CMOS IP Camera Repair Guidance

FI8918W
Tool Preparation

1-01

Adjustable thermostat electric iron
Nominal voltage: 110-220v; output power: 60W, temperature range: 200℃ - 480℃

1-02

Heat gun
Output power: 280W, temperature range: 100℃ - 480℃

1-03

Adjustable DC Power Supply
Output voltage: 0-15V, output current: 0-20A

1-04

Digital Oscilloscope
Bandwidth: 100-200MHz,
sample rate: 1GS/s
1-05

Digital Multimeter

1-06

Nipper, Screwdriver & Solder wire

1-07

Hot Spray Gun

1-08

USB to Serial port debug board
Replace lens dismantle illustration

Step 1: Hold and screw the lens counter clockwise. (2-01)

Step 2: The lens. (2-02)
Step 3: Divide lens and lens circle, and then change lens and install it back by referring above steps. (2-03)
Chang Wi-Fi module illustration

Step 1: Get rid of the QC stickers. (3-01)

Step 2: Get out the 4 nuts on bottom by screwdriver. (3-02)
Step 3; Unfold the bottom head. (3-03)

Step 4; Get out the main board. (3-04)
Step 5: Get out reference circuit lines from main board. (3-05)

Step 6: Screw out the two nuts on Wi-Fi module. (3-06)
Step 7: Get out the Wi-Fi module, change the new Wi-Fi module and install it back by referring above steps. (3-07)

Chang horizontal step-ahead motor illustration

Step 1: Remove the three nuts which fix pedestal. When the first two nuts are removed, please screw the camera’s head tenderly to see the last nut from one of hole and remove it. (4-01)
Step 2: Remove the two nuts fixed on motor. (4-02)
Step 3: Remove the small nut fixed on pinion. (4-03)

Step 4: The motor. (4-04)
Chang vertical step-ahead motor illustration

Step 1: Remove the two nuts fixed on circuit lines. (5-05)

Step 2: Remove the nuts fixed on left and right ear. (6-06)
Step 4: Divide left and right ears. (6-07)

Step 5: Get out the camera ear without small aperture. (6-08)
Step 6: Get out the camera ear with small apertures. (6-09)

Step 7: Remove two nuts fixed on camera head. (6-10)
Step 8: Unfold the camera’s head. (6-11)

Step 9: Remove two nuts fixed on motor. (6-12)
Step 10: The motor. (6-13)

Step 11: The motor. (6-14)
# Description of Mainboard chipset’s features and ports

## The Front

### J7 vertical motor port
### J2 serial port debug port
### U6 vertical and horizontal motor chip
### U3 flash program storage
### J6 Wi-Fi module port
### J8 horizontal motor port
### J12 microphone port
### U8 power chip with 3.3V input 1.8V output
### U9 reset chip with plug power plugged

<table>
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<tr>
<th>J3 lens board port</th>
<th>J5 control horizontal motor switch port</th>
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<tr>
<td>J4 speaker and vertical motor switch port</td>
<td>U12 encryption chip</td>
</tr>
<tr>
<td>U7 power chip with 5V input 3.3V output</td>
<td>J1 5V power input DC outlet</td>
</tr>
<tr>
<td>Y1 main chip ARM 7 15M crystal oscillator</td>
<td>J13 power and internet indicated light</td>
</tr>
<tr>
<td>T1 network adapter</td>
<td>NJ1 Ethernet cable port</td>
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<td>J14, J13 external audio port</td>
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### The Back

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<tr>
<th>Component</th>
<th>Description</th>
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<td>restore factory setting switch</td>
</tr>
<tr>
<td>U2</td>
<td>data buffer memory chip</td>
</tr>
<tr>
<td>U1</td>
<td>ARM 7 series processor</td>
</tr>
<tr>
<td>U10</td>
<td>internet control chip</td>
</tr>
<tr>
<td>U4</td>
<td>audio control chip</td>
</tr>
<tr>
<td>U13</td>
<td>8-bit latch to control the motor driver chip</td>
</tr>
</tbody>
</table>
Description of lens board chipset’s features and ports

The Front

<table>
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<tr>
<th>U3</th>
<th>image sensor</th>
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<tr>
<td>R1</td>
<td>photosensitive resistor</td>
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<tr>
<td>LED1-LED11</td>
<td>IR LED for night vision</td>
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The back

<table>
<thead>
<tr>
<th>JP3-JP2</th>
<th>speaker and vertical motor switch and the related board J4 port</th>
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<tbody>
<tr>
<td>U2</td>
<td>program saving chip</td>
</tr>
<tr>
<td>U1</td>
<td>data signal processor chip</td>
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<tr>
<td>Y1</td>
<td>12M crystal oscillator</td>
</tr>
<tr>
<td>U5</td>
<td>power chip with 5V input 1.8output</td>
</tr>
<tr>
<td>JP1</td>
<td>image data port and related main board J3 port</td>
</tr>
</tbody>
</table>
Maintenance flow chart

Does PCB board short circuit?

Yes
Detect the circuit.

No

Any info printed on connection serial board

Yes

No
Detect mainboard voltage. Detect circuit.

Analyze print info to check mainboard detect any data from lens board

Yes

No
Detect connecting line. Detect voltage of lens board, 12M crystal oscillator and circuit.

Analyze print info to check mainboard detect the network

Yes

No
Detect voltage of network chip, 25M network crystal oscillator and circuit.
Mainboard testing parameters

Output status of mainboard’s two sets power
- Correct
- Incorrect: Does input and output short circuit to earth? Check the 1.8V, 3.3V output

Status of SDCLK80Mhz clock frequency range
- Correct
- Incorrect: Does 15M crystal vibrate? Is there any dry joint or short circuit on chip? Check CPU power supply.

Status of Flash
- Correct
- Incorrect: Is there any dry joint or short circuit on data lines and address lines? Check electrical level of power supplier foot, Chip Selection, reset foot.

Status of SDRAM
- Correct
- Incorrect: Is there any dry joint or short circuit on data lines and address lines? Check electrical level and signal of power supplier.

Lens board testing parameters

Output status of picture units’ three sets power.
- Correct
- Incorrect: Does input and output short circuit to earth? Check the 1.8V, 2.8V and 3.3V output.

Does 12M clock vibrate?
- No: Check the power supply of base pin; capacitance, inductance, resistance and circuit of crystal on corresponding chips.
- Correct: Check the power supply of base pin; capacitance, inductance, resistance and circuit of crystal on corresponding chips.
Debugging information based on the bootloader

The procedure bootloader is burned in mainboard’s FLASH. The bootloader is carried out and then lead the LINUX system start after power on. An external command can be used on bootloader to stop starting the Linux system and enter in debugging status.

Connect the debugging serial port plate and main board according to the silk-screen Numbers.

Connection instruction: 3.3- connect to 3.3,
TXD-connect to TXD
RXD- connect to RXD
GND- connect to GND

Start the Super terminal in computer.
click ‘start’→ ‘program’→ ‘appendix’→ communication’→ ‘HyperTerminal’. Set correct communication interface (COM1 to COM4). Click ‘Configuration’ to set super terminal:
The correct and complete debugging information should be as below; find the
problem according to the print information:

W90P745 Boot Loader [ Version 1.1 $Revision: 1 $ ] Rebuilt on May 11 2010
Memory Size is 0x1000000 Bytes, Flash Size is 0x400000 Bytes
Board designed by Winbond
Hardware support provided at Winbond
Copyright (c) Winbond Limited 2001 - 2006. All rights reserved.
Boot Loader Configuration:

MAC Address : 00:0D:C5:D2:D6:1A
IP Address : 0.0.0.0
DHCP Client : Enabled
CACHE : Enabled
BL buffer base : 0x00300000
BL buffer size : 0x00100000
Baud Rate : -1
USB Interface : Disabled
Serial Number : 0xFFFFFFFF

For help on the available commands type 'h'

Press ESC to enter debug mode ......
Cache enabled!
Processing image 1 ...
Processing image 2 ...
Processing image 3 ...
Processing image 4 ...
Processing image 5 ...
Processing image 6 ...
Processing image 7 ...
Unzip image 7 ...
Executing image 7 ...
Linux version 2.4.20-uc0 (root@maverick-linux) (gcc version 3.0) #1453 一 12
月 6
08:30:46 CST 2010
Processor: Winbond W90N745 revision 1
Architecture: W90N745
On node 0 totalpages: 4096
zone(0): 0 pages.
zone(1): 4096 pages.
zone(2): 0 pages.
Kernel command line: root=/dev/rom0 rw

www.foscam.com
Calibrating delay loop... 39.83 BogoMIPS
Memory: 16MB = 16MB total
Memory: 14320KB available (1481K code, 299K data, 40K init)
Dentry cache hash table entries: 2048 (order: 2, 16384 bytes)
Inode cache hash table entries: 1024 (order: 1, 8192 bytes)
Mount-cache hash table entries: 512 (order: 0, 4096 bytes)
Buffer-cache hash table entries: 1024 (order: 0, 4096 bytes)
Page-cache hash table entries: 4096 (order: 2, 16384 bytes)
POSIX conformance testing by UNIFIX
Linux NET4.0 for Linux 2.4
Based upon Swansea University Computer Society NET3.039
Initializing RT netlink socket
Starting kswapd
PTZ Driver has been installed successfully.
Winbond W90N745 Serial driver version 1.0 (2005-08-15) with no serial options enabled
ttyS00 at 0xffff80000 (irq = 9) is a W90N745
Winbond W90N7451 Serial driver version 1.0 (2005-08-15) with no serial options enabled
ttyS00 at 0xffff80100 (irq = 10) is a W90N7451
I2C Bus Driver has been installed successfully.
Blkmem copyright 1998,1999 D. Jeff Dionne
Blkmem copyright 1998 Kenneth Albanowski
Blkmem 1 disk images:
  0: 7F0E0000-7F1EBFFF [VIRTUAL 7F0E0000-7F1EBFFF] (RO)
S29GL032N Flash Detected
01 eth0 initial ok!
which:0
PPP generic driver version 2.4.2
Linux video capture interface: v1.00
Winbond Audio Driver v1.0 Initialization successfully.
usb.c: registered new driver hub
add a static ohci host controller device
  : USB OHCI at membase 0xffff05000, IRQ 15
hc_alloc_ohci
usb-ohci.c: AMD756 erratum 4 workaround
hc_reset
usb.c: new USB bus registered, assigned bus number 1
hub.c: USB hub found
hub.c: 2 ports detected
usb.c: registered new driver audio
audio.c: v1.0.0:USB Audio Class driver
usb.c: registered new driver serial
usbserial.c: USB Serial Driver core v1.4

ZD1211B - version 2.24.0.0
usb.c: registered new driver zd1211b
main_usb.c: VIA Networking Wireless LAN USB Driver 1.20.04
usb.c: registered new driver vntwusb
usb.c: registered new driver rt73
dvm usb cam driver 0.0.0.1 by Maverick Gao in 2010-8-3
usb.c: registered new driver dvm
dvm usb cam driver 0.1 for sonix288 by Maverick Gao in 2009-4-20
usb.c: registered new driver dvm usb cam driver for sonix288
NET4: Linux TCP/IP 1.0 for NET4.0
IP Protocols: ICMP, UDP, TCP
IP: routing cache hash table of 512 buckets, 4Kbytes
TCP: Hash tables configured (established 1024 bind 2048)
VFS: Mounted root (romfs filesystem) readonly.
Freeing init memory: 40K
BINFMT_FLAT: bad magic/rev (0x74202d74, need 0x4)
BINFMT_FLAT: bad magic/rev (0x74202d74, need 0x4)
Shell invoked to run file: /bin/init
Command: mount -t proc none /proc
Command: mount -t ramfs none /usr
Command: mount -t ramfs none /swap
Command: mount -t ramfs none /var/run
Command: mount -t ramfs none /etc
Command: mount -t ramfs none /flash
Command: mount -t ramfs none /home
Command: mount -t ramfs none /tmp
Command: mkdir /tmp/run
Command: camera&
[8]
Command: sh

Sash command shell (version 1.1.1)
no support
/> hub.c: connect-debounce failed, port 1 disabled
new USB device :80fb4004-fed740
hub.c: new USB device 1, assigned address 2
detect_sensor: mi360
dvm cmos successfully initialized
dvm camera registered as video0
new USB device :80fb4404-fed740
hub.c: new USB device 2, assigned address 3
VIA Networking Wireless LAN USB Driver Ver. 1.20.04
Copyright (c) 2004 VIA Networking Technologies, Inc.

vntwusb_init-->eth1 initial ok!
inmod VNTWUSB SUCCESSFUL...
params length is 5352
sw version is 11.22.2.38
aw version is 2.4.18.17

Wait for auto-negotiation complete...OK
100MB - FULL
video0 opened
1
1
1
1
1
1
1
1
set resolution 5
set brightness 100
set contrast 4
set sharpness 3
set mode 0
unknown command
do_zoom_stop: write error 5
__pthread_initial_thread_bos:440000
manage pid:14
2
2
2
2
2
audio_dev.state not AU_STATE_RECORDING
wb_audio_start_record
inet_srs.c INET_rinput 321
action==1
options==33
inet_srs.c INET_setroute 75
*args==255.255.255.255
*args==netmask
*args==eth0
[26]
ntpc adjust ok
bonjour callback: service registered