

03 Arduino

UART, GPS

8 Default messages

Interface	Settings
UART Output	9600 Baud, 8 bits, no parity bit, 1 stop bit Configured to transmit both NMEA and UBX protocols, but only the following NMEA (and no UBX) messages have been activated at start-up: GGA, GLL, GSA, GSV, RMC, VTG, TXT
UART Input	9600 Baud, 8 bits, no parity bit, 1 stop bit, Autobauding disabled Automatically accepts following protocols without need of explicit configuration: UBX, NMEA The GNSS receiver supports interleaved UBX and NMEA messages.
DDC	Fully compatible with the I ² C industry standard, available for communication with an external host CPU or u-blox cellular modules; operated in slave mode only. NMEA and UBX are enabled as input messages, only NMEA as output messages Maximum bit rate 400 kb/s.
TIMEPULSE (1Hz Nav)	1 pulse per second, synchronized at rising edge, pulse length 100 ms

Table 9: Default messages



Please refer to the *u-blox 7 Receiver Description Including Protocol Specification* [2] for information about further settings.

uBlox

Standard precision GNSS and dead reckoning modules

Model	Category	GNSS				Interfaces				Features							Grade										
		Standard Precision GNSS	High Precision GNSS	Dead Reckoning	Timing	GPS / QZSS	GLONASS	Galileo	BeiDou	Number of Concurrent GNSS	UART	USB	SPI	DDC (I ² C compliant)	Programmable (Flash)	Data logging	Additional SAW	Additional LNA	RTC crystal	Oscillator	Built-in antenna	Built-in sensor	Built-in antenna supply and supervisor	Timepulse	Standard	Professional	Automotive
EVA-M8M		•				•	•	m	•	3	•	•	•	•	◦	◦			◦	C				1			
EVA-7M		•				•	•			1	•	•	•	•					◦	C				1			
LEA-M8S		•				•	•		•	2	•	•					•		•	T		•		1			
MAX-M8C		•				•	•		•	2	•								◆	C				1			
MAX-M8Q		•				•	•		•	2	•								•	T				1			
MAX-M8W		•				•	•		•	2	•								•	T		•		1			
MAX-7C		•				•	•			1	•								◆	C				1			
MAX-7Q		•				•	•			1	•								•	T				1			
MAX-7W		•				•	•			1	•								•	T		•		1			
NEO-M8N		•				•	•	•	•	3	•	•	•	•	•	•	•	•	•	T				1			
NEO-M8Q		•				•	•		•	2	•	•	•	•			•	•	•	T				1			
NEO-M8M		•				•	•		•	2	•	•	•	•					•	C				1			
NEO-7N		•				•	•			1	•	•	•	•	•	•	•	•	•	T				1			
NEO-7M		•				•	•			1	•	•	•	•					•	C				1			
CAM-M8Q		•				•	•		•	2	•		•	•			•	•	•	T	•			1			
CAM-M8C		•				•	•		•	2	•		•	•			•	•	◆	C	•			1			
PAM-7Q		•				•				1	•								•	T	•			1			
NEO-M8L			ADR			•	•	•	•	3	•	•	•	•	•	•	•	•	•	C		•		1			
NEO-M8U			UDR			•	•	•	•	3	•	•	•	•	•	•	•	•	•	C		•		1			

- GPS <-> Arduino Serial3 9600 8/n/1
- Arduino Serial0 <-> PC 115200 8/n/1

```
void setup() {  
    Serial.begin(115200);  
    Serial3.begin(9600);  
}  
  
void loop() {  
    while(Serial3.available()) {  
        Serial.println(Serial3.readStringUntil('\n'));  
    }  
  
    while(Serial.available()) {  
        Serial3.println(Serial.readString());  
    }  
}
```

```
09:28:45 $GPGSA,A,3,09,23,16,30,05,02,07,06,,,,,2.22,1.11,1.92*01.
09:28:45 $GPGSV,3,1,11,02,32,276,25,03,02,137,28,05,21,309,36,06,27,224,09*75.
09:28:45 $GPGSV,3,2,11,07,70,184,31,09,67,066,46,16,21,047,44,23,34,082,46*74.
09:28:45 $GPGSV,3,3,11,26,04,025,42,29,00,334,,30,40,207,23*44.
09:28:45 $GPGLL,4732.05981,N,01902.03999,E,092845.00,A,A*6C.
09:28:46 $GPRMC,092846.00,A,4732.05991,N,01902.04002,E,0.105,,080316,,,A*73.
09:28:46 $GPVTG,,T,,M,0.105,N,0.194,K,A*2B.
09:28:46 $GPGGA,092846.00,4732.05991,N,01902.04002,E,1,08,1.11,158.2,M,39.4,M,,*5E.
09:28:46 $GPGSA,A,3,09,23,16,30,05,02,07,06,,,,,2.22,1.11,1.92*01.
09:28:46 $GPGSV,3,1,11,02,32,276,26,03,02,137,27,05,21,309,36,06,27,224,09*79.
09:28:46 $GPGSV,3,2,11,07,70,184,31,09,67,066,46,16,21,047,44,23,34,082,46*74.
09:28:46 $GPGSV,3,3,11,26,04,025,42,29,00,334,,30,40,207,23*44.
09:28:46 $GPGLL,4732.05991,N,01902.04002,E,092846.00,A,A*62.
09:28:47 $GPRMC,092847.00,A,4732.05995,N,01902.04003,E,0.048,,080316,,,A*7F.
09:28:47 $GPVTG,,T,,M,0.048,N,0.089,K,A*2E.
09:28:47 $GPGGA,092847.00,4732.05995,N,01902.04003,E,1,07,1.32,158.0,M,39.4,M,,*56.
09:28:47 $GPGSA,A,3,09,23,16,30,05,02,07,,,,,2.60,1.32,2.24*0E.
09:28:47 $GPGSV,3,1,11,02,32,276,26,03,02,137,27,05,21,309,36,06,27,224,09*79.
09:28:47 $GPGSV,3,2,11,07,70,184,30,09,67,066,46,16,21,047,44,23,34,082,46*75.
09:28:47 $GPGSV,3,3,11,26,04,025,42,29,00,334,,30,40,207,23*44.
09:28:47 $GPGLL,4732.05995,N,01902.04003,E,092847.00,A,A*66.
09:28:48 $GPRMC,092848.00,A,4732.05997,N,01902.04003,E,0.107,,080316,,,A*78.
09:28:48 $GPVTG,,T,,M,0.107,N,0.198,K,A*25.
09:28:48 $GPGGA,092848.00,4732.05997,N,01902.04003,E,1,07,1.32,157.9,M,39.4,M,,*5D.
09:28:48 $GPGSA,A,3,09,23,16,30,05,02,07,,,,,2.60,1.32,2.24*0E.
09:28:48 $GPGSV,3,1,11,02,32,276,26,03,02,137,28,05,21,309,37,06,27,224,09*77.
09:28:48 $GPGSV,3,2,11,07,70,184,31,09,67,066,46,16,21,047,45,23,34,082,46*75.
09:28:48 $GPGSV,3,3,11,26,04,025,42,29,00,334,,30,40,207,23*44.
09:28:48 $GPGLL,4732.05997,N,01902.04003,E,092848.00,A,A*6B.
09:28:49 $GPRMC,092849.00,A,4732.05994,N,01902.03999,E,0.119,,080316,,,A*78.
09:28:49 $GPVTG,,T,,M,0.119,N,0.221,K,A*2B.
09:28:49 $GPGGA,092849.00,4732.05994,N,01902.03999,E,1,07,1.32,157.6,M,39.4,M,,*5D.
09:28:49 $GPGSA,A,3,09,23,16,30,05,02,07,,,,,2.60,1.32,2.24*0E.
09:28:49 $GPGSV,3,1,11,02,32,276,26,03,02,137,28,05,21,309,37,06,27,224,09*77.
09:28:49 $GPGSV,3,2,11,07,70,184,30,09,67,066,46,16,21,047,45,23,34,082,46*74.
09:28:49 $GPGSV,3,3,11,26,04,025,42,29,00,334,,30,40,207,22*45.
09:28:49 $GPGLL,4732.05994,N,01902.03999,E,092849.00,A,A*64.
09:28:50 $GPRMC,092850.00,A,4732.05988,N,01902.03994,E,0.031,,080316,,,A*7B.
09:28:50 $GPVTG,,T,,M,0.031,N,0.057,K,A*23.
09:28:50 $GPGGA,092850.00,4732.05988,N,01902.03994,E,1,07,1.32,157.4,M,39.4,M,,*57.
09:28:50 $GPGSA,A,3,09,23,16,30,05,02,07,,,,,2.60,1.32,2.24*0E.
09:28:50 $GPGSV,3,1,11,02,32,276,26,03,02,137,27,05,21,309,37,06,27,224,09*78.
09:28:50 $GPGSV,3,2,11,07,70,184,30,09,67,066,46,16,21,047,45,23,34,082,46*74.
09:28:50 $GPGSV,3,3,11,26,04,025,42,29,00,334,,30,40,207,22*45.
09:28:50 $GPGLL,4732.05988,N,01902.03994,E,092850.00,A,A*6C.
```



NMEA 0183

- <http://aprs.gids.nl/nmea/>
- **\$GPRMC**
 - Recommended minimum specific GPS/Transit data
- **\$GPGGA**
 - Global Positioning System Fix Data
- **\$GPGLL**
 - Geographic Position, Latitude / Longitude and time
- **\$GPGSA**
 - GPS DOP and active satellites

uBlox uCenter

COM4 - u-center 8.20

File Edit View Player Receiver Tools Window Help



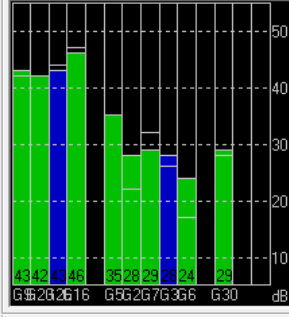
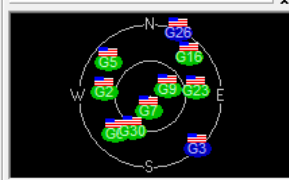
Text Console

```
09:32:18 $GPRMC,093218.00,A,4732.05861,N,01902.04225,E,0.047,,080316,,A*7D.
09:32:18 $GPVTG,,T,,M,0.047,N,0.088,K,A*20.
09:32:18 $GPGGA,093218.00,4732.05861,N,01902.04225,E,1.08,1.10,156.4,M,39.4,M,,
09:32:18 $GPGSA,A,3,09,23,16,30,05,02,07,06,,,,,2.17,1.10,1.87*02.
09:32:18 $GPGSV,3,1,10,02,32,275,26,03,01,138,27,05,22,309,35,06,26,223,20*7A.
09:32:18 $GPGSV,3,2,10,07,72,183,30,09,66,068,42,16,20,045,46,23,32,083,42*78.
09:32:18 $GPGSV,3,3,10,26,03,024,43,30,41,207,29*76.
09:32:18 $GPGLL,4732.05861,N,01902.04225,E,093218.00,A,A*6B.
09:32:19 $GPRMC,093219.00,A,4732.05863,N,01902.04225,E,0.004,,080316,,A*79.
09:32:19 $GPVTG,,T,,M,0.004,N,0.008,K,A*2F.
09:32:19 $GPGGA,093219.00,4732.05863,N,01902.04225,E,1.08,1.10,156.4,M,39.4,M,,
09:32:19 $GPGSA,A,3,09,23,16,30,05,02,07,06,,,,,2.17,1.10,1.87*02.
09:32:19 $GPGSV,3,1,10,02,32,275,27,03,01,138,28,05,22,309,35,06,26,223,21*75.
09:32:19 $GPGSV,3,2,10,07,72,183,30,09,66,068,42,16,20,045,46,23,32,083,42*78.
09:32:19 $GPGSV,3,3,10,26,03,024,44,30,41,207,29*71.
09:32:19 $GPGLL,4732.05863,N,01902.04225,E,093219.00,A,A*68.
09:32:20 $GPRMC,093220.00,A,4732.05866,N,01902.04227,E,0.043,,080316,,A*77.
09:32:20 $GPVTG,,T,,M,0.043,N,0.080,K,A*2C.
09:32:20 $GPGGA,093220.00,4732.05866,N,01902.04227,E,1.08,1.10,156.5,M,39.4,M,,
09:32:20 $GPGSA,A,3,09,23,16,30,05,02,07,06,,,,,2.17,1.10,1.87*02.
09:32:20 $GPGSV,3,1,10,02,32,275,27,03,01,138,28,05,22,309,35,06,26,223,22*76.
09:32:20 $GPGSV,3,2,10,07,72,183,30,09,66,068,42,16,20,045,46,23,32,083,42*78.
09:32:20 $GPGSV,3,3,10,26,03,024,43,30,41,207,29*76.
09:32:20 $GPGLL,4732.05866,N,01902.04227,E,093220.00,A,A*65.
09:32:21 $GPRMC,093221.00,A,4732.05870,N,01902.04229,E,0.040,,080316,,A*7C.
09:32:21 $GPVTG,,T,,M,0.040,N,0.075,K,A*25.
09:32:21 $GPGGA,093221.00,4732.05870,N,01902.04229,E,1.08,1.10,156.6,M,39.4,M,,
09:32:21 $GPGSA,A,3,09,23,16,30,05,02,07,06,,,,,2.17,1.10,1.87*02.
09:32:21 $GPGSV,3,1,10,02,32,275,27,03,01,138,28,05,22,309,35,06,26,223,23*77.
09:32:21 $GPGSV,3,2,10,07,72,183,30,09,66,068,42,16,20,045,46,23,32,083,42*78.
09:32:21 $GPGSV,3,3,10,26,03,024,43,30,41,207,29*76.
09:32:21 $GPGLL,4732.05870,N,01902.04229,E,093221.00,A,A*6D.
09:32:22 $GPRMC,093222.00,A,4732.05871,N,01902.04227,E,0.034,,080316,,A*73.
09:32:22 $GPVTG,,T,,M,0.034,N,0.062,K,A*20.
09:32:22 $GPGGA,093222.00,4732.05871,N,01902.04227,E,1.08,1.10,156.7,M,39.4,M,,
09:32:22 $GPGSA,A,3,09,23,16,30,05,02,07,06,,,,,2.17,1.10,1.87*02.
09:32:22 $GPGSV,3,1,10,02,32,275,28,03,01,138,28,05,22,309,35,06,26,223,23*78.
09:32:22 $GPGSV,3,2,10,07,72,183,29,09,66,068,43,16,20,045,46,23,32,083,42*71.
09:32:22 $GPGSV,3,3,10,26,03,024,43,30,41,207,29*76.
09:32:22 $GPGLL,4732.05871,N,01902.04227,E,093222.00,A,A*61.
09:32:23 $GPRMC,093223.00,A,4732.05873,N,01902.04226,E,0.030,,080316,,A*75.
09:32:23 $GPVTG,,T,,M,0.030,N,0.055,K,A*20.
09:32:23 $GPGGA,093223.00,4732.05873,N,01902.04226,E,1.08,1.10,156.7,M,39.4,M,,
09:32:23 $GPGSA,A,3,09,23,16,30,05,02,07,06,,,,,2.17,1.10,1.87*02.
09:32:23 $GPGSV,3,1,10,02,32,275,28,03,01,138,28,05,22,309,35,06,26,223,24*7F.
09:32:23 $GPGSV,3,2,10,07,72,183,29,09,66,068,43,16,20,045,46,23,32,083,42*71.
09:32:23 $GPGSV,3,3,10,26,03,024,43,30,41,207,29*76.
09:32:23 $GPGLL,4732.05873,N,01902.04226,E,093223.00,A,A*63.
```

GPS G9
EI 66 Az 68
C/N0 43.0
GPS G23
EI 32 Az 83
C/N0 42.0
GPS G26
EI 3 Az 24
C/N0 43.0
GPS G16
EI 20 Az 45
C/N0 46.0

GPS G5
EI 22 Az 309
C/N0 35.0
GPS G2
EI 32 Az 275
C/N0 28.0
GPS G7
EI 72 Az 183
C/N0 29.0
GPS G3
EI 1 Az 138
C/N0 28.0
GPS G6
EI 26 Az 223
C/N0 24.0

GPS G30
EI 41 Az 207
C/N0 29.0



Longitude	19.03403767
Latitude	47.53431217
Altitude	196.100 m
TTFF	
Fix Mode	3D
3D Acc.	
2D Acc.	
PDOP	0 12.2
HDOP	0 11.1
Satellites	10

0.27 deg

0.02 m/s = 0.1 km/h

196.100 m x100

09:32:23 UTC

Tuesday 03/08/2016

Ready COM4 115200 u-blox 5 No file open NMEA 00:31:51 09:32:23

```
char delimiters[] = "$,*";  
char *GPSdata = "$GPRMC,080.....3,E,A*1B\n\  
$GPRMB,A,,,,,,,,,,,,,V,A*1C\n\  
$GPGGA,080232,47.....7,M,41.0,M,,*70\n\  
...  
$GPGSA,A,2,11,,,18,19,,22,,,4.0,3.9,1.0*3D\n\,,
```

strtok_r is my friend 😊