



Milesight-Troubleshooting

AloT Camera

Version 1.0	Update	2022.9.22
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Milesight

1. Introduction of AloT Camera

Milesight AloT Pro Bullet Plus Network Camera is our newest member of the 5G Series. Offering IoT technology, AI deep learning, compact structure and more, Milesight AloT Pro Bullet Plus Network Camera builds a whole new world by combining high-tech with high-performance. IoT is an advanced function which allows to get information of any things need to be monitored, connected and interacted in real-time via various technologies and devices, like sensor and RFID to smartly realize perceiving, recognizing and managing things.

This article will introduce the basic configuration of AloT Camera, so that you can quickly learn to use our AloT Camera.

Note: For more information about how to configure 5G, please refer to *Milesight-Troubleshooting-5G AI Camera*

Released Model		
	Milesight 5G AloT 4X/12X Pro Bullet Plus Network Camera	
	Milesight AloT 12X Pro Bullet Plus Network Camera	

2. How to Set IoT

1) Device Settings

① Radios Settings

Step 1: After logging into the web, go to "Settings" \rightarrow "IoT" \rightarrow "Settings". Check the checkbox "Enable IoT", and IoT function will be enabled.

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	📩 Media	Radios Settings Profiles Settings Devices Management		
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	System	> FSK Channel Settings >		
		Additional Channels		

Step 2: Check the checkbox to enable Milesight IoT Cloud management so that you can have a central

management for devices.

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Step 3: Configure Radios Settings.

Currently our IoT camera supports <u>three IoT frequency bands of 915M</u> (The corresponding channel plan is US915/AU915/KR920/AS923/AS923-2), 868M (The corresponding channel plan is IN865/EU868/ RU864) and 470M (The corresponding channel plan is CN470). Before buying the camera, you need to contact our sales to choose the frequency band that is supported in your country.

For example, here I choose the IoT camera with the frequency bands of **868M** or reference document regional parameters for LoRaWAN, and it will show that the current channel plan is **EU868** on the camera's web.

Note: Usually you can directly use the default settings without configuring Radio Settings. If you need to customize some radio settings, you can make further settings as shown below.

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e loT	×	Radio Channel Settings		
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System	>	FSK Channel Settings		
		Additional Channels		
6				

Para	meters	Function Introduction
Chan	nel Plan	The required Channel Plan can be selected according to the country region. For example, here I choose the IoT camera with the IoT frequency band of 915M, then it will list all the channel plans supported by this frequency band, including US915, AU915, AS923, AS923-2 and KR920, then I need to select the corresponding channel plan.
Channel Mask		Enabled frequencies are controlled using channel mask. Leave it blank means using all the default standard usable channels specified in the LoRaWAN [®] regional parameters document. A bit in the ChMask field set to 1 means that the corresponding channel ca n be used for uplink transmissions if this channel allows the data rate currently used by the end-device. A bit set to 0 means the c orresponding channels should be avoided. Note: This option is optional for CN470, US915 and AU915.
	Center Frequency of Radio 0	Supports transmitting and receiving packet; Note: For details of default value and configuration ranges in different regions, please refer to Appendix 1 at the end of this document.
Radio Channel Settings	Center Frequency of Radio 1	Only supports receiving packet from nodes; Note: For details of default value and configuration ranges in different regions, please refer to Appendix 2 at the end of this document.
	Multi-channel list	The radio and frequency corresponding to all channels will be listed here. All channels are enabled by default. You can also check the box to enable the corresponding channel.

			Channel	Radio	Frequency/MHz	
			1	Radio 0 \vee	868.9	
			2	Radio 0 👻	869.1	
			3	Radio 0 \vee	869.3	
			4	Radio 1 🗡	867.3	
			5	Radio 1 👻	867.5	
			6	Radio 1 🗡	867.7	
			7	Radio 1 👻	867.9	
			8	Radio 1 \vee	868.1	
	Enable	Enable/Disable tl	he LoRa Channe	el.		
	Radio	Choose Radio 0	or Radio 1 as ce	enter frequency.		
		Enter the freque	ncy of this char	inel.		
		For example:				
		1. The frequency	/ range formula	of US915 and AU9	15: Center frequency	
		±0.55;				
LoRa Channel Settings	Frequency	2. The frequency range formula of other regions (except US915 and				
		AU915): Center frequency ± 0.4625 ;				
		For example, the center frequency is configured with 867.5, then the				
-		867 5-0 4625~867 5+0 4625				
		Foter the bandwidth of this channel 125KHz 250KHz and 500KHz are				
	Bandwidth	available. The default option is 250KHz;				
		Note: The defaul	t option is 500k	KHz for AU915 and	I US915.	
		From SF7 to SF1	2, the transmis	sion rate decrease	es and the	
	Data Data	transmission dist	ance increases.	In general, the ra	nge of Data Rate is	
	Dala Rale	SF7 \sim SF12, the default value would be SF7. Only the default value of				
		the Channel Plan AU915 and US915 is SF8.				
	Enable	Enable/Disable tl	he FSK Channe	l.		
	Radio	Choose Radio 0	or Radio 1 as ce	enter frequency.		
FSK Channel	Frequency	Enter the freque	ncy of this char	inel.		
Settings		Enter the bandw	idth of this chai	nnel. 125KHz, 250	KHz and 500KHz are	
	Bandwidth	available. The de	fault option is 1	25KHz.		
		Note: The defaul	t option is 250k	KHz for AU915 and	I US915.	
	Data Rate	Enter the data ra	ate. The Date R	ate must be betw	een 500~250000.	
		For some regiona	al variants, if all	owed by your LoR	aWAN [®] region, you	
Additional		can use Addition	al Plan to config	gure additional cha	annels undefined by	
Channels	Add	the LoRaWAN [®]	Regional Param	eters, like EU868 a	and KR920;	
		Note: If you choo	ose the channel	plan as CN470, A	U915 and US915,	
		additional channe	els are not supp	oorted.		

Note: The configurations here should be the same with those in End Device.

Devices Management

Step 4: Add and manage End Devices.

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			OSD Font Color		
			Device List		
			Device Name Device EUI Device Profile Battery Last Seen Activation S	Sensor Operation	
			AM104-668M 24e124127a234203 1 - 32min ago 🥥 S	Sensor 🖌 🗍	
			Save		

Parameters	Function Introduction		
Device Name	Customize the device name.		
Device EUI	Fill in Device EUI which can be obtained from the device label. You can also get Device EUI from Milesight Tool Box if you use Milesight Lora Sensor.		
Device-profile	Usually you can use the default settings without configuring Profiles Settings. If you need to customize some profiles settings, you can click the Edit button to make further settings and click save button, it will list the Device-profiles you created.		

	be between 0~16.
	[Join Type]: OTAA and ABP are optional, the default option is OTAA.
	> OTAA: Over-the-Air Activation.
	For over-the-air activation, end-devices must follow a join procedure prior
	to participating in data exchanges with the network server. An end-device
	has to go through a new join procedure every time as it has lost the session cont
	ext information.
	ABP: Activation by Personalization.
	Under certain circumstances, end-devices can be activated by
	personalization. Activation by personalization directly ties an end-device to
	a specific network bypassing the join request - join accept procedure.
	[Class Type]: Device type is Class A by default. Users can check the box of Class B
	or Class C to add the class type.
	[MAC Version]: Choose the version of the LoRaWAN [®] supported by the end-device.
	1.0.0/1.0.1/1.0.2/1.1.0 are optional, the default option is 1.0.2.
	[Regional Parameters Revision]: Revision of the Regional Parameters document is
	supported by the end-device. A and B are optional, the default option is B.
	[RX1 Data Rate Offset]: The offset used for calculating the RX1
	data-rate is based on the uplink data-rate.
	[RX2 Data Rate]: Enter the RX2 datarate which is used for the RX2
	receive-window.
	[RX2 Channel Frequency]: RX2 channel frequency is used for the RX2 Frequency
	receive-window.
	[Frequency List]: List of factory-preset frequencies. The range is based on what is
	specified in the LoRaWAN® regional parameters document.
	Whenever an end-device joins a network via over-the-air activation, the application
	key is used for derive the Application Session key. It is mainly used to generate
Application Kay	corresponding Device Address/Network Session Key/Application Session Key.
Application Rey	Note:
	1. The default key can be obtained from the end-device;
	2. Milesight Sensors' default key is 5572404c696e6b4c6f52613230313823.
	Information needed to access the network. If you choose ABP network access
	mode, you need to fill in these items. And you can obtain them from End Device. For
	example, you can get such information from Milesight Tool Box when you use
	Milesight Lora Sensor.
Device	Device Address: The device address identifies the end-device within the current
Address/Network	network.
Session Koy/Application	Network Session Key: The network session key is specific for the end-device. It is
Session Rey/Application	used by the end-device to calculate the MIC or part of the MIC (message integrity
Session Key	code) of all uplink data messages to ensure data integrity.
	The default key of Milesight Sensor is 5572404c696e6b4c6f52613230313823.
	Application Session Key: The AppSKey is an application session key specific for the
	end-device. It is used by both the application server and the end-device to encrypt
	and decrypt the payload field of application-specific data messages.

	The default key of Milesight Sensor is 5572404c696e6b4c6f52613230313823.
Uplink Frame-counter	Calculate the number of uplink frames sent from End Device to network server. This
	count is increased and received by the End Device. The default value is 0.
	The number of data frames which sent uplink to the network server. It will be
Downlink	incremented by the end-device and received by the end-device. Users can reset
	the personalized end-device manually, then the frame counters on the end-device
Frame-counter	and the frame counters on the network server for that end-device will be reset to 0.
	The default value is 0.
	Select the device type according to the actual situation. Lora Sensor and Lora
	Sensor Node are optional. Lora Sensor is a kind of sensor that supports LoraWAN
Device Type	protocol, while Lora Sensor Node is a kind of device which receives data from
	interfaces of RS485, AI and GPIO.
Font Color	Configure the OSD fant color
Fort Circ	
Font Size	Configure the OSD font size.

Note:

1. Device Name and Device EUI cannot be repeated.

2. Device EUI, Application Key, Device Address, Network Session Key and Application Session Key should be consistent with the configuration of End Device.

3. Uplink Frame-counter and Downlink Frame-counter can be reset only in ABP mode.

Step 4: Sensor Settings. You can enter	[.] sensor co	onfiguration page by clicking	ensor	After the	ڊ
configuration is finished, you can click	Save	to save your configuration or clic	ck 🦳 🤇	Cancel	
to cancel your configuration.					

LoRa Sensor	Sensor Settings		×
Sensor ID	1	~	
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Sign			
Decimal Point Forward	0 1		
Unit	°C	~	
Show OSD			
Sa	Cancel		

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GPIO GPIO 2 Temperature Sensor		ORa Node Sen POT Type I Channel ID · Sensor Type · Sign · Decimal Point Forward · Unit · Show OSD · Save · Port Type · Channel ID · Save · Port Type · Channel ID · RS485 · 5 · GPIO · GPIO 2 ·	Asor Settings	X Only Al of LoRa Port Type Channel ID Sensor Type Sign Decimal Point I Unit Show OSD	Forward Control Contro	Settings 5 5 erature Sensor Cancel Sensor Type emperature Sensor	V V V V V V	

Parameters	Function Introduction
	Select the Sensor ID that you want to configure. The number of sensor IDs depends
Sensor ID	on how many kinds of data the sensor has and there is a one-to-one relationship
	between ID and data.
	Select the correct port type according to the actual situation. RS485, GPIO and AI
Port Type	are available.
	Note: Only for LoRa Node;
Channel ID	Select the Channel ID that you want to configure. There are eight Channel IDs for
	each kind of interface.
Oah	The high value of the device range.
USI	Note: Only AI of LoRa Node;
Osl	The low value of the device range.

	Note: Only AI of LoRa Node;
	Sensor Type configuration. We have several common used sensor types as shown below:
	Temperature Sensor
	Humidity Sensor
	Dust Sensor(PM2.5)
	Dust Sensor(PM10)
	Water Level Sensor
	Speed Sensor
	Weight Sensor
	Photoelectric Sensor
	Vibration Sensor
	Pressure Sensor
	Other
Sensor Type	Or you can also customize it:
	Sensor Settings ×
	Sensor ID 1
	Sensor Type CO2
	Decimal Point Forward
	Show OSD 🗹
	Save Cancel
Sign	The tick indicates that the value has a plus or minus sign.
Decimal Place	Decimal configuration. For example, when you fill in 1, you are moving the decimal point one to left, and you get a decimal.
Unit	Data unit configuration. We have some common units here and users can also customize it.
Show OSD	As the picture shown below, once you enable this function, you can see the
5100 030	detected data on the screen.



Note:

1. The channel ID and Sign should be consistent with those in End Device.

2. Decimal Place is set according to the properties of the sensor. For example, you need to set this value to 1 to get the correct temperature when using the Milesight temperature sensor.



Step 6: You can click \Box to delete the device you added.

Mil	lesight Network Ca	mera	I								🕀 English 🛩	💄 admin 🗸
	👌 Media	>	Radios Settings Profiles Settings	Devices Management								
•	Network	>		/	Device Name*	AM104-868M						
\odot	E Storage				Device EUI+	24e124127a234203						
	5 Event	,		Decile ABE 78hos	Device Profile	Class A-OTAA	~					
ø	📾 loT	Ÿ		and a second second	Application Key+	5572404c696e6b4c6f52	6132303					
	Settings Alarm Settings			States of the little little	Device Type	Lora Sensor	~					
	@ System	>	And a second sec	Terrer Co statute 1	OSD Font Size	Medium	¥					
					OSD Font Color		٠				×	
					Device List						\mathbf{i}	
					Device Name	Device EUI	Device Profile	Battery	Last Seen	Activation	Sensor o eratio	•
					AM104-868M	24e124127a234203	Class A-OTAA				Sensor	
					Save	Cancel						

2) Alarm Setting

Mil	esight Network Came	əra		🕀 English 🗸	💄 admin 🛩
	📥 Media	>	Alarm Settings		
•	Network	>	Rules 1 2 3 4		
\odot	E Storage		Enable		
	5 Event	>	Threeholds Settings		
ø	e loT	~	Schedule Settings		
J	Settings Alarm Settings		Alam Action		
	🕼 System	>	Save		

Step 1: Select the alarm rule that you want to set and you can configure four kinds of rules.

Step 2: Check the checkbox to enable Alarm Rules.

Mi	lesight ·Network Carr	nera		🕀 English 🛩	💄 admin 🛩
	📥 Media	>	Alarm Settings		
•	Network	>	Rifes 1 2 3 4		
•	E Storage				
<u> </u>	S Event	>			
ø	e loT	~	Intestous settings		
	Settings		Screaue Settings		
	Alarm Settings	,			
	i a oyoun		Save		

\bigcirc Thresholds Settings

Step 3: Click to select the sensor to alarm and set threshold for the selected sensor.

When the data reaches the critical value, the alarms will be triggered. Both upper and lower thresholds are configurable. You can also only configure upper or lower threshold.

Mile	<i>esight</i> ∙Network Can	nera		🕀 English 🛩	💄 admin 🛩
	🖧 Media	>	Alarm Settings		
	Network	>	Rules 1 2 3 4		
\odot	Storage		Enable		
*	S Event	,	Thresholds Settings		
8	E IoT Settings Alam Settings & System	>	Therbods Schrups C I EM50-02-915M 1 Temperature Sensor I I Mar Limit + 28 IC I UC512-01-915M 1 Temperature Sensor I UC512-01-915M 1 Temperature Sensor I UC512-01-915M 1 Temperature Sensor I Schedule Settings I Alum Action I		

☑ Schedule Settings

Step 5: Set the alarm schedule for IoT.

Mill	esight Network Car	nera		🕀 English 🛩	💄 admin 🛩
	📥 Media	>	Alarm Settings		
•	Network	>	Rifes 1 2 3 4		
0	🗄 Storage				
Ŭ	S Event	>	Linuxe 🔽		
đ	U Even Folo Semps Ann Settops	, ,	Thresholds Settings > Sum • Sum • Num • True • Fri • Sate •		

Please refer to the meaning of the options as follows:

Parameters	Function Introduction
Copy To × Sun. Mon. Tue. Wed. Thu. Fri. Sat. Save	Copy the schedule area to another date.
Select All	Select all schedule.
Clear All	Clear all schedule.

Step 6: Set Alarm Action.

Mil	esight Network Ca	mera				⊕ English ∽	💄 admin 🛩
	🐣 Media	>	Alarm Settings				
•	Network	>	Rules 1 2 3 4				
\odot	E Storage		Fnable				
	🗊 Event	>					
ð	■ IoT Settings	ř	Schedule Settings	3	_		
	Alarm Settings		Alarm Action	~			
	S System		Duration Duration Save to Storage (Please munit storage device.) Upload via FTP				
			Snapshot	>			
			External Output	>			
			Play Audio (Please enable the Audio Speaker.)				
			Alarm to SIP Phone (Please open the SIP.)	14			
			OSD Blink (Please check the Show OSD)	,			
			Sine				

Parameters	Function Introduction		
Record	 Duration: Selected the duration time of alarm. 5s/10s/15s/20s/25s/30s are available. Linkage: Save alarm recording files into SD Card or NAS or Upload the recording files via FTP. 		
Snapshot	 Number: The number of snapshot, 1~5 are available. Interval: This cannot be edited unless you choose more than 1 to Snapshot. Linkage: Save alarm recording files into SD Card or NAS, Upload the recording files via FTP and send alarm email. 		
Play Audio	Auto/10 seconds/30 seconds/1 minute/5 minutes/10 minutes are available. Note: Please enable the Audio Speaker.		
Alarm to SIP Phone	Support to call the SIP phone after enabling the SIP function. Note: Please open the SIP.		
HTTP Notification	Support to pop up the alarm news to specified HTTP URL.		
OSD Blink	If the Show OSD in the page of sensor configuration is checked, the OSD will blink when alarm is triggered. OSD Blink Time: Support to set the blinking duration of the OSD, 1~10 are Available. For example, the alarm action is set to OSD blinking at an interval of 3 seconds, when the data reaches the critical value, the alarms will be triggered and the OSD blinking on the live view interface.		

3. Compatibility with Milesight back-end

After completing the basic settings of AloT camera, you can access the camera through the Milesight back-end.

• For Milesight CMS, it supports adding AloT camera via P2P, and then the parameter of IoT can be configured.

Step 1: After logging into the Milesight CMS, go to **"Management"→ "Devices"→ "Add Devide Manually"**, and you can add AloT Camera by Mac Address when selecting P2P connection type.

Device Type:	Camera	•
Name:		
Connection Type:	P2P	
Mac Address:	1C:C3:16:	8
User Name:	admin	8
Password:		
5G Data Mode:	Low Data Mode	
Note: P2P require	s higher bandwidth for sta	ability.
Note: P2P require	or nighter bandwidth for su	Add

Step 2: Go to "Devices Config" \rightarrow "AloT Camera" \rightarrow "loT", You can set the loT settings on CMS as shown below.

	Charnel Plan CM470
	Channel Mask
	Radio Channel Settings
	Center Frequency of Radio 0: 472.3
	Center Frequency of Radio 1: 472.9
	Enable Channel Radio Frequency/MHZ
	✓ 0 Radio 0 ▼ 471.9
	✓ 1 Radio 0 ▼ 472.1
	2 Radio 1 472.3
	3 Radio 1 472.5
	4 Radio 1 1 4727
	5 Bullo 1 (720
	Loka Channel Settings
	Radio 0
	Frequency 472.1
	Bandwidth 200KHz T
	Data Rater
	Language de la companya de la
	UK AP
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erm Settings	Name
	Mar Telleman 0
	A T Class Class
	Class Type: Class A Class B Class C
	Advanced setting:
	Nuc, version: 1.0.2
	Regional Parameters Revision: B
	RX1 Data Rate Offset: 0
	RX2 Data Rate: DR0(SF12, 12SKHz)
	RX2 Channel Frequency: 505300000 Hz
	Frequency List Hz
	Name Max TXPower Join Type Class Type Operation
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• For M-sight Pro APP, it supports adding AloT camera via P2P.

Step 1: After logging into the M-Sight Pro, go to "Device Manager"→ "Add Camera", and you can add AloT Camera by Mac Address when selecting P2P protocol. Or you can connect the AloT Camera by P2P QR Code.



Note: The P2P QR Code of AloT Camera is activated by default on camera Web.



• For Milesight IoT Cloud, it supports <u>adding AloT Camera</u> to Milesight IoT Cloud <u>as a gateway</u>, and then <u>manages the sensor data</u> on the cloud centrally.



Interface of AloT Camera

Milesight IoT Cloud						xingzzn@163.com 🥘
O Dashboard	Devices	Gateways	+			
My Devices	Search	a.		Normal 5 all Offline 10 (2) inactive 2		+ New Devices
Map		Status	Name	Associated Devices (Joimed /Not Joimed /Failed)	Last Updated	
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		<u>کلا</u>	64.103-915 21f	9/9/9 Datail	2022-03-29 17:30	0 <u>v</u> ©
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		\otimes	67 <u>6</u> * 6	Device is not bound, please power on the device, after that, it will be associated with your account automatically	34	@ <u>w</u> @
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Interface of Milesight IoT Cloud

Appendix 1

According to different regions, the default value and configurable range of the **Center Frequency of Radio 0** are different, as follows:

Channel Plan	Default Value	Configurable Range
EU868	867.5	863-870
IN865	865.3	865~867

RU864	868.9	864~870
US915	904.3	902~928
AU915	917	915~928
AS923	923	915~928
AS923-2	921.5	915~928
KR920	922.3	920.9~923.3
CN470	472.3	470~510

Appendix 2

According to different regions, the default value and configurable range of the **Center Frequency of Radio 1** are different, as follows:

Channel Plan	Default Value	Configurable Range
EU868	868.5	863~870
IN865	866.385	865~867
RU864	867.7	864~870
US915	905.1	902~928
AU915	917.8	915~928
AS923	922.2	915~928
AS923-2	922.3	915~928
KR920	923.1	920.9~923.3
CN470	472.9	470~510

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