### ThoughtWorks\*

### Voting Box User Manual

Product Name:Voting BoxProduct Model:Voting Box

The Responsible party information: FCC ID: Z4T-VOTINGBOXV1

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### Voting Box

Voting Box integrated with Bluetooth low energy and NFC.it use NordicnRF51822 and NXP PN532 to achieve the Bluetooth and NFC function.

#### Voting Box's Bluetooth Low Energy

The nRF51822 is a powerful, highly flexible multiprotocol SoC ideally suited for Bluetooth® low energy and 2.4GHz ultra low-power wireless applications. The nRF51822 is built around a 32-bit ARM® Cortex™ M0 CPU with 256kB/128kB flash + 32kB/16kB RAM for improved application performance. The embedded 2.4GHz transceiver supports both Bluetooth low energy and the Nordic Gazell 2.4 GHz protocol stack which is on air compatible with the nRF24L series products from Nordic Semiconductor.

nRF51822 incorporates a rich selection of analog and digital peripherals that can interact without CPU intervention through the Programmable Peripheral Interconnect (PPI) system. A flexible 31-pin GPIO mapping scheme allows I/O like serial interfaces, PWM and guadrature demodulator to be mapped to any device pin as dictated by PCB requirements. This enables complete design flexibility associated with pin-out location and function. nRF51822 supports Bluetooth low energy protocol stacks as well as 2.4GHz protocol stacks, including Gazell, both available as downloads. nRF51822 requires a single power supply and gives the user the option of using on chip linear regulators giving a supply range of 1.8-3.6V, a direct 1.8V mode and a on chip DC-DC buck converter giving a supply range of 2.1-3.6V. The use of the DC-DC converter can be dynamically controlled during run time and enables nRF51822 to operate at radio peak currents below 10 mA @ 3V supply (TX @ 0 dBm& RX).

#### Voting Box's NFC

PN532 is a highly integrated transceiver module for contactless communication at 13.56 MHz based on the 80C51 microcontroller core supporting different card and reader/writer operating modes

#### Voting Box's function

Voting Box can scan the NFC Tag and save the information to the server by the mesh net created by Bluetooth Low Energy.

Voting Box's core part

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Voting Box's interface

USB: Just for battery's charging. No use communication function. Switch: Power ON/OFF Voting Box DFU Switch: Upload Nrf51822's firmware Buzzer:Buzzer will on when completed NRF read Battery connector: Connect a button cell, keep Voting Box's RTC working all the time.

• Voting Box's wrok process



Voting Box's usage

- 1. Power on Voting Box by turn the switch to on terminal.
- 2. Make sure buzzer and LEDS on Voting Box will on/off several times.
- 3. Place the NFC tag near to the NFC antenna.
- 4. Make sure the buzzer and LEDs will on/off when NFC tag near Voting Box.
- 5. Administrator can access the NFC tag information from the server.

#### Warning

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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.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: 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 needed.
- □ Consult the dealer or an experienced radio/TV technician for help.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction