Talaria TWO™ INP101x

Multi-Protocol Wireless Modules

Integrated Communications & Control for Ultra-Energy Efficient IoT Nodes

The Talaria TWO modules are complete solutions with integrated wireless connectivity plus microcontroller for edge-of-network IoT designs. They incorporate the award-winning Talaria TWO Multi-Protocol System on Chip (SoC) with Wi-Fi and BLE5 for wireless data transfer, an embedded Arm Cortex-M3 for system control and user applications plus advanced security elements for device safeguards.

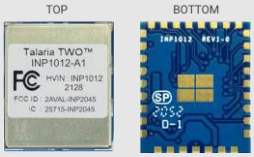
The Talaria TWO's unique digital polar radio architecture makes the modules the world's lowest power Wi-Fi solution. It also provides BLE connectivity for Wi-Fi provisioning, diagnostics and other local communication. The smaller module sizes and antenna options of the INP1012/13/14/15 enable integration into compact designs such as smart door locks, remote security cameras, connected sensors or other space-constrained products. All modules include Wi-Fi Alliance, Bluetooth SIG, FCC, IC (Canada), and CE certification.

Antenna Options:

- **INP1010 & INP1014 – PCB Antenna (PIFA)**
- **INP1011 & INP1015 – U.FL Antenna Connector**
- **INP1012 – RF Pad**

Ultra-Low Power Wireless Modules
New Smaller Sizes & Antenna Options

INP1010 **INP1011**
(21.6mm x 19.1mm x 2.5mm)



INP1012
(15.0mm x 12.8mm x 2.5mm)

INP1013
(20.0mm x 12.8mm x 3.08mm)

INP1014
(20.0mm x 12.8mm x 2.5mm)

INP1015
(17.0mm x 12.8mm x 2.5mm)

Ultra-Low Power

Industry's lowest Wi-Fi power consumption enables battery-based cloud-connected IoT products

Superior Integration

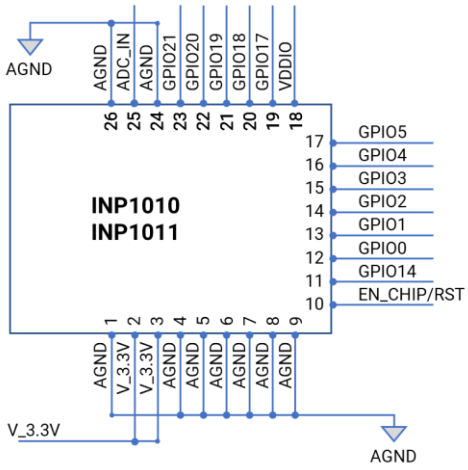
Complete module solutions with new smaller footprint options and various antenna configurations

Maximum Flexibility

Programmable radio protocols can be easily changed within microseconds through software APIs

InnoPhase IoT, Inc.
2870 Zanker Road, Suite 200,
San Jose, CA 95134
innophaseiot.com

INP1010/INP1011 I/O Diagram



Features

- **Fully Integrated Module Including All Required Clocks & Passives**
- **Agency and Standards Certifications**
- **Hostless Operation Using Internal Arm Cortex-M3, or Connect to a Host MCU Through UART/SPI Ports**
- **Eleven (11) Configurable GPIO Ports + Console Port (GPIO17)**
- **Ultra-Low Power Wi-Fi Connectivity**
- **BLE5.0 with Advanced Features**
- **Full SDK Environment for Application Development**
- **Arduino Compatible EVB Available for Evaluation**

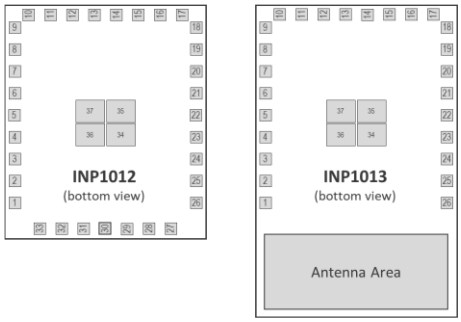
INP1010 & INP1011 Product Specifications

Wi-Fi Technology	802.11 b/g/n, up to MCS7 Single-stream (1x1)
Bluetooth Technology	BLE 5.0 w/ Advanced Features: 2Mbps PHY, LE Coding (Long-Range), Extended Advertising
Frequency Band	2.4GHz
Application Processor	Arm Cortex-M3, 80MHz
Embedded Memory	512KB SRAM, 2MB Flash
Host Interface Options	UART, SPI (slave)
Peripherals	GPIO, 10-bit SAR ADC, PWM, PDM, SPI (slave & master), UART JTAG, I2C, and I2S
Hardware Based Security	PUF (Physically Unclonable Function), Crypto Engines, Secure Boot
WiFi Active Mode Power/Performance (@ 3.3V)	TX Current Consumption/Output Power 802.11b DSSS 1 Mbps 178 mA (+17.5 dBm) 802.11g OFDM 54 Mbps 100 mA (+15.5 dBm) 802.11n OFDM 65 Mbps MCS7 81 mA (+12.5 dBm) RX Current Consumption/Sensitivity 802.11b DSSS 1Mbps 31 mA (-96 dBm)
WiFi Power Save Mode 802.11b, 1 Mbps (Clean Environment, @ 3.3V)	150 µA (DTIM = 3) 97 µA (DTIM = 5) 57 µA (DTIM = 10)
BLE Active Mode Consumption (@ 3.3V, 2Mbps)	30 mA RX 27 mA TX (0dBm), 38mA TX (+10dBm)
Deep Sleep Mode (@ 3.3V)	19µA (RTC, memory retained)
Temperature Range	-40°C to +85°C
Antenna	INP1010: PCB Antenna INP1011: U.FL Connector
Packaging Information	21.6mm x 19.1mm x 2.5mm (height includes shield, both INP1010 & INP1011) 26 Castellated Pins

InnoPhase IoT, Inc.
2870 Zanker Road, Suite 200,
San Jose, CA 95134
innophaseiot.com

PRODUCT BRIEF – Talaria TWO™ Modules

INP1012/INP1013 Pin Diagram



PIN TABLE	GND	GND (RF)	RFIO (Ant.)	V_3.3V	EN_CHIP	VDDIO	ADC_IN	GPIO14	GPIO0	GPIO1	GPIO2	GPIO3	GPIO4	GPIO5	GPIO17	GPIO18	GPIO19	GPIO20	GPIO21
INP1012	1,4,5,6,7, 8,9,24,26, 34,35,36,37	27,28,29, 31,32,33	30	2,3	10	18	25	11	12	13	14	15	16	17	19	20	21	22	23
INP1013		N/A	N/A																

Features

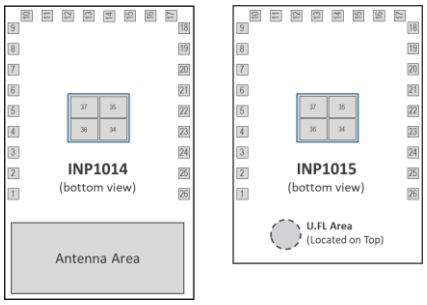
- **Fully Integrated Module in a Smaller, More Compact Footprint**
- **Agency and Standards Certifications**
- **Hostless Operation Using Internal Arm Cortex-M3, or Connect to a Host MCU Through UART/SPI Ports**
- **Eleven (11) Configurable GPIO Ports + Console Port (GPIO17)**
- **Ultra-Low Power Wi-Fi Connectivity**
- **BLE5.0 with Advanced Features**
- **Full SDK Environment for Application Development**
- **Arduino Compatible EVB Available for Evaluation**

INP1012 & INP1013 Product Specifications

Wi-Fi Technology	802.11 b/g/n, up to MCS7 Single-stream (1x1)
Bluetooth Technology	BLE 5.0 w/ Advanced Features: 2Mbps PHY, LE Coding (Long-Range), Extended Advertising
Frequency Band	2.4GHz
Application Processor	Arm Cortex-M3, 80MHz
Embedded Memory	512KB SRAM, 2MB Flash
Host Interface Options	UART, SPI (slave)
Peripherals	GPIO, 10-bit SAR ADC, PWM, PDM, SPI (slave & master), UART JTAG, I2C, and I2S
Hardware Based Security	PUF (Physically Unclonable Function), Crypto Engines, Secure Boot
WiFi Active Mode Power/Performance (@ 3.3V)	TX Current Consumption/Output Power 802.11b DSSS 1 Mbps 178 mA (+17.5 dBm) 802.11g OFDM 54 Mbps 100 mA (+15.5 dBm) 802.11n OFDM 65 Mbps MCS7 81 mA (+12.5 dBm) RX Current Consumption/Sensitivity 802.11b DSSS 1Mbps 31 mA (-96 dBm)
WiFi Power Save Mode 802.11b, 1 Mbps (Clean Environment, @ 3.3V)	150 µA (DTIM = 3) 97 µA (DTIM = 5) 57 µA (DTIM = 10)
BLE Active Mode Consumption (@ 3.3V, 2Mbps)	30 mA RX 27 mA TX (0dBm), 38mA TX (+10dBm)
Deep Sleep Mode (@ 3.3V)	19µA (RTC, memory retained)
Temperature Range	-40°C to +85°C
Antenna	INP1012: RF Pad INP1013: Ceramic Chip-Antenna
Packaging Information	INP1012: 12.8mm x 15.0mm x 2.5mm (height includes shield), LGA Pads INP1013: 12.8mm x 20.0mm x 2.5mm (@ shield) / 3.1mm (@ antenna), LGA Pads

InnoPhase IoT, Inc.
2870 Zanker Road, Suite 200,
San Jose, CA 95134
innophaseiot.com

INP1014/INP1015 Pin Diagram



PIN TABLE	GND	GND (RF)	RFIO (Ant.)	V_3.3V	EN_CHIP	VDDIO	ADC_IN	GPIO14	GPIO0	GPIO1	GPIO2	GPIO3	GPIO4	GPIO5	GPIO17	GPIO18	GPIO19	GPIO20	GPIO21
INP1014	1,4,5,6,7, 8,9,24,26, 34,35,36,37	N/A	N/A	2,3	10	18	25	11	12	13	14	15	16	17	19	20	21	22	23
INP1015		N/A	N/A																

INP1014/1015 Features

- **Fully Integrated Module in a Smaller, More Compact Footprint**
- **Agency and Standards Certifications**
- **Hostless Operation Using Internal Arm Cortex-M3, or Connect to a Host MCU Through UART/SPI Ports**
- **Eleven (11) Configurable GPIO Ports + Console Port (GPIO17)**
- **Ultra-Low Power Wi-Fi Connectivity**
- **BLE5.0 with Advanced Features**
- **Full SDK Environment for Application Development**
- **Arduino Compatible EVB Available for Evaluation**

INP1014 & INP1015 Product Specifications

Wi-Fi Technology	802.11 b/g/n, up to MCS7 Single-stream (1x1)
Bluetooth Technology	BLE 5.0 w/ Advanced Features: 2Mbps PHY, LE Coding (Long-Range), Extended Advertising
Frequency Band	2.4GHz
Application Processor	Arm Cortex-M3, 80MHz
Embedded Memory	512KB SRAM, 2MB Flash
Host Interface Options	UART, SPI (slave)
Peripherals	GPIO, 10-bit SAR ADC, PWM, PDM, SPI (slave & master), UART JTAG, I2C, and I2S
Hardware Based Security	PUF (Physically Unclonable Function), Crypto Engines, Secure Boot
WiFi Active Mode Power/Performance (@ 3.3V)	TX Current Consumption/Output Power 802.11b DSSS 1 Mbps 178 mA (+17.5 dBm) 802.11g OFDM 54 Mbps 100 mA (+15.5 dBm) 802.11n OFDM 65 Mbps MCS7 81 mA (+12.5 dBm) RX Current Consumption/Sensitivity 802.11b DSSS 1Mbps 31 mA (-96 dBm)
WiFi Power Save Mode 802.11b, 1 Mbps (Clean Environment, @ 3.3V)	150 µA (DTIM = 3) 97 µA (DTIM = 5) 57 µA (DTIM = 10)
BLE Active Mode Consumption (@ 3.3V, 2Mbps)	30 mA RX 27 mA TX (0dBm), 38mA TX (+10dBm)
Deep Sleep Mode (@ 3.3V)	19µA (RTC, memory retained)
Temperature Range	-40°C to +85°C
Antenna	INP1014: PCB Antenna INP1015: U.FL Antenna Connector
Packaging Information	INP1014: 12.8mm x 20.0mm x 2.5mm (height includes shield), LGA Pads INP1015: 12.8mm x 17.0mm x 2.5mm (height includes shield), LGA Pads

InnoPhase IoT, Inc.
2870 Zanker Road, Suite 200,
San Jose, CA 95134
innophaseiot.com