EN CE

akYtec

akYtec IoT devices

communication protocol description

User guide

akYtec IoT devices_3-EN-159135-1.1

Contents

1 Protocol description

The akYtec protocol is an exchange protocol designed to work with akYtec devices. It provides the ability to exchange data between end-devices and application platforms, monitor current state or exchange commands. The protocol is a binary half-duplex protocol optimized for operation on low-speed communication channels. It is based on RFC8949 (CBOR) binary data representation format.
Data from devices is transmitted as a set of “frames”. Each frame is an object containing complete information on any measurement or event. One data packet from a device may consist of one or more consecutive frames. The number of frames in one packet is variable and depends on the limitations of the data transmission channel, as well as on the number of frames available in the built-in queue of the device at the time of transmission.
Each frame from the device is an CBOR “map” type object, that contains a set of “**data units**”, that could be:

– Metrics
– Settings
– Commands

Every data unit is represented as record in “map” object: {ID: VALUE}, where:

– **ID**: Unique identifier of data unit
– **VALUE**: Data

The VALUE field can contain a single value or a CBOR array, in case if data unit is complex data. An example of composite data unit is LoRaWAN radio signal quality parameters, that contain two values: RSSI and SNR.

2 Description of akYtec protocol data units

Table 2.1 Description of akYtec protocol data units

ID	Name	Direc-tion	Description	Type	Units	Example	Explanation	Com-ments
Metrics								
0	Timestamp	UP	Frame generation timestamp in the unix time (UTC)	integer	sec-onds	1698240094	Wed Oct 25 2023 13:21:34 GMT+0000	
1	Serial	UP	Device unique serial number	integer	–	123456	Device serial number is 123456.	
2	Battery voltage	UP	Device battery voltage	integer	mV	5500	Device battery voltage is 5500 mV or 5.5 V.	
3	Power voltage	UP	External power voltage	integer	mV	14200	External power voltage is 14200 mV or 14.2 V.	
4	Uptime	UP	Device working time since last reboot	integer	sec-onds	86400	Device last reboot was 86400 seconds ago.	
5	Version	UP	Device firmware version [major, minor]	[integer, integer]	–	[10, 7]	Device firmware version is 10.7.	
6	ICCID	UP	Unique identifier of SIM-card installed in device	integer	–	12345678901234567-89	SIM ICCID is 1234567890123456789.	
7	IMEI	UP	Device modem IMEI	integer	–	123456789012345	Device IMEI is 123456789012345.	
8	Tamper	UP	Device enclosure state: 0: Closed 1: Opened	boolean	–	[1]	Device enclosure is opened.	
9	MCU tempera-ture	UP	Device MCU temperature multiplied by 10	integer	°C	-145	Device temperature is -14.5 °C.	
10	LoRaWAN signal	UP	LoRaWAN signal quality at last data exchange: [<RSSI>, <SNR>]	[integer, integer]	dB	[-85,-5]	RSSI is -85 dBm. SNR is -5 dB.	

ID	Name	Direc-tion	Description	Type	Units	Example	Explanation	Com-ments
11	Nb-IoT signal	UP	Nb-IoT signal quality at last data exchange: [<RSSI>, <SNR>]	[integer, integer]	dB	[-74,2]	RSSI is -74 dBm. SNR is 2 dB.	
12	Analog input	UP	Device analog input readings: [<InputNumber>, <Readings>]	[integer, integer]	[–, mV]	[2, 9200]	Device analog input 2 voltage is 9200 mV or 9.2 V.	not used
13	Security input	UP	Device security input readings: [<InputNumber>, <Readings>] <Readings>: 0: Normal, 1: Alarm, 2: Alarm Permanent	[integer, boolean]	[–, –]	[1,1]	Device security input 1 is in the alarm state. Alarm	
14	Pulse input	UP	Device pulse input readings: <InputNumber>, <Readings>]	[integer, integer]	[–, coun-ter]	[2, 1023654]	Number of pulses on pulse input 2 of device is 1023654.	
15	Digital output	UP	Device digital output state: [<OutputNumber>, <EventCode>, <State>] <EventCode>: 0: Manual mode, 1: Auto mode <State>: 1: On, 0: Off	[integer, boolean, boolean]	[–, –, –]	[1, 0, 0]	Device digital output 1 is closed in the manual mode.	
16	Modbus	UP	Data read from an externally connected device via the Modbus RTU protocol: [<SlaveAddr>, <RegisterAddr>, <Readings>]	[integer, integer, integer]	[–, –, –]	[10, 0, 12254781]	Value of data read from an externally connected device via the Modbus RTU protocol is 12254781. Data is read from register 0 of slave device address 10.	
17	M-Bus	UP	Data is read from external connected device via M-Bus interface: Array includes: [Timestamp, <RSP_UD>, <SlaveSerial>, //serial number of M-Bus device in the little-endian byte order <Medium>, // see Section 8.4.1 Measured Medium Variable	[data]		[B850C365 00 9524437200 02 00 00 00]	Unix timestamp in little-endian byte order RSP_UD Slave device serial number in little-endian byte order for example: 0xB850C365 is converted to 0x65C350B8 -> 1707299000 (Dec) -> 07.02.2024, 09:43:20 UTC. M-Bus data:	

ID	Name	Direc-tion	Description	Type	Units	Example	Explanation	Com-ments
			Structure of the M-Bus specification <Status>, // Status package in accordance with the M-Bus specification <DIF>, // see Section 8.4.2 Data Field Codes of the M-Bus specification [<DIFE], // 0-10 bytes, see Section 6.3.2 Variable Data Blocks of the M-Bus specification <VIF>, // see Section 8.4.3. Codes for VIF of the M-Bus specification [<VIFE>], // 0-10 bytes, see Section 8.4.5 Codes for VIFE of the M-Bus specification [<DATA>] //1-12 bytes readings For values of <RSP_UD>, <SlaveSerial>, <Medium>, <Status>, <DIF>, <DIFE>, <VIF>, <VIFE>, <DATA> refer to the M-Bus specification				for example: 00952443720002000000 Slave Serial -> 0x95244372 -> 0x72432495	
18	4-20 mA input	UP	Device 4-20 mA input readings: [<InputNumber>, <Readings>]	[integer, integer]	[–, uA]	[2, 9450]		not used
19	0-10 V input	UP	Device 0-10 V input readings: [<InputNumber>, <Readings>]	[integer, integer]	[–, mV]	[1, 5250]		not used
20	Tempera-ture input	UP	Device temperature input readings multiplied by 10: [<InputNumber>, <Readings>]	[integer, integer]	[–, °C]	[3;-25]		not used
Settings								
1000	General settings		[<DataSendPeriodMinutes>, <Turn off indication>, <Antenna type>]	[integer, boolean, boolean]	[min, – –]	[30, 0, 0]	Data transmission period 30 min Indication enabled Internal antenna	

ID	Name	Direc-tion	Description	Type	Units	Example	Explanation	Com-ments
			<DataSendPeriodMinutes>: Period of data send attempts in minutes. Data will be sent only if device internal queue is not empty. Data may have values: 1, 5, 10, 30, 60, 240, 360, 720, 1440. <Turn off indication>: 0: Enable indication, 1: Disable indication. <Antenna type>: 1: External, 0: Internal					
1001	LoRaWAN settings	UP/ DOWN	[<Activation in network>, <Region>, <ADR>, <Starting speed>, <Synchronization period>, <RejoinPeriodMinutes>, <Confirmation>] <Activation in network>: 0: ABP, 1: OTAA <Region>: 0: EU868, 1: US915, 2: AS923, 3: RU864 <ADR>: 0: Disabled, 1: Enabled <Starting speed>: 0: DR0, 1: DR1, 2: DR2, 3: DR3, 4: DR4, 5: DR5. <Synchronization period> MIn: Period of time synchronization with the network. <RejoinPeriodMinutes> Min: Period of join network attempts if device not joined to the network <Confirmation>: 0: Disabled, 1: Enabled	[integer, integer, boolean, integer, integer, integer, boolean]		[1, 3, 1, 0, 20, 60, 1]	OTAA, EU868, ADR , DR0, Synchronization period 20 min, Rejoin period is 60 minutes, Confirmation enabled	

ID	Name	Direc-tion	Description	Type	Units	Example	Explanation	Com-ments
1002	Nb-IoT settings	UP/ DOWN	[<DataSendPeriodMinutes , <MqttAddress>, <MqttPort>, <MqttTopic>] <DataSendPeriodMinutes>: Period of data send attempts in minutes. Data will be sent only if device internal queue is not empty. <MqttAddress>: Address of server data should be sent to <MqttPort>: Port on server data should be sent to <MqttTopic>: Topic, data should be published to. Device will append "/<Serial>" to the end of the topic, where <Serial> is serial number of device.					not used
1003	Analog input settings	UP/ DOWN	[<InputNumber>, <IsEnabled>, <FrameGenerationPeriod>, <TriggerDataTransmission>] <InputNumber>: Device input number <IsEnabled>: 0: Disabled, 1: Enabled, <FrameGenerationPeriod>: 0: 1 hour, 1: 4 hours, 2: 12 hours, 3: 24 hours <TriggerDataTransmission>: 0: Data transmission isn't triggered, data will be just inserted in queue and sent in according with radio data send period setting. 1: Data transmission is triggered when frame is generated.	[integer, boolean, integer, boolean]	[–, –, Hour, –]	[1, 1, 2, 1]	Analog input 1 is enabled, data frame is generated every 12 hours and data transmission procedure is triggered.	not used

ID	Name	Direc-tion	Description	Type	Units	Example	Explanation	Com-ments
1004	Digital input settings	UP/ DOWN	[<InputNumber>, <InputMode>, <FrameGenerationPeriod>, <TriggerDataTransmission>, <TriggerMormDataTransmission>, <Permanent anti-bounce>, <Automatic alarm reset>] <InputNumber>: Device input number <InputMode>: 0: Pulse, 1: Alarm Opened, 2: Alarm Closed, 3: Disabled. <FrameGenerationPeriod>(min): [1,5,10,15,30,60,240,360,720,14-40] <TriggerDataTransmission>: 0: Data transmission isn't triggered, data will be just inserted in queue and sent in according with radio data send period setting. 1: Data transmission is triggered when frame is generated. <TriggerMormDataTransmission>: 0: Data transmission isn't triggered, data will be just inserted in queue and sent in according with radio data send period setting. 1: Data transmission is triggered when frame is generated. <Permanent anti-bounce>:(mS) [3 - 255] <Automatic alarm reset>(Sec.). Alarm is automatically reset, when the security input is restored. 0: Manual reset	[integer, integer, integer, boolean, boolean, integer, integer]	[–, –, min, – –, mS, S]	[1, 0, 60, 0, 0, 5, 0]	Input 1 is enabled, configured as pulse input that generate data frame every 1 hour and doesn't trigger data transmission procedure. Debounce time 5 mS. Manual reset alarm	

ID	Name	Direc-tion	Description	Type	Units	Example	Explanation	Com-ments
1005	RS-485 settings	UP/ DOWN	Device RS-485 interface settings: [<Speed>, <Parity>] <Speed>: 0: 2400, 1: 4800, 2: 9600, 3: 14400, 4: 19200, 5: 38400, 6: 57600 <Parity>: 0: None, 1: Even, 2: Odd	[integer, integer]		[2, 0]	9600 bps no parity Parity – None	not used
1006	Modbus general settings	UP/ DOWN	<ModbusEnabled>, <PollPeriod>, <initiate data transfer>, <Operation from backup battery>, <Constant monitoring>, <Start polling all measurements> <ModbusEnabled>: 1: On, 0: Off. <PollPeriod>: (Min) Period of polling slave for data to check if readings is in/out of thresholds 1: 1 min, 5: 5min, 10: 10 min, 30: 30 min, 60: 1 hour, 240: 4 hours, 360: 6 hours, 720: 12 hours, 1440: 24 hours. <Initiate data transfer>: 0: Off, 1: ALWAYS, 2: If state changed <Operation from backup battery>: 1: On, 0: Off. <Constant monitoring>: 1: On, 0: Off. <Start polling all measurements>: 1: On, 0: Off.	[boo-lean, integer, integer, boolean, boolean, boolean]	[– min, –, –, –, –]	[1, 30, 0, 0, 0, 1]	Modbus enabled Poll period 30 min initiate data transfer – off Operation from backup battery – off Constant monitoring – off Start polling all measurements – on	
1007	Modbus settings	UP/ DOWN	[<MeasurementNumber>, <MeasurementEnabled>, <SlaveAddress>, <BaudRate>, <Parity>, <Warm-up time>,	[integer, integer, integer, integer, integer, integer, integer,		[2, 1, 20, 3, 1, 1,	Measurement #2 Enabled Slave with address 14 BaudRate: 9600 Parity: None Warm-up time 1 Sec.	

ID	Name	Direc-tion	Description	Type	Units	Example	Explanation	Com-ments
			<ModbusFunction>, <StartRegister>, <RegisterCount>, <Endian>, <IsSigned>, <HighThreshold>, <LowThreshold>] <MeasurementNumber>: Measurement number from 1 to 10 <MeasurementEnabled>: 0: Disabled, 1: Enabled <SlaveAddress>: Modbus slave device address on bus <BaudRate>: 0: 1200, 1: 2400, 2: 4800, 3: 9600, 4: 14400, 5: 19200, 6: 28800, 7: 31250, 8: 38400, 9: 57600, 10: 76800, 11: 115200 <Parity>: 0: None, 1: Even, 2: Odd <Warm–up time> <ModbusFunction>: 1: Coils, 2: Inputs, 3: Holding registers, 4: Input registers <StartRegister>: Address of first register to read <RegisterCount>: Number of registers to read from 1 to 4 <Endian> : 0: Little endian, 1: Big endian, 2: Little endian byte swap, 3: Big endian byte swap. <IsSigned>: 0: not signed, 1: signed <HighThreshold>: Upper threshold of read value <LowThreshold>: Lower threshold of read value	integer, integer, integer, boolean, integer, integer]		3, 0, 10, 1, 0, -1000, 1000]	ModbusFunction: holding registers StartRegister: 0 RegisterCount: 10 Endian: big endian IsSigned: not signed Lower threshold is -1000 Upper threshold is 1000	

ID	Name	Direc-tion	Description	Type	Units	Example	Explanation	Com-ments
1008	M-Bus general settings	UP/ DOWN	[< MeasurementEnabled , <FrameGenerationPeriodMi-nutes>] < MeasurementEnabled : 0: Disabled, 1: Enabled <FrameGenerationPeriodMi-nutes>: Period of measurement frame generation: 1: 1 min, 5: 5 min, 10: 10 min, 30: 30 min, 60: 1 hour, 240: 4 hours, 360: 6 hours, 720: 12 hours, 1440: 24 hours.	[boo-lean, integer]		[1, 5]	Enabled measurement Frame generation period 5 minutes	
1009	M-Bus settings	UP/ DOWN	[<MeasurementNumber>, <SlaveSerial>, <BaudRate>, <MeasurementParameter> <MeasurementNumber>: Measurement number from 1 to 10 <SlaveSerial>: M Bus slave device serial number (secondary address) <BaudRate>: 0: 300, 1: 600, 2: 1200, 3: 2400, 4: 4800, 5: 9600 <MeasurementParameter> Measurement parameter from 1 to 10	[integer, integer, integer, integer]		[1, 98765, 4, [3,4,5]]	M-Bus measurement #1 Slave serial (secondary address) is 987654. Baud rate – 4800 Poll slave and generate frame every hour Measurement parameter 3,4,5	
1010	4-20 mA input settings		N/A					
1011	0-10 V input settings		N/A					
1012	Tempera-ture input settings		N/A					

ID	Name	Direc-tion	Description	Type	Units	Example	Explanation	Com-ments
1013	GNSS geoloca-tion settings		N/A					
1014	Settings of Digital Output		[<Alarm mode>, <Alarm output control. In1>, <Alarm output control. In2>, <Alarm output control. In3>, <Alarm output control. In4>] <Alarm mode>: 1: On, 0: Off. <Alarm output control. In (N): 1: On, 0: Off	[boo-lean, boolean, boolean, boolean, boolean]		[1, 1, 1, 1, 1]	Digital output enabled by alarm. Input 1 controls the digital output automatically in security mode. Input 2 controls the digital output automatically in security mode, if available. if there is no such input – 0.	
Commands								
2001	Reboot	UP/ DOWN	Restart device	integer		[1]	Restart device example: {2001:[1]}	
2002	Reset to defaults	UP/ DOWN	Reset device to factory default settings	integer		[1]	Reset device to the factory default settings {2002:[1]}	
2003	Set device time	UP/ DOWN	Set device time to value in unixtime (UTC) format	integer	sec-onds	1698240094	Set device time to Wed Oct 25 2023 13:21:34 GMT +0000	For Nb-IOT only
2004	Digital output control	UP/ DOWN	Control the device digital output [<State>, <TimeAutoMode>] <State>: 0: Off, 1: On. <TimeAutoMode>:(Min) Switching time to automatic mode for **CI201-LW** always – 0.	[boo-lean, integer]		[1, 60]	Digital output is on. Switches to automatic mode after 60 minutes {2004:[1,60]}	
2005	Start all measure-ments	UP/ DOWN	Start all measurements	integer		[1]	{2005:[1]}	
2006	Send packet	UP/ DOWN	Send packet	integer		[1]	{2006:[1]}	

ID	Name	Direc-tion	Description	Type	Units	Example	Explanation	Com-ments
2007	Manual reset alarm	UP/ DOWN	Manual reset alarm	integer		[1]	{2007:[1]}	
2008	Find device	UP/ DOWN	Find device	integer		[1]	{2008:[1]}	
2009	Erase flash	UP/ DOWN	Erase flash	integer		[1]	{2009:[1]}	
2010	Reset counters	UP/ DOWN	Reset counters	integer		[1]	{2010:[1]}	
2011	Reset device opening flag	UP/ DOWN	Reset device opening flag	integer		[1]	{2011:[1]}	
2012	Rejoin	UP/ DOWN	Rejoin	integer		[1]	{2012:[1]}	

3 Examples of akYtec protocol data frames

Frame description	Diagnostic notation	Annotated HEX

Device information frame.
It should be sent after every device restart and every 48 hours, contains data units:
– Timestamp
– Serial number
– Firmware version
– MCU temperature
– Uptime
– Tamper
– Battery voltage
– External voltage
– LoRaWAN signal
	{
	0: 1702733757,
	1: 72012345,
	5: [0, 1],
	9: 0,
	4: 45,
	8: 0,
	2: 6303,
	3: 10848,
	10: [-42, 14]
	}
		A9 # map(9)
		00 # unsigned(0)
		1A 657DA7BD # unsigned(1702733757)
		01 # unsigned(1)
		1A 044AD239 # unsigned(72012345)
		05 # unsigned(5)
		82 # array(2)
		00 # unsigned(0)
		01 # unsigned(1)
		09 # unsigned(9)
		00 # unsigned(0)
		04 # unsigned(4)
		18 2D # unsigned(45)
		08 # unsigned(8)
		00 # unsigned(0)
		02 # unsigned(2)
		19 189F # unsigned(6303)
		03 # unsigned(3)
		19 2A60 # unsigned(10848)
		0A # unsigned(10)
		82 # array(2)
		38 29 # negative(41)
		0E # unsigned(14)

Digital input 1 data frame (input is configured as pulse) could be sent periodically, contains data units:
– Timestamp
– Pulse input 1 data
	{
	0: 1702733757, // Sat Dec 16 2023 13:35:57 GMT+0000
	14:[1, 10] // 10 pulses on input 1
	}
		A2 # map(2)
		00 # unsigned(0)
		1A 657DA7BD # unsigned(1702733757)
		0E # unsigned(14)
		82 # array(2)
		01 # unsigned(1)
		0A # unsigned(10)

Security input 3 data frame could be sent periodically or based on alarms, contains data units: – Timestamp	{ 0: 1702733757, // Sat Dec 16 2023 13:35:57 GMT+0000	A2 # map(2) 00 # unsigned(0) 1A 657DA7BD # unsigned(1702733757) 0D # unsigned(13)

Frame description	Diagnostic notation	Annotated HEX
– Security input 3 data	13:[3, 1] // Security input 3 is in the alarm state }	82 # array(2) 03 # unsigned(3) 01 # unsigned(1)

4 Examples of device commands

Table 4.1 Settings of commands used for CI200-LW

Settings/Commands	Direction	DOWN	UP	Data transmission period	Frame saving period
1000	UP/DOWN	{1000:[1,0,0]}	{0:72012345, 1000: [1,0,0]}	Command	
1001	UP/DOWN	{1001:[1,3,1,0,20,60,1]}	{0:72012345,1001: [1,3,1,0,20,60,1]}	Command	
1004	UP/DOWN	{1004:[1,0,60,0,0,5,0]}	{0:72012345,1004: [1,0,60,0,0,5,0]}	Command	
1014	UP/DOWN	{1014:[0,1,1,1,1]}	{0:72012345,1014: [0,1,1,1,1]}	Command	
2001	DOWN	{2001:[1]}		Command	
2002	UP/DOWN	{2002:[1]}	{0:72012345,2002:[1]}	Command	
2004	UP/DOWN	{2004:[1,5]}	{0:72012345,2004: [1,5]}	Command	
2005	UP/DOWN	{2002:[1]}	{0:72012345,2005:[1]}	Command	
2006	UP/DOWN	{2006:[1]}	{0:72012345,2006:[1]}	Command	
2007	UP/DOWN	{2007:[1]}	{0:72012345,2007:[1]}	Command	
2008	UP/DOWN	{2008:[1]}	{0:72012345,2008:[1]}	Command	
2009	UP/DOWN	{2009:[1]}	{0:72012345,2009:[1]}	Command	
2010	UP/DOWN	{2010:[1]}	{0:72012345,2010:[1]}	Command	
Device information frame includes frames: (0,5,9,4,8,2,3,10)	UP		{0: 1706845405, 1: 73012347, 5: [0, 1], 9: 0, 4: 45, 8: 0, 2: 6303, 3: 10848, 10: [-42, 14]}	48 hours For example 24 hours	48 hours For example 24 hours
13	UP		{1: 72012345, 13:[1,0]}	Setting	State changed

Settings/Commands	Direction	DOWN	UP	Data transmission period	Frame saving period
14	UP		{1: 72012345, 14: [2,4558]}	Setting	Setting
15	UP		{1: 72012345, 15:[1,0]}	Setting	State changed

Table 4.2 Settings of commands used for CI201-LW

Settings/Commands	Direction	DOWN	UP	Data transmission period	Frame saving period
1000	UP/DOWN	{1000:[1,0,0]}	{0:72012345, 1000: [1,0,0]}	Command	
1001	UP/DOWN	{1001:[1,3,1,0,20,60,1]}	{0:72012345,1001: [1,3,1,0,20,60,1]}	Command	
1004	UP/DOWN	{1004:[1,0,60,0,0,5,0]}	{0:72012345,1004: [1,0,60,0,0,5,0]}	Command	
1014	UP/DOWN	{1014:[0,1,1,1,1]}	{0:72012345,1014: [0,1,1,1,1]}	Command	
2001	DOWN	{2001:[1]}		Command	
2002	UP/DOWN	{2002:[1]}	{0:72012345,2002:[1]}	Command	
2004	UP/DOWN	{2004:[1,0]}	{0:72012345,2004: [1,0]}	Command	
2005	UP/DOWN	{2002:[1]}	{0:72012345,2005:[1]}	Command	
2006	UP/DOWN	{2006:[1]}	{0:72012345,2006:[1]}	Command	
2007	UP/DOWN	{2007:[1]}	{0:72012345,2007:[1]}	Command	
2008	UP/DOWN	{2008:[1]}	{0:72012345,2008:[1]}	Command	
2009	UP/DOWN	{2009:[1]}	{0:72012345,2009:[1]}	Command	
2010	UP/DOWN	{2010:[1]}	{0:72012345,2010:[1]}	Command	

Settings/Commands	Direction	DOWN	UP	Data transmission period	Frame saving period
Device information frame includes frames: (0,5,9,4,8,2,3,10)	UP		{0: 1706845405, 1: 73012347, 5: [0, 1], 9: 0, 4: 45, 8: 0, 2: 6303, 3: 10848, 10: [-42, 14]}	48 hours For example 24 hours	48 hours For example 24 hours
13	UP		{1: 72012345, 13:[1,0]}	Setting	State change
14	UP		{1: 72012345, 14: [2,4558]}	Setting	Setting
15	UP		{1: 72012345, 15:[1,0]}	Setting	State change

Table 4.3 Settings of commands used for IC200-MRTU-LW

Settings/Commands	Direction	DOWN	UP	Data transmission period	Frame saving period
1000	UP/DOWN	{1000: [1,0,0]}	{0:72012345, 1000: [1,0,0]}	Command	
1001	UP/DOWN	{1001: [1,3,1,0,20,60,1]}	{0:72012345,1001: [1,3,1,0,20,60,1]}	Command	
1004	UP/DOWN	{1004: [1,0,60,0,0,5,0]}	{0:72012345,1004: [1,0,60,0,0,5,0]}	Command	
1006	UP/DOWN	{1006: [1,30,0,0,0,1]}	{0: 72012399, 1006: [1, 30, 0, 0, 0, 1]}	Command	
1007	UP/DOWN	{1007: [2,1,20,3,1,1,3,0,10,1,-0,-1000, 1000]}	{0: 1706774091, 1007: [2, 1, 20, 3, 1, 1, 3, 0, 10, 1, 0, -1000, 1000]}	Command	
1014	UP/DOWN	{1014:[0,1,1,1,1]}	{0:72012345,1014: [0,1,1,1,1]}	Command	
2001	DOWN	{2001:[1]}		Command	
2002	UP/DOWN	{2002:[1]}	{0:72012345,2002:[1]}	Command	

Settings/Commands	Direction	DOWN	UP	Data transmission period	Frame saving period
2004	UP/DOWN	{2004:[1,5]}	{0:72012345,2004:[1,5]}	Command	
2005	UP/DOWN	{2002:[1]}	{0:72012345,2005:[1]}	Command	
2006	UP/DOWN	{2006:[1]}	{0:72012345,2006:[1]}	Command	
2007	UP/DOWN	{2007:[1]}	{0:72012345,2007:[1]}	Command	
2008	UP/DOWN	{2008:[1]}	{0:72012345,2008:[1]}	Command	
2009	UP/DOWN	{2009:[1]}	{0:72012345,2009:[1]}	Command	
2010	UP/DOWN	{2010:[1]}	{0:72012345,2010:[1]}	Command	
Device information frame includes frames: (0,5,9,4,8,2,3,10)	UP		{0: 1706845405, 1: 73012347, 5: [0, 1], 9: 0, 4: 45, 8: 0, 2: 6303, 3: 10848, 10: [-42, 14]}	48 hours. For example 24 hours	48 hours. For example 24 hours
13	UP		{1: 72012345, 13:[1,0]}	Setting	State changed
14	UP		{1: 72012345, 14:[2,4558]}	Setting	Setting
15	UP		{1: 72012345, 15:[1,0]}	Setting	State changed
16	UP		{0: 1707308520, 16: [1, 0, 122547818191810634-92]}	Setting	Setting

Table 4.4 Settings of commands used for IC200-MBUS-LW

Settings/Commands	Direction	DOWN	UP	Data transmission period	Frame saving period
1000	UP/DOWN	{1000:[1,0,0]}	{0:72012345, 1000: [1,0,0]}	Command	
1001	UP/DOWN	{1001:[1,3,1,0,20,60,1]}	{0:72012345,1001: [1,3,1,0,20,60,1]}	Command	
1004	UP/DOWN	{1004:[1,0,60,0,0,5,0]}	{0:72012345,1004: [1,0,60,0,0,5,0]}	Command	
1014	UP/DOWN	{1014:[0,1,1,1,1]}	{0:72012345,1014: [0,1,1,1,1]}	Command	
1008	UP/DOWN	{1008:[1,30]}	{0:72012345,1008: [1,30]}	Command	
1009	UP/DOWN	{1009:[1,74954825,3, [4,5,9]]}	{0: 1706844407, 1009: [1, 74954825, 3, [4, 5, 9]]}	Command	
2001	DOWN	{2001:[1]}		Command	
2002	UP/DOWN	{2002:[1]}	{0:72012345,2002:[1]}	Command	
2004	UP/DOWN	{2004:[1,5]}	{0:72012345,2004: [1,5]}	Command	
2005	UP/DOWN	{2002:[1]}	{0:72012345,2005:[1]}	Command	
2006	UP/DOWN	{2006:[1]}	{0:72012345,2006:[1]}	Command	
2007	UP/DOWN	{2007:[1]}	{0:72012345,2007:[1]}	Command	
2008	UP/DOWN	{2008:[1]}	{0:72012345,2008:[1]}	Command	
2009	UP/DOWN	{2009:[1]}	{0:72012345,2009:[1]}	Command	
2010	UP/DOWN	{2010:[1]}	{0:72012345,2010:[1]}	Command	
Device information frame includes frames:	UP		{0: 1706845405, 1: 73012347, 5: [0, 1], 9:	48 hours. For example 24 hours	48 hours. For example 24 hours

Settings/Commands	Direction	DOWN	UP	Data transmission period	Frame saving period
(0,5,9,4,8,2,3,10)			0, 4: 45, 8: 0, 2: 6303, 3: 10848, 10: [-42, 14]}		
13	UP		{1: 72012345, 13:[1,0]}	Setting	State changed
14	UP		{1: 72012345, 14: [2,4558]}	Setting	Setting
15	UP		{1: 72012345, 15:[1,0]}	Setting	State changed
17	UP		{17: h'C261-C3650095244372063-00266DC00'}	Setting	Setting