2ALHR003 Module User's Manual

1. Features
   - On-chip low power microcontroller
   - 128KB of In-system programmable flash
   - 8KB SRAM
   - On board crystal and PCB Antenna
2. Application
   - Mobile device accessories (Android/ iOS)
   - Wireless data communication
   - Remote sensors
3. Pin definition

| Pin No.	Description	Pin Type	Functions
1	BLE_RX	Digital I/O	UART RX
2	BLE_TX	Digital I/O	UART TX
3	WAKE_UP	Output	Digital I/O
4	STATUS	Input	Digital I/O
5	GND	Digital I/O	GND
6	V+	Digital I/O	VDD
7	BLE_EN	Digital I/O	VDD Enable

4. How to use:
   - Before sending any UART Command, "WAKE_UP 1 → 0" must be done by external MCU.
   - If the RF module is connected to Smart Devices (Android/ iOS), the pin STATUS will be logic "1" to inform external MCU.
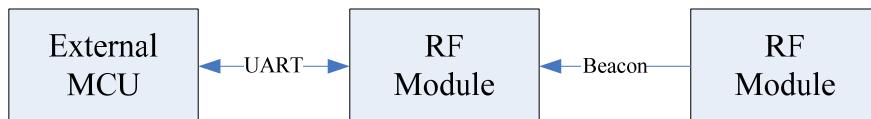   - Beacon
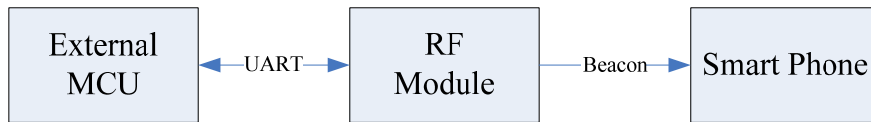
1. Send Command 'D'/'P' to send live measured data from external through Beacon.
2. This is default mode, and RF module send data only. Cannot receive any data.

- BLE
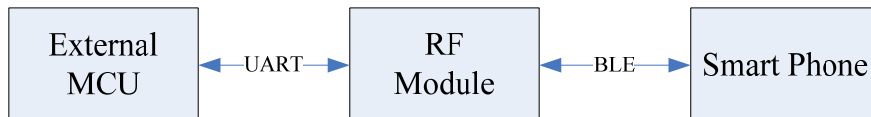
1. Send Command 'M' to switch mode from Beacon to BLE.
2. After the mode switch successfully, the external MCU can receive data from Smart phone.

- Receiver

1. Send Command 'A'/'B' to switch mode from Beacon to Receiver.
2. Only specific Beacon data can be received, and the external MCU receives the data from UART

5. Protocol:
   - UART Baud Rate: 115200, 8, N, 1
   - Commands

   'D': Send Measured Data

   External MCU → RF Module

Starter	Len	OP	R/B	Battery	Data	CK	End
#		D					(0D 0A)h

   External MCU ← RF Module

Starter	Len	OP	Indi	CK	End
>		D			(0D 0A)h

   'P': Send Product Information

   External MCU → RF Module

Starter	Len	OP	FP	Prod.	S/N	Cal. Date	CK	End
#		P						(0D 0A)h

External MCU ← RF Module

Starter	Len	OP	Indi	CK	End
>		P			(0D 0A)h

'M': Mode Switch

External MCU → RF Module

Starter	Len	OP	S/N	CK	End
#		M			(0D 0A)h

External MCU ← RF Module

Starter	Len	OP	Indi	CK	End
>		M			(0D 0A)h

'A': Scan Product Information

External MCU → RF Module

Starter	Len	OP	CK	End
'#'		'A'		(0D 0A)h

External MCU ← RF Module

Starter	Len	OP	SN	APO	Batt	RSSI	CK	End
'>'		'A'						(0D 0A)h

'B': Scan Measured Data

External MCU → RF Module

Starter	Len	OP	SN	CK	End
'#'		'B'			(0D 0A)h

External MCU ← RF Module

Starter	Len	OP	APO	Batt	Data	RSSI	CK	End
'>'		'B'						(0D 0A)h

'C': Scan stop

External MCU → RF Module

Starter	Len	OP	CK	End
'#'		'C'		(0D 0A)h

External MCU ← RF Module

Starter	Len	OP	CK	End
'>'		'C'		(0D 0A)h

'O': Scan Beacon Information

External MCU → RF Module

Starter	Len	OP	CK	End
'#'		'O'		(0D 0A)h

External MCU ← RF Module

Starter	Len	OP	Beacon Data	RSSI	CK	End
'>'		'O'				(0D 0A)h

'X': Setting RF Module parameter

External MCU → RF Module

Starter	Len	OP	Setting	FP	Prod.	S/N	Cal. Date	Tx Power	CK	End
#		X								(0D 0A)h

External MCU ← RF Module

Starter	Len	OP	FP	Prod	SN	Cal Date	Tx Power	BLE_Ver	CK	End
>		X								(0D 0A)h

'R': Send Beacon data

External MCU → RF Module

Starter	Len	OP	Beacon Data	CK	End
'#'		'R'			(0D 0A)h

External MCU ← RF Module

Starter	Len	OP	Indi	CK	End
'>'		'R'			(0D 0A)h

'E': Scan product code Beacon Information

External MCU → RF Module

Starter	Len	OP	Product Code	CK	End
'#'		'E'			(0D 0A)h

External MCU ← RF Module

Starter	Len	OP	Beacon Data	RSSI	CK	End
'>'		'E'				(0D 0A)h

'G': Scan Beacon Information

External MCU → RF Module

Starter	Len	OP	CK	End
'#'		'G'		(0D 0A)h

External MCU ← RF Module

Starter	Len	OP	Beacon Data	RSSI	CK	End
'>'		'G'				(0D 0A)h

Federal Communication Commission Interference 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 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 Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

End Product Labeling

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in visible area with the following: "Contains FCC ID: 2ALHRO03"
"

End Product Manual Information

The user manual for end users must include the following information in a prominent location "IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be colocated or operating in conjunction with any other antenna or transmitter." 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.

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or colocation with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for reevaluating the end product (including the transmitter) and obtaining a separate FCC authorization.   This device is intended only for OEM integrators under the following conditions: The antenna must be installed such that 20 cm is maintained between the antenna and users. As long as a condition above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed   (for example, digital device emissions, PC peripheral requirements, etc.).

Industry Canada Statement

This device complies with Industry Canada licence-exempt RSS standard.

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 host device shall be properly labelled to identify the modules within the host device.

The Industry Canada certification label of a module shall 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, as follows:

  "Contains transmitter module IC: 22518-BT003

IC Radiation Exposure Statement:

This equipment complies with IC RSS-102 radiation exposure limit set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body

Cet équipement est conforme aux CNR-102 d'Industrie Canada. Cet équipement doit êtreinstallé et utilisé avec une distance minimale de 20 centimètres entre le radiateur et votrecorps. Cet émetteur ne doit pas être co-localisées ou opérant en conjonction avec autreantenne ou émetteur. Les antennes utilisées pour cet émetteur doivent être installés etfournir une distance de séparation d'au moins 20 centimètre de toute personne et doit pas être co-située ni fonctionner en conjonction avec une autre antenne ou émetteur.