

## Advantech AE Technical Share Document

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<b>Category</b>	■FAQ □SOP	<b>Related OS</b>	N/A
<b>Abstract</b>	What is Data Format Definition of WISE-4000 System Log in JSON Format (Overall)		
<b>Keyword</b>	WISE, data format, system log, record, logsys_message		
<b>Related Product</b>	WISE-4010/LAN, WISE-4050/LAN, WISE-4060/LAN, WISE-4012, WISE-4012E, WISE-4050, WISE-4051, WISE-4060, WISE-4220-S231		

### ■ Problem Description:

This document shows that the data in system log.

### ■ Brief Solution - Step by Step:

Description	Retrieves the system log data in system memory.
URL Structure	<b>http://10.0.0.1/logsys_message</b>
HTTP Method	GET : According to the setting of filtering, server returns the all/partial of system logged data.
GET	<p>Request :</p> <p><b>GET /logsys_message</b></p> <p>[Example]:</p> <ul style="list-style-type: none"> <li>● Request : <b>GET /logsys_message</b> for WISE-4060 module</li> </ul> <p>Content-type: application/json</p> <p>Response: 200 OK</p> <pre>{   "LogMsg": [     {       "PE":6,       "TIM":"2014-11-11T15:48:32+08:00",       "UID":"WISE-4060_00D0C9CC0001",       "MAC":"00-D0-C9-CC-00-01",       "Record" : "00000001"</pre>

```

    },
    {
      "PE":8,
      "TIM":"2014-11-11T15:49:44+08:00",
      "UID":"WISE-4060_00D0C9CC0001",
      "MAC":"00-D0-C9-CC-00-01",
      "Record" : "0A090B04"
    },
    {
      "PE":1,
      "TIM":"2014-11-11T15:51:02+08:00",
      "UID":"WISE-4060_00D0C9CC0001",
      "MAC":"00-D0-C9-CC-00-01",
      "Record" : "C9CC00F5"
    }
  ]
}

```

● JSON array name definition:

Field	Abbreviation	Data Type
Array of log messages	LogMsg	Array

● Resource value definitions :

Field	Abbreviation	Data Type	Property	Description
Periodic / Event	PE	Number	R	Recording mode of the storage (Reference <a href="#">system Logging Event Table</a> )
Timestamp	TIM	String	R	Timestamp of the storage ✓ Coordinated Universal Time (UTC) Ex. <b>"1415757750"</b> corresponds to November 12, 2014, 2:02:30 am, Standard Time. (meanwhile, 2014, 10:02:30 am, Taipei Time.) ✓ Local Date/Time according GMT time zone (ISO 8601) Ex. <b>"1994-11-05T08:15:30-05:00"</b> corresponds to November 5, 1994, 8:15:30 am, US Eastern Standard Time.
UUID	UID	String	R	Universally Unique Identifier (UUID)

Max. 32 characters

MAC ID      MAC      String      R

MAC address.

(12+5) characters, ex, "00-D0-C9-F0-63-F7"

Recording      Record      String      R

The data detail for event

message

Event	Description	Record	
1	Wireless connection	MAC(last 4 octets) Ex: 00-D0-C9-F0-63-F7 → C9F063F7	
2	Wireless disconnection	MAC(last 4 octets) Ex: 00-D0-C9-F0-63-F7 → C9F063F7	
3*	Communication WDT	Byte 3 (index)	Byte 0,1,2 (content)
		0x00: FSV	0
		0x01: Modbus/TCP	User IP
		0x02: RESTful	User IP
4	Cloud file upload	Byte 3, 2 Index	Byte 1, 0 Error code
		0: I/O	<a href="#">Click here</a>
		1: System	
5	Cloud data push	Byte 3, 2 Index	Byte 1, 0 Error code
		0: I/O	<a href="#">Click here</a>
		1: System	
6*	SNTP fail	0: no error 1: DNS error 2: No socket 3: No reply 4: Socket fatal Other*: ntp time	
7	Power on/off	1: Power on 2: System restart 3: Power off 4: CoreTask WDT timeout	
8	Memory full/overwrite in log function	1: IO full 2: IO overwrite 3: System overwrite	
9	Remote access fail( Access control)	IP	
10	Login error	IP	
11	FW upgrade	Version Ex: A1.00 B01→0A100B01	
12*	RTC battery low		
13	Internal configuration table error	Bit order for internal configuration error	
		Bit	Error item
		0	Device information
		1	Wifi setting
		2	Network setting
		3	Access control setting

			4	IO setting			
			5	Modbus 0X address			
			6	Modbus 4X address			
			7	User account setting			
			8	Internal buffer			
			9	Analog calibration value			
			10	IO log setting			
			11	Cloud setting			
			12	File upload setting			
			13	Private server setting			
			14	System log setting			
			15	Internal buffer			
			16	File upload tag setting			
			14	Internal flash access error			
			15*	RF event	Most significant byte: 01*: WLAN disconnect event 02: Unexpected 03: Unexpected socket 04: TCP Tx socket failed 05*: Disconnect(profile[0], priority, name len) + SSID[0] ~ SSID[3] 06*: Rssi level changes more than 1 slot, datactrl/mgt rsi   old level   new level 07*: histogram[0]~[5] for data ctrl rssi, shows 2 logs one time 08: Unexpected WLAN policy 09: IP acquired 0A: WLAN RF reset 0B: Connect to server fail (push) 0C: Connect to server fail (upload) 0D: Connect to server fail (MQTT) 0E: Internal error 0F: Internal abort error 10: Check ping error (Byte 2: 1 is no packet received) 11: Reserved 12*: Connection List Full(without webserver) 13: reboot interval timeout 14:Socket connect(byte 2: conn type, 1 is Modus/TCP ; byte 0: socket ID in Hex) 15:Socket disconnect(byte 2: conn type, 1 is Modus/TCP ; byte 0: socket ID in Hex)		
			16	P2P	1: Access control error 2: Password error 3: No QOS ACK		
			17*	Webserver_Utility	Byte 3 (index)	Byte 0,1,2 (content)	
		0x01:	deleted				

			delete oldest login user	User IP (last 3 bytes)	
			0x02: Login list is full	login User IP (last 3 bytes)	
			0x03~0xFF reserved		
	18	HW	Byte 3 (index)	Byte 0,1,2 (content)	
			I2C error	0	
Remarks	* → See example in below.				

For example: Receive SNTP server time data.

System log:

Event	Description	Record
6	SNTP fail	0: no error 1: DNS error 2: No socket 3: No reply 4: Socket fatal Other: ntp time

In the following figure, the E16 is the time that WISE received from a NTP server. Then it will be used to adjust the RTC of the WISE module. The next timestamp is after adjusted. The unit of the received time is second, which needs to be added with 1900/1/1 00:00:00.

A	B	C	D	E	F	G
1	UID	TIM	PE	Record		
16	WISE-4050 00D0C9E34CF0	2021-06-11T13:12:25+08:00	6	e46d6f39	3832377145	2021/06/11 13:12:25
17	WISE-4050 00D0C9E34CF0	2021-06-11T13:12:25+08:00	6	00000000		
389	WISE-4050 00D0C9E34CF0	2021-06-11T14:12:26+08:00	6	e46d7d4a	3832380746	2021/06/11 14:12:26
390	WISE-4050 00D0C9E34CF0	2021-06-11T14:12:26+08:00	6	00000000		
582	WISE-4050 00D0C9E34CF0	2021-06-11T15:12:27+08:00	6	e46d8b5b	3832384347	2021/06/11 15:12:27
583	WISE-4050 00D0C9E34CF0	2021-06-11T15:12:27+08:00	6	00000000		
587	WISE-4050 00D0C9E34CF0	2021-06-11T16:12:28+08:00	6	e46d996b	3832387947	2021/06/11 16:12:27
588	WISE-4050 00D0C9E34CF0	2021-06-11T16:12:27+08:00	6	00000000		

Calculation:

E587 is the original record from WISE-4050.

F587 = HEX2DEC(E587) → e46d996b (HEX) = 3832387947 (DEC)

G587 = TEXT(F587/86400 + 2 + 8/24, "yyyy/mm/dd hh:mm:ss") → +8/24 is for GMT +8:00

For example: # of LED

Event	Description	Record
15*	RF event	06*: Rssi level changes more than 1 slot, datactrl/mgt rsi   old level   new level 07*: histogram[0]~[5] for data

		ctrl rssi, shows 2 logs one time
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Usually Event 15, record: 06XXXXXX comes with record:07XXXXXX, but the module only received data about 07XXXXXX because of weak connection.

If you can see 06XXXXXX, which indicates the number of LED(s).

Related explanation FAQ: [How to know the connection status throughout LED on WISE?](#)

Related explanation FAQ: [The relationship between the Wi-Fi RSSI and the number of LED\(s\)](#)

The following table shows WISE only with 1 LED (06XXXX01)

15	WISE- 4050_00D0C9F75B26	2017-09- 24T05:49:12+08:00	064a0401
15	WISE- 4050_00D0C9F75B26	2017-09- 24T05:49:12+08:00	07140000
15	WISE- 4050_00D0C9F75B26	2017-09- 24T05:49:12+08:00	0700001f

Event 15, record: 07xxxxx is calculated histogram level when module is calculating RSSI, which happens after connect to AP successfully.

Event	Description	Record
15*	RF event	05*: Disconnect(profile[0], priority, name len) + SSID[0] ~ SSID[3]

Important information is event 15, record: 05xxxxxx (disconnect) that could help to understand when the module is disconnected with an AP. Record: 04xxxxxx usually come with record 05xxxxxx which indicates the disconnect target object.

For example: SSID and MAC address of the disconnected target

Event	Description	Record
2	Wireless disconnection	MAC(1sat 4 octets) Ex: 00-D0-C9-F0-63-F7 → C9F063F7
15*	RF event	05*: Disconnect(profile[0], priority, name len) + SSID[0] ~ SSID[3]

The SSID of the AP in my office is named “TPLINK8”.

The system log is shown as following figure.

PE 2, means wireless discounted. It records the MAC of the connected AP.

PE 15 record 05....., means disconnect action, the following record 54504c49 indicate the **first 4 characters of the SSID** of the AP.

Hexadecimal (54504c49) convert into ASCII (TPLI).

```
{
  "PE": 2,
  "UID": "WISE-4050",
  "TIM": "2018-03-07T09:30:18+08:00",
  "Record": "2736f630"    MAC addr of target AP
},
{
  "PE": 15,
  "UID": "WISE-4050",
  "TIM": "2018-03-07T09:30:18+08:00",
  "Record": "0100006d"    WLAN disconnect event
},
{
  "PE": 15,
  "UID": "WISE-4050",
  "TIM": "2018-03-07T09:30:18+08:00",
  "Record": "0500020a"    Disconnect
},
{
  "PE": 15,
  "UID": "WISE-4050",
  "TIM": "2018-03-07T09:30:18+08:00",
  "Record": "54504c49"    SSID of target AP
},
```

## TP-LINK®

### 產品狀態

快速安裝指南

WPS

網路設定

無線網路

DHCP伺服器

通訊埠對向 (NAT)

安全性設定

未成年子女上網管理

網路使用權限規則管理

固定路由

頻寬管理

ARP綁定

DDNS設定

系統工具

### 產品狀態

韌體版本: 3.16.9 Build 141027 Rel.55078n

硬體版本: WR940N v2/WR941ND v5 00000000

### 區域網路 (LAN)

MAC位址: E8-DE-27-36-F6-30

IP位址: 192.168.0.1

子網路遮罩: 255.255.255.0

### 無線網路 (WLAN)

無線網路功能: 啟用

無線網路名稱 (SSID): TPLINK8\_AE

模式: 使用11bgn混合模式

頻道寬度: 自動

頻道: 7

MAC位址: E8-DE-27-36-F6-30

WDS狀態: 不啟用



## For example: Communication WDT

Event	Description	Record	
3	Communication WDT	Byte 3 (index)	Byte 0,1,2 (content)
		0x00: FSV	0
		0x01: Modbus	User IP
		0x02: WEB	User IP

The Communication WDT will be triggered if there is none of TCP connection in/out to/from the WISE module.

Related explanation FAQ: [There are 4 different WDT in WISE series FW, what are they exactly?](#)

1. Communication WDT is not triggered due to scan WISE module every 1 second.

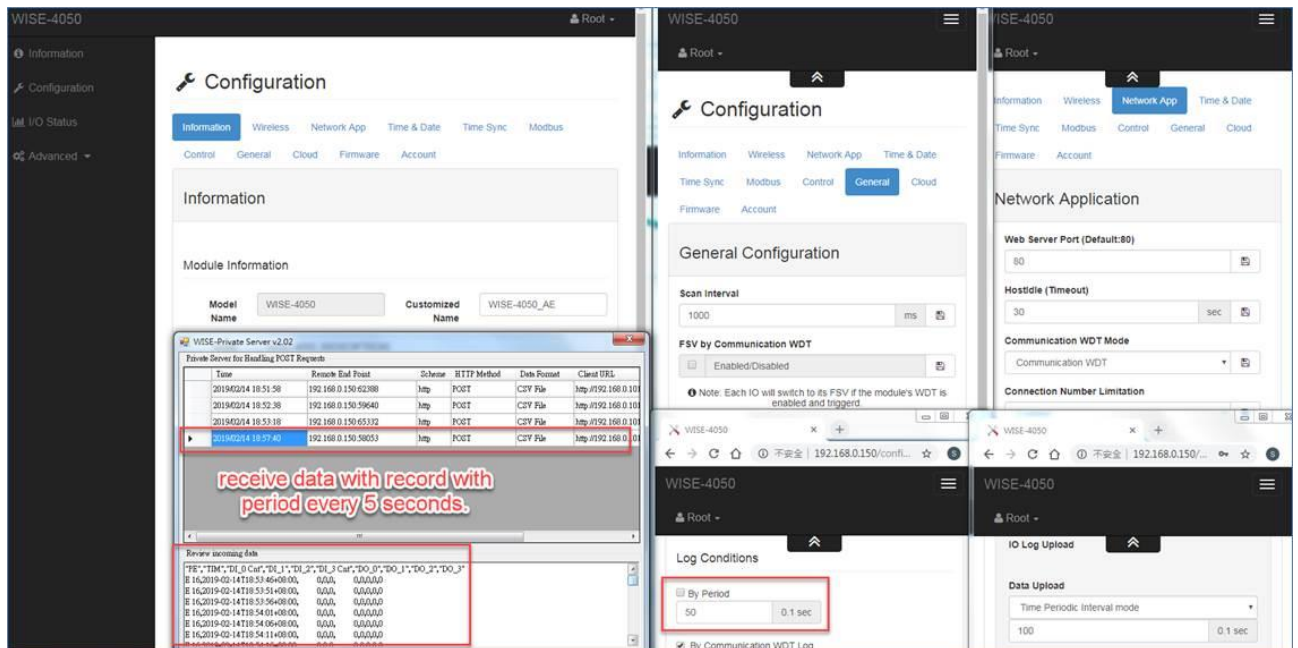
The first set of screenshots illustrates the configuration for Communication WDT. The 'IO Status' page shows a 'Scan I/O status according to' label with a red arrow pointing to the 'Scan Interval' field in the 'General Configuration' page, which is set to 1000 ms. The 'Network Application' page shows the 'Hostile (Timeout)' set to 30 sec. A 'WISE-Private Server v2.02' window shows a log entry: 'Scan WISE <30 seconds, WDT is not triggered.'

2. Communication WDT is triggered and server receives data every 40 seconds.

The second set of screenshots shows the configuration for Communication WDT. The 'General Configuration' page shows the 'Scan Interval' set to 1000 ms. The 'Network Application' page shows the 'Hostile (Timeout)' set to 30 sec. The 'Communication WDT Mode' is set to 'Communication WDT'. The 'Log Conditions' page shows the 'By Period' set to 50 and 'By Communication WDT Log' checked. A 'WISE-Private Server v2.02' window shows a log entry: 'receive a packet every 30+10 seconds.'



3. Disconnect power AP with power and reconnect. WISE upload data which was logged with period every 5 seconds.



4. System log event “PE: 3, record: 00000000”. The time that server receives data depends on the Internet environment condition.

3	2019-02-14T18:53:45+08:00	WISE-Private Server v2.02	00000000
3	2019-02-14T18:53:05+08:00	WISE-Private Server v2.02	00000000
3	2019-02-14T18:52:25+08:00	WISE-Private Server v2.02	00000000
3	2019-02-14T18:51:44+08:00	WISE-Private Server v2.02	00000000

For example: RCT battery low

Event	Description	Record
12	RTC battery low	

If a module **RTC (real-time clock) battery status is low**, it cannot reserve the internal clock of a module, there will be an event 12 in system log and the timestamp will become initial value “2000-01-01”.

The firmware detects the battery status when the module is booted up and every 60 seconds after booted up. The system log will be recorded only 1 time after booted up.

12	2000-01-01T12:00:00+08:00	WISE-4050_00D0C9F70C85	00000000
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For example: Connection # reaches the maximum limitation.

Event	Description	Record
15	RF event	12: Connection List Full(without webserver)

**Iff:** a user **enabled “Connection Number Limitation” function**, the 4<sup>th</sup> TCP connection will be kicked out by firmware, so there will be system log “PE:15, Record:12000000” recording the event “Connection List Full”. The 4<sup>th</sup> TCP connection could be requested from a server to WISE, or the WISE to a cloud service.

**Note:** If the P2P function is not using default port number, it will occupy 1 connection if a user

enabled P2P function. The reason is the default port number (5048) is constantly listening to utility search. So, if P2P function is using default port number, there is no need to open an extract connection.

**Note:** The module will auto restart after a user enables the function, there will be “Event: 7, Record: 00000002” (powered-off) and “Event: 7, Record: 00000001” (powered-on).

The setting and the system log are shown as following figures.

The screenshot shows the 'Configuration' page with the 'Network App' tab selected. Under the 'Network Application' section, the 'Connection Number Limitation' is set to 'Enabled'. Other settings include Web Server Port (80), Hostile (Timeout) (720 sec), Communication WDT Mode (Disabled), and Peer to Peer Port (5048).

Event Type	Timestamp	UUID	Record
15	2019-01-17T03:27:04+08:00	WISE-4012_00D0C9FAC804	12000000
15	2019-01-17T03:27:01+08:00	WISE-4012_00D0C9FAC804	12000000
15	2019-01-17T03:26:38+08:00	WISE-4012_00D0C9FAC804	061b0004
15	2019-01-17T03:26:38+08:00	WISE-4012_00D0C9FAC804	07500000
15	2019-01-17T03:26:38+08:00	WISE-4012_00D0C9FAC804	07000000
1	2019-01-17T03:26:35+08:00	WISE-4012_00D0C9FAC804	2736f630
15	2019-01-17T03:26:35+08:00	WISE-4012_00D0C9FAC804	09a80070
7	2019-01-17T03:26:27+08:00	WISE-4012_00D0C9FAC804	00000001

For example: Log-in # reaches the maximum limitation.

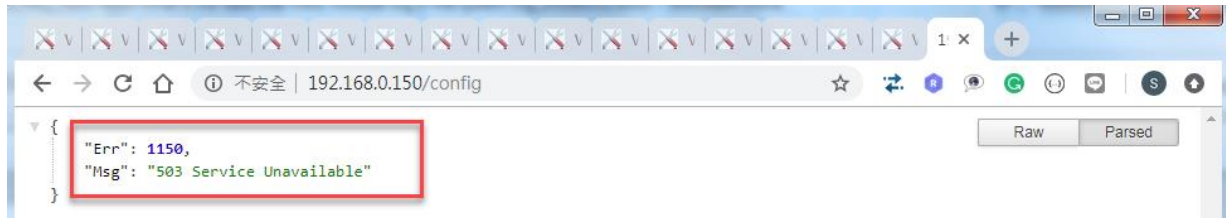
Event	Description	Record	
17	Webserver_Utility	Byte 3 (index)	Byte 0,1,2 (content)
		0x01: delete oldest login user	deleted User IP
		0x02: Loginlist is full	login User IP

If a user opens more than 15 log-in webpage, the 1<sup>st</sup> log-in IP of the server will be deleted from the WISE internal buffer when 16<sup>th</sup> webpage opens log-in page.

15	2000-01-01T15:52:45+08:00	WISE-4050_00D0C9F70C85	016500a8
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If a user log-in the WISE module more than 15 times, the 16<sup>th</sup> server who wanted to log-in would be blocked out. There will be a system log and error code on the 16<sup>th</sup> server webpage.

15	2000-01-01T15:33:51+08:00	WISE-4050_00D0C9F70C85	026500a8
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“6500a8” in record indicate the IP address (192.168.0.101) of the server which is blocked out or kicked out.

→ 65 (HEX) = 101 (Dec)

→ A8 (HEX) = 168 (Dec)

Event Type	Timestamp	UUID	Record
17	2000-01-01T15:52:45+08:00	WISE-4050_00D0C9F70C85	016500a8
17	2000-01-01T15:33:51+08:00	WISE-4050_00D0C9F70C85	026500a8