

XF2 Data Controller – Enable Internal GPS Module

Part Number 874-0305-000 Released: February 13, 2013

Overview

This document describes how to enable and use the internal GPS module in the XF2 data collector. It describes how to select the COM Ports and Baud rates to output GPS data from the XF2's internal GPS module to software programs installed on the XF2 data controller that can include the u-Center Mobile GPS Evaluation software and the Carlson SurvCE software.

Equipment and Software Required:

- Hemisphere GNSS XF2 Data Collector, Part Number: 940-2097-000
- Carlson SurvCE software, Part Number: 750-2008-000
- u-Blox u-Center Mobile software

The free ublox Mobile Terminal Application – GPS Evaluation software can be downloaded from the following link: <u>http://www.u-blox.com/en/evaluation-tools-a-software/u-center/u-center-</u>

Unzip and install the ublox mobile u-Center software onto the XF2 using the USB cable and Windows Mobile Device Center software.

The Carlson SurvCE software can be downloaded from the following link:

http://www.hemispheregps.com/Products/SurveyConstruction/S320LandingPage/tabid/640/Defau It.aspx

From the S320 Landing page, the SurvCE software can be downloaded from the **Resources**, **XF Series Data Collectors** area.

SurvCE Software Download for XF2 (English and Spanish)

For the XF2 Data Collector, download the file: XF2_SurvCE_ENG_SPA.zip

Unzip and install the Carlson SurvCE software in the preferred language onto the XF2 using the USB cable and Windows Mobile Device Center software.



Procedure

Screenshot or Graphic	Step
Image: Sign in to Mindows Live	 Press the Power button the XF2 data collector, turning the XF2 unit On,
Eind Gentuus stanted The Phone off Phone	 From the Windows Mobile Desktop, tap/select the Windows Start icon on the lower left corner of the task bar,
Start SurvCE Fhone Home For E-mail Internet Explorer Calendar	3. From the Start menu, navigate to the Settings icon, tap/select Settings ,
Settings Bluetooth Bluetooth Clock & Alarms Conections Dersonal System Dersonal System	 From the Settings menu, navigate to the System icon, tap/select System,



Screenshot or Graphic	Step
System (2) #10 Certificates About Certificates Backlight Encryption Feedback Device Information Error Reporting External GPS (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)	5. From the System menu, navigate to the External GPS icon, tap/select External GPS ,
GPS Settings Image: The set of	 From the GPS Settings menu, select the <access> menu,</access> Activate the [X] Manage GPS automatically (recommended) option,
GP5 Settings Image: The set of	 From the GPS Settings menu, select the <hardware> menu,</hardware> From GPS hardware port: (none) option, tap/select the down-arrow to reveal the COM port options,



Screenshot or Graphic	Step
GPS Settings Image: Access Programs ✓ Hardware Access Specify the hardware port to which your GPS (None) Image: Access (None) Image: Access Image: Access COM0 Image: Access Image: Access COM1 Image: Access Image: Access COM2 Image: Access Image: Access Image: Access Image: Access Image: Access COM0 Image: Access Image: Access COM2 Image: Access Image: Access Image: Access Image: Access Image: Access Image: Access Image: Access Image: Access Image: Access Image: Access Image: Access COM1 Image: Access Image: Access Image: Access Image: Access Image: Acc	9. From the GPS Hardware port: COM port options, tap/select COM3 ,
GPS Settings Image: Settings <	10. From the GPS Hardware port: Baud rate: option, tap/select the down- arrow to reveal to Baud rate options, select 9600 ,
GPS Settings Image: The set of	11. GPS Settings <hardware> GPS hardware port: COM3 Baud rate: 9600</hardware>



Screenshot or Graphic	Step
GPS Settings Image: The set of the point of the po	12. From GPS Settings menu, select Programs> menu, From GPS program port: (none), tap/select the down-arrow to reveal the Port options,
GPS Settings Programs Hardware Choose the port that programs will use to COM4 COM5 COM6 COM7 COM8 COM8 COM6	13. From the GPS Program Ports options, tap/select COM6
GPS Settings Image: The second se	14. GPS Settings <programs> menu GPS program port: COM6 Tap/Select the OK button on the task bar.</programs>



Screenshot or Graphic	Step
System () + 10 Tx () + 25 About Certificates Backlight Customer Feedback Device Information Error Reporting External GPS () () () () () () () () () () () () () (15. User is returned to the System menu, Tap/Select the (X) icon on the task bar. The user will be returned to the Windows Mobile Desktop. This completes the required steps to enable the internal GPS module on the XF2 data controller.
Plonday, December 03, 2012/ Sgrin In to Windows Live Sign in the Windows Live	 The following steps describe how to view GPS satellite data and record log files in the u-Center Mobile software. The following steps presume the u-Center Mobile software has already been installed on the XF2 data collector. 1. From the Windows Mobile Desktop, tap/select the Windows Start icon on the lower left-corner of the task bar,
Start Task Manager Task Manager Task Manager Compass	 From the Start menu, navigate to the u-Center Mobile icon, tap/select u-Center Mobile,



Screenshot or Graphic	Step
u-CenterMobile 4 ③ ♣ ♀ ♀ 9:30 N Lon Lat Alt SoG @blox u-center Gis Receiver Evaluation fool 0 0 0 0 0 0 0 0 0 0 0 0 0	3. U-Center Mobile 4 splash screen,
u-CenterMobile 4 (2) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2	 4. From the u-Center Mobile 4 software, From the task bar menu along the bottom of the display, tap/select RX menu, The RX menu will pop-open, Tap/Select Port >
u-CenterMobile 4 (2) #*	5. From the Port > menu Browse the Ports list, select COM6



Screenshot or Graphic	Step
u-CenterMobile 4 (3) III Tx (2) 9:30 N Lon Lat Alt SoG UTC Date Port Port Baudrate Autobauding Action File View Rx Play (2) III III	 6. From the u-Center Mobile 4 software, From the task bar menu along the bottom of the display, tap/select RX menu, The RX menu will pop-open, Tap/Select Baudrate >
u-CenterMobile 4 ③ ♣ 🔭 🗙 ♠ 🔁 9:30 Lon Lat Alt Alt SoG E UTC Date 9'600 19'200 38'400 U = ● I = ● III UTC Date UTC DATE	7. From the Baudrate > menu, Browse the list, select 9600
u-CenterHobile ③ ↓	 8. The u-Center Mobile software will connect to the internal GPS module in the XF2 data controller. The user should observe live/active GPS data being displayed in SV Summary menu. Note the Green (active) connection icon on the task bar. To disconnect from the internal GPS module, tap on the connection icon on the task bar. The connection icon will separate, disconnect from the internal GPS module. To restore the connection, simply tap on the connection icon again. This will refresh the display.



Screenshot or Graphic	Step
u-Center SV Summary 10:04 51701 ° 34094 ° 10:40 m NAV Summary 10:40 m 0 km/h 59:000 13/2012 2/30 6 10 10 Packet Console Binary Console Text Console 10:04	 9. From the u-Center Mobile software, From the task bar menu along the bottom of the display, tap/select View menu, The View menu will pop-open, Browse the list, select Text Console,
u-CenterHobile 3 ★ CPL 165903.00, A, 412 16:59:03 \$GPRMC, 165903.00, A, 412 16:59:03 \$GPGGA, 165903.00, 4129. 16:59:03 \$GPGGA, 165903.00, 4129. 16:59:03 \$GPGSV, 3, 1, 10, 02, 67, 31 16:59:03 \$GPGSV, 3, 2, 10, 12, 39, 26 16:59:03 \$GPGSV, 3, 3, 10, 02, 67, 31 16:59:03 \$GPGSV, 3, 1, 10, 02, 67, 31 16:59:03 \$GPGSV, 3, 1, 10, 02, 67, 31 16:59:04 \$GPGSV, 3, 3, 10, 24, 25, 30 16:59:04 \$GPENC, 165904.00, 3, 12 16:59:04 \$GPCGA, 165904.00, 4, 129 16:59:04 \$GPGSV, 3, 1, 10, 02, 67, 31 16:59:04 \$GPGSV, 3, 2, 10, 12, 39, 26 16:59:04	 10. Example Text Console display, The current GMT time with corresponding NMEA message sentences are displayed. The NMEA messages include: GSA,GSV,GLL,ZDA,GGA and VTG. To change the View, tap/select View on the task bar menu, select SV Summary, or select other available views,
U-Cc 2.851663 ° 1.484069 ° 41.80 m 0 km/h 01:38.000 2/03/2012 3D 0pen 1.1 5 Close Database Empty Preferences 29 13 dB File View Rx Play () =0=	 11. To capture Log Files from the internal GPS module in the XF2, tap/select File from the task bar menu, Note, the Log files consist of a series of NMEA messages output by the internal GPS module. 12. From the File menu, browse the list, select New



Screenshot or Graphic	Step
u-CenterMobile 段 🗰 🏹 🗲 🔁 10:07	13. New File configuration menu,
Name: COM6_121203_170645	Name: S/w automatically names the file: COM6_MMDDYR_GPS Seconds of the Week format. The filename can be change by the user if required.
Type: u-blox Log Files (*.ubx)	Folder: tap down-arrow to select Folder.
ocation:	Type: u-blox Log Files (*.ubx)
Main memory	Location: Select from options:
Save	Main memory or Storage Card
	Note: If Storage Card option is selected, the user must insert a Micro SD-Card into the XF2 battery compartment.
	Tap/Select Save
	Log File is opened and stored in specified folder location.
CenterHobile 3 Image: CenterHobile 10:27 23 2 10 4 72.851691 ° 25 2 10 4 44.84077 ° 25 2 10 4 35.90 m 30 0 km/h 17:22:49.000 12/03/2012 12 10 Fix 3D PDoP 0 1.1 5 40 30 30 50 20 20 30 6 29 2 10 5 4 12 13 17 23 dB View Rx Play Image: Play State Image: Play State Image: Play State Image: Play State Image: Play State	14. From the SV Summary display, note the Green connection (Active) icon and the Record File icon on the task bar.
-CenterMobile	15. To stop the data collection, close the Log file, on the task bar tap/select Play
22 Eject 20 m	Browse the list, select Stop.
12 10 4 12 5 Stop 2012	Alternatively, the user can also tap/select
Pause 2/30 5 5 7 8 8 7 8 7 8 7 7 7 7 7 7 7 7 7 7 7	the Play icon on the task bar, toggling the icon to Stop .
3 23 29 2 10 23 dB e View Rx Play 0 = 0 = 0 = 0	



Screenshot or Graphic	Step
u-CenterMobile ⑧	 16. From the SV Summary menu, Note the u-Center Mobile is still connected to the internal GPS module green (active) connection icon, but the software is not currently logging a file; the red circle icon is displayed on the task bar. To start a new Log file, tap the Red circle icon on the task bar, the new file menu will be displayed to the user, tap/select Save, a new log file will be opened, NMEA messages recorded into the log file.
U-CC Cluse Database Empty Preferences AlmanacPlus Recent Files Exit 25 File View Rx Play C = 0 View Rx Play C = 0 Cluse 2.851895 ° 1.484259 ° 2.7.50 m 0 km/h :32:04.000 2/03/2012 30 2.4 10 1.5 10 AlmanacPlus 30 2.4 10 1.5 10 AlmanacPlus 30 2.4 10 1.5 10 AlmanacPlus 20 317 23 dB	 17. To exit from the u-Center Mobile software, tap/select File, browse the list, select Exit 18. The user is returned to the Windows Mobile Desktop. 19. If needed, the u-Center Mobile Log files can be copied from the XF2 data controller to the office PC using USB cable and Windows Mobile Device Center software.
No unread messages	 The following steps describe the steps to output data from the XF2's internal GPS module to the Carlson SurvCE software. <i>The following steps presume the Carlson</i> <i>SurvCE software has already been</i> <i>installed on the XF2 data collector.</i> From the Windows Mobile Desktop, tap/select the Windows Start icon on the lower left-corner of the task bar,



Screenshot or Graphic	Step
Start SurvCE Fhone Home Home Fhone Frail Cortacts E-mail Cortacts E-mail Cortacts E-mail Cortacts E-mail Cortacts E-mail Cortacts E-mail Cortacts E-mail Cortacts E-mail Cortacts Cortacts	 From the Start menu, navigate to the SurvCE icon, tap/select SurvCE,
	4. Carlson SurvCE splash screen,
SurvCE Survey COGO Road Equip Surve Code List Pata Surve Code List Pata Surve Code List Pata Surve Code List Pata Surve Code List Pata Pata </td <td> 5. From the <u>File</u> menu, Select from the two available options, <u>C</u>ontinue Last Job <u>S</u>elect New/Existing Job, In this Example, choose: Tap/select <u>Select New/Existing Job</u> </td>	 5. From the <u>File</u> menu, Select from the two available options, <u>C</u>ontinue Last Job <u>S</u>elect New/Existing Job, In this Example, choose: Tap/select <u>Select New/Existing Job</u>



Screenshot or Graphic	Step
SurvCE S L Coordinate Files Coordinate Files Type: CRD File S Program Files\SurvCE\Data\ Backup ADM.crd GSMP2P.crd INT-GPS-TEST.crd NewJob.crd NewJob.crd Name: NewJob.crd	6. From the Coordinate Files menu Tap/Select into the Name: template,
SurvCE B I C 4:27 Enter data C X XF2-INTERNAL-GPS Alphanumeric Special Num A B C D E F G H I J K L M N 0 P Q R S T U V W X Y Z abc 7 8 9 * + # ' 4 5 6 / - = " 1 2 3 Del Alt 0 Bk Sp Space	7. The virtual keyboard will pop-open, Using the stylus, tap into the Name template, enter a new job name, when finished entering a suitable job name, tap the green check mark, the virtual keyboard will close.
SurvCE SurvCE SurvCE SurvCE Coordinate Files SurvCE SurvE SurvCE SurvCE SurvCE SurvCE SurvCE SurvCE Surv	 8. From the Coordinate Files menu, Name: XF2-Internal-GPS The name of the new job has been entered, tap the green check mark again, Select the Linear Units for the new job. In this example: Metric was selected.



Screenshot or Graphic	Step
SurvCE SurvCE S	 From the Job Settings System menu, Projection: tap/select the down-arrow to select a previously used Projection. If the Projection you need is not available from the drop-down menu; tap/select on the Edit Projection List, then tap/select the Add Predefined menu button, set the Country: (in this example) USA/NAD83, Browse the list of States/Zones, select the Projection needed for your project, then tap/select the green check mark. Tap/select the green check mark again to save the Job Settings.
Survet Image: Second secon	 10. User is returned to the SurvCE main menu, 11. Select the Equip <u>3</u>GPS Rover menu,
SurvCE SurvCE S	12. From the GPS Rover Current menu, Select the following options, Manufacturer: NMEA GPS Receiver Model: defaults to NMEA GPS Receiver,



Screenshot or Graphic	Step
SurvCE Image: Surver image: Surver image: Superimed and image: Stop Bits: Image: Superimed and image: Stop Bits: Image: Superimed and image: Superimed and image: Stop Bits: Parity: Stop Bits: Data Bits: Image: Superimed and image: Superimed and image: Stop Bits: Superimed and image: Superimage: Superimed and image: Superimage: Superimed and	 13. From the GPS Rover Comms menu, Select the following options, Type: Cable Port: COM 6 Baud: 9600 Parity: None Stop Bits: 1 Data Bits: 8
SurvCE GPS Rover Current Comms Receiver [UNKNOWN] UNI]] 0.0 mm Vertical Slant NGS Antenna Height: 0 m Advanced	 14. From the GPS Rover Receiver menu, Select the following options: [Unknown] Unknown (•) ⊻ertical This sets the antenna model for the GPS Rover. In this case, it's best to select the Unknown GPS antenna model. The GPS antenna is an internal antenna inside the XF2 data collector. Tap the Green check mark to accept these settings and continue
SurvCE	15. Configuring rover display Connected to NMEA GPS Receiver



Screenshot or Graphic	Step
SurvCE Image: Survey Survey COGO Road File Equip 1 Station Image: Station Image: Survey Image: Survey	16. User is returned to the Equip menu 17. Select Equip <u>5</u> Configure,
SurvCE Configure Configure Ceneral View Sets Store Fixed Only (GPS) Prompt for Total Station Setup Prompt for Height & Description Prompt for Height & Description No. Readings to Average - TS: 1 GPS: 1 Enter/Store Icon - TS: Read & Store Enter/Store Icon - RTS/GPS: Read & Store Enter/Store Icon - RTS/GPS:	 18. From the Configure General menu, 19. Un-check the option for Store Fixed Only (GPS). This setting applies only for RTK surveying, when the user only wants to store Fixed RTK measurements. When using the Internal L1 only GPS module, (NMEA GPS Receiver), the accuracies will be at Autonomous GPS level, not differentially corrected. Set No. Readings to Average for GPS: 1 Tap the Green check mark to save settings and continue.
Survce Image: Survey Image: COGO Road Survey COGO Road File Equip 1 Total Image: General condition 2 GPS Base Image: Code 3 GPS Rover Image: Code 4 GPS Image: Peripherals 5 Configure Image: One	20. User is returned to the Equip menu 21. Select Equip <u>8</u> Tolerences,



Screenshot or Graphic	Step
SurvCE () () () () () () () () () () () () ()	22. From the Tolerances menu, Set reasonable HRMS, VRMS and Stakeout Tolerances for the NMEA GPS Receiver equipment currently being used. In this example, HRMS Tolerance: 3.000 m VRMS Tolerance: 5.000 m Stakeout Tolerance: 3.000 m Note: the RMS values may not be available from the currently selected GPS
SurvCE Image: Second sec	 Tap the Green check mark to save settings and continue, 23. User is returned to the Equip menu, 24. Select Equip <u>7</u>Monitor/Skyplot, In this menu, the user will be able to confirm the NMEA GPS Receiver is sending data into SurvCE; the user can view the Quality, Position, SATView and SATInfo menus to confirm the NMEA data streams.
SurvCE Image Notion Image Notion SATView SATInfo Quality Position Status: AUTONOMOUS Latency: 0.0 12/03/2012 Satellites: 4/11 16:27:53.0 Local Northing: 224680.6937 Local Easting: 296316.5409 Local Elev: 43.0000 HDOP: 4.66 TDOP: N/A VDOP: 1.00 GDOP: N/A VDOP: 4.77 HRMS: N/A VRMS: N/A	 25. From the Monitor/Skyplot Quality menu, The Status: Autonomous Latency: 0 Date: 12/03/2012 Satellites: 4/11 Time: 16:27:53.0 Local Northing, Local Easting, Local Elev HDOP, TDOP, VDOP, GDOP, PDOP HRMS: N/A VRMS: N/A



Screenshot or Graphic	Step
SurvCE Image: The second	 26. From the Monitor/Skyplot Position menu, The Latitude, Longitude and Ellipsoid Elev are coordinates displayed. Local Northing, Local Easting and Local Elev coordinates are displayed. Selected Projection is displayed.
SurvCE SurvCE SurvCE SurvCE SurvCE SurvCE SurvCE SurvCE SurvCE SurvCE SurvCE SurvCE SurvCE SurvCE SurvCe	27. From Monitor/Skyplot SatView menu, The currently tracked GPS SV's are displayed in a Sky Plot view. The Sat S/N (Signal to Noise Ratios) are displayed.
SurvCE Image: Constraint of the symplet Image: Constraint of the symplet Quality Position SATView SATInto PRN TY AZI ELV S/ 3 GPS 286 0 0 6 GPS 272 3 0 9* GPS 68 55 25 12 GPS 133 5 0 14 GPS 351 81 27 19 GPS 309 7 22 21* GPS 138 44 24 22* GPS 84 61 31 24* GPS 84 61 31	 28. From the Monitor/Skyplot SATInfo menu, The Individual PRN, SV Type, Azimuth, Elev and S/N Ratio are displayed. SV's depicted with an asterisk * are above the Elev Mask Angle and being used. All four of these menus confirm the NMEA GPS receiver data is being sent into SurvCE. If there is no data displayed in these menus, check/verify the NMEA GPS Receiver Port and Baud Rate settings in the Equip GPS Rover menu. Tap/Select the Orange Left arrow (Return) button in the upper right corner.



Screenshot or Graphic	Step
SurvCE Image: File Equip File Equip Survey COGO Road 1 Store Image: File Equip Survey COGO Road 1 Store Image: File Equip 2 Stake Image: File Equip 2 Stake Image: File Equip 3 Stake Image: File Image: File 4 Offset Image: File Image: File 5 Elev Image: File Image: File 5 Elev Image: File File	 29. The user is returned to the SurvCE main menu, 30. The user can start collecting data, 31. Select Survey 1Store Points,
SURVCE Image: Store PTS STORE PTS Image: Store PTS Autonomous Image: Store PT Autonomous Image: Store PT Autonomous Image: Store PT Image: Store PT Image: Store PT Image: Store PT </td <td> 32. From the Store Points menu, Enter a starting PT: number Enter a Description: Leave the HT: 0000 m When ready to Store the Point/Feature, Tap/Select the [S], or Store button, Continue storing Points/Features as needed, When finished Storing Points, tap/select the Red [X] button in the upper right corner of the menu, </td>	 32. From the Store Points menu, Enter a starting PT: number Enter a Description: Leave the HT: 0000 m When ready to Store the Point/Feature, Tap/Select the [S], or Store button, Continue storing Points/Features as needed, When finished Storing Points, tap/select the Red [X] button in the upper right corner of the menu,
Survce Image: Constraint of the second s	 33. If the user wants to store a continuous line or trajectory, 34. Select <u>Survey 6</u> Auto by Interval menu,



Screenshot or Graphic	Step
SurvCE ③ #	 35. From the Auto Store by Interval menu, Select from the two available options: <u>D</u>istance or <u>T</u>ime method, In this example, to get best data coverage, select the <u>Time</u> option Enter a 1-second time interval, Enter a Starting PT ID and Description, Tap the Green check mark to save settings and start the Auto Store,
Record Max Points: 100 SurvCE ③ #* ★ € € 5:43 Autonomous ► 9/11 Autonomous ► 9/11 N:224674.2425 E:296308.9890 N:224674.2425 E:296308.9890 N:224674.2425 E:296308.9890 V:224674.2425 E:296308.9890 N:224674.2425 E:296308.9890 N:224674.2425 E:296308.9890 E E Image: Content of the second of	 36. From the Auto INTVL menu, Note the Green [>] icon, this indicates the Auto INTVL is active, storing points every second Points stored are displayed in the Map view screen, Tap the [C] icon, or Configure to control what information is displayed in the Map View, To stop the Auto INTVL Store Pts, tap/Select the Green [>] arrow, this will stop the Auto INTVL Store Pts, it will toggle the icon to a Red [=]
SurvCE ⓐ ♣ ♀ € € 543 ▲utonomous ▲ Autonomous ⊷+8/11 8 m Autonomous ⊷+8/11 8 m Pt: 82 Desc: HT: N:224679.6459 £:296310.3873 Z:46.4000 HSDV:N/A VSDV:N/A ⓐ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @	 37. From the Auto INTVL menu, If the Red [•] icon is displayed, no Auto INTVL points are being stored. To start the Auto INTVL again, tap/Select the [•] icon again, it will toggle the icon to [>] again, resume storing Auto INTVL points again. If the user is finished storing Auto INTVL points, tap/Select the Red [X] in the upper right corner of the menu.



Screenshot or Graphic	Step
SurvCE Image: Constraint of the second s	38. User is returned to the main menu, 39. To exit SurvCE, select <u>F</u> ile <u>0</u> Exit,
Survet Image: Constraint of the second s	40. SurvCE confirmation message, Are you sure you want to exit? Select Yes or No In this example, Yes was selected, The user is returned to the windows Mobile Desktop.
Augustation of the second	The data files from the SurvCE software can be copied from the XF2 to the office PC using the USB cable and Windows Mobile Device Center software. The SurvCE data files can be found on the XF2 \Program Files\SurvCE\Data folder. Files to copy: CurrentJobName with file extensions: .crd,.inf, .ref, .rw5, .sys



Further Information

The Precision Products Technical Support team in Scottsdale has coordinated defining these Quick Reference Guides. You can contact Precision Products Technical Support at techsupport@hemispheregnss.com for further information.

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Notes: