ShenZhen C&D Electronics CO.Ltd.
Add: 9/F,Tower9A, Baoneng Science&Technology Park, Qinghu Industrial Park,Qingxiang Road,Longhua Street,Longhua New District,Shenzhen City,Guangdong Province,P.R.China
Tel: 86-755- 28142422 Fax: 86-755-28142699 E-mail: export@cn-cdrc.com

User manual

(Ver 1.0)

Seller approval	Customer approval
Prepared By: James Date: 2020.9.25	Received by: Date：
Checked By: Beiji Li Date: 2020.9.25	Checked by: Date:
Approved By: Date:	Approved by: Date:
company chop：	company chop：

Change history

Version	Date	Description	Author
Ver1.0	2020.9.25	Preliminary	James

2. Index

NO.	描述 appellation
1	Approval Sheet Cover
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3	Product Cosmetics drawing
4	Main functions
5	spec and electric feature
6	Code table
7	RF Performance
8	MIC Performance

产品认证 Product certification

No.	Item	Spec
1	FCC/IC	FCC 15B (US & Canada, other market regions TBC)
2	BQB	Bluetooth BQB
3	RoHS	RoHS compliant parts & materials
4	CE	
5		

3. Product cosmetics drawing

工艺丝印图 Process description

NO.	A1	A2	A3	A4	A5	A6	A7
Component 组件	Top cover 面壳	P+R按键	Decoration 装饰环	Decoration 装饰环2	Bottom cover 底壳	Battery cover 电池盖	Lanyard 绳 挂
Material 材质	ABS	ABS	ABS	ABS	ABS	ABS	
Process 处理	Injection 注塑	Injection 注塑	Injection 注塑	Injection 注塑	Injection 注塑	Injection 注塑	
Surface effect 表面处理	Texuring+Graphic 晒纹+丝印 （编号：NP1055-2B）	Texuring+Graphic 晒纹+丝印 （编号：NP1055-2B）	electrochromism 镀铬贴 （见样品）	electrochromism 镀铬贴 （见样品）	Texuring 晒纹 （编号：NP1055-2B）	Texuring 晒纹 （编号：NP1055-2B）	
Color	Injection color: PANTONE Cool Gray 1C Graphic color: PANTONE Cool Gray 9C	Injection color: PANTONE Cool Gray 1C PANTONE 151C Graphic color: PANTONE Cool Gray 9C	silver	silver	PANTONE Cool Gray 1C	PANTONE Cool Gray 1C	PANTONE 151C

深圳创荣发电子有限公司 SHENZHEN C&D ELECTRONICS CO., LTD.			
Client model No. 客户型号		Version No. 版本	1.0
C&D Model No. 内部型号	RF427A	Scale 比例	1:1
Design by. 设计师	刘巨平	Date 日期	2020.10.12

Remark: The wrist straps and logo badge are provided by Customer.

4. Mainfunctions

RF427A (SCRA1) Compliant with Bluetooth low protocol stack (V4.2) -Bluetooth module should be built-in and be compatible with Android9.

4.1 Voice function

Press and hold the Microphone button to talk.

Voice function stops after Microphone button is released.

4.2 Gyroscope & Accelerometer Sensor

6-axis motion tracking device with 3-axis gyroscope and 3-axis accelerometer.

Air mouse cursor should not drift when the RCU is stable on the table.

-Digital-output X-, Y-, and Z-Axis angular rate sensors (gyroscopes) with full-scale range of ±1000°/sec

-Digital-output triple-axis accelerometer with a programmable full scale range of ±2g

4.3 Environmental

Operating Temperature	0°C to 45°C (32°F to 113°F)
Storage Temperature	-15°C to 55°C (-5°F to 131°F)
Operating Humidity	20% to 80% non-condensing humidity
Storage Humidity	20% to 90% non-condensing humidity

4.4 Certification & Compliances

FCC / IC	FCC 15B (US & Canada, other market regions TBC)
CE	
BLE Support	Compliant with Bluetooth low protocol stack (V4.2)
RoHS	RoHS compliant parts & materials
Bluetooth	BQB Bluetooth certification (TBC)

4.5 LED Indicator Mode

1. Microphone listening: Green led on and solid
2. BT pairing: Blue led on and flashing
3. Other keypresses: LED off.

4.6 BLE Supported

Remote controller is compliant with Bluetooth low protocol stack (V4.2).

4.7 Pairing Mode

Power ON → Press Home + back key to enter pairing mode.(LED behavior 0.5sec on,1.5 sec off)

4.8 Pairing Clear Mode

Press Home + back key on pairing mode the RCU will to do pairing clear function..(LED behavior 0.3 sec on,0.3 sec off)

4.9 OTA

STB will trigger firmware update on connected remote controller if it is not running on latest firmware .

However, unless special circumstances do not occur, there is no plans to execute.

4.10 Battery reports

The remote controller reports the estimated voltage level ,only when inquired by host.

5. Spec and electric feature

Type	Bluetooth Voice Remote Control with Air Mouse function
Frequency	2402 ~ 2480 MHz
Distance	> 10 meters
Power	AA battery x2. Battery usage life: 1 year (100 times/day, 0.5s/time)
Current	Working: <15mA, Standby: < 20uA
Voice Input button	Hold to Talk
Microphone build-in	Digital MEMS microphone, 16 KHz sampling rate
Air Mouse function	Support mouse functions
Sensor	6 axis Gyroscope & Accelerometer
Size	~ 157.5 x 41 x 22 mm
Weight	65g (including batteries)
Color/Material/Finish	Pantone Cool Gray 1C, Texture NP1055-2B. See Merlyn RCU CMF document
Number of keys	19
OS Software support LED	HID device, Air Mouse, Voice Microphone. Android 9 driver support. LED flashing under Bluetooth pairing mode
Low battery reminder	Communicate to main unit
Buzzer built-in	Support buzzer and MIDI music

6. Button function

6.1Button Keycodes and Click Behaviors

Buttons	Codes	Behavior	HID code (Default Usage Page: 0x0C)
Power	Standard KEYCODE_POWER	**Expecting normal behavior, with keycode and value of 1 when pressed, and 0 when released.**	0x30 Consumer page (0x0C)
Onboard Mic mute	Standard KEYCODE_MUTE	Send code when pressed	0x306 Consumer page (0x0C)

Input	Custom MM_KEYCODE_INPUT_SELECT	Send code when pressed	0x301Consumer page (0x0C)
Back	MM_KEYCODE_BACK	Send code when pressed	0x03a Usage page (0x07)
Home	MM_KEYCODE_HOME	Send code when pressed	0x03b Usage page (0x07)
Menu	MM_KEYCODE_MENU	Send code when pressed	0x03cUsage page (0x07)
Microphone	Custom, Data over BT MM_KEYCODE_REMOTE_MIC_PRESSED	Similar button behavior as others. Host to take care of switching audio paths till the button is released.	0x3E Usage page (0x07)
Up	MM_KEYCODE_UP	Send code when pressed	0x42 Consumer page (0x0C)
Left	MM_KEYCODE_LEFT	Send code when pressed	0x44 Consumer page (0x0C)
Right	MM_KEYCODE_RIGHT	Send code when pressed	0x45 Consumer page (0x0C)
Down	MM_KEYCODE_DOWN	Send code when pressed	0x43

			Consumer page (0x0C)
Vol +	Standard KEYCODE_VOLUME_UP	Send code when pressed.	0xe9 Consumer page (0x0C)
Vol -	Standard KEYCODE_VOLUME_DOWN	Send code when pressed	0xea Consumer page (0x0C)
Mute speaker	Standard KEYCODE_VOLUME_MUTE	Send code when pressed	0xe2 Consumer page (0x0C)
Select button	Standard KEYCODE_SELECT	Send code when pressed	0x41 Consumer page (0x0C)
Play/ Pause	MM_KEYCODE_PLAY_PAUSE	Send code when pressed	0xCD Consumer page (0x0C)
Rewind	MM_KEYCODE_REWIND	Send code when pressed	0xB4 Consumer page (0x0C)
Forward	MM_KEYCODE_FORWARD	Send code when pressed	0xB3 Consumer page (0x0C)
Airmouse	Custom MM_KEYCODE_AIRMOUSE_ON	Behavior outlined in separate section below.	0x303

	MM_KEYCODE_AIRMOUSE_OFF		0x304
Airmouse locations	Standard mouse location feed	Send the mouse locations when Airmouse Mode is ON	
Remote pairing	Custom	10, 12: Back and Menu long press: Enable Regular pairing process, **Displayed Name should be MerlynRemote.**	Explain action to be taken on the host
Airmouse calibration		Airmouse and Select buttons pressed together	Explain action to be taken on the host
Remote Battery low indicator	MM_BATTERY_LOW	If battery low, send message once every 10 minutes.	0x305 Consumer page (0x0C)

7. RF Performance

7-1 Basic Rate

Item	Min.	Typ.	Max.	Bluetooth Spec	Unit
Output power P_{AV} (1)	-12	-8	-5	-20 to 10	dBm
Leakage Power Avg(1)	-100	-65	100	< 100	dBm
Output power P_{PK} (1)	—	4.5	23	< 23	dBm
Ppeak-PavgAvg (1)	—	0.5	3	< 3	dBm
Frequency range	2402	—	2480	2402 to 2480	MHz
Frequency Accuracy Avg (1)	-150	8	150	<±150	kHz
Frequency Offset Avg (1)	-150	11	150	<±150	kHz
Frequency Drift Avg (1)	-50	3	50	<±50	kHz
Initial Frequency Drift Avg (1)	-20	-0.1	20	<±20	kHz
Max Drift Rate Avg (1)	-20	3	20	<±20	kHz
Avg Frequency Deviation Avg (1)	185	225	275	185 to 275	kHz
Min Frequency Deviation Avg (1)	185	210	275	185 to 275	kHz
Max Frequency Deviation Avg (1)	-1000	240	1000	-1000 to 1000	kHz

Delta F1 Avg[2]	225	250	275	225 to 275	kHz
Delta F2 Avg / Delta F1 Avg[2]	0.8	—	—	> 0.8	—
Delta F2 Max Threshold: 185.0 kHz [2]	99.9	—	—	> 99.9	%

Note：

[1]Payload: 10101010, Length: 37 Bytes

[2]Payload: 11110000 & 10101010, Length: 37 Bytes

7-2 Basic Rate

Item	Min.	Typ.	Max.	Bluetooth Spec	Unit
Sensitivity at 30.8% PER [1] [2]	-	-80	-70	≤ -70	dBm
Maximum received signal at 30.8% PER [1] [2]	-20	-10	-	≥ -20	dBm

Note：

[1]Packets: 1500, Payload: PRBS 9, Length: 37 Bytes

[2] Measured at F_0 = 2442MHz.

8. MIC Performance

- Digital MEMS microphone
- Audio CODEC output: 16KHz, 16bit
- Ensure wind noise is minimize while talking into the remote
- Isolate as much as possible from the enclosure to minimize enclosure vibrations fromaffecting microphone performance.
- Question : Is there a guideline for proximity of microphone to LED in terms of minimizing LED related EMI noise (if a concern) ?

Parameter	Conditions	Min	Typ	Max	Unit
Directivity		Omni-Directional			
Sensitivity	@1KHz (0dB -1V/Pa)	-29	-26	-23	dBFS
SNR	@1KHz (0dB -1V/Pa)		65		dB(A)
THD @94dB SPL	@1KHz			0.5	%
Max Input Sound Pressure	@1KHz, THD<10%		120		dB SPL
Power Supply Rejection (PSR)	217Hz, 100m Vpp square wave		-90	-80	dBFS

IC Warning

This device complies with Industry Canada licence-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 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

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

FCC Caution.

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.

Any Changes or modifications 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 connected.
-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.

CE Maintenance

1.Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

2.EUT Operating temperature range: 0 °C to 45 °C .

3.The device complies with RF specifications when the device used at 0mm from your body.

Declaration of Conformity

Merlyn Mind, Inc. hereby declares that this Mobile Phone is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.

This product is allowed to be used in some of EU member states. For example the following Member States can be used:

Max E.I.R.P power: 1.84dBm

Operating frequency Range: 2402-2480MHz

Shenzhen C&D Electronics Co.,Ltd

EU DECLARATION OF CONFORMITY

in accordance with
Annex VI of Directive 2014/53/EU of the European Parliament and of the Council

1. For the following Radio equipment:
Product: Symphony Classroom Remote Control
Model: SCRA1
Tradename or Brand: Symphony Classroom
Software / Hardware number: V102 / V1.3

Powered by DC 3.0V(2*1.5V AA battery)

2. Name and address of the manufacturer or his authorised representative:
Manufacturer: Shenzhen C&D Electronics Co.,Ltd
Add: 9/F,Tower9A, Baoneng Science&Technology Park, Qinghu Industrial Park,Qingxiang Road,Longhua Street ,Longhua New District, Shenzhen City, Guangdong Province ,P.R.China

3. This declaration of conformity is issued under the sole responsibility of the Manufacturer.

4. Object of the declaration (identification of the radio equipment allowing traceability; it may include a colour image of sufficient clarity where necessary for the identification of the radio equipment):

5. The object of the declaration described above is in conformity with the relevant Union harmonization legislation:
Directive 2014/53/EU (RED)

6. References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared:

Article 3.2: ETSI EN 300 328 V2.2.2 (2019-07)

Article 3.1b: ETSI EN 301 489-1 V2.2.3 (2019-11)
ETSI EN 301 489-17 V3.2.4 (2020-09)

Article 3.1a Health: EN 50663: 2017
Article 3.1a Electrical Safety: EN 62368-1:2014/A11:2017

7. Notified Body Name: MET Laboratories, Inc.

Notified Body Number: 0980
Notified Body Assessment Performed: Module B/C on Article 3.1a, 3.1b, 3.2
Technical File Identification Number: N/A

8. Where applicable, description of accessories and components, including software, which allow the radio equipment to operate as intended and covered by the EU declaration of conformity: User instructions are provided in the User Manual. The Software and Hardware versions are specified above.

9. Additional information:
Referring to Article 10.2 of the Directive, this equipment is so constructed that it can be operated in all Member States, without infringing applicable requirements on the use of radio spectrum.
Referring to Article 10.10 of the Directive, there are no restrictions on putting this equipment intoservice or of requirements for authorisation of use. Please refer to the User Manual for details.

On behalf of:

Manufacturer: Shenzhen C&D Electronics Co.,Ltd
Add: 9/F,Tower9A, Baoneng Science&Technology Park, Qinghu Industrial Park,Qingxiang Road,Longhua Street ,Longhua New District, Shenzhen City, Guangdong Province ,P.R.China

Shenzhen C&D Electronics Co.,Ltd

(place and date of issue): Shenzhen, 2021-02-23

(name, function): ……Weiyongfu / Manager

(signature): ……  ……