

EnOcean Equipment Profiles

REVISION HISTORY

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EnOcean Alliance Inc.
2400 Camino Ramon, Suite 375
San Ramon, CA 94583
USA
Graham Martin
Chairman & CEO EnOcean Alliance

D2-14: Multi Function Sensors

TYPE 00 ... 24 *Submitter: Perfactory*

TYPE 30 ... 31 *Submitter: Nexelec*

Description:

Indoor Smarthome Multisensor

These EEPs describe a family of smarthome multi-functional sensors with optional Touch Button devices. Each device/member of the family is equipped with a different set of sensors to measure ambient environmental parameters, e.g. temperature, humidity, light level etc. Some family-members are equipped with buttons in addition to the sensors. The response to pressing a button can be defined freely.

Sensor fault mode status (COA / SMA):

A smoke sensor failure prevents operation of a smoke / CO alarm signal. The smoke / CO sensor is supervised and a failure activates this flag.

Smoke Alarm Condition analysis:

The smoke alarm might be activated by improper environmental conditions like dust, humidity, etc. The product will activate flags if some of these conditions are observed at the moment of alarm activation.

- Maintenance: the flag is set if there is a lack of maintenance
- Temperature: the flag is set if the temperature may cause the alarm
- Humidity: the flag is set if the relative humidity may cause the alarm

!!! An activated flag doesn't mean that there is no smoke. It is dangerous to suspect a false alarm as the smoke preceding the onset of the flames are toxic and may cause you to lose consciousness: despite the absence of flames, a fire may blaze up in a few minutes. Nexelec recommends to analyse the environmental condition of a smoke alarm after the disappearance of the smoke alarm signal.

CO Alarm Condition analysis:

The CO alarm might be activated by improper environmental conditions like dust, humidity, etc. The product will activate flags if some of these conditions are observed at the moment of alarm activation.

- Maintenance: the flag is set if there is a lack of maintenance
- Temperature: the flag is set if the temperature may cause the alarm
- Humidity: the flag is set if the relative humidity may cause the alarm

!!! An activated flag doesn't mean that there is no CO. It is dangerous to suspect a false alarm. Nexelec recommends to analyse the environmental condition of a CO alarm after the disappearance of the CO alarm signal.

EEP Properties defined by the submitter:

Data exchange

Direction: unidirectional

Addressing: broadcast

Communication trigger: event- & time-triggered

Communication interval: According to configuration ((non-)autonomous operation, battery status, etc.)

Trigger event: change of value (configuration-dependent) over threshold

Tx delay: -

Rx timeout: -

Teach-in

Teach-in method: Universal teach-in (UTE)

Security

Encryption supported: no

Security level format: -

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Parameters applied by EEP family members:

Each member of the family transports at least one or more parameters in its messages as defined later. The parameters are defined in the following table; these are the "building blocks" of the telegrams.

| Name | ShortCut | Size | Description | Valid Range | Scale | Unit |
|----------------|----------|------|---------------------------------|----------------------------------------------------------|---------------------------------------|-------|
| Message ID | MSGID | 8 | Message ID | 0 ... 255 | | |
| Temperature | TMP8 | 8 | Temperature | 0 ... 250 | Linear, range sensor (TYPE) dependent | °C |
| | | | Status of Temperature Sensor | Enum: 251 ... 254: Reserved 255: Error | | |
| | | | | | | |
| Temperature | TMP9 | 9 | Temperature | 0 ... 500 | Linear, range sensor (TYPE) dependent | °C |
| | | | Status of Temperature Sensor | Enum: 501 ... 510: Reserved 511: Error | | |
| | | | | | | |
| Humidity | HUM | 8 | rel. Humidity (linear) | 0 ... 200 | 0 ... 100 | % |
| | | | Status of Humidity Sensor | Enum: 201 ... 254: Reserved 255: Error | | |
| | | | | | | |
| Illumination | ILL | 17 | Illumination (linear) | 0 ... 100,000 | 0 ... 100,000 | lx |
| | | | Status of Illumination Sensor | Enum: 100,001 ... 131,070: Reserved 131,071: Error | | |
| | | | | | | |
| Energy Storage | ES | 2 | Energy Storage Status | Enum: 0: High 1: Medium 2: Low 3: Critical | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| VOC | VOC | 8 | VOC in CO2 equivalents (linear) | 0 ... 250 | 0 ... 2,000 | ppm/e |
| | | | TVOC (linear) | 0 ... 250 | 0 ... 1,150 | ppb |
| | | | Status of VOC Sensor | Enum: 251 ... 254: Reserved 255: Error | | |
| | | | | | | |
| CO2 | CO2 | 8 | CO2 (linear) | 0 ... 250 | Sensor dependent, e.g. 0 ... 2,000 | ppm |
| | | | Status of CO2 Sensor | Enum: 251 ... 254: Reserved 255: Error | | |
| | | | | | | |

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|-------------|-----|---|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------|------|
| CO | CO | 8 | CO (linear) | 0 ... 200 | Sensor dependent, e.g. 0 ... 1,000 | ppm |
| | | | Status of CO Sensor | Enum: 201 ... 254: Reserved 255: Error | | |
| | | | | | | |
| Barometer | BAR | 9 | Barometer (linear) | 0 ... 500 | 600 ... 1,000 | hPa |
| | | | Status of Barometer Sensor | Enum: 501 ... 510: Reserved 511: Error | | |
| | | | | | | |
| Presence | PR | 2 | Presence Detector | Enum: 0: Present 1: Not present 2: Not detectable 3: Presence Detector error | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Button A | BA | 2 | Button A | Enum: 0: Button A released 1: Button A pressed 2: Reserved 3: Button A error (state not detectable) | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Button B | BB | 2 | Button B | Enum: 0: Button B released 1: Button B pressed 2: Reserved 3: Button B error (state not detectable) | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Smoke Alarm | SMA | 1 | Smoke Alarm status | Enum: 0: Smoke Alarm non-activated 1: Smoke Alarm activated | | |
| | | 1 | Sensor fault mode status | Enum: 0: Sensor Fault mode non-activated 1: Sensor Fault mode activated | | |
| | | 1 | Smoke Alarm Condition analysis: Maintenance | Enum: 0: Maintenance OK 1: Maintenance not done | | |
| | | 1 | Smoke Alarm Condition analysis: Humidity | Enum: 0: Humidity range OK 1: Humidity range NOK | | |
| | | 1 | Smoke Alarm Condition analysis: Temperature | Enum: 0: Temperature range OK 1: Temperature range NOK | | |
| | | 8 | Time since last maintenance | 0 ... 250 | 0 ... 250 | Week |
| | | | | Enum: 251 ... 254: Reserved 255: Error | | |

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|-----------------------------|-------|---|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------|
| CO Alarm | COA | 1 | CO Alarm status | Enum: 0: CO Alarm non-activated 1: CO Alarm activated | | |
| | | 1 | Sensor fault mode status | Enum: 0: Sensor Fault mode non-activated 1: Sensor Fault mode activated | | |
| | | 1 | CO Alarm Condition analysis: Maintenance | Enum: 0: Maintenance OK 1: Maintenance not done | | |
| | | 1 | CO Alarm Condition analysis: Humidity | Enum: 0: Humidity range OK 1: Humidity range NOK | | |
| | | 1 | CO Alarm Condition analysis: Temperature | Enum: 0: Temperature range OK 1: Temperature range NOK | | |
| | | 8 | Time since last maintenance | 0 ... 250 | 0 ... 250 | Week |
| | | | | Enum: 251 ... 254: Reserved 255: Error | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Remaining Product Life Time | RPLT | 8 | Countdown time until product end of life | 0 ... 250 | Product dependent, e.g. 0 ... 250 | Month |
| | | | | Enum: 251 ... 254: Reserved 255: Error | | |
| | | | | | | |
| Hygrothermal Comfort Index | HCI | 2 | Comfort Index based on temperature and humidity | Enum: 0: Good 1: Medium 2: Bad 3: Error | | |
| | | | | | | |
| T/Hum. Indoor Air Analysis | IAQTH | 3 | Indoor Air quality analysis based on temperature and humidity | Enum: 0: Optimal air range 1: Dry Air range 2: High humidity range 3: High temperature and humidity range 4: Temperature or Humidity out of analysis range 5 ... 6: Reserved 7: Error | | |
| | | | | | | |
| CO Indoor Air Analysis | IAQCO | 2 | Indoor Air quality analysis based on CO | Enum: 0: Good 1: Medium 2: Bad 3: Error | | |
| | | | | | | |

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EEP Family Tables:

Each line in the Family Table describes a parameter which is part of the message(s) of the marked Family Members (= column in the table / TYPE).

Line Powered devices:

| Type | 0x00 | 0x01 | 0x02 | 0x03 | 0x04 | 0x05 |
|----------------------------------|--------|--------|----------|----------|--------|----------|
| Temperature Sensor, TMP9 | 0...50 | 0...50 | | 0...50 | 0...50 | 0...50 |
| Humidity Sensor, HUM | X | X | | X | X | X |
| Illumination Sensor, ILL | | | | | X | X |
| VOC Sensor [CO2-equiv.], VOC | | | 0...2000 | 0...2000 | | 0...2000 |
| Freely Programmable Button A, BA | | X | | | | |
| Freely Programmable Button B, BB | | X | | | | |

| Type | 0x06 | 0x07 | 0x08 | 0x09 | 0x0A |
|------------------------------|----------|----------|----------|----------|----------|
| Temperature Sensor, TMP9 | | 0...50 | 0...50 | 0...50 | 0...50 |
| Humidity Sensor, HUM | | X | X | X | X |
| Illumination Sensor, ILL | | | X | | X |
| VOC Sensor [CO2-equiv.], VOC | | | | 0...2000 | 0...2000 |
| CO2 Sensor, CO2 | 0...2000 | 0...2000 | 0...2000 | 0...2000 | 0...2000 |

| Type | 0x0B | 0x0C | 0x0D | 0x0E | 0x0F | 0x10 |
|----------------------------------|----------|----------|----------|----------|--------|----------|
| Temperature Sensor, TMP9 | 0...50 | | 0...50 | 0...50 | 0...50 | 0...50 |
| Humidity Sensor, HUM | X | | X | X | X | X |
| VOC Sensor [CO2-equiv.], VOC | | | 0...2000 | 0...2000 | | 0...2000 |
| VOC Sensor, TVOC | 0...1150 | | | | | |
| CO2 Sensor, CO2 | | | | 0...2000 | | |
| CO2 Sensor, CO2 | | 0...5000 | | | | |
| Barometer Sensor, BAR | | | | | X | |
| Room Occupancy Sensor, PR | | | | | | X |
| Freely Programmable Button A, BA | | | X | X | | |

Autonomous devices (indoor):

| Type | 0x1A | 0x1B | 0x1C | 0x1D |
|---------------------------|--------|--------|--------|--------|
| Temperature Sensor, TMP9 | 0...50 | 0...50 | 0...50 | 0...50 |
| Humidity Sensor, HUM | X | X | X | X |
| Illumination Sensor, ILL | | X | | X |
| Energy Storage Status, ES | X | X | X | X |
| Barometer Sensor, BAR | | | X | X |

| Type | 0x30 | 0x31 |
|-----------------------------------|--------|----------|
| Temperature Sensor, TMP8 | 0...50 | 0...50 |
| Humidity Sensor, HUM | X | X |
| Smoke Alarm, SMA | X | |
| CO Alarm, COA | | X |
| CO Sensor, CO | | 0...1000 |
| Energy Storage Status, ES | X | X |
| Remaining Product Life Time, RPLF | 120 | 120 |
| Hygrothermal Comfort Index, HCI | X | X |
| T/Hum. Indoor Air Analysis, IAQTH | X | X |
| CO Indoor Air Analysis, IAQCO | | X |

Autonomous devices (outdoor):

| Type | 0x20 | 0x21 | 0x22 | 0x23 | 0x24 |
|---------------------------|----------|----------|----------|----------|------|
| Temperature Sensor, TMP9 | -40...60 | -40...60 | -40...60 | -40...60 | |
| Humidity Sensor, HUM | X | | X | | |
| Illumination Sensor, ILL | X | | | X | X |
| Energy Storage Status, ES | X | X | X | X | X |

System Specification

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|-------------|----|----------------------------------------------------------------------|
| RORG | D2 | VLD Telegram |
| FUNC | 14 | Multi Function Sensors |
| TYPE | 05 | Sensor for Temperature, Humidity, Illumination and VOC, line-powered |

Submitter: Perfactory

TYPE 0x05 – Sensor for Temperature, Humidity, Illumination and VOC, line-powered

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------|------|---|---|---|---|---|---|---|------|---|----|----|----|----|----|----|------|----|-----|----|----|----|----|----|------|----|------|----|----|----|----|----|
| Data Byte | DB_5 | | | | | | | | DB_4 | | | | | | | | DB_3 | | | | | | | | DB_2 | | | | | | | |
| DB Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Bit Offset | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| Data | TMP9 | | | | | | | | HUM | | | | | | | | 16 | | ILL | | | | | | | | 2... | | | | | |

| | | | | | | | | | | | | | | | | |
|------------|---------|----|----|----|-----|----|----|----|------|----|----|----|----|----|----|----|
| | DB_1 | | | | | | | | DB_0 | | | | | | | |
| DB Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Bit Offset | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 |
| Data | ... ILL | | 0 | | VOC | | | | | | | | | | | |

| Offset | Size | Data | ShortCut | Description | Valid Range | Scale | Unit |
|--------|------|----------------|----------|------------------------------------------------------------------|-----------------------------------------------------------------------|------------|------|
| 0 | 9 | Temperature | TMP9 | Temperature (linear) ----- Status of Temperature Sensor | Enum: 0...500: °C 501...510: Reserved 511: Error | 0...50 | |
| 9 | 8 | Humidity | HUM | Rel. Humidity (linear) ----- Status of Humidity Sensor | Enum: 0...200: % 201...254: Reserved 255: Error | 0...100 | |
| 17 | 17 | Illumination | ILL | Illumination (linear) ----- Status of Illumination Sensor | Enum: 0...100000: lx 100001...131070: Reserved 131071: Error | 0...100000 | |
| 34 | 8 | VOC | VOC | VOC in CO2 equivalents (linear) ----- Status of VOC Sensor | Enum: 0...250: ppm/e 251...254: Reserved 255: Error | 0...2000 | |
| 42 | 6 | Not Used (= 0) | | | | | |