

User Manual

KWR600001/01

FCC Statement

FCC Part 15.19

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device maynot cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

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 connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

No special accessory is required to enable the equipment to comply with the emission limits.

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1. General product description

1.1 Product functions

This KWR product is a Bluetooth keyboard + Bluetooth & IR Remote.

From the whole system point of view, the Bluetooth TV will be the host, the remote is a dummy slave.

In normal working mode, the IR host always report key information to the BT host and wait instruction from the BT host. For example, a play button on remote is pressed, the remote report this key event to BT host, BT host send this info to TV (report key ID), TV will send 4 bytes payload information via BT host to the IR host, these 4 bytes contain the device mode, IR code set ID (if under IR device mode), and key ID, after IR host get this info, it will call IR engine to transmit this IR code.

There is no mode indicate on the remote, all remote mode info are displayed on the TV.

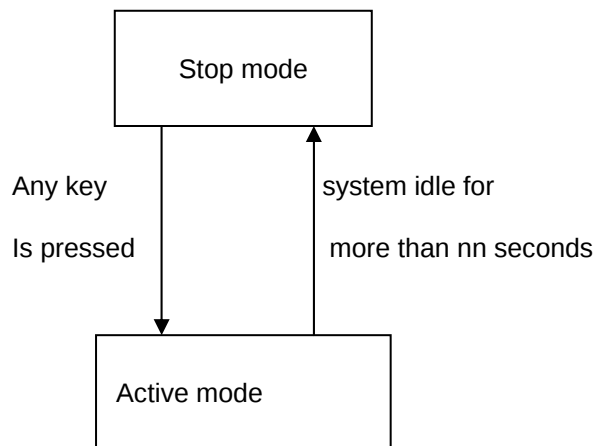
IR DB auto / manual search will be done by remote/TV mutual active.

Below is the product diagram.



2. Functional requirements

2.1 Description of processes



This remote will contain below functions:

Inputs:

- key scan info
- data from Bluetooth interface

Outputs:

- Data to BT host
- IR transmit

When the keyboard is slide out, user touch either keyboard or remote will trigger the KWR send key event to the TV.

2.2 Description of system

The software features of this KWR can be summarised as follows:

- Normal operation
- TV off mode
- Device mode change
- Preprogram mode
- Auto search
- Volume mapping
- Stuck key Timeout

- BT HID keyboard
- Simultaneous Keypress
- Reset feature
- Special mode

2.2.1 Normal operation mode

This is the normal operation when TV is turns on; micro-controller is in active mode, keyboard/remote function as BT HID device.

For remote, any valid key press event will report to BTH then BTH toTV, TV will decide the button is for Bluetooth TV function or normal IR device control and send ACK / command back to remote via BTH.

For keyboard, BTH will report key stroke info to TV via Bluetooth stack.

2.2.2 TV off mode

This is when TV is totally power off, if the IR device is set and selected before TV turns off, remote will function as an IR remote control, the device mode will be the last device mode before TV switch off.

2.2.3 Special mode

This special mode is for control Vizio TV with IR receiver only, when user setting to this mode, the remote will send IR code for Vizio TV instead of control Vizio Bluetooth TV.

There are 7 IR code set for Vizio IR receiver TV, the digital key 1~7 map to the IR code set 1~7 in below description.

*Note: the number of code set pending for confirmation from Zilog IR DB team.

To active this mode, user should press below button in sequence

1st press and hold <OK> key, then <Vizio Widget> key, then <digital x (x: 1~7)>, then release all of them, this will change remote to IR remote mode and assign the Vizio IR TV code set in IR DB for the remote.

From IR TV remote mode back to normal Bluetooth TV remote mode, press below button in sequence

1st press and hold <OK> key, then <Vizio Widget> key, then <Back> key, then release all of them.

When remote enter Vizio IR TV remote mode, there will be no Bluetooth function, BT host will go to standby mode.

2.2.4 Device mode change

For the remote function, there are Bluetooth TV mode (as mentioned in 2.2.1) and IR device mode, under IR device, there are multiple devices, they are SAT/CABLE, TV (IR TV), VCR, DVD / Blue ray / HD, PVR, Audio (Tuner/Receiver) and Amplifier.

When user active device change function on the TV, the device name or icon will display on TV, user can use navigate key to move between devices, press <ok> key on remote will inform TV to make device selection.

2.2.5 ID setup

There is a table contain devices, brand names and code set IDs stored in TV, this function is to setup IR database code set ID for an IR device.

For example user have a Philips DVD player, user select DVD device, and select brand Philips, under Philips there may have multiple code sets, each code set represent a physical remote control codes. After make the selection, the remote will understand what control code to transmit.

TV application can assign default code set for each device, or leave it blank,

There will be 11 devices.

SAT	CABLE	TV (IR TV)	VCR	DVD	Blue ray	HD	PVR	Tunner	Receiver	Amplifier
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Below example is a very short piece of brand name list and code sets ID list

Panasonic	115 130 160 169 170 172 175 176
	177 181 196 201 215 216 217 218
	219 220 228 229 307
Penney	065
Philco	080
Philips	048 053 161 180 184 202
Philips Magnavox	162
Pioneer	049 051 085 088 096 099 129 132
	140 168 193

2.2.6 Volume mapping function

Volume mapping means that the Audio control keys ("Volume Up", "Volume Down" and "Mute") under the desired device mode will have its IR codes transmitted for the device being programmed under the Secondary device if there is any.

Otherwise, it will send its command via BT module under Bluetooth TV mode.

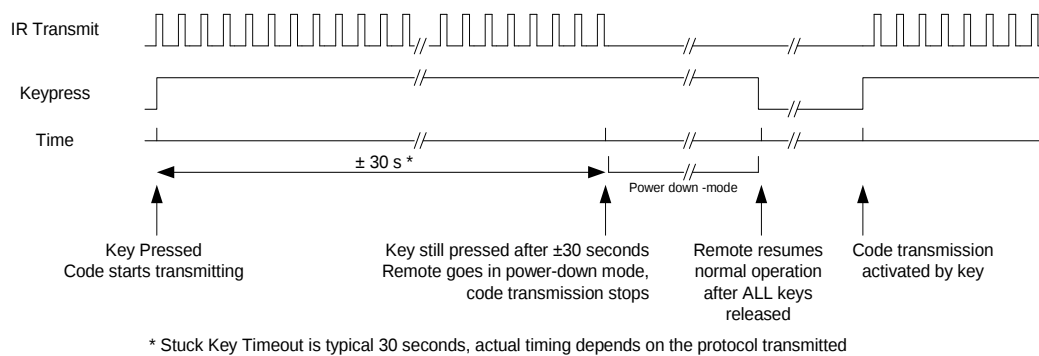
Default setting for volume control function: Vol + / Vol - / Mute will map to Bluetooth TV volume control. This mapping info will store in TV. TV will maintain this volume control mapping table.

2.2.7 Stuck Key time out function

Stuck Key means that a key has been pressed for a very long time in normal operating mode. To preserve battery power, the remote will shut down after 25-30 seconds after the last key transition to consume minimal power. After all keys are released, the remote resumes normal operation.

The following diagram shows the time limit when the stuck key power down mode is entered.

STUCK KEY TIMEOUT



Note: For some protocols in database, the stuck key timeout ranges from 15s to 70s.

2.2.8 Simultaneous Keypress

If more than one key press is detected, remote controller will stop sending IR code.

2.2.9 Standby mode

The standby mode of the remote shall be entered approximately 5 seconds after the last key is released.

2.3 Real time requirements

There will be data transmit latency on both Bluetooth interface and GPIO interface, compare the timing, the BT latency is much heavy, around 100ms (maximum).

3. GPIO communication

3.1 Software version and IR DB version checking .

Expected under TV menu, there is one item for this function, to check remote software version and IR database version. Data exchange method below:

After user make selection on TV, TV will send a ACK packet to IR host via BTH, this will trigger IR host return s/w version number and IR DB version number. The version number will be 3 digit: x.y.z (0 <= x, y, z <=0xF), for example: 3.B.2

Payload from TV to IR host will be:

- DeviceID = 0x30 (this data means get s/w version and IR DB version)
- CodesetID xxxx (don't care)
- KeyID xx (don't care)

Payload data from IR host to TV will be total 6 bytes, these 6 bytes will follow the single byte transmit protocol defined in **Error! Reference source not found.**, send from IR host to BT host one byte by one byte.

1. 0x8x, s/w version
2. 0x8y
3. 0x8z
4. 0x9x', IR DB version
5. 0x9y'
6. 0x9z'