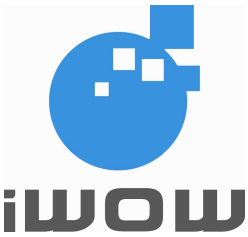


TR-800 MODULE EVALUATION KIT

USER GUIDE

Date of Release	:	20 April 2005
Document Version	:	1.0
Our Reference	:	02000C01

Document Information

Revision	Date	Document History
0.0	23 Aug 2004	▪ Initial release version 0.0
1.0	20 Apr 2005	▪ Evaluation Board was modified according to the final phase (P3) of TR-800 module hardware.

For enquiries, please contact:

iWOW Connections Pte Ltd
13 Serangoon North Ave 5 #03-00 Singapore 554787
Office: (65) 6748 8123
Fax : (65) 6748 2668
http://www.iwow.com.sg

CONTENT

1. MODULE EVALUATION KIT

The Evaluation Kit includes:

- A Module Evaluation Board (MEB), including all the interface electronics
- A TR-800 GSM/GPRS module, which is mounted on the MEB
- Universal power supply:
  Input: 100~240VAC 50/60Hz
  Output: 5.0VDC @ 1.0A
- An external tri-band GSM antenna with magnetic base (SMA-ended)
- A RF cable connector for module to MEB RF connection
- 4-pole audio headset
- User Guide CD

2. MEB FEATURES

- Antenna interface: SMA jack for GSM antenna
- RF receptacle for MEB to module RF connection (Hirose Part No. U.FL-R-SMT)
- 80-pin general-purpose module connector (Harwin Part No. M402M1-8005)
- Power supply interface with 2 input source possibility:
  - Hosiden's HEC3350 dc power jack, 3.5~6.5VDC @ 500mA input
  - Twin headers for connection to external power supply/battery, 3.3~5.5VDC @ 500mA input
- 2 serial interfaces using D-SUB9 female connectors
- Standard RS-232 cable, can be used for connecting to
  - Modem Port: Main AT command interface
  - Debug Port: Debugging interface or utility communication port
- SIM card holder
- Power ON/OFF push button
- RESET signal push button
- "CALL" and "1" push buttons
- LED indicators, to show:
  - Status of supply to MEB
  - Status of the module that is mounted on the MEB
- Phone Audio jack
- Auxiliary Audio jack
- Test points to the rest of the pins of the 80-pin connector. They are used for connecting to external peripherals and general troubleshooting purposes

3. INSTALLATION

Procedure:

1. Connect the serial cable from host PC to Port 1 (for AT commands interface) and to Port 2 (for programming or debugging purposes).
2. Connect the magnetic GSM antenna to the SMA antenna connector of the MEB.
3. Ensure that the RF receptacle of module is connected to the RF receptacle of MEB using the mating cable provided.
4. Ensure that the module is properly mounted and the legs properly soldered.
5. Connect the power supply to the MEB.
6. The power supply LED should be light-on when the MEB supply is turned on.
7. Follow the instructions in the next section and do module connection setups.

4. QUICK SETUPS

4.1 Hyperterminal Configuration

1. Open **HyperTerminal** (Start > Programs > Accessories > Communications > HyperTerminal)
2. Enter **TR800**. Click **OK**.

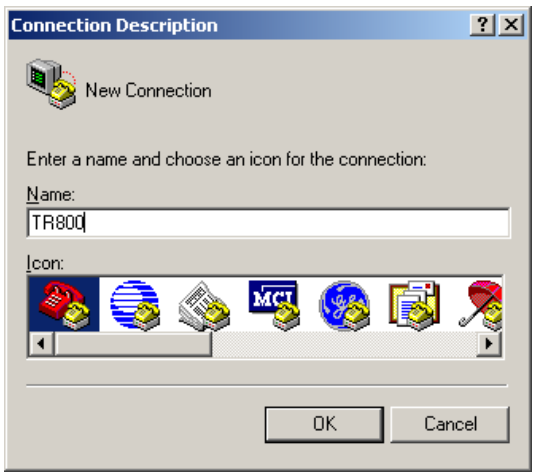


Figure 1

3. Select the **COM1** for Connect using.
4. Click OK.

Figure 2

5. Please make sure:
   - Bits per second: **115200**
   - Data bits: **8**
   - Parity: **None**
   - Stop bits: **1**
   - Flow control: **Hardware**

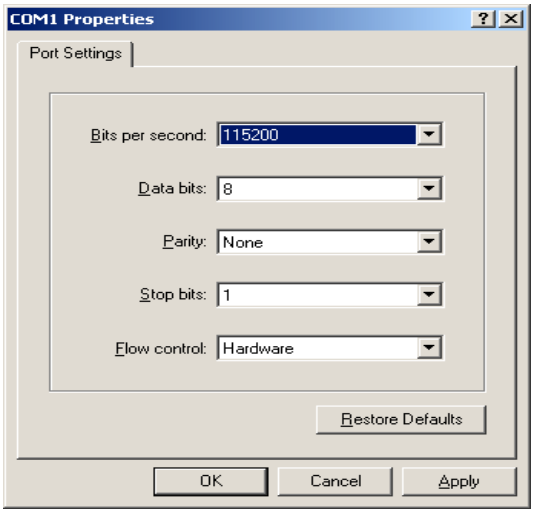


Figure 3

6. Click OK.

7. Press Reset button on the MEB.
   Now you can communicate with
   the modem using AT commands.

8. To test the communication, type
   AT+HVER and press **enter**.
   You should get an "**HVER: AMB20**"
   or similar response if the setup is correct.

9. To check SIM card status:
   AT+CPIN?<ENTER>

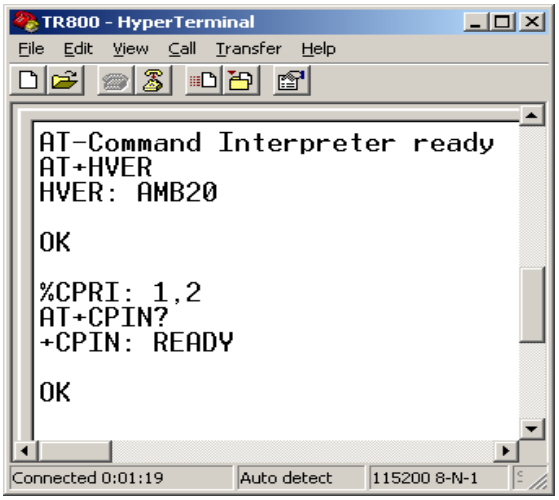


Figure 4

10. To query the Network registration
    status and Operator Name:

    AT+CREG?<ENTER>
    AT+COPS?<ENTER>

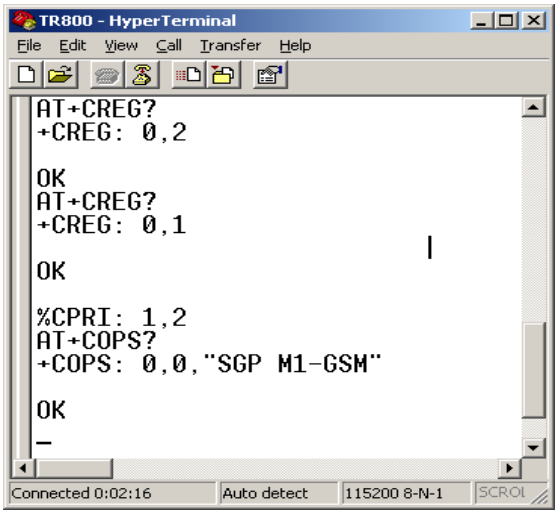


Figure 5

4.2 Testing On Short Message

4.2.1 Send SMS

1. Set the short message format as text mode:
   AT+CMGF=1<**ENTER**>

2. Check if SMS service center (SMSC) number is set to SIM card:
   AT+CSCA?<**ENTER**>

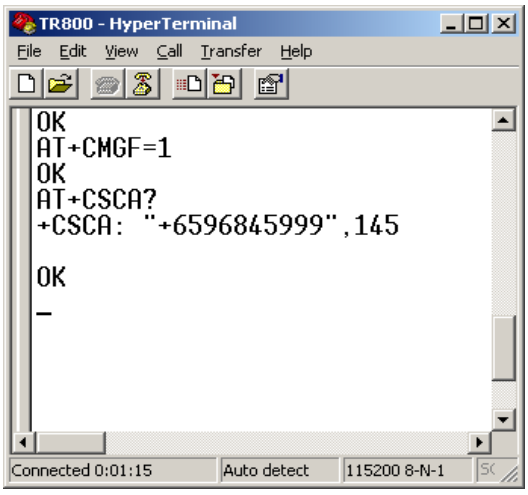


Figure 6

3. Set the new incoming SMS to be displayed immediately:
   AT+CNMI=2,2,0,0,0<ENTER>

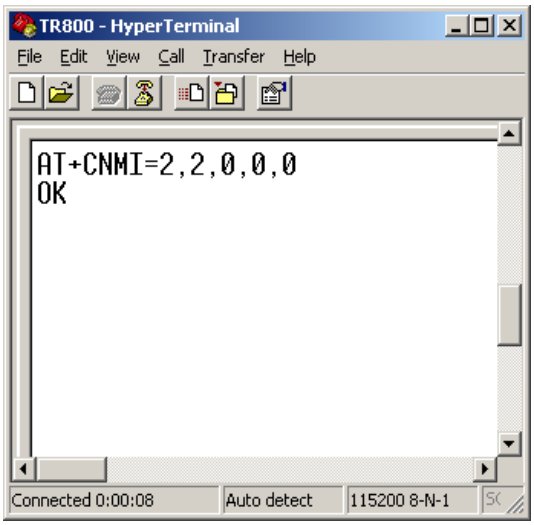


Figure 7

4. Send a message using this command:
   AT+CMGS= "Phone number"
   <ENTER>Message<Ctrl-Z>

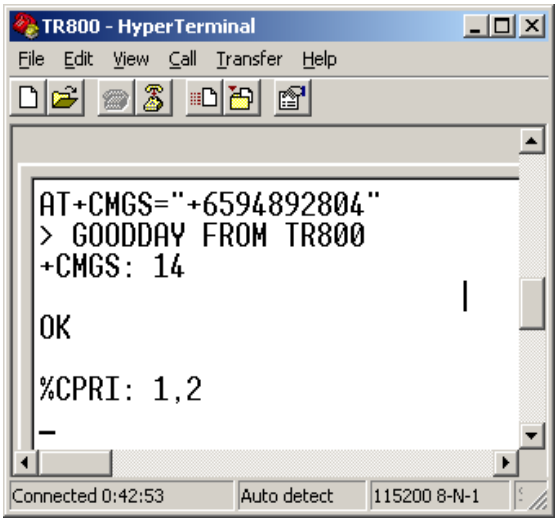


Figure 8

4.2.2 Receive SMS

1. Set the message format by typing **AT+CMGF=1**
2. Set the new incoming SMS to be displayed immediately: **AT+CNMI=2,2,0,0,0<ENTER>**
3. Upon receiving new SMS, it will be displayed immediately on TA.

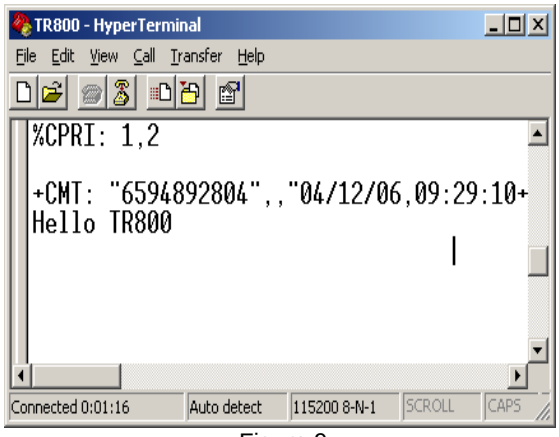


Figure 9

4. To Enable new SMS indication instead of display it directly on TA: **AT+CNMI=2,0,0,0,0<ENTER>**

5. Upon receiving new SMS, **+CMTI: "SM"**, 7 indication will be given. This means the new SMS is stored at location index 7 of the SIM card.

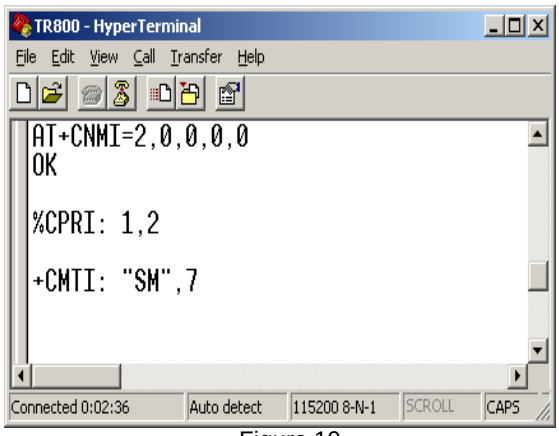


Figure 10

6. To access SIM card storage for SMS: **AT+CPMS="SM"<ENTER>**

7. To read SMS at location 7: **AT+CMGR=7<ENTER>**

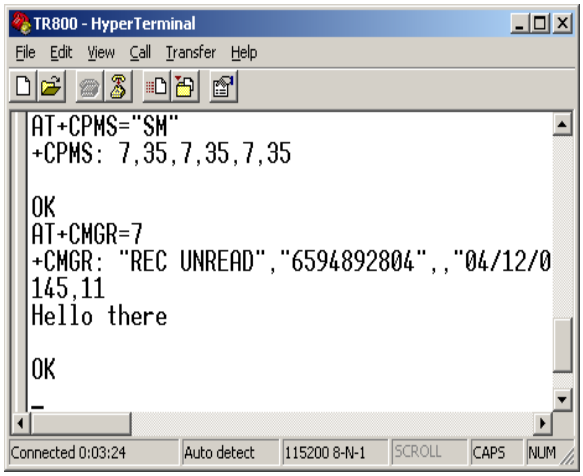


Figure 11

4.3 Set up TR-800 as a serial modem

To use the serial modem for Internet connection, either via GSM CSD or GPRS, you must first set it up as a modem on COM1 on your PC. Otherwise, it will only be recognized as a device on COM1. This section will detail how this can be done in the Win2000 environment. For other Windows OS, similar steps apply.

1. Go to **Control Panels > Phone And Modem Options**.
   Select the **Modems** tab.
   Click on **Add…** for the next screen.

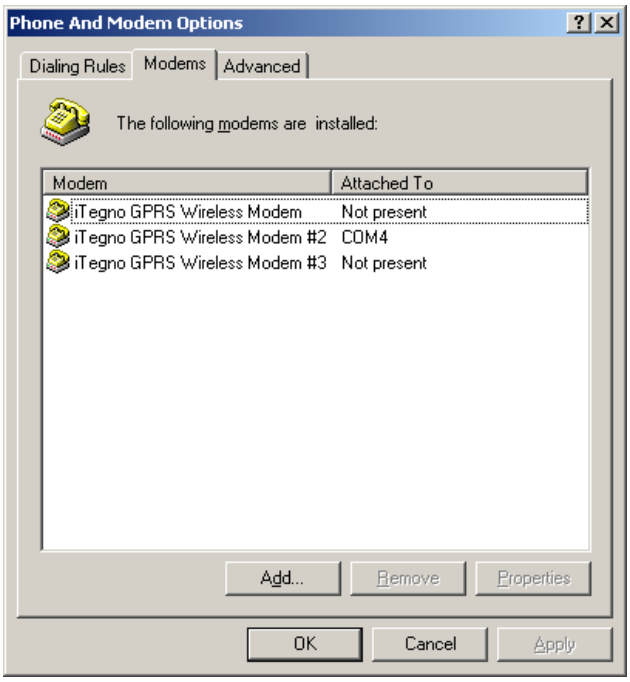


Figure 12

2. Please ensure that the option "**Don't detect my modem. I will select it from a list"** is checked.
   Click on **Next** for the next screen.

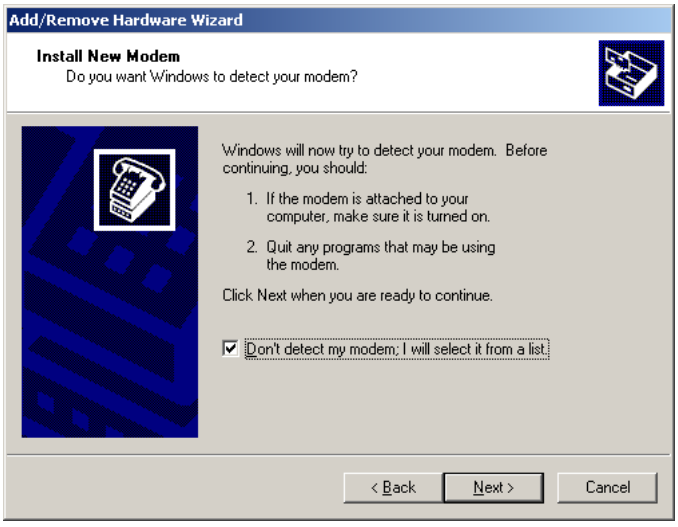


Figure 13

3. Select **Standard 33600 bps modem** for Models.
   Click on **Next** for the next screen.

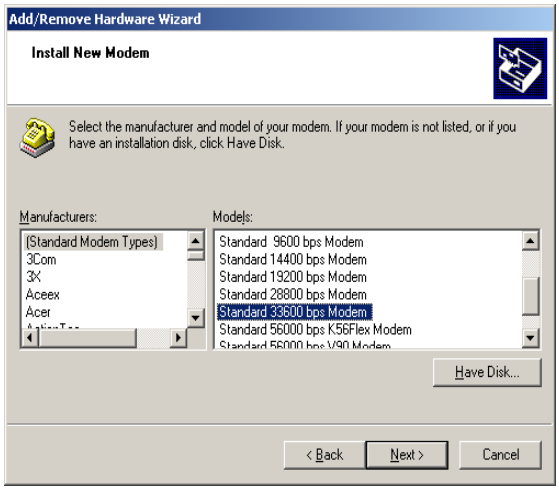


Figure 14

4. Select **COM1** before clicking on **Next** for the next screen. Please ensure that COM1 is the correct communication port for the serial port of your PC.

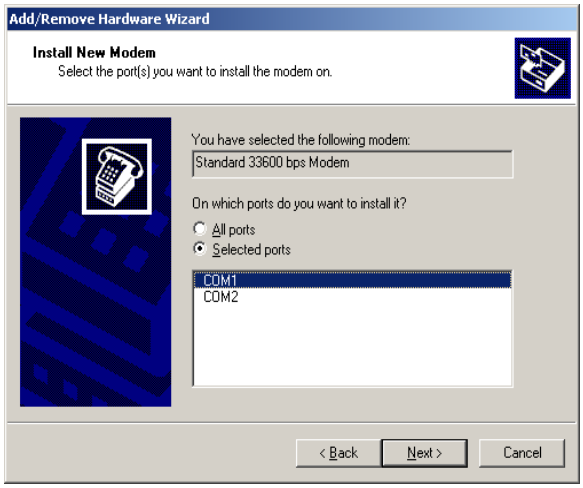


Figure 15

5. On the last screen, click Finish to complete setting up your serial modem on your PC.

6. You should be able to see the recently created modem in your **Phone And Modem Options** screen.

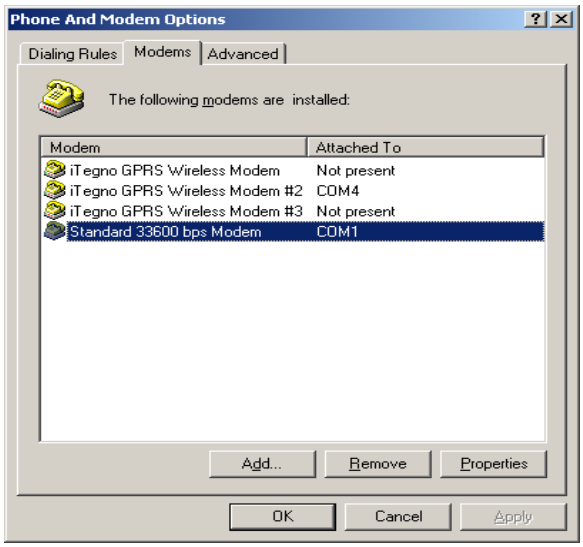


Figure 16

7. To ensure that the correct communication parameter has been set-up, click on its Properties. Ensure the parameters below are correct:

- Port Speed/Baud Rate: **115200**
- Data Bits: **8**
- Parity: **None**
- Stop Bit: **1**
- Flow Control: **Hardware**

4.4 Establish a GSM Dial-up Connection

After TR800 is set up as a Serial Modem as shown in previous section, you can then create a GSM dial-up connection by the following steps:

1. Go to **Control Panel>Network Connections**.
   Run **New Connection Wizard**.
   Click **Next**.

Figure 17

2. Select Connect to the Internet.
   Click **Next**.

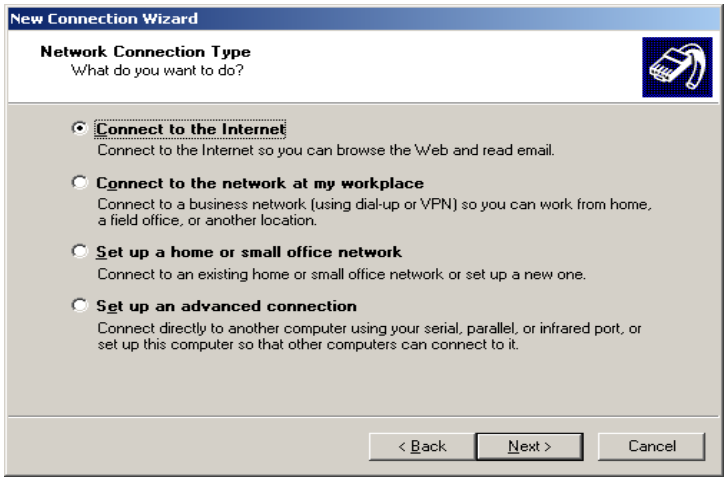


Figure 18

3. Select **Set up my connection manually**. Click **Next**.

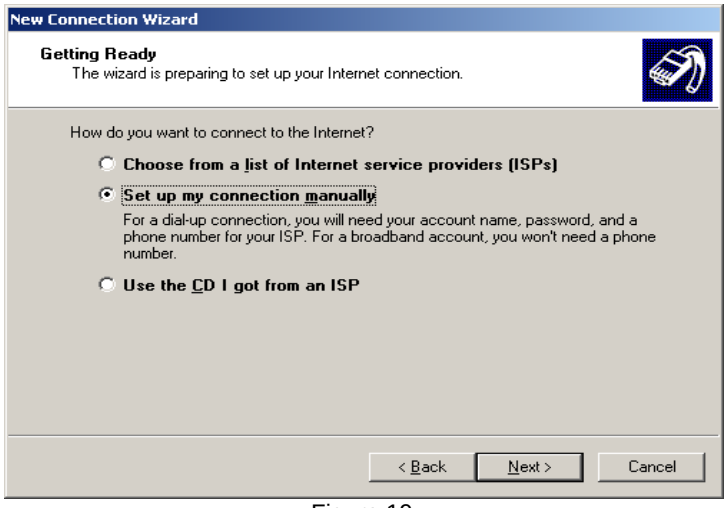


Figure 19

4. Select **Connect using a dial-up modem**. Click **Next**.

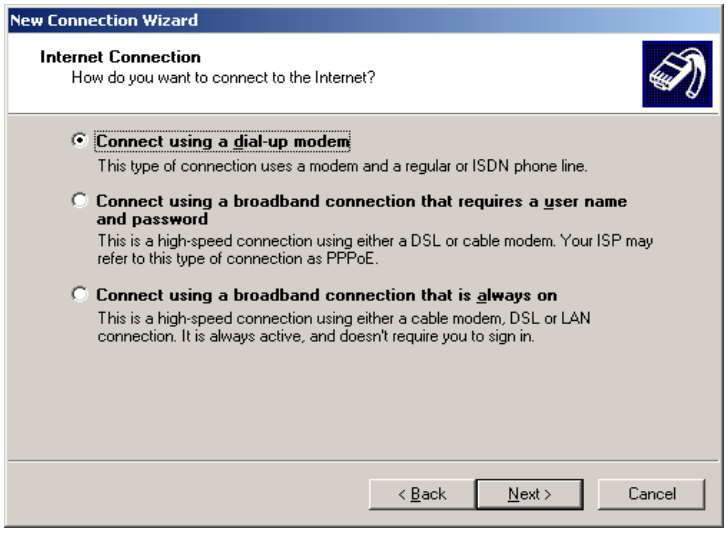


Figure 20

5. Select Modem – **Standard 33600 bps Modem (COM1)** for dialing device. Click **Next.**

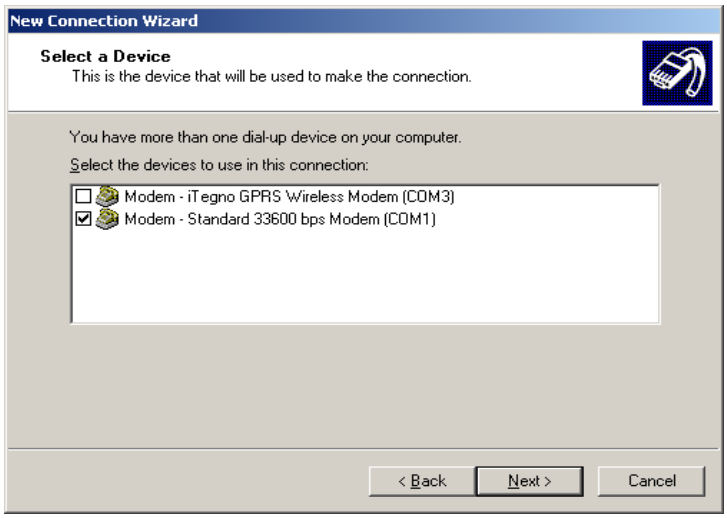


Figure 21

6. Enter a Connection Name. Click **Next**.

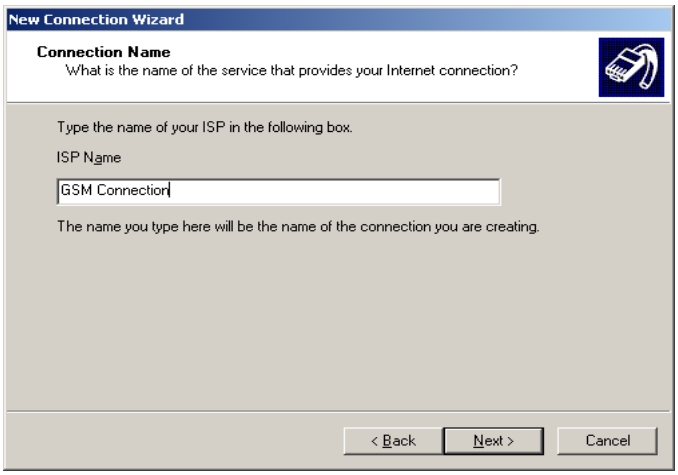


Figure 22

7. Enter the Phone number. Click **Next**.

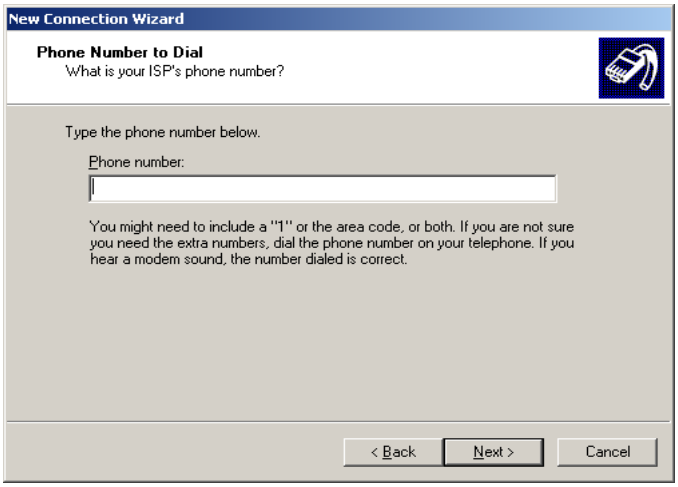


Figure 23

8. Enter User name and Password if applicable. Uncheck on all three options. **Click Next**.

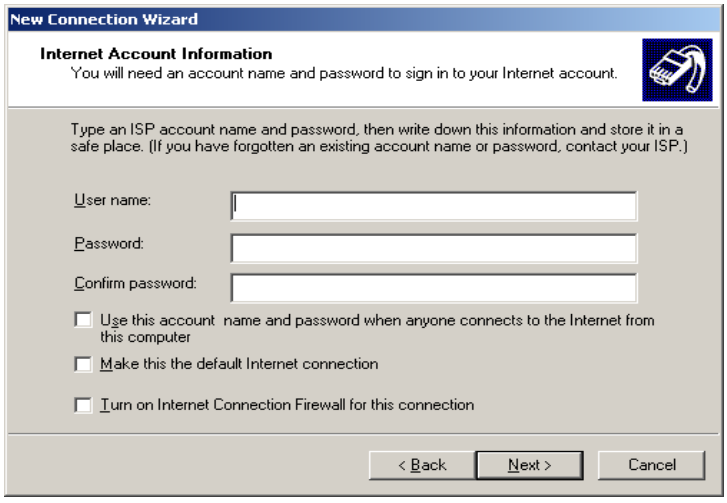


Figure 24

9. Click Finish to complete the New Connection Wizard.

4.5 Establish a GPRS Dial-up Connection

After TR800 is set up as a Serial Modem as shown in Section **6.1.3**, you can then create a GPRS dial-up connection by the following steps:

1. Go to **Control Panel>Network Connections.**
   Run New Connection Wizard.
   Click **Next**.

Figure 25

2. Select **Connect to the internet**.
   Click **Next**.

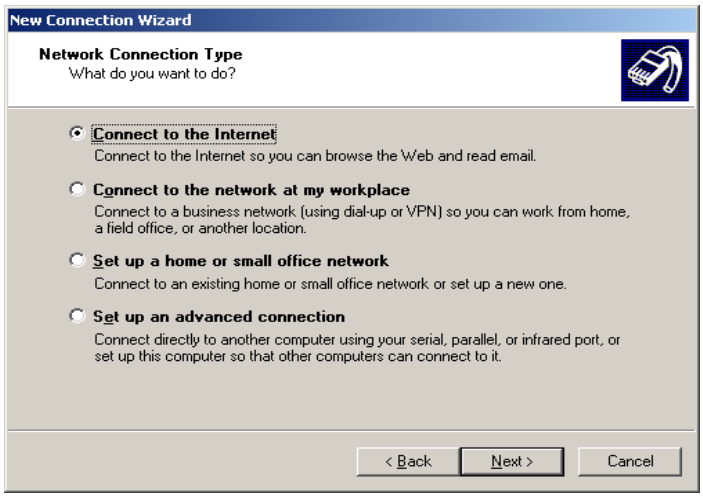


Figure 26

3. Select **Set up my connection manually**. Click **Next**.

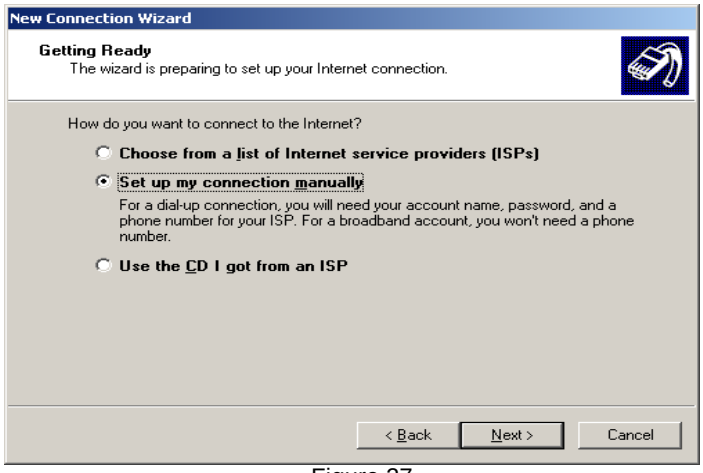


Figure 27

4. Select **Connect using a dial-up** modem. Click Next.

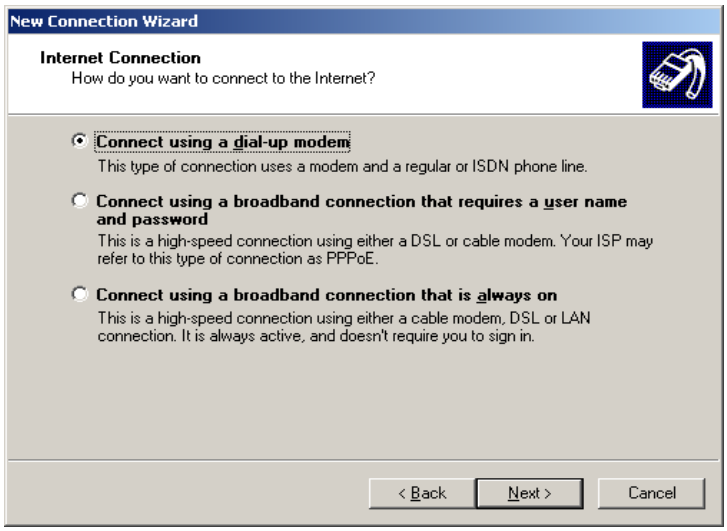


Figure 28

5. Enter a Connection Name. Click **Next**.

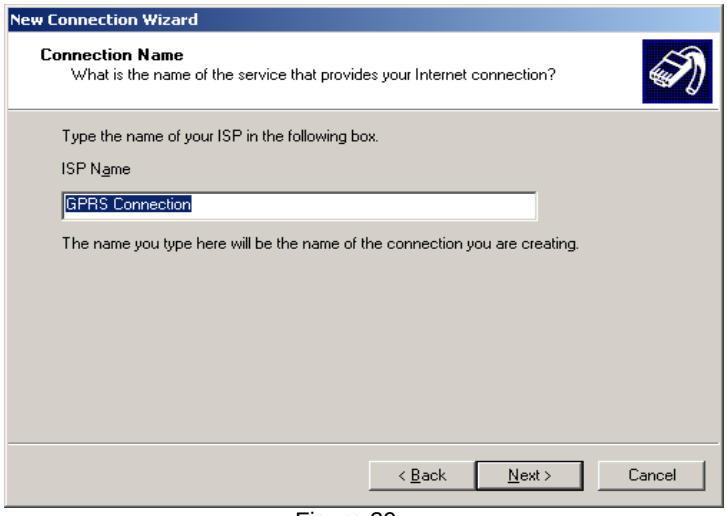


Figure 29

6. Enter "*99***1#" for the Phone number. This is a fixed GPRS connection dialing number for the module.
Click **Next**.

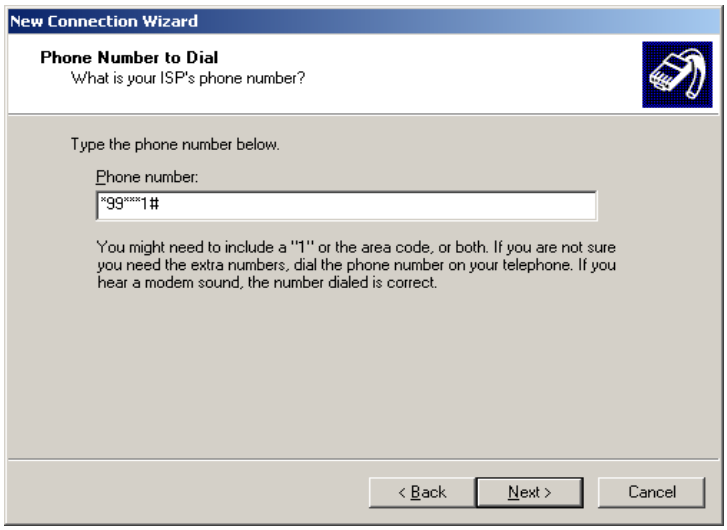


Figure 30

7. Enter User name and Password if applicable. Uncheck on all three options. Click **Next**.

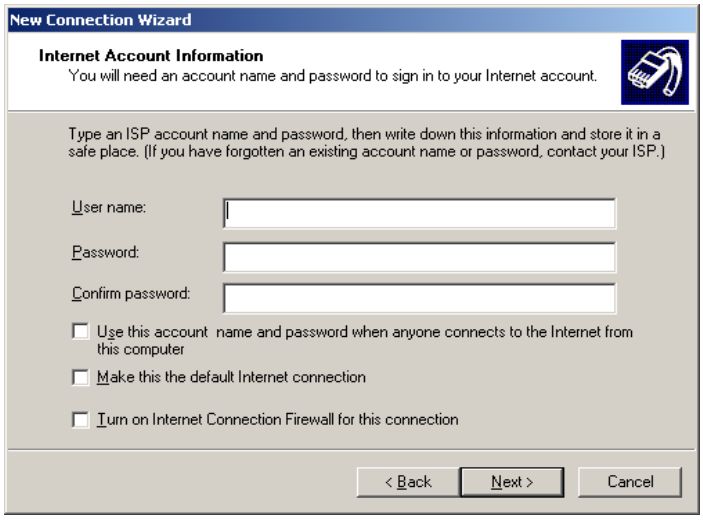


Figure 31

8. Click Finish to complete the New Connection Wizard.

Figure 32

9. From HyperTerminal, enter the network's APN (Access Point Name) into the TR800 module: **AT+CGDCONT=1,"IP","APN"** and **ENTER**.
   The APN can be obtained from your network operator.

10. You can now connect to the GPRS network using Windows Dial-up connection created.

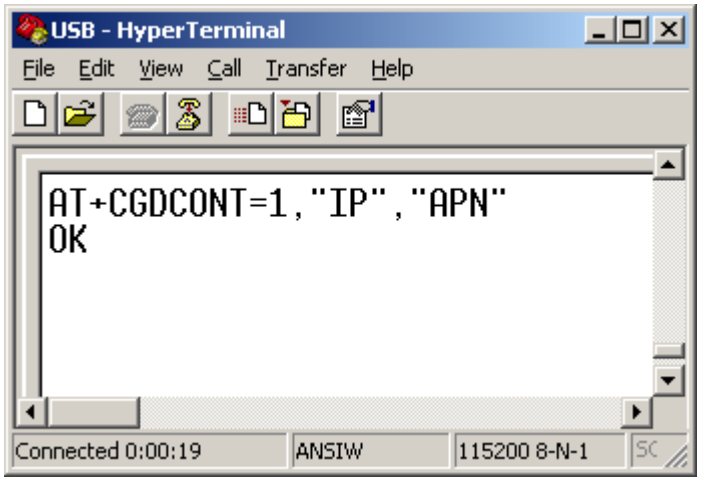
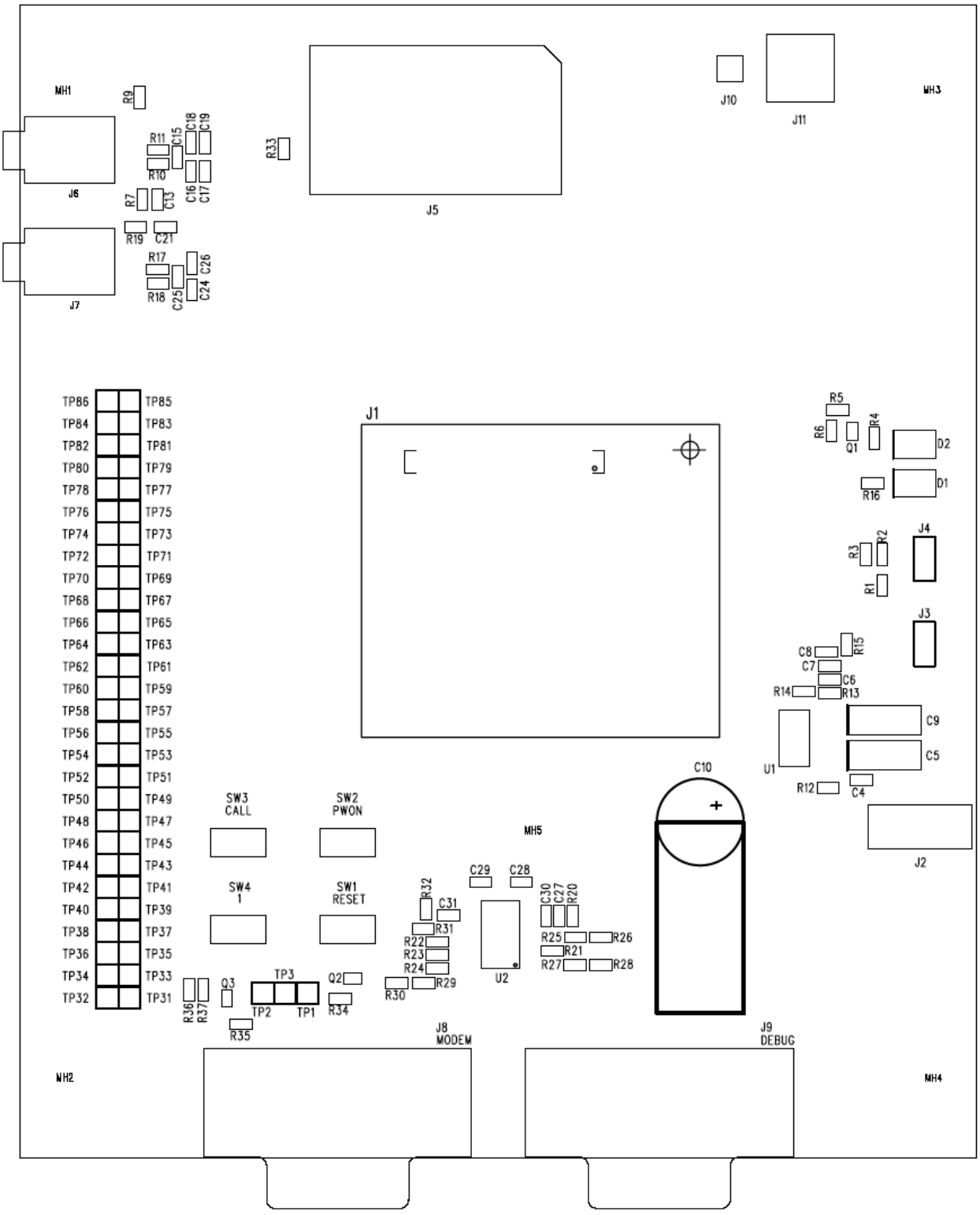


Figure 33

5. COMPONENT PLACEMENT INFORMATION

5.1 TOP COMPONENT PLACEMENT DIAGRAM



5.2 COMPONENT LIST

Reference	Description
J1	80-pin connector – GSM/GPRS module
J2	DC supply jack
J3	External supply/battery input test points
J4	Backup battery connector
J5	SIM card holder
J6	Phone audio jack
J7	Auxiliary audio jack
J8	Modem Serial UART port
J9	Debug Serial UART port
J10	RF receptacle – for connection to module's RF receptacle
J11	SMA jack – for RF connection to an external antenna or test equipment
SW1	RESET pushbutton
SW2	Power ON/OFF pushbutton
SW3	"CALL" function pushbutton
SW4	"1" function pushbutton
D1	LED indicator – MEB power supply
D2	LED indicator – Module status indicator

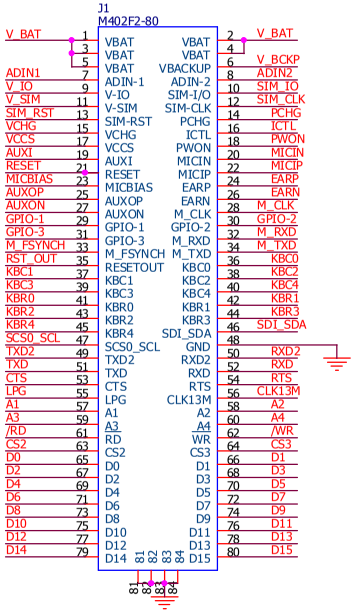
5.3 TEST POINT LIST

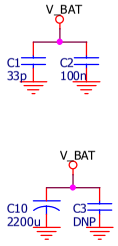
The test-points provided on the MEB allows access to module pins or features that are not implemented or used on the MEB board itself, e.g. parallel bus, rest of keypad pins, battery charging interface etc.

Test Point	Function	Test Point	Function
TP86	D15	TP85	D14
TP84	D13	TP83	D12
TP82	D11	TP81	D10
TP80	D9	TP79	D8
TP78	D7	TP77	D6
TP76	D5	TP75	D4
TP74	D3	TP73	D2
TP72	D1	TP71	D0
TP70	CS3	TP69	CS2
TP68	/WR	TP67	/RD
TP66	A4	TP65	A3
TP64	A2	TP63	A1
TP62	GND	TP61	GND
TP60	CLK13M	TP59	SCS0_SCL
TP58	SDI_SDA	TP57	RST_OUT
TP56	KBR3	TP55	KBR4
TP54	KBR1	TP53	KBR2
TP52	KBC4	TP51	KBR0

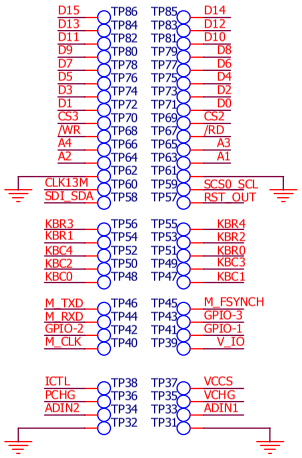
Test Point	Function	Test Point	Function
TP50	KBC2	TP49	KBC3
TP48	KBC0	TP47	KBC1
TP46	M_TXD	TP45	M_FSYNCH
TP44	M_RXD	TP43	GPIO-3
TP42	GPIO-2	TP41	GPIO-1
TP40	M_CLK	TP39	V_IO
TP38	ICTL	TP37	VCCS
TP36	PCHG	TP35	VCHG
TP34	ADIN2	TP33	ADIN1
TP32	GND	TP31	GND

Appendix: TR-800 MEB Schematic

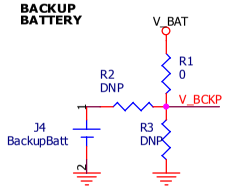




TESTPOINTS



BACKUP BATTERY

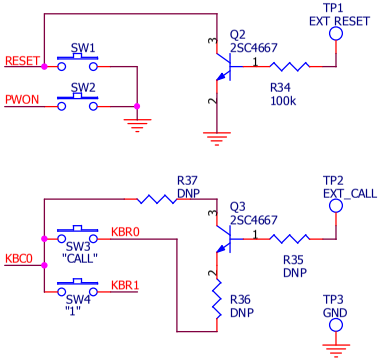


NOTE (using a backup battery):
V_BACKUP max: 3.6V
V_BACKUP nom: 3.0V

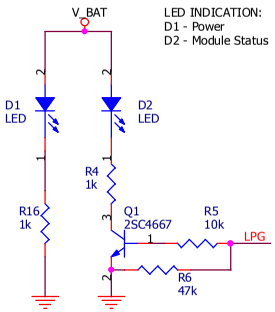
R1 must be removed if using external backup battery

PCB SUPPORT / MOUNTING HOLES

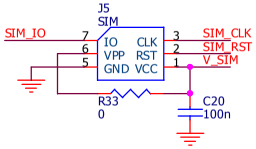
RESET, ON SWITCHES & PUSHBUTTONS



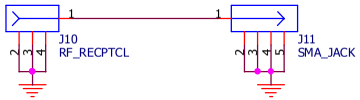
LED INDICATOR



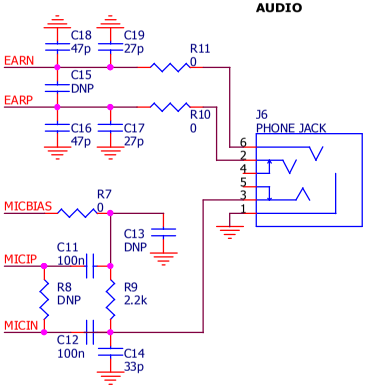
SIM CARD INTERFACE



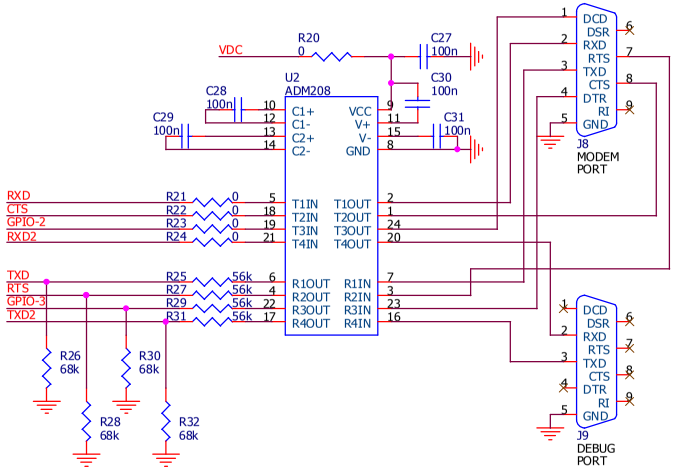
RF & ANTENNA CONNECTOR



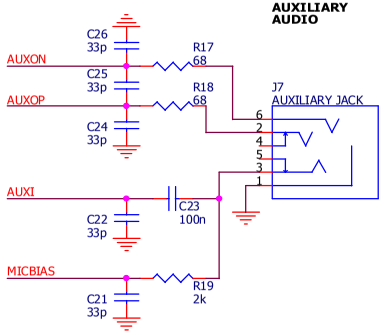
PHONE AUDIO



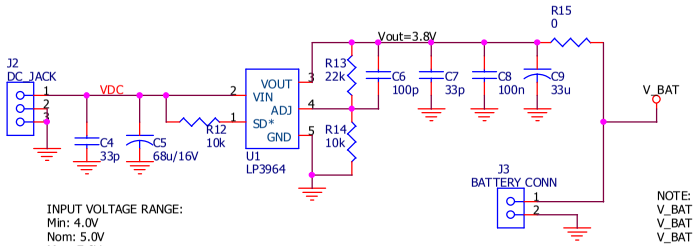
MODEM & DEBUG UART PORTS



AUXILIARY AUDIO



POWER SUPPLY CIRCUITRY



INPUT VOLTAGE RANGE:
Min: 4.0V
Nom: 5.0V
Max: 7.0V

NOTE:
V_BAT max: 5.5V
V_BAT nom: 3.6V
V_BAT min: 3.0V

Title	Module Evaluation Board (MEB)		
Size A3	Document Number <Doc>		Rev 3.0
Date: Friday, February 04, 2005	Sheet 1 of 2		