

**Pitney Bowes Android Based User
Interface (PB AB UI)
User Manual**

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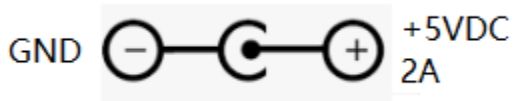
Component Overview

Pitney Bowes Android Based User Interface (PB AB UI) Characteristics

Requirements	Conditions
Operating Temperature	+10° C to +50° C (50° F to 122° F)
Operating Voltage	5 Volts DC
Operating Current	2A max @ 5V

Connector Pinouts

2-pin Barrel DC Jack



5-pin Micro USB Connector

Pin #	Function
1	VUSB
2	D-
3	D+
4	ID
5	GND

The PB AB UI unit has no user-serviceable parts. The device is for the printer using only. Proper recycling or disposal per local law is required for all components of the PB AB UI.

FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in an industrial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20cm between the radiator & your body.

Note: The country code selection is for non-US model only and is not available to all US model. Per FCC regulation, all WiFi product marketed in US must be fixed to US operation channels only.

IC Compliance Statement

This device complies with ISED's licence-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Caution :

(i) the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

(ii) where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the E.I.R.P. elevation mask requirement set forth in section 6.2.2.3 shall be clearly indicated.

Avertissement:

Le guide d'utilisation des dispositifs pour réseaux locaux doit inclure des instructions précises sur les restrictions susmentionnées, notamment :

(i) les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

(ii) lorsqu'il y a lieu, les types d'antennes (s'il y en a plusieurs), les numéros de modèle de l'antenne et les pires angles d'inclinaison nécessaires pour rester conforme à l'exigence de la P.I.R.E. applicable au masque d'élévation, énoncée à la section 6.2.2.3, doivent être clairement indiqués

Radiation Exposure Statement:

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment must be installed and operated with greater than 20cm between the radiator & your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à plus de 20 cm entre le radiateur et votre corps.

CE Compliance Statement

This device complies with *Directive 2014/53/EU* issued by the Commission of the European Community.

A minimum separation distance of **20 cm** must be maintained between the user's body and the device, including the antenna during body-worn operation to comply with the RF exposure requirements in Europe.

- Frequency bands and Powers

Frequency band(s) in which the radio equipment operates and transmission power:

Wifi:

2.4 GHz receiver specifications

Parameter	Description	Min.	Typ.	Max.	Unit
Frequency Range		2,412	-	2,484	MHz
Rx sensitivity	1 Mbps DSSS		-98		dBm
	2 Mbps DSSS		-94.5		dBm
	5.5 Mbps DSSS		-92		dBm
	11 Mbps DSSS		-89.5		dBm
Rx sensitivity	6 Mbps OFDM		-93.5		dBm
	9 Mbps OFDM		-91.5		dBm
	12 Mbps OFDM		-90.5		dBm
	18 Mbps OFDM		-88		dBm
	24 Mbps OFDM		-85		dBm
	36 Mbps OFDM		-81		dBm
	48 Mbps OFDM		-77.5		dBm
54 Mbps OFDM		-76.5		dBm	
Rx sensitivity BW = 20MHz Green field 800 ns guard interval Non-STBC	MCS 0		-93		dBm
	MCS 1		-89.5		dBm
	MCS 2		-87.5		dBm
	MCS 3		-84.5		dBm
	MCS 4		-81.5		dBm
	MCS 5		-77		dBm
	MCS 6		-75.5		dBm
	MCS 7		-74		dBm

Rx sensitivity BW = 40MHz Green field 800 ns guard interval Non-STBC	MCS 0		-90		dBm
	MCS 1		-86.5		dBm
	MCS 2		-84.5		dBm
	MCS 3		-81.5		dBm
	MCS 4		-78.5		dBm
	MCS 5		-74		dBm
	MCS 6		-72.5		dBm
	MCS 7		-70.5		dBm
Maximum receive level	11 Mbps DSSS			-5.5	dBm
	6 Mbps OFDM			-10.5	dBm
	54 Mbps OFDM			-10.5	dBm
	MCS 0			-10.5	dBm
	MCS 7			-10.5	dBm
Adjacent channel rejection (30 MHz offset)	1 Mbps DSSS			41.5	dB
Adjacent channel rejection (25 MHz offset)	11 Mbps DSSS			41.5	dB
Adjacent channel rejection (25 MHz offset)	6 Mbps OFDM			38.5	dB
	54 Mbps OFDM			26.5	dB
Adjacent channel rejection (25 MHz offset), BW = 20 MHz	MCS 0			34.5	dB
	MCS 7			10.5	dB
Adjacent channel rejection (40 MHz offset), BW = 40 MHz	MCS 0			26.5	dB
	MCS 7			4.5	dB

2.4 GHz transmitter specifications

Parameter	Description	Min.	Typ.	Max.	Unit
Frequency Range		2,412	-	2,484	MHz
Output power VBAT = 3.6V	802.11b, 1~11 Mbps DSSS		20		dBm
	802.11g, 6~54 Mbps OFDM		17.5		dBm
	802.11n, HT20 MCS0~4		18		dBm
	802.11n, HT20 MCS7		17		dBm
	802.11n, HT40 MCS7		16		dBm
EVM	802.11b, 1~11 Mbps DSSS @Pout = 18 dBm		25		%
	802.11b, 6~54 Mbps OFDM @Pout = 15.5 dBm		-31		dB
	802.11n, HT20 MCS0~7 @Pout = 15 dBm		-31		dB
	802.11n, HT40 MCS0~7 @Pout = 14 dBm		-31		dB
Tx power accuracy	-40~85°C, 2~18 dBm			±1.5	dB
Transmitted power (Data rate = 1M, Pout = 20 dBm)	76~108 MHz			-146.5	dBm/Hz
	776~794 MHz			-145.5	dBm/Hz
	869~960 MHz			-146.5	dBm/Hz
	925~960 MHz			-146.5	dBm/Hz
	1,570~1,580 MHz			-146.5	dBm/Hz
	1,805~1,880 MHz			-145.5	dBm/Hz
	1,930~1,990 MHz			-143.5	dBm/Hz
	2,110~2,170 MHz			-136.5	dBm/Hz
Harmonic output power (Data rate = 1M, Pout = 20 dBm)	2 nd harmonic			-21	dBm/MHz
	3 rd harmonic			-28	dBm/MHz

5 GHz receiver specifications

Parameter	Description	Min.	Typ.	Max.	Unit
Frequency Range		4,915	-	5,925	MHz
Rx sensitivity	6 Mbps OFDM		-93.5		dBm
	9 Mbps OFDM		-92		dBm
	12 Mbps OFDM		-91		dBm
	18 Mbps OFDM		-88.5		dBm
	24 Mbps OFDM		-85.5		dBm
	36 Mbps OFDM		-81.5		dBm
	48 Mbps OFDM		-78		dBm
	54 Mbps OFDM		-76.5		dBm
Rx sensitivity BW = 20 MHz Green field 800 ns guard interval Non-STBC (HT20/VHT20)	MCS 0		-93.5		dBm
	MCS 1		-90		dBm
	MCS 2		-88		dBm
	MCS 3		-85		dBm
	MCS 4		-82		dBm
	MCS 5		-77.5		dBm
	MCS 6		-76		dBm
	MCS 7		-74.5		dBm
	MCS 8		-70		dBm
Rx sensitivity BW = 40 MHz Green field 800 ns guard interval Non-STBC (HT40/VHT40)	MCS 0		-90.5		dBm
	MCS 1		-87		dBm
	MCS 2		-85		dBm
	MCS 3		-82		dBm
	MCS 4		-79		dBm
	MCS 5		-74.5		dBm
	MCS 6		-73		dBm
	MCS 7		-71		dBm
	MCS 8		-66.5		dBm
	MCS 9		-65		dBm

Rx sensitivity BW = 80 MHz Green field 800 ns guard interval Non-STBC (VHT80)	MCS 0		-87.5		dBm
	MCS 1		-84		dBm
	MCS 2		-81.5		dBm
	MCS 3		-78.5		dBm
	MCS 4		-75.5		dBm
	MCS 5		-70.5		dBm
	MCS 6		-69		dBm
	MCS 7		-68		dBm
	MCS 8		-63.5		dBm
	MCS 9		-62		dBm
Maximum receive level	6 Mbps OFDM		-11		dBm
	54 Mbps OFDM		-16		dBm
	MCS 0		-16		dBm
	MCS 9		-16		dBm
Adjacent channel rejection (25 MHz offset)	6 Mbps OFDM			24	dB
	54 Mbps OFDM			6	dB
Adjacent channel rejection (25 MHz offset), BW = 20 MHz	MCS 0			23	dB
	MCS 8			0	dB
Adjacent channel rejection (40 MHz offset), BW = 40 MHz	MCS 0			23	dB
	MCS 9			2	dB
Adjacent channel rejection (80 MHz offset), BW = 80 MHz	MCS 0			23	dB
	MCS 9			2	dB

5 GHz transmitter specifications

Parameter	Description	Min.	Typ.	Max.	Unit
Frequency Range		4,900	-	5,950	MHz
Output power VBAT = 3.6V Spectral mask and EVM compliance	802.11a, 6~54 Mbps OFDM		17		dBm
	802.11n, HT20 MCS0~7		16		dBm
	802.11n, HT40 MCS0~7		16		dBm
	802.11ac, VHT20 MCS8		15.5		dBm
	802.11ac, VHT40 MCS9		15		dBm
	802.11ac, VHT80 MCS9		15		dBm
EVM	802.11g, 6~54 Mbps OFDM @Pout = 15 dBm		-31		dB
	802.11n, HT20 MCS0~7 @Pout = 14 dBm		-31		dB
	802.11n, HT40 MCS0~7 @Pout = 14 dBm		-31		dB
	802.11ac, VHT20 MCS8 @Pout = 13.5 dBm		-33		dB
	802.11ac, VHT40 MCS9 @Pout = 13 dBm		-33		dB
	802.11ac, VHT80 MCS9 @Pout = 13 dBm		-33		dB
Tx power accuracy	-40~85°C, 2~18 dBm			±1.5	dB
Transmitted power (Data rate = 54M, Pout = 17 dBm)	76~108 MHz			-149	dBm/Hz
	776~794 MHz			-149	dBm/Hz
	869~960 MHz			-149	dBm/Hz
	925~960 MHz			-149	dBm/Hz
	1,570~1,580 MHz			-149	dBm/Hz
	1,805~1,880 MHz			-149	dBm/Hz
	1,930~1,990 MHz			-149	dBm/Hz
2,110~2,170 MHz			-149	dBm/Hz	
Harmonic output power (Data rate = 6M, Pout = 17 dBm)	2 nd harmonic			-16	dBm/MHz
	3 rd harmonic			-22	dBm/MHz

Bluetooth:

Bluetooth LE receiver specifications

Parameter	Description	Min.	Typ.	Max.	Unit
Frequency Range		2,402	-	2,480	MHz
Rx sensitivity (*)	PER < 30.8%		-97	-70	dBm
Max. usable signal	PER < 30.8%	-10	-5.5		dBm
C/I co-channel	Co-channel selectivity (PER < 30.8%)		2.5	21	dB
C/I 1 MHz	Adjacent channel selectivity (PER < 30.8%)		-13.5	15	dB
C/I 2 MHz	2 nd adjacent channel selectivity (PER < 30.8%)		-31.5	-17	dB
C/I ≥ 3 MHz	3 rd adjacent channel selectivity (PER < 30.8%)		-34.5	-27	dB
C/I image channel	Image channel selectivity (PER < 30.8%)		-26.5	-9	dB
C/I image 1 MHz	1 MHz adjacent to image channel selectivity (PER < 30.8%)		-36.5	-15	dB
Out-of-band blocking	30~2,000 MHz			-30	dBm
	2,001~2,339 MHz			-35	dBm
	2,501~0,000 MHz			-35	dBm
	3,001~12.75 MHz			-30	dBm

Bluetooth LE transmitter specifications

Parameter	Description	Min.	Typ.	Max.	Unit
Frequency Range		2,402	-	2,480	MHz
Output power (*)	Power output level	-20	1.5	6	dBm
Carrier frequency offset and drift	Frequency offset	-150	-2	150	kHz
	Frequency drift	-50	2	50	kHz
	Max. drift rate	-20	3	20	Hz/us
Modulation characteristics	$\Delta f_{1_{avg}}$	225	251	275	kHz
	$\Delta f_{2_{max}}$ (for at least 99% of all $\Delta f_{2_{max}}$)	185	215		kHz
	$\Delta f_{2_{avg}} / \Delta f_{1_{avg}}$	0.8	0.88		
In-band spurious emission	±2 M offset		-48.5	-20	dBm
	>±3 M offset		-52.5	-30	dBm

- **WLAN 5GHz:**

Operations in the 5.15-5.35GHz band are restricted to indoor usage for all countries.

- **For single module:**

In all cases assessment of the final product must be mass against the Essential requirements of the [Directive 2014/53/EU](#) Articles 3.1(a) and (b), safety and EMC respectively, as well as any relevant Article 3.2 requirements.

Installation Planning

Safety, Reliability, and Accessibility

- Use eye protection when performing work that may be hazardous to the eyes.
- Use ear protection in noisy work areas.
- Wear appropriate clothing/uniforms and safety shoes.
- Install equipment so it will not cause damage to the surroundings or work loose over time.
- Make sure there are no loose components/cables and no unsecured components.
- Route all cables away from hot or abrasive areas.
- Choose installation locations where components can be easily serviced.
- Choose installation locations where components are safe from tampering and damage

IMPORTANT SAFETY INFORMATION

WARNING

Do not locate the product where it obstructs corridors, entrances or exits, access to necessities like fire extinguishers, firehose, first aid kits, etc. or may cause people to trip and fall and creates a safety hazard. Follow all laws and regulations governing the placement of equipment.

DO locate the product where:

- it can be safely installed to minimize any vibration and sustain the weight of the product.
- the mounting surface is strong enough to support the mounting hardware.
- the mounting surface is flat.
- it does not block the view of people of the area or room.
- the surrounding area is clear of fire extinguishers, firehose, first aid kits.
- it does not block access to any other area.
- it does not interfere with anyone entering or exiting the area.
- it is not likely to impact the user in case of a fall or collision.

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DO NOT locate the Product where it:

- obstructs a person’s field of vision of the place.
- obstructs people walking or accessing certain items.
- blocks the deployment of a fire extinguisher, firehose, first aid kit, etc.

Additional information for selecting an installation location:

- Installations should comply with all applicable federal and state laws and regulations regarding
- Consider the user’s preference in selecting the installation location and whether there is a team or a single user.
- Once a suitable location is selected, verify that there is nothing behind the mounting surface that might be used during an emergency and might be obstructed from reaching it.

WARNING

Excess cable can be a tripping hazard. Ensure cable is not draped where it will interfere with either the user or passer-by when they are near the device.
