THE WAND COMPANY LTD.

Integration manual

PC-010 Bluetooth® speakerphone module

Operation and integration instructions

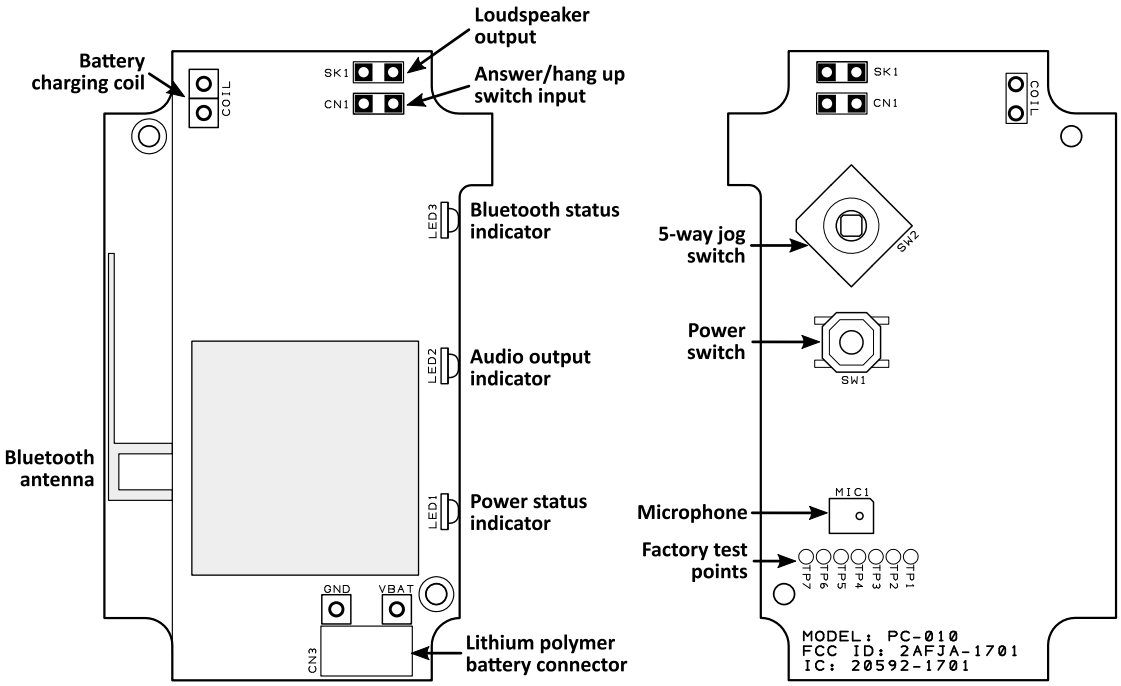
General description

PC-010 is a simple-to-integrate module for adding Bluetooth speakerphone functionality to a product, based on the CSR8615 single-chip Bluetooth solution. The module was originally designed for The Wand Company's Star Trek Communicator prop replica but can also be used to enable Bluetooth functionality in other products.

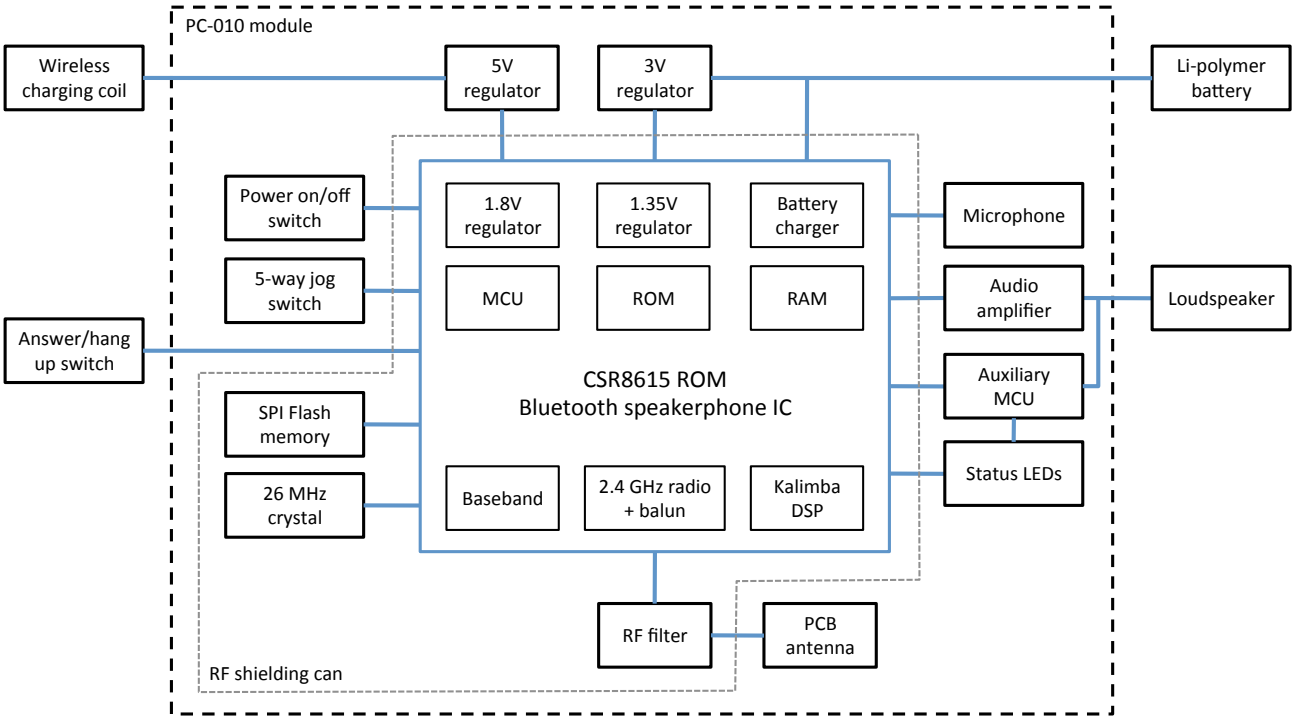
Features

- Bluetooth v2.1 + EDR
- Supports Headset Profile (HSP), Hands-free Profile (HFP) and Audio Streaming (A2DP)
- Integrated inverted-F PCB antenna
- Powered by lithium polymer battery
- Integrated wireless power receiver for recharging battery
- Built-in MEMS microphone and loudspeaker amplifier

Outline diagram



1 Block diagram



2 Operation

2.1 Powering up and down

To power up the module, press and hold the power switch (SW1) until the power up sound is heard. When the module is powered up and is not connected with another Bluetooth device, the power status indicator (LED1) flashes green. When the module is connected with another Bluetooth device, the Bluetooth status indicator (LED3) double-flashes blue.

When the battery needs recharging, the power status indicator (LED1) glows red.

Press and hold the power switch (SW1) to power down the module. When powering down, the power status indicator (LED1) will glow red briefly and the power-down sound will be heard.

2.2 Pairing

To pair and connect the module with a mobile phone:

- Power up the module.
- Activate Bluetooth on the mobile phone.
- Press and hold the 5-way jog switch (SW2) until the module says “waiting for Bluetooth connection”, and LED1 and LED3 alternately flash green and blue.
- Make sure the mobile phone is searching for Bluetooth devices.
- Within 60 seconds the mobile phone should show “TWC Communicator” in its list of available devices.
- Select “TWC Communicator” from the list.
- Once the module is paired it will emit a short high-pitched tone and say, “Connected”.
- The Bluetooth status indicator (LED3) will double flash blue while the module is connected.

Typically the module’s Bluetooth radio will work with a range of up to five metres. The housing into which it is assembled, atmospheric conditions and other dense solid objects (such as walls) can reduce this range. If the module moves out of range of the device it is paired with, then the connection will be broken. However, the module and the other device will not forget their pairing and as soon as they move back within range of each other they will automatically reconnect.

2.3 Volume control

Whilst paired, the volume of the module's speaker may be adjusted by pushing and holding the 5-way jog switch (SW2) up or down. A low beep is played for each volume step and a higher beep is heard when the volume is at its maximum or minimum setting.

2.4 Receiving a call

Once the module has been paired with and is connected to a mobile phone, it can receive calls made from other phones to that mobile phone. When a call is coming in, if the answer/hang up switch contacts (CN1) are closed, opening the switch will answer the call. If the answer/hang up switch is already open then the call may be answered by a short press of the 5-way jog switch (SW2).

The incoming call may be rejected by a long press of the 5-way jog switch (SW2) or by closing the answer/hang up switch (CN1).

The module is not intended to be held close to the ear whilst making a call and therefore cannot be used to make private telephone conversations: it is designed to be used only in speakerphone mode. If privacy is required, a call that has been answered on the module may be transferred to the mobile phone by pressing and holding the 5-way jog switch (SW2) during the call.

2.5 Making a call

The module does not have a numerical key pad or graphical display, so calls may only be initiated via the module if it is paired with and connected to a mobile phone that supports voice dialling from a hands-free Bluetooth handset, or by using the 'last number redial' function (see below).

To make a call, single click the 5-way jog switch (SW2) to initiate voice dialling. Once voice dialling is initiated the module will play speech prompts and confirmation tones from the mobile phone through the module's speaker and the mobile phone will use the module's microphone. (For some phones, an internet connection is required for voice dialling.)

2.6 Ending a call

To end a call, close the answer/hang up switch (CN1) or single click the 5-way jog switch (SW2).

2.7 Last number redial

Press and hold the 5-way jog switch (SW2) for last number redial.

2.8 Playing music

When the module is paired with and connected to a device capable of streaming music, it can act as a wireless Bluetooth speaker. Remember that the module speaker is relatively small and therefore the music will not be as loud or as rich as that played through a dedicated Bluetooth speaker designed purely for playing music.

To play music, double click the 5-way jog switch (SW2). If music doesn't start playing automatically, browse to the music on the music player and select play. Once the music is playing through the module, double clicking the 5-way jog switch (SW2) will pause or play the music.

While playing music, jogging right and left on SW2 will skip tracks forward and back respectively. Hold right and hold left are fast forward and rewind.

2.9 Status indicators

- LED1 flashing green: module is not connected to another Bluetooth device.
- LED3 double-flashing blue: module is connected to another Bluetooth device.
- LED3 pulsing blue: a call is in progress or music is playing.
- LED1 alternating green and red: a call is incoming.
- LED1 glowing red: battery is low.
- LED1 and LED3 alternating green and blue: Pairing Mode (waiting for Bluetooth connection).

3 Regulatory Information

3.1 UNITED STATES

The PC-010 module has been tested and approved under Federal Communications Commission (FCC) CFR47 Telecommunications, Part 15 Subpart C "Intentional Radiators" in accordance with Part 15.212 Modular Transmitter approval. Modular approval allows the end user to integrate the PC-010 module into a finished product without obtaining subsequent and separate FCC approvals for intentional radiation, provided no changes or modifications are made to the module circuitry. The FCC requires the end user to be notified that any changes or modifications made to the device that are not expressly approved by The Wand Company may void the user's authority to operate the equipment. The end user must comply with all of the instructions provided by the Grantee, which indicate installation and/or operating conditions necessary for compliance.

The finished product is required to comply with all applicable FCC equipment authorisations, regulations, requirements and equipment functions not associated with the transmitter module portion. For example, compliance must be demonstrated to regulations for other transmitter components within the host product; to requirements for unintentional radiators (Part 15 Sub- part B "Unintentional Radiators"), such as digital devices, computer peripherals, radio receivers, etc.; and to additional authorisation requirements for the non-transmitter functions on the transmitter module (i.e. Verification, or Declaration of Conformity) (e.g. transmitter modules may also contain digital logic functions) as appropriate.

3.1.1 Labelling and user information requirements

The PC-010 module is labelled with its own FCC ID number, and if the FCC ID is not visible when the module is installed inside another device, then the outside of the finished product into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording as follows:

> Contains Transmitter Module FCC ID: 2AFJA-1701
> or
> Contains FCC ID: 2AFJA-1701
>
> 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.

The user's manual for the finished product should include the following statement:

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 a residential 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 or more 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.

Additional information on labelling and user information requirements for Part 15 devices can be found in KDB Publication 784748 available at the FCC Office of Engineering and Technology (OET) Laboratory Division Knowledge Database (KDB).

3.1.2 **RF Exposure**

All transmitters regulated by FCC must comply with RF exposure requirements. KDB 447498 General RF Exposure Guidance provides guidance in determining whether proposed or existing transmitting facilities, operations or devices comply with limits for human exposure to Radio Frequency (RF) fields adopted by the Federal Communications Commission (FCC).

The FCC grant will be valid only when the module is sold to OEM integrators and must be installed by the OEM or OEM integrators. This module is restricted for use only with the integral PCB antenna and must not be co-located or operating in conjunction with any other antenna or transmitters within a host device, except in accordance with FCC multi-transmitter product procedures.

3.1.3 **Helpful websites**

Federal Communications Commission (FCC):
http://www.fcc.gov

FCC Office of Engineering and Technology (OET) Laboratory Division Knowledge Database (KDB):
http://apps.fcc.gov/oetcf/kdb/index.cfm

3.2 CANADA

The PC-010 module is approved for use in Canada under Industry Canada (IC) Radio Standards Specification RSS-247. Modular approval permits the installation of a module in a host device without the need to recertify the device.

IC Certification Number: 20592-1701

3.2.1 Labelling and user information requirements

The host device shall be properly labelled to identify the module within the host device.

The Industry Canada certification label of the module should be clearly visible at all times when installed in the host device, otherwise the host device must be labelled to display the Industry Canada certification number of the module, preceded by the words "Contains transmitter module", or the word "Contains", or similar wording expressing the same meaning.

The finished product should contain the following or equivalent notice in a conspicuous location in the user manual, or alternatively on the device, or both:

> This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference including in interference that may cause undesired operation of the device.
>
> Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

3.2.2 RF Exposure

All transmitters regulated by IC must comply with RF exposure requirements listed in RSS-102 - Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands).

3.2.3 Helpful websites

Industry Canada: http://www.ic.gc.ca

Disclaimer

This document is intended as a guide for the development and integration of The Wand Company's products and the contents are believed to be accurate at the time of compilation.

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