FlexCom104-GPS Manual

Flexible Communications

PC/104 Platform

With GPS

Manufactured by:

Tri-M Technologies

Technical Manual

Revision: 2014-09-22

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PREFACE

This manual is for integrators of applications of embedded systems. It contains information on hardware requirements and interconnection to other embedded electronics.

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Chapter 1 INTRODUCTION

General Description

The FlexCom104-GPS has the following restrictions:

- Both Universal Socket modules supplied with 5V. No support for 3.3V socket modules
- Only Multitech Universal Socket wireless modules supported.

The FlexCom104-GPS is a communications platform capable of supporting two of the Multitech Universal Socket compatible devices. Embedded in the FlexCom104-GPS is a quad UART (ST16C554DIQ64) to provide communications to the two Universal Sockets, a mounting point for the FV-4H GPS and an additional serial port. The ST16C554DIQ64 is an enhanced quad UART with 16 byte FIFOs on both transmit and receive.

The PC/104 bus provides access to quad UARTs. One UART port is connected to the auxiliary serial port.

The FlexCom104-GPS supports wireless Multitech modules, with mounting holes.

In this document, the term “serial port” refers to a UART based communications port that is available on pin headers.

Features

- *Two Multitech compatible Universal Sockets*
- *One RS-232 serial port on a 2x5 pin 2mm header with a MAX3250 ±50V isolated interface*
- *One mounting location for an FV-4H GPS*
- *PC/104 interface to high speed quad UART*
- *Selectable I/O address & IRQ*
- *Supports 5V Multitech modules*
- *GPS 1 Pulse per Second LED*
- *GPS 1 Pulse Per Second line fed to Carrier Detect line for time synchronization as per the standard PPSKit configuration*

Specifications

Module specifications	
Model	FlexCom104-GPS
Supplied oscillator frequency	14.7456MHz
Universal Sockets	2
RS232 Serial ports	1
Size, PC/104 form factor compliant*	3.55”W x 3.75”L x 0.6”H

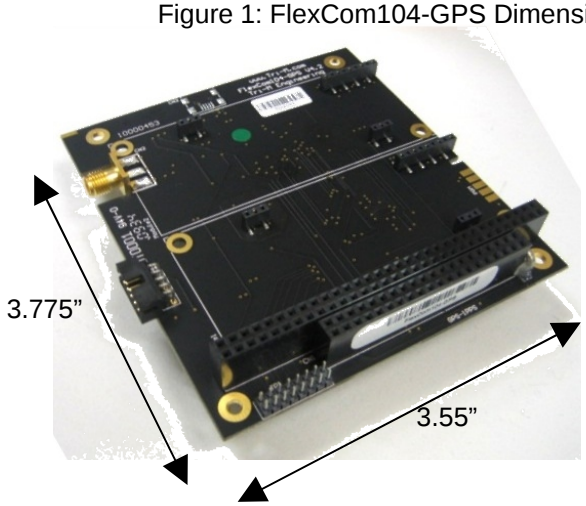
Height measured without Universal Socket module installed.

Some Universal Socket modules may be large enough to violate the PC/104 form factor.

UART specifications	
Model	ST16C554DIQ64
FIFOs	16 bytes
Ports	4

Serial port specifications	
Protocol	RS-232
Duplex RS-232	Full

Figure 1: FlexCom104-GPS Dimensions



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Chapter 2 CONFIGURATION

2.1 Introduction

Chapter 2 describes the software and hardware configuration required to properly integrate the FlexCom104-GPS into a PC/104 Stack

The FlexCom104-GPS has configuration jumpers for I/O address, IRQ, mode of operation, and module voltage.

2.2 Software Configuration

A utility is available from the Tri-M website (www.tri-m.com) to configure the FlexCom104-GPS under Windows. Under Linux, setserial can be used to configure the FlexCom104-GPS.

The following command would configure the Linux kernel to use Module 1 as /dev/ttyS2 correctly with the default settings.

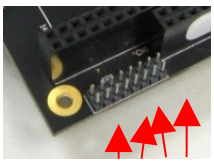
setserial /dev/ttyS2 port 0x100 irq 7 uart 16850 baud_base 921600 spd_vhi

2.3 IRQ Interrupt Configuration

The FlexCom104-GPS can be configured for IRQ5, IRQ7, IRQ10, IRQ11 and IRQ12 by the installation of jumper shunts on JP1 as per Table 1.

PC/104 IRQ Signal	Jumper JP1 Position Shunts			
	3	2	1	0
IRQ7 *	**No**	**No**	**No**	**No**
Reserved	No	No	No	Yes
Reserved	No	No	Yes	No
Reserved	No	No	Yes	Yes
Reserved	No	Yes	No	No
Reserved	No	Yes	No	Yes
IRQ12	**No**	**Yes**	**Yes**	**No**
IRQ11	**No**	**Yes**	**Yes**	**Yes**
IRQ10	**Yes**	**No**	**No**	**No**
Reserved	Yes	No	No	Yes
IRQ7	**Yes**	**No**	**Yes**	**No**
Reserved	Yes	No	Yes	Yes
IRQ5	**Yes**	**Yes**	**No**	**No**
Reserved	Yes	Yes	No	Yes
Reserved	Yes	Yes	Yes	No
Reserved	Yes	Yes	Yes	Yes

Where “Yes” = shunt installed, “No” = shunt not installed



7-4 3-0

JP1 Jumper Shunts

- No jumper shunt installed default is IRQ7.

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2.4 Serial Port I/O Address Configuration

The FlexCom104-GPS I/O address can be configured by the installation of jumper shunts on JP1 as per Table 2.

Table 1: Serial Port I/O Address Configuration

Serial Port I/O Addresses - Hex				Jumper JP1 Position Shunts			
Socket Modem# 1	Socket Modem# 2	On-board GPS Module	External RS232 Serial Port – CN4	7	6	5	4
100	108	110	118	No	No	No	No
180	188	190	198	No	No	No	Yes
1C0	1C8	1D0	1D8	No	No	Yes	No
200	208	210	218	No	No	Yes	Yes
240	248	250	258	No	Yes	No	No
280	288	290	298	No	Yes	No	Yes
300	308	310	318	No	Yes	Yes	No
380	388	390	398	No	Yes	Yes	Yes
Reserved				Yes	xx	xx	xx

Where “Yes” = shunt installed, “No” = shunt not installed, and “xx” = don’t care.

- No jumper shunt installed default is base addresses 100, 108, 110 & 118

2.5 Power Source

Universal Socket modules are available in 3.3V and 5V models. The FlexCom104-GPS supports only 5V modules. The 5V power for the FlexCom104-GPS must be supplied over the PC/104 bus.

2.6 Inserting the Module

There are two Universal Socket module locations (Module1 and Module2) and modules will only fit in the FlexCom104-GPS in one orientation. Attempting to insert the module in any other orientation may damage the module or the FlexCom104-GPS.

Insert a module by placing the largest group of pins in their sockets at once, then align the rest of the pins, and apply pressure evenly to the module until it settles in the socket.

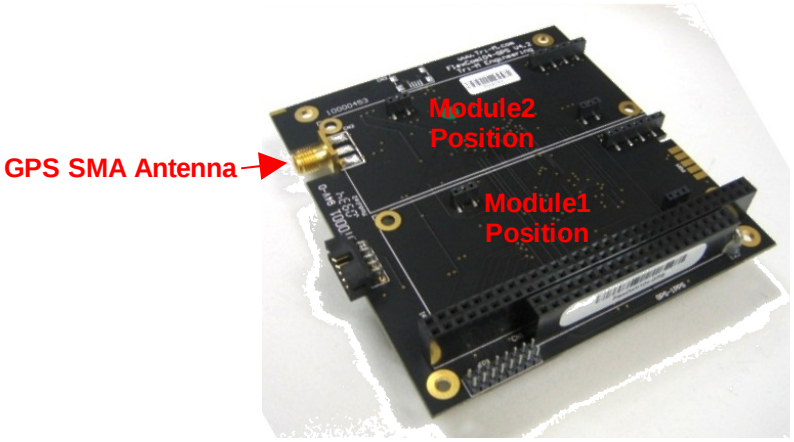
The antenna cable will need to be routed from the Wireless Modem module to the outside of the enclosure for the antenna to get a good signal.

2.7 Securing the Module

Wireless modules use two mounting screws to hold them into the socket. Two 4-40 1/8” countersunk screws can be used with 0.312” female standoffs to secure the module.

2.8 Connecting an FV-4H GPS

A GPS antenna must be connected to the SMA connector on the FlexCom104-GPS for the FV-4H GPS to operate.

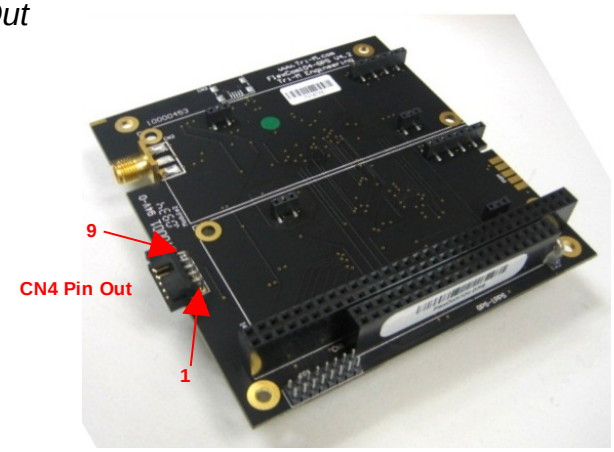


2.9 Connecting an External Serial Port

The serial port has the same pin out (see Table 3.6.1) as a standard IDC serial connector, however it has 2mm pin spacing.

Table 2: External Serial Port Pin Out

Pin number	Pin Function
1	CD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	GND
10	NC



The external serial has an on-board level converter for speeds up to 250kbps and has built-in ESD protection.