

# M2M Solutions

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## User and Installation Manual

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## M2M Smart Modem

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## Overview

The M2M Smart Modem is a ready-to-deploy, standalone quad-band GSM/GPRS device that provides wireless data communication for IoT (Internet of Things) devices. The modem integrates 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 power supply
- External SMA antenna
- MicroSIM or internal ChipSIM
- Status, Tx and Rx LED indicators
- RS232 interface
- RS485 interface

## Firmware

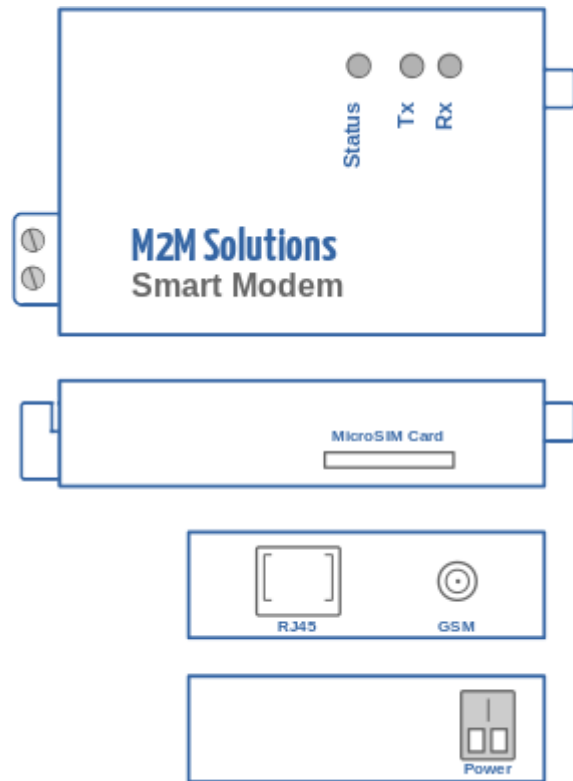
- Private or public APN
- 3 Simultaneous TCP/IP Sockets
- Client or Server mode
- Configurable connection interval
- SMS configuration
- Various device protocols integrated
- M2M Platform support for configuration, control and monitoring

# Connectors and indication

## LED indicators

### Status (Blue)

- **Flashing fast** twice 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 attachment.
- **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 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 has 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 installations 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 preferred 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 modem then connect the other end to the serial port on the application device.
3. Screw on the power cables into the power connection on the modem.
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 and to protect from direct sunlight and moisture.

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

## Configuration

The M2M Smart Modem can be configured via SMS messages. After the M2M Smart Modem is powered up, 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
<b>General</b>	
<b>Performance</b>	GPRS Class 12
<b>Frequency Bands</b>	Quad-band: GSM850, EGSM900, DCS1800, PCS1900
<b>GPRS Speed</b>	Up to 85.6 Kbps downlink and uplink
<b>Connectors</b>	
<b>SMA</b>	Cellular 50 ohm Antenna
<b>RJ45</b>	RS232, RS485 and GPIO
<b>Degson 5MM</b>	AC Supply
<b>Power Requirements</b>	
<b>DC Supply</b>	6 to 32V
<b>AC Supply</b>	85 to 264V, 50Hz
<b>Consumption</b>	10W max
<b>Physical Description</b>	
<b>Dimensions</b>	78mm x 58mm x 21mm
<b>Weight</b>	86 grams
<b>Environment</b>	
<b>Operating Temperature</b>	-35°C to +75°C
<b>Humidity</b>	Relative humidity 15% to 93% non-condensing
<b>Certifications, Compliance, Warranty</b>	
<b>EMC Compliance</b>	ETSI EN 301-489-1
<b>Radio Compliance</b>	ETSI EN 301-511
<b>Safety Compliance</b>	IEC 60950-1
<b>Warranty</b>	12 Months