

M2M Solutions

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User and Installation Manual

November 2020

rev 1.1



M2M Smart Modem

Table of content

[Table of content](#)

[Overview](#)

[Hardware](#)

[Firmware](#)

[Connectors and indication](#)

[LED indicators](#)

[Status \(Blue\)](#)

[Tx \(Red\)](#)

[Rx \(Green\)](#)

[MicroSIM Card](#)

[GSM](#)

[RJ45](#)

[Power](#)

[RS232](#)

[RS485](#)

[GPIO](#)

[Power](#)

[Installation](#)

[Installing a SIM card](#)

[Installing the device](#)

[Mounting the device](#)

[Configuration](#)

[Technical Specification](#)

Overview

The M2M® Smart Modem is a ready-to-deploy, standalone quad-band GSM/GPRS device that provide wireless data communication for IOT (Internet of Things) devices. The modem integrate seamlessly with virtually any application, and is useful for automated applications, such as remote diagnostics, remote monitoring and remote controlling. It is available with both RS232 and RS485 interface ports or a USB interface on request.

Hardware

- Quadband modem GSM 850/900/1800/1900MHz
- Internal mains power supply (85 to 264V, 50Hz)
- External SMA antenna
- MicroSIM or internal industrial ChipSIM
- Status, Tx and Rx LED indicators
- RS232 interface
- RS485 interface
- LastGasp feature powered by super capacitor

Firmware

- Private or public APN
- 3 Simultaneous TCP/IP Sockets
- Client or Server mode
- Configurable connection interval
- SMS configuration
- M2M Platform support for configuration, control and monitoring
- Optional - Various device protocols integrated
- Edge computing

Connectors and indication

LED indicators

Status (Blue)

- **Flashing fast** 2 times per second – No SIM card detected.
- **Flashing slow** 1 second on, 2 second off – Searching for GSM signal.
- **1 Flash** every 2 seconds – Registered on the GSM network, waiting for GPRS attach.
- **2 Flashes** every 2 seconds – GPRS attached and modem ready.
- **3 Flashes** every 2 seconds – M2M connection established and registered online. Device is working normally.

Tx (Red)

Data is sent out on one of the modem interface ports.

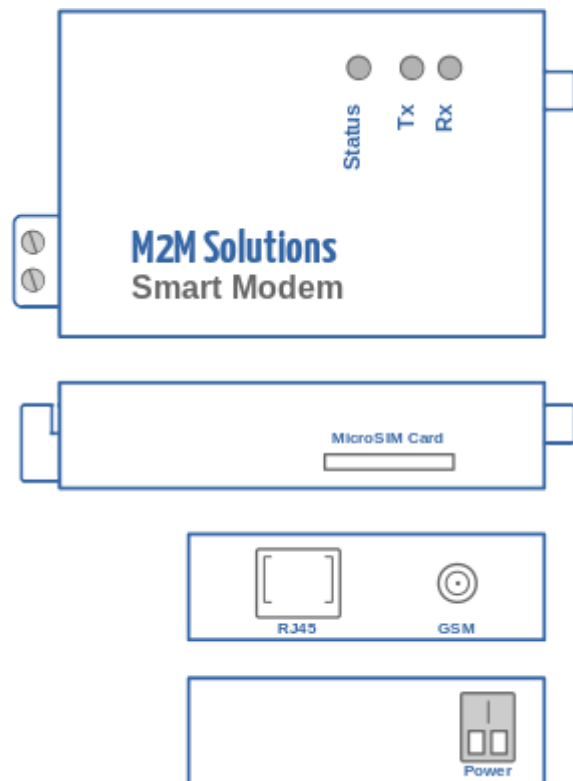
Rx (Green)

Data is received on one of the modem interface ports.

MicroSIM Card

Standard MicroSIM card. The modem has a push-push card holder. To insert the SIM push it in all the way until you feel a light click, then release it. To remove the SIM, push it in again until you feel the light click, release it and the SIM card should come out.

Note: The modem does have onboard provisioning for a ChipSIM. Please contact us should you require this feature with your APN ChipSIM cards.



GSM

SMA connector for and external antenna. The external antenna needs to be QuadBand-capable and equipped with a male SMA connector. External antenna is required for proper operation of the device.

RJ45

All the communication lines for the modem is available via the RJ45 connector as in the following table:

Pin	Power	RS232	RS485	GPIO
1	6 - 32 VDC	6 - 32 VDC	6 - 32 VDC	6 - 32 VDC
2			A (+)	
3			B (-)	
4	GND	GND	GND	GND
5		TX		
6		RX		
7		RTS		Output
8		CTS		Input

Power

The power modem can be powered from 6 to 32V DC (10W) via the RJ45 connector pins 1 and 4. When using this connector to power the modem, there is no need to connect the main power supply. This power connector is normally used when the end device already have a power supply capable of delivering 10W or more.

RS232

The RS232 port features a standard TIA-232-F Data Terminal Equipment (DTE) interface with hardware flow control.

Baud rate can be configured for 1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200kbps with 9600kbps as default.

Data bits can be configured as 5, 6, 7 or 8 data bits with 8 data bits as default

Frame format can be configured as None, Odd, Even, Space or Mark with None as default

Stop bits can be configured as 1, 2 or 1.5 with 1 as default

RS485

The RS485 port features a standard half duplex EIA-485 interface

Baud rate can be configured for 1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200kbps with 9600kbps as default.

Data bits can be configured as 5, 6, 7 or 8 data bits with 8 data bits as default

Frame format can be configured as None, Odd, Even, Space or Mark with None as default

Stop bits can be configured as 1, 2 or 1.5 with 1 as default

GPIO

Two General purpose input/output (GPIO) pins are available on the RJ45 connector that can be used to control a output relay or as a input for pulse counting or trigger events.

Power

The modem has a built in power supply capable of powering directly from main supply via the 2 pin green terminal connector.

The internal power supply is rated at 85 - 264VAC 50Hz input and is protected by a PTC resettable fuse and MOV.

For fixed installation it is recommended to install a fuse box inline with the live wire using a 1A slow blow fuse.

Installation

Installing a SIM card

This model requires a MicroSIM card, which is supplied by your service provider. To install the SIM card:

1. Locate the SIM card slot on the side of the modem. The slot is labeled SIM.
2. Push the MicroSIM card into the SIM card slot with the contact side facing down until you feel a light click.
3. Release the SIM card.

Installing the device

1. Connect a suitable antenna to the SMA connector.
2. Connect a RJ45 cable to the device then connect the other end to the serial port on the other desired device.
3. Screw-on the power cables into the power connection on the device.
4. For a fixed installation, make sure the device is wired through a fuse box.
5. The blue status LED will start to blink according to the current state.

Mounting the device

The device can be secured under the meter terminal cover to limit possibility of theft.

The devices should alternatively be mounted in a IP65 enclosure to protect it from direct sunlight, moist and rain.

Configuration

The M2M Smart Modem can be configured via SMS messages. After the M2M Smart Modem is powered up and the, the user can send a configuration SMS with the following configuration parameters.

Parameters are delimited by a [ENTER] or semicolon [;]

Each configuration parameter consists of a key and value except for the RESET and INFO command. Key and values are separated by a colon [:]

Multiple parameters can be sent together in one SMS message.

For example

```
APN:internet
User:web
Pass:web
IP:www.google.co.za
Port:80
Mode:client
Baud:9600
Frame:8N1
Reset
```

This will set the APN to internet, username to web and password to web. It will also configure socket 1 to connect in client mode to www.google.co.za on port 80 and create a transparent link on interface port 1 with a baud rate of 9600 kbps and a frame format of 8 databits, none parity and 1 stop bits.

The Reset command doesn't have a value, but instead saves the configuration and resets the modem. Some parameters can take an optional index denoted by [x]. This value can be 1 to 3 and indicates the socket index to configure. When no index is specified, it defaults to socket 1.

The following parameters can be configured:

Parameter	Description	Values	Default
APN	APN Name	String up to 64 characters	internet
USER	APN Username	String up to 64 characters	(blank)
PASS	APN Password	String up to 64 characters	(blank)
IP(1-3)	IP Address for TCP/IP connection	IP or DNS name	m2msolutions.co.za
PORT(1-3)	TCP Port for TCP/IP connection	2010	1 - 65535
MODE(1-3)	TCP/IP connection mode	CLIENT or SERVER	SERVER
BAUD(1-3)	Serial port baud rate	1200 to 115200	9600
FRAME(1-3)	Serial frame format	Databits, Parity, Stopbits	8N1
IDX(1-3)	Serial port index	1 - RS232, 2- RS485	1
RESET	Save configuration and restart		
INFO	Reply with current configuration		

Note: SMS message should not be longer than 160 characters. When your total configuration message is longer than 160 characters, it is advised to send multiple SMS messages with the RESET command only in the last message.

If the SIM card has credit or SMS bundle available, you will receive an acknowledge message back.

To retrieve the current configuration, you can send a SMS message with INFO. This will reply with the current modem configuration.

Technical Specification

Category	Description
General	
Performance	GPRS Class 12
Frequency Bands	Quad-band: GSM850, EGSM900, DCS1800, PCS1900
GPRS Speed	Up to 85.6 Kbps downlink and uplink
Connectors	
SMA	Cellular 50 ohm Antenna
RJ45	RS232, RS485 and GPIO
Degson 5MM	AC Supply
Power Requirements	
DC Supply	6 to 32V
AC Supply	85 to 264V, 50Hz
Consumption	10W max
Physical Description	
Dimensions	78mm x 58mm x 21mm
Weight	86 grams
Environment	
Operating Temperature	-35°C to +75°C
Humidity	Relative humidity 15% to 93% non-condensing
Certifications, Compliance, Warranty	
EMC Compliance	ETSI EN 301-489-1
Radio Compliance	ETSI EN 301-511
Safety Compliance	IEC 60950-1
Warranty	12 Months