

# Control Protocol for UC3x

v2.2

# Content

<b>Description .....</b>	<b>3</b>
<b>Milesight IoT Cloud .....</b>	<b>3</b>
<b>AWS/MQTT .....</b>	<b>3</b>
<b>TCP/UDP .....</b>	<b>4</b>
Attribute Report (F3) .....	5
Params Report (F5) .....	6
<i>UC3x14/52</i> .....	6
<i>UC3x22</i> .....	7
Regular Report (F4) .....	8
<i>UC3x14</i> .....	8
<i>UC3x22</i> .....	10
<i>UC3x52</i> .....	11
Change Report (F2) .....	13
DTU Report (F6) .....	14
Alarm Report (F7) .....	15
<b>Control Protocol .....</b>	<b>21</b>
Cheat Sheet .....	22
Password Validation (01/81) .....	22
Reboot UC3x (02/82) .....	23
Parameter Query (04/84) .....	23
Configure the Device (05/85) .....	25
<i>Change Report Interval (28)</i> .....	25
<i>Change Collecting Interval (29)</i> .....	25
<i>Control osh and osl for UC3x22 (2A/2B)</i> .....	26
<i>Control Digital Output (10)</i> .....	26

## Description

This document is only for the introduction to Milesight IoT UC3x Remote I/O, and discusses message exchange mechanism, control method under different application mode – Milesight IoT Cloud, AWS/MQTT, TCP/UDP.

We provide software the parser [download link](#) for test only (source code not included).

Parser configuration for UC3x:

Mode	Cloud
Device Type	Digit(3x14)/Analog(3x22)/UART(3x52)
UCP Version	v1.3

## Milesight IoT Cloud

Select Milesight IoT Cloud mode. After adding device to your account, you can check “Interface Status” on “Devices”. The toggle button indicates low-level and green button indicates high-level. Click these buttons to operate and you may see a red exclamation mark on the right of the buttons if the status control fails.

The screenshot shows the Milesight IoT Cloud interface. The 'Devices' tab is active, displaying a list of devices. The first device is 'AM107 Ambience Monitoring Sensor' (ID: 6128A1650502). Its interface status includes: Temperature (22.8°C), Humidity (63%), Activity Level (PIR) (0), Illumination (6lux), CO2 (348ppm), TVOC (388ppb), and Barometric Pressure (1014.3hPa). The second device is 'UC1114 LoRa Remote IO' (ID: 611693925791). Its interface status includes: DI 1 (Low), DI 2 (Low), Air Conditioner (OFF), and Light (OFF). The interface also shows a search bar, status filters (Normal 0, Alarm 0, Offline 2, Inactive 0), and a '+ New Devices' button.

## AWS/MQTT

### Server -> UC3x

- Control the Digital Output Directly

Topic: \$aws/things/[SN]/shadow/update/accepted

Content (JSON):

```
{"state":{"desired":{"dout1":"on"}}
```

```
{"state":{"desired":{"dout1":"off"}}
```

- Reboot or modify configuration

Topic: uc/[SN]/ucp/13/cfg/update

Content (hex): Command string\* referring to [Control Protocol](#).

\*Query is not supported under AWS/MQTT mode.

## UC3x -> Server

Reporting Interval is identical as Reporting Interval set in ToolBox.

Except "status" reports regularly, the rest topics report only when the device turns on.

Use "+" as a single-level wildcard to subscribe: uc/[SN]/ucp/13/+

Corresponding content:

Topic	Content
uc/[SN]/ucp/13/cfg	SIM number
uc/[SN]/ucp/13/attr	ucp/SN/hardware No./firmware No./Model/IMEI/IMSI
uc/[SN]/ucp/13/status	Timestamp/cellular Signal/value
uc/[SN]/ucp/13/dev	Online (6F6E 6C69 6E65)/offline (6F66 666C 696E 65)

Command statement:

Type	Topic	Content
Accepted	uc/[SN]/ucp/13/cfg/update/accepted	accepted
Rejected	uc/[SN]/ucp/13/cfg/update/rejected	rejected

## TCP/UDP

### Server -> UC3x

Content (hex): Command string referring to [Control Protocol](#).

## UC3x -> Server

If "Register String" in UC3452's RS232 setting is not left blank, device will send the ASCII string when connected to the server.

Messages only send as powered:

1. Device SN; ends with an extra 5C(hex) as the escape character "\".
2. [Attribute report \(F3\)](#)
3. [Params report \(F5\)](#)

When digital output is changed by issuing command according to [Control Digital Output \(10\)](#), device responds with a [Change Report \(F2\)](#).

[Regular Reports \(F4\)](#) is sent every cycle set as "reporting interval" in ToolBox, default interval is 1800 sec.

When RS232's transparent transmission to TCP/UDP server has established connection with server side, [DTU Report \(F6\)](#) sends local IP address and port that this UC3x uses for connection. Due to interface difference among models, only UC3x52 reports this message.

If there's a command that triggers "THEN send an alarm", [Alarm Report \(F7\)](#) message with trigger situation is sent specially.

[Intelligence Report \(F8\)](#) is related to command as well, which is more about the input side. When data collected meets "IF input" condition, the F8 message comes to server with updated value or state.

## Attribute Report (F3)

Parameter	Length (byte)	Description
Protocol version	1	Defined by Milesight IoT
UCP version	1	Defined by Milesight IoT, 0.1 for resolution
SN	12	Same with S/N under barcode on device info sticker
Hardware version	4	0.01 for resolution
Firmware version	4	0.01 for resolution
Model	4	byte 1 is 3 for UC3x; byte 2 is network type, 2 for 2G, 3 for 3G, 4 for 4G, 5 for NB-IoT;

		the rest may be 14, 22, 52 for different interface
IMEI	15	Module specification
IMSI	15	SIM card specification
Description	16	1 byte for 1 ASCII character

Example:

<pre> 7E F3 3F 00 01 13 36 31 31 33 39 35 31 39 37 37 39 35 30 32 31 30 30 33 31 33 33 34 32 32 38 36 37 39 36 32 30 34 32 36 35 34 39 35 37 00 34 36 30 30 37 37 35 39 32 33 39 34 33 35 38 00 5445535420412F422D436400 7E </pre>	
Total packet length	3F 00=>00 3F=63
Protocol version	01=1
UCP version	13=1.3
SN	36 31 31 33 39 35 31 39 37 37 39 35 =611395197795
Hardware version	30 32 31 30=>0210=2.10
Firmware version	30 33 31 33=>0313=3.13
Model	33 34 32 32=>3422=UC3422
IMEI	38 36 37 39 36 32 30 34 32 36 35 34 39 35 37 00=867962042654957
IMSI	34 36 30 30 37 37 35 39 32 33 39 34 33 35 38 00=460077592394358
Description	5445535420412F422D4364000000000000 00000000000000000000000000000000=> TEST A/B-Cd

## Params Report (F5)

### UC3x14/52

Parameter	Length (byte)	Description
-----------	---------------	-------------

Protocol version	1	Defined by Milesight IoT
Network type	1	00 for AUTO,
SMSC number	Mutable	Starts with 2B for "+" before country code
PIN code	8	00 00 00 00 00 00 00 00 for not set
Reporting interval	4	INT16 - Little Endian, number in <i>second</i>
Collecting interval	4	INT16 - Little Endian, number in <i>second</i>

Example:

<pre>7E F5 37 00 01 00 2B 38 36 31 33 38 30 30 35 39 32 35 30 30 00 00 00 00 00 00 00 00 00 00 08 07 00 00 68 01 00 00 7E</pre>	
Total packet length	37 00=>00 37=55
Protocol version	01
Network type	00=>AUTO
SMSC number	2B 38 36 31 33 38 30 30 35 39 32 35 30 30 00 00=>+8613800592500
PIN code	00 00 00 00 00 00 00 00=>not set
Reporting interval	08 07 00 00=>00 00 07 08=1800s
Collecting interval	68 01 00 00=>00 00 01 68=360s

## UC3x22

Parameter	Length (byte)	Description
Protocol version	1	Defined by Milesight IoT
Network type	1	00 for AUTO,
Mobile number	Mutable	Starts with 2B for "+" before country code
PIN code	8	00 00 00 00 00 00 00 00 for not set
Reporting interval	4	INT16 - Little Endian, number in <i>second</i>
Collecting interval	4	INT16 - Little Endian,

		number in <i>second</i>
AI1_osh	4	Float - Little Endian, number in <i>mA</i>
AI1_osl	4	Float - Little Endian, number in <i>mA</i>
AI2_osh	4	Float - Little Endian, number in <i>mA</i>
AI2_osl	4	Float - Little Endian, number in <i>mA</i>

Example:

<pre> 7E F5 37 00 01 00 2B 38 36 31 33 38 30 30 35 39 32 35 30 30 00 00 00 00 00 00 00 00 00 00 08 07 00 00 68 01 00 00 00 00 A0 41 00 00 80 40 00 00 A0 41 00 00 80 40 7E </pre>	
Total packet length	37 00=>00 37=55
Protocol version	01
Network type	00=>AUTO
Mobile number	2B 38 36 31 33 38 30 30 35 39 32 35 30 30 00 00=>+8613800592500
PIN code	00 00 00 00 00 00 00 00=>not set
Reporting interval	08 07 00 00=>00 00 07 08=1800s
Collecting interval	68 01 00 00=>00 00 01 68=360s
AI1_osh	00 00 A0 41=> 41 A0 00 00=20mA
AI1_osl	00 00 80 40=>40 80 00 00=4mA
AI2_osh	00 00 A0 41=>41 A0 00 00=20mA
AI2_osl	00 00 80 40=>40 80 00 00=4mA

## Regular Report (F4)

Regular Reports (F4) is sent every cycle set as "reporting interval" in ToolBox, default interval is 1800 sec.

## UC3x14

Parameter	Length (byte)	Description
-----------	---------------	-------------



Protocol version	1	Defined by Milesight IoT
Timestamp	4	Unix hex timestamp; number in <i>second</i> since 1970-01-01 00:00:00
Signal strength	1	Number in <i>asu, dBm</i> =- 113+2* <i>asu</i>
Digital input state	1	bit1 for DI1, bit2 for DI2; 1 for high, 0 for low
Digital output state	1	bit1 for DO1, bit2 for DO2; 1 for high, 0 for low
Digital input1 mode	1	00 for DI mode, 01 for counter not started, 02 for counter started
Digital input1 count	4	Number in times
Digital input2 mode	1	00 for DI mode, 01 for counter not started, 02 for counter started
Digital input2 count	4	Number in times

Example:

<i>7E F4 15 00 02 E7 35 7E 5E 12 00 00 00 00 00 00 00 00 00 00 7E</i>	
Total packet length	15 00=>00 15=21
Protocol version	02
Timestamp	E7 35 7E 5E=>5E 7E 35 E7=1585329639; 1585329639+1970/01/01 00:00:00 =2020/03/28 01:20:39
Signal strength	12=>18asu
Digital input state	00=>low (DI1), low (DI2)
Digital output state	00=> low (DO1), low (DO2)
Digital input1 mode	00=>DI mode
Digital input1 count	00 00 00 00=0
Digital input2 mode	00=>DI mode
Digital input2 count	00 00 00 00=0

## UC3x22

Parameter	Length (byte)	Description
Protocol version	1	Defined by Milesight IoT
Timestamp	4	Unix hex timestamp; number in <i>second</i> since 1970-01-01 00:00:00
Signal strength	1	Number in <i>asu</i> , $dBm=113+2*asu$
Digital input state	1	00 for low, 01 for high
Digital output state	1	00 for low, 01 for high
State of analog input1	1	00 for disabled, 01 for enabled
Collecting interval	4	Unix hex timestamp; number in <i>second</i> since 1970-01-01 00:00:00
Analog input1 value	16 (float)	ccy(current value), max(maximum value), min(minimum value), avg(average value)
State of analog input2	1	00 for disabled, 01 for enabled
Collecting interval	4	Unix hex timestamp; number in <i>second</i> since 1970-01-01 00:00:00
Analog input2 value	16 (float)	ccy(current value), max(maximum value), min(minimum value), avg(average value)

Example:

<i>7E F4 37 00 02 DE 5A 67 5E 19 00 00</i> 01 68 01 00 00 00 00 01 00 00 00 01 00 00 00 01 00 00 00 01 00 01 68 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 <i>7E</i>	
Total packet length	37 00=>00 37=55
Protocol version	02

Timestamp	DE 5A 67 5E=>5E 67 5A DE= 1583831774; 1583831774+1970-01-01 00:00:00=2020/03/10 17:16:14
Signal strength	19=>25asu
Digital input state	00=>low
Digital output state	00=>low
State of analog input1	01=>enabled
Collecting interval	68 01 00 00=>00 00 01 68=360s
Analog input1 value	Ccy=00 00 01 00=Max=Min=Avg =>9.18355e-41
State of analog input2	01=>enabled
Collecting interval	68 01 00 00=>00 00 01 68=360s
Analog input2 value	Ccy=00 00 00 00=Max=Min=Avg =>0

## UC3x52

Parameter	Length (byte)	Description
Protocol version	1	Defined by Milesight IoT
Timestamp	4	Unix hex timestamp; number in <i>second</i> since 1970-01-01 00:00:00
Signal strength	1	Number in <i>asu</i> , $dBm=113+2*asu$
Digital input state	1	00 for low, 01 for high
Digital output state	1	00 for low, 01 for high
Channel1 value length	1	Channel1 value length (1, 2, 4)
Channel1 collecting interval	4	Number in <i>second</i>
Channel1 data type	1	00 for Coil; 01 for Discrete; 02 for Input Register (INT16); 03 for Holding Register

		(INT16); 04 for Holding Register (INT32); 05 for Holding Register (Float); 06 for Input Register (INT32); 07 for Input Register (Float); 08 for Input Register (INT32 with upper 16 bits); 09 for Input Register (INT32 with lower 16 bits); 10 for Holding Register (INT32 with upper 16 bits); 11 for Holding Register (INT32 with lower 16 bits)
Channel1 quantity	1	Number in <i>digit</i>
Channel1 sign	1	00 for unsigned; 01 for signed
Channel1 decimal	1	Number in <i>power of 10</i> by which channel value is divided
Channel1 value	1 (type 00, 01), 2 (type 02, 03, 08-11), 4 (type 04-07)	Response from channel1
...	...	...

Example:

7E F4 18 00 02 DE 5A 67 5E 1B 00 02 02 3C 00 00 00 03 01 01 03 00 01 7E	
Total packet length	18 00=>00 18=24
Protocol version	02
Timestamp	DE 5A 67 5E=>5E 67 5A DE =1583831774; 1583831774+1970-01-01 00:00:00=2020/03/10 17:16:14
Signal strength	1B=>27asu
Digital input state	00=>low

Digital output state	01=>high
Channel1 value length	02=>2
Channel1 polling interval	3C 00 00 00=>00 00 00 3C=60s
Channel1 data type	03=>Holding Register (INT16)
Channel1 quantity	01=>1digit
Channel1 sign	01=>signed
Channel1 decimal	03=>10 <sup>3</sup> ;
Channel1 value	00 01=>01 00=256; 256÷10 <sup>3</sup> =0.256;

## Change Report (F2)

If output state was changed, device sends this change report to server. If not, device replies with command statement only.

Only channels in Coil/Discrete type will be counted in “Channel Number” and display its value.

Parameter	Length (byte)	Description
Protocol version	1	Defined by Milesight IoT
Timestamp	4	Unix hex timestamp; number in <i>second</i> since 1970-01-01 00:00:00
Digital input state	1	00 for low, 01 for high
Digital output state	1	00 for low, 01 for high
Channel Number	1	Number of channels
Channel ID	1	Channel ID
Channel Value	1	00 for low, 01 for high
...	...	...

Example:

<i>7E F2 11 00 01 DE 5A 67 5E 00 00 02 01 01 03 01 7E</i>	
Total packet length	11 00=>00 11=17
Protocol version	01
Timestamp	DE 5A 67 5E=>5E 67 5A DE =1583831774; 1583831774+1970-01-01 00:00:00=2020/03/10 17:16:14



	=112.5.64.162
Port number of DTU1	2B 23=9003
Connection state of DTU1	01 for "connected"
IP address of DTU2	00 7E 00=
Port number of DTU2	00 00=
Connection state of DTU2	00 for "disconnected"

## Alarm Report (F7)

Parameter	Length (byte)	Description
Protocol version	1	Defined by Milesight IoT
Timestamp	4	Unix hex timestamp; number in <i>second</i> since 1970-01-01 00:00:00
Events relationship	1	00 for "and" indicating more than one source events and event payloads, 01 for "or" indicating single source event and event payload
Event source1	4	Refer to Source event below
Mode of Event payload1	1	Refer to Event payload below
Type of Event payload1	1	
Sign of Event payload1	1	
Current value of Event payload1	4	
Low value of Event payload1	4	
High value of Event payload1	4	
...	...	...

*Table 1 Source event*

Event Type	Source event code
IF Digital Input1 goes active (rising edge-triggered)	01 00 00 00
IF Digital Input1 goes inactive (falling edge-triggered)	02 00 00 00
IF Digital Input1 changes status (triggered on rising or falling edge)	04 00 00 00
IF Digital Input1 is active (high level triggered)	08 00 00 08
IF Digital Input1 is inactive (low level triggered)	10 00 00 00
IF Digital Input2 goes active (rising edge-triggered)	20 00 00 00
IF Digital Input2 goes inactive (falling edge-triggered)	40 00 00 00
IF Digital Input2 changes status (triggered on rising or falling edge)	80 00 00 00
IF Digital Input2 is active (high level triggered)	00 01 00 00
IF Digital Input2 is inactive (low level triggered)	00 02 00 00
IF Signal is weak	00 10 00 00
THEN Send an alarm	00 08 00 00
THEN Restart the device	00 20 00 00
IF Analog Input1	00 40 00 00
IF Analog Input2	00 80 00 00
IF Modbus Channel1	00 00 01 00
IF Modbus Channel2	00 00 02 00
IF Modbus Channel3	00 00 04 00
IF Modbus Channel4	00 00 08 00



IF Modbus Channel5	00 00 10 00
IF Modbus Channel6	00 00 20 00
IF Modbus Channel7	00 00 40 00
IF Modbus Channel8	00 00 80 00
IF Modbus Channel9	00 00 01 04
IF Modbus Channel10	00 00 02 04
IF Modbus Channel11	00 00 04 04
IF Modbus Channel12	00 00 08 04
IF Modbus Channel13	00 00 10 04
IF Modbus Channel14	00 00 20 04
IF Modbus Channel15	00 00 40 04
IF Modbus Channel16	00 00 80 04
IF Counter1	00 00 00 01
IF Counter2	00 00 00 02

For "IF Digital Input1" (1F 00 00 00):

Parameter	Length (byte)	Description
Mode of Event payload	1	00 00 00
Type of Event payload	1	
Sign of Event payload	1	
Current value of Event payload	4	00 00 00 00 for low, 00 00 00 01 for high
Low value of Event payload	4	00 00 00 00 00 00 00 00
High value of Event payload	4	

For DI alarm:

Parameter	Length (byte)	Description
Mode of Event payload	1	00 00 00
Type of Event payload	1	
Sign of Event payload	1	
Current value of Event payload	4	00 00 00 00 for low, 00 00 00 01 for high
Low value of Event payload	4	00 00 00 00 00 00 00 00

High value of Event payload	4	
-----------------------------	---	--

For "IF Signal is weak" (00 10 00 00):

Parameter	Length (byte)	Description
Mode of Event payload	1	00 00 00
Type of Event payload	1	
Sign of Event payload	1	
Current value of Event payload	4	Number in <i>asu</i> , $dBm = -113 + 2 * asu$
Low value of Event payload	4	00 00 00 00 00 00 00 00
High value of Event payload	4	

For "THEN Send an alarm" (00 08 00 00):

Parameter	Length (byte)	Description
Mode of Event payload	1	00 00 00
Type of Event payload	1	
Sign of Event payload	1	
Current value of Event payload	4	Unix hex timestamp; number in <i>second</i> since 1970-01-01 00:00:00
Low value of Event payload	4	00 00 00 00 00 00 00 00
High value of Event payload	4	

For "THEN Restart the device" (00 20 00 00):

Parameter	Length (byte)	Description
Mode of Event payload	1	00 00 00
Type of Event payload	1	
Sign of Event payload	1	
Current value of Event payload	4	00 00 00 00
Low value of Event payload	4	00 00 00 00 00 00 00 00
High value of Event	4	

payload		
---------	--	--

For AI alarm:

Parameter	Length (byte)	Description
Mode of Event payload	1	00 for above, 01 for below, 02 for within
Type of Event payload	1	05
Sign of Event payload	1	01
Current value of Event payload	4	Analog value
Low value of Event payload	4	Lower threshold value
High value of Event payload	4	Upper threshold value

IF Channel:

Parameter	Length (byte)	Description
Mode of Event payload	1	00 for false (when type is coil or discrete) and trigger if true, 01 for true (when type is coil or discrete) and trigger if false, 02 for above, 03 for below, 04 for within
Type of Event payload	1	00 for Coil; 01 for Discrete; 02 for Input Register (INT16); 03 for Holding Register (INT16); 04 for Holding Register (INT32); 05 for Holding Register (Float); 06 for Input Register (INT32); 07 for Input Register

		(Float); 08 for Input Register (INT32 with upper 16 bits); 09 for Input Register (INT32 with lower 16 bits); 10 for Holding Register (INT32 with upper 16 bits); 11 for Holding Register (INT32 with lower 16 bits)
Sign of Event payload	1	00 for unsigned; 01 for signed
Current value of Event payload	4	Modbus value
Low value of Event payload	4	Lower threshold value
High value of Event payload	4	Upper threshold value

Example:

### Configuration for command NO.1

**If**

**Then**

7E F7 31 00 01 4C 27 86 60 00 00 10 00 00 00 00 02 00 00 00 00 00 00 00 00 00 00 08 00 00 00 00 00 4C 27 86 60 00 00 00 00 00 00 00 7E	
Total packet length	31 00=>00 31=49
Protocol version	01
Timestamp	4C 27 86 60=>60 86 27 4C=1619404620; 1619404620+1970/01/01 00:00:00 =2021-04-26 10:37:00
Signal strength	00 indicating more than 1 event

Event Source1	00 10 00 00 stands for IF Signal is weak
Mode of event payload1	00
Type of event payload1	00
Sign of event payload1	00
Signal strength of event payload1	02 00 00 00=>00 00 00 02=2asu
Low value of event payload1	00
High value of event payload1	00
Event Source2	00 08 00 00 stands for THEN Send an alarm
Mode of event payload2	00
Type of event payload2	00
Sign of event payload2	00
Timestamp of event payload2	4C 27 86 60=>60 86 27 4C=1619404620; 1619404620+1970/01/01 00:00:00 =2021-04-26 10:37:00
Low value of event payload2	00
High value of event payload2	00

## Control Protocol

The first command string should be password validation; if not, any follow-up commands will not take effect.

Data bytes adopt little-endian format, please note that ADC value is in float.

A complete command string consists of **a start bit (1 byte, 7E)**, **a function code (1 byte, Defined by Milesight IoT)**, **total package length (2 byte)**, **data/configuration (mutable)** and **an end bit (1 byte, 7E)**.

For the mutable section, data statement consists of different data parameters. Configuration statement consists of a **type ID (1 byte)** that specifies a configuration parameter, following new corresponding setting (with or without old setting according to different setting).

Every request to UC3x is responded with at least 1 statement – execution condition flag, that looks like 7E 8x 06 00 00/01 7E. Sending a parameter query command will receive an additional response including requested information.

## Cheat Sheet

Description Function	Request		Execution condition	
	Function (0x)	Type ID	Function (8x)	Flag
Password validation	01	-	81	00 for confirmed; 01 for rejected
Reboot UC3x	02		82	
Parameter query	04		84	
Control digital output	05	10	85	
Change password		11		
Change reporting interval		28		
Change collecting interval		29		
Control UC3x22 ADC		2A/2B		

## Password Validation (01/81)

Request:

Parameter	Length (byte)	Description
Password	6	123456 for default

Example:

<i>7E 01 0B 00 31 32 33 34 35 36 7E</i>	
Packet length	0B 00=>00 0B=11
Password	31 32 33 34 35 36=>123456

- **Change Password (05/85...11)**

Request:

Parameter	Length (byte)	Description
Type ID	1	11 for changing password
Old password	6	123456 for default
New password	6	-

Example:

<i>7E 05 12 00 11 31 32 33 34 35 36 35 35 30 38 32 30 7E</i>	
Total packet length	12 00=>00 12=18
Type ID	11
Old password	31 32 33 34 35 36=>123456
New password	35 35 30 38 32 30=>550820

## Reboot UC3x (02/82)

The device will restart soon after it responds with this payload.

Request:

<i>7E 02 05 00 7E</i>	
Total packet length	05 00=>00 05=5

## Parameter Query (04/84)

Request:

Parameter	Type ID	Example
Signal strength	0E	<i>7E 04 06 00 0E 7E</i>
Network type	12	<i>7E 04 06 00 12 7E</i>
Device model	71	<i>7E 04 06 00 71 7E</i>
Device SN	72	<i>7E 04 06 00 72 7E</i>
Hardware version	73	<i>7E 04 06 00 73 7E</i>
Software version	74	<i>7E 04 06 00 74 7E</i>
Digital input1 state	0F 01	<i>7E 04 07 00 0F 01 7E</i>
Digital input2 state	0F 02	<i>7E 04 07 00 0F 02 7E</i>
Digital output1 state	10 01	<i>7E 04 07 00 10 01 7E</i>
Digital output2 state	10 02	<i>7E 04 07 00 10 02 7E</i>

Analog input1 value	2D 01	<i>7E 04 07 00 2D 01 7E</i>
Analog input2 value	2D 02	<i>7E 04 07 00 2D 02 7E</i>

Response:

Parameter	Length (byte)	Description
Signal strength	1	Number in <i>asu</i> , $dBm=113+2*asu$
Network type	1	00 for AUTO, 01 for 4G first, 02 for 4G only, 03 for 3G first, 04 for 3G only, 05 for 2G first, 06 for 2G only
Device model	4	Byte 1 is 3 for UC3x; byte 2 is network type, 2 for 2G, 3 for 3G, 4 for 4G, 5 for NB-IoT; the rest may be 14, 22, 52 for different interface
Device SN	13	Same with S/N under barcode on device info sticker, ends with an extra 0x00
Hardware version	4	0.01 for resolution
Software version	4	0.01 for resolution
Digital input1 state	1	00 for low, 01 for high
Digital input2 state		
Digital output1 state		
Digital output1 state		
Analog input1 value	8 (float)	Byte 1-2 for ccy(current value), byte 3-4 for max(maximum value), byte 5-6 for min(minimum value), byte 7-8 for avg(average value)
Analog input2 value		

Example:

Parameter	Example	Description
Signal strength	<i>7E 84 06 00 1E 7E</i>	1E=30asu



Network type	7E 8406 00 00 7E	00=>AUTO
Device model	7E 8409 00 33 34 32 32 7E	33 34 32 32=>3422
Device SN	7E 8412 00 36 31 31 33 39 35 31 39 37 37 39 35 7E	36 31 31 33 39 35 31 39 37 37 39 65=> 611395197795
Hardware version	7E 840A 00 30 32 31 30 7E	30 32 31 30=> 210*0.01=2.10
Software version	7E 840A 00 30 33 31 31 7E	30 33 31 31=> 311*0.01=3.11
Digital input1 state	7E 8406 00 00 7E	00=>low
Digital output2 state	7E 8406 00 01 7E	01=>high
Analog input1 value	7E 840D 00 00 00 00 00 00 00 00 00 7E	Ccy=max=min=avg=0

## Configure the Device (05/85)

### Change Report Interval (28)

Request:

Parameter	Length (byte)	Description
Type ID	28	28 for changing reporting interval
Desired reporting interval	4	INT16 - Little Endian, number in <i>second</i>

Example:

7E 050A 00 28 08 07 00 00 7E	
Total packet length	0A 00=>00 0A=10
Type ID	28
Desired reporting interval	08 07 00 00=>00 00 07 08=1800s

### Change Collecting Interval (29)

Request:

Parameter	Length (byte)	Description
-----------	---------------	-------------

Type ID	29	29 for changing collecting interval
Desired collecting interval	4	INT16 - Little Endian, number in <i>second</i>

Example:

<i>7E 05 0A 00 29 84 03 00 00 7E</i>	
Total packet length	0A 00=>00 0A=10
Type ID	29
Desired collecting interval	84 03 00 00=>00 00 03 84=900s

## Control osh and osl for UC3x22 (2A/2B)

Request:

Parameter	Length (byte)	Description
Type ID	1	2A for osh, 2B for osl
Analog input ordinal	1	01 for AI1, 02 for AI2
Analog input value	4	Float - Little Endian

Example:

<i>7E 05 0B 00 2A 01 00 00 8C 42 7E</i>	
Total packet length	0B 00=>00 0B=11
Type ID	2A for osh
Analog input ordinal	01 for AI1
Analog input value	00 00 8C 42=>42 8C 00 00=+70mA

## Control Digital Output (10)

Request:

Parameter	Length (byte)	Description
Type ID	10	10 for controlling digital output state
Digital output ordinal	1	01 for DO1, 02 for DO2
Action	1	00 to de-activate/pull low,

		01 to activate/pull high
Duration	4	Int - Little Endian, number in ms

Example:

7E 05 0C 00 10 01 00 70 17 00 00 7E	
Total packet length	0C 00=>00 0C=12
Type ID	10
Digital output ordinal	01 for DO1
Action	00 for de-activate/pull low
Duration	70 17 00 00=>00 00 17 70=6000ms

Response: Command string referring to [Change Report \(F2\)](#).

**-END-**