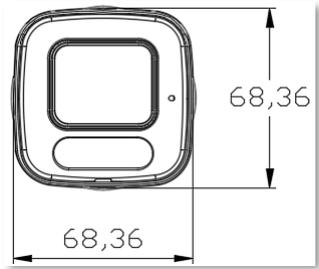
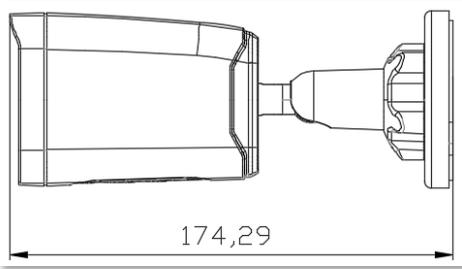


3004 Type - WiSen® Vision Unit (TR) with Wisen X1 Camera	
Basics	
Primary Battery Power	Qty. x 4 (3.6V Lithium primary D-Cell ER34615)
Secondary DC Power	7 - 32VDC @ Min. 2A, including: A. IP68 110-240VAC to 12VDC adaptor; B. M001 - External Battery Unit; C. M101 - Solar Unit.
4G Network Stop Voltage	2.1V
Local Storage	≥ 100 days @ T=60min, i.e., 2600 Images
Dimension (L x W x H)	180 x 140 x 60mm
Weight	≤ 2.6kg
Cable Gland	A. Qty. 1 x EMC-CMA20 for Camera connection & LED/Buzzer Warning connection (2 holes of through cable diameter, 3-6mm); B. Qty. 1 x EMC-CMA14 for external DC input power connection (through cable diameter, 4-8mm).
External Camera – High Definition 8MP / Full Colour / Black Light Grade / Waterproof	
	 Black Light  Auto electronic shutter  Auto ICR  IP67 Waterproof
Image Resolution: 3840 x 2160	Image Compression: JPEG
HD Lens: 5.0mm	Angle of View: Horizontal 93° / Vertical 50°
Camera Flash Range in a complete darkness: White colour flash, 20-30m+; Camera warm up time: 40s; (During which, if Camera flash is auto enabled, then it lasts for 3 seconds.) Automatically controllable when environmental ambient light density is over customised threshold.	
Operating Temperature: -20°C to 65°C	Operating Humidity: 10%RH to 90%RH
IP Rating: IP67	Weight: 360g
Enclosure Material: Aluminium alloy	External Cable Length: 1.0m
Dimension: 68mm x 68mm x 174mm	
	
Application	
The Wisen X1 Camera is suitable for places with ultra-low light conditions and requiring high-definition image quality, such as roads, warehouses, underground parking lots, bars, pipelines, parks, etc.	
External LED / Buzzer On-Site Warning Issuing	

Buzzer Beeping Volume	≥ 90dB@10cm		
LED Light Colour	LED Off / Green / Yellow / Orange / Red		
Two Levels of LED Light Blinking & Buzzer Beeping	Warning: yellow LED light with synchronised buzzer beeping (Default)	Once per second	
	Normal: No LED & Buzzer Beeping (Default)	N.A.	
	Note: LED light colours, LED light blinking Frequency (identical to Buzzer beeping frequency) can be modified via commands.		
External Camera – High Definition 8MP / Full Colour / Black Light Grade / Waterproof			
Mode 1 (Default): Active Mode & Battery Life (@ 4G Connection)	Photo is automatically taken at every T.		
	Time Interval (LED/Buzzer Off)	Internal Battery Life in Days	Internal Battery Life in Months
	3min (Default Setting)	3.6	0.1
	5min	5.4	0.2
	15min	16	0.5
	30min	31	1.0
	60min	60	2.0
	8Hr	477	16.0
24Hr	1431	47.7	
Mode 2: Passive Mode (switched via Command) & Battery Life (@ 4G Connection)	Photo is not taken until a Photo-Taken command is sent, more specifically: - At $T < 5\text{min}$, a photo comes back at close to real time, internal battery life ≈ 10 days; - At $T \geq 5\text{min}$, a photo comes back with a delay of 1-2Ts, internal battery life ≈ 44 days @ $T=5\text{min}$.		
Mode 3: Trigger Mode (switched via Command)	In a Wisen Trigger Mesh System, if any node is triggered, the camera will immediately take one image. We recommend a use of T=8hrs or 24Hrs.		
Note 1: Sampling Time Interval $T = [3\text{min}, 1\text{day}]$.			
Note 2: The bigger T value is, the less power consumption is, i.e., internal battery life can last longer.			
External Interface			
Wireless Module	Wisen 4G Daughter Board (Be default) Note: Micro SIM card is required. Or switchable to 2.4GHz WiFi Daughter Board.		
Wired Port	RS232 on Board / Ethernet Daughter Board		
WSN Interface			
Mesh Wireless Interface	WiSen® Protocol		
Standard System Parameter			
Temperature	Range: -40 to 85°C; Accuracy: $\pm 1^\circ\text{C}$; Resolution: 0.1°C		
Voltage	Accuracy: $\pm 0.1\text{V}$		
Industrial Standard			
Casing and Painting Materials	Aluminium-Alloy Die Castings 12 (Epoxy Polyester Powder Coating)		
IP Rating	≥ IP67		
Operating Temperature	-40 to 85°C		
Applications			
<ol style="list-style-type: none"> When a Vision Unit is deployed at Control centre / Data centre, the LED warnings can be configured with one or more projects. So that a visual and auditory warning system can be established in the centre. This frees the operators from frequent checking of warning emails; When a Vision Unit is deployed on site: <ol style="list-style-type: none"> The image data can help on illustrating the progress of the construction works; 			

- B. The LED and Buzzer warnings can present a systematic visual and auditory warning to the on-site team so that the maximum safety can be achieved.

Note: Vision Unit relies on a stable 4G connection, so its image data can be transferred smoothly and furthermore, the LED warnings can be received from a remote control centre.

Highlights

1. After a 3004 Unit is powered on, the actions below will be performed:
 - A. Immediately, the external LED flashes in the sequence of:
 - a. Red, Yellow, Green, for 1 time each;
 - b. Warning Colour (by default, Yellow), for 3 times;
 - c. All the above is synchronised with Buzzer beeping sound.
 - B. The unit runs at T=3min for the initial 2 Time Intervals;

And ONLY if connection to server is available, the 2nd Time Interval takes **one** photo and sends back to the server.
 - C. After the initial two Time Intervals (i.e., 6min), Time Interval automatically changes back to the customer T (if set before).
2. When a Unit connects to a remote server, "NET" LED will be constantly on;
3. Do not stare at the LED light at close distance;
4. Photo quality tips (including the ones in days and nights):
 - A. Ensure the camera is not installed close to any object (e.g., trees, poles, etc.). Otherwise, Camera flash (if used) will be reflected by the nearby object(s) and causing the distant objects not clearly seen;
 - B. Do not face the camera toward strong light source (e.g., street lamp, high up to sun), otherwise the internal light balancer in the camera will be severely disturbed;
 - C. When needed, a user can stick reflectors on the most concerned positions, then a reflector (of 8cm x 8cm) can be seen from 120m+. This gives the user extended range of monitoring;
 - D. Camera flash can be automatically turned on or off based on the environmental ambient light density. The related setting is via commands.

Installation Demo



Figure. Vision unit overview (Connected with X1 Camera).

Wiring Sequence

X1 Camera		Alarm (LED & Buzzer)	
Wire Colour	Node Terminal	Wire Colour	Node Terminal

Orange	R-		Green	G	
White	R+		Yellow	Y	
Green	T-		Red	R	
Blue	T+		White	Buzzer	
Black	GND		Black	VCC	
Red	VCC				

Image Examples



Figure. Image taken during daytime from X1 Camera.



Figure. Image taken during night time (Light density $\geq 0.001\text{Lux}$) **without** LED On from X1 Camera.



Figure. Image in dark room test (Light density $< 0.001\text{Lux}$) **with** Camera LED Turned On.

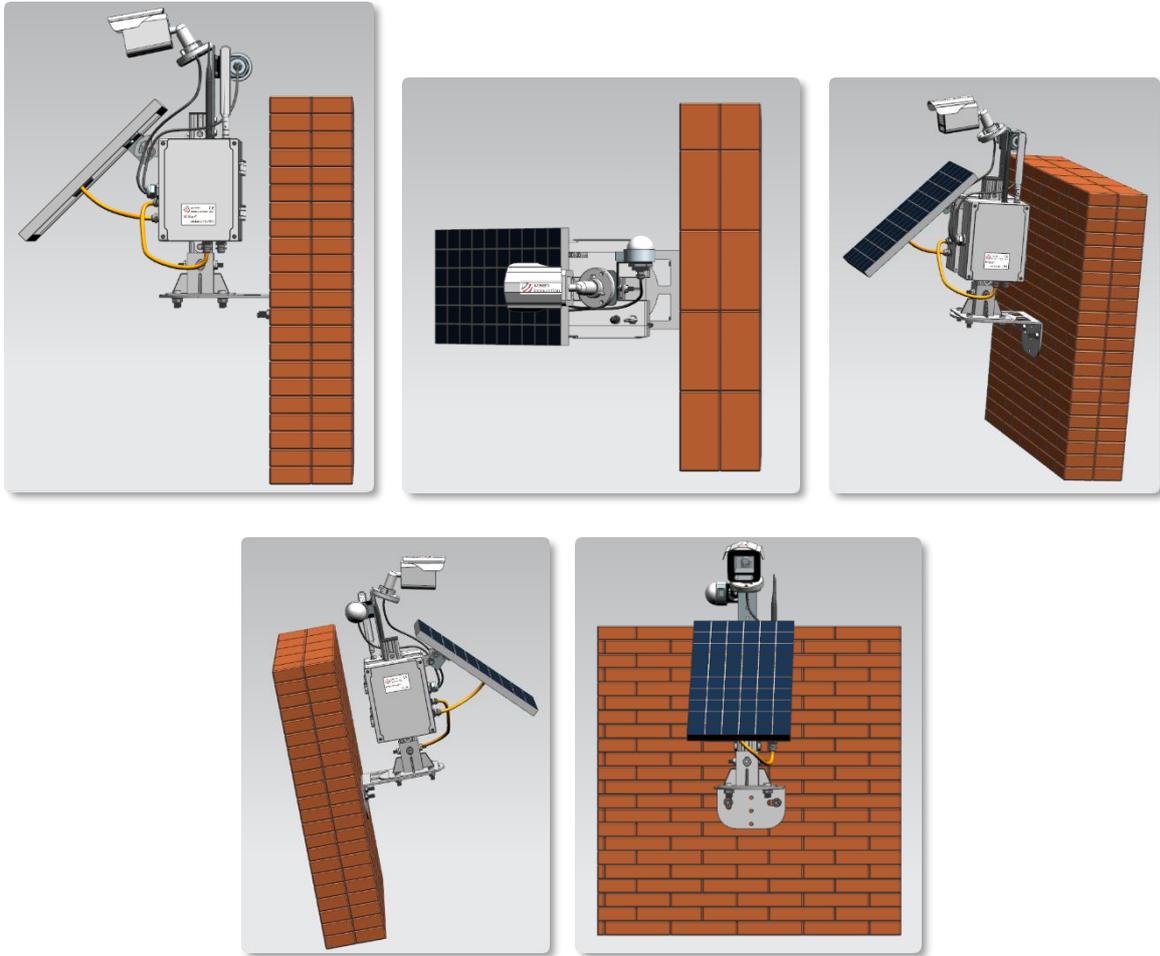


Figure. X1 Camera with 3004 Unit with Solar Unit Connected.