EMIV-DUAL V2.0 User Manual
Application Information

Sep. 29, 2006
01-EMIV-DUAL V2.0_X1

AnyDATA.NET

AnyTime AnyPlace Any Wireless Data Solutions™

AnyDATA CDMA EMIV-DUAL V2.0

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Warning: Exposure to Radio Frequency Radiation
The radiated output power of this device is below the FCC radio frequency exposure limits. Nevertheless, the device should be used in such a manner that the potential for human contact during normal operation is minimized. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna should not be less than 20cm during normal operation and the gain of the external antenna must not exceed 1dBi.
This device contains DTG2000-DUAL V2.0 of which the FCC ID is P4M-DTG2000V2 and the IC number is 4594A-DTG2KV2.

Contents

1. Introduction

1.1 Purpose

This Manual provides hardware interface and programming information for EMIV-DUAL V2.0 CDMA Wireless Data Modem.

1.2 Organization

The interface and operation section is organized into the following subsections:

- Section 2 – Introduces users to the EMIV-DUAL V2.0 CDMA Wireless Data Modem basic features and general specifications.
- Section 3 – Contains EMIV-DUAL V2.0 Pin description - DC12V Input Port, 8pin Serial Port and Debugging Port.
- Section 4 – Describes the UART Interface.
- Section 5 – Specifies the recommended operating conditions, DC voltage characteristics, I/O timing, and power estimations for the modem.
- Section 6 – Provides package dimensions and outlook features for the modem.
- Section 7 – Displays installation example.

1.3 Revision History

The revision history for this document is shown in Table 1-1.

Table 1-1 Revision History

Version	Date	Description
X1	Sep 2006	Initial Release

2. Overview

2.1 Application Descriptions

The CDMA Wireless Data Modem is a complex consumer communications instrument that relies heavily on both digital signal and embedded processor technologies. The Wireless Data Modem manufactured by AnyDATA.NET supports Code-Division-Multiple-Access (CDMA). This operates in 800MHz CDMA and 1900MHz PCS spectrum.

In a continuing effort to simplify the design and to reduce the production cost of the Wireless Data Modem, AnyDATA.NET has successfully developed the EMIV-DUAL V2.0. The EMIV-DUAL V2.0 is AnyDATA.NET's latest compact Wireless Data Modem operating in 800MHz CDMA and 1900MHz PCS spectrum, also contains complete digital modulation and demodulation system for CDMA standards as specified in IS-95 A/B and IS-2000.

The subsystem within the EMIV-DUAL V2.0 includes a CDMA processor (MSM6050), an integrated CODEC with an ear piece and microphone amplifiers, and an RS-232 serial interface supporting forward link data communications of a rate of 153kbps.

The EMIV-DUAL V2.0 provides external interface. External interface includes the standard RS-232, Digital Audio, External reset control, parallel LCD Display, Keypad, Ringer extension ports and R-UIM for China market.

The EMIII-DUAL has the capability to power down unused circuits in order to dynamically minimize power consumption.

2.2 Technical Specifications

2.2.1 General Specifications

Parameters	Descriptions
External Access	Code-Division-Multiple-Access (CDMA)
CDMA Protocol	IS-95 A/B, IS-126, IS-637A, IS-707A, IS-2000
Data Rate	153 Kbps max. on both the forward and reverse links
Transmit/Receive Frequency Interval	45MHz for Cellular and 80MHz for PCS
Band Width	1.23MHz
RF technology	Zero Intermediate Frequency
Number of Channel	832 for Cellular and 42 for PCS
Operating Voltage	DC 7V ~ 16V
Current Consumption	Sleep mode : 30mA, Idle mode (70mA) , Traffic mode : 350mA (Max) at 12V
Operating Temperature	-30℃ ~ +60℃
Frequency Stability	±300Hz for 800MHz CDMA and ±150Hz for 1900MHz CDMA
Antenna	Magnet mount helical antenna, 50ohm, 1dBi Gain for 800MHz and 1900MHz
Size	60 X 112 X 29mm
Weight	About 110g
External Interface	RS-232 (Molex-8pin 85503), Power (12VDC Molex-2pin 5268), Dual Antenna (800MHz,1900MHz), Debug port (Mini USB)

2.2.2 Receive Specifications

Parameters	Descriptions
Frequency Range	869.04 ~ 893.97 MHz for 800MHz CDMA and 1931.25 ~ 1988.75MHz for 1900MHz CDMA
Sensitivity	Below –104dBm
800MHz Interference Rejection 1900MHz	Single tone (-30dBm @900KHz): Below –101dBm Two tone (-43 dBm @900KHz and 1700KHz): Below –101dBm Two tone (-32 dBm @900KHz and 1700KHz): Below –90dBm Two tone (-21 dBm @900KHz and 1700KHz): Below –79dBm Single tone (-30dBm @1250KHz): Below –101dBm Two tone (-43 dBm @1250KHz and 2050KHz): Below –101dBm
Spurious Wave Suppression	Below –80dBc
Input Dynamic Range	-25dBm ~ -104dBm

2.2.3 Transmit Specifications

Parameters	Descriptions
Frequency Range Cellular PCS	 824.04 ~ 848.97 MHz 1851.25 ~ 1908.75MHz
Nominal Max Power	0.28 W (24.5dBm)
Peak Power in Operation Mode	800MHz CDMA : 0.5W (26.5dBm) 1900MHz CDMA : 0.5W (26.5dBm)
Minimum Controlled Output Power	Below –50dBm
Max Power Spurious Cellular PCS	 900KHz: Below –42dBc/30KHz 1.98MHz: Below –54dBc/30KHz 1.25MHz: Below –42dBc/30KHz 1.98MHz: Below –50dBc/30KHz

2.2.4 Standards

IS-95A/B/C : Protocol Between MS & BTS
IS-96A : Voice Signal Coding
IS-98A : Base MS Function
IS-126 : Voice Loop-Back
IS-637 : Short Message Service
IS-707 : Data Service
Built-in TCP/IP : AnyDATA proprietary software
IS-657 : packet data

2.3 Interface Diagram

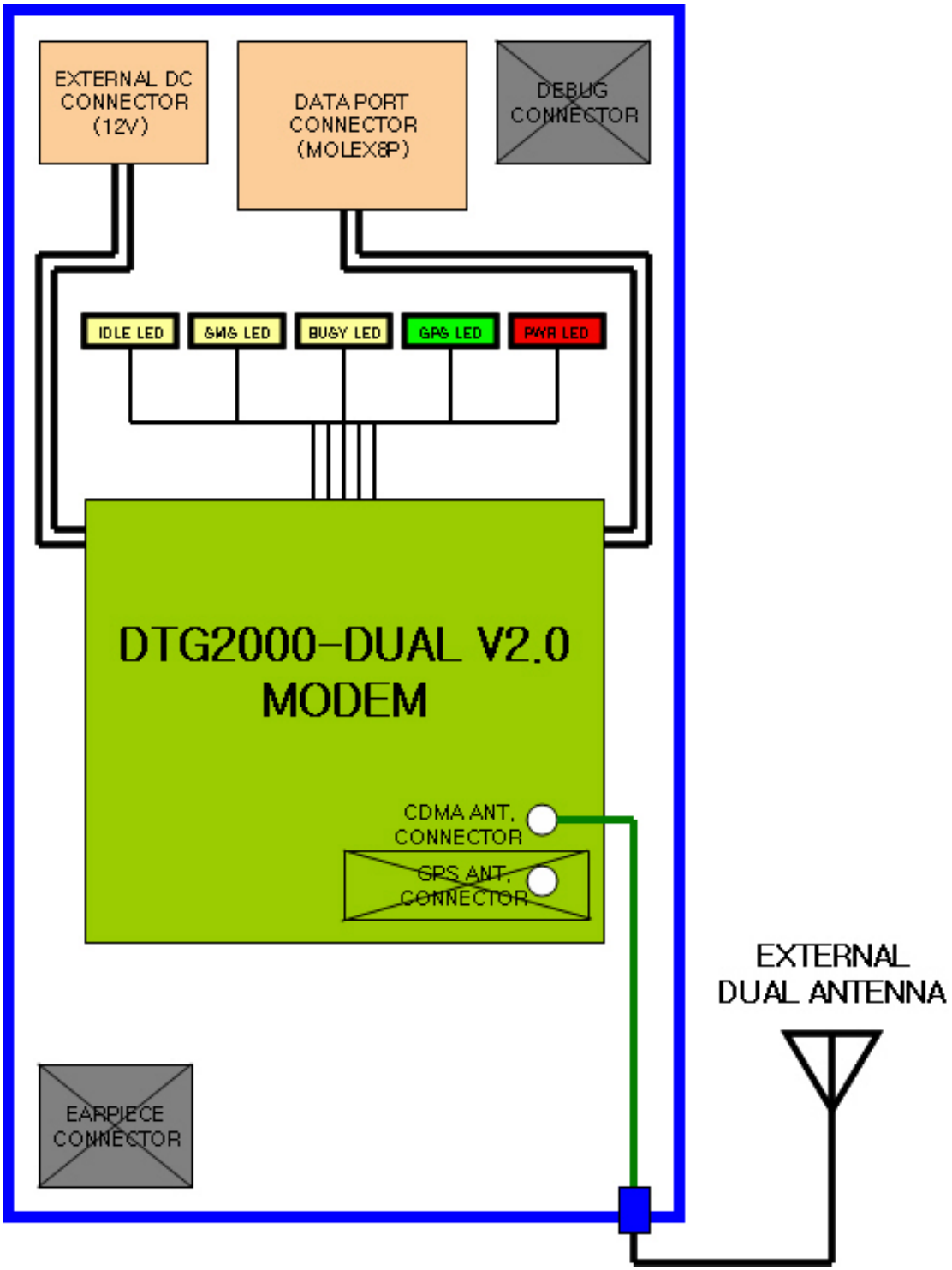


Figure 2-1 Interface Block Diagram

2.4 EMIV-DUAL V2.0 Photo

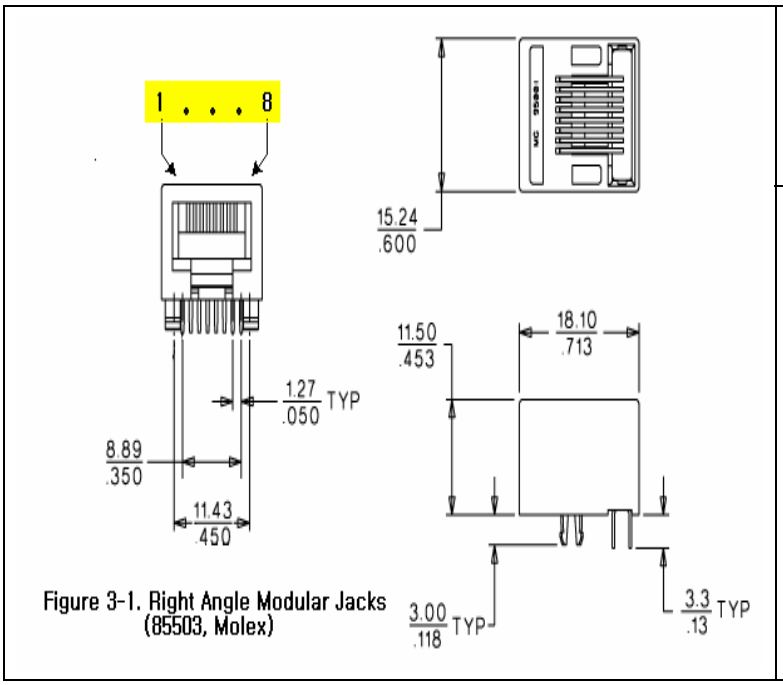
Figure 2-2 EMIV-DUAL V2.0 Photo

2.5 Internal Module Photo

Figure 2-3 Internal Module Photo (DTG2000-DUAL V2.0)

3. PIN Description

3.1 8-Pin Male Modular Jacks (RS232 Standard)



Molex (85503)	RS-232 (Host)
Pin 1	RI
Pin 2	GND
Pin 3	DTR
Pin 4	CTS
Pin 5	TX
Pin 6	RTS
Pin 7	RX
Pin 8	DCD

Figure 3-1 Right Angle Modular Jacks Pin Description (85503,Molex 8P)

3.2 Debug Connector

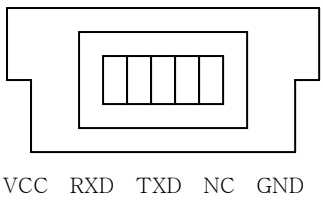


Figure 3-2 Debugging Connector (UX60-MB-5S8)

3.3 DC Power Connector

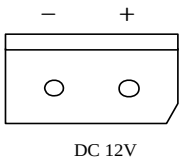


Figure 3-3 DC 12V Power Connector (5268, Molex 2P)

4. Interface Descriptions

4.1 Overview

This chapter covers information required to design the EMIV-DUAL V2.0 into a subscriber unit application. In addition, the internal signals that are necessary for complete understanding of the UART interfaces are described below.

4.2 RS232 Interface (Standard)

The Universal Asynchronous Receiver Transmitter (UART) communicates with serial data that conforms the RS-232 Interface protocol. The modem provides 5.0V CMOS level.

All the control signals of the RS-232 signals are active low, but data signals of RXD, and TXD Are active high. The UART has a 64byte transmit (TX) FIFO and a 64byte receive (RX) FIFO. The UART Features hardware handshaking, programmable data sizes, programmable stop bits, and odd, even, no parity. The UART operates at a 115.2kbps maximum bit rate.

NAME	DESCRIPTION	CHARACTERISTIC
DP_DCD/	Data Carrier Detect	Network connected from the modem
DP_RI/	Ring Indicator	Output to host indicating coming call
DP_RTS/	Request to Send	Ready for receive from host
DP_TXD	Transmit Data	Output data from the modem
DP_DTR/	Data Terminal Ready	Host ready signal
DP_RXD	Receive Data	Input data to the modem
DP_CTS/	Clear to Send	Modem output signal
GND	Signal Ground	Signal ground

Figure 4-1 UART Interface Pinout

5. Electrical Specifications

5.1 Absolute Maximum Ratings

Operating the modem under conditions that exceed those listed in the Absolute Maximum. The Ratings table may result in damage to the modem.

Absolute Maximum Ratings may be considered as limiting values, and are considered individually. While all other parameters are within their specified operating ranges, the functional operation of the modem under any of the conditions in the Absolute Maximum Ratings table is not implied.

Table 5-1 Absolute Maximum Ratings

PARAMETER	MIN	MAX	UNITS
Storage Temperature	-40	+80	ºC
Voltage On Any Input	-	+20	V
Voltage On Any Output		+10	V
Supply Voltage	-	+20	V
Initializing Current	100		mA
Drop	No damages after 60-Inch drop over concrete floor		

5.2 Recommended Operating Conditions

PARAMETER	MIN	MAX	UNITS
Supply Voltage	+7	+16	V
Operating Temperature	-30	+60	ºC
Operating Humidity	95%(50ºC) Relative Humidity		

5.3 Power Consumption

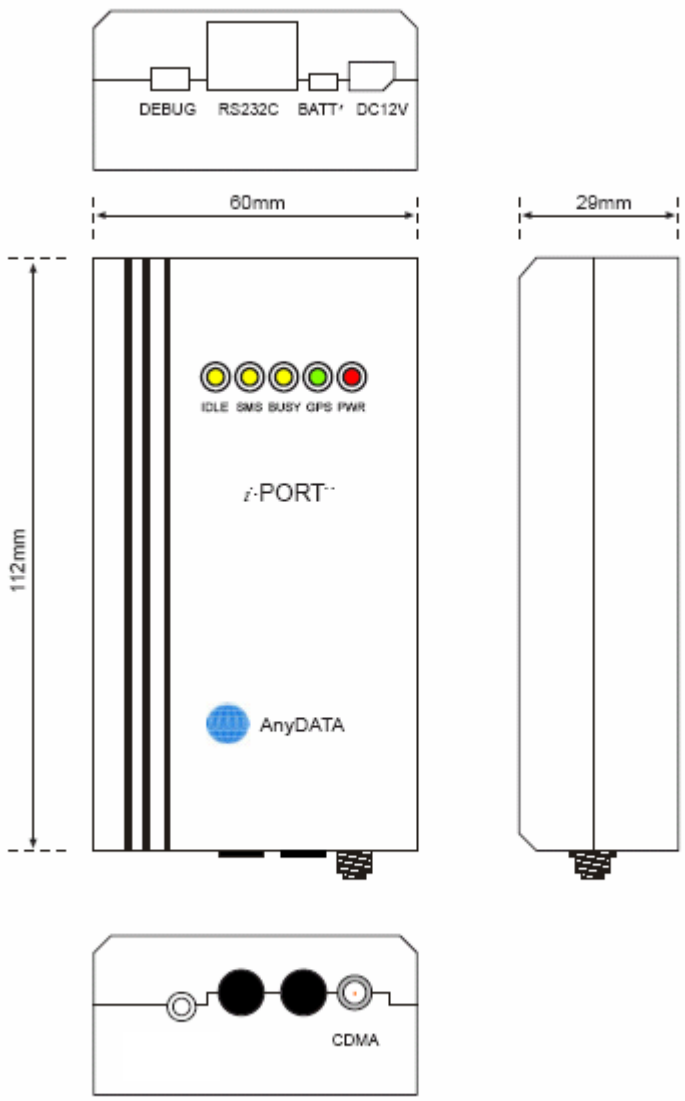
Conversation	STANDBY	
	Idle	Sleep
350mA (MAX) at 12V	70mA	30mA

5.4 Serial Interface Electrical Specifications

PARAMETER	MIN	MAX	UNITS
Input High Voltage	+2	+15	V
Input Low Voltage	-15	-2	V
Output High Voltage	+5	+7	V
Output Low Voltage	-7	-5	V

6. Mechanical Dimensions

6.1 EMIV-DUAL V2.0 Outline



7. Installation Example