VIPER CAMERA MANUAL

09/10/2016 ver 1.0

Contents

1 INTRODUCTION

This equipment is the interaction of the interface includes two buttons and a LCD display. One of the keys for the on/off key, another key to mode function keys, the user through the long press or short press button to realize all the work. LCD display auxiliary display corresponding, the upper left corner shows Fahrenheit temperature information, and the upper right corner of the display power information

2 USER MANUAL

The Viper Camera is designed to be easy to use and friendly to user. Connect the device to USB power socket before first use to fully charge and activate the device.

All the configurations is saved and will remain after power cycle.

2.1 RESTORATION

In the design of this equipment in the software opens the watchdog, when something goes wrong when they tested the program is run by the system will be reset to restart.

2.2 POWER ON/OFF

Power on When device power is off, simply press ON button for at least 3 second to power on the device. Booting animation will display while system initialize and then everything is ready to go. Plug-in the micro-USB charging cable with power adaptor to charge the device, and charging status will display on screen.Users in the 40 s automatic shutdown time, long press mode key equipment to boot.

Power off User can easily power off device by press ON button for 3 second. And the device can be automatically power down under following conditions: * Battery is below critical level * Sleep is enabled and power on configuring sleep time achieved

2.3 CHARGING

Link micro - USB charger for charging device, interface of red, green, double color LED will light up.If the light become green,the device is full charging.

Plug-in the micro-USB charging cable with power adaptor to charge the device when the device is ON state,the charging status will display on the screen.

Charge the device when it's OFF state,the device will boot immediately and the full screen display the charging status.Then you can long press the mode key to exit the status and use the device . If you want close the device,just pull out the charger or wait 40s.

This device is a built-in overcharge protection circuit, charging is completed, will automatically cut off the charging current of lithium-ion batteries

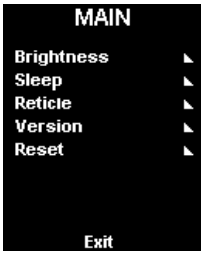
2.4 CONFIGURE DEVICE

2.4.1 Change Mode

Color Mode In the normal use of device,short press the mode key can make LCD display mode switch in color grey and green three color modes.

Size Mode In the normal use of device,short press the ON/OFF key can make LCD display mode switch in 1.0X and 1.5X two size modes.

Main Menu In the normal use of device, long press mode key for 2 seconds, the device will enter the main menu .As picture:



The mode button uses short press to switch options and long press to select. Viper will exist to image view 30s after user's last operation on MODE button.

2.4.2 Brightness

Viper provides 4 brightness level. User can easily switch from different level by short press MODE button to move cursor and long press MODE button to select. After the success of the change option will appear a red color of hook behind.The screen will back to main menu 10s after user's last operation on MODE button.

Options	Desc
Level-1	25% of full brightness
Level-2	50% of full brightness
Level-3	75% of full brightness
Level-4	full brightness
back	back to previous menu

2.4.3 Sleep Mode

There are 5 levels in the Sleep Mode, 3 min to 15 min on behalf of the system in the corresponding period of time without any key operation,

automatic shutdown. N/A representative system in the condition of electricity will not automatically power off.

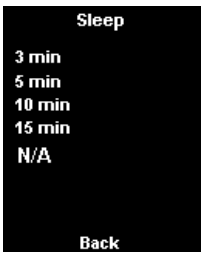
If the sleep mode is N/A, it'll not countdown.

If the sleep mode is the others:

When the countdown is greater than 20 seconds, the countdown display at the top of the screen, in addition to the shutdown of any button operation, can make the countdown time back to the set time.

When the countdown is equal to or less than 20 seconds, on both sides of the countdown display on the screen, short press mode key only make the countdown time back to set the time, and won't switch color mode.

User can easily switch from different level by short press MODE button to move cursor and long press MODE button to select. After the success of the change option will appear a red color of hook behind.The screen will back to main menu 10s after user's last operation on MODE button.



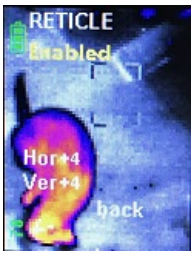
Options	Desc
3 min	Sleep after 3 minutes inactivate
5 min	Sleep after 5 minutes inactivate
10 min	Sleep after 10 minutes inactivate
15 min	Sleep after 15 minutes inactivate
N/A	disabled
back	back to previous menu

2.4.4 Reticle

Reticle can be configured under this sub-menu. Four options was listed in this menu, which is Enable/Disable, Hor, Ver, back. **Be aware that this operation is different from other menus.**To navigate through this menu, user need to use long press MODE button to move cursor and short press MODE button to select.The screen will back to main menu 10s after user's last operation on MODE button.

If Hor is the modify option,modify the crosshair horizontal position, short press the coordinates, add 1, and + 9 again after a short press for - 9.

IF Ver is the modify option,modify the crosshair vertical position.

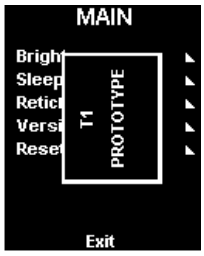


Options	Desc
Enable/Disable	Toggle to enable the reticle display
Hor	Adjust the horizon location of the reticle
Ver	Adjust the vertical location of the reticle

back	back to previous menu

2.4.5 Version

Version information will displayed by selecting this options. The screen will back to main menu after 4s.



2.4.6 Reset

User can reset all configurations to factory mode by selecting this option.

Factory Settings of the sleep time of N/A, reticle open position in the center of the epicenter, brightness Level - 3, color display mode.

2.5 STORAGE

To keep battery in best performance, Viper needs to be full charge bofore storage. If the storage is longer than one month, user needs to pree ON button for at least 15s to enable HARD RESET mode which allow the system goes into deeper sleep mode.

3 SPECIFICATIONS

3.1 Camera Specifications

3.1.1 Basic Specifications

Parameters	Detail
Sensor technology	Uncooled VOx microbolometer
Spectral range	Longwave infrared, 8 µm to 14 µm
Array format	80 × 60, progressive scan
Pixel size	17 µm
Effective frame rate	8.6 Hz (exportable)
Thermal sensitivity	<50 mK (0.050° C)
Temperature compensation	Automatic. Output image independent of camera temperature.
Non-uniformity corrections	Shutterless, automatic (with scene motion); also compatible with external shutter
Image optimization	Factory configured and fully automated
FOV - horizontal	25°
FOV - diagonal	31°
Output format	User-selectable 14-bit, 8-bit (AGC applied), or 24-bit RGB (AGC and colorization applied)
Solar protection	Integral
Package dimensions–socket version	8.5 × 8.5 × 8.6 mm (w × l × h)

Weight	0.55 grams (typ)
Optimum	operating
temperature range	-10 °C to +65 °C
Non-operating temperature range	-40 °C to +80 °C
Shock	1500 G @ 0.4 ms

3.1.2 Electrical Specifications

Parameters	Detail
Input clock	25-MHz nominal, CMOS IO Voltage Levels
Video data interface	Video over SPI
Control port	CCI (I2C-like), CMOS IO Voltage Levels
Input supply voltage (nominal)	2.8 V, 1.2 V, 2.5 V to 3.1 V IO
Power dissipation	Nominally 150 mW at room temperature (operating), 4 mW (standby)

3.2 TFT Screen Specifications

3.2.1 Basic Specifications

Parameters	Detail
Type	TFT-type LCD screen
Screen size	1.77(inch)
Color	262k, colour
Brightness	100-250
Contrast ratio	300 : 1
Resolution	128*RGB*160
Pixel	128*160
Pitch	0.18*0.18（mm）
Response time	10(ms)

3.2.2 Electrical Specifications

Parameters	Detail
I/O Voltage (VDDI to DGND)	1.65v~3.7v (VDDI ≤ VDD)
Analog Voltage (VDD to AGND)	2.5V~4.8V
Operating current (brightness lv1)	94 mA
Operating current (brightness lv1)	96 mA
Operating current (brightness lv1)	99 mA

Operating current (brightness lv1)	103 mA

3.3 Battery

Parameter	Typ	Unit
PN	603048	
Capacity	900	mAh
Charge Current	400	mA
Charging time	2-3	hour
Battery life	8.5	hour
Weight	17	g
Charge Limit Voltge	4.2	V
Temperature Limit	Charging：0～45 Discharging：-20～60	°C
Humidity	≤90%	RH

4 TROUBLE SHOTTING

Apperance	Posible Reason	Measure	Solution
Not able to power up device	Battery failure	Battery volatege measured as 0v or low voltage	Recharge battery, if not work, replace battery pack
	Battery cable broken	Battery cable broken and not connected with board	Re-solder the cable
	ON putton broken	ON press button cannot trigger low-voltage level	Replace ON button
No image comes out after booting	Broken flir sensor/socket		Replace Flir Lepton camera
Screen flashing	Screen cable broken	Flex cable contact problem	Replace screen