



ED1608 NC-Alarm tracker

The NC Alarm tracker is an extended version of a standard ED1608 tracker.

For all functions of the tracker, please see "1M2M Technical product description general sensor" on our website <https://www.1m2m.eu/manuals>.

There are two versions of this tracker, one with a siren and one without, in this last version it is not possible to add a siren in a later stage. Firmware and commands are the same for both versions.

Extension board

The NC-Alarm tracker contains a standard ED1608 pcb with a small connector extension board (ED2090) placed in the 1M2M Click-enclosure.

Contents:

Alarm with Siren version

- ED1608 Full with extension board
- Click housing with 3 cable glands
- Battery pack: ED-850-AS4-3.6V-X-1A
- Siren

Alarm version

- ED1608 basic with extension board
- Click housing with 2 cable glands
- Battery pack: ED-850-AS4-3.6V-X-1A

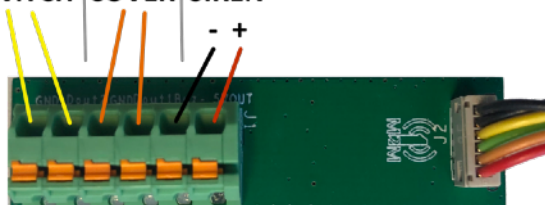


ED1608 NC-Alarm hardware features

- 1 NC contact (NC-1) circuit breaker door
- 1 NC contact (NC-2) circuit breaker cover
- 1 siren 5V/100mA (external 110 dB max.)
- Standard battery pack operated (ED-850-AS4-3.6V-X-1A)
- ESD/Surge protected for > 30 meters cables, according to IEC-61000-4-2 (level 4) and IEC-61000-4-5
- Easy fitting of external wires
- 1M2M Click enclosure with 2 (or 3) cable glands for cover and door (and siren) contacts

Connections for NC contacts and Siren on ED2090 board:

SWITCH COVER SIREN



Alarm + Siren version

SWITCH COVER



Alarm version



ED1608 Application note #003

Application note for Normally Closed contact Alarm

Alarm functionality

There are two NC (Normally Closed) inputs for alarm purposes. To save battery power the detection current uses a duty cycle of 0.1%, sampled every 1 second.

When an input state becomes High or Low and differs from the previous state 5 possible actions can be started.

- 1) Increment a 11-bit input counter. Bit 0 represents the high or low state of the input.
- 2) Uplink an alarm message with last known GPS location.
- 3) Sound the alarm: 90 seconds ON, 60 seconds OFF and 90 seconds ON
- 4) Stop the alarm
- 5) Get a GPS location (for max 240 seconds) and Uplink an alarm message with latest GPS location

If action 2 and 3 are started at the same time, action 3 waits for action 2 (siren is activated after first alarm message is sent).

When all config bits are set to 0 the input state is set to Disabled and the input is not sampled.

In all other modes the input is sampled every second.

- NCArmConfigX is one byte (8 bits) per input
- Bit0 to Bit3 select the actions when the input state becomes high
- Bit4 to Bit7 select the actions when the input state becomes low

B0	When input state becomes High:	Uplink alarm and last known GPS
B1	When input state becomes High:	Siren for 90 seconds, 60 seconds silence and again 90 seconds siren.
B2	When input state becomes High:	Kill the alarm.
B3	When input state becomes High:	Enable GPS and send new position when available.
B4	When input state becomes Low:	Uplink alarm and last known GPS.
B5	When input state becomes Low:	Siren for 90 seconds, 60 seconds silence and again 90 seconds siren.
B6	When input state becomes Low:	Kill the alarm.
B7	When input state becomes Low:	Enable GPS and send new position when available.

NC Alarm configuration parameters (downlink)

0x37: NCArmConfig1 8 bits that define actions for input state changes in NC_Input1

0x38: NCArmConfig2 8 bits that define actions for input state changes in NC_Input2

Example:

NCArmConfig1 command : 0x37

bits 0,1,4,6 (01001011) : 0x4B

- Input high: Uplink alarm, Siren ON, get fix and uplink GPS location
- input low: Siren off

->Downlink: 37004BFF69EB

See <https://www.1m2m.eu/webtools.php> for CRC calculator webtool.



ED1608 Application note #003

Application note for Normally Closed contact Alarm

NC Alarm uplink messages

Information to be uploaded in case of an alarm:

- NCAAlarmCounter1 (11 bit)
- NCAAlarmCounter2 (11 bit)
- GPS position, satellites in fix and fix age (8 bytes)
- Source of the alarm (2 bit)

Counters are packed in 2 times 11 bit = 1024 times open and 1024 times closed.

If a counter is incremented and no message has been uploaded for 512 counts, the alarm message is sent with NC_AlarmCause1 and NC_AlarmCause2 set to 0.

This allows for server-side extending of the counters if required.

```
#define MsgIDNC_Alarm (0x99) // used in NC Alarm messages

typedef struct {
    byte MsgId; // Size must be 12 byte for Sigfox // Message Identification Value = MsgIDNC_Alarm
    byte NC_AlarmCntLo1; // bit 0..7 of NCAAlarmCounter 1
    byte NC_AlarmCntLo2; // bit 0..7 of NCAAlarmCounter 2
    bits NC_AlarmCntHi1 :3; // bit 0..2 = bit 8 to 10 of NCAAlarmCounter 1
    bits NC_AlarmCause1 :1; // bit 3 = NC-input 1 triggered
    bits NC_AlarmCntHi2 :3; // bit 4..6 = bit 8 to 10 of NCAAlarmCounter 2
    bits NC_AlarmCause2 :1; // bit 7 = NC-input 2 triggered
    byte GPSFixAge; // bit 0..7 = Age of last GPS Fix in Minutes
    byte SatCnt_HiLL; // bit 0..4 = SatInFix, bit5 Latitude 25 // bit 6,7 = Long 25,26
    byte Lat[3]; // bit 0..23 = latitude bit 0..23
    byte Lon[3]; // bit 0..23 = longitude bit 0..23
} TNC_AlarmMsg;
```

Example uplink:

Payload: 9901010000054F812A07A687

The GPS information is compressed in exactly the same way as in the alive and moving messages

The payloads can be expanded via the 1M2M Payload decoding JSON service

<https://1m2m.eu/services/GETPAYLOAD?>

[Human=0&PL=YourPayload](https://1m2m.eu/services/GETPAYLOAD?Human=0&PL=YourPayload)

```
{
  "MsgID": "NC_Alarm",
  "Alarm1": "No",
  "Alarm2": "No",
  "SlopeCount1": "1",
  "SlopeCount2": "0",
  "SatInFix": "5",
  "Lat": "52.10410",
  "Lon": "5.01383",
  "FixAge": "0 minutes ago",
  "Addr": "Pastoor Ohlleen 34, 3451 C"
}
```

There are web tools for coding and decoding available on <https://www.1m2m.eu/webtools.php>.