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## Introduction to Trimble GPS Monitor.

The new Trimble GPS Monitor (TGM) application is a tool that can replace many of the previous "monitor" and "chat" programs used for Trimble Embedded and Resolution T products.

The TGM has the features found in the older Trimble applications to configure a GPS receiver as well as improvements in the user interface. It will work with the standard RS 232 serial interface as well as the USB version found in the later starter kits. Instructions for the USB interface are included below.

It has new features such as "Detect Receiver" that will test a GPS receiver port for protocol and baud rate if the user cannot remember, or has lost the settings.

There is a feature to log the output of several GPS devices at the same time, and another to send, and view received raw data.

Some of the basic command steps are listed later on in this document.

## 1. Installing the FTDI USB/Serial Driver Software.

1.1. Confirm that you have the following:

• A PC with Windows Vista, Windows XP Service Pack 2, or Windows 2000 Service Pack 4 installed and a free USB port.

- Internet access to complete the following installation
- 1.2. Download the software for your Trimble product as follows:

• Go to the Trimble Support web site http://www.trimble.com/ support.shtml and select the relevant product link and then "Software Tools".

- 1.3. Select and Save all files to a directory on the hard drive.
- 1.4. Install the FTDI driver on your PC. The starter kit uses a USB 2.0 dual serial port emulator interface chip from Future Technology Devices International Ltd. (FTDI). In order to use the Monitor software tool to communicate with the GPS receiver, you must first install the FTDI driver on your PC. The driver is available in the Software Tools directory mentioned above or you may check for the latest version at <a href="http://www.ftdichip.com/Drivers/VCP.htm">http://www.ftdichip.com/Drivers/VCP.htm</a> . To simplify installation select and download to your local disk drive the "setup executable" version.
- 1.5. Use MS Explorer to locate the executable file just saved, and double click it. Follow the instructions given by the installer.

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## 2. Connect the PC via the USB serial interface.

- 2.1. On the PC desktop pass the mouse pointer over the "MyComputer" icon and right hand click.
- 2.2. Select the Properties option to view the System Properties Window.



2.3. Select the Hardware tab.

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2.4. Select the Device Manager button.

🖴 Device Manager	
File Action View Help	
🖻 🧐 Display adapters	~
- 😼 Intel(R) 82865G Graphics Controller	
- 🧕 LogMeIn Mirror Driver	
WYIDIA GeForce FX 5200	
Superior of the second drives	
E Floppy disk controllers	
IDE ATA/ATAPI controllers	
🗈 🥩 Imaging devices	
🕀 🦢 Keyboards	
Mine and other pointing devices	=
Microsoft Serial BallPoint     S/2 Compatible Mouse	
E → La Modems	
E 2 Mouents	
Hondors     Hondors     Hondors     Hondors	
Ports (COM & LPT)	
Communications Port (COM1)	
ECP Printer Port (LPT1)	
JSB Serial Port (COM5)	
USB Serial Port (COM6)	
🕀 💭 Processors	~

2.5. Open the Ports (Com & LPT) section and note down the two USB Serial Port COM numbers. In the example above, they are COM5 and COM6.

Note: In general Port A of the GPS device will be on the lower COM number and Port B will be on the higher.

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2.6. To avoid possible conflicts with any other hardware double click on a USB Serial Port entry to view the Properties window.

JSB Seri	al Port (COM5) I	Properties	? 🗙
General	Port Settings Driv	ver Details	
Ţ	USB Serial Port (C	OM5)	
	Device type:	Ports (COM & LPT)	
	Manufacturer:	FTDI	
	Location:	on USB Serial Converter A	
This If you	e status device is working pr u are having problem the troubleshooter.	operly. Is with this device, click Troubleshoot to Troubleshoot	
Device			
Use th	is device (enable)		×
		ОК	Cancel

2.7. Select the Port Settings tab and select the Advanced button

USB Serial Port (COM5) Propertie	es ? 🔀
General Port Settings Driver Detai	s
Bits per seco Data b Par Stop b	its: 8
Flow cont	rol: None 💌
	Advanced Restore Defaults
	OK Cancel

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2.8. Deselect the Serial Enumerator check box. This prevents the automatic recognition of a new pointing device, which eventually happens, if the USB-connector is plugged in while the GPS receiver is externally powered and sending data to the port. If that occurs, the mouse pointer would randomly jump around on the screen.

Advanced Settings for COM5		? 🛛
COM Port Number: COM5 USB Transfer Sizes Select lower settings to correct performance problems at low Select higher settings for faster performance. Receive (Bytes): 4096 • Transmit (Bytes): 4096 •	/ baud rates.	OK Cancel Defaults
BM Options Select lower settings to correct response problems. Latency Timer (msec): 16 • • Timeouts Minimum Read Timeout (msec): 0 • • Minimum Write Timeout (msec): 0 • •	Miscellaneous Options Serial Enumerator Serial Printer Cancel If Power Off Event On Surprise Removal Set RTS On Close Disable Modem Ctrl At Startup	

- 2.9. You may optionally change the Com Port Number in the Advanced Settings above if desired.
- 2.10. Repeat the above steps for each USB Serial Port.

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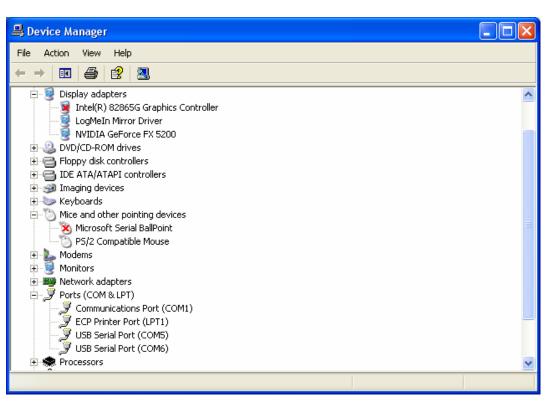
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#### 2.11. Go back to the Device Manager Window



2.12. Check for any entries under Mice and other pointing devices. If there is one for Microsoft Serial mouse and you know it does not exist then right hand click over it and select Disable.

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#### 3. Start the TGM application

3.1. Go to the directory in which the Trimble GPS Monitor application is stored and double click the icon. The main window will be displayed.

Primble GPS Monitor		
File Initialize View Configure Tools V	Window Help	
IDLE 👻 쥷 🎒 GPS DATA 👻	📓 🔲 🕍 🥑 🍯	
Time [GPS]         Time         Date         Week       TOW         Velocity         East       m/s         North       m/s         Up       m/s         Speed       mi/hr         Position       Latitude         Longitude       m HAE	DOPs     Status       PDOP     BBRAM       HDOP     RTC       VDOP     Osc (ppb)       TDOP     Firmware Info       GPS Core     Info	Satellite Data           SV         C/No         Az.         Elev.           Image: Strategy of the stra
Tx 🙆 Rx 🚳		IDLE

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### 4. Connect to the GPS Receiver

#### 4.1. Select Initialize > Detect Receiver

Trimble GPS Monitor	
File Initialize View Configure Tools Window Help	
IDLE Connect Detect Receiver	]
E Initialize Receiver N Get from Receiver L Upload/Download Ctrl+U	atus RAM O rc O
Speed mi/hr TDOP	
Position     Firmware Info       Latitude     Application       Longitude     GPS Core	
Tx 👁 Rx 👁	IDLE

		dentify the com ver connected	munication settings and to the PC.
protocols. T	o speed thi		h all ports, settings, and the COM port to which th cols to check.
COM Port:	COM 1	~	Check even parities
Protocols:	💌 TSIP	NMEA	Check non-Trimble product baud rates
	TAIP	TEP	
Status	Select ( click Sta		rotocol(s), and

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- 4.2. Select port and protocol being used on the module.
- 4.3. If you do not know which protocol is being used you can select TSIP, TAIP and NMEA. The TGM will try each in turn at different baud rates.



4.4. Click on Yes to accept the discovered connection parameters.

## 5. Configure GPS Ports

5.1. Select the Configure pull down menu from the main screen.

File Initialize	e View	Configure	Tools	Window	Help						
сом 5 💌	6	Data Lo V Auto Qu			Ctrl+L	)	1				
Time [GPS] Time	Tł		-	uration			tus uto (8 SV)	Satellit SV	e Data C/No	Az.	Elev.
Date Week	Au(	Settings	2020	Aimar		-	sition fixes e & current	13 19	21.0	154.6 52.0	21.6 27.5
_Velocity _				DOPs			Status	11	46.0	113.7	9.6
West North		0.000	m/s m/s	PDOP			BBRAM 🛇 RTC 🛇	17 28	26.0	185.3 261.3	18.9 65.0
Up		1.000	m/s	HDOP VDOP		-   L	ANT OK Osc (ppb)	27	46.0	68.2 360.0	62.6
Speed		0.0	mi/hr	TDOP	1.87	_	24816.43	25	50.0	92.4	43.4
Position Latitude	N 3	37° 32.44	4975'		are Info ation :	2.01.0	07/17/07	26	10.0	320.8	13.7
Longitude Altitude		22° 18.22 .75 m	2055' HAE	GPS C		2.01.0	07/17/07				

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- 5.2. Select Receiver Configuration.
- 5.3. Select Port Configuration tab.

Receiver Configura	tion 🔀
PPS Configuration Po GPS Configuration	sition Filter SV Masks NMEA TAIP Port Configuration Outputs
Receiver Port: Port A	Protocols Input: Output:
Baud Rate: 38400	
Parity: None	
Data Bits: 8	AUX AUX
Stop Bits: 1	Change local COM settings to match receiver's port settings
Save Configuration	Query Set Close

- 5.4. Select the required receiver port, baud rate, parity, data bits and stop bits.
- 5.5. Select one input and one output protocol.
- 5.6. Click the Set button.
- 5.7. If the configuration is to be permanent, click Save Configuration.

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### 6. Enable Auto Query

6.1. Make sure the Auto Query menu option under the Configure pull down list is selected as shown below. This will enable the display of the satellite data on the right hand side of the screen.

Trimble G	PS Monit	or										
File Initialize	View Con	figure	Tools	Window	Help							
сом 5 💌 🔇		)ata Lo; suto Qu	gging Iery		Ctrl+	L )	ł	1				
_Time [GPS] =	F	eceive	r Confiau	ration		5ta	atus	s	Satellit	e Data -		
Time	TL		nfigurati			A	uto	(8 SV)	SV	C/No	Az.	Elev.
Date	Aug	ettings				P	osit	ion fixes	13	21.0	154.6	21.6
Week 1	442 100	-	2020	Aimar	au	complet	:e 8	current	19	44.0	52.0	27.5
-Velocity				-DOPs			Ch.	atus	11	46.0	113.7	9.6
West	0.000		m/s	PDOP	2.8	- ) (			17	26.0	185.3	18.9
			·			_	RI		28	22.0	261.3	65.0
North	0.000		m/s	HDOP	2.4	3	AN		27	46.0	68.2	62.6
Up	0.000		m/s	VDOP	1.5	3	Os	c (ppb)	8	33.0	360.0	67.3
Speed	0.0		mi/hr	TDOP	1.8	7	2	24816.43	25	50.0	92.4	43.4
Position				Firmw	are Inf				26	10.0	320.8	13.7
Latitude N	J 37°	32.44	1975'									
Longitude W	V 122°	18.22	2055'	Applic	ation	2.01.0		07/17/07				
Altitude	-0.75	m	HAE	GPS C	ore	2.01.0		07/17/07				
Tx 🔕 Rx 🚳							_	7637	TSIP	00	:02:29	COM 5

The Auto Query options may be viewed under the Configure>Settings menu.

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#### 7. Configure Output Formats

7.1. Select the Configure pull down menu from the main screen.

- 7.2. Select Receiver Configuration.
- 7.3. Select Outputs tab.

Receiver Configuration	
PPS Configuration Position Filt GPS Configuration Po	ter SV Masks NMEA TAIP ort Configuration Outputs
Position: ⊙LLA ○ECEF Altitude: ⊙HAE ○MSL	Double precision     Position super-packet (0x8F-20)
Velocity:  ENU ECEF Time:  GPS UTC	Raw measurements (0x5A)
Sig Level: OAMU OdB/Hz	Signal Levels (0x47)
Save Configuration	Query Set Close

- 7.4. After selecting required setup options, click on Set.
- 7.5. If the configuration is to be permanent, click Save Configuration.

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### 8. Configure GPS

8.1. Select the Configure pull down menu from the main screen.

- 8.2. Select Receiver Configuration.
- 8.3. Select the GPS Configuration tab.

Receiver Configuration
PPS Configuration         Position Filter         SV Masks         NMEA         TAIP           GPS Configuration         Port Configuration         Outputs
Receiver Mode: Auto (2D/3D) V Elevation Mask (deg): 5 Dynamics: Land V Signal Level Mask (AMU): 0.6
Datum: WG5-84
Save Configuration Query Set Close

- 8.4. After selecting required setup options, click on Set.
- 8.5. If the configuration is to be permanent, click Save Configuration.

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## 9. Configure PPS Output

9.1. Select the Configure pull down menu from the main screen.

9.2. Select Receiver Configuration.

9.3. Select the PPS Configuration tab.

Receiver Configuration
GPS Configuration Port Configuration Outputs PPS Configuration Position Filter SV Masks NMEA TAIP
Output:      Always ON     Fixed-based     Always OFF
Polarity:  O Positive Negative
Offset: 0 sec
Save Configuration Query Set Close

*Note:* Always ON – the PPS is present even without a GPS fix, it will free run until fix is obtained. *Fixed-based* – the PPS will only be output when the receiver has a fix.

9.4. After selecting required setup options, click on Set.

9.5. If the configuration is to be permanent, click Save Configuration.

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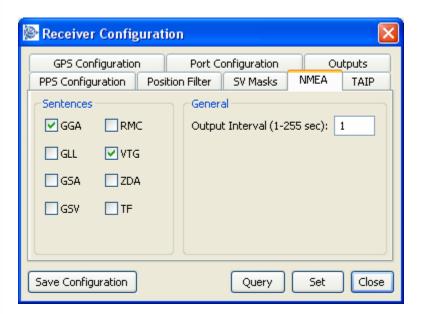
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## 10. Configure NMEA Output

- 10.1. Select the Configure pull down menu from the main screen.
- 10.2. Select Receiver Configuration.
- 10.3. Select the NMEA tab.



- 10.4. After selecting required setup options, click on Set.
- 10.5. If the configuration is to be permanent, click Save Configuration.

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## 11. Configure TAIP Output

- 11.1. Select the Configure pull down menu from the main screen.
- 11.2. Select Receiver Configuration.
- 11.3. Select the TAIP tab.

🖗 Receiver Config	uration 🔀
GPS Configuration PPS Configuration	Port Configuration Outputs Position Filter SV Masks NMEA TAIP
Output Period Packet: AL Interval: 0 Epoch: 0 Set Period	General         Vehicle ID:       Get ID         Reporting Mode         ID Flag (Vehicle ID)       Get Mode         CS Flag (Checksum)         FR (Frequency Output)         FR (Frequency Return)         EC Flag (Echo Commands)
Save Configuration	Query Set Close

- 11.4. After selecting required setup options, click on Set.
- 11.5. If the configuration is to be permanent, click Save Configuration.

Note: This screen can only be edited if TAIP is enabled as a port input and output.

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## 12.Creating a Log

To log the output of the GPS receiver take the following steps.

le Initialize	View	Configure	Tools	Window	Help					
ом 5 💌	۵	Data Log 🗸 Auto Qu			Ctrl+L	) 📲				
Time [GPS] Time	Tł		r Configu nfigurati			Status Auto (8 SV)	Satelli SV	te Data C/No	Az.	Elev.
Date	Auç	Settings				position fixes	13	21.0	154.6	21.6
Week	1442	1000 1422	.020	Aiman	ac   com	olete & current	19 11	44.0	52.0 113.7	27.5 9.6
Velocity West	0	.000	m/s	PDOP	2.88	Status BBRAM O	17	26.0	185.3	18.9
North	0	.000	m/s	HDOP	2.43	RTC O	28	22.0	261.3	65.0
Up	0	.000	m/s	VDOP	1.53	Osc (ppb)	27 8	46.0	68.2 360.0	62.6 67.3
Speed		0.0	mi/hr	TDOP	1.87	24816.43	25	50.0	92.4	43.4
Position Latitude Longitude	N 3 W 12	7° 32.44 2° 18.22		- Firmwa Applic	are Info ation 2.0	1.0 07/17/07	26	10.0	320.8	13.7
Altitude	-0.		HAE	GPS C	ore 2.0	1.0 07/17/07				

12.1. Select Configure > Data Logging

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Multiport Da		<u> </u>
Available Ports	Log File for COM 5         File:       F:\Trimble\Ddrive\TrimbleManuals\OngoingMarkup         Append to file if exists         Use standard file naming:       Unit ID         Port Settings for COM 5         Baud Rate:       9600         Parity:       None         Data Bits:       8         Stop Bits:       1         Status Info for COM 5       Generate .csv (MS St         Status Info for COM 5       TX         Activity:       Ready to start	ase #
		C O Dim n/a

- 12.2. From the available ports select the com port that connects to your device.
- 12.3. Create a filename and path in the file field.
- 12.4. Use standard file naming if appropriate with the Unit ID and Test Case number
- 12.5. Select the correct protocol and logging options.
- 12.6. Select Start Logging.

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#### Sending Raw Data to device

e Initialize	View Configur	e Tools	Window He	lp					
ом 5 💌	🌀 道 🛛 GPS	D, Geni	eric Packets	· (	9 📲				
Time [GPS]			-Receiver M	1ode &	Status	Satelli	te Data -		
Time	Thu 21:25:	57	Mode	3-D	, Auto (7 SV)	SV	C/No	Az.	Elev
Date	August 30, 2	007	Status	doinç	position fixes	13	26.0	156.0	16.3
Week	1442 TOW	122757	Almanac	comp	lete & current	19	36.0	47.9	24.3
the least start					Status	11	30.0	109.2	12.3
Velocity West	0.000	m/s	PDOP 2	2.83	BBRAM O	17	12.0	184.9	24.3
North	0.000				RTC O	28	23.0	273.2	68.4
Up	0.000	m/s	HDOP 2	2.40	ANT OK	27	45.0	78.3	59.8
	0.000	ings	VDOP 1	.50	Osc (ppb)	8	41.0	14.9	68.9
Speed	0.0	mi/hr	TDOP 1	.90	24817.02	25	48.0	98.0	39.6
Position			-Firmware 1	(nfo —		26	9.0	319.8	18.5
Latitude	N 37° 32	.45066'				29	16.0	315.5	29.9
Longitude	W 122° 18	.22109'	Applicatio	n 2.01	1.0 07/17/07				
Altitude	-2.07	m HAE	GPS Core	2.01	1.0 07/17/07				

12.7.	From the	Tools Menu	select the	Generic	Packets	ontion
14./.	1 I UIII UIIC	1 0015 MICHU	solution the	OCHUIC	I acheto	option.

Generic Pac	kets			
Protocol: TSIP	~	Presets:	<select></select>	~
Enter packet dat selected protoco		the following	g rules for l	the
For TSIP protoco separated by a s trailing DLE/ETX.	space. Do not e	nter the sta		and
Packet Data:	10 1E 0E			10 03
To view a respor below to open a raw output after multiple packets	raw data windo r sending the co	ow. Make su	re to paus	e the
View Raw Data		(	Send	Close

12.8. Select the required protocol to send the raw data.

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12.9. You can select one of the pre-canned messages from the Presets pull down, or enter your own data in the Packet Data field.

Note: If entering your own message in the Packet Data, the TGM only requires the user data, not the surrounding start and end bytes. In the example above TSIP user data is being entered, but TGM already adds the starting DLE and ending DLE/ETX.

12.10. Select the View Raw Data button.

Resume Clear
. EO 04 00 00 🗸
00 00 00 00
) 13 OB 11 1C DB BD 7F AO 81 OO 10 O3
) 13 OB 11 1C
0 00 00 00 00 2 94 53 00 00 2 11 5D 00 00 4 97 57 00 00
: 63 9C 00 00 ↓ 55 1A 00 00

12.11. To view the sent data as well as the received, select the Show Sent Data box.

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