

# **MAESTRO 20**

## **GSM GPRS Modem**

### **900 / 1800**

Application notes :  
Connecting the power  
Connecting the audio

Rev. 00

## Revision history

Rev.	Date	Details	Originated by
00	3 December, 2002	First release	Frank TANG

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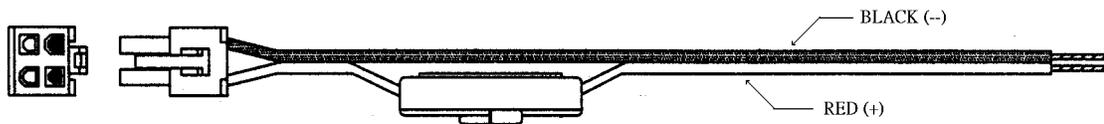
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## 1. Introduction

In this document, we intend to give some guidance and useful hints for the first-time users of MAESTRO 20. The topics are “Connecting the Power Supply” and “Connecting the audio”

## 2. Connecting the Power supply

Power supply is through the power cable that comes together with MAESTRO 20 modem. The power cable has its supply end stripped & tinned, users can directly solder to the supply points or make wire-harness.



MAESTRO 20 accepts power sources from 5V to 32 DC, However, it is recommended to supply at 12V or above in order to minimize the value of peak current during RF transmission.

The following table illustrates how the supply voltage affects the current demand:

Supply DC voltage	When MAESTRO 20 is transmitting maximum RF power (+33dBm GSM band)	
	Average current (typical) drawn at supply voltage	Peak current (typical) drawn at supply voltage
8V	156 mA	1.38A
12V	116 mA	660mA
15V	90 mA	500mA
19V	75 mA	300mA

If you use battery to supply, please check the specifications to make sure it can deliver sufficient current.

If you use AC/DC power adaptor, please make sure its rated current is sufficient.

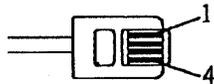
MAESTRO 20 has built-in protection against over-voltage and reverse-polarity, it is safe to tap power from cars or trucks from the fuse block or through a cigarette lighter plug.

### 3. Connecting the audio

#### 3.1 Wiring

For GSM voice call, a simple way to connect the audio is to make use of the handset of an ordinary desktop telephone. If you have already bought the RS232 / audio cable from FARGO TELECOM, then it is possible to use it to connect MAESTRO 20 to the handset. Follow these steps :

Below is the pin assignment of the RJ11 plug on the RS232/audio cable. Open up the handset to check if the microphone and receiver are wired correctly to the required pins, if not, re-wire internal connections of the handset.



Pin number on RJ11 plug	Function description
1	Microphone (+)
2	Speaker (+)
3	Speaker(-)
4	Microphone (-)

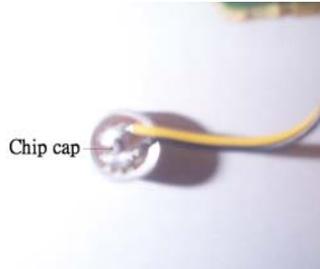
Desktop phone normally use Electret condenser microphone capsule which has polarity and the DC bias voltage required is supplied by MAESTRO 20. Microphone (+) must be wired to the capsule's positive terminal ; Microphone (-) must be wired to the capsule's negative terminal; it does not work if reversed.

Speaker (+) and Speaker (-) are wired to the handset's receiver. There is no requirement on polarity.

Connect the RS232/audio cable, antenna and power supply to MAESTRO 20. Load SIM card. Plug the RJ11 into the handset's module jack. Plug the 9-pin D-SUD to PC's Serial port. Make GSM voice call by sending the dial up AT command from the PC. After connection, you should hear voice of the called party from the earpiece and the called party can hear your voice.

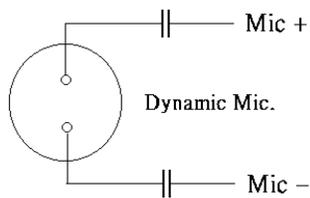
### 3.2 TDMA noise

You might hear TDMA noise from the earpiece during a GSM phone call, this is because the Electret microphone picks up the RF energy radiated from the antenna. TDMA noise can be suppressed by soldering a 33pF chip capacitor across the terminals of the Electret microphone. For better suppression of TDMA noise on 1800MHz band, one more capacitor (value= 12 to 15pF) can be added across the terminals of the Electret microphone.



### 3.3 Dynamic microphone (coil type)

In case the microphone you would use is dynamic type, then it is necessary to add capacitors to block the DC bias voltage generated by MAESTRO 20 from entering the microphone.



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