Sensors Integration

Telemetry:

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| **Byte:Length** | **Field Value** | **Description** |
| 1:4 | <Req Id> | Request ID. For heartbeat messages, the request must be set to -1. |
| 5:1 | 0x10 | Key = Temperature-IAQ, Length = 4 |
| 6:4 | Float value | Value of Temperature in Celsius from IAQ sensor |
| 10:1 | 0x20 | Key = Humidity-IAQ, Length = 4 |
| 14:4 | Float value | Value of Humidity in % from IAQ sensor |
| 18:1 | 0x30 | Key = IAQ, Length = 2 |
| 19:2 | Short | Value of IAQ from 0-500 |
| 11:1 | 0x40 | Key = CO2, Length = 4 |
| 12:4 | Float | Value of CO2 in ppm |
| 16:1 | 0x50 | Key = b-VOC, Length = 4 |
| 17:4 | Float | Value of breath-VOC in ppm |
| 21:1 | 0x00 | End of Packet Marker |

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| **MQTT Topic** | {Device Id}/NOTIFICATION |
| **JSON Payload** | {  “Temperature-IAQ”: 25.5  “Humidity-IAQ”: 55,  “IAQ”: 200,  “CO2”: 422,  “b-VOC”: 666  } |
| **Description** | In MQTT topic, {Device Id} is set with the user-readable string as listed in CloudExt’s UI (for example: F1-R101-Lock), indicating that the notification corresponds to that lock.  Notification object comprising of the following fields:   * Value of Temperature in Celsius * Value of Humidity in % * Value of IAQ from range 0-500 * Value of CO2 in ppm * Value of b-VOC in ppm |

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| **Byte:Length** | **Field Value** | **Description** |
| 1:4 | <Req Id> | Request ID. For heartbeat messages, the request must be set to -1. |
| 5:1 | 0x60 | Key = Temperature, Length = 4 |
| 6:4 | Float value | Value of Temperature in Celsius |
| 10:1 | 0x70 | Key = Humidity, Length = 4 |
| 11:4 | Float value | Value of Humidity in % |
| 15:1 | 0x00 | End of Packet Marker |

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| **MQTT Topic** | {Device Id}/NOTIFICATION |
| **JSON Payload** | {  “Temperature”: 25.5  “Humidity”: 55  } |
| **Description** | In MQTT topic, {Device Id} is set with the user-readable string as listed in CloudExt’s UI (for example: F1-R101-Lock), indicating that the notification corresponds to that lock.  Notification object comprising of the following fields:   * Value of Temperature in Celsius * Value of Humidity in % |

State:

Sensor1-AirQualityData

Request PDU (Gateway -> Sensor node)

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| **MQTT Topic** | {Device Id}/CMD |
| **JSON Payload** | {  "Command": "sensor1-AirQualityData",  "Seq": <integer>  } |
| **Description** | In the MQTT topic, **{Device ID}** is set with the user-readable string as listed in CloudExt’s UI (for example: F1-R101-Lock), indicating that the staff data for the corresponding lock controller should be set.  The Seq field contains an integer that should be returned back as is in the response payload. The Seq id is used by the IoT server for tracking the requests. |

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| **Byte:Length** | **Field Value** | **Description** |
| 1:4 | <Req Id> | Request ID. Signed int (4 bytes). This is actually the value received in the request payload for the **Seq** field. |
| 5:1 | 0x10 | Key = sensor1-AirQualityData, Length = 1 |
| 6:1 | 0x00 | End of Packet Marker |

Response PDU (Sensor node -> Gateway)

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| **Byte:Length** | **Field Value** | **Description** |
| 1:4 | <Req Id> | Request ID. Signed int (4 bytes). This is actually the value received in the request payload for the **Seq** field. |
| 5:1 | 0x1C | Key = sensor1-AirQualityData, Length = 18 |
| 6:4 |  | Value of Temperature-IAQ in Celsius |
| 10:4 |  | Value of Humidity-IAQ in % |
| 14:2 |  | Value of IAQ from 0-500 |
| 16:4 |  | Value of CO2 in ppm |
| 20:4 |  | Value of breath-VOC in ppm |
| 24:1 | 0x00 | End of Packet Marker |

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| **MQTT Topic** | {Device Id}/CMD\_RESP |
| **JSON Payload** | {  “Command”: “sensor1-AirQualityData”,  “Seq”: <integer that was received in the request message>,  “Response”: {  “Temperature-IAQ”: 25.5  “Humidity-IAQ”: 55,  “IAQ”: 200,  “CO2”: 422,  “b-VOC”: 666  }  } |
| **Description** | In the MQTT topic, **{Device ID}** is set with the user-readable string as listed in CloudExt’s UI (for example: F1-R101-Lock), indicating that the JSON payload is coming from that lock controller.  The JSON payload contains three fields: command, seq, and response.  The command field contains the name of the command for which the response is associated.  The seq (sequence) field contains the integer that was received in the corresponding command request’s seq field.  The response will send current values of temperature, humidity, index of air quality, CO2, and b-VOC |

Sensor2-TemperatureHumidityData

Request PDU (Gateway -> Sensor node)

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| **MQTT Topic** | {Device Id}/CMD |
| **JSON Payload** | {  "Command": "Sensor2-TemperatureHumidityData",  "Seq": <integer>  } |
| **Description** | In the MQTT topic, **{Device ID}** is set with the user-readable string as listed in CloudExt’s UI (for example: F1-R101-Lock), indicating that the staff data for the corresponding lock controller should be set.  The Seq field contains an integer that should be returned back as is in the response payload. The Seq id is used by the IoT server for tracking the requests. |

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| **Byte:Length** | **Field Value** | **Description** |
| 1:4 | <Req Id> | Request ID. Signed int (4 bytes). This is actually the value received in the request payload for the **Seq** field. |
| 5:1 | 0x20 | Key = Sensor2-TemperatureHumidityData, Length = 1 |
| 6:1 | 0x00 | End of Packet Marker |

Response PDU (Sensor node -> Gateway)

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| **Byte:Length** | **Field Value** | **Description** |
| 1:4 | <Req Id> | Request ID. Signed int (4 bytes). This is actually the value received in the request payload for the **Seq** field. |
| 5:1 | 0x2C | Key = Sensor2-TemperatureHumidityData, Length = 8 |
| 6:4 |  | Value of Temperature in Celsius |
| 10:4 |  | Value of Humidity in % |
| 14:1 | 0x00 | End of Packet Marker |

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| --- | --- |
| **MQTT Topic** | {Device Id}/CMD\_RESP |
| **JSON Payload** | {  “Command”: “Sensor2-TemperatureHumidityData”,  “Seq”: <integer that was received in the request message>,  “Response”: {  “Temperature”: 25.5  “Humidity”: 55  }  } |
| **Description** | In the MQTT topic, **{Device ID}** is set with the user-readable string as listed in CloudExt’s UI (for example: F1-R101-Lock), indicating that the JSON payload is coming from that lock controller.  The JSON payload contains three fields: command, seq, and response.  The command field contains the name of the command for which the response is associated.  The seq (sequence) field contains the integer that was received in the corresponding command request’s seq field.  The response will send current values of temperature, humidity |

Alarm:

Sensor1-AirQualityData

Temperature-IAQ Alarm

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| **Byte:Length** | **Field Value** | **Description** |
| 1:4 | <Req Id> | Request ID. For alarm messages, the request must be set to -1. |
| 5:1 | 0x15 | Key = temperature-IAQ\_alert, Length = 5 |
| 6:4 |  | Value of Temperature-IAQ in Celsius |
| 10:1 |  | 0x01 if below the normal range and 0x02 for above the normal range |
| 11:1 | 0x00 | End of Packet Marker |

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| **MQTT Topic** | {Device Id}/ALARM |
| **JSON Payload** | {  “temperature-IAQ\_alert”: {  “temperature-IAQ”: <float>,  “range”: “Below” | “Above”  }  } |
| **Description** | In MQTT topic, {Device Id} is set with the user-readable string as listed in CloudExt’s UI (for example: F1-R101-Lock), indicating that the alarm corresponds to that lock.  In the JSON payload’s Notification field contains the following data:   * Current Temperature-IAQ value * Is the temperature-IAQ below normal range or above normal range |

Humidity-IAQ Alarm

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| **Byte:Length** | **Field Value** | **Description** |
| 1:4 | <Req Id> | Request ID. For alarm messages, the request must be set to -1. |
| 5:1 | 0x25 | Key = humidity-IAQ\_alert, Length = 5 |
| 6:4 |  | Value of Humidity-IAQ in % |
| 10:1 |  | 0x01 if below the normal range and 0x02 for above the normal range |
| 11:1 | 0x00 | End of Packet Marker |

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| --- | --- |
| **MQTT Topic** | {Device Id}/ALARM |
| **JSON Payload** | {  “humidity-IAQ\_alert”: {  “humidity-IAQ”: <float>,  “range”: “Below” | “Above”  }  } |
| **Description** | In MQTT topic, {Device Id} is set with the user-readable string as listed in CloudExt’s UI (for example: F1-R101-Lock), indicating that the alarm corresponds to that lock.  In the JSON payload’s Notification field contains the following data:   * Current humidity-IAQ value * Is the humidity-IAQ below normal range or above normal range |

IAQ Alarm

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| **Byte:Length** | **Field Value** | **Description** |
| 1:4 | <Req Id> | Request ID. For alarm messages, the request must be set to -1. |
| 5:1 | 0x35 | Key = IAQ\_alert, Length = 3 |
| 6:2 |  | Value of IAQ in range 0-500 |
| 8:1 |  | 0x01 if below the normal range and 0x02 for above the normal range |
| 9:1 | 0x00 | End of Packet Marker |

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| **MQTT Topic** | {Device Id}/ALARM |
| **JSON Payload** | {  “IAQ\_alert”: {  “IAQ”: <short>,  “range”: “Below” | “Above”  }  } |
| **Description** | In MQTT topic, {Device Id} is set with the user-readable string as listed in CloudExt’s UI (for example: F1-R101-Lock), indicating that the alarm corresponds to that lock.  In the JSON payload’s Notification field contains the following data:   * Current IAQ value * Is the IAQ below normal range or above normal range |

CO2 Alarm

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| **Byte:Length** | **Field Value** | **Description** |
| 1:4 | <Req Id> | Request ID. For alarm messages, the request must be set to -1. |
| 5:1 | 0x45 | Key = CO2\_alert, Length = 5 |
| 6:4 |  | Value of CO2 in ppm |
| 10:1 |  | 0x01 if below the normal range and 0x02 for above the normal range |
| 11:1 | 0x00 | End of Packet Marker |

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| **MQTT Topic** | {Device Id}/ALARM |
| **JSON Payload** | {  “CO2\_alert”: {  “CO2”: <float>,  “range”: “Below” | “Above”  }  } |
| **Description** | In MQTT topic, {Device Id} is set with the user-readable string as listed in CloudExt’s UI (for example: F1-R101-Lock), indicating that the alarm corresponds to that lock.  In the JSON payload’s Notification field contains the following data:   * Current CO2 value * Is the CO2 below normal range or above normal range |

b-VOC Alarm

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| **Byte:Length** | **Field Value** | **Description** |
| 1:4 | <Req Id> | Request ID. For alarm messages, the request must be set to -1. |
| 5:1 | 0x55 | Key = b-VOC\_alert, Length = 5 |
| 6:4 |  | Value of b-VOC in ppm |
| 10:1 |  | 0x01 if below the normal range and 0x02 for above the normal range |
| 11:1 | 0x00 | End of Packet Marker |

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| **MQTT Topic** | {Device Id}/ALARM |
| **JSON Payload** | {  “b-VOC\_alert”: {  “b-VOC”: <float>,  “range”: “Below” | “Above”  }  } |
| **Description** | In MQTT topic, {Device Id} is set with the user-readable string as listed in CloudExt’s UI (for example: F1-R101-Lock), indicating that the alarm corresponds to that lock.  In the JSON payload’s Notification field contains the following data:   * Current b-VOC value * Is the b-VOC below normal range or above normal range |

Sensor2-TemperatureHumidityData

Temperature Alarm

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| **Byte:Length** | **Field Value** | **Description** |
| 1:4 | <Req Id> | Request ID. For alarm messages, the request must be set to -1. |
| 5:1 | 0x65 | Key = temperature\_alert, Length = 5 |
| 6:4 |  | Value of Temperature in Celsius |
| 10:1 |  | 0x01 if below the normal range and 0x02 for above the normal range |
| 11:1 | 0x00 | End of Packet Marker |

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| **MQTT Topic** | {Device Id}/ALARM |
| **JSON Payload** | {  “temperature\_alert”: {  “temperature”: <float>,  “range”: “Below” | “Above”  }  } |
| **Description** | In MQTT topic, {Device Id} is set with the user-readable string as listed in CloudExt’s UI (for example: F1-R101-Lock), indicating that the alarm corresponds to that lock.  In the JSON payload’s Notification field contains the following data:   * Current Temperature value * Is the temperature below normal range or above normal range |

Humidity Alarm

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| **Byte:Length** | **Field Value** | **Description** |
| 1:4 | <Req Id> | Request ID. For alarm messages, the request must be set to -1. |
| 5:1 | 0x75 | Key = humidity\_alert, Length = 5 |
| 6:4 |  | Value of Humidity in % |
| 10:1 |  | 0x01 if below the normal range and 0x02 for above the normal range |
| 11:1 | 0x00 | End of Packet Marker |

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| --- | --- |
| **MQTT Topic** | {Device Id}/ALARM |
| **JSON Payload** | {  “humidity\_alert”: {  “humidity”: <float>,  “range”: “Below” | “Above”  }  } |
| **Description** | In MQTT topic, {Device Id} is set with the user-readable string as listed in CloudExt’s UI (for example: F1-R101-Lock), indicating that the alarm corresponds to that lock.  In the JSON payload’s Notification field contains the following data:   * Current humidity value * Is the humidity below normal range or above normal range |