LoRaWAN® Controller

UC11 Series

Communication Protocol

Revision History

Date	Doc Version	Description
Feb. 24, 2021	V 1.0	Initial version
Nov. 25, 2021	V 1.1	Add Modbus descriptions and reboot command

Contents

1. Overview

UC11 Series use the standard Milesight IoT payload format based on IPSO. All data are based on following format:

Channel1	Type1	Data1	Channel2	Type2	Data2	Channel 3	...
1 Byte	1 Byte	N Bytes	1 Byte	1 Byte	M Bytes	1 Byte	...

Channel	Description
01	Digital Input 1
02	Digital Input 2
...	...
08	Digital Input 8
09	Digital Output 1
0a	Digital Output 2
...	...
10	Digital Output 8
11	Analog Input1
...	...
18	Analog Input8
ff	Device information or RS485 data

Note:

1) All explanations and examples in this document are based on HEX format.
2) For all Milesight IoT decoder examples please find files on https://github.com/Milesight-IoT/SensorDecoders

2. Uplink Payload

Uplink payloads of UC11 Series are made up of device information and sensor data.

2.1 Device Information

UC11 series report basic device information of device everytime joining the network.

Channel	Type	Data Size/Byte	Description
ff	01(Protocol Version)	1	01=>V1
	08 (Device SN)	6	64 12 a4 30 44 14=> Device SN is 6412a4304414
	09 (Hardware Version)	2	02 10=>V2.1
	0a(Software Version)	2	01 01=>V1.1

Examples:

ff 08 61 16 a3 91 74 56 ff 09 03 00 ff 0a 03 08					
Channel	**Type**	**Value**	**Channel**	**Type**	**Value**
ff	08 (Device SN)	61 16 a3 91 74 56	ff	09 (Hardware version)	0300 (V3.0)
Channel	**Type**	**Value**			
ff	0a (Software version)	0308 (V3.8)			

2.2 Sensor Data

UC11 series report sensor data according to reporting interval (10min by default).

Channel	Type	Data Size/Byte	Description
01(DI 1)	00(Digital Input)	1	00=low, 01=high
	c8(Counter)	4	Unsigned
02(DI 2)	00(Digital Input)	1	00=low, 01=high
	c8(Counter)	4	Unsigned
09(DO 1)	01 (Digital Output)	1	00=low, 01=high
0a(DO 2)			
11(AI 1)	02(Analog Input)	8	**Byte 1-2:** Current value **Byte 3-4:** Min value **Byte 5-6:** Max value
12(AI 2)			

			Byte 7-8: Average value
ff	0e(RS485)	Mutable (6-8)	Total: Byte 1+Byte 2+Value **Byte 1:** Channel ID **Byte 2:** **Bit 0~2:** Data Type 001: Coil 001: Discrete 010: Input Register (INT16) Input Register (INT32 with upper 16 bits) Input Register (INT32 with lower 16 bits) 011: Holding Register (INT16) Holding Register (INT32 with upper 16 bits) Holding Register (INT32 with lower 16 bits) 100: Holding Register (INT32) 101: Holding Register (Float) 110: Input Register (INT32) 111: Input Register (Float) **Bit 3~7:** Data Length
ff	15	1	Modbus data collection failed package.The device will return the failed Modbus channel ID.

Note: Modbus Channel ID can be configured in ToolBox.

Channel ID of RS485	Description
19	RS485(Modbus Master) Channel 1
1a	RS485(Modbus Master) Channel 2
1b	RS485(Modbus Master) Channel 3
...	...
28	RS485(Modbus Master) Channel 16

Examples:

1. UC1114 regular uplink

01 00 01 02 c8 06 00 00 00 09 01 00 0a 01 01					
Channel	**Type**	**Value**	**Channel**	**Type**	**Value**
01 (DI 1)	00 (Digital	01=>High	02 (DI 2)	c8(Pulse Counter)	06 00 00 00 =>00 00 00

	Input)				06=6
Channel	**Type**	**Value**	**Channel**	**Type**	**Value**
09 (DO 1)	01 (Digital Output)	00=>Low	0a (DO 2)	01 (Digital Output)	01=>High

2. UC1122 regular uplink

01 00 00 09 01 01 11 02 c302 c302 c302 c302 12 02 0000 0000 0000 0000					
Channel	**Type**	**Value**	**Channel**	**Type**	**Value**
01 (DI)	00 (Digital Input)	00=>Low	09 (DO)	01 (Digital Output)	01=>High
Channel	**Type**	**Ccy Value**	**Min Value**	**Max Value**	**Avg Value**
11 (AI 1)	02 (Analog Input)	C3 02 => 02 c3 = 707 means 7.07	C3 02 => 02 c3 = 707 means 7.07	C3 02 => 02 c3 = 707 means 7.07	C3 02 => 02 c3 = 707 means 7.07
Channel	**Type**	**Ccy Value**	**Min Value**	**Max Value**	**Avg Value**
12 (AI 2)	02 (Analog Input)	00 00 => 00 00 = 0	0 00 => 00 00 = 0	0 00 => 00 00 = 0	0 00 => 00 00 = 0

3. UC1152 regular uplink

01 c8 06 00 00 00 09 01 00					
Channel	**Type**	**Value**	**Channel**	**Type**	**Value**
01 (DI)	c8(Pulse Counter)	06 00 00 00 =>00 00 00 06=6	09 (DO)	01 (Digital Output)	00=>Low

ff 0e 19 25 00000000				
Channel	**Type**	**Channel ID**	**Data Type**	**Value**
ff	0e (RS485)	19 means RS485 (Modbus Master) Channel 1	25 => 00100101 Bit0-bit2: 101 means Holding Register (Float) Bit3-Bit7: 00100=>4 Means data length = 4	00000000

ff 15 19		
Channel	Type	Value
ff	15 (collect failed)	19 means RS485(Modbus Master) Channel 1

3. Downlink Payload

Downlink is used for controlling the UC11 via network server remotely. Downlink port (Application port) is 85 by default and can be configured via ToolBox.

When the channel range is 1~253, the format is:

Channel1	Data1	Reserved	Channel2	Data2	Reserved	Channel3	...
1 Byte	2 Byte	ff	1 Byte	2 Byte	ff	1 Byte	...

When the channel is 255(ff), the format is:

Channel1	Type1	Data1	Channel2	Type2	Data2	Channel 3	...
1 Byte	1 Byte	N Bytes	1 Byte	1 Byte	M Bytes	1 Byte	...

Examples:

1. DO Control

09 01 00 ff		
Channel	Value	Reversed
09(Digital Output 1)	01 00(High)	ff

2. Reporting Interval

ff 03 b0 04		
Channel	Type	Value
ff	03(Set Reporting Interval)	b0 04 => 04 b0 = 1200s

3. Configure the device time

ff 11 3d 1c de 5d		
Channel	Type	Value
ff	11(Set Device Time)	3d 1c de 5d=>5d de 1c 3d=1574837309(Unix timestamp) =>2019/11/17 14:48:29

4. Reboot the device

ff 10 ff		
Channel	Type	Reversed
ff	10(Reboot)	ff

-END-