

Trimble R6 GPS

Trimble R8 GNSS

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www.trimble.com

Trimble.

© 2004-2007, Trimble Navigation Limited.
Trimble, « »,
BlueCap, Terramodel -
Trimble Navigation Limited,

Trimble.

B -

CMR, CMR+, eRTK, Micro-Centered,
Maxwell, SiteNet Survey Pro, Trimble
Geomatics Office, Trimble Survey Controller,
TRIMMARK, TRIMTALK, TRS, TSC2, TSCe,
Zephyr Zephyr Geodetic-
Trimble Navigation Limited.

15

B,

Bluetooth -
Bluetooth SIG,
Inc. Trimble Navigation
. Microsoft, Windows Windows
NT

Microsoft Corporation /

2006

(A)
Trimble R6 GPS Trimble R8
GNSS. 3.23
(Trimble R8 GNSS Trimble R6
GPS).

/TV



www.trimble.com/ev.shhtml

(Trimble WEEE),
: +31 497 53 24 30 «
WEEE»



89/336/EEC
CE Marking
(EEA).
ROK 104001.

EMC,

Trimble Europe BV
c/o Menlo Worldwide Logistics
Meerheide 45
5521 DZ Eersel NL

, Trimble Navigation Limited

935 Stewart Drive
3642
Sunnyvale, CA 94088-3642

+1-408-481-8000

Trimble R6 GPS
GNSS

Trimble R8

15

FCC.

(1)

(2)

EMC,
C-Tick



Marking



Trimble R6 GPS Trimble R8 GNSS,

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GSM , 20 (FCC, 8).
GSM 0 .

Li-Ion

Li-Ion .
- Li-Ion .
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Trimble R6 GPS/R8 GNSS	3
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Trimble R6 GPS
Trimble R8 GNSS.
Trimble R6 GPS
Trimble R8 GNSS.

(GPS), Trimble

GPS,
Trimble GPS
www.trimble.com
Trimble
Microsoft Windows

PDF CD-ROM
Adobe Acrobat Reader

PDF CD. Adobe
Acrobat Reader

CD-ROM,

www.trimble.com

Trimble

Trimble –

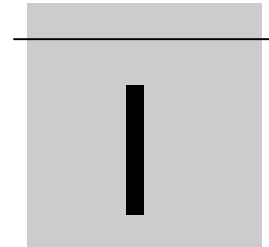
GPS

www.trimble.com/training.htm.

Trimble: *Trimble.*

www.trimble.com/support.htm

ReaderFeedback@trimble.com.



Trimble R6 GPS/R8 GNSS

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- 1,
- 2,
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- 4,
- 5,
- 6,
- 7,
- 8,



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Trimble R6 GPS R8 GNSS,

GPS.

Trimble R6 GPS R8 GNSS

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GPS/GNSS

GSM

RTK.

Bluetooth

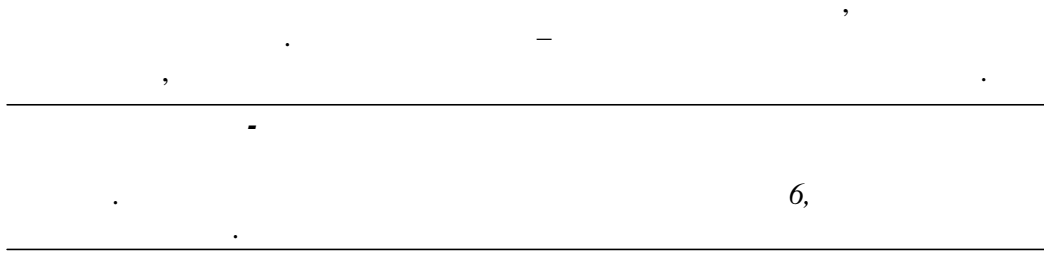
Trimble R6 GPS 72 : L1 C/A- , L1/L2,
L1/L2 () GLONASS L1 C/A- , L1 P- , L2 P-

Trimble R8 GNSS 72 : L1 C/A- , L2C,
L1/L2/L5, GLONASS L1 C/A- , L1 P- , L2 P- L1/L2,

GPS Total Station,

- Trimble R-Track,
 - GLONASS (Trimble R6 GPS Trimble R8 GNSS)
 - L2C L5 (Trimble R8 GNSS)
- RTK/OTF, 10 ;
- ;
- RTK- ;
- SBAS WAAS/EGNOS;
- (OTF) ;
- Li-Ion ;
- Bluetooth
 - ACU, TSC2, TCU TSCe BlueCap;
- RS-232 :
 - NMEA ,
 - RTCM SC-104,
 - Trimble (CMR CMR+);
- TNC .
- 11
- 450 GSM

1.



400

Trimble

GNSS. GPS
Trimble R6 GPS R8
18000 1000

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GPS R8 GNSS , Trimble R6 .

2.1

Trimble R8 GNSS.



. 2.1

Trimble R8 GNSS

RTK.

18.

. 2.2

Trimble R6 GPS
, TNC

Trimble R8 GNSS.

GSM

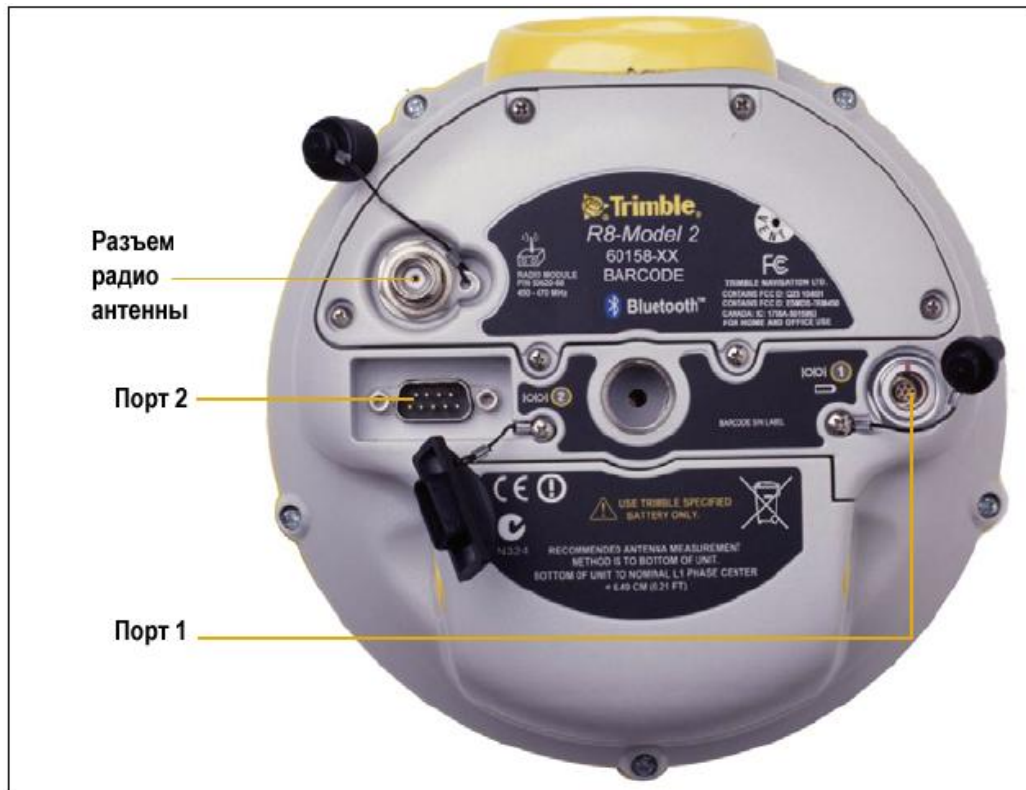
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Trimble R6 GPS Trimble R8 GNSS.




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. 2.2

Trimble R8 GNSS

Trimble R8 GNSS

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	2	,	,
			

1	7- RS-232	0-shell LEMO,	1
2		DB-9,	RS-232.
2			
8,		7,	
TNC			
		(«	»)
		,	
GSM			

Trimble R6 GPS Trimble R8 GNSS.

GSM

UHF TNC UHF GSM.

UHF 16.5 (6.5) . GSM

UHF 16.5 (6.5) ,

20 (8) .

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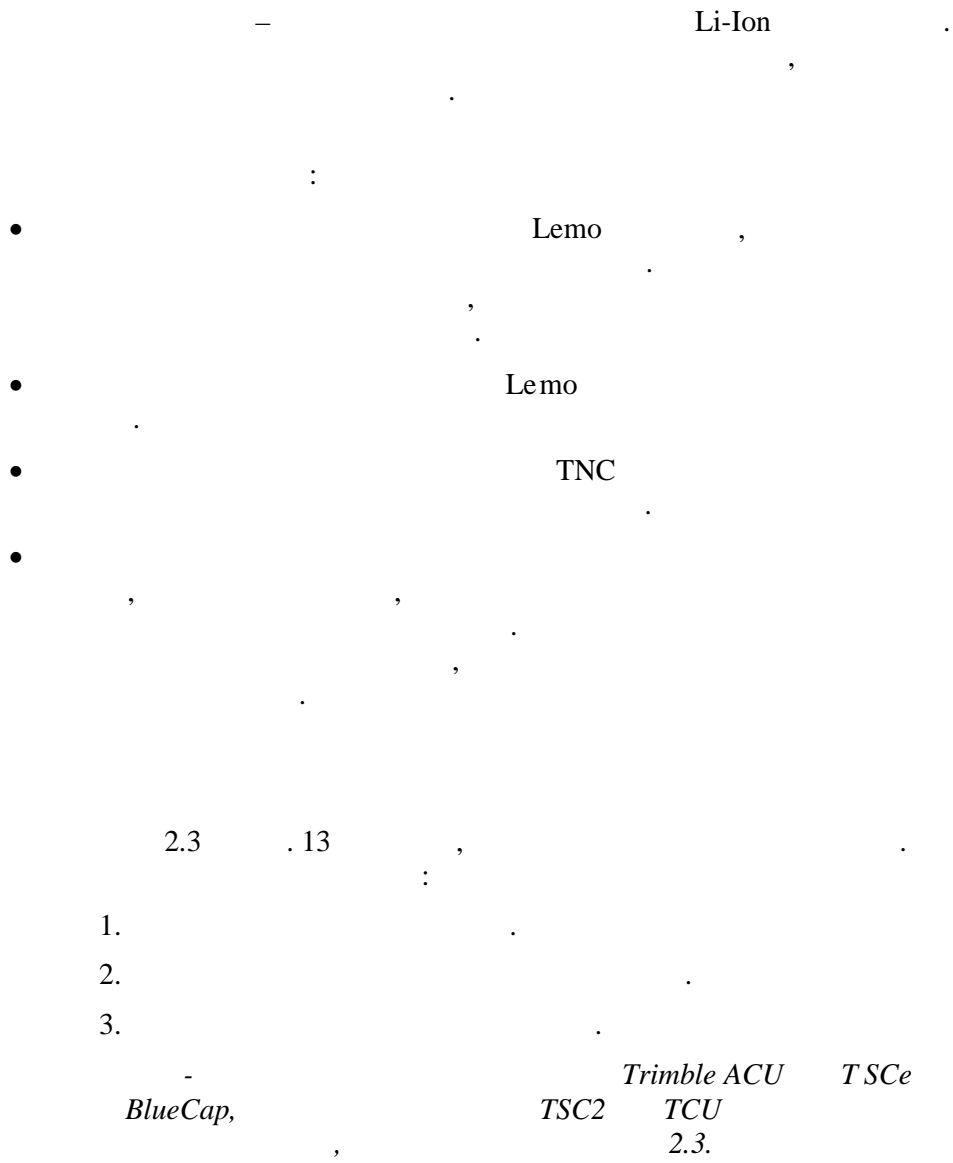
FCC

GSM

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- +65°C (145°F)
- -40°C (-40°F)
-

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2.





. 2.3

450 MHz GSM ,

2.

450 MHz:

- TRIMMARK 3
- TRIMMARK IIe
- TRIMTALK 450S
- 450 MHz
- HPB 450

GSM

Trimble Survey Controller,
GSM

Trimble Survey

Controller.

:

- GPS Configurator
- WinFLASH
- Trimble Survey Controller

GPS

*Configurator WinFLASH
Trimble Survey Controller.*

« »

WinFLASH.
WinFLASH . 31.

Frequency Configuration ().

:

- Trimble R6 GPS/R8 GNSS.
-
- (DB9/).

Trimble R6 GPS Trimble R8 GNSS.

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CDPD

Trimble.

- 2 RS-232

Bluetooth,

Trimble Survey Controller.

:

- Trimble R6 GPS/R8 GNSS.

- Trimble.

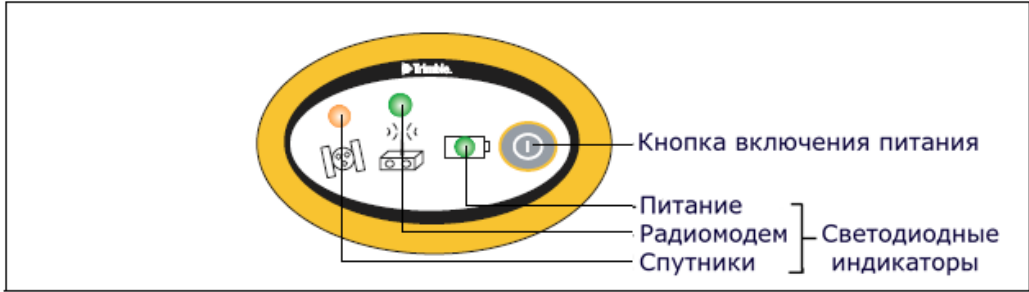
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3.1



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Trimble.

GNSS

11

Trimble Data Transfer

Trimble DAT (.dat).

Trimble Data Transfer, GLONASS

Trimble Geomatics Office

.dat

GLONASS

Trimble Business Center,

.T01

GLONASS

.T01

Trimble

Business Center

GLONASS

200

8.3,

Trimble Survey Controller

GPS Configurator.

, 6 1 .

10	2 588
1	335
5	87
15	37

Trimble Survey Controller , ,

Trimble Survey Controller , ,

Survey Controller.

Trimble

Trimble Data Transfer.

GNSS

Trimble

Survey Controller

Trimble Survey Controller.

P 15 .

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Li-Ion . /

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5,3 3,5
(
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Li-Ion

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Li-Ion

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Li-Ion

Li-Ion

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Li-Ion

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Trimble
WinFLASH
WinFLASH 31.



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Trimble R6 GPS R8 GNSS

GPS Configurator, Trimble Survey Controller WinFlash.

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4.

GPS Configurator Trimble Survey Controller

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GPS Configurator.

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(/)

(Default.cfg)

15

GPS Configurator.

(Current.cfg)

)

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4.

(Power_Up.cfg)

extension.cfg.

GPS Configurator.
power_up.cfg.

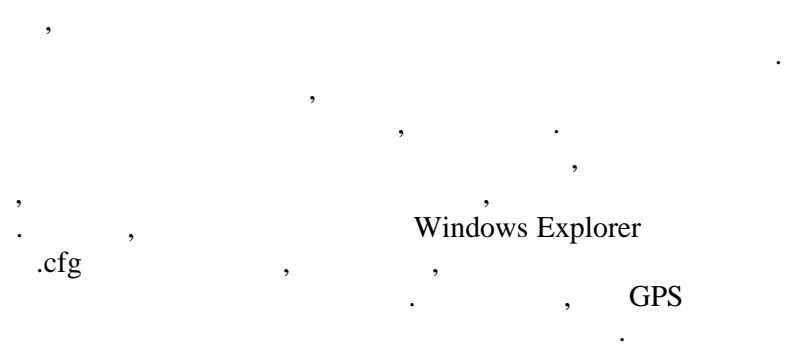
power_up.cfg

GPS Configurator,

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•

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5

- :
- GPS Configurator
- WinFLASH

Trimble R6 GPS R8 GNSS.

GPS Configurator

GPS Configurator –

Trimble GPS GNSS.

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-

GPS Configurator

GPS Configurator

CD-ROM,


:

1. CD-ROM CD
2. *Install individual software packages*
3. *Install GPS Configurator vX.XX.*
4. ,

C

GPS Configurator

1. 1 2 (COM)

2. GPS Configurator, 
Programs / Trimble / GPS Configurator / GPS Configurator.

3. *Trimble R8/R6 Device Type.*

- 4.

GPS Configurator.

5. **Apply.**

GPS Configurator,

WinFLASH

WinFLASH

Trimble

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•

WinFLASH Windows 95,
98, NT, 2000

WinFLASH

1. CD-ROM CD
2. *Install individual software packages*
3. *Install WinFlash vX.XX for R/5000/NetR5 receivers*

WinFlash

Trimble.

WinFLASH

1. WinFLASH. *Device Configuration.*
2. *Device type* Trimble R8/R6.
3. *PC serial port*
4. **Next.**
Operation Selection. *Operations*
Description.
5. *GPS software upgrade* **Next.**
GPS Software Selection.

6. *Available Software*
Next.
Settings Review.

7. **Finish.**
Upgrade, *Software*
Establishing communication with the R8GNSS. Please wait ...)

8. *Software Upgrade*

9. **Menu,** **Exit,**
WinFLASH.

10. **Exit,**
WinFLASH.

450

WinFLASH,

:

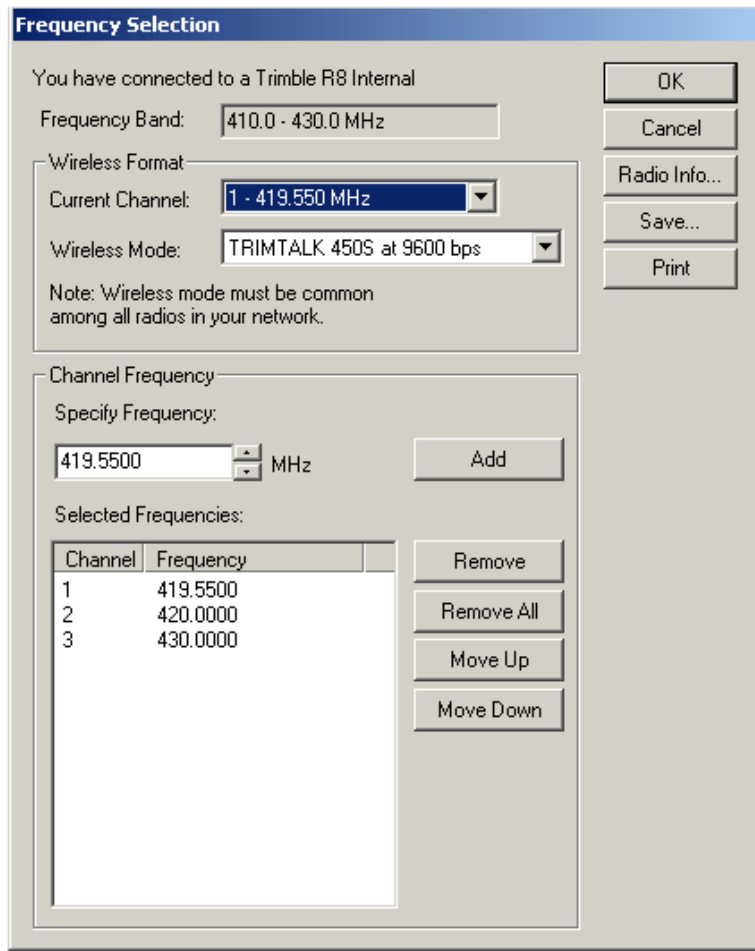
1. WinFLASH. *Device Configuration.*

2. *Device type* *Trimble R8/R6.*

3. *PC serial port*

4. **Next.**
Operation Selection. *Operations*
Description.

5. *Configure Radio* **Next.**
Frequency Selection.



6. *Wireless Format*

7. *Specify Frequency*

8. **Add.**

Selected Frequencies.

Radio Info.

12,5 25

9.

WinFLASH

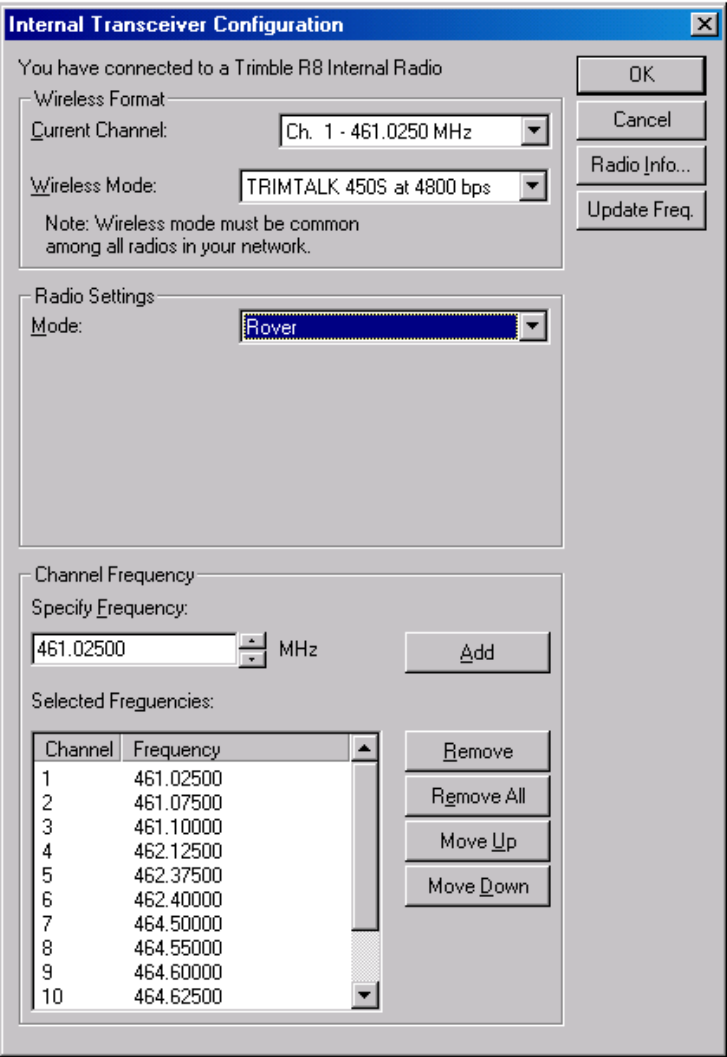
FCC

Trimble.

Internal Transceiver Configuration.

Radio Info,

- 1. *Current Channel (Ch. 1 - 461.0250 MHz),*
- 2. *Wireless Mode,*

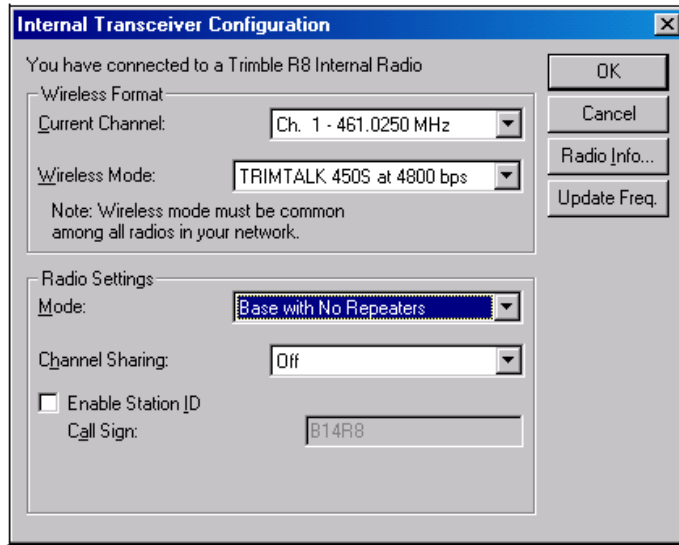


9600 /

4800 /

3.

, Base with No Repeaters ():



4.

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5.

(90).
Enable Station ID
Call Sign. FCC

6.

Status () WinFlash.

Trimble,

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Trimble R6 GPS R8 GNSS.

	19	(7,5")	11.2 (4,4")
(1,35	(2.97)
)	450	: 3.5	(
)
	GSM: 3.8	()
	5,3		-
(20°)		2,4 /	
	11 - 28		
	-40°C	+65°C (-40°F +149°F)
	-40°C	+75°C (-40°F +167°F)
	100%,		
		,	,
		-40°C.	-20°C.

-	()	(
))
RTK (OTF)	-	± 10	+ 1 / ± 20 + 2 /
		± 20	+ 2 / ¹ ± 30 + 2 / ¹
L1 C/A	-	25	50
/			
/	-	±5	+ 0,5 / ± 5 + 1 /
WAAS	-	5	² 5 ²

¹

²3D ,

WAAS

:	72	L1 /	, L2C, L1/L2/L5
Trimble R8 GNSS	L2	, GLONASS	L1 / , L1
		, L1/L2/L5	.
		SBAS WAAS/EGNOS.	P-
:	72	L1 /	, L1/L2
Trimble R6 GPS		, () GLONASS L1 /
		, L1	, L2
			L1/L2
			SBAS WAAS/EGNOS.
			P-
	GNSS	Trimble Maxwell™ Custom Survey	
		<1	1
			GNSS c
		: <60	
		: <30	
	10	0,5	()
		RS-232 (1 2)
			:
		1 – 115 200	/
		2 – 115200	/
			2
	TSCe	Trimble TSC2, TCU, ACU	
	Bluetooth	Bluecap	
		410-430	430-450
		, 450-470	
		12.5	25
			20

Trimble R6 GPS Trimble R8 GNSS.

Gaussian Minimum
Shift Keying (GSMK)
4800,
8000, 9600, 16000
19200 /
- 10
(: 3-5 ();
(
3.5 ()
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GSM : , 15, 22, 24
FCC: 850/1900 10 GSM

-Tick
GSM:

Trimble.

Bluetooth

Trimble.

6.

NMEA-0183: AVR; GGA; GSA; GST; GSV;
PTNL,GGK; PTNL,GGK_SYNC; HDT;
PTNL,PJK; PTNL,PJT; RMC, ROT; PTNL,
VGK;VHD; VTG, ZDA GSOFF (Trimble Binary
Streamed Output)

RT17



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Default.cfg,

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(Power_Up.cfg),

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24.

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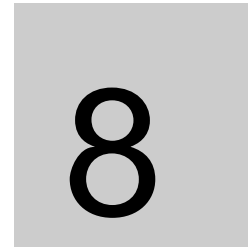


(All SVs enabled)

		13°
:	PDOP	7
	RTK	
1:		115200
		8-None-1
2:		115200
		8-None-1
		38400
:		
NMEA/ASCII ()		
		= 00
RT17/Binary		
:		0°
		0°
		0.00
:	Type	Trimble R6 Internal/Trimble R8 Model 2
	()	0.00
		All

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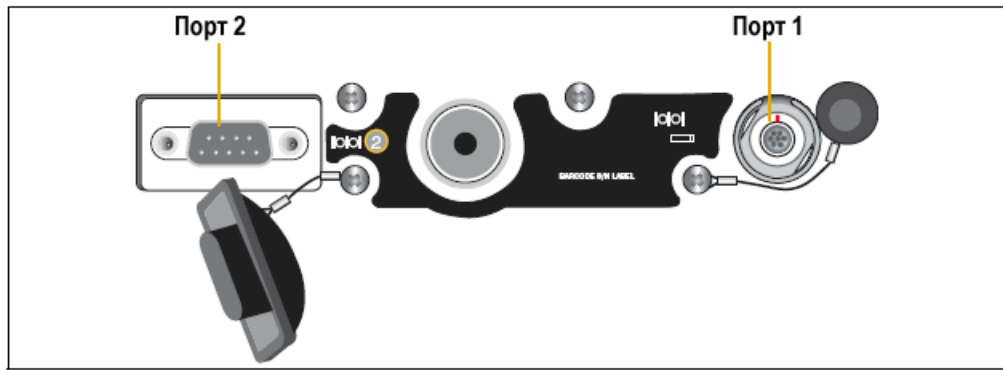
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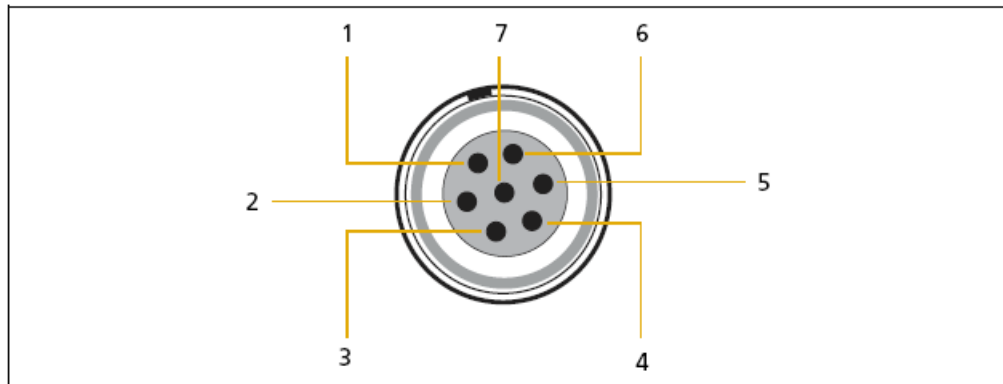
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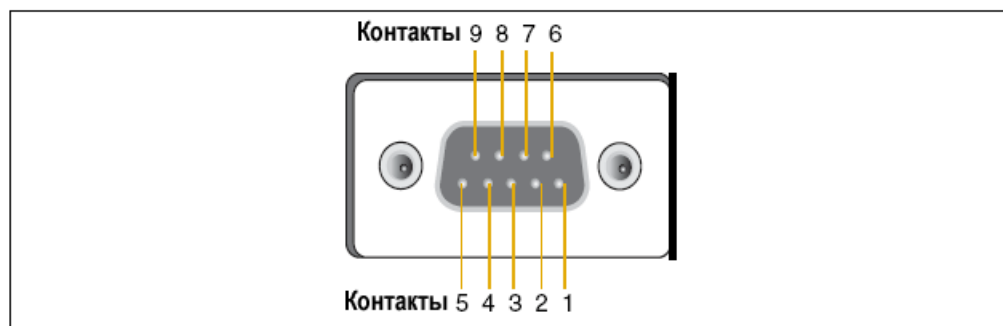


. 8.1.



. 8.2.

1.



. 8.3.

2.

	1 (7-	Lemo)	2 (DB-9)
1			DCD
2		(-)	RXD
3	TXD		TXD
4			DTR
5			
6		(+)	DSR
7	TRXD		RTS
8	-		CTS
9	-		

/

/

(18532)

8.1.

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DB-9		DB-9	
9		9	
1-6	DCD5_232	4	DTR5_232
2	RX5_232	3	TX5_232
3	TX5_232	2	RX5_232
4	DTR5_232	1-6	DCD5_232
5		5	
7	RTS5_232	8	CTS5_232
8	CTS5_232	7	RTS5_232
9	RI5_232	9	

-

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- / (32345),
I,

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Multi Battery Adaptor.
Multi Battery Adaptor

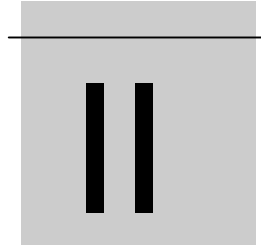
8.2.

1.

8.2.

/

7-	Lemo 0-shell	DE9-F				2 Cond	
		7 Cond					
1			5				
2							V-OUT
3	TX3_232		2		TXD		
4	RTS/TXD		8		RTS		
5	CTS/RXD		7		CTS		
6	PWR_IN						(+)
7	RX3_232		3		TXD		



Trimble R6 GPS

Trimble R8 GNSS



NMEA-0183

- :
- NMEA-0183
-
- NMEA

Trimble R6 GPS Trimble R8 GNSS. NMEA-0183,
NMEA-0183, National Marine Electronics Association
www.nmea.org.

NMEA-0183

NMEA-0183,
 NMEA-0183
 NMEA-0183
 3.01. \$ (,)
 (*)
 NMEA-0183. -
 (\$) (*).
 ASCII (0-9, A-F).
 NMEA

AVR	, PDOP Moving Baseline RTK	56
GGA	,	56
GSA	GNSS DOP	57
GST		58
GSV	, /	58
HDT		59
PTNL, GGK	, DOP	59
PTNL, GGK_SYNC	, DOP	60
PTNL, PJK		61
PTNL, PJT		61
PTNL, VGK	, DOP	62
PTNL, VHD		62

RMC	,	63
ROT		63
VTG		64
ZDA	UTC,	64

NMEA

:

- GPS Configurator
- NMEA Serial outputs GPS Configurator.

NMEA

:

- , GGA \$GPGGA \$GP. ,
-
- , ,
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-

(\$GPGGA),

13

:

\$GPGGA,172814.0,3723.46587704,N,12202.26957864,W,2,6,1.2,18.893,M,
-25.669,M,2.0,0031*4F

NMEA

:

ddmm.mmmm,

dddmm.mmmm,

- *dd ddd* –
- *mm.mmmm* –

N, S, E W. (, ,)

:

(UTC)

hhmmss.cc,

- *hh* – , 00 23
- *mm* -
- *ss* -
- *cc* –

NMEA

NMEA-0183,

AVR , , , , **PDOP**
Moving Baseline RTK

AVR . A.1

\$PTNL,AVR,181059.6,+149.4688,Yaw,+0.0134,Tilt,,60. 191,3,2.5,6*00

.1. AVR

1	UTC
2	
3	“Yaw”
4	
5	“Tilt”
6	
7	
8	
9	: 0: 1: 2: RTK, 3: RTK, 4: DGPS,
9	PDOP
10	,

GGA , ,

GGA . A.2

\$GPGGA,172814.0,3723.46587704,N,12202.26957864, W,2,6,1.2,18.893,M,-
25.669,M,2.0,0031*4F

.2. GGA

1	UTC
2	
3	: N – , S –
4	
5	: E – , W –
6	: 0: 1: 2: 4: RTK, 5: RTK,
7	00 12
8	HDOP
9	
10	:
11	
12	:
13	9. , GPS , 1 DGPS .
14	1023. , 0000 ,

GSA GNSS DOP

GSA . A.3

\$GPGSA,<1>, <2>,<3>,<3>, ,,,, <3>, <3>, <3>, <4>, <5>, <6>* <7> <CR><LF>

.3. GSA

1	1, - , -
2	2, , 1 = , 2 = 2D, 3=3D
3	01 32, 12
4	PDOP - , 0.5 99.0
5	HDOP - , 0.5 99.9
6	VDOP - , 0.5 99.0
7	

NMEA

GST

GST

A.4

\$GPGST,172814.0,0.006,0.023,0.020,273.6,0.023,0.020,0.031*6A

A.4. GST

1	UTC
2	(RTK)
3	(1),
4	(1),
5	,
6	(1),
7	(1),
8	(1),

GSV

GSV

GSV A.5

\$GPGSV,4,1,13,02,02,213,,03,-3,000,,11,00,121,,14,13,172,05*67

A.5. GSV

1	
2	
3	
4	
5	, 90°
6	000° 359°
7	/ (SNR), 00-99 (,)
8-11	, , 4-7
12-15	, , 4-7
16-19	, , 4-7

Trimble R6 GPS Trimble R8 GNSS.

HDT

HDT . A.6

\$GPHDT,123.456,T*00

A.6. HDT

1	()
2	: ,

PTNL, GGK , ,

DOP

PTNL, GGK . A.7

\$PTNL,GGK,172814.00,071296,3723.46587704,N,12202.26957864,W,3,06,1.7,EH
T-6.777,M*48

A.7. PTNL, GGK

1	UTC
2	
3	
4	:
5	
6	:
7	: ,
8	
9	DOP
10	
11	:

– PTNL, GGK ,
NMEA-0183 80 .

NMEA

PTNL, GGK_SYNC

DOP

PTNL, GGK_SYNC
GGK, 1
RTK PTNL, GGK_SYNC

A.8

\$PTNL,GGK_SYNC,172814.00,071296,3723.46587704,N,12202.26957864, W,3,06,
1.7,EHT-6.777,M*48

A.8. PTNL, GGK_SYNC

1	UTC
2	
3	
4	:
5	
6	:
7	: 0: 1: 2: RTK, 3: RTK, 4:
8	
9	DOP
10	
11	:

- PTNL, GGK_SYNC
NMEA-0183 80

PTNL, PJK

PTNL, PJK . A.9

\$PTNL,PJK,010717.00,081796,+732646.511,N,+1731051.091,E,1,05,2.7,EHT - 28.345,M*7C

A.9. PTNL, PJK

1	UTC
2	
3	,
4	: N ()
5	,
6	: E ()
7	:
8	
9	DOP
10	
11	

NMEA-0183 - 80 PTNL, PJK ,

PTNL,PJT

PTNL,PJT . A.10

\$PTNL,PJT,NAD83(Conus),California Zone 4 0404,*51

A.10. PTNL,PJT

1	()
2	()

NMEA

PTNL,VGK

PTNL,VGK

A.11

\$PTNL,VGK,160159.00,010997,-0000.161,00009.985,-0000.002,3,07,1,4,M*0B

A.11.

PTNL,VGK

1	UTC <i>hhmmss.ss</i>
2	<i>mmdyy</i>
3	,
4	,
5	,
6	:
7	
8	DOP
9	:

PTNL,VHD

PTNL,VHD

A.12

\$PTNL,VHD,030556.00,093098,187.718,-22.138,-76.929,-5.015,0.033,0.006,3,07,2.4,M*22

A.12.

PTNL,VHD

1	UTC <i>hhmmss.ss</i>
2	<i>mmdyy</i>
3	
4	/
5	
6	/
7	
8	/

A.12. PTNL,VHD ()

9	:
10	
11	PDOP

RMC,

RMC . A.13

\$GPRMC,123519, A, 4807.038, N, 01131.000, E, 022. 4, 084.4, 230394, 003.1, W*6A

A.13. RMC

1	UTC
2	- , V-
3	
4	
5	
6	()
7	
8	
9	, *

ROT

ROT . A.14

\$GPROT,35.6,A*4E

A.14. ROT

1	, / , “_”
2	A: V:

VTG

VTG . A.15

\$GPVTG,,T,,M,0.00,N,0.00,K*4E

A.15. VTG

1	()
2	
3	()
4	
5	
6	
7	/
8	

ZDA UTC,

ZDA . A.16

\$GPZDA,172809,12,07,1996,00,00*45

A.16. ZDA

1	UTC
2	, 01 31
3	, 01 12
4	
5	, 00 ±13
6	, 00 59

5 6
5 -5, 6 +15,
5 15 .



RTCM

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.1 ,
 RTCM ,

GPS Configurator.

RTCM c .

.1. RTCM

2	1	3				22			59
USCG 9-3		3	9-3						
RTCM/RTK 2.2+2.3	1	3		18	19	22	23	24	59
RTK 2.2+2.3		3		18	19	22	23	24	59
RTCM/RTK 2.3	1			18	19		23	24	
RTK 2.3				18	19	22			
RTCM/RTK 2.2	1	3		18	19	22			59
RTK 2.2		3		18	19	22			59
RTCM/RTK 2.1	1	3		18	19	22			59
RTK 2.1		3		18	19	22			59
RTCM/RTK 3.00						1004	1006	1008	1013

.2. , ,

.2.

1	
3	10- , 10
9-3	
18	
19	
22	5- , 10
23	4- , 10
24	4- , 10
59, 13	5- , 10
1004	
1006	10
1008	10
1013	300



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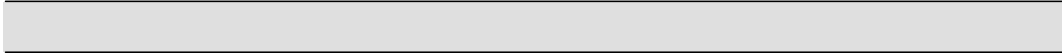
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