USB GPS RECEIVER

GP-G217-USB

SECTRON company offers a wide portfolio of GSM/UMTS antennas with various versions differing in shape, level of gain and manner of attachment. SECTRON guarantees a compatible connection between an antenna and all antenna adaptors produced by SECTRON.

FEATURES

- U-blox G6010 high performance GPS Chip Set
- 50-channel u-blox engine with over 1 million effective correlators
- Very high sensitivity (Tracking Sensitivity: -161 dBm)
- Extremely fast TTFF (Time To First Fix) at low signal level
- <1 second Time To First Fix for Hot and Aided Starts
- Support NMEA 0183 data protocol
- Built-in SuperCap to reserve system data for rapid satellite acquisition
- Built-in patch antenna
- LED indicator for GPS fix or not fix
    - LEDOFF: Receiver switch off
    - LED ON: No fixed, Signal searching
    - LED flashing: Position fixed

GENERAL	
Chipset	UBX G6010
Frequency code	L1, 1575.42 MHz
Code	C/A code
Channels	50 channel
Sensitivity	-161 dBm
ACCURACY	
Position	Autonomous: <2.5 m average / SBAS: <2.0 m average
Velocity	0.1 m/s
Time	RMS 30 ns
Acquisition Time	
Aided start	<1 second, average
Reacquisition	<1 second, average
Hot Start	1 second, average
Cold start	29 second, average
DYNAMIC CONDITIONS	
Altitude	18 000 meters max.
Velocity	515 meters/second max.
Acceleration	Less than 4g
POWER	
Main power input	3.3V – 5V DC input
Power consumption:	
Tracking	42 mA (max performance), 38 mA (ECO mode)
Acquisition	49 mA (max performance), 48 mA (ECO mode)
Power save mode	16 mA
INTERFACE	
Interface	1 serial port or 1 USB 2.0 port
Baud rate	4 800 bps / 9 600 bps / 38 400 bps
PROTOCOL	
Output message	NMEA 0183 GGA, GSA, GSV, RMC, VTG, GLL
PHYSICAL CHARACTERISTICS	
Dimensions	50 × 39 × 17 mm
Operating temperature	-40 to +85 °C

PIN DESCRIPTION

VIN (DC power input):
This is the main DC supply for a 3V ~5 DC input power.

DM and DP:
These are the main transmits and receive channel for outputting navigation and measurement data to user's navigation software or user written software,and receiving software commands to the engine board from u-center or from user written software.

GND:
GND provides the ground for the engine board. Connect all grounds.

VARIANTS

Different connector variants or cable lengths are available on request.

NMEA Output Command / GGA-Global Positioning System Fixed Data

Table 2 contains the values for the following example:

$GPGGA,092725.00,4717.11399,N,00833.91590,E,1,8,1.01,499.6,M,48.0,M,,0*5B

Table 2 GGA Data Format

NAME	EXAMPLE	UNITS	DESCRIPTION
Message ID	$GPGGA		GGA protocol header
UTC Time	092725.00		hhmmss.sss
Latitude	4717.11399		ddmm.mmmm
N/S indicator	N		N=north or S=south
Longitude	00833.91590		dddmm.mmmm
E/W indicator	E		E=east or W=west
Position fix indicator	1		See table 3
Satellites used	8		Range 0 to 12
HDOP	1.01		Horizontal dilution of precision
MSL altitude 1	499.6	meters	
Units	M	meters	
Geoid separation 1	48.0	meters	
Units	M	meters	
Age of diff. corr.		second	Null fields when DGPS is not
Diff. ref. station ID	0		
Checksum	*18		
<CR><LF>			End of message termination

Table 3 Position Fix Indicator

VALUE	DESCRIPTION
0	Fix not available or invalid
1	Standard GPS (2D/3D)
2	Differential GPS
3	Estimated (DR) Fix

GLL-Geographic Position-Latitude/Longitude

Table 4 contains the values for the following example:

$GPGLL,4717.11364,N,00833.91565,E,092321.00,A,A*60

Table 4 GLL Data Format

NAME	EXAMPLE	FORMAT	DESCRIPTION
$GPGLL	$GPGGA	string	Message ID, GLL protocol
Latitude	4717.11364	ddmm.mmmm	Latitude, degrees + minutes
N/S indicator	N	characte	N=north or S=south
Longitude	00833.91565	ddmm.mmmm	Longitude, degrees + minutes
E/W indicator	E	character	E=east or W=west
UTC Time	092321.00	hhmmss.ss	Current time
Valid	A	character	V=data invalid or receiver warning/A=data valid
Start of optional block			
Position mode	A	character	A=autonomous / D=differential
End of optional block			
Checksum	*60	hexadecimal	
<CR><LF>			End of message termination

GSA-GNSS DOP and Active Satellites

Table B-5 contains the values for the following example:

$GPGSA,A,3,07,02,26,27,09,04,15,,,,,1.8,1.0,1.5*33

Table 5 GSA Data Format

NAME	EXAMPLE	UNITS	DESCRIPTION
Message ID	$GPGSA		GSA protocol header
Mode 1	A		See table 6
Mode 2	3		See table 7
Satellite used 1	07		Sv on Channel1
Satellite used 1	02		Sv on Channel 2
..			
Satellite used 1			Sv on Channel 12
PDOP	1.8		Position dilution of precision
HDOP	1.0		Horizontal dilution of precision
VDOP	1.5		Vertical dilution of precision
Checksum	*33		
<CR><LF>			End of message termination

Table 6 Mode1

VALUE	DESCRIPTION
M	Manual-forced to operate in 2D or 3D mode
A	2D automatic-allowed to automatically switch 2D/3D

Table 7 Mode2

VALUE	DESCRIPTION
1	Fix not available
2	2D
3	3D

GSV-GNSS Satellites in View

Table 8 contains the values for the following example:

$GPGSV,2,1,07,07,79,048,42,02,51,062,43,26,36,256,42,27,27,138,42*71
$GPGSV,2,2,07,09,23,313,42,04,19,159,41,15,12,041,42*41

Table 8 GSV Data Format

NAME	EXAMPLE	UNITS	DESCRIPTION
Message ID	$GPGSV		GSV protocol header
Number of messages	2		Range 1 to 3
Message number 1	1		Range 1 to 3
Satellites in view	07		
Satellite ID	07		Channel1 (Range 1 to 32)
Elevation	79	degrees	Channel1 (Max 90)
Azimuth	048	degrees	Channel1 (True, Range 0 to 359)
C/No	42	dBHz	Range 0 to 99, null when not
..			
Satelitte ID	27		Channel4 (range 1 to 32)
Elevation	27	degrees	Channel4 (True, Range 0 to 359)
Azimuth	138	degrees	Channel4 (True, Range 0 to 359)
C/No	42	dBHz	Range 0 to 99, null when not
Checksum	*71		
<CR><LF>			End of message termination

Depending on the number of satellites tracked multiple messages of GSV data may be required.

RMC-Recommended Minimum Specific GNSS Data

Table 9 contains the values for the following example:
$GPRMC,161229.487,A,3723.2475,N,12158.3416,W,0.13,309.62,120598,,*10

Table 9 RMC Data Format

NAME	EXAMPLE	UNITS	DESCRIPTION
Message ID	$GPRMC		RMC protocol header
UTC Time	161229.487		hhmmss.sss
Status	A		A=data valid or V=data not valid
Latitude	3723.2475		ddmm.mmmm
N/S indicator	N		N=north or S=south
Longitude	12158.3416		ddmm.mmmm
E/W indicator	W		E=east or W=west
Speed over ground	0.13	knots	
Course over ground	309.62	degrees	True
Date	120598		ddmmyy
Magnetic variation2		degrees	E=east or W=west
Checksum	*10		
<CR><LF>			End of message termination

VTG-Course Over Ground and Ground Speed

Table 10 contains the values for the following example:
$GPVTG,309.62,T,,M,0.13,N,0.2,K,A*6E

Table 10 VTG Data Format

NAME	EXAMPLE	UNITS	DESCRIPTION
Message ID	$GPVTG		VTG protocol header
cotg	309.62	degrees	Course over ground
T	T		Fixed field: True
cogm		degrees	Course over ground (magnetic)
M	M		Fixed field: Magnetic
sog	0.13	km/h	Speed over ground
N	N		Fixed fields: Knots
kph	0.2	km/hr	Speed over ground
K	K		Kilometers per hour
Mode A			Mode indicator, A=autonomous, D=differential GNSS fixed
Checksum	*6E		
<CR><LF>			End of message termination

UBX Input/Output Command

Get/Set Port Configuration for UART

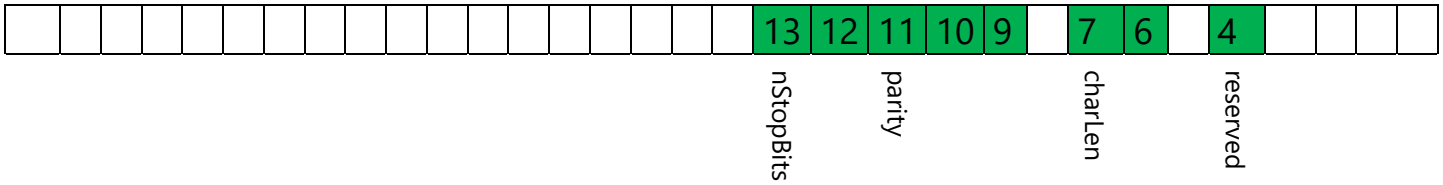
Message	CFG-PRT
Description	Get/Set Port Configuration for UART
Firmware	Supported on u-blox 5 from firmware version 4.00 up to version 6.00
Type	Get/Set
Comment	Several configuarations can be concatenated to one input message. In this case the payload length can be a multiple of the normal length (see the other version of CFG-PRT). Output messages from the module contain only one configuration unit.

	Header	*ID*	*Length (Bytes)*	*Payload*	*Checksum*
Message	0xB5 0x62	0x06 0x00	20	see below	CK_A CK_B

Payload contents:

Byte offset	*Number format*	*Scaling*	*Name*	*Unit*	*Description*
0	U1	-	portID	-	Port identifier number (=1 or 2 for UART ports)
1	U1	-	res0	-	Reserved
2	U2	-	res1	-	Reserved
4	X4	-	mode	-	A bit mask describing the UART mode (see graphic below)
8	U4	-	baudRate	Bits/s	Baudrate in bits/second
12	X2	-	inProtoMask	-	A mask describing which input protocols are active. Each bit of this mask is used for a protocol. Through that, multiple protocols can be defined on a single port. (see graphic below)
14	X2	-	outProtoMask	-	A mask describing which output protocols are active. Each bit of this mask is used for a protocol. Through that, multiple protocols can be defined on a single port. (see graphic below)
16	X2	-	flags	-	Reserved, set to 0
18	U2	-	pad	-	Reserved, set to 0

Bitfield mode
This graphic explain the bits of mode



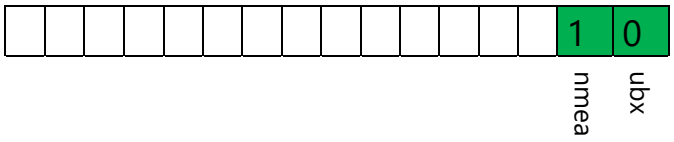
signed value

unsigned value

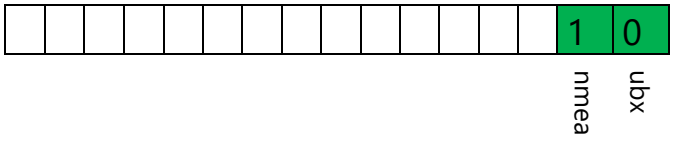
reserved

NAME	DESCRIPTION
reserved	Default1 for compatibility with A4
charLen	Character length 00 5bit (not supported) 01 6bit (not supported) 10 7bit (supported only with parity) 11 8bit
parity	000 Even parity 001 Odd parity 10X No parity X1X Reserved
nStopBits	Number of stop bits 00 1 stop bit 01 1.5 stop bit 10 2 stop bit 11 0.5 stop bit

Bitfield inProtoMask
This graphic explain the bits of inProtoMask



Bitfield outProtoMask
This graphic explain the bits of outProtoMask



signed value

unsigned value

reserved

Get/Set Port Configuration for SB Port

Message	CFG-PRT
Description	Get/Set Port Configuration for USB
Firmware	Supported on u-blox 5 from firmware version 4.00 up to version 6.00
Type	Get/Set
Comment	Several configuarations can be concatenated to one input message. In this case the payload length can be a multiple of the normal length (see the other version of CFG-PRT). Output messages from the module contain only one configuration unit.

	Header	*ID*	*Length (Bytes)*	*Payload*	*Checksum*
Message	0xB5 0x62	0x06 0x00	20	see below	CK_A CK_B

Payload contents:

Byte offset	*Number format*	*Scaling*	*Name*	*Unit*	*Description*
0	U1	-	portID	-	Port identifier number (=3 for USB port)
1	U1	-	res0	-	Reserved
2	U2	-	res1	-	Reserved
4	X4	-	res2	-	Reserved
8	U4	-	res3	-	Reserved
12	X2	-	inProtoMask	-	A mask describing which input protocols are active. Each bit of this mask is used for a protocol. Through that, multiple protocols can be defined on a single port. (see graphic below)
14	X2	-	outProtoMask	-	A mask describing which output protocols are active. Each bit of this mask is used for a protocol. Through that, multiple protocols can be defined on a single port. (see graphic below)
16	X2	-	flags	-	Reserved, set to 0
18	U2	-	pad	-	Reserved, set to 0

Set Message Rate

Message	CFG-MSG
Description	Set Message rate
Firmware	Supported on u-blox 5 from firmware version 4.00 up to version 6.00
Type	Get/Set
Comment	Set message rate configuration for the current target.

	Header	*ID*	*Length (Bytes)*	*Payload*	*Checksum*
Message	0xB5 0x62	0x06 0x01	3	see below	CK_A CK_B

Payload contents:

Byte offset	*Number format*	*Scaling*	*Name*	*Unit*	*Description*
0	U1	-	msgClass	-	Message Class
1	U1	-	msgID	-	Message Identifier
2	U1	-	rate	-	Send rate on current Target in

Mnemonic	*Cis/ID*	*Description*
DTM	0xF0 0x0A	Datum reference
GBS	0xF0 0x0A	GNSS Satellite Fault Detection
GGA	0xF0 0x00	Global positioning system fix data
GLL	0xF0 0x01	Latitude and longitude, with time of position fix and status
GPQ	0xF0 0x40	Poll message
GRS	0xF0 0x06	GNSS Range Residuals
GSA	0xF0 0x02	GNSS DOP and Active Satellites
GST	0xF0 0x07	GNSS Pseudo Range Error Statistics
GSV	0xF0 0x03	GNSS Satellites in View
RMC	0xF0 0x04	Recommended Minimum data
TXT	0xF0 0x41	Text Transmission
VTG	0xF0 0x05	Course over ground and Ground speed
ZDA	0xF0 0x08	Time and Date

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