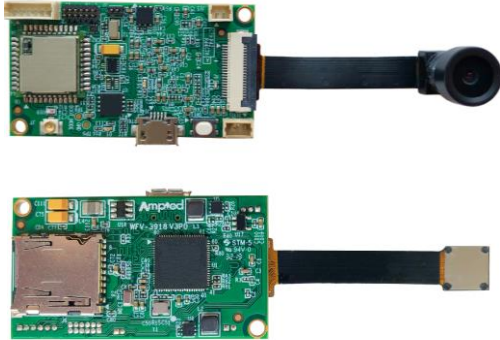


**WiFi Video Module**  
**WFV3918**

Amp'ed RF Technology, Inc.

## WFV3918 Product Specification



### Description

Amp'ed RF Tech presents the WFV3918 Wi-Fi dual band, 2.4/5GHz video module. The WFV3918 is a small footprint low cost RF video module, supporting 720p video resolution, both live streaming and SD card storage, up to 300m range line-of-sight (5Ghz band). Day/night camera options are offered. Intended to help customers shorten product development cycles and reduce cost, this module is ready to go. Typical applications include:

- Home security
- Remote audio & video transmission
- Smart home control
- Drone/RC vehicle camera

### Features

#### Hardware

- Wi-Fi: ACC1340
- CPU: AK3918E or Fullhan 8632
- SD storage up to 128GB
- 25mm x 45mm
- Day/night option
- Low power option
- PIR motion sensor support
- Microphone
- Speaker output

#### Video

- 1280x720P, 25 fps
- H.264/MJPEG encoding

#### WLAN

- 802.11a/b/g/n
- Dual Band: 2.4/5GHz
- Output Power, +23dBm for 5GHz
- Soft Access Point
- Security: WPAI/WPA2, AES, WEP
- 300m line-of-sight range

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## 1. Hardware Specifications

General Conditions (VIN= 5.0V and 25°C)

### 1.1. Recommended Operating Conditions

Rating	Min	Typical	Max	Unit
Operating Temperature Range	0	-	40	°C
Supply Voltage VIN/VBATT	4.0	5	5.5	Volts
Signal Pin Voltage	-	3.3	-	Volts
RF Frequency for 2.4G (optional)	2400	-	2483.5	MHz
RF Frequency for 5G	5150	-	5850	MHz

### 1.2. Absolute Maximum Ratings

Rating	Min	Typical	Max	Unit
Storage temperature range	-40	-	+70	°C
Supply voltage VIN	-0.3	-	+6.0	Volts
I/O pin voltage VIO	-0.3	-	+4.8	Volts
RF input power	-	-	-5	dBm

### 1.3. I/O Operating Conditions

Symbol	Parameter	Min	Max	Unit
V <sub>IL</sub>	Low-Level Input Voltage	-	0.6	Volts
V <sub>IH</sub>	High-Level Input Voltage	1.3	-	Volts
V <sub>OL</sub>	Low-Level Output Voltage	-	0.2	Volts
V <sub>OH</sub>	High-Level Output Voltage	2.95	-	Volts
I <sub>OL</sub>	Low –Level Output Current	-	4.0	mA
I <sub>OH</sub>	High-Level Output Current	-	4.0	mA

### 1.4. Current Consumption

VIN=5v	Avg	Unit
Idle	30	mA
Video streaming 720P	140	mA

Ipeak: system maximum peak current draw, IR not enabled	300	mA
Ipeak: system maximum peak current draw with IR sensor enabled	420	mA

### 1.5. Selected RF Characteristics

Parameters	Conditions	Typical	Unit
Antenna load		50	ohm
<b>Wi-Fi Receiver 5GHz 11n</b>			
Sensitivity	BPSK 6.5Mbps@PER<10%,Nss=1	-91	dBm
Sensitivity	QPSK 13Mbps@PER<10%, Nss=1	-88	dBm
Sensitivity	16QAM 26MbpsPER<10%,Nss=1	-83	dBm
Sensitivity	64QAM 65MbpsPER<10%,Nss=1	-72.5	dBm
<b>Wi-Fi Transmitter 5GHz, 11n</b>			
Output Power	802.11n MCS-1	24	dBm

### 1.6. Camera Specifications IR Option

#### 1.6.1. FOV136



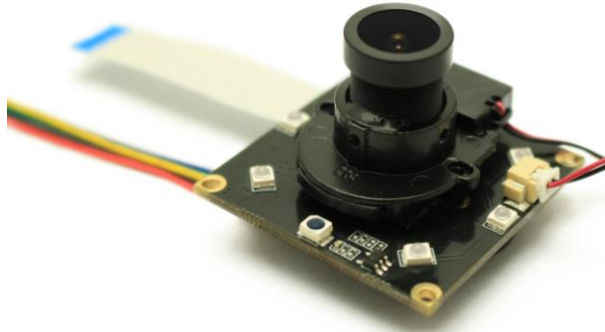
Parameters	Specifications	Unit
Focusing Range	180	cm
Focal Length	2.3	mm
F Number	2.6	
FOV (D)	136°	
Optical Distortion	<18%	
Resolution	1280*720	
Frame rate	30fps	
Sensor Model	H62	

1.6.2. FOV60



Parameters	Specifications	Unit
Focusing Range	50	cm
Focal Length	3.25	mm
F Number	2.8	
FOV (D)	60°	
Optical Distortion	<1%	
Resolution	1280*720	
Frame rate	30fps	
Sensor Model	H62	

1.6.3. IR



Parameters	Specifications	Unit
Focusing Range	180	cm
Focal Length	2.4	mm
F Number	2.2	
FOV (D)	130°	
Optical Distortion	<28%	
Optical format	1/4	Inch

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Resolution	1280*720	
Frame rate	30fps	
Sensor Model	H62	
Night vision distance	5	Meter

Note: IR LEDs and lens are included in the sensor unit.

### 1.7. Pin Assignment/Connectors

J5 (Manufacturer P/N : 653002114822)			
Assignment	Type	Pin #	Description
VDD		1	VIN from BATT
GND		2	Ground
J1 (Manufacturer P/N : FH12-20S-0.5SH(55))			
Assignment	Type	Pin #	Description
GND		1	
I2C_SDA	I/O	2	
AVDD		3	AVDD 2.8V
I2C_SCL	I/O	4	
CIS_RSTN		5	Camera Reset active low
CIS_VSYNC		6	Vertical synchronize signal
CIS_HREF		7	Line data valid signal output
DVDD		8	VDD 1.8V
DOVDD		9	AVDD 2.8V
VID9		10	Camera pixel data input
MCLK	I/O	11	System clock
VID8		12	Camera pixel data input
GND		13	DGND
VID7		14	Camera pixel data input
PCKL	I/O	15	Pixel clock
VID6		16	Camera pixel data input
VID2		17	
VID5		18	
VID3		19	
VID4		20	
GND		21	
GND		22	



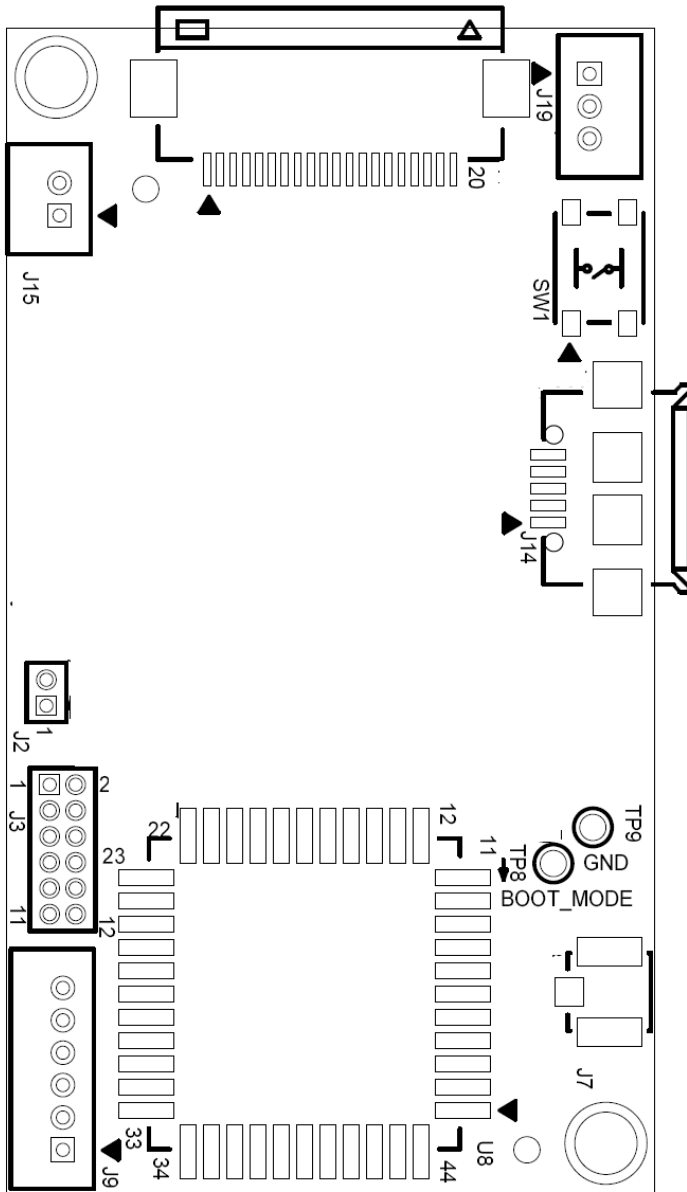
J3 (Manufacturer P/N : 161012106AWG1S050001)			
Assignment	Type	Pin #	Description
I2C_SDA/GPIO 28	I/O	1	I2C Data
I2C_SCL/GPIO 27	I/O	2	I2C Clock
CIS_PWDN		3	GPIO (Default), JTAG reset pin
AK_TXD1		4	Uart1 Tx
RXD2	I/O	5	Uart2 Rx
AK_RXD1	I/O	6	Uart1 Rx
TXD2		7	Uart2 Tx
GPIO 15		8	GPIO (Default), Photosensitive
GND		9	
PWR_LED/GPIO 13		10	GPIO (Default), IR-CUT-InputA
GPIO 47		11	GPIO (Default), IR-LEDs control
GPIO 11		12	GPIO (Default), IR-CUT-InputB
J2 (Manufacturer P/N : 16101102AWG1S05000X )			
Assignment	Type	Pin #	Description
GND		1	
HPOUTL	O	2	Headphone output
J9 (Manufacturer P/N: WE 653006114822)			
Assignment	Type	Pin #	Description
5V	O	1	
GND		2	
IR-CUT-A	O	3	Standby: L/L Day mode: H/L Night mode: L/H
IR-CUT-B	O	4	
IR-LED Control	O	5	H: on, L: off
Photosensitive	I	6	H: night, L: day
J19 (Manufacturer P/N : WE 653003114822)			
Assignment	Type	Pin #	Description
GND		1	

5V	0	2	
PIR signal	1	3	Active high

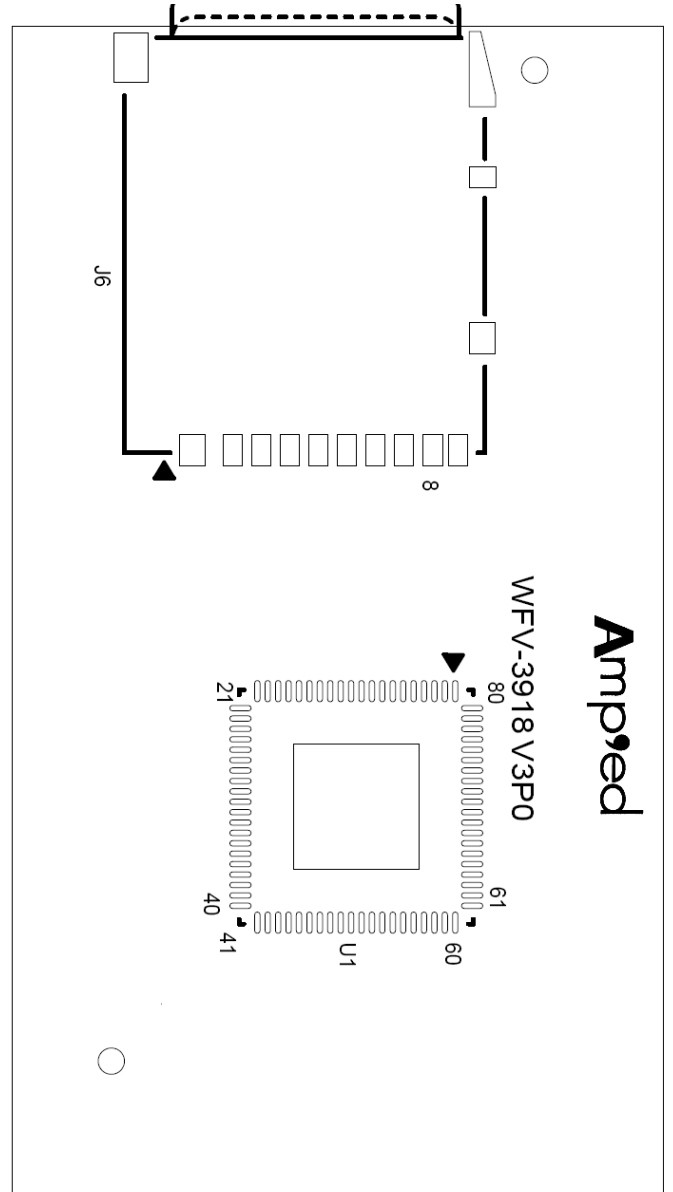
## 2. Module Drawing

Size: 25 mm x 45 mm

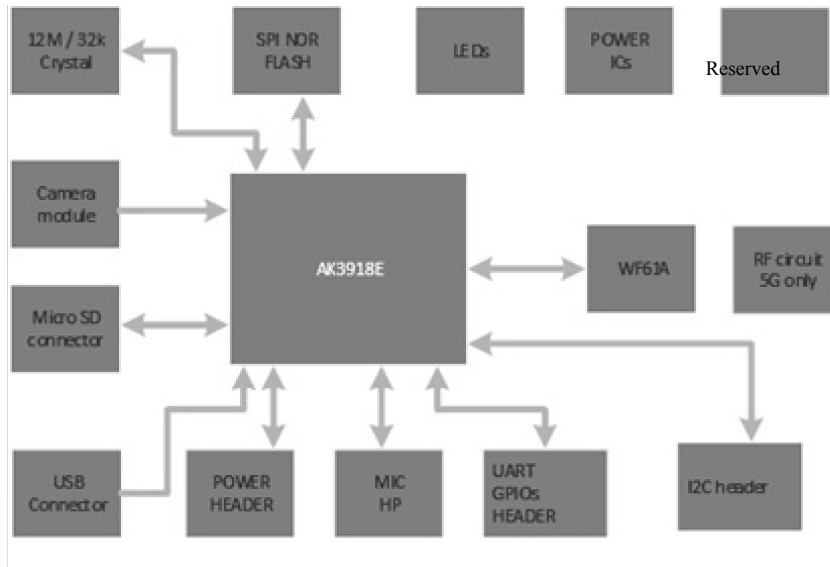
Top view



Bottom view



### 3. Hardware Block Diagram



### 4. Startup Guide

4.1. Power up the video module by applying Vin and GND to J5 pins 1 & 2.

Note1: the USB connector does NOT supply Vin power.

Note2: suggested mating connector to J5: 653002114822, Mfg: WE, pitch: 1.25mm

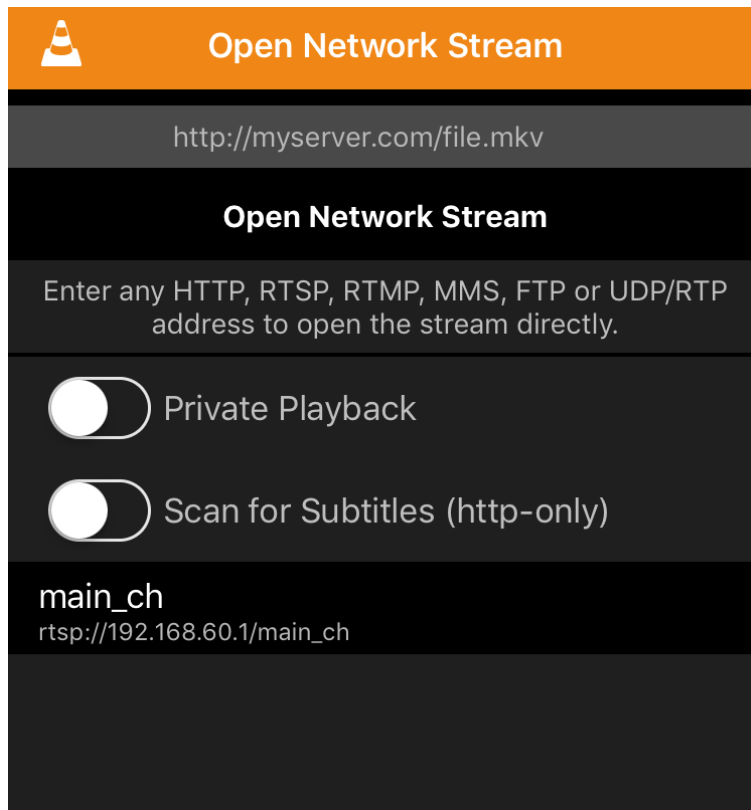
4.2. Download and install the app “VLC” from “Google Play” or “Apple Store”. Note that other video players supporting RTSP protocol will also work: Easy Player, RTSP Player, etc... The video latency will vary from player to player depending on the buffer size and setup.

4.3. Connect the WiFi from mobile phone.

- The SSID is “ART\_IPCAM\_XXXXXX”, where XXXXXX is the session MAC address of the device.
- The default password is “12345678”.
- The WFV3918 will assign the mobile phone an IP Address: 192.168.60.20 (to the first phone connection and incrementing after that).
- The default startup mode is AP mode (user connects directly to the module using a PC or mobile phone).

4.4. Launch the app, VLC, and select the network stream RTSP option using this channel:

rtsp://192.168.60.1/main\_ch. This RTSP channel is not the same as the phone’s IP Address above.



4.5. For technical support, please contact us at: [support@ampedrftech.com](mailto:support@ampedrftech.com)

## 5. Network Setup

(Note: this feature is supported in software versions: 190613 or later)

- When joined in AP mode, enter this address into the connected PC or Phone's browser: 192.168.60.1. Or when joined in STA mode, enter the router assigned address into the browser.
- The following HTML page will load into the browser for setup:

The screenshot shows a web-based configuration interface for a device. It features a light blue background with rounded corners. The settings are organized into a list of labels on the left and input fields on the right. The labels are: WiFi Mode, SSID, Password, Record, Rtsp, Video Size, Band, Country, AP Channel, UART Modem, and PIR. The input fields are: a dropdown menu for WiFi Mode (set to AP), a text box for SSID (test1234), a text box for Password (123456789), a dropdown menu for Record (set to Both), a dropdown menu for Rtsp (set to Video), a text box for Video Size (60), a dropdown menu for Band (set to 5G), a dropdown menu for Country (set to India), a dropdown menu for AP Channel (set to 161), a dropdown menu for UART Modem (set to Off), and a checkbox for PIR (unchecked). A blue Save button is located at the bottom center of the form.

WiFi Mode: Select AP mode or Station mode  
SSID: Router network to join (not used in AP mode)  
Password: Router password (not used in AP mode)  
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Record:	Both: save video to SD card and send over Wi-Fi Stream over Wi-Fi: send over Wi-Fi only Store to SD Card: use SD card only
PIR/Video Size:	Select number of seconds to store each PIR trigger (when enabled): 5-300 seconds
Band:	Select 2.4G or 5G
Country:	Select country for WI-FI in AP mode
AP Channel:	Select channel for WI-FI in AP mode
UART Modem:	When enabled, incoming TCP data, corresponding to the Data Bypass Mode feature, will be routed to UART2.

### 5.1. STA mode usage

Check your joined router for the assigned IP address. Replace the default streaming address: 192.168.60.1, with the assigned (DHCP) address from your router.

## 6. Data Bypass Mode

(Note: this feature is supported in software versions 190712 or later)

UART2 is reserved for received data, and will be connected via TCP socket. Any received data will be sent to the UART2. By default, the module will start in Bypass mode.

- 115200 baud, no flow control
- Destination port is 6789.

## 7. Audio Support

(Note: this feature is supported in software versions 191127 or later)

### 7.1. Speaker output

Audio data can be sent from the remote application to the module's speaker out.

- Format: PCM compression, 16b, mono, 8K sampling rate.
- TCP: 4096 bytes per data block, 100ms intervals
- TCP Destination port is 6888.

### 7.2. Microphone input

Audio data can be obtained from mic and sent to remote application.

- Format: PCM compression, 16b, mono, 8K sampling rate.
- TCP Destination port is 6888.
- Audio stream start use AT command "AT+AV StartMic"
- Audio stream stop use AT command "AT+AV StopMic"

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## 8. Remote AT Commands

(Note: this feature is supported in software versions 191127 or later)

A remote application may send AT commands to the module over a TCP socket, detailed below:

- Destination port is 6789.

AT commands can execute with CRLF. But the escape sequence requires no CR and no LF.

### 8.1. Bypass

The **Bypass** command is used to return the TCP data interface to bypass mode.

#### Syntax

```
AT+AV Bypass
```

#### Response

```
AT-AV BypassMode
```

### 8.2. Escape

When the Escape sequence, “^#^\$^%”, is received, the module will switch from Bypass mode to command mode. When in command mode, AT commands may be sent from the remote application, using the TCP socket, and handled by the module.

(Note: there is no CR, LF, or other characters after these 6 characters)

```
AT-AV CommandMode
```

### 8.3. GPIOConfig

The **GPIOConfig** command is used to configure a GPIO pin to input or output.

#### Syntax

```
AT+AV GPIOConfig [GPIO Num] [Configuration]
```

Where [GPIO Num] is the GPIO number to configure. [Configuration] is “i” or “I” for input and “o” or “O” for output.

#### Response

If the operation is successful, the response is:

```
AT-AV GPIOConfigDone
```

### 8.4. GPIORead

The **GPIORead** command is used to read a GPIO pin.

#### Syntax

```
AT+AV GPIORead [GPIO Num]
```



Where [GPIO Num] is the GPIO to read.

### Response

If the operation is successful, the response is:

```
AT+AV GPIOReadDone [result]
```

Where [result] is either a 1 to indicate high, or 0 to indicate low.

## 8.5. GPIOWrite

The **GPIOwrite** command is used to set a GPIO pin to high or low. A GPIO may only be set when configured as an output.

### Syntax

```
AT+AV GPIOWrite [GPIO Pin] [Setting]
```

Where [GPIO Num] is the GPIO number to read. [Setting] is a 1 to set a pin to high and a 0 to set a pin to low.

### Response

If the operation is successful, the response is:

```
AT+AV GPIOWriteDone
```

## 8.6. SetGain

The **setGain** command changes the microphone gain settings. This change is stored in NVM each time. Range is 0-9, default 6.

### Syntax

```
AT+AV SetGain
```

## 8.7. SetRecord

The **setRecord** command may be used to turn on and shut off the SD card video recording option, when this feature is enabled: on or off.

### Syntax

```
AT+AV SetRecord [on/off]
```

## 8.8. SetVolume

The **setVolume** command changes the speaker volume settings. This change is stored in NVM each time. Range is 0-12, default 8.

### Syntax

```
AT+AV SetVolume
```

### 8.9. StartStream

The **startStream** command is used start the video and audio stream to be viewed on a remote application. The default streaming timeout is 240 seconds.

#### Syntax

```
AT+AV StartStream
```

### 8.10. GetID

The **GetID** command is used to get product ID/MAC address.

#### Syntax

```
AT+AV GetID
```

### 8.11. StartMic

The **startMic** command is used to get audio stream from mic and transmit by TCP.

#### Syntax

```
AT+AV StartMic
```

#### Response

If the operation is successful, the response is:

```
AT-AV StartMic
```

### 8.12. StopMic

The **StopMic** command is used to stop audio stream from mic.

#### Syntax

```
AT+AV StopMic
```

#### Response

If the operation is successful, the response is:

```
AT-AV StopMic
```

## 9. Restore Factory Settings

(Note: this feature is supported in software versions 190712 or later)

Press and hold the button (SW1) for 5-10 seconds. The system will reset to its initial state

## 10. Ordering Information

Part Name	Description
WFV3918-S	720p, 2.4/5Ghz dual band, FOV: 136
WFV3918-IR	720p, 2.4/5Ghz dual band, FOV: 130, infra-red support
WFV3918-N	720p, 2.4/5Ghz dual band, FOV: 60
WFV3918-LP	720p, 2.4/5Ghz dual band, FOV: TBD, low power
XXX-XX-B	The -B option indicates bulk packaging for higher qty orders: No battery case, individually bag packaged
Optional Accessories	Description
	(WFV3918 includes 1 image sensor above)
WFV-SPK	TBD (speaker)
WFV-FOV60	Image sensor, 720p, FOV: 60
WFV-FOV136	Image sensor, 720p, FOV: 136
WFV-IR	Image sensor, 720p, FOV: 130, infra-red

WFV3918 contents (eval kit):

- WFV3918 video module
- One image sensor: FOV136, FOV60, or IR
- Antenna
- Battery case (batteries not incl.)
- Individually boxed
- Integrated MEMS microphone (speaker no incl.)



## 11. Revision History

Data	Revision	Description
1-May-2018	1.0	Initial release.
18-Jan-2019	1.1	Updated SSID name.
28-Jan-2019	1.2	Updated picture and diagram.
22-Feb-2019	1.3	New usage instructions.
11-July-2019	1.4	Added IR option. Added HTML setup page.
17-July-2019	1.5	Add connector part numbers.
15-Aug-2019	1.6	Add SD Card max size.
17-Sep-2019	1.7	Add Reset Description. Add Headphone connector. Updated block diagram and module drawing.
27-Nov-2019	1.8	Add GPIO default settings. Add audio support for speaker and microphone.
3-March-2020	1.9	Updated setup page. New part numbers added.
23-June-2020	2.0	Add new AT command and configuration setting.
2-July-2020	2.1	Add pictures and sensor spec details.