# MAX-M10M

## Standard precision GNSS module

### Professional grade

Data sheet


**Abstract**

This data sheet describes the MAX-M10M module, an ultra-low-power GNSS receiver for high-performance asset-tracking applications.

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# Document information

| | | |
|---|---|---|
| **Title** | **MAX-M10M** | |
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| **Document type** | Data sheet | |
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| Product status | Corresponding content status | |
|---|---|---|
| **Functional Sample** | Draft | For functional testing. Revised and supplementary data will be published later. |
| **In development / prototype** | Objective specification | Target values. Revised and supplementary data will be published later. |
| **Engineering sample** | Advance information | Data based on early testing. Revised and supplementary data will be published later. |
| **Initial production** | Early production information | Data from product verification. Revised and supplementary data may be published later. |
| **Mass production / End of life** | Production information | Document contains the final product specification. |

This document applies to the following products:

| Product name | Type number | FW version | IN/PCN reference | Product status |
|---|---|---|---|---|
| MAX-M10M | MAX-M10M-00B-01 | ROM SPG 5.10 | UBX-22024093 | Engineering sample |

# Contents

# 1 Functional description

## 1.1 Overview

The MAX-M10M module features the u-blox M10 standard precision GNSS platform and provides exceptional sensitivity and acquisition time for all L1 GNSS signals.

The M10 platform supports concurrent reception of four GNSS (GPS, GLONASS, Galileo, and BeiDou). The high number of visible satellites enables the receiver to select the best signals. This maximizes the position availability, in particular under challenging conditions such as in deep urban canyons.

u-blox Super-S (Super-Signal) technology offers great RF sensitivity and can improve the dynamic position accuracy with small antennas or in non-line-of-sight scenarios.

MAX-M10M is cost and power optimized for designs where a SAW filter and an LNA are integrated in the external active antenna. It works in a wide main supply voltage range of 1.8 - 5 V with an extremely low power consumption of less than 10 mW in a 1 Hz cyclic tracking power save mode.

MAX-M10M offers backwards pin-to-pin compatibility with products from the previous u-blox generations, which saves the designer's effort and reduces costs when upgrading designs to the advanced low-power u-blox M10 GNSS technology.

## 1.2 Performance

| Parameter | Specification | Value |
|---|---|---|
| Receiver type | | u-blox M10 receiver |
| Accuracy of time pulse signal | RMS | 30 ns |
| | 99% | 60 ns |
| Frequency of time pulse signal | | Default 1PPS (0.25 Hz to 10 MHz configurable) |
| Operational limits[1] | Dynamics | ≤ 4 g |
| | Altitude | 80,000 m |
| | Velocity | 500 m/s |
| Velocity accuracy[2] | | 0.05 m/s |
| Dynamic heading accuracy[2] | | 0.3 deg |

| Parameter | GPS+GAL (default) | GPS+GAL +GLO | GPS+GAL +BDS B1I | GPS+GAL +BDS B1C | GPS+GAL +BDS B1C +GLO |
|---|---|---|---|---|---|
| Maximum navigation update rate[3] | 10 Hz | 10 Hz | 10 Hz | 10 Hz | 5 Hz |
| Position accuracy (CEP)[4, 5] | 1.5 m | 1.5 m | 1.5 m | 1.5 m | 1.5 m |

1 Assuming Airborne 4 g platform

2 50% at 30 m/s for dynamic operation

3 For high navigation update rates, increase the communication baud rate and reduce the number of enabled messages. The maximum achievable navigation rate depends on the number of tracked SVs.

4 GPS is always in combination with SBAS and QZSS.

5 CEP, 50%, 24 hours static, -130 dBm, > 6 SVs for each GNSS system

| Parameter | | GPS+GAL (default) | GPS+GAL +GLO | GPS+GAL +BDS B1I | GPS+GAL +BDS B1C | GPS+GAL +BDS B1C +GLO |
|---|---|---|---|---|---|---|
| Time To First Fix (TTFF)[4, 6, 7] | Cold start | 28 s | 23 s | 27 s | 28 s | 23 s |
| | Hot start | 1 s | 1 s | 1 s | 1 s | 1 s |
| | AssistNow Online[8] | 1 s | 1 s | 1 s | 1 s | 1 s |
| | AssistNow Offline[9] | 2 s | 2 s | 3 s | 2 s | 2 s |
| | AssistNow Autonomous[10] | 3 s | 4 s | 4 s | 4 s | 4 s |
| Sensitivity[11] | Tracking and nav. | -165 dBm | -167 dBm | -165 dBm | -165 dBm | -167 dBm |
| | Reacquisition | -160 dBm | -160 dBm | -160 dBm | -160 dBm | -160 dBm |
| | Cold Start | -148 dBm | -148 dBm | -148 dBm | -148 dBm | -148 dBm |
| | Hot start[6] | -159 dBm | -159 dBm | -159 dBm | -159 dBm | -159 dBm |

**Table 1: MAX-M10M typical performance in multi-constellation GNSS modes.**

| Parameter | | GPS | GLONASS | BDS B1I | GALILEO | BDS B1C |
|---|---|---|---|---|---|---|
| Maximum navigation update rate | | 18 Hz | 18 Hz | 18 Hz | 18 Hz | 18 Hz |
| Position accuracy (CEP)[4, 5] | | 1.5 m | 4 m | 2 m | 3 m | 2 m |
| Time To First Fix (TTFF)[4, 6, 7] | Cold start | 29 s | 27 s | 30 s | 41 s | 56 s |
| | Hot start | 1 s | 1 s | 1 s | 1 s | 1 s |
| | AssistNow Online[8] | 1 s | 1 s | 2 s | 7 s | TBD |
| Sensitivity[11] | Tracking and nav. | -165 dBm | -166 dBm | -159 dBm | -160 dBm | TBD |
| | Reacquisition | -160 dBm | -158 dBm | -158 dBm | -154 dBm | TBD |
| | Cold Start | -148 dBm | -147 dBm | -144 dBm | -139 dBm | TBD |
| | Hot start[6] | -159 dBm | -159 dBm | -159 dBm | -155 dBm | TBD |

**Table 2: MAX-M10M typical performance in single-GNSS modes**

## 1.3 Supported GNSS constellations

MAX-M10M is a concurrent GNSS receiver that can receive and track multiple GNSS systems. The single RF front-end architecture enables concurrent reception of multiple GNSS constellations. The receiver can be configured for a subset of GNSS constellations to achieve lower power consumption.

The default configuration on MAX-M10M is concurrent reception of GPS and Galileo with QZSS and SBAS enabled.

The following GNSS and their signals are supported:

| System | Signals |
|---|---|
| GPS / QZSS | L1C/A (1575.42 MHz) |
| Galileo | E1-B/C (1575.42 MHz) |
| GLONASS | L1OF (1602 MHz + k*562.5 kHz, k = -7,..., 5, 6) |

6 Commanded starts.

7 All satellites at -130 dBm. Measured at room temperature.

8 Dependent on the speed and latency of the aiding data connection, commanded starts.

9 Using seven days old AssistNow Offline data. External memory may be required.

10 Using two days old orbital predicted data. External memory may be required.

11 Demonstrated with a good external LNA. Measured at room temperature.

| System | Signals |
|---|---|
| BeiDou[12] | B1I (1561.098 MHz), B1C (1575.42 MHz) |

**Table 3: Supported GNSS and signals on MAX-M10M**

The following GNSS assistance services are supported:

| Service | Support |
|---|---|
| AssistNow™ Online | GPS L1C/A, QZSS L1C/A, Galileo E1, GLONASS L1OF, BeiDou B1I |
| AssistNow™ Offline | GPS L1C/A, GLONASS L1OF |
| AssistNow™ Autonomous | GPS L1C/A, QZSS L1C/A, Galileo E1, GLONASS L1OF, BeiDou B1I |

**Table 4: Supported Assisted GNSS (A-GNSS) services**

The following augmentation systems are supported:

| System | Support |
|---|---|
| SBAS | EGNOS, GAGAN, MSAS and WAAS |
| QZSS | L1S (SLAS) |

**Table 5: Supported augmentation systems**

The augmentation systems SBAS and QZSS can be enabled only if GPS operation is also enabled.

## 1.4 Supported protocols

MAX-M10M supports the following interface protocols:

| Protocol | Type |
|---|---|
| UBX | Input/output, binary, u-blox proprietary |
| NMEA versions 2.1, 2.3, 4.0, 4.10 and 4.11 (default). | Input/output, ASCII |

**Table 6: Supported protocols**

## 1.5 Firmware features

| Feature | Description |
|---|---|
| Antenna supervisor[13] | Antenna supervisor for active antenna control and short detection |
| CloudLocate GNSS | Extends the life of energy-constrained IoT applications. Small payload messages supported. |
| Assisted GNSS | AssistNow Online, AssistNow Offline and AssistNow Autonomous |
| Backup modes | Hardware backup mode and software standby mode |
| Power save modes[14] | On/off, cyclic tracking |
| Super-S | Improved dynamic position accuracy with small antennas |
| Protection level | Real-time position accuracy estimate with 95% confidence level[15] |
| Galileo return link messages | Galileo search and rescue (SAR) return link messages (RLM) via Galileo satellite signal |
| Data batching | Autonomous tracking up to 10 minutes at 1 Hz |

12 BeiDou B1I cannot be enabled simultaneously with BeiDou B1C or GLONASS L1OF.

13 External components required, some pins need to be reconfigured.

14 The power save modes are not available if BeiDou B1C is enabled.

15 Verified for automotive environment only.

| Feature | Description |
|---|---|
| Odometer | Measure traveled distance with support for different user profiles |

**Table 7: Firmware features**

| Feature | Description |
|---|---|
| Anti-jamming | RF interference and jamming detection and reporting |
| Anti-spoofing | Spoofing detection and reporting |
| Configuration lockdown | Receiver configuration can be locked by command |
| Message integrity | All messages can be cryptographically signed |
| Secure boot | Only signed firmware images executed |

**Table 8: Security features**

# 2 System description

## 2.1 Block diagram

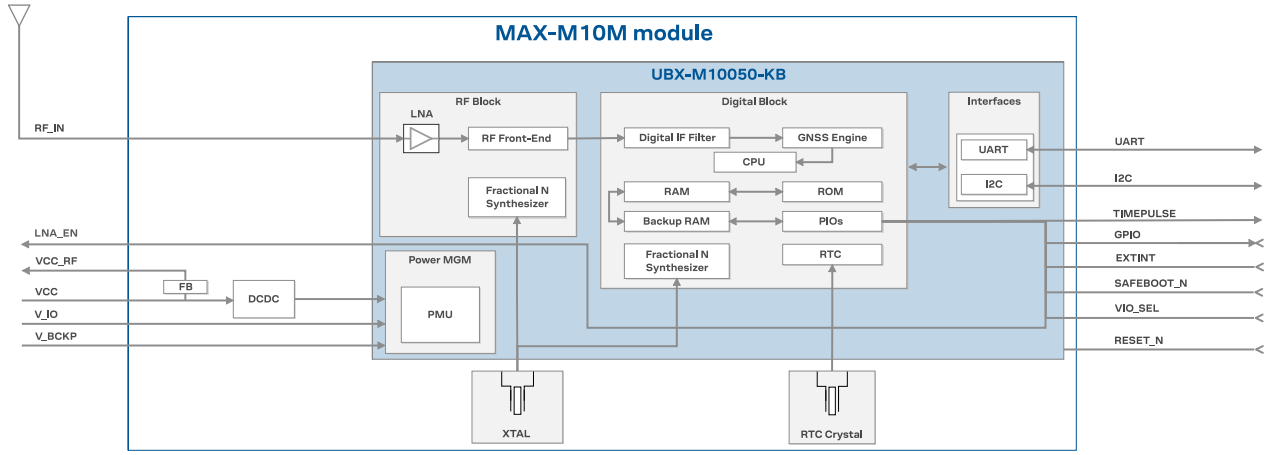



**Figure 1: MAX-M10M block diagram**

# 3 Pin definition

## 3.1 Pin assignment

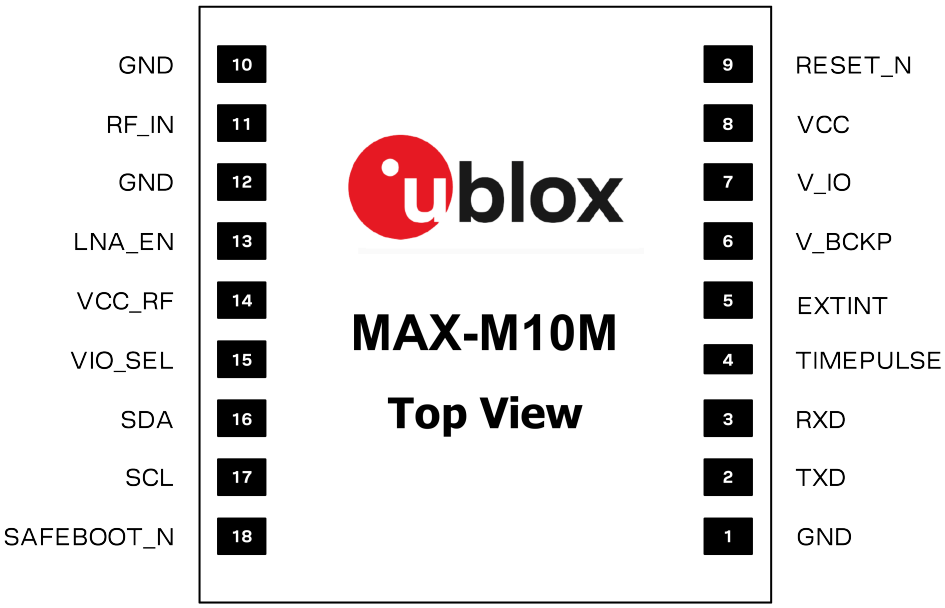



**Figure 2: MAX-M10M pin assignment**

| Pin no. | Name | PIO no. | I/O | Description |
|---|---|---|---|---|
| 1 | GND | - | - | Connect to GND |
| 2 | TXD | 1 | O | UART TX |
| 3 | RXD | 0 | I | UART RX |
| 4 | TIMEPULSE | 4 | O | Time pulse signal (shared with SAFEBOOT_N pin)[16] |
| 5 | EXTINT | 5 | I | External interrupt |
| 6 | V_BCKP | - | I | Backup voltage supply |
| 7 | V_IO | - | I | IO voltage supply |
| 8 | VCC | - | I | Main voltage supply |
| 9 | RESET_N | - | I | System reset (active low). Has to be low for at least 1 ms to trigger a reset. |
| 10 | GND | - | - | Connect to GND |
| 11 | RF_IN | - | I | GNSS signal input |
| 12 | GND | - | - | Connect to GND |
| 13 | LNA_EN | - | O | On/Off external LNA or active antenna |
| 14 | VCC_RF | - | O | Output voltage RF section |
| 15 | VIO_SEL | - | I | Voltage selector for V_IO supply. Connect to GND for 1.8 V supply, or leave open for 3.3 V supply. |
| 16 | SDA | 2 | I/O | I2C data |
| 17 | SCL | 3 | I | I2C clock |
| 18 | SAFEBOOT_N | - | I | Safeboot mode (leave open)[16] |

**Table 9: MAX-M10M pin assignment**

[16] The receiver enters safeboot mode if this pin is low at start up. The SAFEBOOT_N pin is internally connected to TIMEPULSE pin through a 1 kΩ series resistor.

## 3.2 Pin state

Table 10 defines the state of the PIOs and RESET_N pins in different modes. The functions of the PIOs are as defined in the default configuration.

| PIO no. | Pin no. | Default function | Continuous mode | Software standby mode | Safe boot mode |
|---|---|---|---|---|---|
| 0 | 3 | RXD | Input pull-up | Input pull-up | Input pull-up |
| 1 | 2 | TXD | Output | Input pull-up | Output |
| 2 | 16 | SDA | Input pull-up | Input pull-up | Input pull-up |
| 3 | 17 | SCL | Input pull-up | Input pull-up | Input pull-up |
| 4 | 18 | SAFEBOOT_N | Output | Input pull-down | High Z |
| | 4 | TIMEPULSE | Output | Input pull-down | High Z |

**Table 10: Pins state**

☞ In reset mode (RESET_N = low), all PIOs are configured as input pull-up.

☞ In hardware backup mode (VCC = 0 V and V_IO = 0 V), PIOs must not be driven.

# 4 Electrical specifications

Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only. Operation of the device at these or at any other conditions above those given below is not implied. Exposure to limiting values for extended periods may affect device reliability.

Where application information is given, it is advisory only and does not form part of the specification.

## 4.1 Absolute maximum ratings

| Symbol | Parameter | Min | Max | Unit |
|---|---|---|---|---|
| VCC | Main supply voltage | -0.3 | 6 | V |
| V_IO | IO supply voltage | -0.3 | 3.6 | V |
| | Voltage ramp on V_IO[17] | 25 | 35000 | µs/V |
| V_BCKP | Backup supply voltage | -0.3 | 3.6 | V |
| V_PIO | Input voltage on RESET_N and digital pins.<br>VIO_SEL = GND. | -0.3 | V_IO + 0.3<br>(max 1.98) | V |
| | Input voltage on RESET_N and digital pins.<br>VIO_SEL = open. | -0.3 | V_IO + 0.3<br>(max 3.6) | V |
| I_PIO | Max source / sink current, digital pins[18] | -10 | 10 | mA |
| ICC_RF | Max source current, VCC_RF | | 100 | mA |
| $P_{rfin}$ | RF input power on RF_IN[19] | | +15 | dBm |
| $T_{amb}$ | Ambient temperature | -40 | +85 | °C |
| $T_s$ | Storage temperature | -40 | +85 | °C |

**Table 11: Absolute maximum ratings**

The product is not protected against overvoltage or reversed voltages. Voltage spikes exceeding the power supply voltage specification, given in the table above, must be limited to values within the specified boundaries by using appropriate protection diodes.

## 4.2 Operating conditions

Table 12 shows the general operating conditions. Table 13 shows the electrical parameters for digital I/O.

The V_IO voltage range is selected with the VIO_SEL pin.

For designs with 1.8 V supply at V_IO, switch off V_IO supply 100 ms before VCC when transitioning to hardware backup mode. Alternatively, send a UBX-RXM-PMREQ message before switching off V_IO and VCC.

| Symbol | Parameter | Min | Typical | Max | Unit |
|---|---|---|---|---|---|
| VCC | Main supply voltage | 1.76 | 1.8, 3.3 | 5.5 | V |
| V_IO | IO supply voltage, VIO_SEL = GND | 1.68 | 1.8 | 1.98 | V |
| | IO supply voltage, VIO_SEL = open | 2.7 | 3.3 | 3.6 | V |

17 Exceeding the voltage ramp speed may permanently damage the device.

18 The SAFEBOOT_N pin has an internal 1 kΩ series resistor.

19 Test conditions: source impedance = 50 Ω, continuous wave.

| Symbol | Parameter | Min | Typical | Max | Unit |
|---|---|---|---|---|---|
| V_BCKP | Supply voltage, backup domain | 1.65 | | 3.6 | V |
| $V\_IO_{SWITCH}$ | V_IO voltage threshold to switch an internal supply for the backup domain from V_IO to V_BCKP | | 1.45 | | V |
| VCC_RF | VCC_RF output voltage | | VCC - 0.1 | | V |
| ICC_RF | VCC_RF output current | | | 50 | mA |
| $NF_{tot}$ | Receiver chain noise figure | | 3.5 | | dB |
| Ext_gain[20] | External gain at RF_IN, normal gain mode (default) | | | 40 | dB |
| | External gain at RF_IN, low gain mode | 14 | | 50 | dB |
| | External gain at RF_IN, bypass mode | 23 | | 60 | dB |
| $T_{opr}$ | Operating temperature | -40 | | +85 | °C |

**Table 12: General operating conditions**

| Symbol | Parameter | Min | Typical | Max | Unit |
|---|---|---|---|---|---|
| $V_{in}$ | Input pin voltage range | 0 | | V_IO | V |
| $V_{il}$ | Low-level input voltage | | | 0.63 | V |
| $V_{ih}$ | High-level input voltage | 0.68 x V_IO | | | V |
| $V_{ol}$ | Low-level output voltage, Iout = -2 mA [21] | | | 0.4 | V |
| $V_{oh}$ | High-level output voltage, Iout = 2 mA [21] | V_IO - 0.4 | | | V |
| $R_{pu, IO}$ | Pull-up resistance, Digital IO[22]. VIO_SEL = GND | 6 | 17 | 72 | kΩ |
| $R_{pu, IO}$ | Pull-up resistance, Digital IO[22]. VIO_SEL = open | 8 | 18 | 40 | kΩ |
| $R_{pd, IO}$ | Pull-down resistance, Digital IO | 21 | 80 | 180 | kΩ |
| $R_{pu, SAFEBOOT\_N}$ | Pull-up resistance, SAFEBOOT_N[23] | 6 | 17 | 72 | kΩ |
| $R_{pu, RESET\_N}$ | Pull-up resistance, RESET_N | 7 | 10 | 13 | kΩ |

**Table 13: Digital IO**

☞ Operation beyond the specified operating conditions can affect device reliability.

## 4.3 Indicative power requirements

Table 14 shows indicative current consumption for VCC and V_IO with a 3.0 V supply.

| Symbol (Parameter) | Conditions | GPS | GPS+GAL (default) | GPS+GAL +GLO | GPS+GAL +BDS B1I | GPS+GAL +BDS B1C | GPS+GAL +BDS B1C +GLO | Unit |
|---|---|---|---|---|---|---|---|---|
| $I_{VCC}$ [24] (Current at VCC) | Acquisition[25] | 6 | 8 | 10 | 9.5 | 9 | 11 | mA |
| | Tracking (Continuous mode) | 5 | 5.5 | 6.5 | 7 | 6 | 7.5 | mA |
| | Tracking (Power save mode)[26] | 2 | 2.1 | 2.5 | 2.5 | - | - | mA |

20 The internal LNA gain is configurable.

21 TIMEPULSE (PIO4) has 4 mA current drive/sink capability.

22 TXD, RXD, TIMEPULSE, EXTINT, SCL, SDA, and LNA_EN.

23 The SAFEBOOT_N pin has an additional 1 kΩ series resistor.

24 Internal LNA set to normal gain. Simulated signal using power levels of -130 dBm.

25 Average current from start-up until the first fix.

26 Power save mode in cyclic tracking operation, 1-second update period. GNSS configurations that include BeiDou B1C do not support this mode.

| Symbol (Parameter) | Conditions | GPS | GPS+GAL (default) | GPS+GAL +GLO | GPS+GAL +BDS B1I | GPS+GAL +BDS B1C | GPS+GAL +BDS B1C +GLO | Unit |
|---|---|---|---|---|---|---|---|---|
| $I_{V\_IO}$ (Current at V_IO) | Acquisition and Tracking (Continuous mode) | 1.7 | 1.7 | 1.8 | 1.7 | 1.7 | 1.8 | mA |
| | Tracking (Power save mode)[26] | 1.5 | 1.5 | 1.5 | 1.5 | - | - | mA |

**Table 14: Typical currents for 3.0 V supply at VCC and V_IO**

Table 15 shows indicative current consumption for VCC and V_IO with a 1.8 V supply.

| Symbol (Parameter) | Conditions | GPS | GPS+GAL (default) | GPS+GAL +GLO | GPS+GAL +BDS B1I | GPS+GAL +BDS B1C | GPS+GAL +BDS B1C +GLO | Unit |
|---|---|---|---|---|---|---|---|---|
| $I_{VCC}$[24] (Current at VCC) | Acquisition[25] | 10 | 13.5 | 16 | 15.5 | 15 | 18 | mA |
| | Tracking (Continuous mode) | 8 | 9 | 11 | 11.5 | 10 | 12.5 | mA |
| | Tracking (Power save mode)[26] | 3.2 | 3.5 | 4.2 | 4.2 | - | - | mA |
| $I_{V\_IO}$ (Current at V_IO) | Acquisition and Tracking (Continuous mode) | 1.7 | 1.7 | 1.8 | 1.7 | 1.7 | 1.8 | mA |
| | Tracking (Power save mode)[26] | 1.5 | 1.5 | 1.5 | 1.5 | - | - | mA |

**Table 15: Typical currents for 1.8 V supply at VCC and V_IO**

☞ These values are provided for customer information only, as an example of typical current requirements. They are characterized on samples using a cold start command. Actual power requirements can vary depending on firmware version used, external circuitry, number of satellites tracked, signal strength, type and time of start, duration, internal LNA gain mode, and test conditions.

☞ The inrush current at startup can go up to 100 mA. Ensure that the external power supply is able to deliver up to 100 mA.

Table 16 shows current consumptions for the backup modes.

| Symbol | Parameter | Conditions | Typ. | Unit |
|---|---|---|---|---|
| $I_{V\_BCKP}$[27] | Total current in hardware backup mode | V_BCKP = 3.3 V, V_IO = VCC = 0 V | 32 | µA |
| $I_{VCC} + I_{V\_IO}$ | Total current in software standby mode | V_IO = 1.8 V, VCC = 1.8 V | 37 | µA |
| | | V_IO = 3.3 V, VCC = 3.3 V | 46 | µA |

**Table 16: Backup currents**

All values in Table 14, Table 15, and Table 16 are measured at 25 °C ambient temperature and with the internal LNA set to normal gain. SBAS and QZSS are activated in all measurements.

[27] $I_{V\_BCKP}$ current in normal operation (V_BCKP = 3.3 V, V_IO = VCC = 3.3 V) is ~3 µA.

# 5 Communication interfaces

The receiver allows communication over UART and I2C interfaces.

All the inputs have internal pull-up resistors in normal operation and can be left open if not used. All the PIOs are supplied by V_IO, therefore all the voltage levels of the PIO pins are related to V_IO supply voltage.

## 5.1 UART

The UART interface supports configurable baud rates. Hardware flow control is not supported. UART specifications are described in Table 17.

| Symbol | Parameter | Min | Max | Unit |
|---|---|---|---|---|
| $R_u$ | Baud rate | 4800 | 921600 | bit/s |
| $\Delta_{Tx}$ | Tx baud rate accuracy | -1% | +1% | - |
| $\Delta_{Rx}$ | Rx baud rate tolerance | -2.5% | +2.5% | - |

**Table 17: UART specifications**

## 5.2 I2C

An I2C interface is available for communication with an external host CPU. The interface is compatible with the Fast-mode of the I2C industry standard, allowing a maximum bit rate of 400 kbit/s[28].

☞ The interface stretches the clock when slowed down while serving interrupts, therefore the real bit rates may be slightly lower. The maximum clock stretching time that the host can expect is 20 ms.

## 5.3 Default interface settings

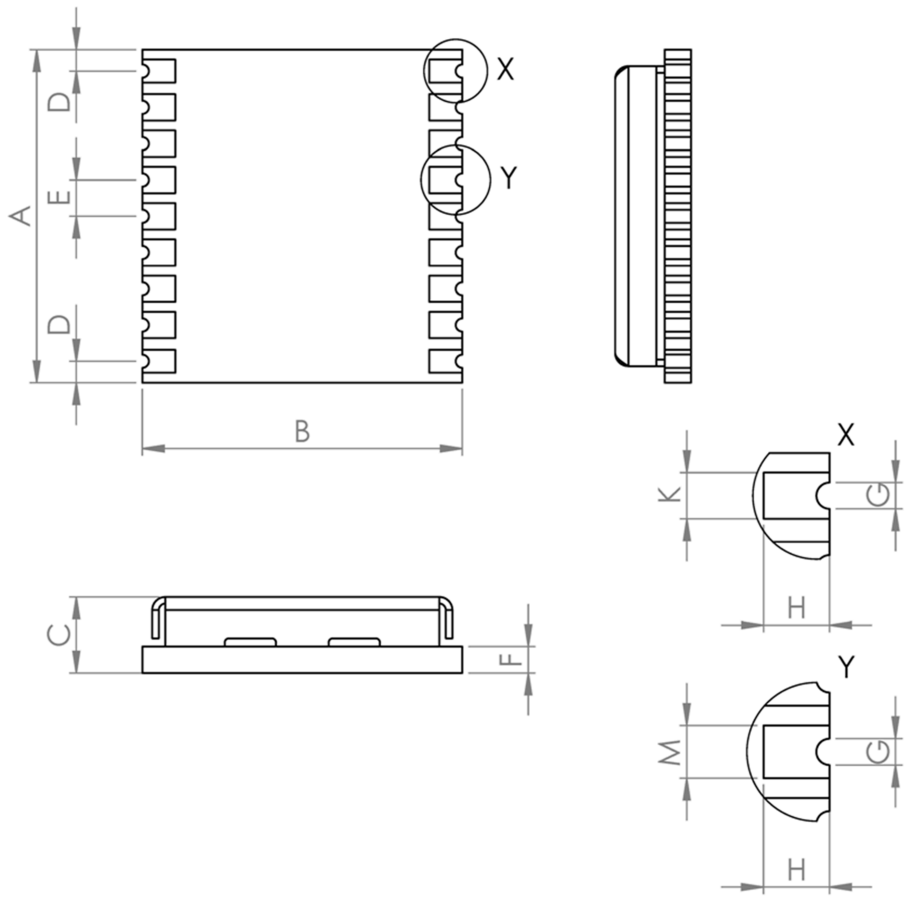
| Interface | Settings |
|---|---|
| UART | • 9600 baud, 8 bits, no parity bit, 1 stop bit.<br>• Input messages: NMEA and UBX.<br>• Output messages: NMEA GGA, GLL, GSA, GSV[29], RMC, VTG and TXT. |
| I2C | • 7-bit I2C address (0x42).<br>• Input messages: NMEA and UBX.<br>• Output messages: NMEA GGA, GLL, GSA, GSV[29], RMC, VTG and TXT. |

**Table 18: Default interface settings**

[28] External pull-up resistors may be needed to achieve 400 kbit/s communication speed, as the internal pull-up resistance can be very large.

[29] In the default configuration, the NMEA-GSV messages are sent at 5-second intervals to avoid overflow in the TX buffer.

# 6 Mechanical specifications




| Symbol | Min. (mm) | Typ. (mm) | Max. (mm) |
|---|---|---|---|
| A | 10.0 | 10.1 | 10.7 |
| B | 9.6 | 9.7 | 9.8 |
| C | 2.2 | 2.5 | 2.7 |
| D | 0.55 | 0.65 | 0.95 |
| E | 1.0 | 1.1 | 1.2 |
| F | | 0.76 | |
| G | 0.3 | 0.4 | 0.5 |
| H | 0.9 | 1.0 | 1.1 |
| K | 0.6 | 0.7 | 0.8 |
| M | 0.7 | 0.8 | 0.9 |
| Weight | | 0.6g | |

**Figure 3: MAX-M10M mechanical drawing**

# 7 Approvals

The MAX-M10M is designed for the presumption of conformity with the essential requirements and other relevant provisions of Radio Equipment Directive (RED) 2014/53/EU.

The MAX-M10M complies with the Directive 2011/65/EU (EU RoHS 2) and its amendment Directive (EU) 2015/863 (EU RoHS 3).

The Declaration of Conformity (DoC) is available at u-blox website within Support > Product Resources > Conformity Declaration.

# 8 Product handling

## 8.1 Moisture sensitivity level

The moisture sensitivity level (MSL) relates to the packaging and handling precautions required. MAX-M10M LCC (professional grade) package is rated at MSL level 4. For MSL standard, see IPC/JEDEC J-STD-020 [5].

# 9 Labeling and ordering information

This section provides information about product labeling and ordering.

## 9.1 Product labeling

The labeling of the MAX-M10M package provides product information and revision information. For more information contact u-blox sales.

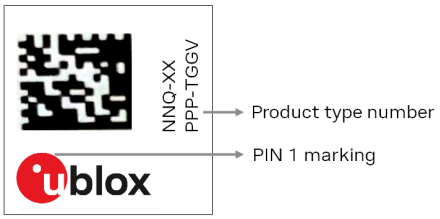



**Figure 4: Location of product type number on MAX-M10M label**

## 9.2 Explanation of product codes

Three product code formats are used. The product name is used in documentation such as this data sheet and identifies all u-blox products, independent of packaging and quality grade. The ordering code includes options and quality, while the type number includes the hardware and firmware versions.

Table 19 details these three different formats for the MAX-M10M module.

| Format | Structure | Product code |
|---|---|---|
| Product name | PPP-TGGV | MAX-M10M |
| Ordering code | PPP-TGGV-NNQ | MAX-M10M-00B |
| Type number | PPP-TGGV-NNQ-XX | MAX-M10M-00B-01 |

**Table 19: Product code formats**

The parts of the product code are explained in Table 20 .

| Code | Meaning | Example |
|---|---|---|
| PPP | Product family | MAX |
| TGG | Platform | M10 = u-blox M10 |
| V | Variant | M = Standard precision, ROM and XTAL |
| NNQ | Option / Quality grade | NN: Option [00...99]<br>Q: Grade, A = Automotive, B = Professional |
| XX | Product detail | Describes hardware and firmware versions |

**Table 20: Part identification code**

## 9.3 Ordering codes

| Ordering code | Product | Remark |
|---|---|---|
| MAX-M10M-00B | u-blox M10 GNSS receiver module, professional grade | |

**Table 21: Product ordering codes**

☞ Product changes affecting form, fit or function are documented by u-blox. For a list of Product Change Notifications (PCNs) see our website at: https://www.u-blox.com/en/product-resources.

# Related documents

[1] MAX-M10M Integration manual, UBX-22038241
[2] u-blox M10 SPG 5.10 Interface description, UBX-21035062
[3] u-blox M10 SPG 5.10 Release notes, UBX-22001426
[4] u-blox Package Information Guide, UBX-14001652
[5] MSL standard IPC/JEDEC J-STD-020, www.jedec.org

☞ For regular updates to u-blox documentation and to receive product change notifications please register on our homepage https://www.u-blox.com.

# Revision history

| Revision | Date | Name | Status / comments |
|---|---|---|---|
| R01 | 08-Dec-2022 | imar | Advance information |

# Contact

For further support and contact information, visit us at www.u-blox.com/support.