

Advantech AE Technical Share Document

Date	2022/6/9	SR#	1-4332494280
Category	<input checked="" type="checkbox"/> FAQ <input type="checkbox"/> SOP	Related OS	N/A
Abstract	What is the data that WISE-2410/4610 log-in the system log?		
Keyword	WISE, data format, system log, record, logsys_message		
Related Product	WISE-2410, WISE-4610		

■ **Problem Description:**

This document explains the data in system log.

■ **Brief Solution - Step by Step:**

● 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 system Logging Event Table)
Timestamp	TIM	String	R	Timestamp of the storage ✓ Coordinated Universal Time (UTC) Ex. "1415757750" 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. "1994-11-05T08:15:30-05:00" 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"

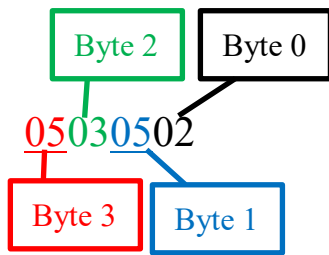
Recording Record String R

The data detail for event

message

Event	Description	Record																								
1	Wireless Connection																									
2	Reserved																									
3	Reserved																									
4	Reserved																									
5	Reserved																									
6	Reserved																									
7	Power on/off	1: Power on 2: System restart																								
8	Memory full/overwrite in log function	1: IO full 2: IO overwrite 3: System overwrite																								
9	Reserved																									
10	Reserved																									
11	FW upgrade	Version Ex: A1.00 B01 → 0A100B01																								
12	battery	<table border="1"> <thead> <tr> <th>Byte 3</th> <th colspan="2">Byte 0~2</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Value</td> <td>Event</td> </tr> <tr> <td></td> <td>1</td> <td>Low battery</td> </tr> <tr> <td>1</td> <td colspan="2">Battery voltage (mV)</td> </tr> <tr> <td>2</td> <td colspan="2">Internal battery input</td> </tr> <tr> <td>3</td> <td colspan="2">Internal Reference</td> </tr> </tbody> </table> <p>Ex: 00000001 → Low Battery Event Ex: 01000DB5 → Battery voltage 3509 mV</p>	Byte 3	Byte 0~2		0	Value	Event		1	Low battery	1	Battery voltage (mV)		2	Internal battery input		3	Internal Reference							
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15	RF Event	<table border="1"> <thead> <tr> <th>Event</th> <th>Byte 3</th> <th>Byte 0~2</th> </tr> </thead> <tbody> <tr> <td>Join fail</td> <td>1</td> <td>0</td> </tr> <tr> <td>RF intial fail</td> <td>2</td> <td>0</td> </tr> <tr> <td>Connect fail</td> <td>3</td> <td>Code</td> </tr> <tr> <td>Error event</td> <td>4</td> <td>Event code</td> </tr> <tr> <td>MAC Command</td> <td>5</td> <td>Command information</td> </tr> <tr> <td>Fcnt</td> <td>6</td> <td>Fcnt information</td> </tr> <tr> <td>Error</td> <td>7</td> <td></td> </tr> </tbody> </table> <p>Detail refer to ** RF Event Table.</p>	Event	Byte 3	Byte 0~2	Join fail	1	0	RF intial fail	2	0	Connect fail	3	Code	Error event	4	Event code	MAC Command	5	Command information	Fcnt	6	Fcnt information	Error	7	
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** RF Event Table



Byte 3		Byte 0~2	
01	Join fail	000000	
02	RF initial fail	000000	
03	Connect fail	Code	Description
		0	No ACK
		-1000	LoRaWAN Busy
		-1001	LoRaWAN would block
		-1002	Service unknown
		-1003	Invalid parameter
		-1004	Invalid frequency
		-1005	Invalid data rate
		-1006	Invalid frequency and data rate
		-1009	The device is not in a LoRaWAN
		-1010	Payload length error
		-1011	The device is switched off
		-1012	Stack not initialized
		-1013	Service not supported
		-1014	Crypto failure
		-1015	Invalid port
		-1016	Connection in progress
		-1017	No active session
		-1018	Idle at the moment
		-1019	Cannot perform requested operation
-1020	Transmission will continue after duty cycle back-off		
-1021	None of the channels is enabled at the moment		

		-1022	None of the enabled channels is ready for another TX (duty cycle limited)	
		-1023	Meta-data after an RX or TX is stale	
		-1024	The device has already joined a network	
04	Error event	Event Code	Description	
		000003 (3)	Tx timeout	
		000004 (4)	Tx error	
		000005 (5)	Crypto error	
		000006 (6)	Tx scheduling error	
		00000C (12)	Automatic uplink error	
05	MAC Command	02 LinkCheckAns		
		Byte 2	Byte 1	Byte 0
		02	00	00
		03 LinkADDRReq		
		(1) Service not supported:		
		Byte 2	Byte 1	Byte 0
		03	00	00
		(2) Normal:		
		Byte 2	Byte 1	Byte 0
		03	DataRate	TXPower
			Status (After LinkADDRReq is completed)	Bytes processed
		Bits	7:2	1
			Reserved	Data rate
				0
			Channel mask	
		04 DutyCycleReq		
		Byte 2	Byte 1	Byte 0
		04	Code	Description
			00	Success
			0E	Payload length error
				MaxDCycle
		05 RXParamSetupReq		

Byte 2	Byte 1	Byte 0																
05	RX1DRoffset	RX2DataRate																
Frequency																		
05	Status (After RXParamSetupReq is completed)																	
	<table border="1"> <tr> <th>Bits</th> <th>7:3</th> <th>2</th> <th>1</th> <th>0</th> </tr> <tr> <td></td> <td>Reserved</td> <td>Rx1Dr Offset range</td> <td>Data rate</td> <td>Frequency</td> </tr> </table>	Bits	7:3	2	1	0		Reserved	Rx1Dr Offset range	Data rate	Frequency	<table border="1"> <tr> <th>Code</th> <th>Description</th> </tr> <tr> <td>00</td> <td>Success</td> </tr> <tr> <td>0E</td> <td>Payload length error</td> </tr> </table>	Code	Description	00	Success	0E	Payload length error
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	Reserved	Rx1Dr Offset range	Data rate	Frequency														
Code	Description																	
00	Success																	
0E	Payload length error																	
06 DevStatusReq																		
Byte 2	Byte 1	Byte 0																
06	00	00																
07 NewChannelReq																		
Byte 2	Byte 1	Byte 0																
07	ChIndex	DrRange																
Frequency																		
07	Status (After NewChannelReq is completed)																	
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00	Success																	
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08 RXTimingSetupReq																		
Byte 2	Byte 1	Byte 0																
08	Delay	<table border="1"> <tr> <th>Code</th> <th>Description</th> </tr> <tr> <td>00</td> <td>Success</td> </tr> <tr> <td>0E</td> <td>Payload length error</td> </tr> </table>	Code	Description	00	Success	0E	Payload length error										
Code	Description																	
00	Success																	
0E	Payload length error																	
09 TxParamSetupReq																		
Byte 2	Byte 1	Byte 0																

		09	EIRP_ DwellTime	Result	
				Code	Description
				00	Success
				0E	Payload length error
				15	Invalid parameter
		0A DIChannelReq			
		Byte 2	Byte 1	Byte 0	
		0A	00	ChIndex	
		Frequency			
		0A	Status (After DIChannelReq is completed)		
		Bits	7:2	1	0
			Reserved	Uplink frequency	Frequency
				Code	Description
				00	Success
				0E	Payload length error
06	Fcnt	Byte 2	Byte 1~0		
		01	Uplink frame counter		
		02	Downlink sequencc counter		
		03	Downlink sequence counter difference		
7	Error	Event Code	Description		
		000001	MIC error		
		000002	LaRaWAN timeout reset		

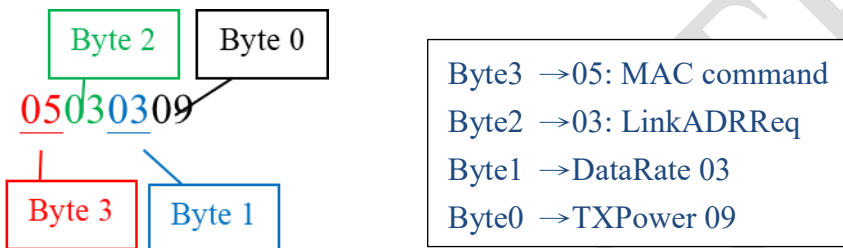
For example: Event type: 15, Value: 05030309 (WISE-2410 FW: NA version)

Important information is event type 15, record: 05xxxxxx (MAC Command) that could help to understand whether the MAC command for WISE-2410 was successfully received.

Event Type	Time	Device Name	Value
15	2020-10-27T13:47:00+08:00	WISE-2410_FF45D737	05060000
15	2020-10-27T13:49:31+08:00	WISE-2410_FF45D737	05030309
15	2020-10-27T13:49:31+08:00	WISE-2410_FF45D737	0503070A
15	2020-10-27T13:49:32+08:00	WISE-2410_FF45D737	05060000
15	2020-10-27T13:50:03+08:00	WISE-2410_FF45D737	05030309

Figure 1. System log captured from WISE-2410.

According to this format and parsing, we can parse the content of MAC command (05030309).



According to each FW version and national regulations, please refer to the LoRaWAN specification of each country, there is definition of “Data Rate 03” and “TX Power 09”.

DataRate	Configuration	Indicative physical bit rate [bit/sec]
0	LoRa: SF10 / 125 kHz	980
1	LoRa: SF9 / 125 kHz	1760
2	LoRa: SF8 / 125 kHz	3125
3	LoRa: SF7 / 125 kHz	5470
4	LoRa: SF8 / 500 kHz	12500
5:7	RFU	
8	LoRa: SF12 / 500 kHz	980
9	LoRa: SF11 / 500 kHz	1760
10	LoRa: SF10 / 500 kHz	3900
11	LoRa: SF9 / 500 kHz	7000
12	LoRa: SF8 / 500 kHz	12500
13	LoRa: SF7 / 500 kHz	21900
14..15	RFU	

US902-928 TX Data rate table

TXPower	Configuration (conducted power)
0	30 dBm – 2*TXpower
1	28 dBm
2	26 dBm
3..13
14	2 dBm
15	RFU

US902-928 TX power table

Figure 2. LoRa definition from LoRaWAN specification v1.0.2.

The result of data rate is changed to DR3-SF7/125K Hz, Tx Power 12 dBm.