

# **ORG447X Evaluation Kit**

# **Quick Start Guide**





# **1. Packaging List**

The ORG447X Evaluation Kit contains:

- A. ORG4472 module mounted on the Demo Board
- B. Passive patch antenna assembly
- C. USB to UART cable
- D. Support CD

# 2. Setup

2.1 Open CD. Select ORG447X series from the main menu.





#### 2.2 Install FTDI USB-UART driver by pressing Driver button.

The driver setup is done in silent mode.

The presence and enumeration of the Virtual COM port can be verified via Control Panel $\rightarrow$ System $\rightarrow$ Device Manager.

#### 2.3 Install SiRFLive software by pressing SiRF Live Setup button.

Follow on-screen instructions during SiRFLive setup process. Uninstall any previous SiRFLive version before current setup attempt.

2.4 Connect antenna assembly cable into RF input connector.

#### 2.5 Connect FTDI USB to UART cable between the Demo Board and the PC.



# **3. Evaluation Kit Essentials**

#### 3.1 Patch antenna

GPS patch antenna should be placed up towards the sky to keep GPS satellites in view.

#### 3.2 Tactile switch

The tactile switch is used to wake up to GPS module from the Hibernate state of one of the low power modes, typically for triggering Push-To-Fix (PTF<sup>™</sup>).



# **4. SiRFLive Essentials**

## 4.1 Linking with EVK

A. Open SiRFLive by clicking desktop icon

Power Vey Low SV Elev Azim State CNU CONU C	Aode: No Fix	X	COM1: Radar View	Image: Second state       Image: Secon			
	'ower:VeryLow ∿ Elev Azim State C/N0	Arg CNo: 0.0 dBH2 0 -5	EI-99	Postion Information Receiver Time: Latitude: HDDP: Number of SVs used	TOW: Week: Longitude: Speed: Mode:	Altitude: Heading:	
Auto Center	) COM1: Debug View						
Auto Center							

B. Press Receiver Settings button on the main toolbar

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C. Rx Port Settings window will open

3 Rx Port Settings	
Product Family: Rx N GSD4e EVK	Physical Connection
RS232 Port: 00M1 Baud Rate: 4800 Advanced Settings	Advance Settings Parity: None Stop Bits: One Data Bits: 8 Flow Control: Xon/Xoff Read Buffer: 8192
	OK Cancel

Select GSD4e in Product Family box.

Select RS232/USB for Physical Connection.

Select the Virtual COM port as assigned by the driver. Typically it would be the highest available.

Select 4800 for Baud Rate.

Press OK button when finished.



D. Press Connect button on the main toolbar

The NMEA messages will start bursting in Debug View window.

### 4.2 Switching Protocols

Extended functions like TTFF measurement are available after switching the receiver into OSP binary protocol.

A. Goto Receiver  $\rightarrow$  Command  $\rightarrow$  Switch Protocols

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: File	Receiver	Feature	s AGPS	Window	1	Help
0	-D- Conn	nect			R	🔲 🖲 🖼 🚸 🗠 🖻 🛃 🖌 🛛 😂 🖾
	Disco	onnect				
	View			•		
CC	Com	mand		•	Ŕ	Reset
Msq4	Navig	gation		•		Poll S/W Version
3-D 11	Plot [	Data		+		Poll Nav Parameters
Power	Set F	Reference L	.ocation			Poll Almanac
Src §	Auto	mation Tes	t	) - F		Poll Ephemeris
GPS 2	5 71.0	133.0 0	47.0			Switch Operating Mode
GPS 2	9 59.0 1 47.0	352.0 0 231.0 0	49.0			Switch Power Mode
GPS 1 GPS 0	2 37.0 5 31.0	133.U U 070.0 0	48.0			Switch Protocols
GPS 3 GPS 3	1 29.0 0 25.0	289.0 0 317.0 0	43.0			Set Almanac
GPS 1	8 09.0	182.0 0	39.0			Set Ephemeris
GPS 2	4 36.0	042.0 0	00.0			Set EE
						Set Debug Levels
D co	M4: Debu	a View SV	Marcion	Not date		Set DGPS
	1914: DEDU 7	ig view av	Version.	NOT GET		Set MEMS
: 10 D.						Set ABP •
						Low Power Commands Buffer
\$GPG5	57,3,1,10,25	0,71,133,47,2	9,59,352,49,	21,47,231,		IC Configure
SGPG5	5V,3,2,10,05 SV.3.3.10.02	0.31,070,40,3	1,29,289,43,3 4.36.042.*7E	30,25,317,		IC Peek/Poke
\$GPRN	AC.082846.	000, A, 3146.1	132,N,03511	.8179,E,0		Input Commands

B. Switch Protocols window will open

Switch Protocol	
Protocols © OSP © NMEA	Set Cancel
Update Rate (s) GGA: 1 GLL: 0 GSA: 1 GSA: 1 GSV: 5 RMC: 1 VTG: 0 VTG:	Baud Rate: 115200  ▼

Click Set button to transfer the EVK into OSP binary protocol @ 115,200 bps.



### 4.3 The TTFF Measurements

A. Press TTFF button of the main toolbar

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B. TTFF/Nav Accuracy window will open

K COM	14: TTFF/Nav Acc	curacy										×
🤅 🙋 Cur	rve Label	世 TTFF Sin	ice Reset	🔹 🤫 Color [	Red]	P 🗴 🖻						
	Reseti Reset Type	TTFF-Reset (s)	TTFF-Aiding (s)	TTFF-First Nav (s)	Horz Acc. (m)	Vert Acc. (m)	Time Error (ms)	Time Unc. (ms)	Freq Error (ppm)	Freq Unc. (ppm)	Aiding Flags	
•*												_
•												
Ref Loc	ation:Lab-SJ-Devo	on (37.3750615,-121	.9142445,-13.8)	Session Type:	Autonomous (2	25,6) Positior	n accuracy com	puted				

C. Click the Setup Reference Location button (for accuracy measurements)

•		•	•	•	
🛛 🗠 Curve Label	🗮 TTFF Since Reset	🝷 🤫 Color [Red]	P 🗶 🗵		

D. Set Reference Location window will open

3	Set Reference Location				×
	Reference Location				
	YourLocation	<ul> <li>Latitude</li> </ul>	31.7686109	Fix Pos	
		Longitude	35.1970284	]	
	Set as Default	Altitude	784		
	ОК	Car	ncel		

Select USER\_DEFINED under Reference Location.

Input location name.

Press Fix Pos button to use current position coordinate.

Press Set as Default button to use current location for position reference.

Press OK button when finished.



E. Press Reset button on the main toolbar.

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F. Reset window will open

:OM5: Reset	
Reference Location	
OriginGPS	Latitude 31.7686109 Fix Pos
	25.1070294
Clieck Position Accuracy	Longitude 135.1370204
Set as Default	Altitude 784
Config	AutoReply
Update with current fixed data	1
Desition	┛
	E. 414 - 1. H. 1211
× (m) -4304282	Tow 86400
7 (m) 3851642	Channels 12
Clock Drift (Hz) 75000	
Reset Mode	Messages
Hot Start	🗹 Enable Navlib Data
C Warm Start (Init)	Enable Development Data
C Cold Start	
C Factory Reset	Switch Protocol/Baud
C Factory (Clear XO learning)	Aiding on Factory
C Factory (Keep Flash/Eeprom data)	
Send	Cancel

Select Reset Mode.

Reset Modes are:

Hot Start - Ephemeris, Almanac, clock and last position data are kept in receiver's RAM.

Warm Start (No Init) – Ephemeris and last position data are discarded.

Warm Start (Init) - Ephemeris data is discarded, position data is loaded.

Cold Start – All data except reference Almanac is discarded.

Factory Reset – All data, including reference Almanac and power settings is discarded.

Factory (Clear XO learning) – Not relevant

Factory (Keep Flash/Eeprom data) – Not relevant

Check Enable Navlib Data box and Enable Development Data box.

Press Send button to start the procedure.

The EVK will perform reset sequence.



G. TTFF/Nav Accuracy window will show TTFF measurements data

ł	Reset;	Reset Type	TTFF-Reset (s) (avg: 16.15)	TTFF-Aiding (s) (avg: 16.15)	TTFF-First Nav (s) (avg: 16.15)	Horz Acc. (m) (avg: 3.91)	Vert Acc. (m) (avg. 4.75)	Time Error (ms)	Time Unc. (ms)	Freq Error (ppm)	Freq Unc. (ppm)	Aiding Flags
1	1	HOT	0.3	0.3	0.3	4.65	5.9	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x02
2	2	COLD	32.0	32.0	32.0	3.17	3.6	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0×02
							1		3			

## 4.4 Sequential TTFF Measurements - LOOPIT function

A. Goto Receiver  $\rightarrow$  Automation Test  $\rightarrow$  Loopit



B. Information pop-up window will open

Informati	ion	×
<b></b>	<ul> <li>**** For position accuracy evaluation, the reference location needs to be set correctly. To set reference location: Receiver&gt; Set Reference Location</li> <li>**** For AGPS test, AGPS parameters need to be set correctly. To set AGPS configuration: AGPS&gt; Configure</li> </ul>	
	Proceed? Yes No	

Press Yes button to continue.



C. Loopit window will open

🕅 Loopit			_ 🗆 ×
For Aided Resets (MSA/MSB) Remember to	o setup aiding param	neters in AGPS Configuration -> Configure	
Initialize reset paramters in Rx Commands -> F	Reset		
Number of DUT detected: 1			
COM5			
Reset Type     Iterations (-1 = Continuous)       HOT     10	Secs/Iteration	Allow Early Iteration Completion	
Switch Protocol/Baud on Factory			
	Start	Cancel	

Select the Reset Type

Set the number of iterations.

Checking Allow Early Iteration Completion box is an option to allow the next reset to be sent immediately after the previous cycle finish.

Leave Switch Protocol/Baud on Factory and Perform Aiding on Factory unchecked.

Press Start button to commence the procedure.

D. Log file pop-up window will open

- F - F			
Log File			×
i	COM5: Log GPS a	nd TTFF/Nav Acc	uracy data?
		Yes	No

Press Yes button to continue.

H. TTFF/Nav Accuracy window will show sequential TTFF measurements data

ve Labe	el	🖄 TTFF Since Reset 🔹 🥲 Color [Red] 👘 🗷 🖾									
Reset	Reset Type	TTFF-Reset (s) (avg: 0.33)	TTFF-Aiding (s) (avg. 0.33)	TTFF-First Nav (s) (avg: 0.33)	Horz Acc. (m) (avg: 4.12)	Vert Acc. (m) (avg: 4.52)	Time Error (ms)	Time Unc. (ms)	Freq Error (ppm)	Freq Unc. (ppm)	Aiding Flags
2	HOT	0.3	0.3	0.3	2.55	1,4	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
3	HOT	0.3	0.3	0.3	8.72	5.2	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
4	HOT	0.3	0.3	0.3	6.19	14.1	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
5	HOT	0.3	0.3	0.3	0.57	3.4	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0×0
6	HOT	0.3	0.3	0.3	2.27	2.8	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
7	HOT	0.3	0.3	0.3	1.28	2.3	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
8	HOT	0.3	0.3	0.3	5.98	0.4	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
9	HOT	0.3	0.3	0.3	9.92	8.1	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
10	HOT	0.3	0.3	0.3	3.57	6.9	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
11	HOT	0.6	0.6	0.6	6.99	14.2	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
12	HOT	0.3	0.3	0.3	2.39	3.0	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
13	HOT	0.3	0.3	0.3	1.21	1.0	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
14	HOT	0.3	0.3	0.3	1.12	6.2	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
15	HOT	0.3	0.3	0.3	7.20	0.3	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
16	HOT	0.3	0.3	0.3	3.94	4.0	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
17	HOT	0.3	0.3	0.3	6.15	5.0	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
18	HOT	0.3	0.3	0.3	8.36	0.6	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0
19	HOT	0.3	0.3	0.3	1.80	3.6	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0×0
20	нот	0.3	0.3	0.3	0.13	3.4	0.000000	Acc<1.0	0.000000	Acc<0.0039	00000010 (0x0)

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### 4.5 Data Logging

A. Press Log File button on the main toolbar

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B. Log File window will open



Prior to logging set the receiver to appropriate data protocol.

For NMEA messages log select TXT format in Log Format combo box.

The log file will be created with .TXT extension.

For OSP binary messages log select GPS format in Log Format combo box. The log file will be created with .GPS extension.

Press Start button to commence logging. Press Log File button while logging to stop the procedure.



### 4.6 Data Playback

A. Press Play File button on the main toolbar

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B. File browser will open

Select saved file.

C. File Playback Warning pop-up will open



Press Yes button to continue.

D. Navigate through recorded file with toolbar controls



E. View windows are selected via main toolbar



For extended support for SiRFLive software refer to the SiRF Live Manual on this CD.