

Talaria TWO™ (INP2045)

Ultra-Low Power Multi-Protocol Wireless Platform SoC IEEE 802.11 b/g/n, BLE 5.0

Quick Start Guide

Talaria TWO Evaluation Kit Release: 08-21-2024



Revision History

Version	Date	Comments
1.0	08-21-2024	First release.



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Terms & Definitions

AP	Access Point
API	Application Programming Interface
DTLA	Development Tool License Agreement
EVB	Evaluation Board
EVK	Evaluation Kit
MNDA	Mutual Non-Disclosure Agreement
SDK	Software Development Kit
UART	Universal Asynchronous Receiver/Transmitter
WPA	Wi-Fi Protected Access



Introduction

This document walks through the steps to quickly get started with the Talaria TWO evaluation kit (EVK). INP301x Talaria TWO evaluation board is designed as an evaluation platform for the INP101x modules.

INP301x Package Contents

The package contains:

- 1. INP3010/INP3011/INP3012/INP3013/INP3014/INP3015 Evaluation Board (EVB)
- 2. Micro USB cable
- 3. Antenna (INP3011/INP3012/INP3015 boards)
- 4. Battery box



INP3010 (Includes INP1010 Module w/ PCB Antenna)



INP3011 (Includes INP1011 Module w/ U.FL Connector)



INP3012 (Includes INP1012 Module w/ RF Pad)



INP3013 (Includes INP1013 Module w/ Ceramic Chip Antenna)



INP3014 (Includes INP1014 module with PCB Antenna)



INP3015 (Includes INP1015 module with SMA Antenna (External))

Figure 1: INP301x EVB-A Board with INP101x module board installed



Getting Started with EVK

Default Jumper Settings and Power Switch

Ensure the default jumper settings and power switch are as follows:

- 1. Jumper J4 and J9 included and installed on VM_3.3V and 3.3V of the EVB
- 2. U3 switch is on V_3.3V of the EVB

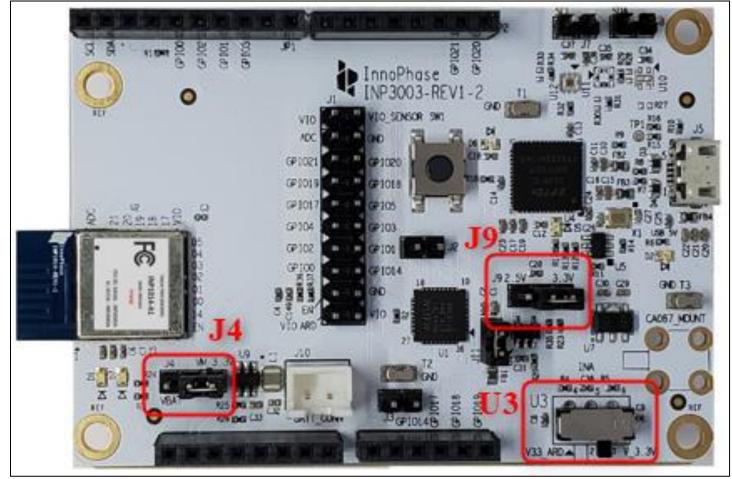


Figure 2: INP301x EVB-A control and connectivity points



Connect to the Talaria TWO Serial Port

Connect EVB to PC using the Micro USB Cable and check the USB serial ports from Device Manager. Four COM ports will be listed under Ports (COM & LPT) listing. The third COM port is the Host communication port & fourth COM port is the debug console logging port.

In this guide, we will interact with Talaria TWO UART interface using the Host communication port, by sending serial data (AT Commands).

🛃 Device Manager	-	×
File Action View Help		
> 🔤 Keyboards		
Mice and other pointing devices		
> 🛄 Monitors		
> 🖵 Network adapters		
Ports (COM & LPT)		1.1
💭 USB Serial Port (COM18)		- 8
USB Serial Port (COM19)		- 8
💭 USB Serial Port (COM20)		
USB Serial Port (COM21)		
> 🚍 Print queues		
> D Processors		

Figure 3: Serial ports on Device Manager

Configure the Serial Port

The default Talaria TWO UART configurations are as follows:

- 1. Baud Rate: 115200bps
- 2. Data: 8 bits
- 3. Parity: None
- 4. Stop bits: 1 bit
- 5. Flow Control: None



Using Teraterm serial terminal, select USB COM Port #20 (third COM port) and use the above serial port configurations. Connect to the Talaria TWO UART console.

COM20 - Tera	Term VT				_		×		
File Edit Setup	Control Window	Help							
	Terminal								
N N	Window	7	Tour Tours Coniclased and	•	1				~
F	Font	>	Tera Term: Serial port set	tup and connec	tion				×
	Keyboard		Dearte	01	ом20				_
	Serial port		Port:	00	JM20		<u>N</u> ew	setting [3])
	Proxy		Sp <u>e</u> ed:	11	5200	2			
	SSH			_					
	SSH Authentication		<u>D</u> ata:	8 k	bit	~	Ca	ancel	
	SSH Forwarding SSH KeyGenerator		P <u>a</u> rity:	no	ne	~			_
	TCP/IP		<u> </u>						
	General		<u>S</u> top bits:	11	bit	~	H	elp	
4	Additional settings		<u>F</u> low contro	d: no	ne	~			
S	Save setup								
F	Restore setup		Tra	ansmit del	ay				
S	Setup directory				-	0			
L	Load key map			0 ms	ec/ <u>c</u> har	0	msec/ <u>l</u> ine		
			Device Friend Device Instar Device Manu Provider Nan Driver Date: 7 Driver Versio	nce ID: FTI facturer: F ne: FTDI 7-5-2021	DIBUSIVIE TDI		(COM20) +PID_6011+10 ⁻	14-92 C\0000	

Figure 4: Teraterm serial terminal



Software Evaluation

The evaluation board is pre-loaded with AT commands application firmware. The subsequent sections demonstrate establishing Wi-Fi connection to an Access Point (AP) and Ping test execution using AT commands.

Establishing Wi-Fi Connection to an Access Point

Description

This use case demonstrates station mode configuration and connection to an Access Point configured with WPA/WPA2/WPA3 personal security.

Note: Skip the passphrase if it is an open AP.

Prerequisites

Access Point configured with any Layer2 (WPA/WPA2/WPA3 Personal) security.

AT Command Sequence

Command	Description
at	Check communication state
at+ver=?	Get current software version
at+wscan	Get list of APs available from the vicinity
at+wcon	Connect to a desired AP from the received scan results.
at+wstatus	Get the IP address of Talaria TWO to verify the connection is successful

Table 1: Wi-Fi connection - AT Commands

Procedure

Issue the following commands to check the AT interface, get current version of the firmware, scan the networks from the vicinity, connect to a desired AP of SSID "InnoPhaseIOT" and Passphrase "InnoIOT2024" in this example.

Check the IP address of the Talaria TWO module to verify whether the connection (Wi-Fi and DHCP) is successful.



Serial Log

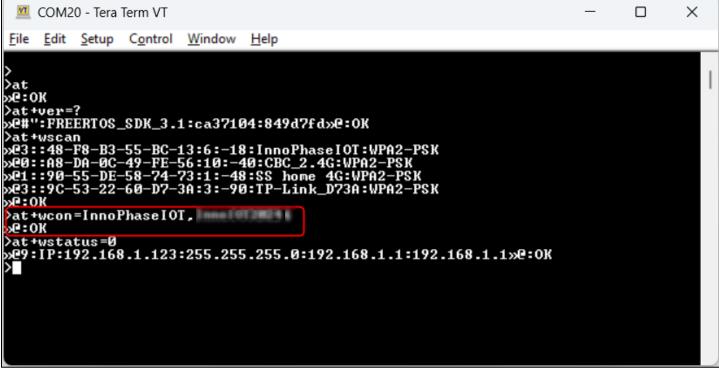


Figure 5: Wi-Fi connection – Serial log



Ping Test using AT commands

Description

This usecase demonstrates a ping operation to check connectivity. It uses at+nhost command.

Prerequisites

Access Point configured with any Layer2 (WPA/WPA2/WPA3) security.

AT Command Sequence

AT Command	Description				
at	Check communication state				
at+ver	Get software version				
at+wscan	Get list of available APs from the vicinity				
at+wcon	Connect to a desired AP from the received scan results."				
at+wstatus	Get IP address of Talaria TWO to verify the connection(L2+L3) is successful				
at+nhostipget	Get Host IP by Name				
at+nping	Connect to a desired AP from the received scan results				
Table 2: Ping - AT Commands					

Table 2: Ping - AT Commands

Procedure

Issue the following commands to check the AT interface is ready, get current version of the firmware, scan the network 'InnoPhaseIOT' (in this example), connect to 'InnoPhaseIOT'. Check the IP address of the Talaria TWO module to verify whether the connection (Wi-Fi, DHCP) is successful.

Issue AT+NHOSTIPGET to get the IP of the <u>www.google.com</u>. Ping <u>www.google.com</u> using the Host IP.



Serial Log

```
💴 COM32 - Tera Term VT
                                                                                                                     Х
File Edit Setup Control
                                 Window
                                             Help
                                                                                                                                  .
>at
≫@:OK
                                                                                                                                  >at+ver=?
»@#":FREERTOS_SDK_3.2:93597d2:14ce7e9»@:OK
>at+wscan=InnoPhaseIOT
»@F::E4-C3-2A-BF-6D-A3:1:-34:InnoPhaseIOT:WPA-PSK/WPA2-PSK Mixed Mode
»C:OK
>at+wcon=InnoPhaseIOT,InnoIOT2024
»C:OK
>at+wstatus=Ø
>>P:IP:192.168.0.108:255.255.255.0:192.168.0.1:192.168.0.1>>P:OK
>at+nhostipget=www.google.com
>>P:IPv4:142.250.141.104>>P:OK
>at+nping=142.250.141.104
>@4::Reply from 142.250.141.104
>@4::Reply from 142.250.141.104
>@4::Reply from 142.250.141.104
                                                   bytes=32 time=395ms
bytes=32 time=373ms
bytes=32 time=562ms
bytes=32 time=569ms
»@4::Reply from 142.250.141.104
»C:OK
>
```





Next Steps

InnoPhase IoT Customer Portal Registration

To download any InnoPhase IoT offered software development kits or evaluation kits, register on the customer portal.

1. Go to the InnoPhase website (<u>www.innophaseiot.com/Register</u>) and click on Register.



Figure 7: InnoPhase website

 Provide the appropriate details to register onto the InnoPhase Customer Portal.
 Note: InnoPhase requires the Mutual Non-Disclosure Agreement (MNDA) and Development Tool License Agreement (DTLA) to be signed prior to granting access to the Customer Portal.



3. On successfully registering for Customer Portal, the following screen will appear:

noPhase	оТ	Products $$	Solutions	Markets	Purchase	Company 🗸	
Welcome	Getting Started	Documentation	Software	Support			
Welcome	to the InnoPl	hase loT Custom	er Portal!				
		-		-		and develop products using Talaria TWO. It	t is also
intended to be	the main site for	logging technical suppo	ort requests as	we add future f	unctionality.		
Contents unde	r the Getting Star	r ted tab include details	on how to setu	up your environr	nent to program	various pre-compiled binaries onto the Tala	aria TWO EVK
hardware. The	binary application	ns allow for initial perfo	mance evalua	tions of Wi-Fi a	nd BLE commun	ication. Also included in this section is the [Download Tool
for programmi	ng and flashing T	alaria TWO.					
The Document	tation tab contain	s Talaria TWO related o	atasheets an	plication notes	valuation kit ha	rdware details and other reference files nee	ded for
	f your product ap		atasneets, app	511041101110103,1	.valuation kit ha	aware details and other reference files field	
The Talaria TW	/O Software Deve	lopment Kit (SDK) is sto	ored under the	Software tab. T	his includes the	current SDK version as well as previous rev	risions.
The Support ta	ab (under develop	ment) will be used for s	ending technic	cal questions, lo	gging support ti	ckets and getting answers to various techni	ical issues.
						ng information, software and support to ou	r customers.
There will be a	dditional tabs with	h new information as w	e continue to g	gather market fe	edback and gro	w our database of support information.	
Thank you for	being an InnoPha	se IoT customer!					
Sincerely,							
The InnoPh	ase loT Team	1					

Figure 8: Customer portal registration



4. Navigate to the Software Tab and download the appropriate software package(s):

Velcome Getting Started D	entation Software Support
SDK 3.2 Beta	
I-CUBE-T2-STW-src	July 26, 2024
I-CUBE-T2-STW-src.zip	
FreeRTOS_sdk_3.2	July 26, 2024
FreeRTOS_sdk_3.2.zip	
factory_loader	July 26, 2024
factory_loader.zip	
I-CUBE-T2-U5-Alpha-src_V1.2	July 26, 2024
I-CUBE-T2-U5-Alpha-src_V1.2.zip	
I-CUBE-T2-U5-Alpha-lib_V1.2	July 31, 2024
I-CUBE-T2-U5-Alpha-lib_V1.2.zip	
I-CUBE-T2-STW-lib	July 26, 2024
I-CUBE-T2-STW-lib.zip	
Release_Notes_SDK_3.2_Beta	July 26, 2024
Release_Notes_SDK_3.2_Beta.pdf	001/ 10, 2014
SDK 3.1 GA	
I-CUBE-T2-U5-Alpha-lib	May 24, 2024
I-CUBE-T2-U5-Alpha-src	May 24, 2024
I-CUBE-T2-STW-lib	May 24, 2024
I-CUBE-T2-STW-src	May 24, 2024
FreeRTOS_sdk_3.1	May 24, 2024
Release_Notes_SDK_3.1	May 24, 2024
Release_Notes_SDK_3.1.pdf	
factory_loader	May 24, 2024

Figure 9: Software tab

Note: For information on flashing Talaria TWO with the AT command application (atcmds.elf) using the PC Tool provided by InnoPhase IoT, Inc. (Download Tool), see section – *Set-up* & *Usage* of the document – UseCases_AT_Commands.pdf (*freertos_sdk_x.y\bin\product\at\doc*).



References

Document	SDK Package Path	Description
SDK_Quick_Reference_Guide	sdk_3.x\	Provides overview of SDK contents, reference apps, solutions available and so on with the SDK Package
UG_Evaluation_Board	\doc\user_guides\u g_evb_a	 For Evaluation Board: Description Hardware setup Jumper settings Component description Board specifications Pin outs
UG_AT_Commands	\bin\product\at\doc	Detailed description of every AT command.
Usecases_AT_Commands	\bin\product\at\doc	Sequence of AT commands to achieve a specific task or function
UG_Download_Tool	\pc_tools\Downloa d_Tool\doc	For details on programming the module.
UG_MPD_Demo_Tool_Part_1_Overview UG_MPD_Demo_Tool_Part_2_MPD_Modes UG_MPD_Demo_Tool_Part_3_iPerf3_and_Scan	\doc\user_guides\u g_mpd_too	MPD (Multipurpose Demo) GUI tool that enables quick evaluation of power consumption under various protocol scenarios (such as TCP, UDP, HTTP etc.) and throughput performances of Talaria TWO modules
UG_Matter	\doc\user_guides\u g_matter	InnoPhase IoT's Talaria TWO is a Matter v1.2 certified Wi-Fi module that can be used to build Matter certified smart home products.
T2_Dual-Stack_Solution_Programmers_Guide	solutions\dual_stac k\doc	Hosted Wi-Fi solution works with high performance Linux based host processor

Table 3: Reference documents



Support

- 1. Sales Support: Contact an InnoPhase IoT sales representative via email sales@innophaseiot.com
- 2. Technical Support:
 - a. Visit: <u>https://innophaseiot.com/contact/</u>
 - b. Also Visit: https://innophaseiot.com/talaria-two-modules/
 - c. Contact: support@innophaseiot.com

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