		ICR mechaless Auto, Manual	
Gamma characteristics		γ=0.45	
Video level		Adjustable	
Noise reduction		2DNR OFF/ON Level adjustable	
Wide dynamic range		WDR OFF/ON Level adjustable, D-WDR OFF/ON Level adjustable	
Lens iris		DC	
Back light compensation		BLC, HSBLC	
White blemish correction		—	
Sharpness		Level adjustable	
Defog		OFF/ON Level adjustable	
Digital zoom		—	
Privacy mask		16 masks	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		—	
Motion detection		—	
Neg.image		—	
Interface		4P connector (Composite Video, Power in), 2P connector (IR light ctd), Remote control(RC-01)	
Power supply		DC+5V - 12V	
Power consumption		0.6W/120mA (DC+5V), 0.72W/60mA (DC+12V)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		M3620BC-12 (F3.6 F2.0)	
Weight		Approx. 13g	
Accessories		4P cable, 2P cable	

Specifications

		NTSC	PAL
Video standard		NTSC	PAL
Pick-up element		1/3.2 inch BSI CMOS image sensor	
Number of effective pixels		1280(H) × 960(V)	1280(H) × 924(V)
Unit cell size		3.5μm(H) × 3.5μm(V)	
Imaging system		RGB+W array mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 750TVL (Center)	
Minimum illumination		0.009 lx F2.4 (AGC ON=54dB, Shutter=OFF)	
S/N		More than 55dB (AGC OFF=0dB, γ=1.0)	
Function settings		OSD : Remote controller	
AE mode	Fixed	1/60 sec.	1/50 sec.
	EI	1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/10000, 1/20000, 1/50000, 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW, AWB, PWB, MWB, PRESET (5100K, 6300K)	
AGC	ON	0 - 54dB	
	OFF	0dB	
MGC		0 - 54dB (6dB step)	
Day/Night		ICR mechaless Auto, Manual	
Gamma characteristics		γ=0.45	
Video level		Adjustable	
Noise reduction		2DNR OFF/ON Level adjustable	
Wide dynamic range		WDR OFF/ON Level adjustable, D-WDR OFF/ON Level adjustable	
Lens iris		DC	
Back light compensation		BLC, HSBLC	
White blemish correction		—	
Sharpness		Level adjustable	
Defog		OFF/ON Level adjustable	
Digital zoom		—	
Privacy mask		16 masks	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		—	
Motion detection		—	
Neg.image		—	
Interface		4P connector (Composite Video, Power in), 2P connector (IR light ctd), Remote control (RC-01)	
Power supply		DC+5V - 12V	
Power consumption		0.6W/120mA (DC+5V), 0.72W/60mA (DC+12V)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		3324B-12P(A) (F3.3 F2.4)	
Weight		Approx. 8g	
Accessories		4P cable, 2P cable	

W-03CDB3 1/3" Multi-function Board Camera with CS Lens Mount

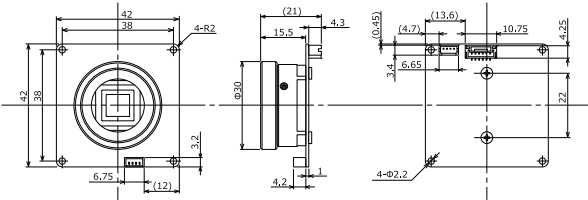
High functionality and high sensitivity for demanding scene conditions



Key features

- 1/3-inch CCD sensor with high sensitivity 0.005 lx F1.2 and resolution 650TVL
- Advanced setting available by OSD (On Screen Display) through an optional remote control
- 2DNR, privacy masking, BLC (Back Light Compensation)
- Mirror image, white blemish correction, contour correction
- Manual iris lens, video drive iris lens and DC drive iris lens compatible

Dimensions



W-04CDB3 1/3" Multi-function Board Camera with Varifocal Lens

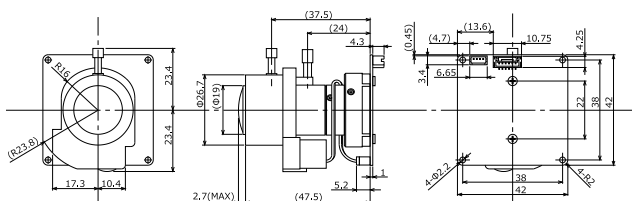
High functionality and high sensitivity for demanding scene conditions



Key features

- 1/3-inch CCD sensor with high sensitivity 0.005 lx F1.2 and resolution 650TVL
- Advanced setting available by OSD (On Screen Display) through an optional remote control
- 2DNR, privacy masking, BLC (Back Light Compensation)
- Mirror image, white blemish correction, contour correction
- Built-in vari-focal lens (f=2.8 – 10.5mm)

Dimensions



Specifications

		NTSC	PAL
Video standard		NTSC	PAL
Pick-up element		1/3 inch interline transfer CCD image sensor	
Number of effective pixels		976(H) × 494(V)	976(H) × 582(V)
Unit cell size		5.4μm(H) × 7.4μm(V)	5.0μm(H) × 6.25μm(V)
Imaging system		Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		2:1 Interlace	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 650TVL (Center)	
Minimum illumination		0.005 lx F1.2 (AGC ON=45dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=-3dB, γ=0.45)	
Function settings		OSD : Remote controller	
AE mode	Fixed	1/60, 1/100 sec.	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.	1/50 - 1/100000 sec.
White balance		ATW, AWB, ACR, PWB, MWB, PRESET (5100K, 6300K)	
AGC	ON	-3 - 45dB	
	OFF	-3dB	
MGC		0 - 42dB (6dB step)	
Day/Night		Digital Auto, Manual	
Gamma characteristics		γ±0.45	
Video level		Adjustable	
Noise reduction		2DNR OFF/ON Level adjustable	
Wide dynamic range		D-WDR OFF/ON Level adjustable	
Lens iris		Video / DC	
Back light compensation		BLC, HSBLC	
White blemish correction		Up to 64 pixels	
Sharpness		Level adjustable	
Defog		OFF/ON Level adjustable	
Digital zoom		—	
Privacy mask		8 masks	
Mirror image		OFF, H-FLIP	
Freeze		—	
Motion detection		—	
Neg,image		—	
Interface		4P connector (Composite Video, Power in), 4P connector (DC iris), Remote control (RC-01)	
Power supply		DC+12V±10%	
Power consumption		0.78W (65mA)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		CS mount	
Weight		Approx. 29g	
Accessories		4P cable, IRIS cable, Hex. Wrench	

Specifications

		NTSC	PAL
Video standard		NTSC	PAL
Pick-up element		1/3 inch interline transfer CCD image sensor	
Number of effective pixels		976(H) × 494(V)	976(H) × 582(V)
Unit cell size		5.4μm(H) × 7.4μm(V)	5.0μm(H) × 6.25μm(V)
Imaging system		Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		2:1 Interlace	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 650TVL (Center)	
Minimum illumination		0.005 lx F1.2 (AGC ON=45dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=-3dB, γ=0.45)	
Function settings		OSD : Remote controller	
AE mode	Fixed	1/60, 1/100 sec.	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.	1/50 - 1/100000 sec.
White balance		ATW, AWB, ACR, PWB, MWB, PRESET (5100K, 6300K)	
AGC	ON	-3 - 45dB	
	OFF	-3dB	
MGC		0 - 42dB (6dB step)	
Day/Night		Digital Auto, Manual	
Gamma characteristics		γ±0.45	
Video level		Adjustable	
Noise reduction		2DNR OFF/ON Level adjustable	
Wide dynamic range		D-WDR OFF/ON Level adjustable	
Lens iris		Video / DC	
Back light compensation		BLC, HSBLC	
White blemish correction		Up to 64 pixels	
Sharpness		Level adjustable	
Defog		OFF/ON Level adjustable	
Digital zoom		—	
Privacy mask		8 masks	
Mirror image		OFF, H-FLIP	
Freeze		—	
Motion detection		—	
Neg,image		—	
Interface		4P connector (Composite Video, Power in), 4P connector (DC iris), Remote control (RC-01)	
Power supply		DC+12V±10%	
Power consumption		1.02W (85mA)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		Ø14mm	
Standard lens		f=2.8mm - 10.5mm F1.2 (2.8) Varifocal lens	
Weight		Approx. 54g	
Accessories		4P cable, Hex. Wrench	

WAT-910HX 1/2" NIR Sensitivity Camera

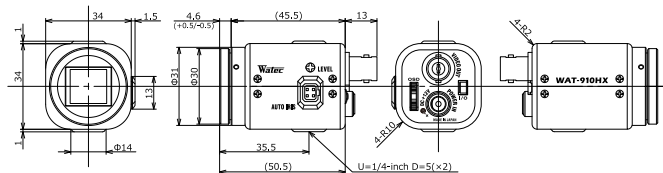
Achieves minimum illumination performance by 1/2-inch high sensitive CCD sensor and our unique circuit design



Key features

- Min. illumination 0.0000025 lx F1.4 (AGC HIGH=41dB, Shutter=x256, $\gamma=0.35$, NR=ON)
- High quality image without noise under poor light condition
- Advanced setting available by OSD (On Screen Display) through jog dial on camera

Dimensions



WAT-910HX/RC 1/2" NIR Sensitivity Camera

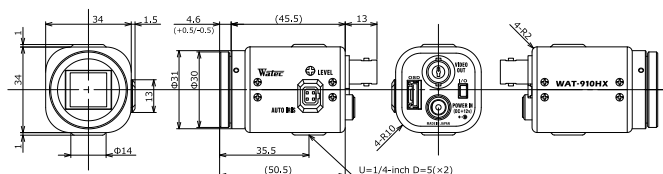
Achieves minimum illumination performance by 1/2-inch high sensitive CCD sensor and our unique circuit design



Key features

- Min. illumination 0.0000025 lx F1.4 (AGC HIGH=41dB, Shutter=x256, $\gamma=0.35$, NR=ON)
- High quality image without noise under poor light condition
- Advanced setting available by OSD (On Screen Display) through a remote control provided in kit
- RS-485 and 1/3" available *MTO

Dimensions



Specifications

Video standard		CCIR
Pick-up element		1/2 inch interline transfer CCD image sensor
Number of effective pixels		752(H) × 582(V)
Unit cell size		8.6μm(H) × 8.3μm(V)
Synchronizing system		Internal
Scanning system		2:1 interlace
Video output		Composite video, 1.0 V(p-p) 75Ω (Unbalanced)
Resolution (H)		More than 570TVL (Center)
Minimum illumination		0.0000025 lx F1.4 (AGC HIGH=41dB, Shutter=x256, γ=0.35, NR=ON)
S/N		More than 52dB (AGC OFF=6dB, γ=1.0, Shutter=x256, NR=ON)
Function settings		OSD : Jog dial
AE mode	Fixed	x2, x4, x8, x16, x32, x64, x128, x256 (field)
		1/50, 1/120 sec.
		1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec.
	EI	1/50 - 1/100000 sec.
		x256 - 1/100000 sec.
AGC	ON	6 - 30dB (LOW), 6 - 34.5dB (MID), 6 - 41dB (HIGH)
	OFF	—
MGC		6 - 41dB (1dB step)
Gamma characteristics		γ=0.05 - 1.0 (0.05 step), USER (S-curve)
Video level		92.5IRE
Noise reduction		3DNR OFF/ON Level adjustable
Wide dynamic range		D-WDR OFF/ON Level adjustable
Lens iris		Video/DC (EIA), Auto-select
Back light compensation		BLC, HSBLC
White blemish correction		Up to 64 pixels
Sharpness		Level adjustable
Defog		—
Digital zoom		ZOOM (x1 - x32), PAN/TILT
Privacy mask		—
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP
Freeze		OFF/ON
Motion detection		OFF/ON 4areas arbitrarily configurable
Neg.image		OFF/ON
Interface		BNC (Composite Video), Power in, Auto iris, 3P connector (GPIO)
Power supply		DC+12V±10%
Power consumption		1.38W (115mA)
Operating temperature		-10 - +50℃
Storage temperature		-30 - +70℃
Operating / Storage humidity		95% RH or less (Without condensation)
Lens mount		CS mount (Back focus adjustable)
Weight		Approx. 83g
Accessories		WPDC12 (DC plug), AIC-G (Iris plug), Hex. wrench, I/O cable

Specifications

Video standard		CCIR
Pick-up element		1/2 inch interline transfer CCD image sensor
Number of effective pixels		752(H) × 582(V)
Unit cell size		8.6μm(H) × 8.3μm(V)
Synchronizing system		Internal
Scanning system		2:1 interlace
Video output		Composite video, 1.0 V(p-p) 75Ω (Unbalanced)
Resolution (H)		More than 570TVL (Center)
Minimum illumination		0.0000025 lx F1.4 (AGC HIGH=41dB, Shutter=x256, γ=0.35, NR=ON)
S/N		More than 52dB (AGC OFF=6dB, γ=1.0, Shutter=x256, NR=ON)
Function settings		OSD : Remote controller
AE mode	Fixed	x2, x4, x8, x16, x32, x64, x128, x256 (field)
		1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec.
		1/50 - 1/100000 sec. x256 - 1/100000 sec.
AGC	ON	6 - 30dB (LOW), 6 - 34.5dB (MID), 6 - 41dB (HIGH)
	OFF	—
MGC		6 - 41dB (1dB step)
Gamma characteristics		γ=0.05 - 1.0 (0.05 step), USER (S-curve)
Video level		92.5IRE
Noise reduction		3DNR OFF/ON Level adjustable
Wide dynamic range		D-WDR OFF/ON Level adjustable
Lens iris		Video/DC (EIA), Auto-select
Back light compensation		BLC, HSBLC
White blemish correction		Up to 64 pixels
Sharpness		Level adjustable
Defog		—
Digital zoom		ZOOM (x1 - x32), PAN/TILT
Privacy mask		—
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP
Freeze		OFF/ON
Motion detection		OFF/ON 4areas arbitrarily configurable
Neg.image		OFF/ON
Interface		BNC (Composite Video), Power in, Auto iris, Remote control (RC-01), 3P connector (GPIO)
Power supply		DC+12V±10%
Power consumption		1.38W (115mA)
Operating temperature		-10 - +50℃
Storage temperature		-30 - +70℃
Operating / Storage humidity		95% RH or less (Without condensation)
Lens mount		CS mount (Back focus adjustable)
Weight		Approx. 83g
Accessories		WPDC12 (DC plug), AIC-G (Iris plug), Hex. Wrench, RC-01 (Remote control), I/O cable

Network

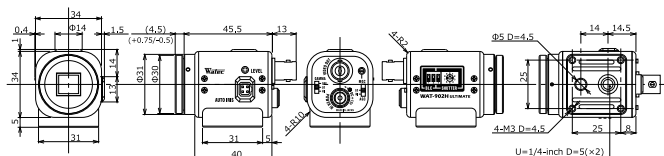
SD



USE

- Min. illumination 0.0002 lx, F1.4 by NIR sensitive CCD sensor and our unique image signal amplifying circuit
- High quality image without noise under poor light condition
- Signal amplification level configurable up to 60dB and suitable for moving object in low light condition
- Electric iris, electric shutter, AGC, MGC, BLC and gamma
- Adjustable back focus CS mount
- Stability design housing for installation

Analog Color



Analog Monochrome

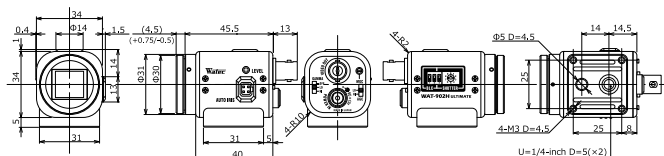
Options



Other

- Min. illumination 0.0001 lx, F1.4 by NIR sensitive CCD sensor and our unique image signal amplifying circuit
- High quality image without noise under poor light condition
- Signal amplification level configurable up to 60dB and suitable for moving object in low light condition
- Electric iris, electric shutter, AGC, MGC, BLC and gamma
- Adjustable back focus CS mount
- Stability design housing for installation

1



Video standard	CCIR	
Pick-up element	1/3 inch interline transfer CCD image sensor	
Number of effective pixels	752(H) × 582(V)	
Unit cell size	6.5μm(H) × 6.25μm(V)	
Synchronizing system	Internal	
Scanning system	2:1 interface	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.0002 lx F1.4 (AGC HIGH=60dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=5dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/50, 1/120 sec.
		1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec.
AGC	EI	1/50 - 1/100000 sec., 1/120 - 1/100000 sec.
	ON	5 - 32dB (LOW), 5 - 60dB (HIGH)
	OFF	—
MGC		5 - 60dB
Gamma characteristics		γ=0.35, 0.45, 1.0
Video level		100IRE
Noise reduction		—
Wide dynamic range		—
Lens iris		Video / DC [EIA], Auto-select)
Back light compensation		BLC
White blemish correction		—
Sharpness		—
Defog		—
Digital zoom		—
Privacy mask		—
Mirror image		—
Freeze		—
Motion detection		—
Neg.image		—
Interface		BNC (Composite Video), Power in, Auto iris
Power supply		DC+12V±10%
Power consumption		1.26W (105mA)
Operating temperature		-10 - +40°C
Storage temperature		-30 - +70°C
Operating / Storage humidity		95% RH or less (Without condensation)
Lens mount		CS mount (Back focus adjustable)
Weight		Approx. 98g
Accessories		WPDC12 (DC plug), AIC-G (Iris plug), Hex. wrench

Video standard	EIA	CCIR
Pick-up element	1/2 inch interline transfer CCD image sensor	
Number of effective pixels	768(H) × 494(V)	752(H) × 582(V)
Unit cell size	8.4μm(H) × 9.8μm(V)	8.6μm(H) × 8.3μm(V)
Synchronizing system	Internal	
Scanning system	2:1 interface	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.0001 lx F1.4 (AGC HIGH=60dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=5dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/60, 1/100 sec. 1/50, 1/120 sec.
	El	1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec. 1/50 - 1/100000 sec, 1/120 - 1/100000 sec.
AGC	ON	5 - 32dB (LOW), 5 - 60dB (HIGH)
	OFF	—
MGC	5 - 60dB	
Gamma characteristics	γ=0.35, 0.45, 1.0	
Video level	100IRE	
Noise reduction	—	
Wide dynamic range	—	
Lens iris	Video / DC (EIA), Auto-select)	
Back light compensation	BLC	
White blemish correction	—	
Sharpness	—	
Defog	—	
Digital zoom	—	
Privacy mask	—	
Mirror image	—	
Freeze	—	
Motion detection	—	
Neg.image	—	
Interface	BNC (Composite Video), Power in, Auto iris	
Power supply	DC+12V±10%	
Power consumption	1.32W (110mA)	
Operating temperature	-10 - +40℃	
Storage temperature	-30 - +70℃	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount (Back focus adjustable)	
Weight	Approx. 98g	
Accessories	WPDC12 (DC plug), AIC-G (Iris plug), Hex. wrench	

WAT-902H3 SUPREME 1/3" High Sensitivity Camera

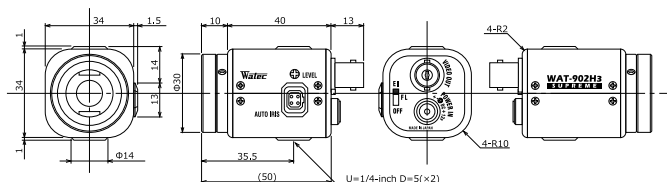
High sensitivity with compact and lightweight body



Key features

- Min. illumination 0.0005 lx, F1.4 (AGC HIGH=50dB, Shutter=OFF)
- NIR visibility for poor light condition
- Selectable AGC level and shutter speed for demanding scene conditions
- Video drive iris / DC drive iris auto select

Dimensions



Specifications

Video standard	CCIR	
Pick-up element	1/3 inch interline transfer CCD image sensor	
Number of effective pixels	752(H) × 582(V)	
Unit cell size	6.5μm(H) × 6.25μm(V)	
Synchronizing system	Internal	
Scanning system	2:1 interface	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.0005 lx F1.4 (AGC HIGH=50dB, Shutter=OFF)	
S/N	More than 46dB (AGC OFF=5dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/50 - 1/100000 sec.
AGC	ON	5 - 32dB (LOW), 5 - 50dB (HIGH)
	OFF	—
MGC	—	
Gamma characteristics	γ≈0.45	
Video level	100IRE	
Noise reduction	—	
Wide dynamic range	—	
Lens iris	Video / DC (EIA), Auto-select	
Back light compensation	BLC	
White blemish correction	—	
Sharpness	—	
Defog	—	
Digital zoom	—	
Privacy mask	—	
Mirror image	—	
Freeze	—	
Motion detection	—	
Neg.image	—	
Interface	BNC (Composite Video), Power in, Auto iris	
Power supply	DC+12V±10%	
Power consumption	1.86W (155mA)	
Operating temperature	-10 - +40°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount	
Weight	Approx. 90g	
Accessories	WPDC12 (DC plug), AIC-G (Iris plug), Hex. wrench	

WAT-902H2 SUPREME 1/2" High Sensitivity Camera

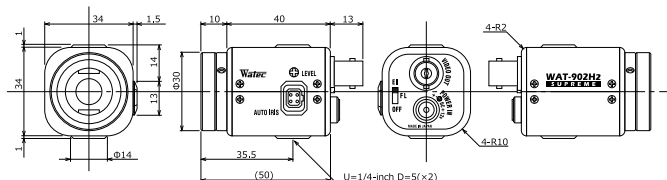
High sensitivity with compact and lightweight body



Key features

- Min. illumination 0.0003 lx, F1.4 (AGC HIGH=50dB, Shutter=OFF)
- NIR visibility for poor light condition
- Selectable AGC level and shutter speed for demanding scene conditions
- Video drive iris / DC drive iris auto select

Dimensions



Specifications

Video standard	EIA	CCIR
Pick-up element	1/2 inch interline transfer CCD image sensor	
Number of effective pixels	768(H) × 494(V)	752(H) × 582(V)
Unit cell size	8.4μm(H) × 9.8μm(V)	8.6μm(H) × 8.3μm(V)
Synchronizing system	Internal	
Scanning system	2:1 interface	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.0003 lx F1.4 (AGC HIGH=50dB, Shutter=OFF)	
S/N	More than 46dB (AGC OFF=5dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/60, 1/100 sec.
	EI	1/60 - 1/100000 sec.
AGC	ON	5 - 32dB (LOW), 5 - 50dB (HIGH)
	OFF	—
MGC	—	
Gamma characteristics	γ≈0.45	
Video level	100IRE	
Noise reduction	—	
Wide dynamic range	—	
Lens iris	Video / DC (EIA), Auto-select	
Back light compensation	BLC	
White blemish correction	—	
Sharpness	—	
Defog	—	
Digital zoom	—	
Privacy mask	—	
Mirror image	—	
Freeze	—	
Motion detection	—	
Neg.image	—	
Interface	BNC (Composite Video), Power in, Auto iris	
Power supply	DC+12V±10%	
Power consumption	1.98W (165mA)	
Operating temperature	-10 - +40°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount	
Weight	Approx. 90g	
Accessories	WPDC12 (DC plug), AIC-G (Iris plug), Hex. wrench	

WAT-902B 1/2" Low Noise · High Sensitivity Camera

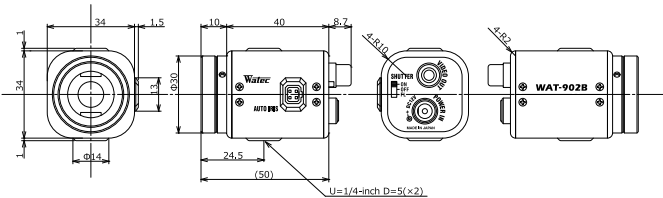
High cost performance model among the WAT-902 series



Key features

- High sensitivity with low noise operation
- Min. illumination 0.003 lx F1.4 (AGC HIGH=32dB, Shutter=OFF)

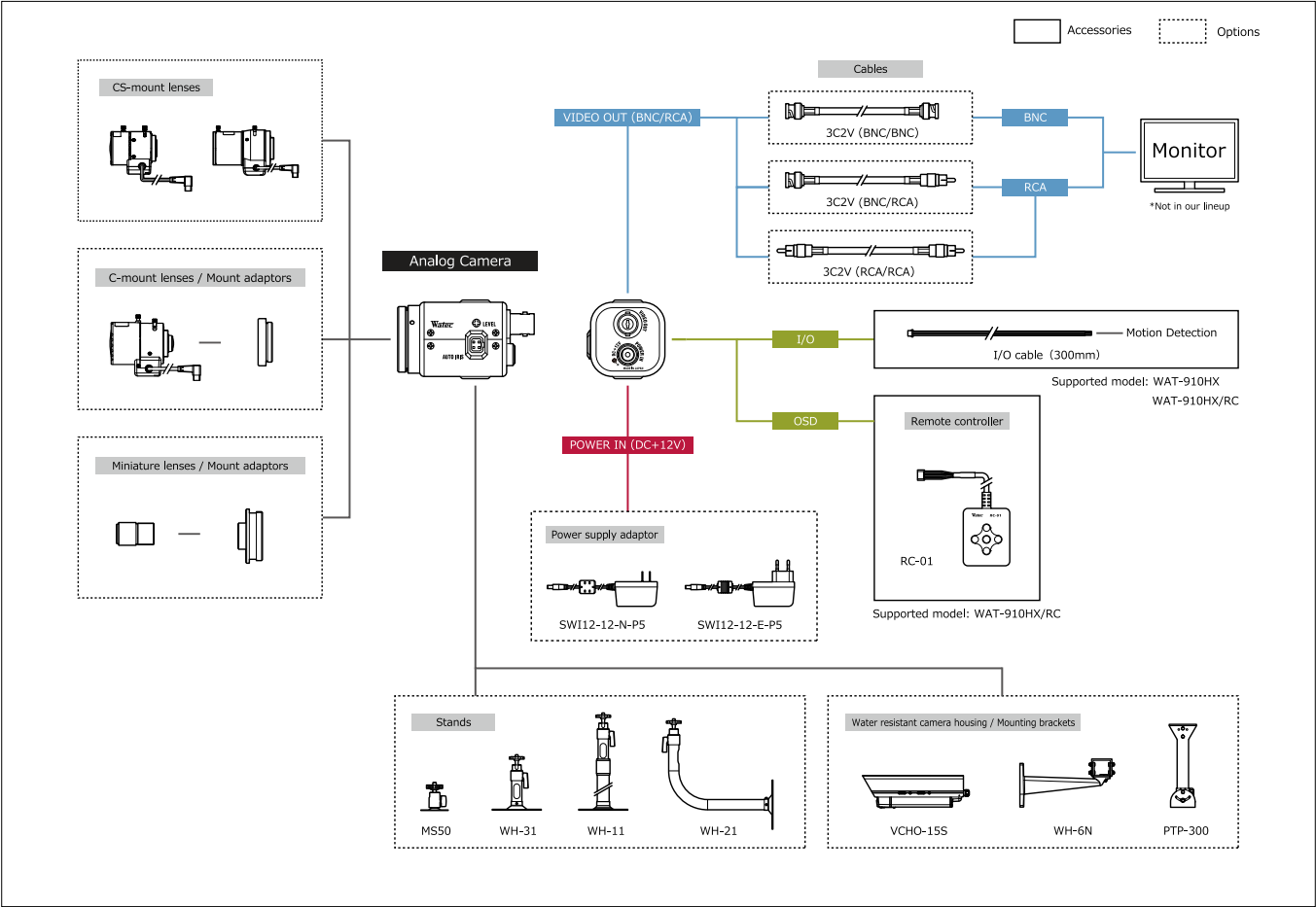
Dimensions



Specifications

		EIA	CCIR
Video standard		1/2 inch interline transfer CCD image sensor	
Pick-up element		768(H) × 494(V)	
Number of effective pixels		752(H) × 582(V)	
Unit cell size		6.35μm(H) × 7.4μm(V)	
Synchronizing system		Internal	
Scanning system		2:1 interface	
Video output		Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 570TVL (Center)	
Minimum illumination		0.003 lx F1.4 (AGC HIGH=32dB, Shutter=OFF)	
S/N		More than 50dB (AGC OFF=10dB, γ=1.0)	
Function settings		DIP Switch	
AE mode	Fixed	1/60, 1/100 sec.	1/50, 1/120 sec.
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
AGC	ON	5 - 20dB (LOW), 5 - 32dB (HIGH)	
	OFF	10dB	
MGC		—	
Gamma characteristics		γ=0.45, 1.0	
Video level		100IRE	
Noise reduction		—	
Wide dynamic range		—	
Lens iris		Video (Watec original arrangement)	
Back light compensation		BLC	
White blemish correction		—	
Sharpness		—	
Defog		—	
Digital zoom		—	
Privacy mask		—	
Mirror image		—	
Freeze		—	
Motion detection		—	
Neg. image		—	
Interface		RCA (Composite Video), Power in, Auto iris	
Power supply		DC+12V±10%	
Power consumption		1.74W (145mA)	
Operating temperature		-10 ~ +40℃	
Storage temperature		-30 ~ +70℃	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		CS mount	
Weight		Approx. 86g	
Accessories		WPDC12 (DC plug), AIC (Iris plug)	

System diagram Representative connection example of the analog cameras



WAT-660E (G3.8) 1/4" Miniature Camera

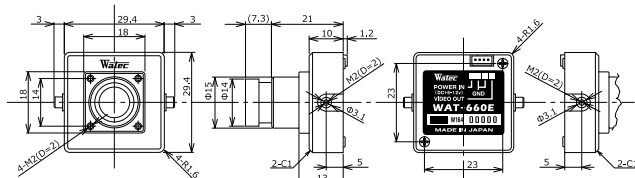
Compact square camera with built-in lens



Key features

- Min.illumination 0.002 lx F2.0 (AGC ON=42dB, Shutter=OFF)
- Wide input voltage range (*DC +5V - 12V)
- Various optional M12 lenses available *Glass lenses and pinhole lens are not interchangeable

Dimensions



WAT-660E (P3.7) 1/4" Miniature Camera

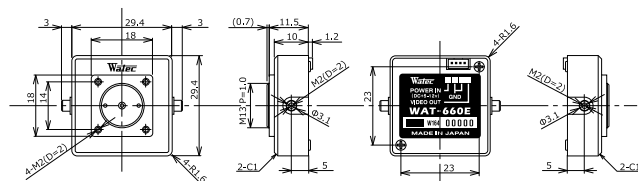
Compact square camera with built-in lens



Key features

- Min.illumination 0.01 lx F4.5 (AGC ON=42dB, Shutter=OFF)
- Wide input voltage range (*DC +5V - 12V)
- *Glass lenses and pinhole lens are not interchangeable

Dimensions



Specifications

		EIA	CCIR
Video standard			
Pick-up element		1/4 inch CMOS image sensor	
Number of effective pixels		648(H) × 488(V)	
Unit cell size		5.6μm(H) × 5.6μm(V)	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 480TVL (Center)	
Minimum illumination		0.002 lx F2.0 (AGC ON=42dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=0dB, γ=1.0)	
Function settings		—	
AE mode	Fixed	—	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
AGC	ON	0 - 42dB	
	OFF	—	
MGC		—	
Gamma characteristics		γ±0.45	
Video level		100IRE	
Noise reduction		—	
Wide dynamic range		—	
Lens iris		—	
Back light compensation		BLC	
White blemish correction		—	
Sharpness		—	
Defog		—	
Digital zoom		—	
Privacy mask		—	
Mirror image		—	
Freeze		—	
Motion detection		—	
Neg.image		—	
Interface		4P connector (Composite Video, Power in)	
Power supply		DC+5V - 12V	
Power consumption		0.45W/90mA(DC+5V), 0.45W/37.5mA(DC+12V)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		3820BC-12 (f3.8 F2.0)	
Weight		Approx. 33g	
Accessories		4P cable	

Specifications

		EIA	CCIR
Video standard			
Pick-up element		1/4 inch CMOS image sensor	
Number of effective pixels		648(H) × 488(V)	
Unit cell size		5.6μm(H) × 5.6μm(V)	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 480TVL (Center)	
Minimum illumination		0.01 lx F4.5 (AGC ON=42dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=0dB, γ=1.0)	
Function settings		—	
AE mode	Fixed	—	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
AGC	ON	0 - 42dB	
	OFF	—	
MGC		—	
Gamma characteristics		γ±0.45	
Video level		100IRE	
Noise reduction		—	
Wide dynamic range		—	
Lens iris		—	
Back light compensation		BLC	
White blemish correction		—	
Sharpness		—	
Defog		—	
Digital zoom		—	
Privacy mask		—	
Mirror image		—	
Freeze		—	
Motion detection		—	
Neg.image		—	
Interface		4P connector (Composite Video, Power in)	
Power supply		DC+5V - 12V	
Power consumption		0.45W/90mA(DC+5V), 0.45W/37.5mA(DC+12V)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M13 P=1.0	
Standard lens		3745B-13P (f3.7 F4.5)	
Weight		Approx. 23g	
Accessories		4P cable	

WAT-910HX MBD (G3.6) 1/3" Super High Sensitivity Miniature Board Camera

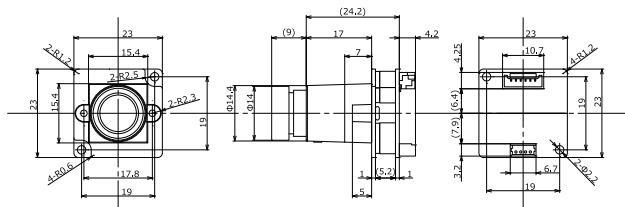
Ultra-compact design only 23 x 23mm for limited space and embedded application



Key features

- Min. illumination 0.00009 lx F2.0 (AGC ON=48dB, Shutter=x8)
 - Advanced setting available by OSD (On Screen Display) through an optional remote control
 - Build-in M12 lens G3.6 (f=3.6mm F2.0), Various Optional M12 lenses available
- *Glass lenses and pinhole lens are not interchangeable

Dimensions



WAT-910HX MBD (P3.3) 1/3" Super High Sensitivity Miniature Board Camera

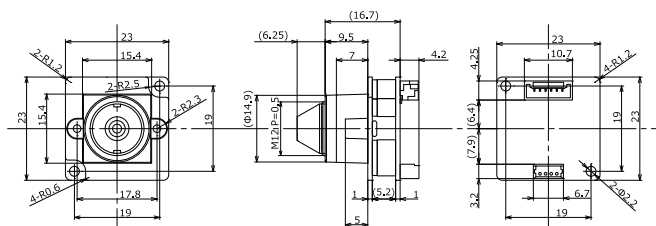
Ultra-compact design only 23 x 23mm for limited space and embedded application



Key features

- Advanced setting available by OSD (On Screen Display) through an optional remote control
 - Build-in M12 Conical Pinhole lens P3.3 (f=3.3mm F2.4)
- *Glass lenses and pinhole lens are not interchangeable

Dimensions



Specifications

Video standard	CCIR	
Pick-up element	1/3 inch interline transfer CCD image sensor	
Number of effective pixels	752(H) × 582(V)	
Unit cell size	6.5μm(H) × 6.3μm(V)	
Synchronizing system	Internal	
Scanning system	2:1 interlace	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.00009 lx F2.0 (AGC ON=48dB, Shutter=x8)	
S/N	More than 50dB (AGC OFF=6dB, γ=0.45, Shutter=OFF, NR=ON)	
Function settings	OSD : Remote controller	
AE mode	Fixed	x2, x4, x8, x16, x32, x64, x128, x256 (field)
		1/50, 1/100 sec.
		1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.
	EI	1/50 - 1/100000 sec.
AGC	ON	x8 - 1/100000 sec.
	OFF	0 - 48dB (Max. 6 - 48)
MGC	6 - 48dB (6dB step)	
Gamma characteristics	γ=0.45	
Video level	Adjustable	
Noise reduction	3D+2DNR ON Level adjustable	
Wide dynamic range	D-WDR OFF/ON Level adjustable	
Lens iris	—	
Back light compensation	BLC, HSBLC	
White blemish correction	Up to 64 pixels	
Sharpness	Level adjustable	
Defog	OFF/ON Level adjustable	
Digital zoom	ZOOM (x1 - x256), PAN/TILT	
Privacy mask	15 masks	
Mirror image	OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze	—	
Motion detection	OFF/ON Select from 96 detection areas	
Neg.image	—	
Interface	4P connector (Composite Video, Power in), Remote control (RC-01)	
Power supply	DC+5V - 12V	
Power consumption	0.75W/150mA (DC+5V), 0.78W/65mA (DC+12V)	
Operating temperature	-10 - +50°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	M12 P=0.5	
Standard lens	M3620BC-12 (f3.6 F2.0)	
Weight	Approx. 14g	
Accessories	4P cable	

Specifications

Video standard	CCIR	
Pick-up element	1/3 inch interline transfer CCD image sensor	
Number of effective pixels	752(H) × 582(V)	
Unit cell size	6.5μm(H) × 6.3μm(V)	
Synchronizing system	Internal	
Scanning system	2:1 interlace	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.00016 lx F2.4 (AGC ON=48dB, Shutter=x8)	
S/N	More than 50dB (AGC OFF=6dB, γ=0.45, Shutter=OFF, NR=ON)	
Function settings	OSD : Remote controller	
AE mode	Fixed	x2, x4, x8, x16, x32, x64, x128, x256 (field)
		1/50, 1/100 sec.
		1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.
	EI	1/50 - 1/100000 sec.
AGC	ON	x8 - 1/100000 sec.
	OFF	0 - 48dB (Max. 6 - 48)
MGC	6 - 48dB (6dB step)	
Gamma characteristics	γ=0.45	
Video level	Adjustable	
Noise reduction	3D+2DNR ON Level adjustable	
Wide dynamic range	D-WDR OFF/ON Level adjustable	
Lens iris	—	
Back light compensation	BLC, HSBLC	
White blemish correction	Up to 64 pixels	
Sharpness	Level adjustable	
Defog	OFF/ON Level adjustable	
Digital zoom	ZOOM (x1 - x256), PAN/TILT	
Privacy mask	15 masks	
Mirror image	OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze	—	
Motion detection	OFF/ON Select from 96 detection areas	
Neg.image	—	
Interface	4P connector (Composite Video, Power in), Remote control (RC-01)	
Power supply	DC+5V - 12V	
Power consumption	0.75W/150mA (DC+5V), 0.78W/65mA (DC+12V)	
Operating temperature	-10 - +50°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	M12 P=0.5	
Standard lens	3324B-12P(A) (f3.3 F2.4)	
Weight	Approx. 10g	
Accessories	4P cable	

WAT-902HB3S

1/3" High Sensitivity Board Camera

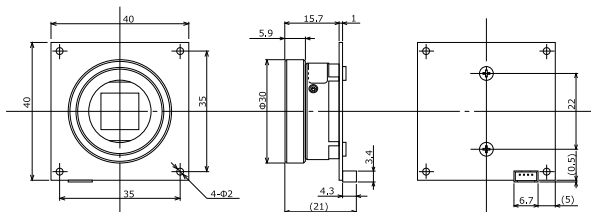
NIR sensitivity with multi-function



Key features

- Equality performance on NIR sensitivity and features to WAT-902H series
- Selectable camera settings for demanding scene conditions
- Electric iris, electric shutter, AGC, BLC and gamma switching

Dimensions



Specifications

Video standard	CCIR	
Pick-up element	1/3 inch interline transfer CCD image sensor	
Number of effective pixels	752(H) × 582(V)	
Unit cell size	6.5μm(H) × 6.25μm(V)	
Synchronizing system	Internal	
Scanning system	2:1 interlace	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.0006 lx F1.4 (AGC HIGH=50dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=5dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec.
AGC	ON	1/50 - 1/100000 sec.
	OFF	5 - 32dB (LOW), 5 - 50dB (HIGH)
MGC	—	
Gamma characteristics	γ=0.45, 1.0	
Video level	100IRE	
Noise reduction	—	
Wide dynamic range	—	
Lens iris	Video	
Back light compensation	BLC	
White blemish correction	—	
Sharpness	—	
Defog	—	
Digital zoom	—	
Privacy mask	—	
Mirror image	—	
Freeze	—	
Motion detection	—	
Neg.image	—	
Interface	4P connector (Composite Video, Power in)	
Power supply	DC+12V±10%	
Power consumption	1.92W (160mA)	
Operating temperature	-10 - +40℃	
Storage temperature	-30 - +70℃	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount	
Weight	Approx. 30g	
Accessories	4P cable, Hex. wrench	

WAT-902HB2S

1/2" High Sensitivity Board Camera

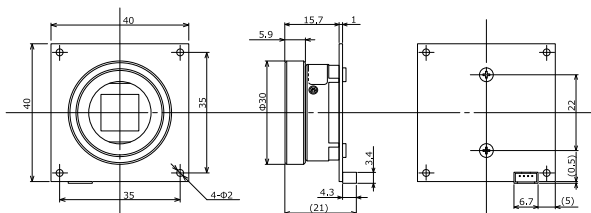
NIR sensitivity with multi-function



Key features

- Equality performance on NIR sensitivity and features to WAT-902H series
- Selectable camera settings for demanding scene conditions
- Electric iris, electric shutter, AGC, BLC and gamma switching

Dimensions



Specifications

Video standard	EIA	CCIR
Pick-up element	1/2 inch interline transfer CCD image sensor	
Number of effective pixels	768(H) × 494(V)	752(H) × 582(V)
Unit cell size	8.4μm(H) × 9.8μm(V)	8.6μm(H) × 8.3μm(V)
Synchronizing system	Internal	
Scanning system	2:1 interlace	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.0003 lx F1.4 (AGC HIGH=50dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=5dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/60, 1/100 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec.
AGC	ON	1/60 - 1/100000 sec.
	OFF	5 - 32dB (LOW), 5 - 50dB (HIGH)
MGC	—	
Gamma characteristics	γ=0.45, 1.0	
Video level	100IRE	
Noise reduction	—	
Wide dynamic range	—	
Lens iris	Video	
Back light compensation	BLC	
White blemish correction	—	
Sharpness	—	
Defog	—	
Digital zoom	—	
Privacy mask	—	
Mirror image	—	
Freeze	—	
Motion detection	—	
Neg.image	—	
Interface	4P connector (Composite Video, Power in)	
Power supply	DC+12V±10%	
Power consumption	1.92W (160mA)	
Operating temperature	-10 - +40℃	
Storage temperature	-30 - +70℃	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount	
Weight	Approx. 30g	
Accessories	4P cable, Hex. wrench	

WAT-910BD 1/2" NIR Sensitivity Board Camera

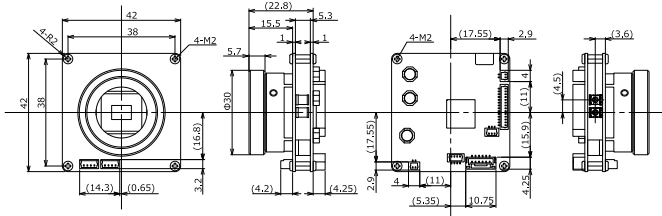
Achieves minimum illumination performance by 1/2-inch high sensitive CCD sensor and unique circuit design



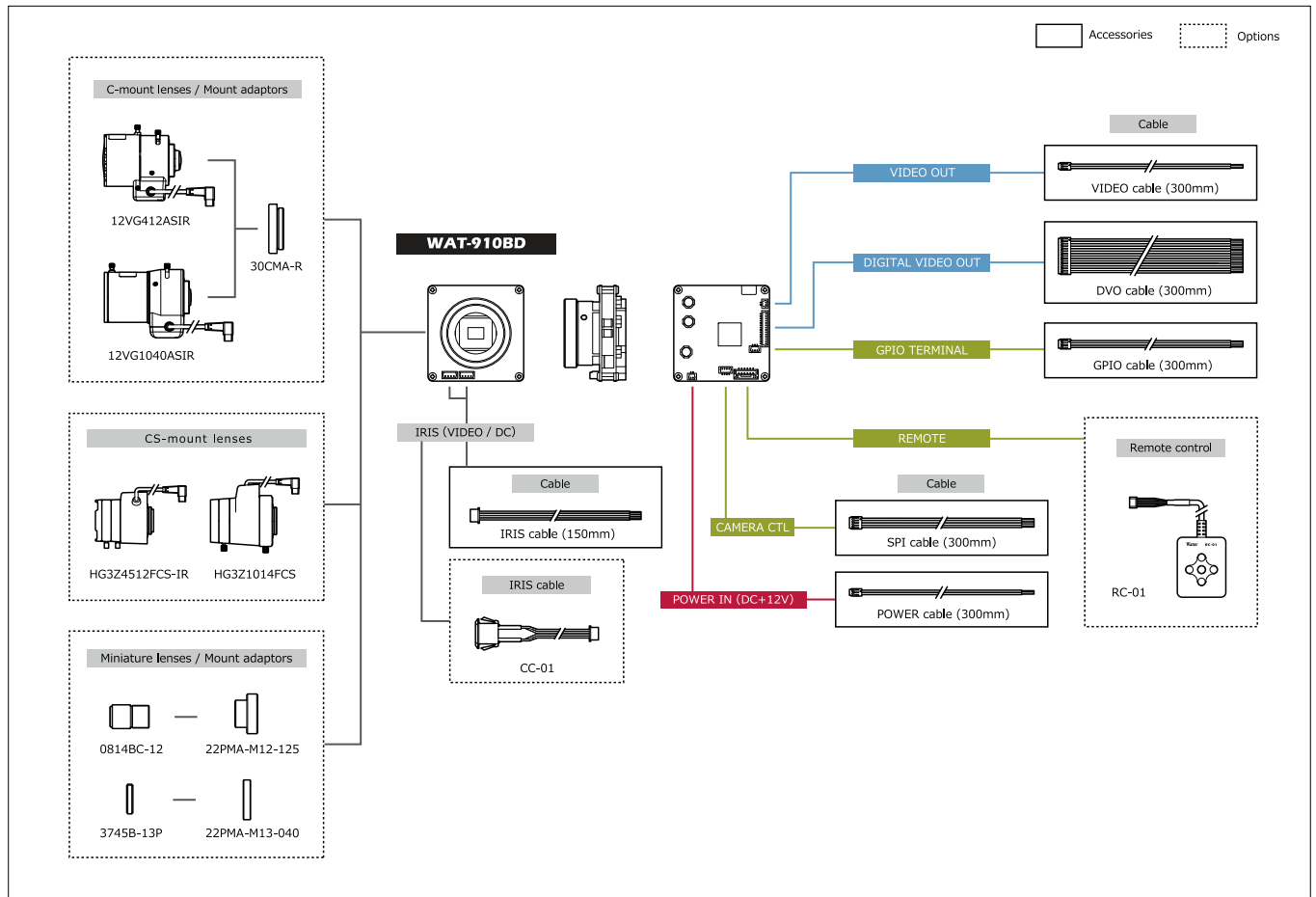
Key features

- Min. illumination 0.0000025 lx F1.4 (AGC HIGH=41dB, Shutter=x256, γ=0.35, NR=ON)
- High quality image without noise under poor light condition
- 3DNR, digital wide dynamic range and slow shutter
- Motion detection, white blemish correction and back light compensation
- Advanced setting available by OSD (On Screen Display) through an optional remote control and SPI communication

Dimensions



System diagram



Specifications

Video standard		CCIR
Pick-up element		1/2 inch interline transfer CCD image sensor
Number of effective pixels		752(H) × 582(V)
Unit cell size		8.6μm(H) × 8.3μm(V)
Synchronizing system		Internal
Scanning system		2:1 interface
Video output		Composite video, 1.0 V(p-p) 75Ω (Unbalanced)
Resolution (H)		More than 570TVL (Center)
Minimum illumination		0.0000025 lx F1.4 (AGC HIGH=41dB, Shutter=x256, γ=0.35, NR=ON)
S/N		More than 52dB (AGC OFF=6dB, γ=1.0, Shutter=x256, NR=ON)
Function settings		OSD : Remote controller, Communication : SPI
AE mode	Fixed	x2, x4, x8, x16, x32, x64, x128, x256 (field)
		1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec.
		1/50 - 1/100000 sec.
AGC	ON	x256 - 1/100000 sec.
		6 - 30dB (LOW), 6 - 34.5dB (MID), 6 - 41dB (HIGH)
	OFF	—
MGC		6 - 41dB (1dB step)
Gamma characteristics		γ=0.05 - 1.0 (0.05 step), USER (S-curve)
Video level		92.5IRE
Noise reduction		3DNR OFF/ON Level adjustable
Wide dynamic range		D-WDR OFF/ON Level adjustable
Lens iris		Video/DC (EIA), Auto-select
Back light compensation		BLC, HSBLCL
White blemish correction		Up to 64 pixels
Sharpness		Level adjustable
Defog		—
Digital zoom		ZOOM (x1 - x32), PAN/TILT
Privacy mask		—
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP
Freeze		OFF/ON
Motion detection		OFF/ON 4areas arbitrarily configurable
Neg.image		OFF/ON
Interface		14P connector (Digital video out), 2P connector (Composite Video), 2P connector (Power in), 4P connector (DC iris), 4P connector (Video iris), Remote control (RC-01), 4P connector (SPI), 3P connector (GPIO)
Power supply		DC+12V±10%
Power consumption		1.32W (110mA)
Operating temperature		-10 - +50℃
Storage temperature		-30 - +70℃
Operating / Storage humidity		95% RH or less (Without condensation)
Lens mount		CS mount
Weight		Approx. 40g
Accessories		Hex. Wrench, Cable (6 pcs)

DC Auto Iris Lenses (MP)



Model		M13VG288IR	M13VG850IR
Imager size		1/2.7" , 1/3"	1/2.7" , 1/3"
Mount type		CS	CS
Focal length / Aperture range		2.8 - 8.0 mm / F1.2 - 360	8.0 - 50 mm / F1.6 - 360
Angle of view (H×V)	1/2.7"	W: 124.3° × 65.2° / T: 43.0° × 24.2°	W: 40.2° × 22.6° / T: 6.6° × 3.8°
	1/3"	W: 100.1° × 72.9° / T: 35.8° × 26.8°	W: 33.5° × 25.1° / T: 5.6° × 4.2°



Model		AG3Z2812FCS-MPWIR	AG4Z1214FCS-MPIR
Imager size		1/2.7" , 1/3"	1/2.7" , 1/3"
Mount type		CS	CS
Focal length / Aperture range		2.8 - 8.5 mm / F1.2 - 360	12.5 - 50 mm / F1.4 - 360
Angle of view (H×V)	1/2.7"	W: 124.7° × 63.9° / T: 41.3° × 22.7°	W: 26.3° × 14.5° / T: 6.7° × 3.8°
	1/3"	W: 99.1° × 72.3° / T: 34.1° × 25.6°	W: 21.7° × 16.2° / T: 5.6° × 4.3°



Model		AG4Z2812FCS-MPIR	EG3Z3915FCS-MPWIR
Imager size		1/2.7" , 1/3"	1/1.8" , 1/2"
Mount type		CS	CS
Focal length / Aperture range		2.8 - 10 mm / F1.2 - 360	3.9 - 10 mm / F1.5 - F360C
Angle of view (H×V)	1/1.8"	—	W: 108.1° × 79.7° / T: 42.1° × 32.0°
	1/2.7"	W: 127.6° × 65.0° / T: 34.3° × 18.9°	—
	1/2"	—	W: 96.0° × 70.2° / T: 37.9° × 28.4°
	1/3"	W: 101.3° × 73.7° / T: 28.4° × 21.3°	—

Manual Iris Lenses (MP)



Model		M13VM288IR	A4Z2812CS-MPIR
Imager size		1/2.7" , 1/3"	1/2.7" , 1/3"
Mount type		CS	CS
Focal length / Aperture range		2.8 - 8.0 mm / F1.2 - Close	2.8 - 10 mm / F1.2 - F16C
Angle of view (H×V)	1/2.7"	W: 124.3° × 65.2° / T: 43.0° × 24.2°	W: 127.6° × 65.0° / T: 34.3° × 18.9°
	1/3"	W: 100.1° × 72.9° / T: 35.8° × 26.8°	W: 101.3° × 73.7° / T: 28.4° × 21.3°

DC Auto Iris Lenses



Model		12VG412ASIR	12VG1040ASIR
Imager size		1/2" , 1/3"	1/2" , 1/3"
Mount type		C	C
Focal length / Aperture range		4.0 - 12 mm / F1.2 - 360	10 - 40 mm / F1.4 - 360
Angle of view (H×V)	1/2"	W: 97.3° × 68.9° / T: 31.2° × 23.4°	W: 37.5° × 27.6° / T: 9.3° × 7.0°
	1/3"	W: 68.9° × 51.1° / T: 23.4° × 17.5°	W: 27.6° × 20.4° / T: 7.0° × 5.3°



Model		13VG308ASIR II	13VG1040ASIR
Imager size		1/3" , 1/4"	1/3" , 1/4"
Mount type		CS	CS
Focal length / Aperture range		3.0 - 8.0 mm / F1.0 - 360	10 - 40 mm / F1.4 - 360
Angle of view (H×V)	1/3"	W: 92.5° × 68.0° / T: 35.7° × 26.8°	W: 37.5° × 27.6° / T: 9.3° × 7.0°
	1/4"	W: 68.0° × 50.4° / T: 26.8° × 20.1°	W: 27.6° × 20.4° / T: 7.0° × 5.3°



Model		TG4Z2813FCS-IR-2
Imager size		1/3" , 1/4"
Mount type		CS
Focal length / Aperture range		2.8 - 12 mm / F1.3 - 360
Angle of view (H×V)	1/3"	W: 102.2° × 74.2° / T: 23.7° × 17.8°
	1/4"	W: 74.2° × 54.7° / T: 17.8° × 13.3°

Manual Iris Lenses



Model		13VM308ASIR II	T4Z2813CS-IR-2
Imager size		1/3" , 1/4"	1/3" , 1/4"
Mount type		CS	CS
Focal length / Aperture range		3.0 - 8.0 mm / F1.0 - Close	2.8 - 12 mm / F1.3 - Close
Angle of view (H×V)	1/3"	W: 92.5° × 68.0° / T: 35.7° × 26.8°	W: 102.2° × 74.2° / T: 23.7° × 17.8°
	1/4"	W: 68.0° × 50.4° / T: 26.8° × 20.1°	W: 74.2° × 54.7° / T: 17.8° × 13.3°

Miniature Lenses (MP)



Model		M2520BC-12	M2920BC-12	M3620BC-12
Focal length / Aperture range		2.5 mm / F2.0	2.9 mm / F2.0	3.6 mm / F2.0
Angle of view (D×H×V)	1/2.8"	154.6° × 131.3° × 70.7°	134.9° × 115.3° × 62.8°	110.0° × 92.0° × 49.0°
	1/3"	143.2° × 111.1° × 81.7°	125.4° × 98.2° × 72.5°	102.0° × 77.0° × 56.0°
	1/3.2"	132.2° × 103.2° × 76.1°	116.2° × 91.2° × 67.6°	93.0° × 72.0° × 52.0°
	1/4"	103.6° × 87.7° × 60.7°	92.0° × 72.8° × 54.2°	73.0° × 57.0° × 42.0°
Mount		M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm



Model		M0620BC-12	M0816BC-12
Focal length / Aperture range		6.0 mm / F2.0	8.0 mm / F1.6
Angle of view (D×H×V)	1/2.8"	62.0° × 53.8° × 30.0°	44.0° × 38.0° × 22.0°
	1/3"	58.2° × 46.3° × 34.6°	41.0° × 33.0° × 25.0°
	1/3.2"	54.2° × 43.1° × 32.3°	-
	1/4"	43.3° × 34.6° × 25.9°	-
Mount		M12 P=0.5mm	M12 P=0.5mm

Miniature Lenses



Model		2520BC-12	2920BC-12	3820BC-12	0625BC-12
Focal length / Aperture range		2.5 mm / F2.0	2.9 mm / F2.0	3.8 mm / F2.0	6.0 mm / F2.5
Angle of view (D×H×V)	1/2"	-	-	-	-
	1/3"	153.9° × 115.5° × 83.8°	122.1° × 96.6° × 71.9°	90.0° × 71.5° × 53.4°	57.8° × 45.7° × 34.0°
	1/4"	107.2° × 83.8° × 61.9°	90.3° × 71.9° × 53.7°	67.0° × 53.4° × 40.0°	42.7° × 34.0° × 25.4°
Mount		M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm



Model		0814BC-12	0820BC-12	1220BC-12	2540EX014-M12
Focal length / Aperture range		8.0 mm / F1.4	8.0 mm / F2.0	12 mm / F2.0	25 mm / F4.0
Angle of view (D×H×V)	1/2"	54.6° × 44.4° × 33.7°	-	-	17.9° × 14.4° × 10.8°
	1/3"	41.8° × 33.7° × 25.5°	44.5° × 34.6° × 25.5°	28.5° × 22.8° × 17.2°	13.5° × 10.8° × 8.1°
	1/4"	-	32.3° × 25.5° × 18.9°	21.4° × 17.2° × 12.9°	10.1° × 8.1° × 6.1°
Mount		M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm



Model		3720B-12P(B)	3745B-13P
Focal length / Aperture range		3.7 mm / F2.0	3.7 mm / F4.5
Angle of view (D×H×V)	1/2"	-	-
	1/3"	90.0° × 57.8° × 48.6°	91.4° × 72.6° × 54.2°
	1/4"	63.5° × 48.6° × 35.7°	68.0° × 54.2° × 40.6°
Mount		M12 P=0.5mm	M13 P=1.0mm

Extenders

Lens mounts to be attached between a lens and a camera to extends the focal length



Model	EX005-M12-2	EX010-M12-2	EX005-M13	EX010-M13
Material / Surface finishing	Aluminum / Black alumite (Pearskin finish)		Aluminum / Black alumite (Pearskin finish)	
Mount	Lens: M12 P=0.5 / Camera: M12 P=0.5		Lens: M13 P=1.0 / Camera: M13 P=1.0	
Dimensions	Φ15 × 9 mm	Φ15 × 14 mm	Φ15 × 9 mm	Φ15 × 14 mm

C-mount Adaptors

CS to C-mount adaptors allow which CS-mount CCTV cameras to be used with C-mount lenses



Model	30CMA-R	34CMA-R
Material / Surface finishing	Aluminum / Black alumite (Pearskin finish)	
Mount	U1-32UN	
Dimensions	Φ30 × 9 mm	Φ34 × 9 mm

Mount Adaptors

Lens mounts to make miniature lenses applicable to CS-mount cameras



Model	28MMA-M12-090	28MMA-M12-140	28MMA-M12-155
Material / Surface finishing	Aluminum / Black alumite (Pearskin finish)		
Mount	M12 P=0.5		
Dimensions	Φ31 × 9 mm	Φ31 × 14 mm	Φ31 × 15.5 mm



Model	22PMA-M12-125	22PMA-M13-040
Material / Surface finishing	Aluminum / Black alumite (Pearskin finish)	
Mount	M12 P=0.5	M13 P=1.0
Dimensions	Φ21.9 × 12.5 mm	Φ21.9 × 4 mm



Model	29PMA-M12-125	30.5MMA-M12-120
Material / Surface finishing	Aluminum / Black alumite (Pearskin finish)	
Mount	M12 P=0.5	
Dimensions	Φ28.9 × 12.5 mm	Φ36 × 12 mm

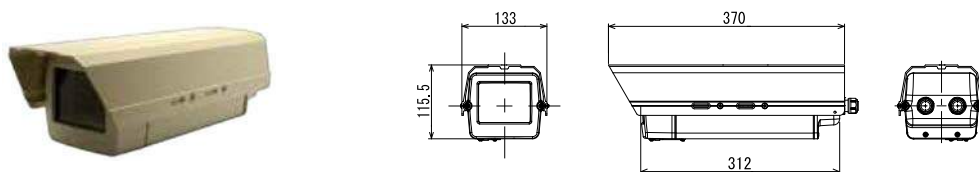
Stands



Model	MS50	WH-31	WH-11	WH-21
Operating locaton	Ceiling (Indoor)	Ceiling (Indoor)	Ceiling (Two stage stretch, Indoor)	Wall/Ceiling (L type, Indoor)
Capability	-	Max. 2kg	Max. 2kg	Max. 2kg
Main materials	Steel SPCC and Aluminium			
Color	Black	Silver	Silver	Silver
Dimensions	50(L) × 50(W) × 46.5(H) mm	φ120 × 130(H) mm	Φ120 × 310 - 470 (H) mm	Φ120 × 204 × 242 (H) mm
Weight	Approx. 70g	Approx. 260g	Approx. 380g	Approx. 340g

*Insulating kit (sold separately) is available for the MS50.

Camera Housing



Model	VCHO-15S
Installation condition	Indoor / Outdoor
Main material	Aluminium (ADC-12, A6063)
Color	Ivory
Inside dimension	95(W) × 70(H) × 210(L) mm
Weight	Approx. 2.4kg
Waterproof performance	IEC standard IPX5

Mounting bracket for VCHO-15S



Model	WH-6N	PTP-300
Operating locaton	Wall (Indoor / Outdoor)	Ceiling (Indoor / Outdoor)
Capability	15Kg	10Kg
Main materials	Aluminium (ADC-12, A6063)	Aluminium (ADC-12, A6063)
Color	Ivory	Ivory
Dimensions	337(L) × 115(W) × 176(H) mm	100(L) × 100(W) × 300(H) mm
Weight	1.4kg	0.9kg

Holders



Model	H002	H003
Materials	Brass / ABS resin	Brass
Description	Bottom mounting bracket for cylindrical-type miniature cameras by attaching the folder ring included with camera (1/4-20UNC)	USB cable fixer for the WAT-03U2, WAT-06U2, WAT-07U2



Model	TS01A
Materials	SUS304 / POM resin
Description	Holder for attaching the WAT-03U2D, WAT-06U2D, WAT-07U2D to the side such as a helmet

Brackets



Model	B001	B004	B005
Materials	Brass / ABS resin	Brass / ABS resin	ABS resin
Supported models	WAT-230V2, WAT-660E	WAT-2200 Mk-2	WAT-03U2, WAT-06U2, WAT-07U2, WAT-1200CS
Description	Brackets for fixing the cameras on a stands or tripods		



Model	B007	B008	B009
Materials	Brass / ABS resin	Brass / ABS resin	SUS304
Supported models	WAT-2400	WAT-05U2M	WAT-05U2M
Description	Brackets for fixing the cameras on a stands or tripods		Clip for attaching the camera to a pocket

Conversion Connectors

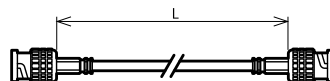


3G/HD-SDI supported

Model	BNCP-RCAJ	RCAP-BNCJ	BNC-A-JJ	BCI-JK
Description	Cable conversion connector (RCA to BNC)	Cable conversion connector (BNC to RCA)	Relay connector (BNC to BNC)	Relay connector (BNC to BNC)

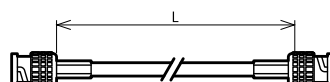
Coaxial Cables

3G/HD-SDI supported

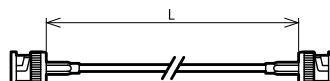


Model	Length(=L)m	Cable	Connector
2.5CHD(BNC/BNC)-2.5M	2.5	75Ω coaxial cable L-2.5CHD (Black) *Cable for fixed wiring	75Ω BNC plug (Crimp type)
2.5CHD(BNC/BNC)-3M	3		
2.5CHD(BNC/BNC)-5M	5		
2.5CHD(BNC/BNC)-10M	10		

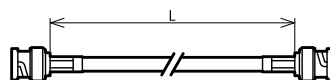
3G/HD-SDI supported



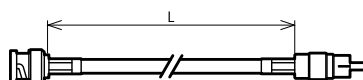
Model	Length(=L)m	Cable	Connector
3CFW(BNC/BNC)-2.5M	2.5	75Ω coaxial cable L-3CFW (Black) *Cable for portable wiring	75Ω BNC plug (Crimp type)
3CFW(BNC/BNC)-3M	3		
3CFW(BNC/BNC)-5M	5		
3CFW(BNC/BNC)-10M	10		



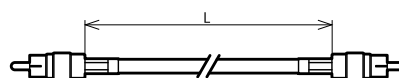
Model	Length(=L)m	Cable	Connector
1.5C2V(BNC/BNC)-1M	1	75Ω coaxial cable 1.5C-2V (Black)	75Ω BNC plug (Crimp type)



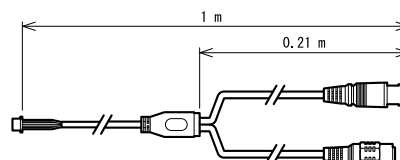
Model	Length(=L)m	Cable	Connector
3C2V(BNC/BNC)-2.5M	2.5	75Ω coaxial cable 3C-2V (Black)	75Ω BNC plug (Crimp type)
3C2V(BNC/BNC)-3M	3		
3C2V(BNC/BNC)-5M	5		
3C2V(BNC/BNC)-10M	10		



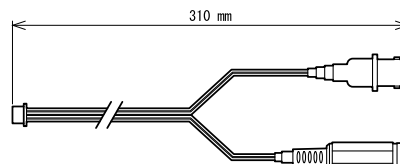
Model	Length(=L)m	Cable	Connector
3C2V(BNC/RCA)-2.5M	2.5	75Ω coaxial cable 3C-2V (Black)	75Ω BNC plug (Crimp type) RCA plug (Crimp type)
3C2V(BNC/RCA)-3M	3		
3C2V(BNC/RCA)-5M	5		
3C2V(BNC/RCA)-10M	10		



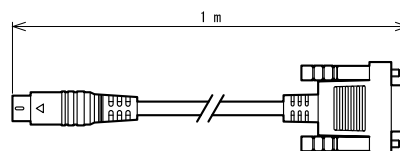
Model	Length(=L)m	Cable	Connector
3C2V(RCA/RCA)-2.5M	2.5	75Ω coaxial cable 3C-2V (Black)	RCA plug (Crimp type)
3C2V(RCA/RCA)-3M	3		
3C2V(RCA/RCA)-5M	5		
3C2V(RCA/RCA)-10M	10		



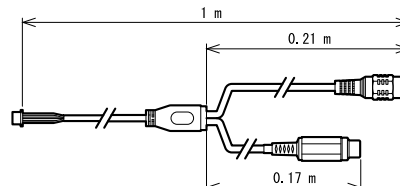
Model	Supported models	Connector
CB-01	WAT-1200CS, WAT-230V2, WAT-1100MBD, WAT-660E, WAT-910HX MBD	VIDEO OUT (BNC), POWER IN (DC Jack)



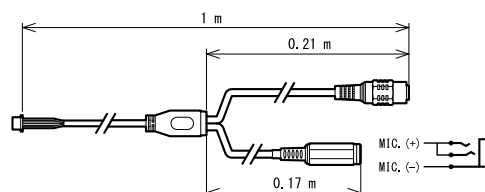
Model	Supported models	Connector
CB-02	WAT-902HB, W-03CDB3, W-04CDB3	VIDEO OUT (BNC), POWER IN (DC Jack)



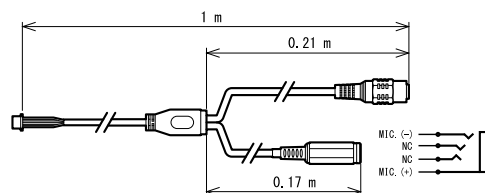
Model	Supported models	Description	Connector
CB-03	WAT-2200 Mk-2	RS-232 communication cable	D-SUB connector (9PIN)



Model	Supported models	Description	Connector
CB-06	WAT-2400S, WAT-933	Utilize when connecting the LINE output.	POWER IN (DC Jack), LINE IN (RCA Jack)



Model	Supported models	Description	Connector
CB-07	WAT-2400S, WAT-933	Utilize when connecting the mic which is plug-in power type.	POWER IN (DC Jack), MIC. IN (3-Conductor miniature jack)



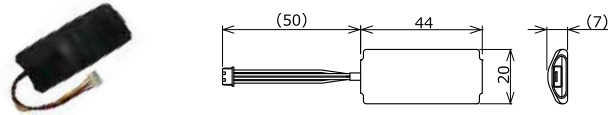
Model	Supported models	Description	Connector
CB-09	WAT-2400S, WAT-933	Utilize when connecting the CTIA / AHJ compatible mic.	POWER IN (DC Jack), MIC. IN (4-Conductor miniature jack)

Iris Cables



Model	CC-01	CC-02
Description	Auto iris cable w/ connectors (WAT-910BD)	Auto iris cable w/ connectors (W-03CDB3)

Remote Controllers



Model	AVM-USB2
Description	Equipment for the functional settings of the WAT-240E/FS
Supported models	WAT-240E/FS
Cable length	Approx. 50mm



Model	RC-01	RC-02
Description	Remote controller for the OSD (On Screen Display) function settings for supported models. The OSD allows you to set camera functions with the setting menu on the monitor while simultaneously checking the video.	
Cable length (m)	Approx. 1.5	
Dimensions	50(H) × 40.5(W) × 12(D) mm (Excluding cable)	

Power Supply Adaptors



Model	SWI6-5.9-N-P13	SWI6-5.9-E-P13	SWI12-12-N-P5	SWI12-12-E-P5
Input voltage	AC100 - 240V		AC100 - 240V	
Output voltage / Current	DC+5.9V / 1.2A		DC+12V / 1.0A	
Plug type	Type A	Type C	Type A	Type C
Connector	EIAJ2 (Φ4.0 × Φ1.7)		Φ5.5 × Φ2.1	
Weight	Approx. 78g	Approx. 96g	Approx. 126g	Approx. 126g

HD-SDI Converter

Model	VPC-SH3STD
Supported resolution	SD-SDI : 720×480i59.94, 720×576i50, HD-SDI : 1280×720p59.94/p60/p50, 1920×1080i59.94/i60/i50, 1920×1080p23.98/p24/p25/p29.97/p30, 3G-SDI Level A : 1920×1080p59.94/p60/p50 3G-SDI Level B-DL : 1920×1080p59.94/p60/p50 *Not supported 3G-SDI Level B-D5
Input / Output terminal	SDI (75ΩBNC) ×1 / HDMI type A ×1, SDI (75ΩBNC) ×1
USB connector	USB Micro-B ×1
Case materials	SECC
Dimensions	63.6(W) × 103.6(D) × 22.5(H) mm (Including bracket)
Weight	204g
Power supply	AC adaptor: AC+100 - 240V, DC+12V 160mA USB bus power: +5V 330mA
Max. power consumption	AC 2.27W
Operating / Storage temperature	0 - 50°C (without condensing) / -20 - +60°C



■ Optional Lenses Correspondence Table

Camera		Lens type	Mount adaptor	Compatible lens
Network	WAT-2400S WAT-933	CCTV	-	M13VG288IR, M13VG850IR, AG3Z2812FCS-MPWIR, AG4Z1214FCS-MPIR
		MINI	28MMA-M12-155	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M0816BC-12
	WAT-2400	CCTV	-	M13VG288IR, M13VG850IR, AG3Z2812FCS-MPWIR, AG4Z1214FCS-MPIR
		MINI	28MMA-M12-140	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M0816BC-12
SDI	WAT-2200 Mk-2	CCTV	-	M13VG288IR, M13VG850IR, AG3Z2812FCS-MPWIR, AG4Z1214FCS-MPIR
		MINI	29PMA-M12-125	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M0816BC-12
USB	WAT-03U2	CCTV	-	M13VM288IR, A4Z2812CS-MPIR
		MINI	28MMA-M12-155	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M0816BC-12
	WAT-06U2 WAT-07U2	CCTV	-	M13VM288IR, A4Z2812CS-MPIR
		MINI	28MMA-M12-155	M2520BC-12, M3620BC-12, M0620BC-12, M0816BC-12
			28MMA-M12-140	M2920BC-12
	WAT-03U2D WAT-06U2D WAT-07U2D	MINI	-	M3620BC-12, M0620BC-12, M0816BC-12
Analog Color	WAT-1200CS	CCTV	-	M13VG288IR, M13VG850IR, AG3Z2812FCS-MPWIR, AG4Z1214FCS-MPIR
	WAT-221S2	CCTV	34CMA-R	12VG412ASIR, 12VG1040ASIR
		MINI	29PMA-M12-125	0814BC-12
	WAT-230V2(G3.6)	MINI	-	2520BC-12, 2920BC-12, M3620BC-12, 0625BC-12, 0820BC-12, 1220BC-12, 2540EX014-M12
	WAT-230V2/CS	CCTV	-	13VM308ASIR II, T4Z2813CS-IR-2
	WAT-240E (G3.8) WAT-240E/CB (G3.8) WAT-240E/FS(G3.8)	MINI	-	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0820BC-12, 1220BC-12, 2540EX014-M12
	WAT-1100MBD (G3.6)	MINI	-	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M0816BC-12
	W-03CDB3	CCTV	-	13VG308ASIR II, 13VG1040ASIR, TG4Z2813FCS-IR-2 *Utilize the option CC-02 (Iris cable) when a DC iris lens issued.
		MINI	22PMA-M12-125	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0814BC-12, 0820BC-12, 1220BC-12, 2540EX014-M12
Analog Monochrome	WAT-910HX WAT-910HX/RC	CCTV	30CMA-R	12VG412ASIR, 12VG1040ASIR
		MINI	28MMA-M12-140	0814BC-12
	WAT-902H3 ULTIMATE	CCTV	-	13VG308ASIR II, 13VG1040ASIR, TG4Z2813FCS-IR-2
		MINI	28MMA-M12-140	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0814BC-12, 0820BC-12, 1220BC-12, 2540EX014-M12
			28MMA-M12-090	3720B-12P(B)
	WAT-902H2 ULTIMATE	CCTV	30CMA-R	12VG412ASIR, 12VG1040ASIR
		MINI	28MMA-M12-140	0814BC-12
	WAT-902H3 SUPREME	CCTV	-	13VG308ASIR II, 13VG1040ASIR, TG4Z2813FCS-IR-2
		MINI	22PMA-M12-125	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0814BC-12, 0820BC-12, 1220BC-12, 2540EX014-M12
			22PMA-M13-040	3745B-13P
	WAT-902H2 SUPREME	CCTV	30CMA-R	12VG412ASIR, 12VG1040ASIR
		MINI	22PMA-M12-125	0814BC-12
			22PMA-M13-040	3745B-13P
	WAT-902B	MINI	22PMA-M12-125	0814BC-12
			22PMA-M13-040	3745B-13P
	WAT-660E (G3.8)	MINI	-	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0820BC-12, 1220BC-12, 2540EX014-M12
	WAT-902HB3S	MINI	22PMA-M12-125	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0814BC-12, 0820BC-12, 1220BC-12, 2540EX014-M12
			22PMA-M13-040	3745B-13P
	WAT-902HB2S	MINI	22PMA-M12-125	0814BC-12
			22PMA-M13-040	3745B-13P
	WAT-910BD	CCTV	30CMA-R	12VG412ASIR, 12VG1040ASIR *Utilize the option CC-01 (Iris cable) when a DC iris lens issued.
		MINI	22PMA-M12-125	0814BC-12
			22PMA-M13-040	3745B-13P

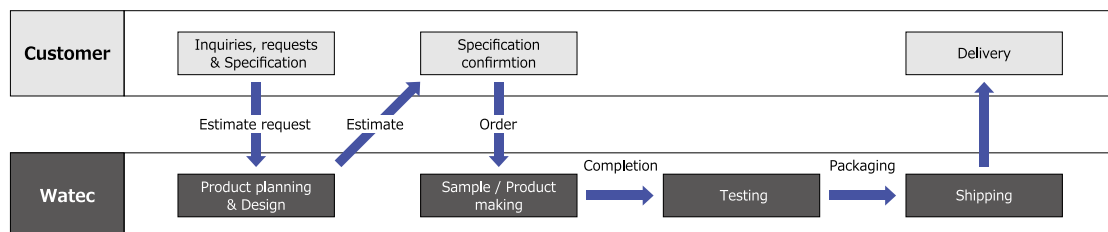
■ Glossary

External Synchronization	Function to synchronize the timing of cameras' motion when multiple cameras are used simultaneously (Composite Sync. of sync. signal generators and CVBS signal of cameras are applied for the timing synchronization.)
Gamma Correction	Function to correct video signal to earn proper contrast on monitored image
BLC (Back Light Compensation)	Function to adjust exposure of silhouetted subject by bright light behind
Defog	Function to improve image quality captured under poor weather condition such as fog, rain, snow, etc.
Minimum Illumination	Value (lx.) to describe how dark the camera can capture usable image
Imaging System	Type of filter systems adapted by color camera sensors (Primary color system: high color reproducibility, Complement color system: high sensitivity)
Horizontal Resolution	Value (TVL) to describe image fineness the camera can provide to monitor in horizontally (The higher, the finer)
Cell Size	Value to describe size of unit pixel of image sensor (The bigger, the better in sensitivity and the less saturation output)
Serial Communication	Function to allow remote operation of parameter setting change or OSD setting for RS232 or RS485 communication method
Day/Night	Function to provide color image under sufficient illumination & B/W image under low-light condition automatically, manually
One-cable System	Transmission system to send video signal & receive power supply via 1 coaxial cable to facilitate cable routing
Motion Detection	Function to detect moving object and provide addressed task in detection
Noise Reduction	Function to reduce noise from the image captured in high gain condition (2D: perform within 1 frame, 3D: perform by using the images before and after)
White Blemish Correction	Function to automatically correct white pixels
Privacy Masking	Function to cover addressed area in captured image for privacy protection purpose
FL (Flickerless)	Function to reduce flicker phenomenon from images captured under commercial power frequency 50Hz
White Balance	Function to optimize color reproduction in accordance with the lighting condition
Mirror Image	Function to obtain horizontal and/or top-bottom inverted image
WDR (Wide Dynamic Range)	Function to stabilize contrast of light and shadow to provide clear and usable image when object has extremely bright and dark parts at once
AE Mode (Automatic Exposure Mode)	Function to automatically control shutter speed to provide appropriate and stable brightness level to image
AGC	Function to automatically control gain of amplifier to provide visible image under low light condition
HD-SDI	HD-SDI is the abbreviation of High Definition Serial Digital Interface, which delivers high quality live HD video over coaxial cable with exceptional resolution and image detail. HD-SDI technology delivers image quality that is far superior to analog CCTV that is easy to install and integrate with existing CCTV systems. (e.g.: WAT-2200 Mk-2)
HSBLC (HLC)	Function to reduce reflection of light by masking the part(s) containing strong light to improve visibility of image
MGC	Function to fix gain of amplifier
OSD	An on-screen display (OSD) is a control panel on a monitor that allows you to select viewing options
S/N	Value (dB) to describe the strength of video signal compare to the back ground noise

■ Technical Support Customizations

About Customizations

Utilizing the techniques and experience we have developed since Watec's founding, we actively accepted special orders and customizations to meet customer needs. We also accept small-scale orders of custom-made products or products with changes in specifications. Please ask a distributor or Watec for details. Please note that we may not be able to meet all requests and the per-unit cost may increase depending on the request. Please contact Watec if you have any questions.



Special Order / Customization Examples

- Change to specified lenses
- Modification of cable length and wire
- Change of body color and print content
- Manufacturing of lens mounts plus other additional manufacturing
- Change of connectors
- Alteration of various function settings and/or default settings

Please see the "Special Modifications" section of each product on our website for further details.

■ Technical Tips

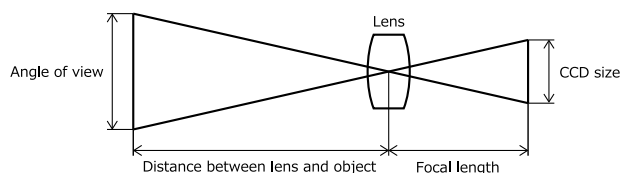
Guide of Minimum Illumination

Lighting condition

Clear sunny sky	10000 lx	Twilight	1 lx
Cloudy sky	1000 lx	Full moon	0.1 lx
Office (with window)	500 lx	A half moon	0.01 lx
Office (no window)	100 lx	Star light	0.001 lx

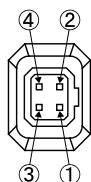
Calculation of the Focal Length

$$\text{Focal length (mm)} = \frac{\text{Distance between lens and object (m)} \times \text{CCD size [H / W] (mm)}}{\text{Angle of view [Height / width of object] (m)}}$$



CCD size(mm)
 1/2" = 4.8(H)×6.4(W)
 1/3" = 3.6(H)×4.8(W)
 1/4" = 2.7(H)×3.6(W)

Pin Configuration Guide for Auto Iris Connectors



Pin	EIAJ Video	EIAJ DC	Watec
①	Power	Control -	Power
②	Not used	Control +	Iris signals
③	Iris signals	Drive +	GND
④	GND	Drive -	GND

■ Watec Technical Support

For Those Considering a Watec Purchase

Our distributors and sales representatives provide many customizations in order to meet your purposes, situation, and needs.

For Current Users of Watec Products

Our distributors and sales representatives provide support for when you need a new product or your needs change. We also provide support for performance issues and product repairs. For product repairs, please see the After-sales Service section.

Please feel free to contact us at any time.

■ After-sales Service

Warranty

All Watec products before being shipped to our customers are tested and inspected to ensure that our products are not faulty and are of the highest quality as directed by our Watec Quality-control System. Watec camera have a 3-year warranty, and the board camera units and peripherals have a 1-year warranty, provided that the products have been operated in accordance with our operation manual and have not been altered in any way.

NB: The Watec 3-year warranty does not cover image sensor repair or replacement caused by whiteblemish phenomena.

Repair Service

Watec makes it a policy to repair Watec products first hand with the appropriate charge in accordance with the detailed defect information supplied by you. All repairs in the Watec workshop are quickly and precisely dealt with and returned after the shortest repair period possible.

About white blemish

White blemish is a pixel on the sensor chip which leave an irremovable white spot on the image. There are two factors for white pixel to be made: 1. production process factor (due to the unevenness of pixels), and 2. after production factor (due to Cosmic-ray exposure).

In the case of 1. production process factor, not only the manufactures but also Watec strictly check with white blemish at the final inspections to make sure the products with white blemish over the permissible range won't be dispatched to the customers.

On the other hand, we are not able to prevent the cameras to earn white blemishes caused by 2. after production factor, because there is no effective solution found, even with the latest study, to block the sensors from exposure to Cosmic-ray. The occurrence rate of this phenomenon increases with the high sensitivity sensors due to their structure. For this reason, the sensor makers don't provide warranty for white blemish with after production factor.

As there is no way to protect the sensors from Cosmic-ray exposure, Watec is not able to take responsibility for our cameras to earn white blemishes with after production factor; therefore, Watec warranty does not cover white blemishes for our products after shipping to the customers.

■ Company Profile

Overview

Company Name	Watec Co., Ltd.
Established	March 20, 1987
President	Shigeto Igarashi
Board Member	Directors: 5, Auditor: 2
Paid Up Capital	¥ 58,500,000

History

1987	Established in Tono, Kawasaki at a received capital of ¥13,000,000
1990	Yamagata factory was built in Higashine, Yamagata.
1994	Taiwan liaison office opened in Taipei, Taiwan
1996	Head office moved to Tsuruoka from Kawasaki.
1997	Capital increased to ¥19,500,000
1999	The U.S. subsidiary, Genwac, Inc. was founded in Orangeburg, NY.
2004	Capital increased to ¥29,250,000 Watec Co., Ltd. Beijing Liaison Office opened in Beijing, China.
2005	The U.S. subsidiary, Genwac, Inc. changes its name to Watec, Inc.
2006	Selected as one of the 300 of Japan's Vibrant Monodzukuri (Manufacturing) small and medium-size(d) enterprises, 2006 by Japanese Ministry of Economy, Trade and Industry
2007	Capital increased to ¥58,500,000
2011	ISO 9001:2008 approved
2014	Tokyo sales office opened in Tokyo
2017	ISO 9001:2015 approved

Contacts

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