PCM-3291
USER MANUAL

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This manual is for the PCM-3291.

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Table of Contents

USER MENU

1.GPS INTRODUCTION

GPS is fully operational and meets the criteria established in the 1960s for an optimum positioning system. The system provides accurate, continuous , worldwide , three-dimensional position and velocity information to users with the appropriate receiving equipment. GPS also disseminates a form of Universal Time Coordinated (UTC). The satellite constellation consists of 24 satellites arranged in 6 orbital planes with 4 satellites per plane. A worldwide ground control/monitoring network monitors the health and status of the satellites. This network also uploads navigation and other data to the satellites. GPS can provide service to an unlimited number of users since the user receivers operate passively(i.e., receive only). The system utilizes the concept of one-way Time Of Arrival (TOA) ranging. Satellite transmissions are referenced to highly accurate atomic frequency standards onboard the satellites, which are in synchronism with an internal GPS system time base. The satellites broadcast ranging codes and navigation data on two frequencies using a technique called Code Division Multiple Access (CDMA); that is, there are only two frequencies in use by the system, called L1 (1575.42MHz) and L2 (1227.6MHz). Each satellite transmits on these frequencies, but with different ranging codes than those employed by other satellites. These codes were selected because they have low cross-correlation properties with respect to one another. The navigation data provides the means for the receiver to determine the location of the satellite at the time of signal transmission, whereas the ranging code enables the user’s receiver to determine the transit (i.e., propagation) time of the signal and thereby determine the satellite-to-user range. This technique requires that the user receiver also contain a clock. Utilizing this technique to measure the receiver’s three-dimensional location requires that TOA ranging measurements be made to four satellites. If the receiver clock was synchronized with the satellite clocks , only three range measurements would be required. However, a crystal clock is usually employed in navigation receivers to minimize the cost, complexity, and size of the receiver. Thus, four measurements are required to determine user latitude, longitude, height, and receiver clock offset from internal system time. If either system time or altitude is accurately known, less than four satellites are required. GPS provides two services : the Standard Positioning Service (SPS) and the Precise Positioning Service (PPS). The SPS is designated for the civil community, whereas the PPS is slated for U.S. authorized military and select government agency users. Access to the GPS PPS is controlled through cryptography.

2.GPS Application

2.1 Automotive applications.

2.2 Marine navigation applications.

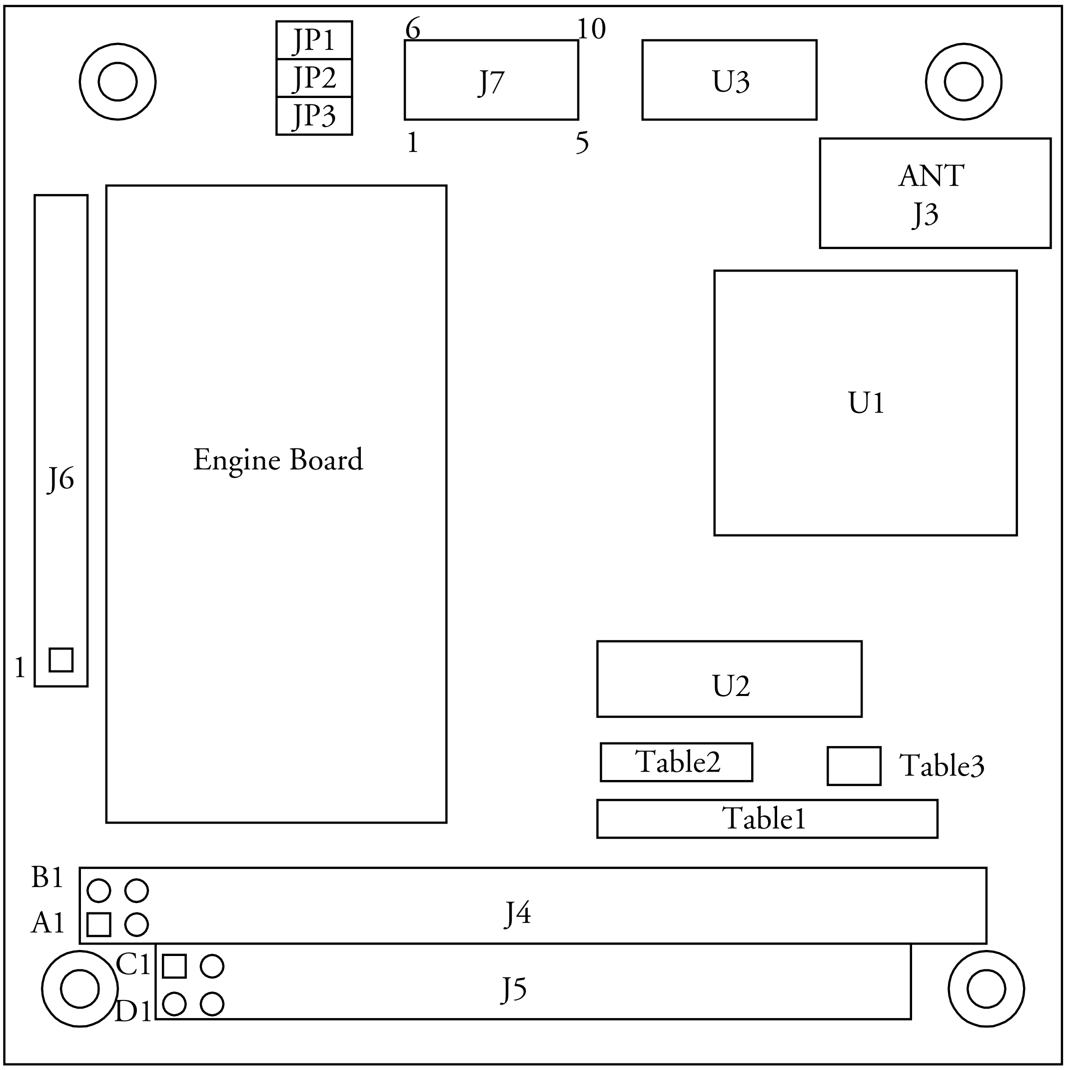
2.3 Aviation applications.

2.4 Surveying.

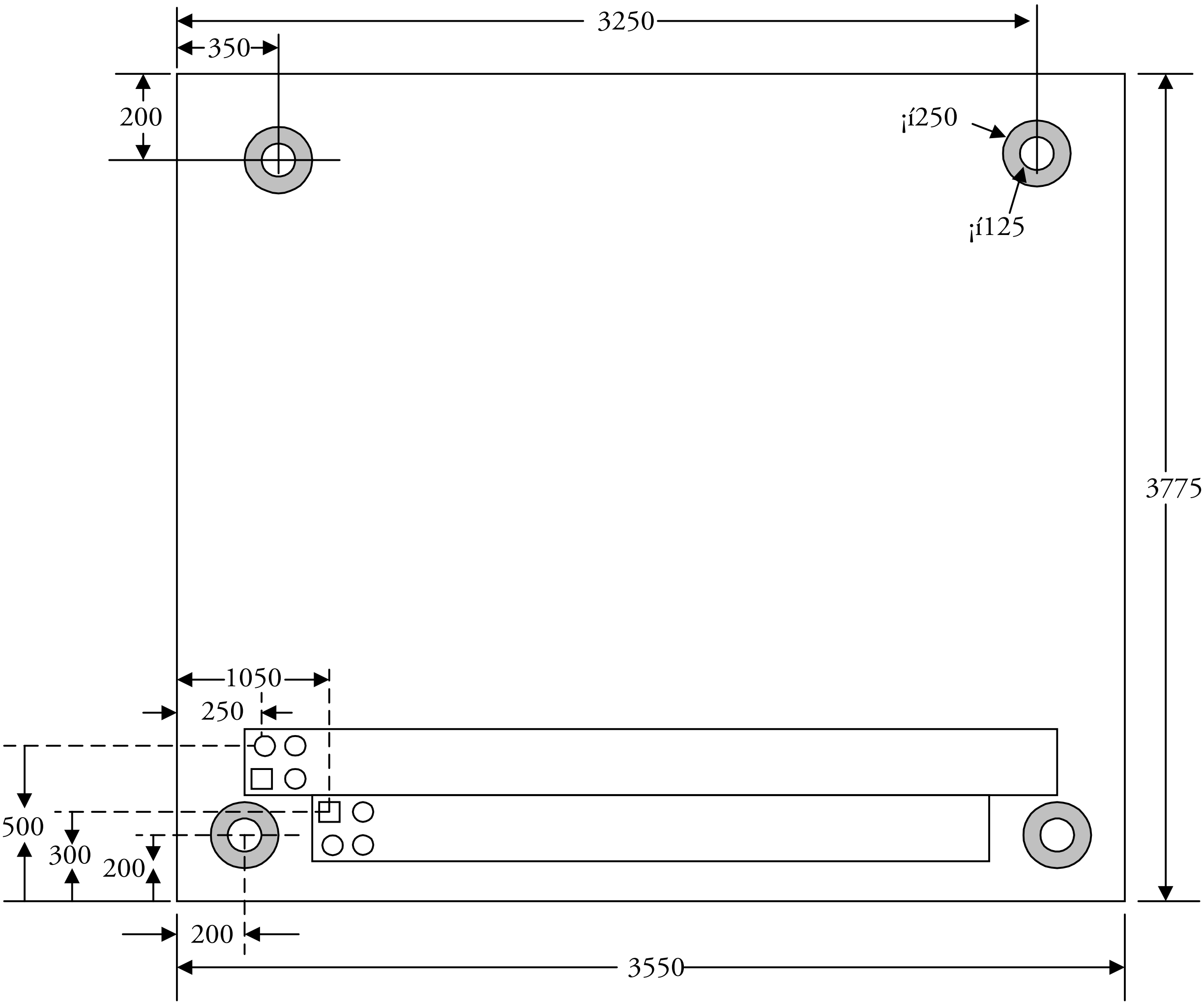
2.5 Timing applications.

3. PCM-3291 INTRODUCTION

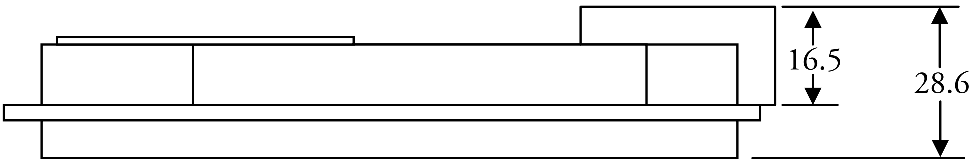
3.1 Top View



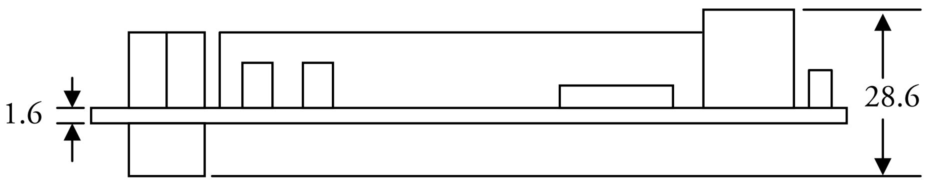
3.2 Module Dimensions



Unit:mil



Unit:mm



Unit:mm

3.3 Connector Define

Table 1

PIN No	PIN Name	PIN No	PIN Name	PIN No	PIN Name
JP12	IRQ7	JP11	IRQ5	JP9	IRQ4
JP8	IRQ3	JP13	IRQ3	JP14	IRQ4
JP20	IRQ14	JP21	IRQ15	JP16	IRQ7
JP19	IRQ12	JP18	IRQ11	JP17	IRQ10

Table 2

PIN No	PIN Name	PIN No	PIN Name	PIN No	PIN Name
JP4	COM1	JP5	COM2	JP6	COM3
JP7	COM4				

Table 3

PIN No	PIN Name	PIN No	PIN Name
JP10	External Interrupt Setting	JP15	IRQ5

J7

PIN No	PIN Name	PIN No	PIN Name
1	Reserved	2	DGPS (Signal In) (I)
3	NC	4	Time Mark Pulse (10KHz)(o)
5	GND (Power)	6	NC
7	NC	8	NC
9	Time Mark Pulse (1PPS)(I)	10	VCC (Power)

JP1

PIN No	PIN Name
JP1	Time Mark Output Setting

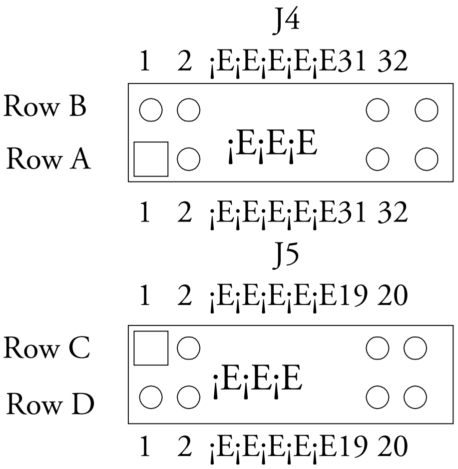
JP2

PIN No	PIN Name
JP2	10KHz Output Setting

JP3

PIN No	PIN Name
JP3	Reserved

PC/104 connectors (J4,J5)



PC/104 connectors				
Pin Number	Signal (J4)		Signal (J5)	
	Row A	Row B	Row C	Row D
1	IOCHCHK*	0V	0V	0V
2	SD7	RESET	SBHE*	MEMCS16*
3	SD6	+5V	LA23	IOCS16*
4	SD5	IRQ9	LA22	IRQ10
5	SD4	-5V	LA21	IRQ11
6	SD3	DRQ2	LA20	IRQ12
7	SD2	-12V	LA19	IRQ15
8	SD1	ENDXFR*	LA18	IRQ14
9	SD0	+12	LA17	DACK0*
10	IOCHRDY	(KEY)	MEMR*	DRQ0
11	AEN	SMEMW*	MEMW*	DACK5*
12	SA19	SMEMR*	SD8	DRQ5
13	SA18	IOW*	SD9	DACK6*
14	SA17	IOR*	SD10	DRQ6
15	SA16	DACK3*	SD11	DACK7*
16	SA15	DRQ3	SD12	DRQ7
17	SA14	DACK1*	SD13	+5V

PC/104 connectors (cont.)				
Pin Number	Signal (J4) Row A	Row B	Signal (J5) Row C	Row D
18	SA13	DRQ1	SD14	MASTER*
19	SA12	REFRESH*	SD15	0V
20	SA11	SYSCLK	(KEY)	0V
21	SA10	IRQ7	—	—
22	SA9	IRQ6	—	—
23	SA8	IRQ5	—	—
24	SA7	IRQ4	—	—
25	SA6	IRQ3	—	—
26	SA5	DACK2*	—	—
27	SA4	TC	—	—
28	SA3	BALE	—	—
29	SA2	+5V	—	—
30	SA1	OSC	—	—
31	SA0	0V	—	—
32	0V	0V	—	—

*Low active

3.4 Jump Setting

Serial Port Select

Jump No	Define	Note
JP4	COM1	Short :Enable ; Open :Disable
JP5	COM2	Short :Enable ; Open :Disable
JP6	COM3	Short :Enable ; Open :Disable
JP7	COM4	Short :Enable ; Open :Disable

Interrupt Port Select

Jump No	Define	Note
JP8	IRQ3	Short :Enable ; Open :Disable
JP9	IRQ4	Short :Enable ; Open :Disable
JP11	IRQ5	Short :Enable ; Open :Disable
JP12	IRQ7	Short :Enable ; Open :Disable

The default setting is COM3, IRQ5 Enable.

Enhance

Jump No	Define	Note
JP13	IRQ3	Short :Enable ; Open :Disable
JP14	IRQ4	Short :Enable ; Open :Disable
JP15	IRQ5	Short :Enable ; Open :Disable
JP16	IRQ7	Short :Enable ; Open :Disable
JP17	IRQ10	Short :Enable ; Open :Disable
JP18	IRQ11	Short :Enable ; Open :Disable
JP19	IRQ12	Short :Enable ; Open :Disable
JP20	IRQ14	Short :Enable ; Open :Disable
JP21	IRQ15	Short :Enable ; Open :Disable

Note: If you want to add on Enhance part, please setting the jump of JP10 at enable before setting JP13~JP21.

3.5 TMARK

The TMARK pulse waveform is shown in Figure 1. This signal is a positive logic , buffered CMOS level output pulse that transitions from a logic “low” condition to a logic “high” at a 1 Hz rate. The TMARK output pulse rise time is typically less than 2 nanoseconds and the pulse duration is typically 25.6 milliseconds.

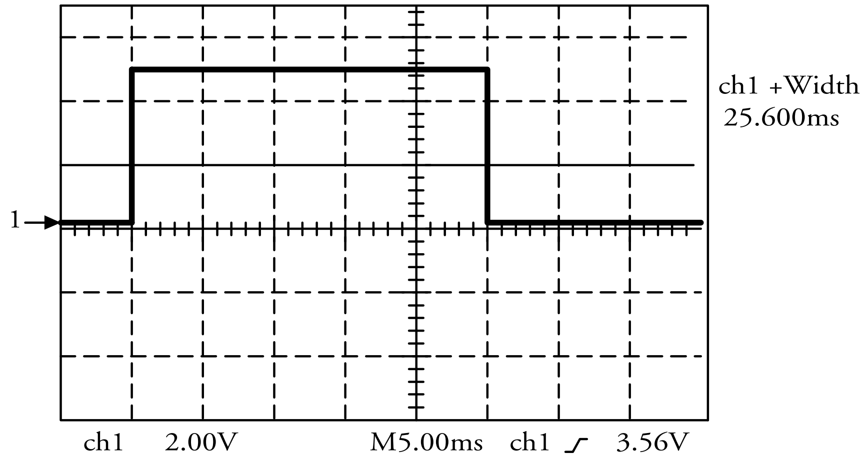


Figure 1. GPS Receiver Time Mark Pulse Waveform.

3.6 10KHz clock

This is a 10KHz clock waveform that is synchronized to the UTC TMARK pulse. The relationship between the 10KHz clock and the TMARK UTC pulse is shown in Figure 2. This clock signal is a positive logic , buffered CMOS level output.

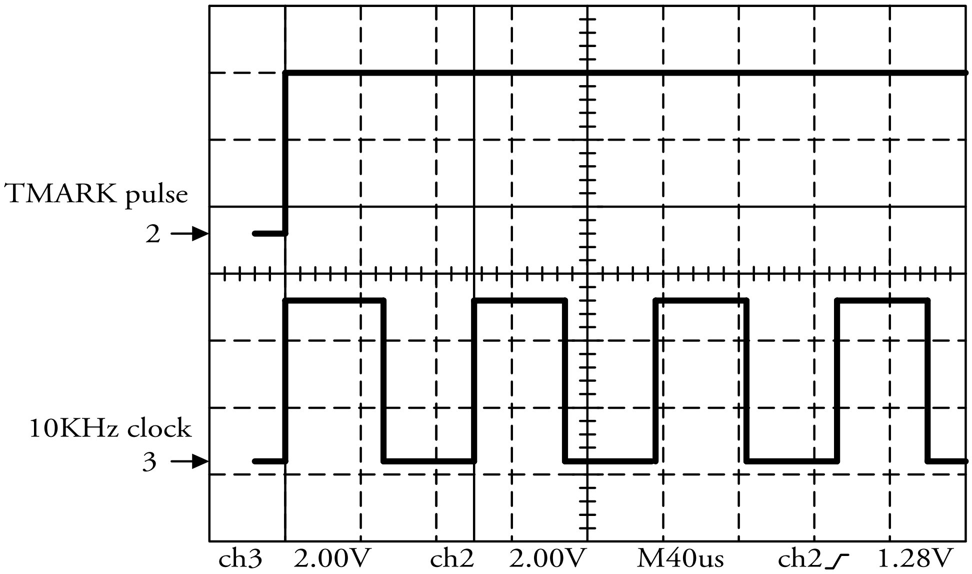
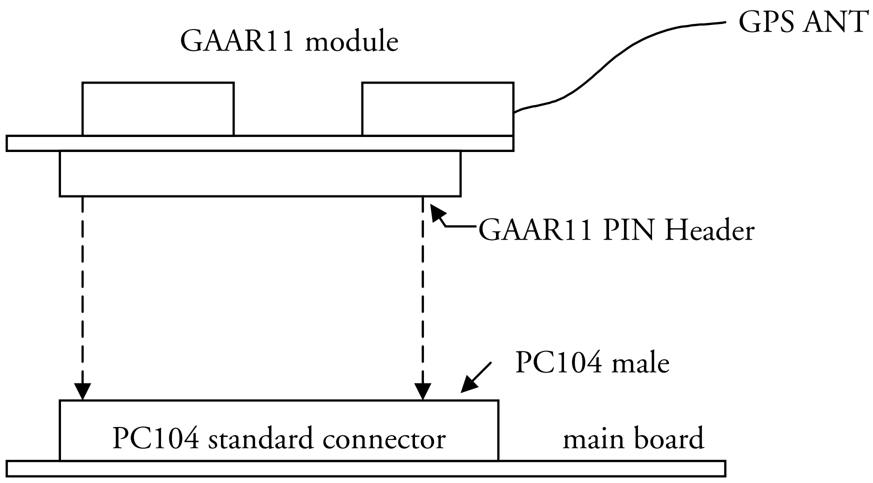


Figure 2. 10KHz Clock/UTC TMARK Pulse Relationship

3.7 How to Use PCM-3291 module

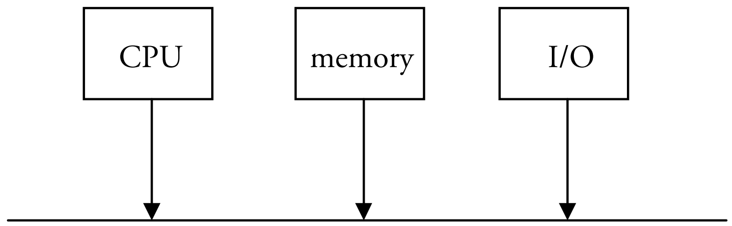
1.PCM-3291 should be connected to PC104 standard connector.



GPS active antenna should be located at ourdoor without cover

2.The data input and output functions of PCM-3291 module are from the signal pins of

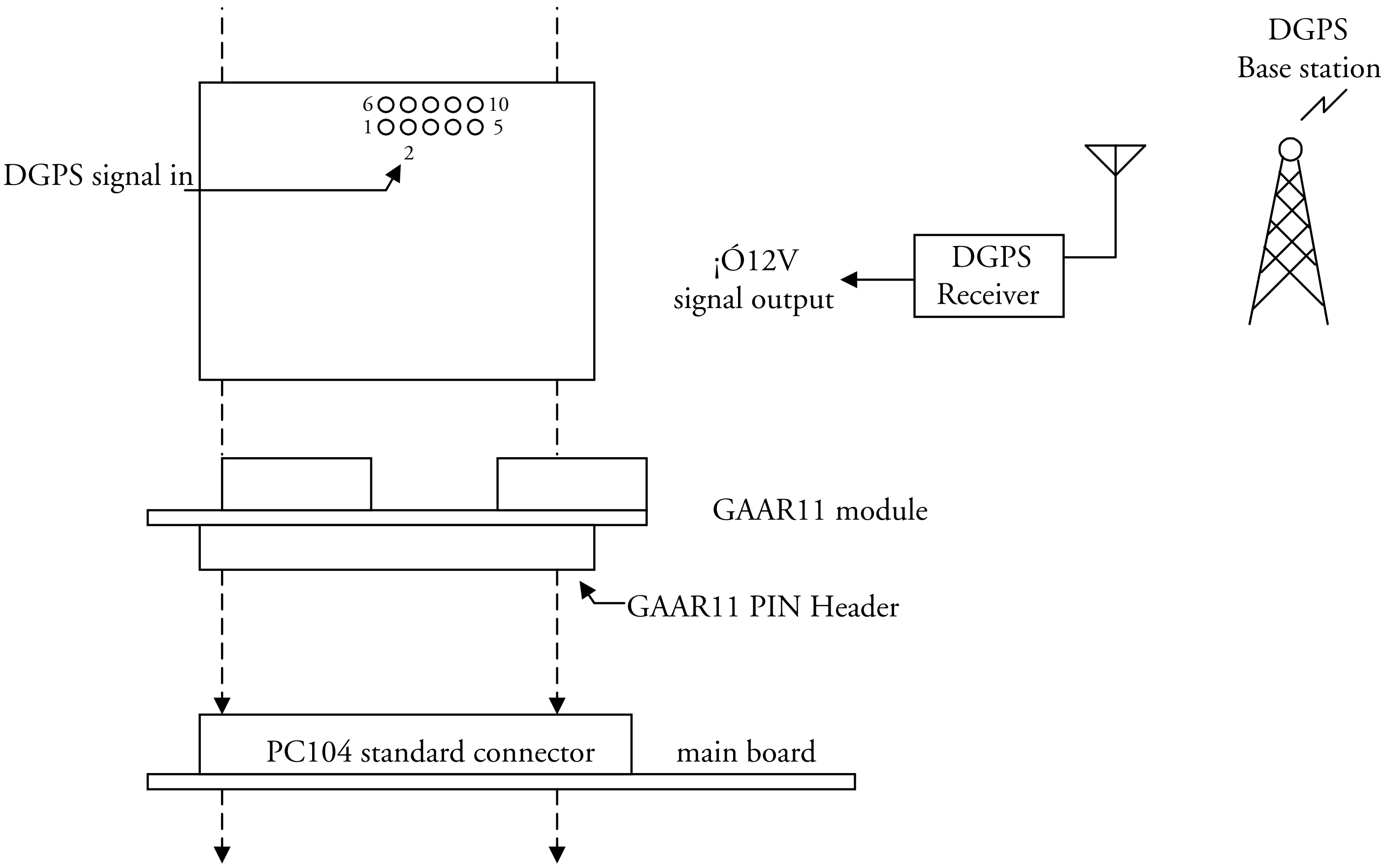
enhance of standard PC XT/AT.



PC XT/AT structure

The signal transmission address are between 02F8H~02FFH, The address of serial transmission control card is the same COM1 IRQ4, COM2 IRQ3 are occupied for general use. Recommending that the set up of PCM-3291 is on COM3, IRQ5. Please refer 3.4 Jump setting.

3.DGPS Connection



4. Software

How to receive NMEA-0183 4800 bps No parity 8 data bits 1 stop bit

C:>232 /C3 /b4800

How to receive Binary Data Message, (9600 bps No parity 8 data bits 1 stop bit)

C:>232 /C3 /b9600 /h

Currently, PCM-3291 default at

COM3,IRQ5 ,4800bps, No parity, 8 data bit, 1 stop bit.

NMEA-0183 Data Messages Regarding to details, please refer the following Data interface specification.

NOTE. Please make sure COM3's IRQ is set to different port other than COM1/COM2's while running under Windows platform.