User Manual

SALUTRON

Product Name: Heart rate module 3300 series

Model:HRM3300,3300 series

Brand: SALUTRON

Manufacture: Salutron Inc.

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Revision History:

Revision	Release date	Description	By
0.1	11/29/16	Preliminary Draft	BC
0.2	12/22/16	Changed output pin assignments	BC
0.3	01/30/17	Revised Uart communication protocol, added response bit	MC/BC
0.4	02/10/17	Corrected UART package table	MC
0.5	02/14/17	Revised general description(page4)	BG
0.6	02/24/17	PCBA picture updated, and revised flow chart	BC
0.7	02/28/17	Added FCC/IC statement	BC
0.8	05/17/17	Added 5KHZ active code indication	MC
0.9	06/25/17	Added FE-C support and module placement guideline	MC/BC
1.0	7/14/17	Added over the air device firmware update information	MC
1.1	7/31/17	Updated document for HR display profile,FEC, Option for auto connect 5KHZ, program flow description, diagram and comm package table	MC

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Model 3300 Series

Wireless Heart Rate Monitor Specifications

General Description

- The Model 3300 Wireless Heart Rate Monitor is designed to manage and support the reception of heart rate data from either 2.4G digital BLE or ANT+ chest straps and wearable devices, and standard 5kHz chest straps.
- Once enabled by the Console, the Model 3300 actively scans for local strap/device signals, and supports a user selection/pairing protocol processed by the Console.
- Once a strap is selected/paired, the Model 3300 streams the user heart rate data until the end of the workout session, when the 3300 then 'unpairs'.

Features:

- Direct connection to equipment; no phone device or app 'middleman'
- Supports multiple inbound sources for HR: BLE, ANT+, 5kHz
- Automatic proximity sensing to minimizing interference from competing HR signals
- Console controllable proximity commands allowing 'customization' of the scanning proximity during integration development of the 3300 into the console
- Simplified user pairing routine
- Future-proof: OTA updateable to support future features (based on console pass-through, if available)
- Interface: UART, custom command protocol
  The Model 3300 series wireless receiver delivers high performance telemetry heart rate monitoring - for both commercial/club and home cardio equipment applications.

Model 3300 is designed to manage and support the reception of heart rate data from either BLE, ANT+, or standard 5kHz chest straps and devices.

The model 3300 series receiver serves as a BLE central or ANT+ master role. It communicates and passes the heart rate data from the heart rate monitor to the equipment console through proprietary UART protocol.

The 3300 series offers a special proximity pairing feature that allows the equipment console to discover only the transmitting devices in close proximity. This feature minimizes unwanted devices and speeds up the pairing process, especially useful in health club environments where there may be multiple BLE or ANT+ devices present. After successful pairing, the reception distance will automatically increase to maximum range.

The 3300 series receiver also supports legacy 5kHz chest strap data reception. It utilizes Salutron proprietary Digital Crosstalk Control and Digital Noise Filter algorithms that can filter out unwanted competing chest strap signals. This supports better wireless reception and reduce 5kHz noise from potentially unfriendly high 'noise' environments coming from power systems and console electronics.

- BLE smart and ANT+ data reception
- Standard 5.3kHz chest strap, coded and un-coded signal reception
- Proximity pairing feature.
- UART communication protocol
- Stationary Bike FE-C support
- 3-6V operation.
- RoHS compliant.

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Physical Dimensions: Inches (mm)

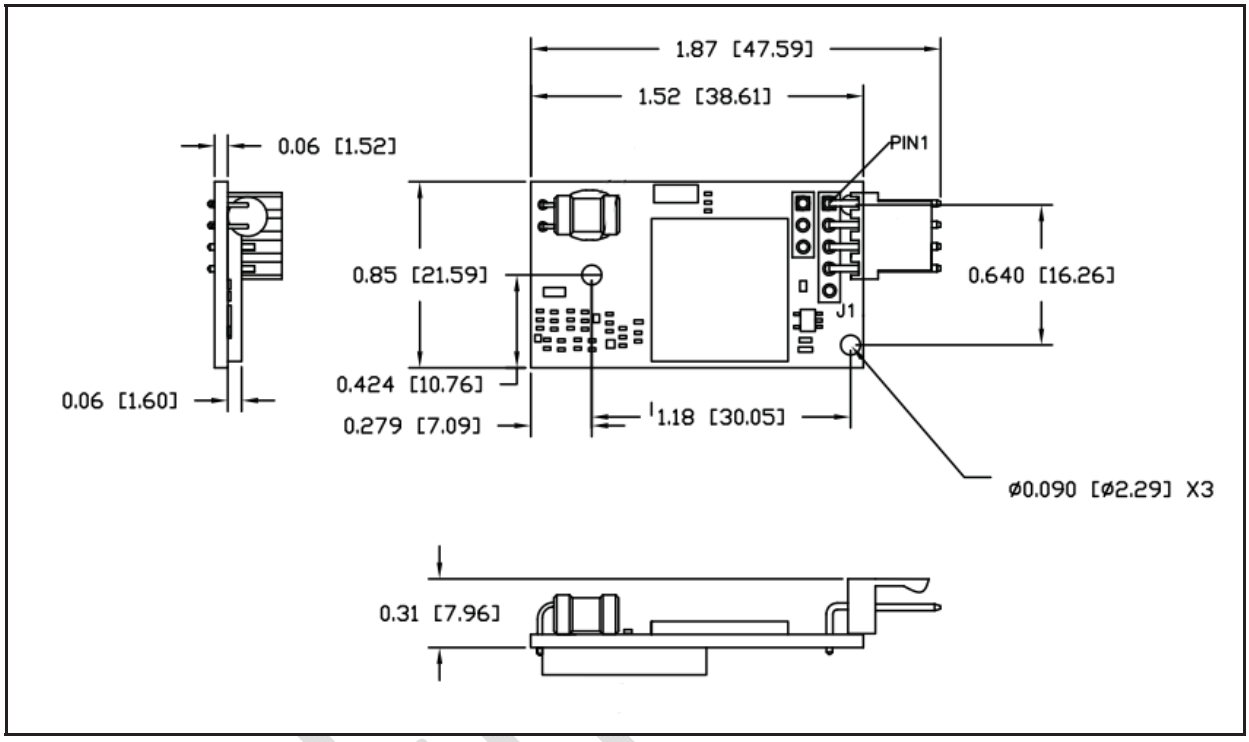

Figure 1: Physical dimensions

Connection Diagram: (Typical)

TYPE	PIN No.	DESCRIPTION
J1 – Main	1	GND
	2	VCC
	3	TXD
	4	RXD

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Electrical Characteristics:

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_S	Supply voltage	-	3	5	6	V
I_S	Supply current	Vcc = 5V	5.2	5.5	10.5	mA
To	Operating Temperature	-	-10	-	60	°C
Ts	Storage Temperature	-	-40	-	85	°C

5KHZ Wireless Specification:

Parameter	Conditions	Min.	Typ.	Max.	Units
5KHZ Wireless reception range	Noise free environment	31 80	35 90	39 100	Inches cm
5KHZ Wireless reception frequency	T= 25ºC, Vcc =5.0V	4.8	5.3	5.9	KHz
Heart rate detection	T= 25ºC, Vcc =5.0V	30	-	240	BPM
Output format	UART Protocol				

BLE/ANT+ Specification:

	Minimum	Typical	Maximum	Unit
HR Measurement				
Range	30	-	240	beats per minute
Frequency	2379	-	2496	MHz
Center Frequency	-	2402	-	MHZ
Channel Bandwidth	-	-	2	MHZ
Low speed Crystal Freq	-	32.768	-	KHZ
High speed Crystal Freq	-	32	-	MHZ
Channel Spacing	-	2	-	MHZ
No. of channels used	-	-	40	Channels
Modulation	GFSK			

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Output power	-20	-	4	dBm
Open Air range	-	-	10	Meter
Power Consumption	Vdd=5.0V @ 25°C			
Standby mode	-	5.5	-	mA
Operation Modes				
Device Searching Mode	-	10	10.5	mA
Heart rate Data transfer	-	5.5	5.6	mA
2.4GHZ Transmission distance	- -	- -	33 10	Feet Meter

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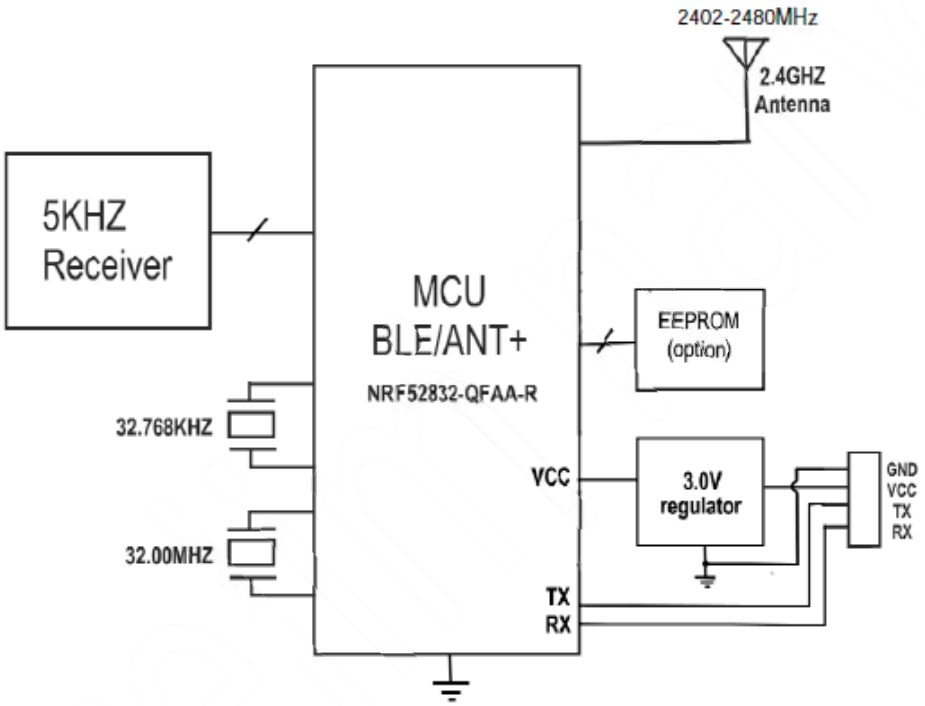
1. UART COMMUNICATION PROTOCOL:

The following section describes the communication protocol between the HRM3300 and Equipment console. The protocol is intended to provide a reliably link between the HRM3300 and Equipment console. The UART protocol supports the two way link communication between the two devices.

1.2.Block Diagram



2. OPERATION

2.1. Description

The Equipment console and HRM3300 uses standard UART protocol to transmit and receive custom packets. The Equipment console control the HRM3300 operation. The HRM3300 operations are:

- Start and stop 5Khz, BLE and ANT+ scanning
- Connect and disconnect to a heart rate sensor using 5khz, BLE and ANT+.
- On-demand scanning
- Stationary bike FE-C broadcast is activated with user selected ID at the start of workout
- HRM display profile is broadcasted with user selected ID at the start of workout
- HRM display profile and Stationary bike have the same ID

2.2. UART Specification

Baudrate: 9600 (default), 4800, 2400, 115200
Parity: No parity
Flow Control: Disable

2.3. Equipment Assumption

Upon power up of the equipment device, the HRM3300 is also power up. Since the equipment is controlling the HRM3300, the HRM3300 will be on the idle state or waiting state for the command from the equipment console.

2.4. Equipment and HRM3300 Operation

The equipment console will send "workout" command to HRM3300 to wake up the HRM3300 from idle state to scanning state. The HRM3300 will start scanning for 5kHz, BLE and ANT+ sensors advertising within its proximity. The proximity setting is added in the "workout" command send by the console.

The sensors that are found during scanning state will be sent to the Equipment console. For BLE, the advertising name and BLE address are sent to the console. A separator key is added in between the advertising name and the BLE address. See the UART package table for the details of communication protocol. All BLE sensors send to the console are uniquely. This means there are no duplicate for BLE sensors received by the equipment console.

For ANT+ the advertising ID is sent to the equipment console. There is a possibility of duplication of ANT+ sensors because of the limitation of ANT+ protocol.

For 5kHz, a "5kHz HRM" name is sent. Only one 5kHz sensor is send to equipment console while a maximum five devices each for BLE and ANT+. Up to maximum of eleven sensors can be sent to the equipment console. Although the console can receive more than eleven devices, the limitation is due to the capacity of HRM3300 microcontroller. Maximum capacity might change in the future or upon customer request.

After all sensors within the pairing proximity range are sent to the equipment console, the user is expected to choose what type of sensor to be used during workout. If the user selects the BLE device, the corresponding BLE address is sent back to HRM3300. The BLE address is one of the parameters for pairing and tracking BLE sensor.

If user selects ANT+ device, the HRM3300 will use the ANT+ advertising name for pairing and tracking. If there are more than one ANT+ device with the same advertising name then there might be a chance for the user to pair to a wrong sensor. For 5kHz device, the strongest signal is expected to be paired.

After the HRM3300 successfully paired with the selected sensor, it starts streaming the heart rate data. The heart rate data will be sent to console. The frequency of heart rate streaming will be dependent upon the kind of sensor device but for 5kHz it would depend upon the heart rate value.

The equipment console would need to send a "stop workout" command to disconnect the HRM3300 to the paired sensor. The HRM3300 will forget that sensor device and go to idle state and wait for next interaction.

A special process was made if only 5kHz was detected during scanning. By default, the HRM3300 will not wait for user confirmation but directly connect to 5kHz sensor if it is the only one detected during scanning. HRM data will automatically send to console after connection However console has an option to override it with "5KHZ disable auto connect" command, in this case the console will wait for user confirmation. A stop workout command will disconnect the HRM3300 to 5kHz sensor and go to idle state.

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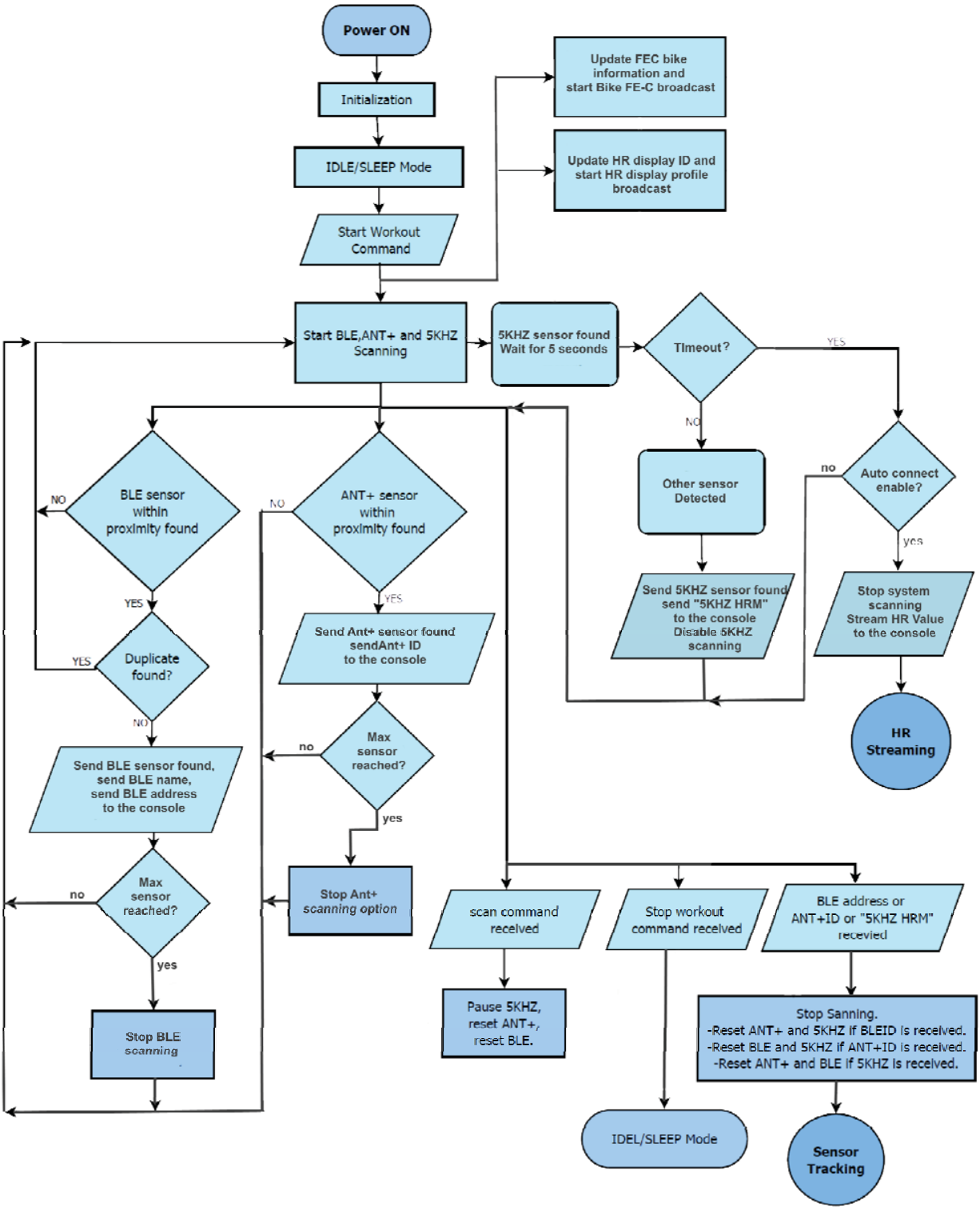
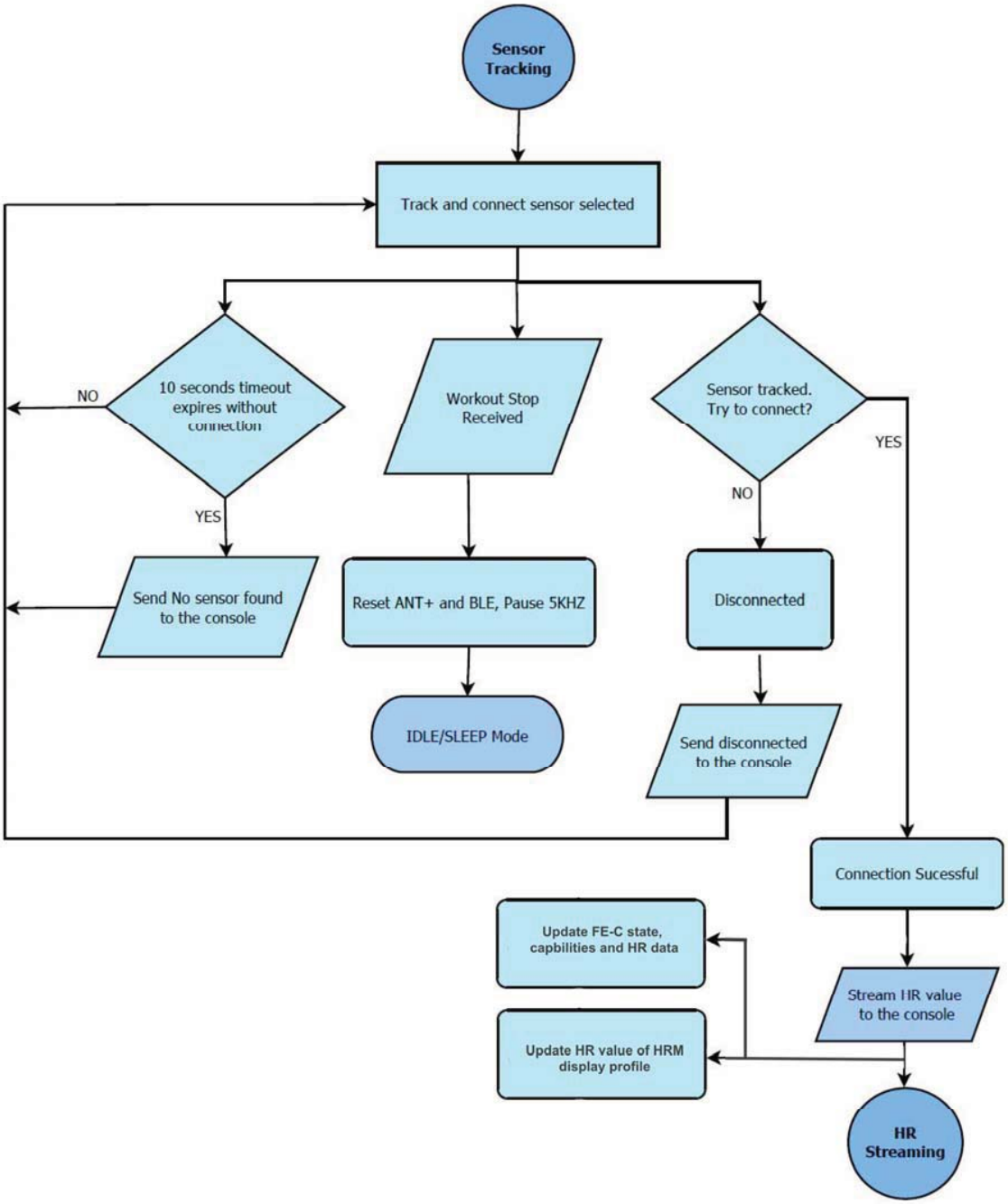
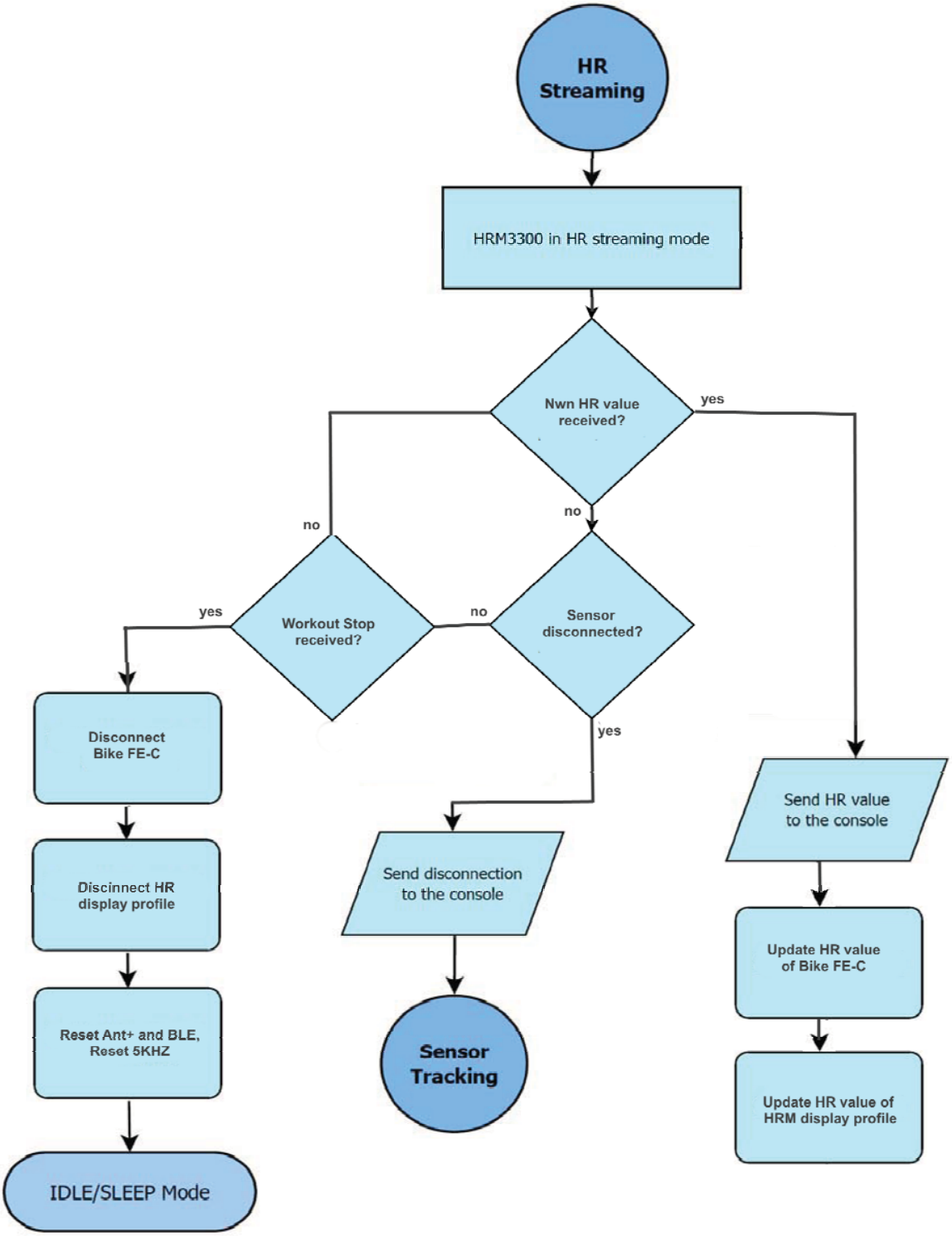
2.5. HRM3300 Programming flow




Sensor Tracking
Track and connect sensor selected
10 seconds timeout expires without connection
NO
YES
Workout Stop Received
Sensor tracked. Try to connect?
YES
NO
Send No sensor found to the console
Reset ANT+ and BLE, Pause 5KHZ
Disconnected
IDLE/SLEEP Mode
Send disconnected to the console
Connection Sucessful
Update FE-C state, capbilities and HR data
Stream HR value to the console
Update HR value of HRM display profile
HR Streaming


HR Streaming
HRM3300 in HR streaming mode
Nwn HR value received?
yes
no
Workout Stop received?
yes
no
Sensor disconnected?
no
yes
Disconnect Bike FE-C
Discinnect HR display profile
Reset Ant+ and BLE, Reset 5KHZ
IDLE/SLEEP Mode
Send disconnection to the console
Sensor Tracking
Send HR value to the console
Update HR value of Bike FE-C
Update HR value of HRM display profile

2.6. HRM3300 OTA.

The new code update can be flashed into the device using over the air programming. The BLE DFU feature of OEM3300 can be triggered using the activation *command* from the console. Once triggered the OEM3300 function as BLE peripheral and will broadcast "OEM_3300". Using Nordic NRF Connect application installed in the phone and the OAD zip file released, the OEM3300 firmware can be updated. For more information and procedure on how to OTA, please refer to OEM3300 OAD procedure document.

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3. UART COMMUNICATION PROTOCOL PACKETS

3.1. Packets

The uart protocol packets contain data that will be used as an interface between the HRM3300 and the equipment console. A maximum of twenty four bytes and a minimum of eight bytes are used during Uart communication.

Fletcher checksum reference: https://en.wikipedia.org/wiki/Fletcher%27s_checksum

For 5kHz analog strap, the name to be transmitted will be "5kHz HRM".

Below is the UART packet:

A response bit when set means the receiver is obliged to response acknowledgement when package is received from the transmitting Uart port

START COMMAND	PACKET LEN	CHECK SUM	RESPONSE BIT	CLASS	SUB	DATAx

Type	Size in bytes	Description
START COMMAND	1	Start byte
PACKET LEN	1	Number of bytes in a packet
CHECK SUM	2	Fletcher checksum
RESPONSE BIT	1	Response bit
CLASS	1	Packet Class type
SUB CLASS	1	Packet sub-class type
DATA	17	BLE advertising name and BLE address with "0x1F" separator between name and address
	8	5Khz HRM name
	2	ANT+ ID
	1	Other data

3.2. Example of Sending Packets Equipment Console

Usage:

Sending packet name to equipment console

Format:

[Start Command]
[Packet Size]
[Fletcher check sum low byte]
[Fletcher check sum high byte]
[Response bit]
[Class]
[Sub Class]
[Name 1st byte]

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[Name … byte]
[Name x^{th} byte]
Packet:
ex. 5Khz advertising name = "5kHz HRM"
[0x0A]
[0x0F]
[0xYY]
[0xZZ]
[0x0C]
[0x00]
[0x01]
[0x35]
[0x6B]
[0x48]
[0x7A]
[0x20]
[0x48]
[0x52]
[0x4D]

3.3. Example of Sending Packet to HRM3300

Usage:
Sending selected packet name to HRM3300

Format:
[Start Command]
[Packet Size]
[Fletcher check sum low byte]
[Fletcher check sum high byte]
[Response bit]
[Class]
[Sub Class]
[Name 1st byte]
[Name … byte]
[Name x^{th} byte]

Packet:
ex. 5Khz advertising name = "5kHz HRM"
[0x0B]
[0x0F]
[0xYY]
[0xZZ]
[0x00]
[0x1C]
[0x01]
[0x35]
[0x6B]
[0x48]
[0x7A]
[0x20]
[0x48]
[0x52]
[0x4D]

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3.4. UART Protocol Packet Table:

UART PROTOCOL PACKET								
DESCRIPTION	COMMAND	PACKET LENGHT	CHECK SUM		RESPONSE BIT	CLASS	SUB	DATA (1-n)
HRM3300 TO EQUIPMENT CONSOLE								
5Khz name to Console	0x0A	15	0xYY	0xYY	0x00	0x0C	0x01	0xYY...
BLE name and Address to Console	0x0A	24	0xYY	0xYY	0x00	0x0C	0x02	0xYY...
ANT name to Console	0x0A	11	0xYY	0xYY	0x00	0x0C	0x03	0xYY...
HR DATA	0x0A	8	0xYY	0xYY	0x00	0x0C	0x04	0xYY
5KHZ ERROR CODE								
Connection lost	0x0A	8	0xYY	0xYY	0x00	0x0C	0x05	0x01
Corrupted HR	0x0A	8	0xYY	0xYY	0x00	0x0C	0x05	0x02
Relearn	0x0A	8	0xYY	0xYY	0x00	0x0C	0x05	0x03
Code Noisy	0x0A	8	0xYY	0xYY	0x00	0x0C	0x05	0x04
Code Noisy Off	0x0A	8	0xYY	0xYY	0x00	0x0C	0x05	0x05
Code Over Limit	0x0A	8	0xYY	0xYY	0x00	0x0C	0x05	0x06
Cross Talk	0x0A	8	0xYY	0xYY	0x00	0x0C	0x05	0x07
BLE Error code only	0x0A	8	0xYY	0xYY	0x00	0x0C	0x05	0x1Y
ANT+ error code only	0x0A	8	0xYY	0xYY	0x00	0x0C	0x05	0x2Y
COMMON ERROR								
Connection lost	0x0A	8	0xYY	0xYY	0x00	0x0C	0x05	0x31
Connection failed	0x0A	8	0xYY	0xYY	0x00	0x0C	0x05	0x32
No device found	0x0A	8	0xYY	0xYY	0x00	0x0C	0x05	0x33
STATUS								
Disconnected	0x0A	8	0xYY	0xYY	0x00	0x0C	0x06	0x01
Searching device	0x0A	8	0xYY	0xYY	0x00	0x0C	0x06	0x02
Device not found	0x0A	8	0xYY	0xYY	0x00	0x0C	0x06	0x03
Device found	0x0A	8	0xYY	0xYY	0x00	0x0C	0x06	0x04
Idle Mode	0x0A	8	0xYY	0xYY	0x00	0x0C	0x06	0x05
Connected	0x0A	8	0xYY	0xYY	0x00	0x0C	0x06	0x06
Scanning	0x0A	8	0xYY	0xYY	0x00	0x0C	0x06	0x07
Stop Scanning	0x0A	8	0xYY	0xYY	0x00	0x0C	0x06	0x08
Workout started	0x0A	8	0xYY	0xYY	0x00	0x0C	0x06	0x09
workout stopped	0x0A	8	0xYY	0xYY	0x00	0x0C	0x06	0x0A
5KHZ WL active	0x0A	8	0xYY	0xYY	0x00	0x0C	0x06	0x0B

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ACKNOWLEDGEMENT								
ACLK	0x0A	8	0xYY	0xYY	0x00	0x0C	0x07	0x01
RSSI Value								
5Khz name	0x0A	8	0xYY	0xYY	0x00	0x0D	0x01	0x01
BLE RSSI Data	0x0A	8	0xYY	0xYY	0x00	0x0D	0x10	0xYY
ANT+ RSSI Data	0x0A	8	0xYY	0xYY	0x00	0x0D	0x20	0xYY
EQUIPMENT CONSOLE TO HRM3300								
CONNECTING								
Sending 5Khz Name to MCU	0x0B	15	0xYY	0xYY	0x00	0x1C	0x01	0xYY...
Sending BLE address to MCU	0x0B	15	0xYY	0xYY	0x00	0x1C	0x02	0xYY...
Sending ANT ID to MCU	0x0B	11	0xYY	0xYY	0x00	0x1C	0x03	0xYY...
WORKOUT								
Start workout with RSSI option 1	0x0B	8	0xYY	0xYY	0x00	0x1C	0x04	0x01
Start workout with RSSI option 2	0x0B	8	0xYY	0xYY	0x00	0x1C	0x04	0x02
Start workout with RSSI option 3	0x0B	8	0xYY	0xYY	0x00	0x1C	0x04	0x03
Stop Workout	0x0B	8	0xYY	0xYY	0x00	0x1C	0x04	0x04
Start Workout with RSSI data(-dbm)	0x0B	8	0xYY	0xYY	0x00	0x1C	0x04	0xYY
SCANNING								
Start Scanning	0x0B	8	0xYY	0xYY	0x00	0x1C	0x05	0x01
GET STATUS								
Get state status	0x0B	8	0xYY	0xYY	0x01	0x1C	0x06	0x01
5KHZ COMMAND								
Auto connect	0x0B	8	0xYY	0xYY	0x01	0x1C	0x07	0x01
Disable auto connect	0x0B	8	0xYY	0xYY	0x01	0x1C	0x07	0x02
ENABLE BLE OTA								
Start BLE Broadcast	0x0B	8	0xYY	0xYY	0x00	0x1E	0x01	0x01
Stop BLE Broadcast	0x0B	8	0xYY	0xYY	0x00	0x1E	0x01	0x02

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3.5. UART BIKE FE-C Protocol Packet Table:

UART BIKE FE-C PROTOCOL PACKET															
DESCRIPTION	CMD	PACKET LENGHT	CHECK SUM		RESPONSE BIT	CLASS	SUB	DATA	DATA	DATA	DATA	DATA	DATA	DATA	DATA
EQUIPMENT CONSOLE TO HRM3300															
Console FE-C status															
Set FEC supported	0x0A	8	0xYY	0xYY	0x00	0x10	0x01	0x01							
Set FEC not supported	0x0A	8	0xYY	0xYY	0x00	0x10	0x01	0x00							
Start FEC Broadcast	0x0B	8	0xYY	0xYY	0x00	0x11	0x01	0x01							
Stop FEC	0x0B	8	0xYY	0xYY	0x00	0x11	0x02	0x02							
Details for Page 16															
Set Page 16	0x0B	15	0xYY	0xYY	0x00	0x12	0x01	Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Details for Page 18															
Set page 18	0x0B	15	0xYY	0xYY	0x00	0x13	0x01	Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Details for Page21															
Set page 21	0x0B	15	0xYY	0xYY	0x00	0x14	0x01	Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Details for Page 80															
Set page 80	0x0B	15	0xYY	0xYY	0x00	0x15	0x01	Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Details for page 81															
Set Page 81	0x0B	15	0xYY	0xYY	0x00	0x16	0x01	Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
DEVICE ID															
Set Device ID	0x0B	8	0xYY	0xYY	0x00	0x17	0x01	0xYY							
HRM3300 TO EQUIPMENT CONSOLE															
FEC Status															
Get FEC support status	0x0A	8	0xYY	0xYY	0x00	0x20	0x01	0x01							
Page 16															
Get data page 16	0x0A	8	0xYY	0xYY	0x00	0x22	0x01	0x01							

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Page 18															
Get data page 18	0x0A	8	0xYY	0xYY	0x00	0x23	0x01	0x01							
Page 21															
Get data page 21	0x0A	8	0xYY	0xYY	0x00	0x24	0x01	0x01							
Page 80															
Get data page 80	0x0A	8	0xYY	0xYY	0x00	0x25	0x01	0x01							
Page81															
Get data page 81	0x0A	8	0xYY	0xYY	0x00	0x26	0x01	0x01							
DEVICE ID															
Get Device ID	0x0A	8	0xYY	0xYY	0x00	0x27	0x01	0x01							

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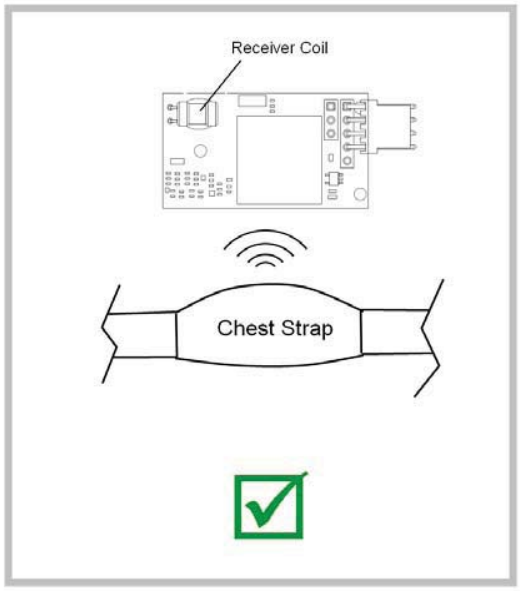
Appendix A : HRM3300 Placement Guideline

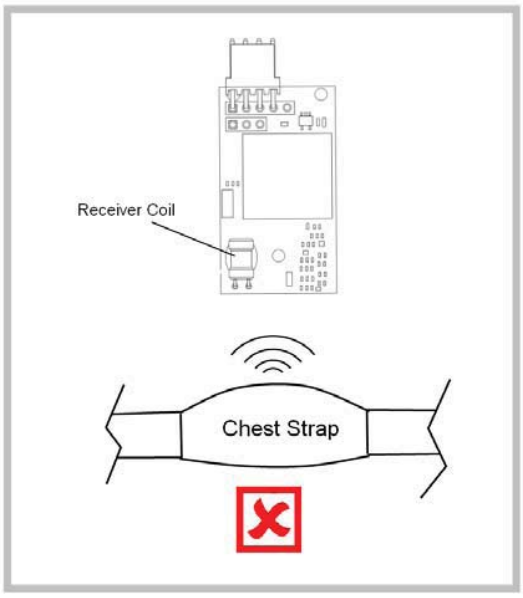
The electrical noise generates from the machine could affect the reception range of 5KHZ wireless receiver. It is better to avoid any noise frequency near 5KHZ or harmonics get near the module.

Although not all electrical noise can be avoided, the following sources could contribute to the interference. It is recommended to position the HR wireless module as far from these sources as possible.

- LED display
- Electrical fan
- Audio speaker
- Magnetic field
- Piezo buzzer/beeper
- Magnetic brake (Bike)
- External/ internal CD player
- Excessive ripple noise on power supply
- Switching power supply
- Motor controller
- Sound or noise source in audio band (20HZ~20KHZ)
- Cell phone

An incorrect wireless coil orientation placement will affect the range. The orientation of the receiving coil on the HRM wireless module should be in horizontal or parallel with the transmitter's coil to obtain the optimal performance.





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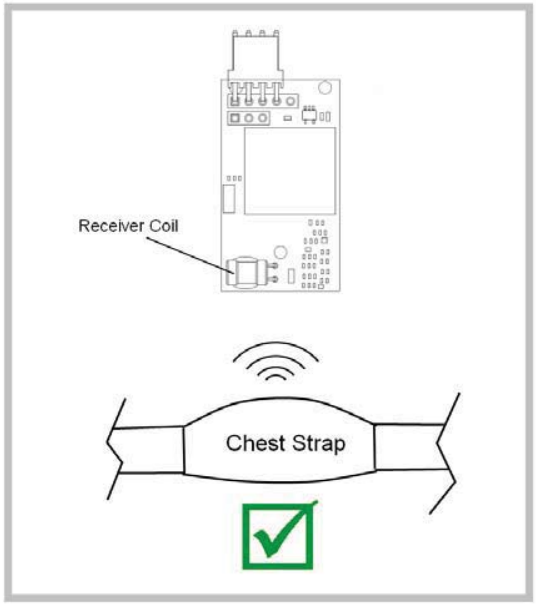

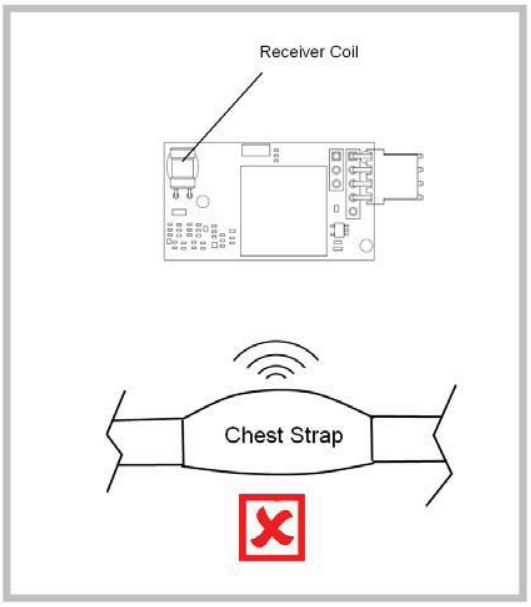

The ideal placement location of the HR wireless module would be at the center, toward the front that is closer to the user, and away from the noise sources.

In case the wireless module has to place off to the left or right side from the center of the console, then try to keep the offset distance within 12 inches (30cm) or less, otherwiseThe reception distance of the HRM will be shorten if it is placed too far off from the center.

Preliminary

FCC/IC statement

FCC 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.
Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device.

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.

FCC Radiation Exposure Statement

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains Transmitter Module FCC ID: N7P-HRM3300 Or ContainsFCC ID: N7P-HRM3300

Preliminary

FCC/IC statement

When the module is installed inside another device, the user manual of the host must contain below warning statements;
1. 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.
(2) This device must accept any interference received, including interference that may cause undesired operation.
2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.
Any company of the host device which install this modular with single modular approval should perform the test of radiated emissionand spurious emission according to FCC part 15C : 15.247 requirement,Only if the test result comply with FCC part 15C : 15.247 requirement，then the host can be sold legally.

IC statement

This device complies with Industry Canada's licence-exempt RSSs. 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.
Cet appareil est conforme aux CNR exemptes de licence d'Industrie Canada . Son fonctionnement est soumis aux deux conditions suivantes :
(1) Ce dispositif ne peut causer d'interférences ; etc
(2) Ce dispositif doit accepter toute interférence , y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appareil.

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

Avertissement RF pour Appareil portable:
Le dispositif a été évalué pour répondre aux exigences générales d'exposition RF. Le dispositif peut être utilisé dans une condition d'exposition portable sans restriction.

For a host manufacture's using a certified modular, if (1) the module's IC number is not visible when installed in the host, or (2) if the host is marketed so that end users do not have straightforward commonly used methods for access to remove the module so that the IC number of the module is visible; then an additional permanent label referring to the enclosed module:

"Contains Transmitter Module IC: "10274A-HRM3300" or "Contains IC: 10274A-HRM3300" must be used.

Preliminary

Order Information

Salutron's commitment to customer satisfaction is the driving force behind our product offerings. Contact us to discuss any specific connector options, preloaded features, and specific application information that you may need.

Life Support Policy

Salutron's products are not authorized for use as critical components in life support devices.

Contact Information

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