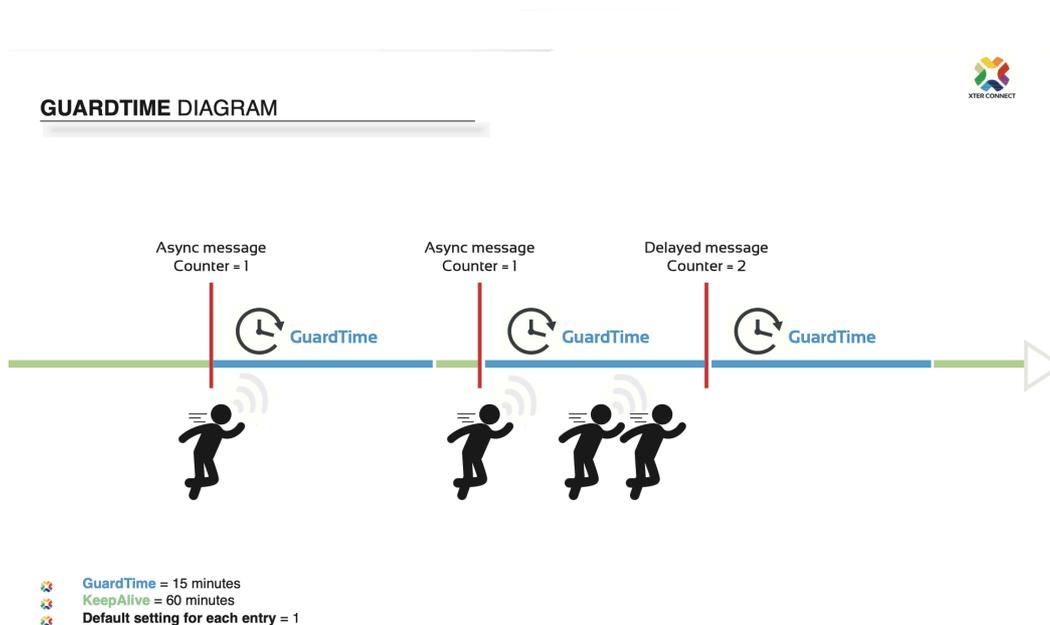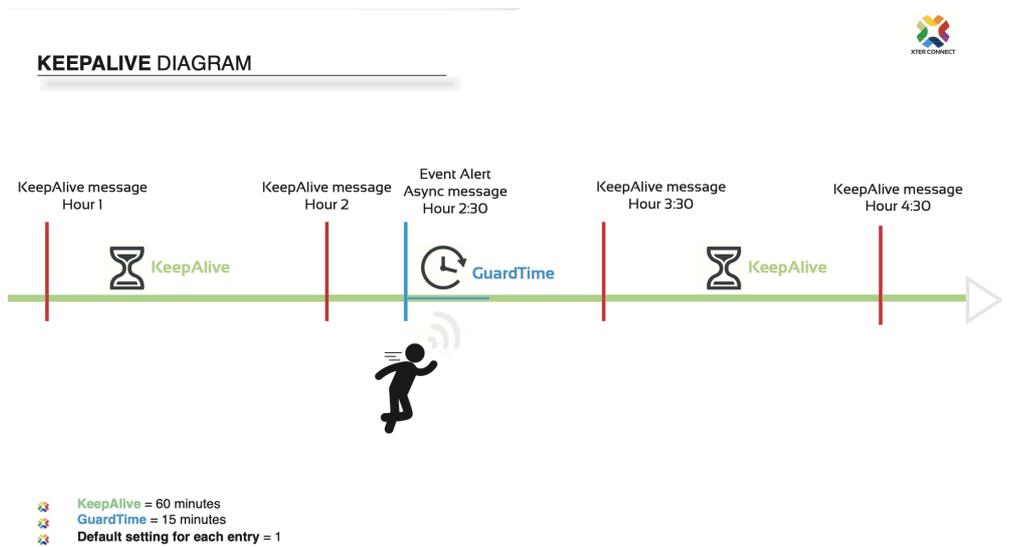# XtercConnect Payload decoding

4 different messages are delivered by the device :

Reset message (following a join request)
KeepAlive message, when no activity is detected for longer than the keepAlive value, this message will be sent
Async messages, if no activity was not detected since the las guard time period, any event will immediately trigger this message (independently from the keepAlice)
Delayed messages, if an event is detects during the « guard time period » following the latest async messages, the event will be counted and delivered only after the guard time period.

KEEPALIVE DIAGRAM

KeepAlive message
Hour 1

KeepAlive message
Hour 2

Event Alert
Async message
Hour 2:30

KeepAlive message
Hour 3:30

KeepAlive message
Hour 4:30

KeepAlive   GuardTime   KeepAlive

- **KeepAlive** = 60 minutes
- **GuardTime** = 15 minutes
- **Default setting for each entry** = 1

GUARDTIME DIAGRAM

Async message
Counter = 1

Async message
Counter = 1

Delayed message
Counter = 2

GuardTime   GuardTime   GuardTime

- **GuardTime** = 15 minutes
- **KeepAlive** = 60 minutes
- **Default setting for each entry** = 1

Command type (cmd) :

0x00 (00) : **Reset**
>   this event message is sent on every reset/restart

0x10 (16) : **KeepAlive**
>   this message is sent every **KeepAliveValue** (minutes) of inactivity
>   with KeepAlive message, value of event counters (below threshold) are reported then
>   cleared

0x20 (32) : **Async**
>   this event message is sent if guardtime (in minutes) is elapsed since the last event
>   (Reset, Async or Delayed). An event occure if any of the pioXEvent counter equal the
>   pioXEvent Threshold.

0x30 (48) : **Delayed**
>   this event message is sent when an event has been detected during the guardtime
>   period, event counter's are incremented and message is delayed until guartime is
>   elapsed.

Parameters :

Night/Day mode
>   **nightStartHours**, **nightStartMinutes** :
>>   define the time when the device switch into Night mode
>   **dayStartHours**, **dayStartMinutes** :
>>   define the time when the device switch into Day mode
>   if **nightStartHours**, **nightStartMinutes == dayStartHours**, **dayStartMinutes,** the
>   device is only in Day mode

GuardTime
>   **guardTimeDay** :
>>   define the minimum delay in minute between two consecutive event
>>   messages in Day mode
>   **guardTimeNight** :
>>   define the minimum delay in minute between two consecutive event
>>   messages in Night mode

KeepAlive
>   Define the value in minutes the last message before sending a KeepAlive message

EventThreshold
>   **pioXEventThresholdDay, pioXEventThresholdNight :**
>>   define the threshold value for every counter to generate an event message :

if value = 0 counter disabled
if value = 1 a message is generated on every event
if value = n, a message is generated on every n events

Syntax	No. Of bits	Mnemonic
payload(){		
cmd	8	uint
if (cmd == 16 || cmd == 32 || cmd == 48){		
hours	8	uint
minutes	8	uint
pio0_present	1	bool
pio1_present	1	bool
pio2_present	1	bool
pio3_present	1	bool
intTemp_present	1	bool
extTemp_present	1	bool
vbat_present	1	bool
vext_present	1	bool
if (pio0_present)		
pio0Event	8	uint
if (pio1_present)		
pio1Event	8	uint
if (pio2_present)		
pio2Event	12	uint
if (pio3_present)		
pio3Event	12	uint
if (intTemp_present)		
intTemp	12	int
if (extTemp_present)		
extTemp	12	int
if (vbat_present)		
Vbat	12	int
if (vext_present)		
Vext	12	int
}		
else if (cmd = 00){		
config_exist	8	uint
hours	8	uint
minutes	8	uint
guardTimeDay	8	uint
guardTimeNight	8	uint
KeepAliveValue	8	uint
pio0EventThresholdDay	8	uint
pio0EventThresholdNight	8	uint

pio1EventThresholdDay		8	uint
pio1EventThresholdNight		8	uint
pio2EventThresholdDay		12	uint
pio2EventThresholdNight		12	uint
pio3EventThresholdDay		12	uint
pio3EventThresholdNight		12	uint
nightStartHours		8	bcd
nightStartMinutes		8	bcd
dayStartHours		8	bcd
dayStartMinutes		8	bcd
en_Register		8	uint

```
    }
}
```

Downlink messages

Time setting :

- only needed if day/night is used
- on reset, the module send a message including its time : see attached doc
- this time is compared to the server time and and offset as to be calculated to set the time in the module :
      - if module time is 09h23m and server time is 10h24m, offset is 01h01m
      - if module time is 09h23m and server time is 08h24m, offset is 22h59m
- this offset value will be transmitted later with a downlink message :
      - Port : 0x22 (34)
      - payload :
            payload[0] = hh   // 0 to 23
            payload[1] = mm)   // 0 to 59

Notice that the reception of Time setting command will reset the module

Parameter setting : (see attached doc)

in order to change the module parameters, a 20 bytes payload must be send with a downlink message to the module :
      - Port : 0x20 (32)
      - payload :
payload[0] = guardTimeDay   // default value 10 -> can be changed from 3 to 255

payload[1] = guardTimeNight   // default value 10 -> can be changed from 3 to 255
payload[2] =keepAliveValue   // default value 60 -> can be changed from 3 to 255

payload[3] = **pio0EventThresholdDay**   // Default value 1 -> can be changer from 0 to 255

```
payload[4] = pio0EventThresholdNight        // Default value 1 -> can be changer from 0 to 255
payload[5] = pio1EventThresholdDay          // Default value 1 -> can be changer from 0 to 255
payload[6] = pio1EventThresholdNight        // Default value 1 -> can be changer from 0 to 255
payload[7] = pio2EventThresholdDay msb      // Default value 0 -> can be changed from 1 to 4095
payload[8] = pio2EventThresholdDay lsb      // msb higher 4 bits are ignored (12bit value)
payload[9] = pio2EventThresholdNight msb    // Default value 0 -> can be changed from 1 to 4095
payload[10] = pio2EventThresholdNight lsb   // msb higher 4 bits are ignored (12bit value)
payload[11] = pio3EventThresholdDay msb     // Default value 0 -> can be changed from 1 to 4095
payload[12] = pio3EventThresholdDay lsb     // msb higher 4 bits are ignored (12bit value)
payload[13] = pio3EventThresholdNight msb   // Default value 0 -> can be changed from 1 to 4095
payload[14] = pio3EventThresholdNight lsb   // msb higher 4 bits are ignored (12bit value)
payload[15] = nightStartHours        // default value 12 -> can be changed from 0 to 23
payload[16] = nightStartMinutes             // default value 00 -> can be changed from 0 to 50
payload[17] =dayStartHours                  // default value 12 -> can be changed from 0 to 23
payload[18] = dayStartMinutes        // default value 00 -> can be changed from 0 to 59
payload[19] = 9                             // do not change
```

Notice that the reception of Parameter Setting command will reset the module