

# FlexCom104-GPS-WG Manual

## Flexible Communications PC/104 Platform With GPS

Manufactured by:  
**TRI-M ENGINEERING**  
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### Technical Manual

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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-WG is a reduced build of the FlexCom104-GPS. It has the following build options:

- No 3.3V power supply
- Both Universal Socket modules supplied with 5V
- Only pin-sockets for wireless modules populated (some unpopulated pin-sockets conflict with the Wireless device mounting holes)

The FlexCom104-GPS-WG is a communications platform capable of supporting two of the Multitech Universal Socket compatible devices. Embedded in the FlexCom104-GPS-WG is a quad UART (XR16C854) to provide communications to the two Universal Sockets, a mounting point for the FV-25 GPS and an additional serial port. The XR16C854 is an enhanced quad UART with 128 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. All ports are capable of rates up to 921.6kbps.

The FlexCom104-GPS-WG 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
- One mounting location for an FV-25 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	XR16C854
Maximum speed	921.6kbps*
FIFOs	Selectable 8-128 bytes
Ports	4

\*Unless a driver capable of changing the base baudrate (such as setserial in Linux) is used, the actual baud rate will be 8x the specified baudrate.

Serial port specifications	
Protocol	RS-232
Duplex RS-232	Full
Maximum speed	921.6kbps

## CHAPTER 2 CONFIGURATION

### **2.1 Introduction**

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

The FlexCom104-GPS-WG 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](http://www.tri-m.com)) to configure the FlexCom104-GPS-WG under Windows. Under Linux, setserial can be used to configure the FlexCom104-GPS-WG.

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
```

## 2.1 Configuration

To set the IRQs, refer to table 2.3.1

To set the IO addresses, refer to table 2.3.2

**Table 2.3.1**

JP1 Jumper positions	Shared IRQ
	NO IRQ
	IRQ3
	IRQ4
	IRQ7

**Table 2.3.2**

JP1 Jumper positions 1&2, 3&4, 5&6	Module 1 I/O address	Module 2 I/O address	FV-25 GPS 1 I/O address	Serial Port I/O address	IRQ Register
	0x100	0x108	0x110	0x118	0x240-247
	0x120	0x128	0x130	0x138	0x240-247
	0x140	0x148	0x150	0x158	0x248-24F
	0x160	0x168	0x170	0x178	0x248-24F
	0x240	0x248	0x260	0x268	0x220-227
	0x380	0x388	0x288	0x230	0x220-227
	0x3F8	0x2F8	0x3E8	0x2E8	0x228-22F
	0x3E8	0x2E8	0x3A8	0x2A8	0x228-22F

## CHAPTER 3 INSTALLATION

### **3.1 Introduction**

Chapter 3 describes the power requirements and installation of the FlexCom104-GPS-WG communications platform and associated Universal Socket Modules.

### **3.1 Power Source**

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

### **3.2 Connecting a Wireless Modem**

When installing a Wireless Modem module into the FlexCom104-GPS-WG, 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.

### **3.3 Inserting the Module**

The Universal Socket modules will only fit in the FlexCom104-GPS-WG in one orientation. Attempting to insert the module in any other orientation may damage the module or the FlexCom104-GPS-WG.

Insert a module by placing the largest group of pins in their sockets at once, then getting the rest of the pins lined up, and applying pressure evenly to the module until it is set in the socket

### **3.4 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.

### **3.5 Connecting an FV-25 GPS**

A GPS antenna must be connected to the SMA connector on the FlexCom104-GPS-WG for the FV-25 GPS to operate.

### 3.6 Connecting an external serial port

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

**Table 3.6.1**

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.