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Client: Innovative Wireless Technologies, Inc.
Model #: IXU1-ASY1168
Standards: FCC 15.247
FCC ID: SP8-IXU1-ASY1168
Report #: 2006098

Appendix I: Manual

Please refer to the following pages.

mProm™ 900MHz Module USER MANUAL

This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:
1. this device may not cause harmful interference, and
2. this device must accept any interference
received, including interference that may cause
undesired operation.

FCC ID: SP8-IXU1-ASY1168

IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. Under normal operating conditions, the antenna is designed to maintain a separation distance of 20 cm from all persons. □□□□

Changes or modifications to this unit not expressly approved by Innovative Wireless Technologies, Inc. could void the user's authority to operate this equipment.

Innovative Wireless Technologies, Inc.
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mProm™

900MHz Mesh Networking Module

User Manual

Overview

IWT's mProm™ Module is a 900 MHz ISM transceiver module that offers an embedded microprocessor. The mProm module is designed for easy integration into systems needing connectivity or wire replacement. The mProm™ module utilizes the 902-928MHz ISM band and is FCC certified for most integrated applications. The modules are pre-programmed with IWT's mProm™ mesh networking protocol including a RTOS and user API supporting customization for a

wide range of applications. The mProm™ 900 MHz Module is compatible with IWT's mProv™ suite of mesh network management, control, and data aggregation tools.

Applications:

- M2M
- Full or Partial Mesh Networking
- Wireless Sensor Networks
- Two-way Remote Keyless Entry
- Automatic Meter Reading

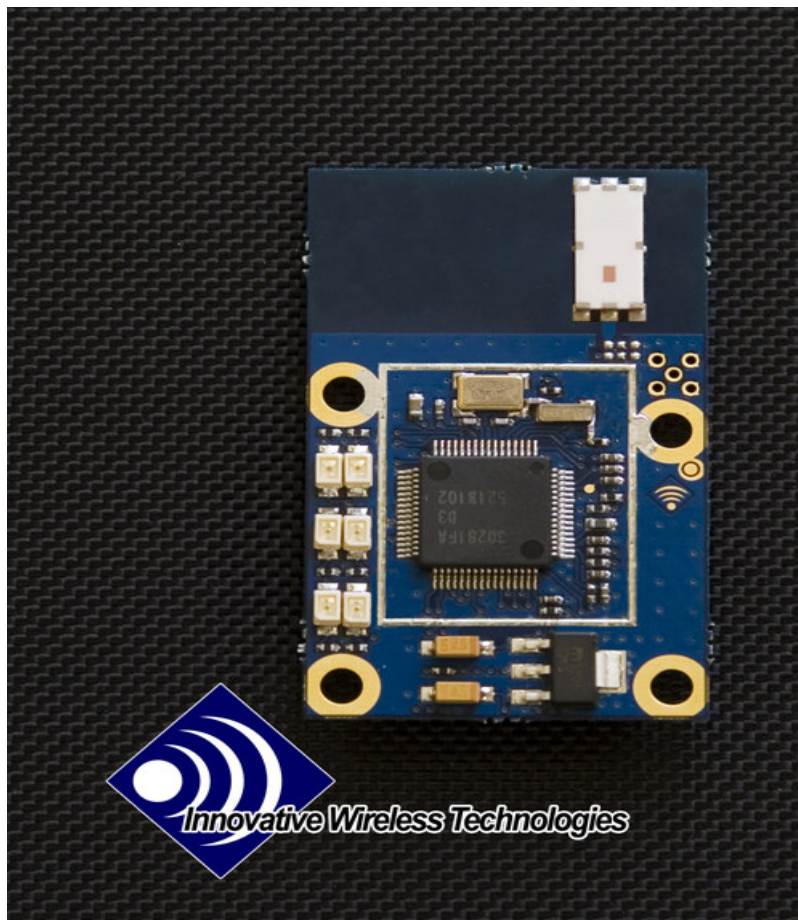


Figure 1 – mProm™ Module

FCC Statement for OEM Integrators

mProm™ Module Use for maintaining RF exposure

This device is intended only for OEM integrators under the following conditions:

1. *Connection to the mProm™ Module should always be made through the 26 pin header. Connection to the mProm™ Module any other way not expressed in this documentation or approved by Innovative Wireless Technologies, Inc. will void the user's ability to operate this device under the FCC certification.*

The header on the mProm™ Module is a SAMTEC FTMH-113-02-L-DV, and mate connection is CLM-113-02-L-D.

2. *The mProm™ Module may not be co-located with any other transmitter or antenna.*

3. *The mProm™ Module is approved using the FCC "**Unlicensed modular transmitter approval**" method. Therefore the mProm™ Module must only be used with the originally approved antenna(s).*

As long as the 3 conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain, co-location with another transmitter, or different antenna), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

OEM End Product Labeling

*The mProm™ module is to be installed in a OEM product without alteration. During installation, do not remove the FCC ID information on the module. The final end product that has integrated the mProm™ Module must be labeled in a visible area with the following: **Contains TX FCC ID: SP8-IXU1-ASY1168***

IMPORTANT NOTE TO OEM

The end user of the OEM's product, with incorporated mProm™ Module, should NOT be provided any instructions on how to remove or install the mProm™ Module.

The mProm™ Module Interface (Getting Started)

Voltage must be supplied to the mProm™ Module via pins 19 and 20 on the interface header. The mProm™ Module regulates its voltage on board, but must be supplied a voltage between 3.5-14 Volts. The table below outlines the 26 pin interface to the mProm™ Module. The mechanical diagram that follows indicates where pin-1 starts.

Pin #	Pin Name	Pin Type	Description
1	CNVss	Digital Input	
2	BUSY/UART_CS	Digital I/O	Pin set to function as UART
3	GDO2_CC1100	Digital I/O	
4	3.3V	Power (RF/Dig.)	3.3V regulated output voltage
5	CE	Digital I/O	Chip enable
6	DfromMicro_UART	Digital Input	Data sent from microprocessor
7	P_SCLK	Digital I/O	Programming clock
8	DfromPC_UART	Digital Input	Data sent from computer
9	GND SIGNAL	Ground (Digital) / RF	Digital ground connection
10	GPIO6	Digital I/O	PWM GPIO
11	RESET	Digital Input	Resets the microprocessor
12	GPIO7	Digital I/O	PWM GPIO
13	UART_CLK	Digital I/O	CLK pin for configurable UART
14	GPIO3	Digital I/O	Interruptible GPIO
15	GPIO5	Digital I/O	Interruptible GPIO
16	GPIO4	Digital I/O	Interruptible GPIO
17	A0	Digital I/O-Analog In	A/D converter
18	3.3V	Power (RF/Dig.)	3.3V regulated output voltage
19	GND SIGNAL	Ground (Digital) / RF	Digital ground connection
20	V _{unreg}	3.6V Battery Connection	3.4V-12V battery/power connection (absolute max 14 V)
21	A1	Digital I/O-Analog In	A/D converter
22	GPIO1/PROG_RxD	Digital I/O	Pin set to function as UART / Programming UART
23	A2	Digital I/O-Analog In	A/D converter
24	GPIO2/PROG_TxD	Digital I/O	Pin set to function as UART / Programming UART
25	A3	Digital I/O-Analog In	A/D converter
26	GPIO0	Digital I/O	Pin set to function as UART

Once power is applied to pins 19 and 20, primary communication through the mProm™ Module will take place on pins 6 and 8. These pins are the buffered UART interface to the Module. This UART interface is 3.3-Volt logic only. To communicate with a PC and RS232 Translator must be used on the customer's end device. The mProm™ Programmer Board, used for prototype development, translates the UART signaling to PC levels. Innovative Wireless Technologies' document "mPros™ Network Interface Specification" (version P10 or later) outlines the communication protocol utilized on the UART plus the over the air communication protocols for your peer-to-peer and mesh network configurations.

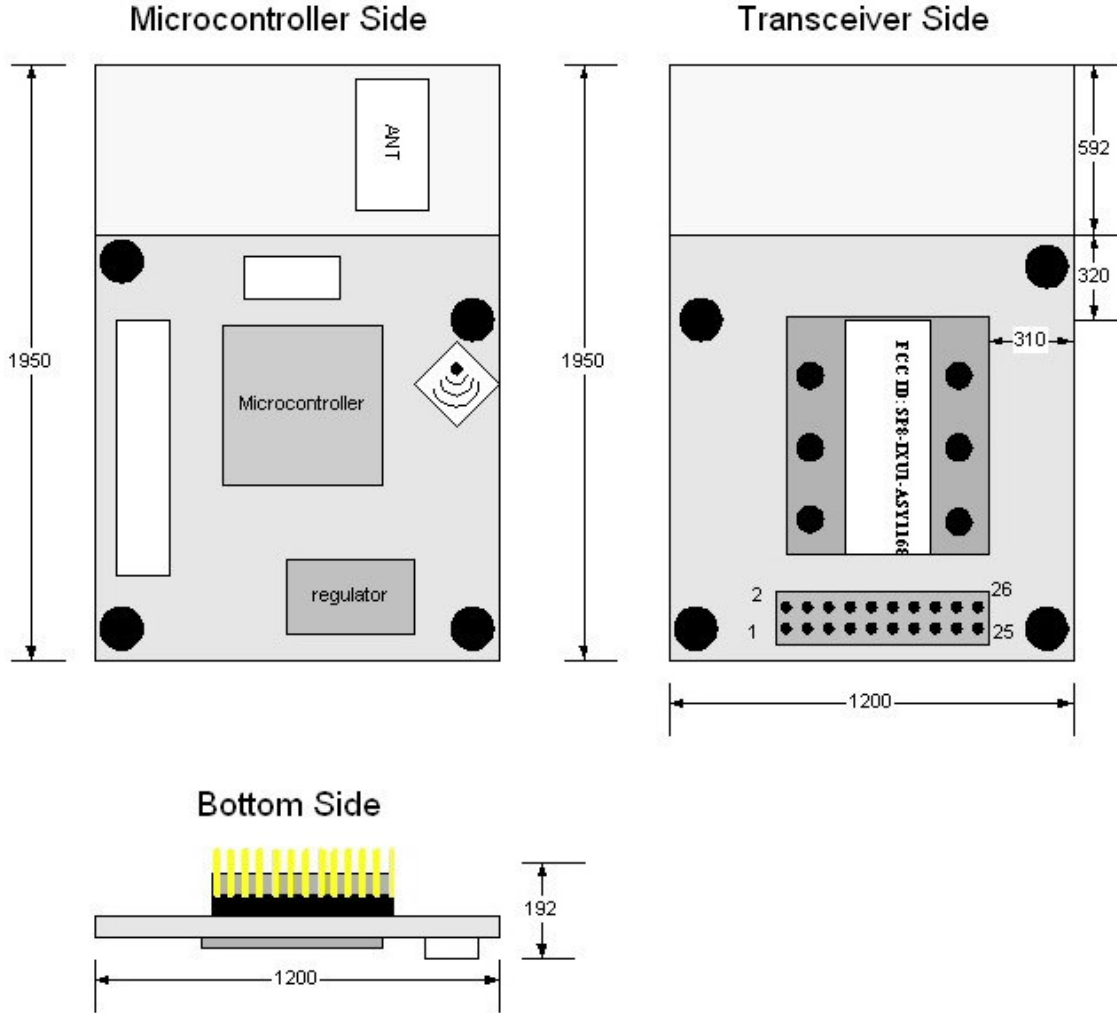
Once the UART link has been correctly initialized, your device can then utilize the mProm™ Module to communicate information wirelessly to other mProm™ Modules. This allows the end user to quickly setup communication links between two or multiple devices. If communication

becomes inoperable, momentarily pulling pin 11 (RESET) low, 0-Volts, will reset the mProm™ Module.

mProm™ Module Electrical Specifications

Parameter	Min.	Typ.	Max.	Unit	Condition/Note
Overall					
Operation Temperature	-40		85	°C	Ambient Temperature
RF Frequency Range	902		928	MHz	FHSS
Absolute Supply Voltage	3.5		14	V	
Transmitter					
Transmit Bit Rate		38.4	500	kbps	
Nominal Output Power		8	10	dBm	Delivered into 50Ω load
Receiver					
Receiver Sensitivity		-100		dBm	PER=1%, Measured through 50Ω load, conducted.
General I/O Available					
GPIO					
SCHMITT-Trigger Input Specifications					
V _{IT+} Positive-going input threshold	0.7V _{cc}		V _{cc}	V	V _{cc} =3.3V
V _{IT-} Negative-going input threshold	0		0.3V _{cc}	V	
Output Specifications					
VOH High-level output voltage					
Test Condition IOH(avg) = -5mA	V _{cc} -0.5		V _{cc}	V	
Test Condition IOH(peak) = -10 mA	V _{cc} -1.0		V _{cc}	V	
VOL Low-level output voltage					
Test Condition IOL(max) = 5 mA	V _{ss}		1.0	V	
Analog to Digital Inputs Available					
A(x)					
Accuracy		10		Bit	10 bit ADC
Input capacitance		220		pF	
Input resistance		56		Ω	
Current Consumptions					
Transmit Mode		42		mA	Measured at 4.5 V (3-AA supply) +10dBm Power Setting
Receive Mode		26		mA	Measured at 4.5 V

Mechanical Board Dimensions



All Dimensions in mils (1/1000 ")

Figure 2 Module Dimensions (mils)

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