WiFiMCU Reference Book

Doit

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Content

Lua Basic Modules

The Lua interpreter in WiFiMCU is based on Lua 5.1.4.

The following modules are supported:

luaopen_base	Supported
luaopen_package	Supported
luaopen_string	Supported
luaopen_table	Supported
luaopen_math	Supported

'io' and 'debug' modules are not supported.

The functions description in supported modules can be found at:

http://www.lua.org/manual/5.1/

MCU Module

Function List

mcu.ver()	Get the WiFiMCU firmware version
mcu.info()	Get the mxchipWNet library version, MAC address, WLAN driver version
mcu.reboot()	Reboot WiFiMCU
mcu.mem()	Get the memory status
mcu.chipid()	Get the stm32 chip ID (96 bits)
mcu.bootreason()	Get the WiFiMCU boot reason that cause its startup

Constant

nil

mcu.ver()

Description

Get the WiFiMCU firmware version.

Syntax

nv,bd=mcu.ver()

Parameters

nil

Returns

nv: string type, WiFiMCU firmware version

bd: string type, build date of the firmware

Examples

>nv,bd=mcu.ver()

>print(nv,bd)

>WiFiMCU 0.9.3 build 20150818

mcu.info()

Description

Get the mxchipWNet library version, MAC address, WLAN driver version.

Syntax

libv,mac,,drv=mcu.info()

Parameters

nil

Returns

libv: mxchipWNet library version

mac: MAC address of the module

drv: WLAN driver version

Examples

>libv,mac,drv=mcu.info()

>print(libv,mac,drv)

>31620002.031 C8:93:46:50:21:4C wl0: Dec 29 2014 14:07:06 version 5.90.230.10 FWID 01-9bdaad4d

mcu.reboot()

Description

Reboot WiFiMCU immediately.

Syntax

mcu.reboot()

Parameters

nil

Returns

nil

Examples

> mcu.reboot()

mcu.mem()

Description

Get the memory status.

Syntax

fm,tas,mtas,fc=mcu.mem()

Parameters

nil

Returns

fm: Total free space

tas: Total allocated space

mtas: Maximum total allocated space

fc: Number of free chunks

Examples

>fm,tas,mtas,fc=mcu.mem()

>print(fm,tas,mtas,fc)

> 35600 50416 86016 25

mcu.chipid()

Description

Get the stm32 chip ID (96 bits).

Syntax

chipid= mcu.chipid()

Parameters

nil

Returns

chipid: the stm32 chip product ID

Examples

> chipid= mcu.chipid()

> print(chipid)

0200C000FDFFFAE005DFF000

mcu.bootreason()

Description

Get the WiFiMCU boot reason that cause its startup.

Syntax

bootreason= mcu. bootreason()

Parameters

nil

Returns

bootreason: The boot reason should be one the followings:

"NONE": Fail to get the boot reason

"SOFT_RST": Software reset

"PWRON_RST": Power on reset

"EXPIN_RST": Pin reset

"WDG_RST": Independent Watchdog reset

"WWDG_RST": Window Watchdog reset

"LOWPWR_RST": Low Power reset

"BOR_RST"：POR/PDR or BOR reset

Examples

> mcu.bootreason()

SOFT_RST

GPIO Moduls

Function List

gpio.mode()	Define the GPIP Pin mode, set the pin to input output or interrupt mode
gpio.read()	Read the pin value
gpio.write()	Set the pin value
gpio.toggle()	Toggle the pin's output value

Constant

gpio.INPUT	Input with an internal pull-up resistor
gpio.INPUT_PULL_UP	Input with an internal pull-up resistor
gpio.INPUT_PULL_DOWN	Input with an internal pull-down resistor
gpio.INPUT_INPUT_HIGH_IMPEDANCE_DOWN	Input high impedance down
gpio.OUTPUT	Output actively driven high and actively driven low
gpio.OUTPUT_PUSH_PULL	Output actively driven high and actively driven low
gpio.OUTPUT_OPEN_DRAIN_NO_PULL	Output actively driven low but is high-impedance when set high
gpio.OUTPUT_OPEN_DRAIN_PULL_UP	Output actively driven low and is pulled high with an internal resistor when set high
gpio.INT	Interrupt
gpio.HIGH	High voltage level
gpio.LOW	Low voltage level

GPIO Pin Table

WiFiMCU Index	Alternative Function	Discription
D0	GPIO/BOOT	WiFiMCU would enter into Bootloader Mode, if D0 goes to LOW
D1	GPIO/PWM/ADC	
D2	GPIO	
D3	GPIO/PWM	

D4	GPIO	
D5	GPIO	SWD Flash Programming Pin: swclk
D6	GPIO	SWD Flash Programming Pin: swdio
D7	GPIO	
D8	GPIO/PWM	Uart1 rx pin: RX1
D9	GPIO/PWM	Uart1 tx pin: TX1
D10	GPIO/PWM	I2C interface: SCL
D11	GPIO/PWM	I2C interface: SDA
D12	GPIO/PWM	
D13	GPIO/PWM/ADC	
D14	GPIO/PWM	
D15	GPIO/PWM/ADC	
D16	GPIO/PWM/ADC	
D17	GPIO/ADC	A LED is connected on WiFiMCU board

gpio.mode

Description

Define the GPIP Pin mode, set the pin to input output or interrupt mode.

Syntax

gpio.mode(pin, mode)

gpio.mode(pin, gpio.INT, trigMode, func_cb)

Parameters

pin: gpio ID, 0~17

mode: Should be one of the followings:

gpio.INPUT

gpio.INPUT_PULL_UP

gpio.INPUT_PULL_DOWN

gpio.INPUT_INPUT_HIGH_IMPEDANCE_DOWN

gpio.OUTPUT

gpio.OUTPUT_PUSH_PULL

gpio.OUTPUT_OPEN_DRAIN_NO_PULL

gpio.OUTPUT_OPEN_DRAIN_PULL_UP

gpio.INT

trigMode: if mode is gpio.INT, trigMode should be:

‘rising’: Interrupt triggered at input signal's rising edge

‘falling’: Interrupt triggered at input signal's falling edge

‘both’: Interrupt triggered at both rising and falling edge

func_cb: if mode is gpio.INT, the interrupt call back function

Note: It’s recommend that DO NOT do too much time consumption operations in the func_cb.

Returns

nil

Examples

```
>gpio.mode(0, gpio.OUTPUT)
>gpio.write(0, gpio.HIGH)
>gpio.mode(1,gpio.INPUT)
>print(gpio.read(1))
>0
```

gpio.read()

Description

Read the pin value.

Syntax

value=gpio.read(pin)

Parameters

pin: gpio ID, 0~17

Returns

value: 0 - low, 1 - high

Examples

```
>gpio.mode(0, gpio.INPUT)
>print(gpio.read(0))
>0
```

gpio.write()

Description

Set the pin value.

Syntax

gpio.write(pin, value)

Parameters

pin: gpio ID, 0~17

value: 0 or 1 or gpio.HIGH or gpio.LOW

Returns

nil

Examples

```
>gpio.mode(0, gpio.OUTPUT)
>gpio.write(0,gpio.HIGH)
> gpio.write(0,0)
```

gpio.toggle()

Description

Toggle the pin’s output value

Syntax

gpio.toggle(pin)

Parameters

pin: gpio ID, 0~17

Returns

nil

Examples

```
>gpio.mode(17, gpio.OUTPUT)
>gpio.toggle(17)
>gpio.toggle(17)
```

TIMER Module

Function List

tmr.start()	Start a timer with call back function
tmr.stop()	Stop a timer
tmr.stopall()	Stop all the timer
tmr.tick()	Get the current time tick of the MCU (ms) since startup
tmr.delayms()	Delay for a assigned time in millisecond
tmr.delayus()	Delay for a assigned time in microsecond
tmr.wdclr()	Clear the Independent watchdog counter

Constant

nil

tmr.start()

Description

Start a timer with call back function.

Syntax

tmr.start(tmrID, interval, func_cb)

Parameters

tmrID: timer ID, 0~15. 16 timers are supported at present

interval: interval time for the timer

func_cb: Callback function for the timer

Returns

nil

Examples

> tmr.start(1,1000,function() print("tmr1 is called") end)

> tmr1 is called

tmr1 is called

tmr1 is called

tmr.stop()

Description

Stop a timer

Syntax

tmr.stop(tmrID)

Parameters

tmrID: timer ID, 0~15

Returns

nil

Examples

> tmr.start(1,1000,function() print("tmr1 is called") end)

> tmr1 is called

tmr1 is called

tmr1 is called

>tmr. stop(1)

tmr.stopall()

Description

Stop all the timer.

Syntax

tmr.stopall(tmrID)

Parameters

nil

Returns

nil

Examples

>tmr. stopall()

tmr.tick()

Description

Get the current time tick of the MCU (ms) since startup.

Syntax

tick=tmr.tick()

Parameters

nil

Returns

nil

Examples

>print(tmr.tick())

1072237

tmr.delayms()

Description

Delay for a assigned time in millisecond.

Syntax

tmr.delayms(ms)

Parameters

ms: The delay time in millisecond

Returns

nil

Examples

> tmr.delayms(1000)

tmr.delayus()

Description

Delay for a assigned time in microsecond.

Syntax

tmr.delayus(us)

Parameters

us: The delay time in microsecond

Returns

nil

Examples

> tmr.delayus(1000)

tmr.wdclr()

Description

Clear the independent watchdog counter. The default independent watchdog time is 10 senconds.

Note: This function should be called if some operations cost over 10 seconds.

Syntax

tmr. wdclr ()

Parameters

nil

Returns

nil

Examples

> tmr.wdclr()

WiFi Module

Function list

wifi.startap()	Setup wifi in soft Access Point (AP) Mode, enable DHCP function
wifi.startsta()	Setup wifi in Station Mode (STA), begin to connect a AP
wifi.scan()	Scan APs
wifi.stop()	Close all the Wi-Fi connections, Both in station mode and soft ap mode
wifi.powersave()	Enable IEEE power save mode
wifi.ap.getip()	Get ip address in soft AP mode
wifi.ap.getipadv()	Get advanced net information in soft AP mode: DHCP mode, ip address, gateway, netmask, dns, MAC, broad cast address
wifi.ap.stop()	Close all the Wi-Fi connections in soft ap mode
wifi.sta.getip()	Get ip address in STA mode
wifi.sta.getipadv()	Get advanced net information in STA mode: DHCP mode, ip address, gateway, netmask, dns, MAC, broad cast address
wifi.sta.getlink()	Get the connected AP information in STA mode:Connect status, WiFi signal strength, ssid, bssid.
wifi.sta.stop()	Close all the Wi-Fi connections in STA mode

Constant

nil

wifi.startap()

Description

Setup wifi in soft Access Point (AP) Mode, enable DHCP function.

Syntax

wifi.startap(cfg)

wifi.startap(cfg,func_cb)

Parameters

cfg: lua table, contains the configurations for soft AP mode.

cfg.ssid: soft AP's ssid

cfg.pwd: soft AP's password. It will be an open WiFi if cfg.pwd is empty

cfg.ip: optional. The local ip address of the module, It's "11.11.11.1" in default.

cfg.netmask：optional. Netmask. It's "255.255.255.0" in default.

cfg.gateway：optional. Gateway. It's "11.11.11.1" in default.

cfg.dnsSrv：optional. DNS server address. It's "11.11.11.1" in default.

cfg.retry_interval：optional. retry interval in micro seconds. It's 1000ms in default.

func_cb: The callback function when the soft AP is setup successfully or the soft AP is shut down.

Returns

nil

Examples

```
>cfg={}
>cfg.ssid="WiFiMCU_Wireless"; cfg.pwd=""
>wifi.startap(cfg)
```

wifi.startsta()

Description

Setup wifi in Station Mode (STA), begin to connect a AP.

Syntax

wifi.startsta(cfg)

wifi.startsta(cfg, func_cb)

Parameters

cfg: lua table, contains the configurations for soft AP mode.

cfg.ssid: AP's ssid

cfg.pwd: AP's password

cfg.dhcp: optional. Set dhcp function: 'enable' is to enable the dhcp function. WiFiMCU will get ip automatically. 'disable' is to disable the dhcp function. It's 'enable' in default.

cfg.ip: optional. The local ip address of the module. If cfg.dhcp is 'disable' this parameter must be assigned.

cfg.netmask：optional. Netmask. If cfg.dhcp is 'disable' this parameter must be assigned.

cfg.gateway：optional. Gateway. If cfg.dhcp is 'disable' this parameter must be assigned.

cfg.dnsSrv：optional. DNS server address. If cfg.dhcp is 'disable' this parameter must be assigned.

cfg.retry_interval：optional. retry interval in micro seconds. If cfg.dhcp is 'disable' this parameter must be assigned.

func_cb: The callback function when WiFiMCU had connected to the AP successfully, or WiFiMCU is disconnected to from the AP.

Returns

nil

Examples

```
>cfg={}
>cfg.ssid="Doit"; cfg.pwd="123456789"
>wifi.startsta(cfg)
```

wifi.scan()

Description

Scan AP list and return a Lua table contains the results.

Syntax

wifi.scan(fun_cb(t))

Parameters

func_cb(t): The callback function when scan is finished. ‘t’ is a Lua table in which the keys are the APs' ssid and values are strings in format (“ mac, signal strength, channel, authmode”)

Returns

nil

Examples

> function listap(t) if t then for k,v in pairs(t) do print(k.."\t"..v);end else print('no ap') end end

> wifi.scan(listap)

CMCC-WEB 00:23:89:22:98:B0,90,11,OPEN

MERCURY_44B6 C0:61:18:21:44:B6,75,6,WPA2 AES

Tomato 8C:28:06:1E:01:54,100,11,WPA2 AES

ChinaNet-mALi 8C:E0:81:30:C1:95,65,10,WPA2 AES

Wireless 00:25:12:62:A6:36,57,6,OPEN

CMCC 00:23:89:22:98:B1,87,11,WPA2 AES

CMCC-FREE 00:23:89:96:02:03,60,11,OPEN

Doit BC:D1:77:32:E7:2E,100,1,WPA2 AES

wifi.stop()

Description

Close all the Wi-Fi connections, Both in station mode and soft ap mode.

Syntax

wifi.stop()

Parameters

nil

Returns

nil

See also

wifi.ap.stop()

wifi.sta.stop()

Examples

> wifi.stop()

wifi.powersave()

Description

Enable IEEE power save mode.

Syntax

wifi. powersave ()

Parameters

nil

Returns

nil

Examples

> wifi. powersave ()

wifi.ap.getip()

Description

Get ip address in AP mode

Syntax

ip=wifi. ap.getip()

Parameters

nil

Returns

ip: The module ip in soft AP mode.

Examples

> ip=wifi.ap.getip ()

> print(ip)

11.11.11.1

wifi.ap.getipadv()

Description

Get advanced net information in soft AP mode: DHCP mode, ip address, gate way, net mast, dns, MAC, broad cast address.

Syntax

dhcp,ip,gw,nm,dns,mac,bip =wifi. ap.getipadv()

Parameters

nil

Returns

dhcp: DHCP mode. in soft AP mode, it will be always “DHCP_Server”

ip: ip address.

gw: gateway address.

nm: netmask.

dns: dns address.

mac: MAC address.

bip: broadcast ip address.

Examples

> dhcp,ip,gw,nm,dns,mac,bip =wifi.ap.getipadv()

>print(dhcp,ip,gw,nm,dns,mac,bip)

DHCP_Server 11.11.11.1 11.11.11.1 255.255.255.0 208.67.222.222 c89346501a62 255.255.255.255

wifi.ap.stop()

Description

Close all the Wi-Fi connections in soft ap mode.

Syntax

wifi.ap.stop()

Parameters

nil

Returns

nil

See also

wifi.stop()

wifi.sta.stop()

Examples

> wifi.ap.stop()

wifi.sta.getip()

Description

Get ip address in STA mode.

Syntax

ip=wifi. sta.getip()

Parameters

nil

Returns

ip: The module ip in STA mode.

Examples

> ip=wifi.sta.getip ()

> print(ip)

192.168.1.108

wifi.sta.getipadv()

Description

Get advanced net information in STA mode: DHCP mode, ip address, gateway, netmask, dns, MAC, broad cast address.

Syntax

dhcp,ip,gw,nm,dns,mac,bip =wifi. sta.getipadv()

Parameters

nil

Returns

dhcp: DHCP mode. in STA mode, “DHCP_Server” or “DHCP_Client” or DHCP_Disable

ip: ip address.

gw: gateway address.

nm: netmask.

dns: dns address.

mac: MAC address.

bip: broadcast ip address.

Examples

> dhcp,ip,gw,nm,dns,mac,bip =wifi.sta.getipadv()

>print(dhcp,ip,gw,nm,dns,mac,bip)

DHCP_Client 192.168.1.108 192.168.1.1 255.255.255.0 192.168.1.1 c89346501a62 255.255.255.255

wifi.sta.getlink()

Description

Get the connected AP information in STA mode:Connect status, WiFi signal strength, ssid, bssid.

Syntax

status,strength,ssid,bssid=wifi.sta.getlink()

Parameters

nil

Returns

status: The connecting status. if connected it’s “connected” else it’s “disconnected”. It will be nil for strength/ssid/bssid if it’s “disconnected”.

strength: The signal strength.

ssid：The connected AP’s ssid.

bssid: The connected AP’s bssid.

Examples

> status,strength,ssid,bssid=wifi.sta.getlink()

>print(status,strength,ssid,bssid)

connected 62 Doit BC:D1:77:32:E7:2E

wifi.sta.stop()

Description

Close all the Wi-Fi connections inSTA mode.

Syntax

wifi.sta.stop()

Parameters

nil

Returns

nil

See also

wifi.stop()

wifi.ap.stop()

Examples

> wifi.sta.stop()

Net Module

Function list

net.new()	Create a new socket, set the socket and transmission protocol
net.start()	Start the socket, set remote port, remote ip address, or local port according to the socket and transmission protocol
net.on()	Register the callback functions for socket events
net.send()	Send data
net.close()	Close socket
net.getip()	Get the ip address and port of the client socket.

Constant

net.TCP	TCP protocol
net.UDP	UDP protocol
net. SERVER	Server type
net.CLIENT	Client type

net.new()

Description

Create a new socket, set the socket and protocol type.

Max 4 server and Max 4 client can be setup in WiFiMCU. If the socket type is Server, max number of 5 clients are allowed to connect.

Syntax

skt=net.new(protocol,type)

Parameters

protocol: The transmission protocol, must be one of the two: net.TCP, net.UDP

type: socket type, must be one of the two: net.SERVER, net.CLIENT

Returns

skt: the andle for this socket

Examples

>skt = net.new(net.TCP,net.SERVER)

>skt2 = net.new(net.UDP,net.CLIENT)

net.start()

Description

Start the socket, set remote port, remote ip address, or local port according to the socket and transmission protocol.

Syntax

net.start(socket, localport)

net.start(socket, remoteport, "domain", [local port])

Parameters

socket: The socket handle returned from net.new()

localport: If the socket type is net.SERVER, It's the local binded port for this socket.

remoteport: If the socket type is net.CLIENT, It's the remote server port.

"domain": If the socket type is net.CLIENT, it's the domain name string for remote server. The remote server's ip address can be used too.

[local port]: Optinal, if the socket type is net.CLIENT, [local port] set the local binded port for the socket. If ignored, a random port would be assigned.

Returns

nil

Examples

```
>skt = net.new(net.TCP,net.SERVER)
>skt2 = net.new(net.UDP,net.CLIENT)
>net.start(skt, 80)
>net.start(skt2,9000,'11.11.11.2', 8000)
```

net.on()

Description

Register the callback functions for socket events.

Syntax

net.on(socket,event,func_cb)

Parameters

socket: The socket handle returned from net.new()

event: If the socket type is net.SERVER, event should be one of the following:

"accept"(TCP server socket only), "receive", "sent", "disconnect".

If the socket type is net.CLIENT, event should be one of the following:

"connect(TCP client socket only)", "receive", "sent", "disconnect", "dnsfound".

func_cb: Callback function for different events. The function parameters diff from events.

"accept": TCP server socket only. If the tcp server accept a tcp client connection request, the function will be called. Function prototype is: func_cb(clt, ip, port). "clt" is the tcp client socket handle, "ip" is the client ip address, "port" is the client's port.

"receive": If data arrived on the assigned socket, the function will be called. Function prototype is: func_cb(clt, data). "clt" is the socket handle, "data" is the received data.

"sent": When data had sent succeffuly on the assigned socket, the function will be called. Function prototype is: func_cb(clt). "clt" is the socket handle.

"disconnect": If the client socket is disconnected from server or some errors happened, the function will be called. Function prototype is: func_cb(clt). "clt" is the socket handle.

"connect": TCP Client socket only. When the client socket connects to the remote server

successfully, the function will be called. Function prototype is: func_cb(clt). “clt” is the socket handle.

“dnsfound”: TCP or UDP Client socket only. When the DNS operations has finished, the function will be called. Function prototype is: func_cb(clt, ip). “clt” is the socket handle, “ip” is the ip address for the domain.

Returns

nil

Examples

```
>clt = net.new(net.TCP,net.CLIENT)
>net.on(clt,"dnsfound",function(clt,ip) print("dnsfound clt:"..clt.." ip:"..ip) end)
>net.on(clt,"connect",function(clt) print("connect:clt:"..clt) end)
>net.on(clt,"disconnect",function(clt) print("disconnect:clt:"..clt) end)
>net.on(clt,"receive",function(clt,d) print("receive:clt:"..clt.."data:"..d) end)
>net.start(clt,9003,"11.11.11.2")
```

net.send()

Description

Send data.

Syntax

net.send(socket, data, [func_cb])

Parameters

socket: The socket handle returned from net.new()

data: Data to be sent.

[func_cb]: Optinal, “sent” eventcall back function. When data had sent succeffuly on the assigned socket, the function will be called. Function prototype is: func_cb(clt). “clt” is the socket handle.

Returns

nil

Examples

```
>net.send(clt,"hello")
```

net.close()

Description

Close socket, release the resource of the socket.

Syntax

net.close(socket)

Parameters

socket: The socket handle returned from net.new()

Returns

nil

Examples

```
>skt = net.new(net.TCP,net.SERVER)
>net.close(skt)
```

net.getip()

Description

Get the ip address and port of the client socket.

Syntax

ip, port = net.getip(socket)

Parameters

socket: The socket handle returned from net.new(). The socket handle should be a client socket.

Returns

ip: the ip address for the socket.

port: the port for the socket.

Examples

```
>ip, port = net.getip(clt)
```

File Module

The file system is based on spi flash embeded in WiFiMCU. The totoal storage capacity is 1280k [(1024+256)*1024] bytes.

Function list

file.format()	Format file system, all stored data will be lost after format
file.open()	Open or create a file
file.close()	Close an opened file
file.write()	Write data to an opened file
file.writeline()	Write data to an opened file, with a '\n' added at the tailed of data
file.read()	Read data from an opened file
file.readline()	Read a line data from an opened file
file.list()	Get the file name and size list in file system
file.slist()	Print the file name and size list on terminal
file.remove()	Remove file
file.seek()	Set the position of file pointer
file.flush()	Clear file buffer
file.rename()	Rename the file
file.info()	Get the file system storage status
file.state()	Get the opened file's name and size
file.compile()	Compile a Lua scripts file to lc file.
dofile()	Run a file

Constant

nil

file.format()

Description

Format file system, all stored data will be lost after format. It's recommended Do not do any things while formatting.

Syntax

file.format()

Parameters

nil

Returns

nil

If formatting is done successfully, “format done” will be printed, else “format error” will be printed.

Examples

>file.format()

format done

file.open()

Description

Open or create a file.

Syntax

ret = file.open(filename,mode)

Parameters

filename: filename string to be created or opened. Directories are not supported yet.

mode: opened type:

"r": read mode (the default parameter)

"r+": update mode, all previous data is preserved

"w": write mode

"w+": update mode, all previous data is erased

"a": append mode

"a+": append update mode, previous data is preserved, writing is only allowed at the end of file

Returns

ret: true if succeed, else nil.

Examples

>file.open("test.lua","w+")

>file.write("This is a test")

>file.close()

file.close()

Description

Close an opened file.

Syntax

file.close()

Parameters

nil

Returns

nil

Examples

```
>file.open("test.lua","w+")
>file.write("This is a test")
>file.close()
```

file.write()

Description

Write data to an opened file.

Syntax

ret=file.write(data)

Parameters

data: The data to be wrote.

Returns

ret: true if succeed, else nil.

Examples

```
>file.open("test.lua","w+")
>file.write("This is a test")
>file.close()
```

file.writeline()

Description

Write data to an opened file, with a ‘\n’ added at the tailed of data.

Syntax

ret=file.writeline(data)

Parameters

data: The data to be wrote. A char ‘\n’ will be added at the end of data.

Returns

ret: true if succeed, else nil.

Examples

```
>file.open("test.lua","w+")
>file.writeline("This is a test")
>file.close()
```

file.read()

Description

Read data from an opened file.

Syntax

ret=file.read()

ret=file.read(num)

ret=file.read(endchar)

Parameters

if the parameter is nil, read all byte in file.

num: if a number is assigned, read the num bytes from file, or all rest data in case of end of file.

endchar: read until endchar or EOF is reached.

Returns

ret: the file data if succeed, else nil.

Examples

>file.open("test.lua","r")

>data=file.read()

>file.close()

>print(data)

This is a test

>file.open("test.lua","r")

>data=file.read(10)

>file.close()

>print(data)

This is a

>file.open("test.lua","r")

>data=file.read('e')

>file.close()

>print(data)

This is a te

file.readline()

Description

Read a line data from an opened file.

Syntax

ret=file.readline ()

Parameters

nil

Returns

ret: the file data if succeed, else nil.

Examples

>file.open ("test.lua","w+")

>file.writeline(“this is a test”)

>file.close()

>file.open ("test.lua","r")

>data=file.readline()

>print(data)

> This is a test

>file.close()

file.list()

Description

Get the file name and size list in file system.

Syntax

ft=file.list()

Parameters

nil

Returns

ft: a Lua table, in which the filename is the key, file size is the value.

Examples

>for k,v in pairs(file.list()) do print("name:"..k.." size(bytes):"..v) end

> name:test.lua size(bytes):15

file.slist()

Description

Print the file name and size list on terminal.

Syntax

file.slist()

Parameters

nil

Returns

nil

Examples

>file.slist()

test.lua size:15

file.remove()

Description

Remove file.

Syntax

file.remove(filename)

Parameters

filename: filename string to be removed.

Returns

nil

Examples

>file.remove (“test.lua”)

file.seek()

Description

Set the position of file pointer.

Syntax

fi = file.seek(whence, offset)

Parameters

whence: should be one of the following:

"set": base is position 0 (beginning of the file);

"cur": base is current position;(default value)

"end": base is end of file;

offset: default 0.

Returns

fi: the file pointer final position if succeed, else nil.

Examples

```
>>file.open ("test.lua","r")
>file.seek("set",10)
>data=file.read()
>file.close()
>print(data)
test
```

file.flush()

Description

Clear file buffer.

Syntax

ret = file.flush()

Parameters

nil

Returns

ret: true if succeed, else nil.

Examples

```
>file.open ("test.lua","r")
>file.flush ()
>file.close()
```

file.rename()

Description

Rename the file.

Syntax

ret=file.rename(oldname,newname)

Parameters

oldname: File name to be changed.

newname: New file name.

Returns

ret: true if succeed, else nil.

Examples

> file.slist()

test.lua size:14

>file.rename ('test.lua',' testNew.lua')

>file.slist()

testNew.lua size:14

file.info()

Description

Get the file system storage status.

Syntax

last,used,total = file.info()

Parameters

nil

Returns

last: free storage left in bytes.

used: used storage in bytes.

total: all allocated storage for file system in bytes.

Examples

> last,used,total = file.info()

> print(last,used,total)

1140500 2750 1143250

file.state()

Description

Get the opened file's name and size

Syntax

fn,sz = file.state()

Parameters

nil

Returns

fn: filename.

sz: file size in bytes.

Examples

>file.open("testNew.lua","r")

```
>fn,sz = file.state()
>file.close()
>print(fn,sz)
testNew.lua         14
```

file.compile()

Description

Compile a Lua scripts file to lc file. The lc file will be named as the same name as the Lua file.

Syntax

file.compile(‘filename.lua’)

Parameters

filename.lua: file name of the Lua scripts.

Returns

nil.

Examples

```
>file.open("test.lua","w+")
>file.write("print('Hello world!')")
>file.close()
>file.compile("test.lua")
>file.slist()
test.lua size:21
test.lc size:100
```

dofile()

Description

Run a file. The file can be either a Lua scripts or a lc format file.

Syntax

dofile(‘filename.lua’)

dofile(‘filename.lc’)

Parameters

filename.lua: Lua scripts file.

filename.lc: a lc file

Returns

nil.

Examples

```
>dofile("test.lua")
Hello world!
>dofile("test.lc")
Hello world!
```

PWM Module

Function list

pwm.start()	Start pwm function at assigned gpio pin
pwm.stop()	Stop pwm

Constant

nil

Pin Table

Plaese refer: “GPIO Table” for detail.

pwm.start()

Description

Start pwm function at assigned gpio pin.

Syntax

pwm.start(pin, freq, duty)

Parameters

pin: gpio pin ID. There are 11 PWM ports supported in WiFiMCU:
D1, D3, D4, D9, D10, D11, D12, D13, D14, D15, D16.

freq: PWM output frequency in Hz, 0<freq<10KHz

duty: Duty of PWM output, must be 0<=duty <=100

Returns

nil.

Examples

```
>i=1;pin=1;
>tmr.start(1,1000,function()
    i=i+10;if i>=100 then i=1 end
    pwm.start(pin,10000,i)
end)
>
```

pwm.stop()

Description

Stop pwm.

Syntax

pwm.stop(pin)

Parameters

pin: gpio pin ID. There are 11 PWM ports supported in WiFiMCU:
D1, D3, D4, D9, D10, D11, D12, D13, D14, D15, D16.

Returns

nil.

Examples

>pwm.stop(1)

ADC Module

Function list

adc.read()	Read the ADC result at assigned pin

Constant

nil

Pin Table

Plaese refer: “GPIO Table” for detail.

adc.read()

Description

Read the ADC result at assigned pin.

Syntax

data= adc.read(pin)

Parameters

pin: gpio pin ID. There are 5 ADC ports supported in WiFiMCU:

D1, D13, D15, D16, D17.

Returns

data: if succeed, data between 0~4095 is returned, else nil. Note that: 0 presents 0V, 4095 presents 3.3V.

Examples

```
>=adc.read(1)
>1
>=adc.read(1)
>4095
```

UART Module

Only one uart is supported in WiFiMCU so far. The GPIO pin is D8(RX1), D9(TX1).

Function list

uart.setup()	Setup uart parameters: buadrate, databits, parity, stopbits.
uart.on()	Register the callback functions for uart events
uart.send()	Send data via uart

Constant

null

uart.setup()

Description

Setup uart parameters: buadrate, databits, parity, stopbits.

Syntax

uart.setup(id, baud, parity, databits, stopbits)

Parameters

id: uart ID, always 1 at present.

baud: baudrate, such as: 4800, 9600, 115200.

parity: 'n': no parity, 'o': odd parity, 'e': even parity.

databits: data bits, '5', '6', '7', '8', '9'.

stopbits: stop bits, '1', '2'

Returns

nil

Examples

>uart.setup(1,9600,'n','8','1')

uart.on()

Description

Register the callback functions for uart events.

Syntax

uart.on(id, event ,func_cb)

Parameters

id: uart ID, always 1 at present.

event: always "data".

func_cb: Callback function for the event. When data arrived, the function will be called. Function prototype is: func_cb(data). “data” is the data received.

Returns

nil

Examples

>uart.on(1, 'data',function(t) len=string.len(t) print(len.." "..t) uart.send(1,t) end)

uart.send()

Description

Send data via uart.

Syntax

uart.send(1, string1,[number],...[stringn])

Parameters

id: uart ID, always 1 at present.

string1: string ready to send.

[number]: Optional, number ready to send.

[stringn]: Optional, The nth string ready to be send.

Returns

nil

Examples

>uart.send(1,'hello wifimcu')

>uart.send(1,'hello wifimcu','hi',string.char(0x32,0x35))

>uart.send(1,string.char(0x01,0x02,0x03))

Bit Module

Function List

bit.bnot	Bitwise negation
bit.band	Bitwise AND
bit.bor	Bitwise OR
bit.bxor	Bitwise XOR
bit.lshift	Logical left shift a number
bit.rshift	Logical right shift a number
bit.arshift	Arithmetic right shift a number
bit.bit	Generate a number with a 1 bit (used for mask generation)
bit.set	Set bits in a number
bit.clear	Clear bits in a number
bit.isset	Test if a given bit is set
bit.isclear	Test if a given bit is cleared

Constant

nil

bit.bnot()

Description

Bitwise negation.

Syntax

num=bit.bnot(val)

Parameters

val: the number to negation, value is 32 bit width.

Returns

num: the bitwise negated value of the number.

Examples

```
>print("result: "..bit.bnot(0x00000000))
result: -1
```

bit.band()

Description

Bitwise AND.

Syntax

num= bit.band(val1, val2, ... valn)

Parameters

val1: the first number to AND

val1: the second number to AND

valn: the nth number to AND

Returns

num: the bitwise AND of all the arguments.

Examples

> print("result: "..bit.band(0xffffffff, 0x000000ff, 0x000000f))

result: 15

bit.bor()

Description

Bitwise OR.

Syntax

num= bit.bor(val1, val2, ... valn)

Parameters

val1: the first number to OR

val1: the second number to OR

valn: the nth number to OR

Returns

num: the bitwise OR of all the arguments.

Examples

> print("result: "..bit.bor(0x00000000, 0x000000ff, 0x000000f))

result: 255

bit.bxor()

Description

Bitwise XOR.

Syntax

num= bit.bxor(val1, val2, ... valn)

Parameters

val1: the first number to XOR

val1: the second number to XOR

valn: the nth number to XOR

Returns

num: the bitwise XOR of all the arguments.

Examples

```
> print("result: "..bit.bxor(0x00000000, 0x000000ff, 0x000000f))
result: 240
```

bit.lshift()

Description

Logical left shift a number.

Syntax

num= bit.lshift(val, shift)

Parameters

val: the value to shift

shift: positions to shift

Returns

num: the number shifted left.

Examples

```
> print("result: "..bit.lshift(0x00000001,8))
result: 256
```

bit.rshift()

Description

Logical right shift a number.

Syntax

num= bit.rshift(val, shift)

Parameters

val: the value to shift

shift: positions to shift

Returns

num: the number shifted right.

Examples

```
> print("result: "..bit.rshift(0x00000080,1))
result: 64
```

bit.arshift()

Description

Arithmetic right shift a number.

Syntax

num= bit.arshift(val, shift)

Parameters

val: the value to shift

shift: positions to shift

Returns

num: the number arithmetically shifted right.

Examples

> print("result: "..bit.arshift(0x00000080,1))

result: 64

bit.bit()

Description

Generate a number with a 1 bit (used for mask generation).

Syntax

num= bit.bit(pos)

Parameters

pos: position of the bit that will be set to 1.

Returns

num: the number that only one bit is set to 1 and 0 for the rests.

Examples

> print("result: "..bit.bit(8))

result: 256

bit.set()

Description

Set bits in a number.

Syntax

num= bit.set(val, pos1,pos2,…,posn)

Parameters

val: the base number.

pos1: first position to be set.

pos2: second position to be set.

posn: nth position to be set.

Returns

num: the number with the bit(s) set in the given position(s)..

Examples

> print("result: "..bit.set(0x00000000, 0, 1, 2, 3))

result: 15

bit.clear()

Description

Clear bits in a number.

Syntax

num= bit.clear (val, pos1,pos2,…,posn)

Parameters

val: the base number.

pos1: first position to be cleared.

pos2: second position to be cleared.

posn: nth position to be cleared.

Returns

num: the number with the bit(s) cleared in the given position(s).

Examples

> print("result: "..bit.clear(0x0000000f, 0, 1, 2, 3))

result: 0

bit.isset()

Description

Test if a given bit is set.

Syntax

res= bit.iset (val, pos)

Parameters

val: the value number to be test

pos: bit position.

Returns

res: true if the bit at the given position is 1, false otherwise.

Examples

>=bit.isset(0x0000000f, 1)

true

>=bit.isset(0x0000000f, 5)

false

bit.isclear()

Description

Test if a given bit is cleared.

Syntax

res= bit.isclear (val, pos)

Parameters

val: the value number to be test

pos: bit position.

Returns

res: true if the bit at the given position is 0, false otherwise.

Examples

>=bit.isclear(0x0000000f, 1)

false

>=bit. isclear (0x0000000f, 5)

true

Sensor Module

Function List

sensor.dth11.init	Init dth11, Assign the GPIO Pin for dht11.
sensor.dth11.get	Get the dth11 temperature and humility value

Constant

nil

sensor.dth11.init()

Description

Init dth11 sensor. Assign the GPIO Pin for dht11.

Syntax

res = sensor.dth11.init(pin)

Parameters

pin: gpio ID, 0~17.

Returns

res: true if dht11 initialization successfully, false otherwise.

Examples

>=sensor.dth11.init(1)

true

sensor.dth11.get()

Description

Get the dth11 temperature and humility value.

Syntax

temp, hum = sensor.dth11.get()

Parameters

nil

Returns

temp: temperature measured by dth11.

hum: humidity measured by dth11.

Examples

>=sensor.dth11. get (1)

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SPI Module

Function List

spi.setup	Init spi, assign GPIO pin
spi.write	Write data via spi interface, data can be multi numbers, string or lua table
spi.read	Read data from spi interface

Constant

spi.CPOL_HIGH	clock polarity: High
spi.CPOL_LOW	clock polarity: Low
spi.CPHA_HIGH	clock phase: High
spi.CPHA_LOW	clock phase: Low
spi.BITS_8	8 Bits data length
spi.BITS_16	16 Bits data length

spi.setup()

Description

Init spi. SPI module works in MASTER mode. The cs pin should be assigned by user individually.

Syntax

spi.setup(id, cpol, cpha, pins)

Parameters

id: should be 0.

cpol: clock polarity, spi.CPOL_HIGH or spi.CPOL_HIGH. It's depend on the SLAVE components.

cpha: clock phase, spi. CPHA _HIGH or spi. CPHA _HIGH. It's depend on the SLAVE components.

pins: lua table, define the pins for spi. {sck=pin1,mosi=pin2, [miso=pin3]}, pin1~pin3 is GPIO pins. sck and mosi must be assigned. miso is optional.

Returns

nil

Examples

```
>spipin={sck=1,mosi=2,miso=3}
>spi.setup(0,spi.CPOL_LOW, spi.CPHA_LOW, spipin)
```

spi.write()

Description

Write data via spi interface. Data can be multi numbers, string or lua table

Syntax

ret = spi.write(id, databits, data1, [data2],…,[datan])

Parameters

id: should be 0.

databits: write databits. spi. BITS_8 or spi. BITS_16.

data1: should be 0<data1 < 255 in spi. BITS_8 mode or 0<data2<65535 in spi. BITS_16 mode.

data2: optional.

datan: optional.

Returns

ret: The number of data wrote.

Examples

>spipin={sck=1,mosi=2,miso=3}

>spi.setup(0,spi.CPOL_LOW, spi.CPHA_LOW, spipin)

> ret = spi.write(0, 0xAA)

spi.read()

Description

Read data via spi interface.

Syntax

ret = spi.read(id, databits, num)

Parameters

id: should be 0.

databits: write databits. spi. BITS_8 or spi. BITS_16.

num: the number of data ready to read.

Returns

ret: the string of read data.

Examples

> ret = spi.read(0, 1)

>print(ret)

I2C Module

Function List

i2c.setup	Init i2c, assign GPIO pin
i2c.start	Send start condition
i2c.stop	Send stop condition
i2c.address	Send i2c device address and set transmission direction
i2c.write	Write data via i2c interface, data can be multi numbers, string or lua table
i2c.read	Read data from i2c interface

Constant

nil

i2c.setup()

Description

Init i2c, assign GPIO pin.

Syntax

i2c.setup(id, pinSDA, pinSCL)

Parameters

id: i2c id, should be 0.

pinSDA: GPIO Pin 0~17

pinSCL: GPIO Pin 0~17

Returns

nil

Examples

>i2c.setup(0, 1, 2)

i2c.start()

Description

Send start condition

Syntax

i2c.start(id)

Parameters

nil

Returns

nil

Examples

>i2c.start(0)

i2c.stop()

Description

Send stop condition

Syntax

i2c.stop(id)

Parameters

id: i2c id, should be 0.

Returns

nil

Examples

>i2c.stop(0)

i2c.address()

Description

Send i2c device address and set transmission direction.

Syntax

ack = i2c.address(id, dev_id, mode)

Parameters

id: i2c id, should be 0.

dev_id: device id address.

mode: transmission direction. Should ether ‘r’ or ‘w’.

Returns

ack: if slave device acknowledge success, return true, else return nil.

Examples

> i2c.address(0, 0x3C)

i2c.write()

Description

Write data via i2c interface, data can be multi numbers, string or lua table

Syntax

ret = i2c.write(id, data1, [data2],…,[datan])

Parameters

id: should be 0.

data1: should be 0<data1 < 255.

data2: optional.

datan: optional.

Returns

ret: The number of data wrote.

Examples

> ret = i2c.write(0, 0x00)

i2c.read()

Description

Read data from i2c interface

Syntax

ret = i2c.read(id, num)

Parameters

id: should be 0.

num: the number of data ready to read.

Returns

ret: the string of read data.

Examples

> ret = i2c.read(0, 1)

>print(ret)

OW Module

To be continued.

MQTT Module

To bo continued