MobileMapper CE NMEA Output

22 February 2007

What NMEA message types does MobileMapper CE (MMCE) record and output?

The most recent version of the MMCE operating system and GPS firmware records and outputs the following types:

- GGA (at an interval settable between one second and 20 minutes)
- GLL, GSA, GSV, RMC, RRE and VTG (at an interval settable between one second and 2 minutes)
- ZDA (at an interval settable between 10 seconds and 3 minutes)

How do I record NMEA data to files in my MMCE?

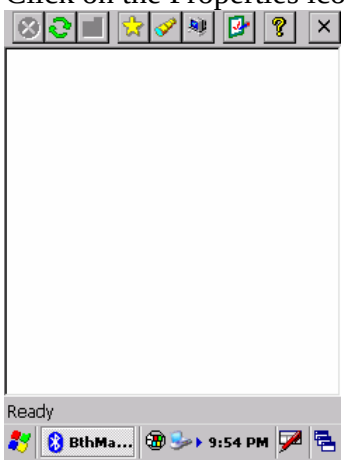
1. Take the receiver outside where it can receive GPS signals.
2. Tap **Start > Programs > GPS Utilities > GPS Status**.
3. Tap the **Sig/Nav** tab and wait until you see that a sufficient number of satellites are being tracked.
4. At the top of the screen, tap **Tools > Log > Start**.
5. Use the browsing window to select a target folder and use the input panel to name the file. When you are done, tap **OK** at the top of the browsing window.
6. To stop logging NMEA data, tap **Tools > Log > Stop**.

How do I stream NMEA to a peripheral device via a serial cable?

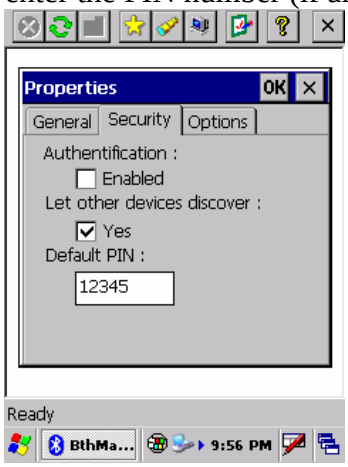
1. Attach the MMCE to its I/O module and a serial cable to the I/O module's DB9 (COM1) port. Attach the other end of the cable to the peripheral device.
2. Tap **Start > Programs > GPS Utilities > GPS Ports Configuration**
3. On the **GPS Ports Configuration** screen, check the box labeled "Enable Messages"
4. Tap **Configure Port** (note: only COM1 is available for serial output) and use same settings as that of the serial port of the device that will receive the NMEA messages. Tap **OK** on the **COM1:** screen when done.
5. Tap the **NMEA** tab and select the NMEA messages required by the peripheral device. Tap **Apply** when done and then tap **OK** at the top right **GPS Ports Configuration** screen.
6. Assuming the MMCE receiver is tracking any GPS satellites, it will now stream NMEA messages out of the COM1 port.

How do I stream NMEA data to a peripheral device via a Bluetooth connection?

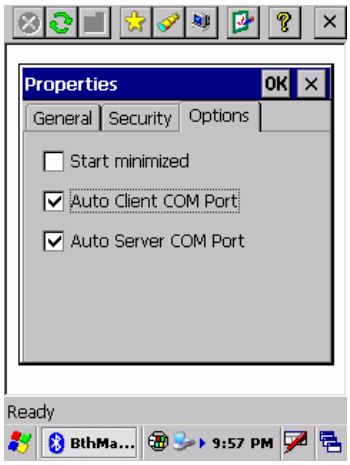
1. Tap **Start** > **Settings** > **Control Panel** and launch the Bluetooth manager
2. Click on the Properties icon (a green picture frame with a red checkmark)



3. On the Security tab, check the box to let other devices discover your MMCE and enter the PIN number (if anything other than the default PIN is required).

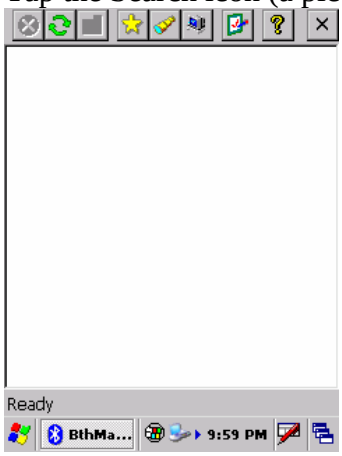


4. Tap the **Options** tab and check “Auto Client COM Port” and “Auto Server COM Port”

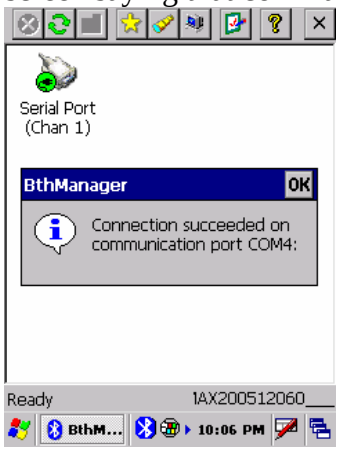


5. Click **OK** to close the **Properties** screen.

6. Tap the Search icon (a picture of a yellow flashlight)

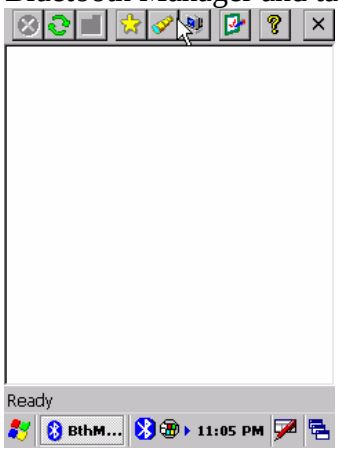


7. The word “Searching…” appears at the bottom. When this changes to “Ready”, your device should be listed. Double-tap your device’s icon.
8. To output NMEA messages over Bluetooth, double-tap the Serial Port icon and to open up a virtual serial port. Remember the port number displayed on the pop-up screen saying that communication has succeeded.



9. Tap **OK** on the pop-up screen.
10. If you wish to create a short-cut for Bluetooth communication with this peripheral device, tap-hold on the Serial Port icon and tap the **Create Shortcut** option. Then tap **OK** on the pop-up saying the shortcut has been created.
11. Tap **X** at the upper right of the Bluetooth screen. This minimizes the Bluetooth Manager; it does not close it.
12. Tap **X** at the upper right of the Control Panel to exit to the Desktop.
13. Tap **Start > Programs > GPS Utilities > GPS Ports Configuration**
14. On the **GPS Ports Configuration** screen, check the box labeled “Enable Messages”
15. Tap the down arrow in the **Port** field and select same port designated for Bluetooth communication (see Step 8 above).
16. Tap **Configure Port** and use same settings as that of the serial port of the device that will receive the NMEA messages. Tap **OK** on the **COM#:** screen when done.

17. Tap the **NMEA** tab and select the NMEA messages required by the peripheral device. Tap **Apply** when done and then tap **OK** at the top right **GPS Ports Configuration** screen.
18. Assuming the MMCE receiver is tracking GPS satellites, it will now stream NMEA messages through the Bluetooth connection.
19. The next time you wish to connect via Bluetooth to this peripheral device, run the Bluetooth Manager and tap the Favorites icon (a star)



What does a standard MMCE NMEA output file look like?

The following is a sample text message recorded by the **GPS Status** utility's **Log** function. Note: the Log tool does not record GGL, RRE or VTG messages but the MMCE does output them.

Log Start: 2007/02/22 -- 14:07:27
$GPZDA,220727.00,22,02,2007,00,00*63
$GPGGA,220727.00,3721.08112,N,12156.12581,W,2,11,0.8,026.99,M,-28.3,M,0,0135*53
$GPGSA,A,3,14,03,22,24,16,06,07,21,26,29,18,,01.4,00.8,01.2*0F
$GPGSV,4,1,15,14,12,188,38,03,30,309,43,22,54,250,49,24,18,094,41*75
$GPGSV,4,2,15,19,06,320,35,16,19,252,38,06,19,156,38,07,29,162,45*7C
$GPGSV,4,3,15,21,62,063,48,26,21,043,41,29,12,036,36,18,79,348,48*7D
$GPGSV,4,4,15,09,03,107,,48,45,198,48,51,44,156,46*44
$GPRMC,220727.00,A,3721.0811,N,12156.1258,W,00.0,000.0,220207,15,E,D*3F

What information is contained in GLL messages?

Parameters	Description	Range
m1	Position latitude in degrees and decimal minutes (ddmm.mmmmmm)	0 - 90°
c2	Direction of latitude N = North, S = South	N/S
m3	Position longitude in degrees and decimal minutes (dddmm.mmmmmm)	0 - 180°
c4	Direction of longitude W = West, E = East	W/E
m5	UTC time of position in hours, minutes, and seconds (hhmmss.ss)	00-235959.90
c6	Status: A = valid V = invalid	A/V
*cc	Checksum	

What information is contained in GGA messages?

Parameter	Description	Range
m1	Current UTC time of position fix in hours, minutes, and seconds (hhmmss.ss)	00-235959.90
m2	Latitude component of position in degrees and decimal minutes (ddmm.mmmmmm)	0-90
c3	Direction of latitude N= North, S= South	N/S
m4	Longitudinal component of position in degrees and decimal minutes (dddmm.mmmmmm)	0-180
c5	Direction of longitude E = East, W= West	E/W
d6	Position type 0. Position not available or invalid 1. Autonomous position 2. RTCM differential corrected position or CPD float position 3. CPD fixed position	0, 1, 2, 3
d7	Number of GPS satellites being used in the position computation	3 - 12
f8	Horizontal dilution of precision (HDOP)	0 - 99.9
f9	Geoidal Height (Altitude above mean sea level)	-1000.000 to 18000.000

What information is contained in GSA messages?

Parameter	Description	Range
c1	Mode: M: manual A: automatic	M or A
d1	Mode: 1: fix not available 2: 2D 3: 3D	1 -3
d2 - d13	Satellites used in solution (null for unused channel)	1 -32
f1	PDOP	0 - 9.9
f2	HDOP	0 - 9.9
f3	VDOP	0 - 9.9
*cc	Checksum	

What information is contained in GSV messages?

Field	Description	Range
d1	Total number of messages	1-3
d2	Message number	1-3
d3	Total number of satellites in view	1-12
d4	Satellite PRN	1-32
d5	Elevation in degrees	0-90
d6	Azimuth in degrees	0-359
f7	SNR in dB-Hz	30.0-60.0
*cc	checksum	

What information is contained in RMC messages?

Parameter	Description	Range
m1	UTC time of the position fix (hhmmss.ss)	000000.00 - 235959.90
c2	Status	A = data valid V = navigation receiver warning
m3	Latitude (ddmm.mmmmmm)	0000.000000 -8959.999999
c4	Latitude direction	N = North S = South
m5	Longitude (dddmm.mmmmmm)	00000.000000 -17959.999999
c6	Longitude direction	E = East W = West
f7	Speed over ground, knots	000.0 - 999.9
f8	Course over ground, degrees true	000.0 - 359.9
d9	Date, ddmmyy	010100 - 311299
f10	Magnetic variation, degrees	0.0 - 99.9
c11	Direction of variation Easterly variation (E) subtracts from true course. Westerly variation (W) adds to true course	E = East W = West
*cc	Hexadecimal checksum	

What information is contained in RRE messages?

Parameter	Description	Range	Units
d1	Number of satellites used to compute position	3 - 12	n/a
d2	Satellite number (PRN Number)	1 - 32	n/a
f3	Range residual	± 999.9	meter
f4	RMS Horizontal position error	0 - 9999.9	meter
f5	RMS Vertical position error	0 - 9999.9	meter
*cc	Checksum		

What information is contained in VTG messages?

Parameter	Description	Range
f1	COG (Course Over Ground) true north	0 - 359.99
T	COG orientation (T = true north)	T
f2	COG magnetic north	0 - 359.99
M	COG orientation (M = magnetic north)	M
f3	SOG (Speed Over Ground)	0 - 999.99
N	SOG units (N = knots)	N
f4	SOG (Speed Over Ground)	0 - 999.99
K	SOG units (K = Km/hr)	K
*cc	checksum	

What information is contained in ZDA messages?

Parameter	Description
m1	UTC time (hhmmss.ss) (hours, minutes, seconds)
d2	Current day 01 - 31
d3	Current month 01 - 12
d4	Current year 0000-9999
d5	Local zone offset from UTC time where s = sign and hh = hours Range 00 - ±13
d6	Local zone offset from UTC time where mm = minutes with same sign as hh
*cc	Checksum