



## **Micro-Cell DB**

Daughter-Board Terminal Modem

**Integrator's Manual**

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1. Introduction.....	4
2. Description.....	4
3. Connector Pin Description.....	4
3.1. Regulated Power Supply Input.....	5
3.2 Serial Data Interfaces.....	6
4. Reset pin (RST).....	7
4.1 Turning the Module ON.....	7
4.2 Turning the Module OFF.....	8
5. Card Dimensions.....	8

### 1) Introduction

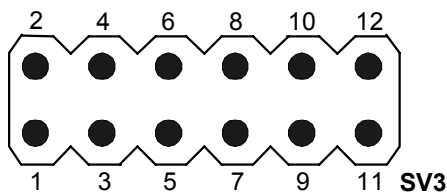
The Micro-Cell Daughter Board (Micro-Cell DB) Modem makes integration as simple as possible, primarily for users in the M2M market. The modem is a dual band, and communicates over GSM 900 and GSM 1800 MHz (or GSM 850 and GSM 1900 MHz for the American version). This manual explains how to integrate the Daughter Board card on a customer main PCB.

### 2) Description

Small and lightweight, the Micro-Cell DB has a 2.54mm pitch connector and an integral SIM card reader making it easy and quick to integrate. A typical application system consists of a microcontroller (or microprocessor) board communicating, via the Micro-Cell DB, with a remote terminal or host using the GSM network. The microcontroller device uses a set of AT commands to control the modem, and to set up the end-to-end communications link, via its RS232 serial interface.

### 3) Connector Pin Descriptions:

The connection of the Micro-Cell DB to the user main board is done through a 12 pin connector – SV3, describe below (top view):



Pin	Signal	Direction	Description
1	TD1	I	Serial data to radio device (UART1).
2	RD1	O	Serial data from radio device (UART1).
3	CTS1	O	Clear To Send (UART1).
4	RTS1	I	Data Terminal Ready (UART1).
5	TD3	I	Transmitted Data (UART3).
6	RD3	O	Received Data (UART3).
7	GND	Power	
8	RST	I	Device ON/OFF control.
9	GND	Power	
10	+3.6V	Power	
11	GND	Power	
12	+3.6V	Power	

### 3.1. Regulated Power Supply Input

Power is supplied to the wireless modem Vcc pins, from an external source. The electrical characteristics for Vcc are shown in the following table:

Parameter	Mode	Limit
Vcc Supply voltage	Nominal	3.6 V
	Tolerance including ripple	3.2V – 4.2V
	Over voltage limit	5.5 V
	Maximum supply ripple	<100mV @ <200kHz <20mV @ >200kHz
Maximum allowable voltage drop	Burst transmission	200mV
Current drawn, at full TX power		< 750 mA (average)

#### Note!

- It is recommended to put two 330uF low ESR electrolytic capacitors close to the SW3 connector on the main board.
- Ensure power supply to wireless modem line resistance is <200 mΩ.

#### Warning!

Stresses in excess of the absolute maximum limits can cause permanent damage to the device. These are absolute stress rating only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the datasheet. Exposure to absolute maximum rating for extended periods can adversely affect device reliability.

### 3.2. Serial Data Interfaces:

The serial channels, consisting of two UART's, are Asynchronous communication link to the application or accessory units.

- UART1 (TD1, RD1) has RS-232 functionality and is used for all on- and off – line communication.
- UART3 (TD3, RD3) behaves as a general-purpose serial data link. It can be used by embedded application.

The standard character format consists of 1 start bit, 8 bit data, no parity and 1 stop bit. In all, there are 10 bits per character.

The default baud rate is 9.6kbits/s, however higher bit rates of up to 460kbits/s are supported, set by an AT command. UART1 starts at a rate of 9.6kbits/s in a standard AT command mode.

- **Serial Data from Radio Device (RD1):**

RD1 is an output signal that the radio device uses to send data via UART1 to the application.

Parameter	Limit
Application load resistance	<100kΩ
Application load capacitance	<100pF

- **Serial Data to Radio Device (TD1):**

TD1 is an input signal, used by the application to send data via UART1 to the radio device.

Parameter	Limit
Application driving impedance	<100Ω
Input capacitance	1nF
Input resistance	100kΩ to Vcc

- **Control Signals – RTS1, CTS1:**

RTS1 and CTS1 are capable of transmitting at 1/10<sup>th</sup> of the transmission speed for data rates up to 460kbits/s (byte-oriented flow control mechanism).

When hardware flow control is not used in communications between the application and the radio device, RTS and CTS must be connected to each other at the radio device.

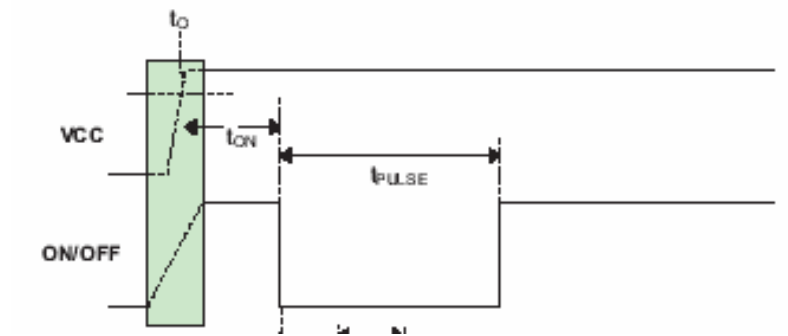
- **UART3 – TD3, RD3:**

UART3 is a full duplex serial communication port with transmission and reception lines. It has the same timing and electrical signal characteristics as UART1, TD and RD.

**Note!**

It is recommended to put a serial resistor of 1k $\Omega$  on every signal of the serial links (TD1, RD1, TD3, RD3).

**4) RESET pin (RST):**



**4.1. Turning the Module ON:**

The power ON sequence is shown above. Initially, power is supplied to the Vcc pins. The presence of power raises RST pin through a pull-up resistor to Vcc potential. In order to turn the module on, RST pin must be pulled to ground. Once RST pin has been held low for a least  $t_{pulse}=1.5s$  the Module will turn-on.

It is recommended that RST pin is held low for a least 1s after the module is turn ON to guarantee completion of the power up sequence.

**4.2. Turning the Module OFF:**

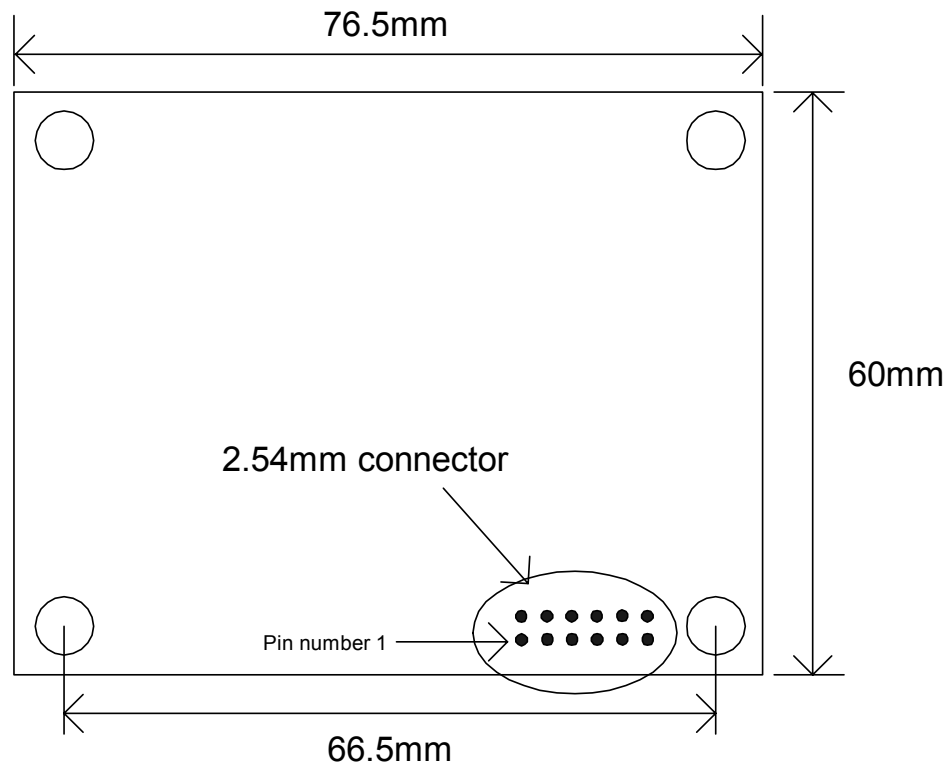
The power OFF sequence is shown above. With the module powered normally, RST pin is pull-up to Vcc potential. Once pin RST has been held low for a least 2s the shut down procedure begins.

It is recommended that RST pin is held low for a least 1s after the module is turn ON to guarantee completion of the power up sequence.

The relevant characteristics of the RST pin are shown in the table below:

Parameter	Conditions	Min	Typ	Max	Unit
Input current	Input low (0), Vcc=3.6V	-60	-25	-12	uA
	Input high (Vcc), Vcc=3.6V	0		1	uA

**5) Card Dimensions:**



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