24GHz Human Presence Radar

Wi-Fi Communication Interfacing Document Format

Description for MQTT Communication Data

(Ver 3.1)

Contents

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Format Description for MQTT Communication Data（V3.1）

This document describes the MQTT protocol format for radar devices, helping users how to obtain and set radar data for easy development and use. The data content is transmitted in JSON format. Product types in a topic are divided into three types: Human Presence Radar (RadarHP), Fall Radar (RadarFL), and Sleep Radar (RadarSP). Corresponding identification shall be added to the product type during use.

1. Radar human presence info

1.1 Online/Offline Status (Read Only)

Topic: /RadarHP/Device ID/sys/online/post

Subscribe to this topic to receive online/offline state info of the radar. Variants of state: "0", offline state; and "1", online state;

```
{
        "version":          "1.0",
        "method":           "post",
        "params":           {
                "online": "0" //The device is offline
        }
}
```

1.2 Version Info (read only)

Topic: /RadarHP/Device ID/sys/version/post

Subscribe to this topic to receive device properties of the radar: Radar ID (radarID), software version number (softwareVersion), firmware version number (firmwareVersion), and protocol version number. These properties are read only and beyond alteration.

```
{
        "version":          "1.0",
        "method":           "post",
        "params":           {
                "radarID":          "3004004513834353",
                "softwareVersion":          "G24VDA45D-210831-A",
                "firmwareVersion":          "MR24D11B1D",
                "protocolVersion":"PVD2.0T"
        }
```

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```
        }
```

1.3 Active report (read only)

Topic: /RadarHP/Device ID/sys/active/post

Subscribe to this topic to receive radar device attributes: Movement sign parameter, approaching/leaving away state, and environment state. These properties can't be set to change, they can only be obtained.

The value of the movementSigns property, ranging from 0 to 100, is reported in real time every second.

```
    {
        "version":          "1.0",
        "method":           "post",
        "params":           {
                "movementSigns":"100"
        }
    }
```

The value of the keepAway property is 1 (none), 2 (closer), 3 (away), 4 (persistently close), and 5 (persistently away). When someone approaches and moves away from the radar, it is reported in real time.

```
    {
        "version":          "1.0",
        "method":           "post",
        "params":           {
                "keepAway":        "1"
        }
    }
```

The "environ" property values for environmental status are as follows: 0 (none), 1 (someone stationary), 2 (someone in motion).

```
    {
        "version":          "1.0",
        "method":           "post",
        "params":           {
                "environ":          "2"
        }
    }
```

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1.4 Passive reporting (readable and settable)

Topic: /RadarHP/Device ID/sys/passive/post

Subscribe to this topic to receive radar device attributes: scene mode, threshold gear (i.e., sensitivity), and forced entry into unmanned mode.

The value of the sceneMode property is 0 (default mode), 1 (area detection), 2 (bathroom), 3 (bedroom), 4 (living room), 5 (office), 6 (hotel), and the default value is 6 stops.

The value of the thresholdGear attribute is 7 by default, and the range is 1-10, and the larger the value, the more sensitive it is.

Force IntoUnmannedGear attribute value, the range is 0 (not used), 1 (10s), 2 (30s), 3 (1min), 4 (2min), 5 (5min), 6 (10min), 7 (30min), 8 (60min).

```
{
        "version":          "1.0",
        "method":           "post",
        "params":           {
                "thresholdGear":   "7",
                "sceneMode":       "0",
                "forceIntoUnmannedGear": "0"
        }
}
```

To set the value of the property, you can use the following topic to publish a command:

Topic: /RadarHP/Device ID/sys/property/set

Subscribe to the following topics to obtain the response result:

Topic: /RadarHP/Device ID/sys/property/set_reply

Format the data as follows:

```
{
        "version":          "1.0",
        "method":           "set",
        "params":           {
                "sceneMode":       "2" // Changed Scene Mode to 2 (Bathroom)
        }
}
```

If the setting is successful, the updated scene mode and other attributes will be reported, and if the setting fails, it will not be reported. Regardless of whether the response result succeeds or fails, the response result data is reported in the following format:

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```
{
    "version":          "1.0",
    "opt":      "set",
    "res":      "success"//Failure is fail
}
```

If the value of the attribute is 1 to allow the attribute to be reported, and a value of 0 is to prohibit the attribute from being reported. The attributes of active reporting include: movementSigns, keepAway, and environ.

```
{
    "version":          "1.0",
    "method":           "control",
    "params":           {
            "movementSigns":"0",
            "keepAway":       "0",
            "environ":        "0"
    }
}
```

The response result data format is as follows:

```
{
    "version":                "1.0",
    "opt":      "control",
    "res":      "success" //Fell in the event of failure, saxophone in success
}
```

1.5 QoS Quality of Service (configurable)

The topic of setting QoS quality of service is the same as setting the property value:

Topic: /RadarHP/Device ID/sys/property/set

By default, QoS Quality of Service is Qos1, with a value of 0, Qos0, 1 for Qos1, and 2 for Qos2.

The following functions can be used to set QoS quality of service:

```
{
    "version":          "1.0",
    "method":           "control_qos",
```

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```
        "params":            {
                "Qos_online":            "0",
                "Qos_version":           "0",
                "Qos_passive":           "0",
                "Qos_set_reply":   "0",
                "Qos_movementSigns":       "0",
                "Qos_keepAway":          "0",
                "Qos_environ":              "0"
        }
    }
```

The response result data format is as follows:

```
    {
        "version":                    "1.0",
        "opt":     "control_qos",
        "res":     "success" //Fell in the event of failure, saxophone in success
    }
```

2. Fall radar information

On the basis of the radar existing in the human body, the fall radar adds the fall function switch , fall warning time , fall sensitivity , fall alarm and resident alarm..

2.1 Online/Offline Status (Read Only)

Topic: /RadarFL/Device ID/sys/online/post

Subscribe to the topic to receive radar online and offline status. The status is divided into: "0", offline status, "1", online status.

```
    {
        "version":           "1.0",
        "method":            "post",
        "params":            {
                "online": "1" //The device is online
        }
    }
```

2.2 Version Information (Read-only)

Topic: /RadarFL/Device ID/sys/version/post

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Subscribe to this topic to receive radar device attributes: radarID, software version, firmwareVersion, and protocol version. These properties can't be set to change, they can only be obtained.

```
{
        "version":            "1.0",
        "method":            "post",
        "params":            {
                    "radarID":            "290410d51383530343339",
                    "softwareVersion":            "G24FDA43D-210831-A",
                    "firmwareVersion":            "MR24D11B1D",
                    "protocolVersion":"PVD2.0T"
        }
}
```

2.3 Proactive escalation (read-only)

Topic: /RadarFL/Device ID//sys/active/post

Subscribe to this topic to receive radar device attributes: kinematic parameters, proximity away from state, and environmental state. These properties can't be set to change, they can only be obtained.

The value of the movementSigns attribute ranges from 0 to 100 and is reported in real time every second.

```
{
        "version":            "1.0",
        "method":            "post",
        "params":            {
                    "movementSigns":"86"
        }
}
```

The "keepAway" property has values ranging from 1 (none), 2 (approaching), 3 (moving away), 4 (persistently approaching), 5 (persistently moving away). It reports in real-time when someone approaches or moves away from the radar.

```
{
        "version":            "1.0",
        "method":            "post",
        "params":            {
```

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```
                    "keepAway":        "2"
            }
    }
```

The value of the Environ property in the range of 0 (unmanned), 1 (manned stationary), and 2 (manned movement)

```
    {
            "version":          "1.0",
            "method":           "post",
            "params":           {
                    "environ":          "2"
            }
    }
```

FallAlarm attribute value in the range of 0 (suspected fall), 1 (fall), 2 (no fall)

```
    {
            "version":          "1.0",
            "method":           "post",
            "params":           {
                    "fallAlarm":        "0"
            }
    }
```

residentAlarm attribute values, ranging from 0 (none), 1 (first, after 5 min), 2 (second, after 10 min), 3 (third, after 30 min), and 4 (fourth, after 60 min)

```
    {
            "version":          "1.0",
            "method":           "post",
            "params":           {
                    "residentAlarm":   "1"
            }
    }
```

2.4 Passive reporting properties (readable and settable)

Topic: /RadarFL/Device ID/sys/passive/post

Subscribe to this topic to receive radar device attributes: scene mode, threshold gear (i.e., sensitivity),

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forced entry into unmanned mode, fall sensitivity, fall alarm time, and fall switch. These properties can be set.

1) The "sceneMode" property has values ranging from 0 (default mode), 1 (area detection), 2 (bathroom), 3 (bedroom), 4 (living room), 5 (office), to 6 (hotel); default is set to 6.

2) The "thresholdGear" property has a default value of 7, with a range from 1 to 10; higher values indicate greater sensitivity.

3) The "forceIntoUnmannedGear" property has values ranging from 0 (not used) to 8 (60 minutes), with intervals such as 1 (10 seconds), 2 (30 seconds), 3 (1 minute), 4 (2 minutes), 5 (5 minutes), 6 (10 minutes), and 7 (30 minutes).

4) The "fallSensitivity" property has values ranging from 0 to 9, with a default sensitivity of 6; higher values indicate greater sensitivity.

5) The "fallWarningTime" property has values ranging from 0 to 9, representing time intervals such as 0 (1 minute), 1 (2 minutes), 3 (4 minutes), 4 (5 minutes), 5 (6 minutes), 6 (7 minutes), 7 (10 minutes), 8 (15 minutes), and 9 (30 minutes)

6) The "fallSwitch" property has values of 0 or 1, where 0 indicates the function is turned off, and 1 indicates the function is turned on.

```
{
    "version":          "1.0",
    "method":           "post",
    "params":           {
            "thresholdGear":   "7",
            "sceneMode":        "0",
            "forceIntoUnmannedGear": "0",
            "fallSwitch":        "1",
            "fallSensitivity":   "4",
            "fallWarningTime":          "2"
    }
}
```

To set the values of these properties, you can issue commands through the following topic:

Topic: /RadarFL/Device ID/sys/property/set

Subscribe to the following topic to receive responses for the settings:

Topic: /RadarFL/Device ID/sys/property/set_reply

The format for setting data is as follows:

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```
{
        "version":          "1.0",
        "method":           "set",
        "params":           {
                "sceneMode":      "2" //Changed Scene Mode to 2 (Bathroom)
        }
}
```

After the setting is successful, the updated scene mode and other attributes are reported. If the setting fails, it will not be reported. Regardless of whether the response results succeed or fail, the response result data is reported in the following format:

```
{
        "version":          "1.0",
        "opt":     "set",
        "res":     "success" //If it fails, it will fail, and if it succeeds, it will succeed
}
```

If the value of the attribute is 1 to allow the attribute to be reported, and a value of 0 indicates that the attribute is not allowed to be reported. Active reporting attributes include: movementSigns, keepAway, and environ

```
{
        "version":          "1.0",
        "method":           "control",
        "params":           {
                "movementSigns":"0",//It is forbidden to report the parameters of telepathic signs
                "keepAway":      "1",           //Start near away from escalation
                "environ":       "1"            //Initiates ring status escalation
        }
}
```

The response result data format is as follows:

```
{
        "version":                 "1.0",
        "opt":     "control",
        "res":     "success" // If it fails, it will fail, and if it succeeds, it will succeed
}
```

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2.5 QoS Quality of Service (configurable)

The topic of setting QoS quality of service is the same as setting the property value:

Topic: /RadarFL/Device ID/sys/property/set

The QoS (Quality of Service) default is QoS1, with a value of 0 representing QoS0, 1 representing QoS1, and 2 representing QoS2. The QoS configuration is as follows:

```
{
        "version":          "1.0",
        "method":           "control_qos",
        "params":           {
                "Qos_online":           "0",
                "Qos_version":          "0",
                "Qos_passive":          "0",
                "Qos_set_reply":   "0",
                "Qos_movementSigns":       "0",
                "Qos_keepAway":         "0",
                "Qos_environ":              "0",
                "Qos_fallAlarm":  "0",
                "Qos_residentAlarm":        "0"
        }
}
```

The response result data format is as follows:

```
{
        "version":                    "1.0",
        "opt":     "control_qos",
        "res":     "success" //If it fails, it will fail, and if it succeeds, it will succeed


}
```

3. Sleep radar information

On the basis of the radar existing in the human body, the sleep radar adds the sleep function switch , respiratory rate, detection signal , bed entry, sleep assessment , awake duration, light sleep duration , DeepSleepDuration and sleepScore.

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3.1 Online/Offline Status (Read-Only)

Topic: /RadarSP/Device ID/sys/online/post

Subscribe to the topic to receive radar online and offline status. The status is divided into: "0", offline state; "1", online status;

```
{
        "version":              "1.0",
        "method":               "post",
        "params":               {
                    "online": "0" //The device is offline
        }
}
```

3.2Version Information (Read-only)

Topic: /RadarSP/Device ID/sys/version/post

Subscribe to this topic to receive radar device attributes: radarID, software version, firmwareVersion, and protocol version. These properties can't be set to change, they can only be obtained.

```
{
        "version":              "1.0",
        "method":               "post",
        "params":               {
                    "radarID":              "3004004513834353",
                    "softwareVersion":              "G24VDA45D-210831-A",
                    "firmwareVersion":              "MR24D11B1D",
                    "protocolVersion":"PVD2.0T"
        }
}
```

3.3 Proactive escalation (read-only)

Topic: /RadarSP/Device ID/sys/active/post

Subscribe to this topic to receive radar device attributes: kinesiology parameters, proximity away from the state, environmental status, respiratory rate, detection signals, bed entry/exit, sleep assessment, awake time parameters, and sleep quality parameters. These properties can't be set to change, they can only be obtained.

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The value of the movementSigns attribute ranges from 0 to 100 and is reported in real time every second.

```
{
        "version":          "1.0",
        "method":           "post",
        "params":           {
                "movementSigns":"100"
        }
}
```

The value of the keepAway property is 1 (none), 2 (closer), 3 (away), 4 (persistently close), and 5 (persistently away). When someone approaches and moves away from the radar, it is reported in real time.

```
{
        "version":          "1.0",
        "method":           "post",
        "params":           {
                "keepAway":       "1"
        }
}
```

Environment state (environ) property values ranging from 0 (unmanned), 1 (manned stationary), 2 (manned motion)

```
{
        "version":          "1.0",
        "method":           "post",
        "params":           {
                "environ":          "2"
        }
}
```

The value of the breathRate attribute, ranging from 0-30.

```
{
        "version":          "1.0",
        "method":           "post",
        "params":           {
```

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```
            "breathRate":        "11"
        }
    }
```

WeakSignal attribute values in the range of 1 (abnormal), 2 (none), 3 (normal), 4 (abnormal movement), 5 (abnormal shortness of breath)

Abnormal motion refers to the abnormal movement of a person when the movement of a person occurs, and informs the user that the movement may affect the detection of breathing by radar.

```
    {
        "version":          "1.0",
        "method":           "post",
        "params":           {
                "weakSignal":        "1"
        }
    }
```

get In to Bed/Get out of bed attribute values in the range of 1 (Abnormal), 2 (None), 3 (Normal)

```
    {
        "version":          "1.0",
        "method":           "post",
        "params":           {
                "getIntoBed":        "0"
        }
    }
```

Sleep Assessment attribute values ranging from 0 (awake state), 1 (light sleep), 2 (deep sleep), 3 (none)

```
    {
        "version":          "1.0",
        "method":           "post",
        "params":           {
                "sleepAssessment":    "6"
        }
    }
```

The value of the AwakeDuration property.

```
    {
```

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```
        "version":          "1.0",

        "method":           "post",

        "params":           {

                " AwakeDuration":    "80"

        }

    }
```

LightSleepDuration, the length of the light-sleep.

```
    {

        "version":          "1.0",

        "method":           "post",

        "params":           {

                " LightSleepDuration":           "20"

        }

    }
```

Sleep Duration (Dipsi Platyon) attribute value.

```
    {

        "version":          "1.0",

        "method":           "post",

        "params":           {

                " DeepSleepDuration":           "50"

        }

    }
```

The value of the sleepScore attribute ranges from 0 to 100.

```
    {

        "version":          "1.0",

        "method":           "post",

        "params":           {

                "sleepScore":           "60"

        }

    }
```

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3.4 Passive reporting (readable and configurable)

Topic: /RadarSP/Device ID/sys/passive/post

Subscribe to this topic to receive radar device attributes: scene mode, threshold gear (i.e., sensitivity), forced entry into unmanned mode, and sleep function switch.

1）The value of the sceneMode property is 0 (default mode), 1 (area detection), 2 (bathroom), 3 (bedroom), 4 (living room), 5 (office), 6 (hotel), and the default value is 6 stops.

2）The value of the thresholdGear attribute is 7 by default, and the range is 1-10, and the larger the value, the more sensitive it is.

3）Force IntoUnmannedGear attribute values, ranging from 0 (not used), 1 (10s), 2 (30s), 3 (1min), 4 (2min), 5 (5min), 6 (10min), 7 (30min), 8 (60min)

4）The value of the sleepSwitch property, the range is 0 for function off, and 1 for function on.

```
{
        "version":          "1.0",
        "method":           "post",
        "params":           {
                "thresholdGear":   "7",
                "sceneMode":       "0",
                "forceIntoUnmannedGear": "0",
                "sleepSwitch":     "1"
        }
}
```

To set the value of the property, you can use the following topic to publish a command:

Topic: /RadarSP/Device ID/sys/property/set

Subscribe to the following topics to receive configuration response results

Topic: /RadarSP/Device ID/sys/property/set_reply

Format the data as follows:

```
{
        "version":          "1.0",
        "method":           "set",
        "params":           {
                "sceneMode":       "2" //Changed Scene Mode to 2 (Bathroom)
        }
}
```

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After the setting is successful, the updated scene mode and other attributes are reported. If the setting fails, it will not be reported. Regardless of whether the response results succeed or fail, the response result data is reported in the following format:

```
{
        "version":              "1.0",

        "opt":     "set",

        "res":     "success"//Failure is fail

}
```

If the value of the attribute is 1 to allow the attribute to be reported, and a value of 0 indicates that the attribute is not allowed to be reported. Active reporting attributes include: movementSigns, keepAway, and environ

```
{
        "version":            "1.0",

        "method":             "control",

        "params":             {

                "movementSigns":"0",

                "keepAway":        "0",

                "environ":           "0"

        }
}
```

The response result data format is as follows

```
{
        "version":                    "1.0",

        "opt":     "control",

        "res":     "success" //If it fails, it will fail, and if it succeeds, it will succeed


}
```

3.5 Quality of Service (QoS) - Configurable

The topic of setting QoS quality of service is the same as setting the property value:

Topic: /RadarSP/Device ID/sys/property/set

By default, QoS Quality of Service is Qos1, with a value of 0, Qos0, 1 for Qos1, and 2 for Qos2.

The following functions can be used to set QoS quality of service:

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```
{
    "version":        "1.0",
    "method":         "control_qos",
    "params":         {
            "Qos_online":           "0",
            "Qos_version":          "0",
            "Qos_passive":          "0",
            "Qos_set_reply":  "0",
            "Qos_movementSigns":      "0",
            "Qos_keepAway":         "0",
            "Qos_environ":            "0",
            "Qos_breathRate":"0",
            "Qos_weakSignal":         "0",
            "Qos_getIntoBed":         "0",
            "Qos_sleepAssessment":    "0",
            "Qos_AwakeDuration":      "0",
            "Qos_LightSleepDuration": "0",
            "Qos_DeepSleepDuration": "0",
            "Qos_sleepScore":"0"
    }
}
```

The response result data format is as follows

```
{
    "version":                  "1.0",
    "opt":     "control_qos",
    "res":     "success" //If it fails, it will fail, and if it succeeds, it will succeed
}
```

4. Historical Version Update Notes

Revision	Release Date	Summary
V1.0	~	first draft

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V2.0	~	Restructuring of documents
V3.0	~	Add MQTT quality of service content
V3.1	2021/12/30	Sync with the latest radar documentation: Sensitivity modified from 0-9 to 1-10; Change the content of the sleep radar detection signal; Change the fall alarm time content;

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