# M7

# Product Specification

| | |
|---|---|
| Document No.: | NQR.CP-M5-2401-001 |
| Product Model: | M7 |
| Product Name: | Built-in transceiver and data transmission radio station |

Prepared by/Date: Reviewed by/Date: Approved by/Date:

| Document Revision Record | | | | | | |
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| S/N | Modify chapters/clauses | Modify the summary | Version | Modified date | Modifier | Approver |
| 1 | All | Create a first draft | V1.0 | 2025.1 | | |
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# I. Overview

M7 is a radio station, supporting both UHF radio . Specifically developed for the surveying and mapping as well as precision agriculture markets, it features long communication distance, good protocol compatibility, and strong anti-interference capability.


Figure 1-1: M7 appearance diagram

## 1.1 Product features

- Radio station operating frequency range: 410-470 MHz
- The package size and pin definition are compatible with HX-DU2005D and HX-DU5002D radios.
- The integration of transceivers can meet the requirements of communication links between base stations and mobile stations.
- Support online upgrade function.
- Supports H, L power switching.

## 1.2 Application field

Surveying and mapping, precision agriculture

# II. Technical Specifications

## 2.1 Working conditions

| Parameter | Minimum | Typical value | Maximum | Unit | Instructions |
|---|---|---|---|---|---|
| Working voltage | \ | 7.5 | \ | V | 5W recommended @ 7.5V |
| Operating temperature | -40 | - | 70 | ℃ | |
| Operating humidity | 10 | - | 90 | %RH | |
| Storage temperature | -45 | - | 85 | ℃ | |
| Electrostatic discharge voltage (Contact discharge) | - | - | 4 | KV | |
| Electrostatic discharge voltage (Air discharge) | - | - | 6 | KV | |

## 2.2 Power consumption parameter

| Parameter | Minimum | Typical value | Maximum | Unit | Remarks |
|---|---|---|---|---|---|
| Emission current | 0.8 | 1.6 | 1.8 | A | 1W transmitting current 0.8A<br>2W transmitting current 1.1A<br>5W transmitting current 1.6A |
| Receive current | - | 80 | - | mA | |
| Standby current | - | 80 | - | mA | |

## 2.3 Radio frequency characteristics

| Item | Content |
|---|---|
| Operating frequency | 410-470 MHz |

| | |
|---|---|
| Working mode | half-duplex |
| Channel bandwidth | 12.5kHz |
| Modulation scheme | 4FSK |
| FSK modes<br>Carrier power | 5.0W, 2.0W, Three power levels are available<br>(default antenna port impedance is 50Ω) |
| Carrier power stability | ±1.5 dB |
| Power consumption<br>(typical value) | Transmitting high power: 12.0@7.5V DC<br>Transmitting medium power: 8.0W@7.5V DC<br>Standby power consumption: 0.55W@7.5V DC |
| Reception sensitivity | FSK mode: better than -114dBm@BER 10-5,9600 |
| Co-channel suppression | >-12dB |

## 2.4 Modem

| | |
|---|---|
| Serial port speed | 9600bps, 19200bps, 38400bps, 115200bps |

## 2.5 Operating temperature

| | |
|---|---|
| Operating temperature | -40~+75℃ |
| Storage temperature | -45~+85℃ |

## 2.6 Communication interface

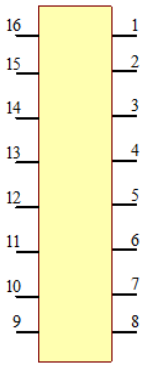
| Item | Content |
|---|---|
| Serial port | Standard TTL level<br>Data bit: 8 bits<br>Stop bit: 1 bit<br>Validation: No validation |

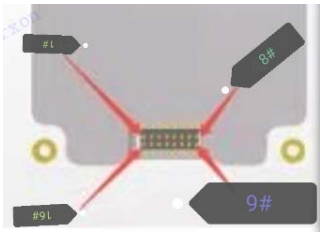
## 2.7 Structural characteristics

| Item | Content |
|---|---|
| Size | 75 (length) × 46 (width) × 11 (height) mm |
| Weight | About 60g |
| Antenna interface | MCX female socket |
| Antenna interface impedance | 50 ohm |
| Data interface | 2*8pin /1.27mm |

# III. Pin Definition

The distribution of M7 pins is shown in the figure below:




**Pin definition:**

Pin 1 - VCC - regulated +7.5V DC power input

Pin 2 - VCC - regulated +7.5V DC power input

Pin 3 - VCC - regulated +7.5V DC power input

Pin 4 - VCC - regulated +7.5V DC power input

Pin 5 - RSSI output

Pin 6 - suspended

Pin 7 - TXD

Pin 8 - RXD

Pin 9 - CONF IG - pull down to enter configuration mode, High level indicates data transmission mode

Pin 10 - for testing, needs to be suspended

Pin 11 - for testing, needs to be suspended

Pin 12 - for testing, needs to be suspended

Pin 13 - External power supply negative input

Pin 14 - External power supply negative input

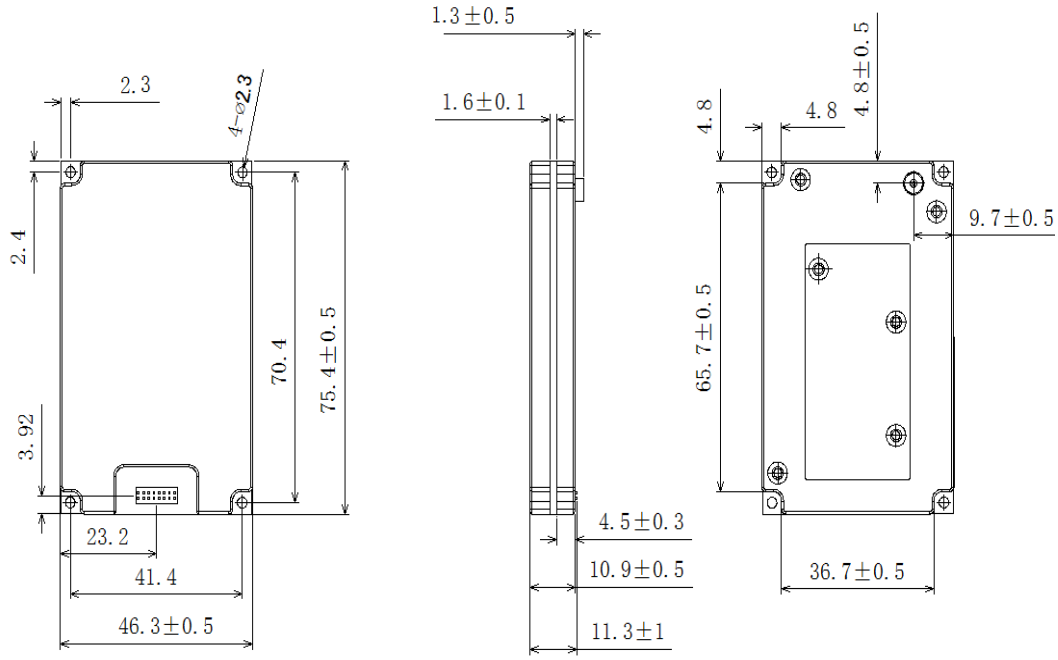
Pin 15 - External power supply negative input

Pin 16 - External power supply negative input

# IV. Mechanical characteristics

## 4.1 Module size

The view and dimensions are shown in the following figure



Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This equipment should be installed and operated with minimum distance 50cm between the radiator& your body.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01

2.2 List of applicable FCC rules

CFR 47 FCC PART 90 has been investigated. It is applicable to the modular.

2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone

modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

2.4 Limited module procedures
Not applicable

2.5 Trace antenna designs
Not applicable

2.6 RF exposure considerations

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This equipment should be installed and operated with minimum distance 50cm between the radiator & your body. If the device built into a host as a portable usage, the additional RF exposure evaluation may be required as specified by 2.1093.

2.7 Antennas

This radio transmitter FCC ID: 2BM2K-M7 has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

| No. | Antenna Type | Antenna Gain | Impedance | Frequency Range |
|---|---|---|---|---|
| 1 | Dipole | 2 dBi | 50Ω | 410-470MHz |

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following " Contains FCC ID: 2BM2K-M7”

2.9 Information on test modes and additional testing requirements

Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed

with all other applicable requirements for the system such as Part 15 B