SRM200A User Manual

SEONG JI

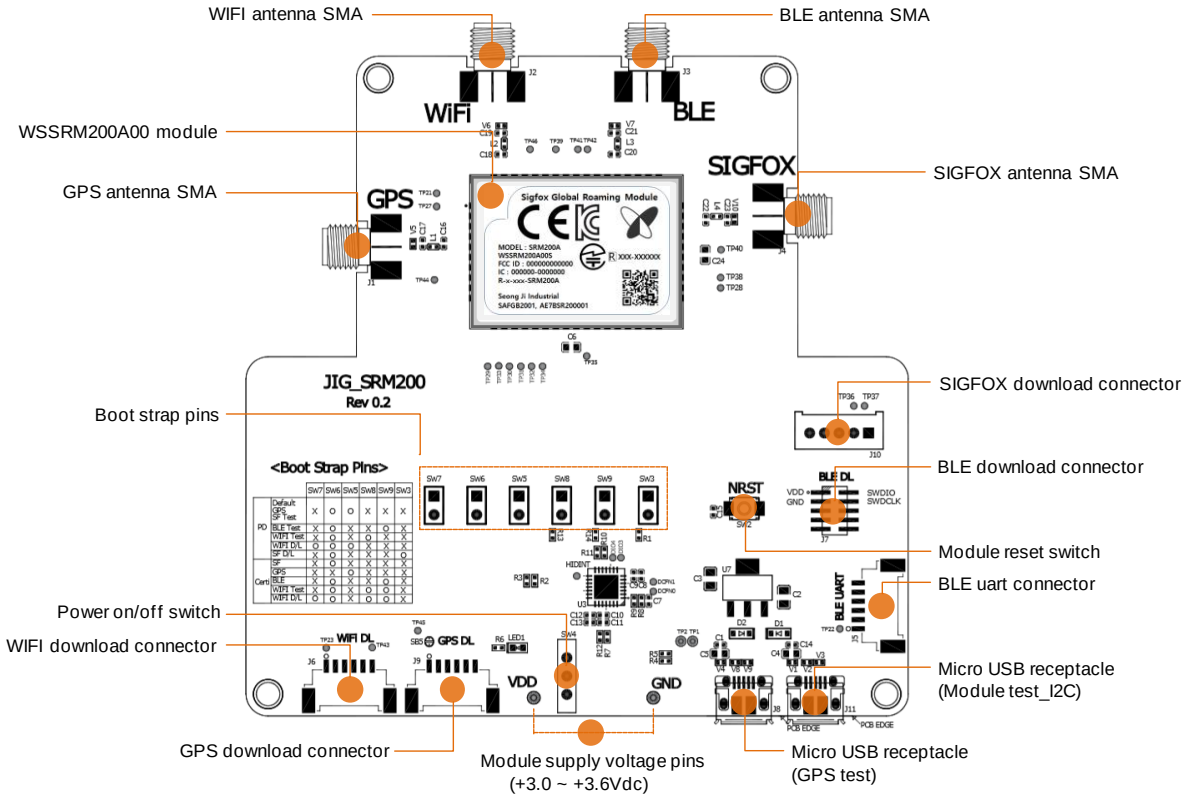
December 9, 2019

Contents

Model	P/N	H/W version	F/W version	Remark
SRM200A	WSSRM200A00	V1.4	V1.01	

Hardware

SRM200A EVB



[Fig. SRM200A_EVB]

- SRM200A module
  - SIGFOX Global Roaming module
- Antenna SAM connector
  - SIGFOX antenna
  - WiFi antenna : 2.4GHz antenna
  - BLE antenna : 2.4GHz antenna
  - GPS antenna
- BLE download connector
  - JLink SWD connector of Host CPU and BLE for debugging and firmware writing
- Module reset switch
  - push to reset module
- Micro USB receptacle
  - Micro USB receptacle for power supply into the EVB and command interface between windows PC and Module
- Power on/off switch

- EVB power on or off switch

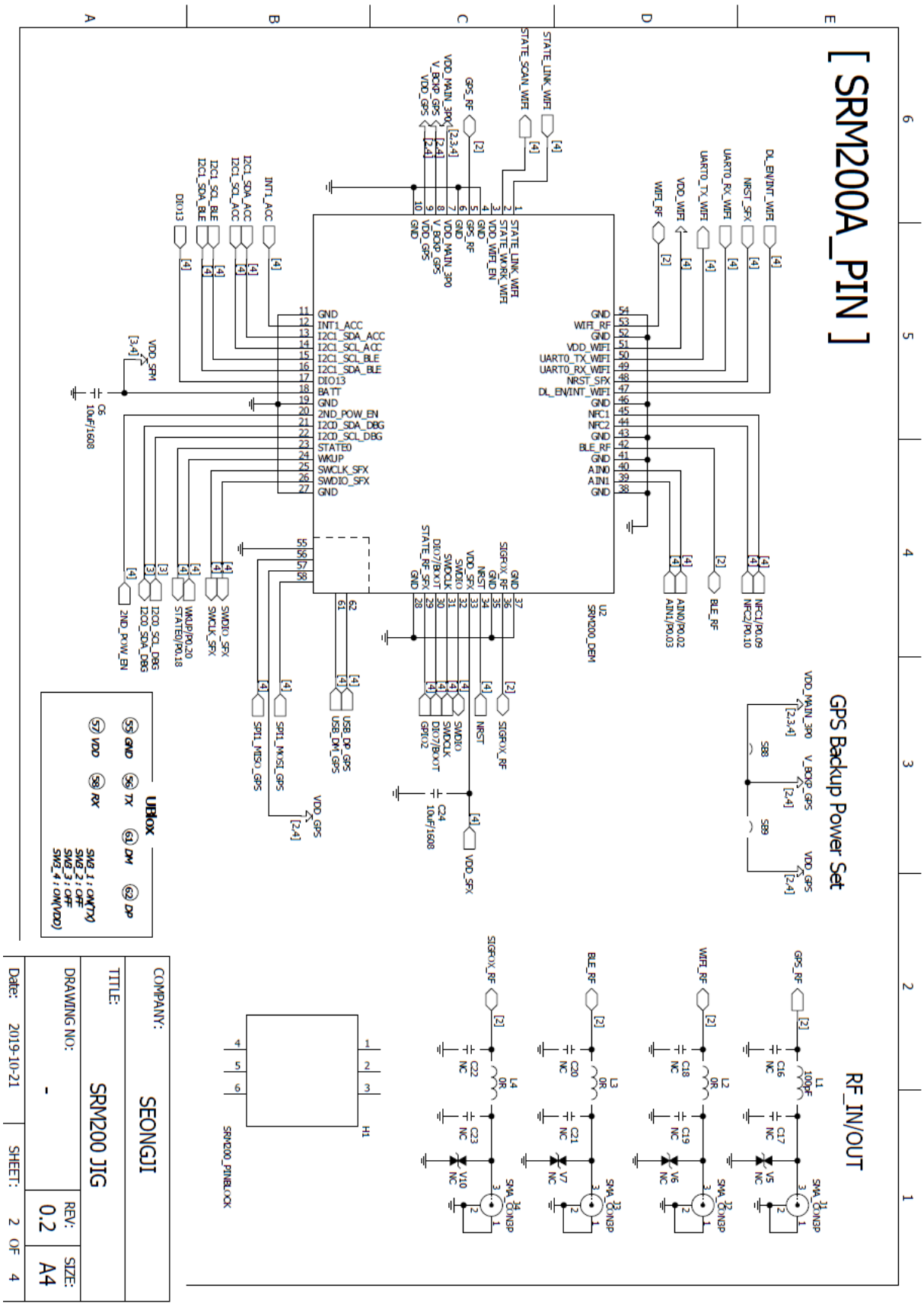
- Boot strap pins
  - User configurable pins

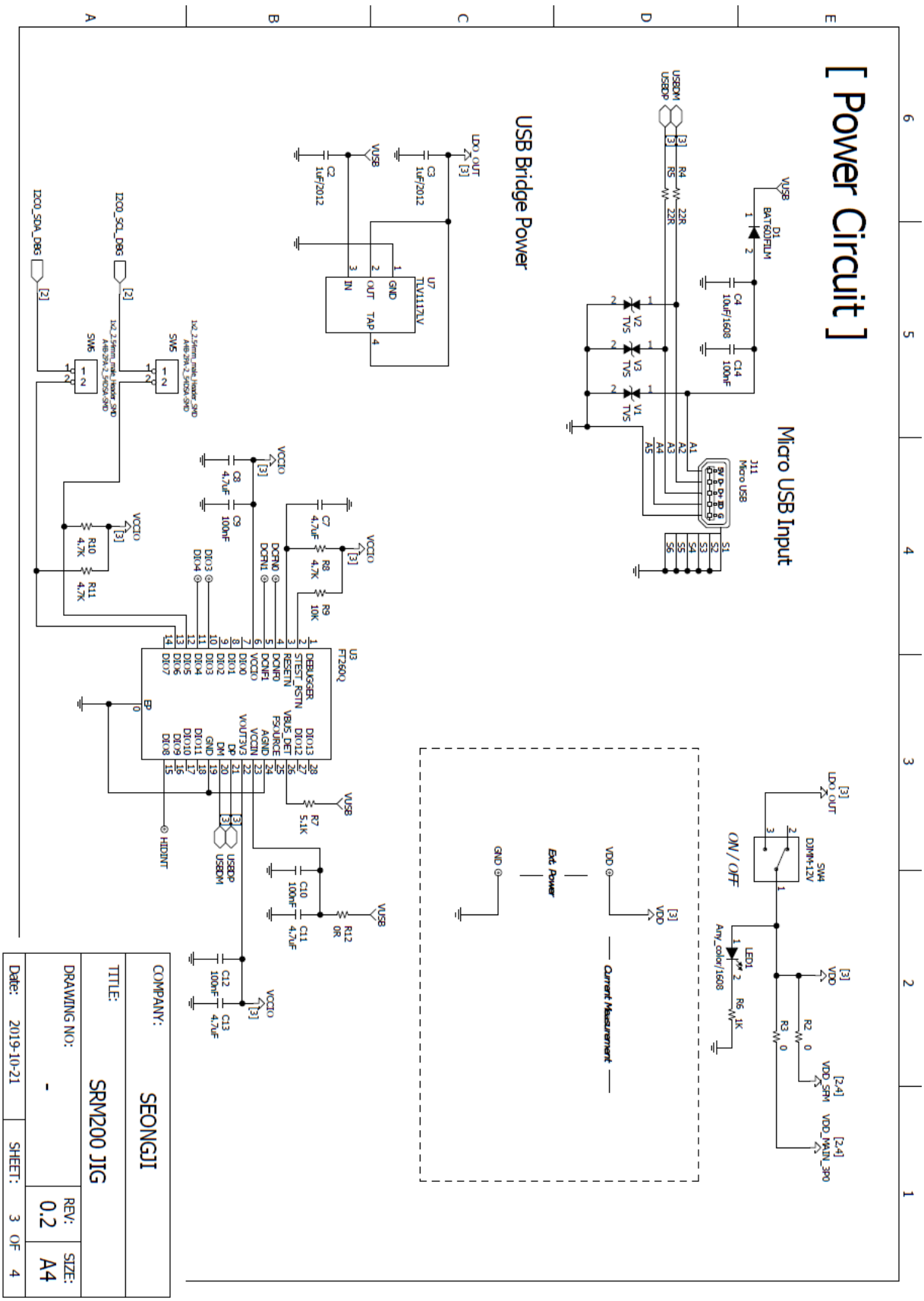
		SW7	SW6	SW5	SW8	SW9	SW3
PD	Default GPS SF Test	X	0	0	X	X	X
	BLE Test	X	0	X	X	0	X
	WIFI Test	X	0	X	0	X	X
	WIFI D/L	0	0	0	X	X	X
	SF D/L	X	0	X	X	X	0
Certi	SF	X	0	X	X	X	X
	GPS	X	X	0	X	X	X
	BLE	X	0	X	X	0	X
	WIFI Test	X	0	X	0	0	X
	WIFI D/L	0	0	X	0	0	X

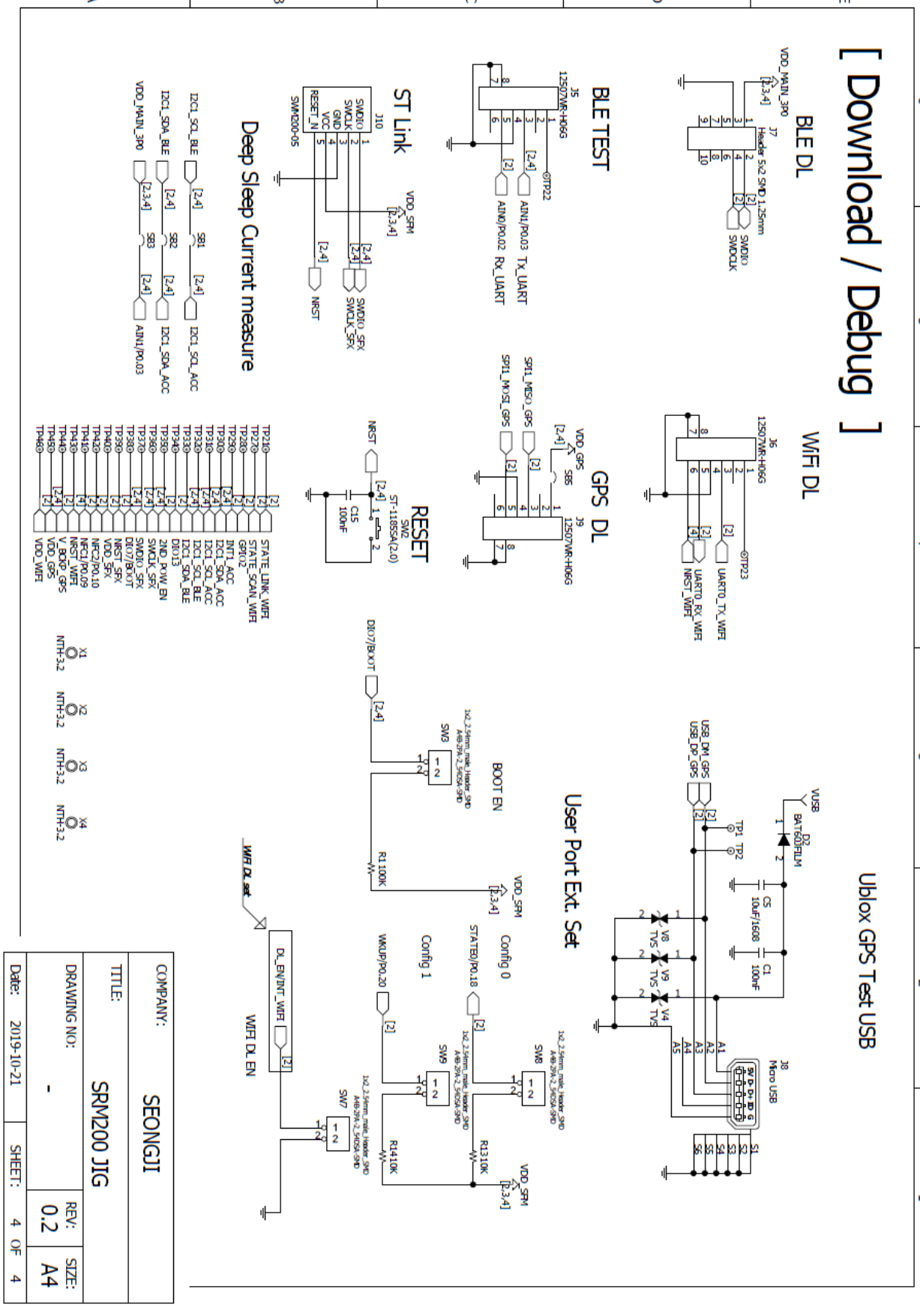
< Pin table >

- WiFi download connector
  - Download connector of WiFi chip inside module
- GPS download connector
  - Download connector of GPS chip inside module

Schematic


[SRM200A_PIN]
GPS Backup Power Set
RF_IN/OUT
U2
SRM200_DEM
SRM200_PINBLOCK
H1
UBlox
COMPANY: SEONGJI
TITLE: SRM200 JIG
DRAWING NO: -
REV: 0.2
SIZE: A4
Date: 2019-10-21
SHEET: 2 OF 4

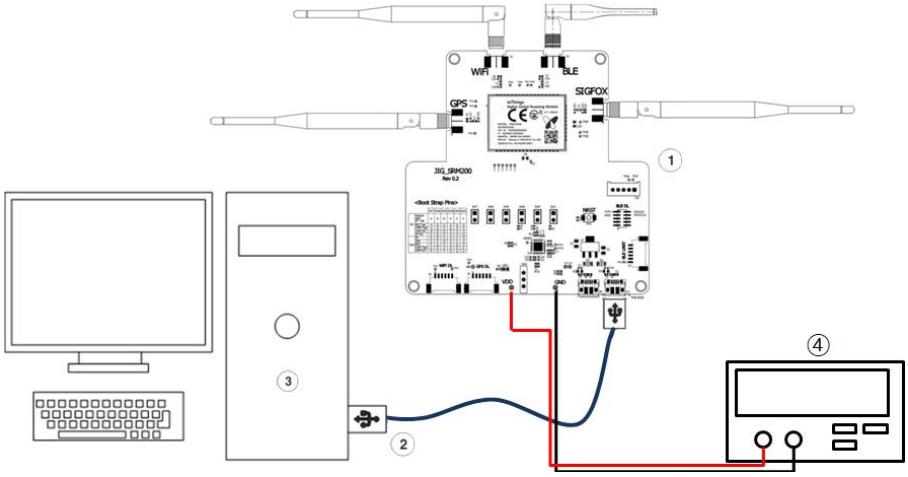

[Power Circuit]
Micro USB Input
ON / OFF
Current Measurement
Ext. Power
USB Bridge Power
J11
Micro USB
SW4
DIMM-12V
LED1
Amy_color/1608
R5 1K
R2 0
R3 0
D1
BAT60FILM
C4
10uF/1608
C14
100nF
R4
22R
R5
22R
V1
TVS
V2
TVS
V3
TVS
U7
TLV1117LV
C2
1uF/2012
C3
1uF/2012
U3
FT260Q
SW5
SW6
C7
4.7uF
C8
4.7uF
C9
100nF
C10
100nF
C11
4.7uF
C12
100nF
C13
4.7uF
R7
5.1K
R8
4.7K
R9
10K
R10
4.7K
R11
4.7K
R12
0R
VUSB
VCCIO
LDO_OUT
VDD
VDD_SPH
VDD_MAIN_3P0
I2C0_SDA_DBG
I2C0_SCL_DBG
USBDM
USBDP
HIDINT
COMPANY: SEONGJI
TITLE: SRM200 JIG
DRAWING NO: -
REV: 0.2
SIZE: A4
Date: 2019-10-21
SHEET: 3 OF 4


[Download / Debug]
BLE DL
WiFi DL
BLE TEST
GPS DL
ST Link
RESET
Deep Sleep Current measure
User Port Ext. Set
Ublox GPS Test USB
BOOT EN
Config 0
Config 1
WiFi DL set
WiFi DL EN
COMPANY: SEONGJI
TITLE: SRM200 JIG
DRAWING NO: -
REV: 0.2
SIZE: A4
Date: 2019-10-21
SHEET: 4 OF 4

Test Program

Test SRM200A_EVB Connection

1. Connect EVBSRM200A board to windows OS PC via micro USB cable

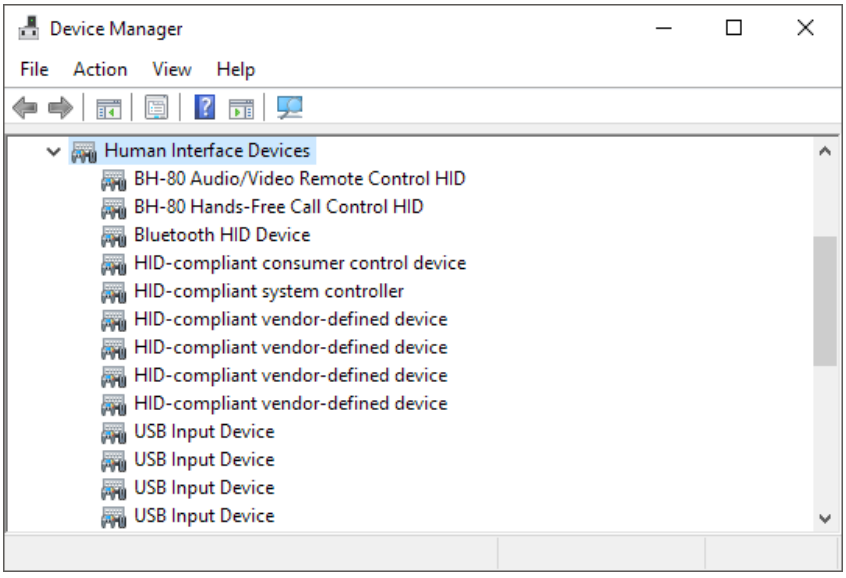


(1) EVMSRM200A
(2) Micro USB cable
(3) Windows PC
(4) Power Supply

[Fig. SRM200A_EVB connection]

Program execution

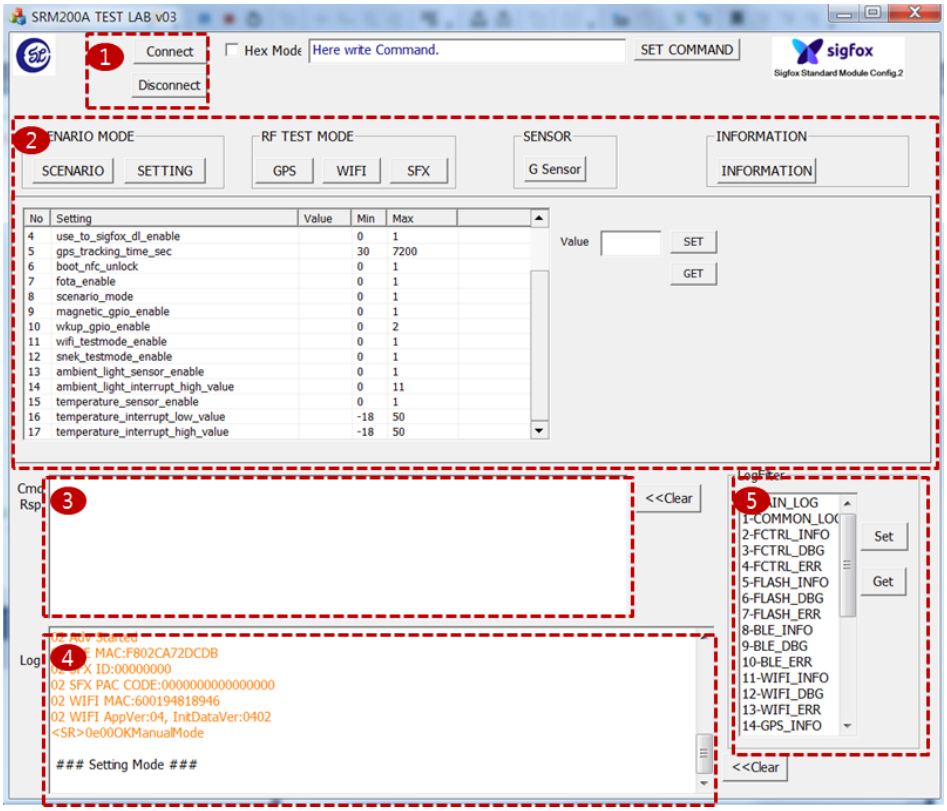
1. Connect SRM200A_EVB to Windows PC via USB cable.
   - SRM200A_EVB support USB HID class driver which will be already installed in most OS.



[Fig. Device manager]

2. Run test program “SRM200A_APP.exe”

Test program Description

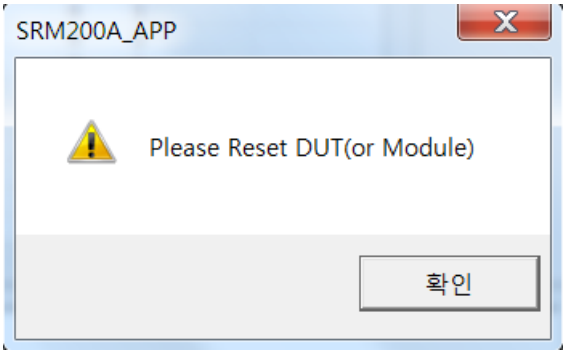


[Fig. Test program SRM200A_APP]

1. Connect / Disconnect button
   - Connect : Connect test program and EVB.
   - Disconnect : Disconnect test program from EVB.
2. menu package for each bellow operation
   - SCENARIO : Operate as predefined software scenario
   - SETTING : Setting menu mode for configuration of scenario
   - RF TEST MODE : RF test mode command for GPS, WIFI, BLE and SIGFOX
   - SENSOR : Menu for Accelerometer sensor
   - INFORMATION :
     - BLE : UUID and MAC address
     - WIFI : MAC MAC address
     - SIGFOX : ID and PAC code
3. Cmd Rsp : Display response message for command
4. Log : Display log message
5. LogFilter : Log filter configuration menu

Test program start

1. Run test program
2. Connect Windows PC to EVB board via USB cable
3. Click Connect button
4. Click Connect I2C
5. Notification dialog will be pop up as soon as click connection button. Click "OK" button and then push the NRST button on the EVB board to reset and enter to the test mode.

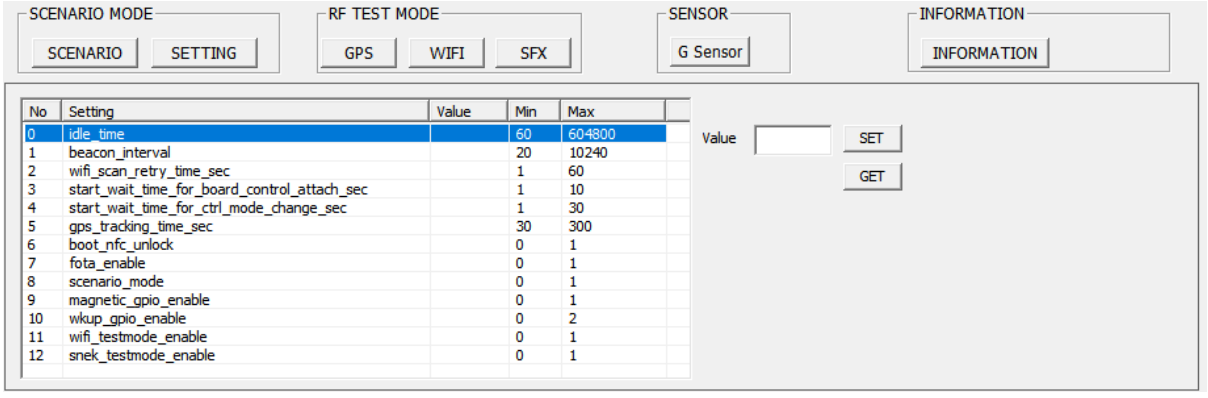


[Fig. Notification dialog]

6. EVB enter to the SETTING menu mode at initial connection from hardware reset
7. After enter to the SCENARIO mode, EVB only operate with its own task scheduler and doesn't support to change its operating mode anymore.
8. To enter to test mode from SCENARIO mode, user has to proceed above sequence again.

Setting menu

User can set or get configuration value of the scenario mode on this menu.



[Fig. Setting menu]

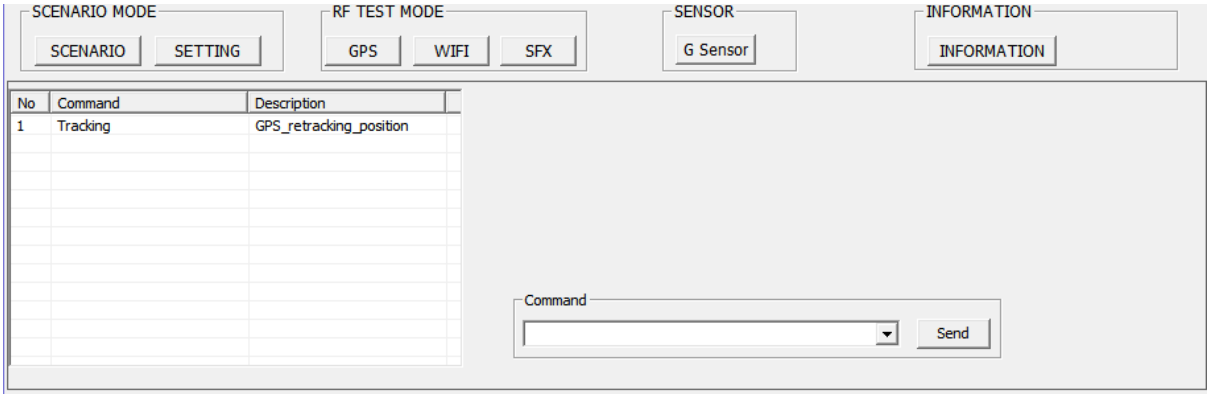
1. Select configuration item on the list
2. Input value on value edit box and click SET button to set value
3. Click GET button to get value of selected item

GPS menu

Double click the command item or write command on Command edit box located on right and

then click Send button to execute command.

Configuration value list is defined on GPS_CommandList.txt.

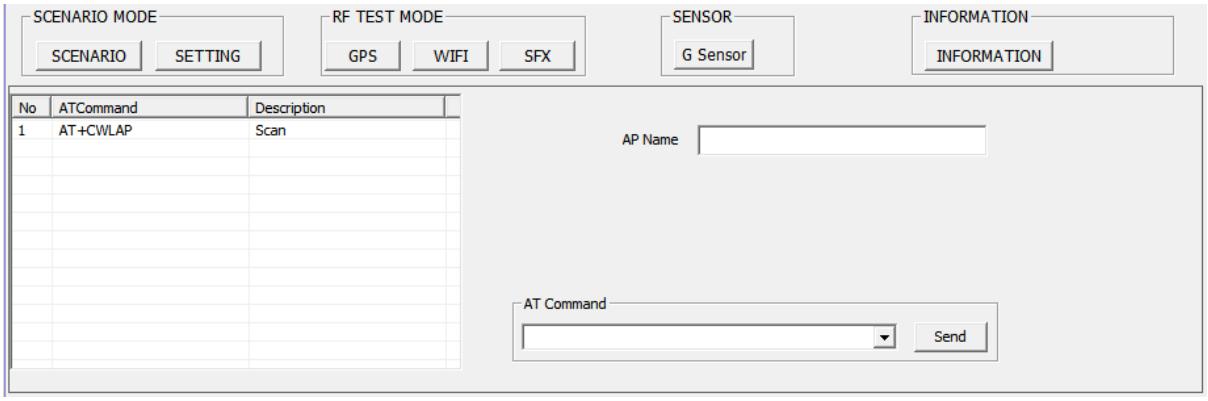


[Fig. GPS menu]

WIFI menu

Double click the command item or write command on Command edit box located on right and then click Send button to execute command.

Configuration value list is defined on WiFi _ATCommandList.txt.



[Fig. WIFI menu]

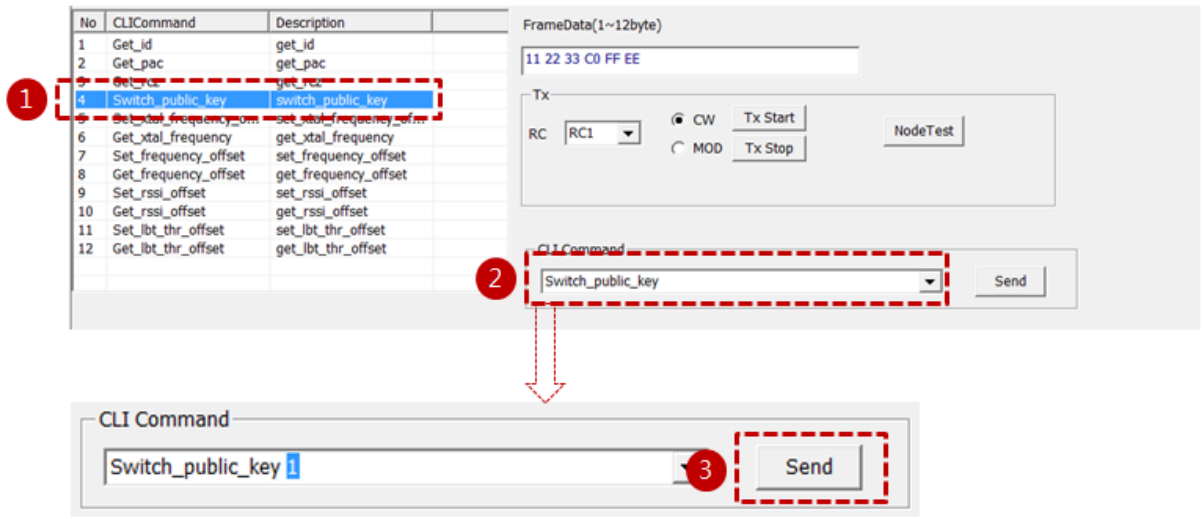
SIGFOX menu

Click the command item and than write command on Command edit box located on right and then click Send button to execute command.

Configuration value list is defined on SigFox_CLICommandList.txt.

Example)

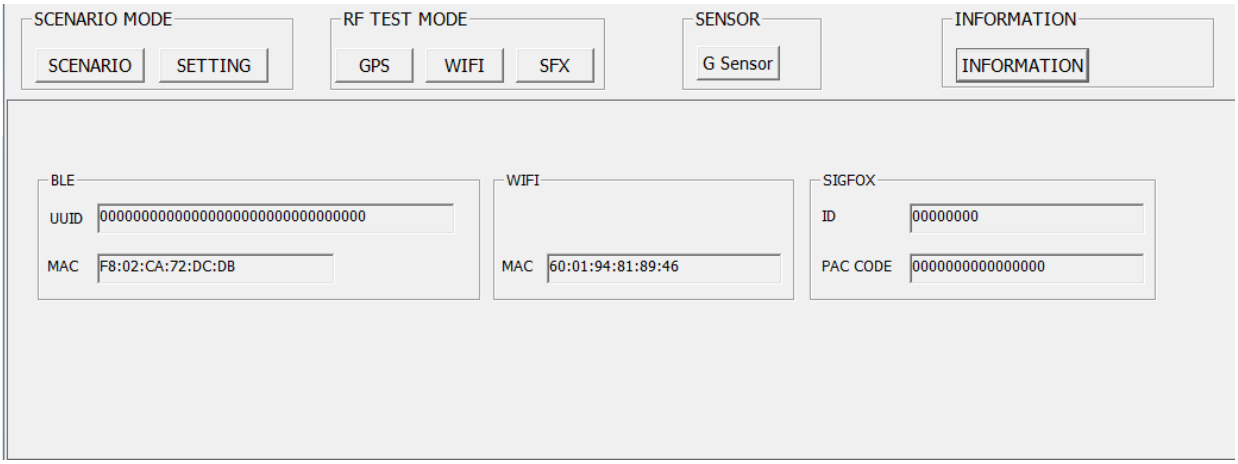
Command: switch_public_key 1<CR><LF> (1:publickey 0: private key)



[Fig. SIGFOX menu]

Information menu

Key information of module displayed.



[Fig. Information menu]

Sigfox CLI commands

Name	Arg	Arguments description	Description
node_close		None	Closes the Sigfox library, resetting its state
node_open	u	**rc**: pointer to sfx_rc_t type representing the RC number (RC1=1, RC2=2, RC3C=3, RC4=4, RC5=5 or RC6=6).	
Node_open_with_zone	u		
node_get_info		None	
node_get_version	u	**type**: The type of version (0=Sigfox, 1=MCU, 2=RF, 5=Monarch, 6=Device)	
node_send_bit	uuu	**bit_value**: bit value to send (0 or 1) **tx_repeat**: tx repeat value (default : 2) **initiate_downlink_flag**: wait for a response after transmitting. (0 or 1)	This function is used to send a single bit. It is mainly used when the node seeks downlink data (and not to transmit).
node_send_frame	buu	**cust_data**: pointer to the data to transmit ex) ASCII : "12345678" Hexa : {0102030405060708} **tx_repeat**: tx repeat value (default : 2) **initiate_downlink_flag**: wait for a response after transmitting. (0 or 1)	DM00365435.pdf Please refer to page 9 of the "DM00365435.pdf" file
Node_execute_monarch_scan	uuu	**rc_capability**: rc 6 5 4 3 2 1 bit 5 4 3 2 1 0 **time**: scan time **time_unit**: 0: ms, 1:sec, 2:min, 3:hour	Execute Monarch scan. rc_capability, time, unit
Node_stop_monarch_scan		None	This function stops any ongoing RC scan
node_set_std_config	wwwv	**config_word1**: ch1 ~ 32 for RC2,4 **config_word2:** ch33~64 for RC2,4 **config_word3:** ch65~86 for RC2,4 **timer_enable :** (0,1) for RC2,4	DM00365435.pdf Please refer to page 10 of the "DM00365435.pdf" file
Node_get_std_config		none	Get std_config value.
start_continuous_transmission	wu	**frequency**: Frequency at which the signal has to be generated **type**: Type of modulation to use in continuous mode (SFX_NO_MODULATION=0 SFX_DBPSK_100BPS=1 SFX_DBPSK_600BPS=2)	Executes a continuous wave or modulation depending on the parameter type
stop_continuous_transmission		None	Stop the current continuous transmission
node_test_mode	uu	**rc** : pointer to sfx_rc_t type representing the RC number (0, 1, 2, 3, 4, 5 or 6). **test_mode** : (SFX_TEST_MODE_TX_BPSK =0 SFX_TEST_MODE_TX_PROTOCOL =1 SFX_TEST_MODE_RX_PROTOCOL =2 SFX_TEST_MODE_RX_GFSK =3 SFX_TEST_MODE_RX_SENSI =4 SFX_TEST_MODE_TX_SYNTH =5 SFX_TEST_MODE_TX_FREQ_DISTRIBUTION =6 SFX_TEST_MODE_TX_BIT=11 SFX_TEST_MODE_PUBLIC_KEY=12 SFX_TEST_MODE_NVM=13)	Sigfox test mode rc : 0 : RC1 1 : RC2 2 : RC3A 3 : RC3C 4 : RC4 5 : RC5 6 : RC6
node_monarch_test_mode	uuu	**rc** : pointer to sfx_rc_t type representing the RC number (0, 1, 2, 3, 4, 5 or 6). **test_mode** : (SFX_TEST_MODE_RX_MONARCH_PATTERN_LISTENING_SWEEP=7 SFX_TEST_MODE_RX_MONARCH_PATTERN_LISTENING_WINDOW=8 SFX_TEST_MODE_RX_MONARCH_BEACON=9 SFX_TEST_MODE_RX_MONARCH_SENSI=10) **rc_capability**: rc 6 5 4 3 2 1 bit 5 4 3 2 1 0	Sigfox monarch test mode rc : 0 : RC1 1 : RC2 2 : RC3A 3 : RC3C 4 : RC4 5 : RC5 6 : RC6

switch_public_key	u	**key** : private=0, public=1	Switch device on public or private key.
Switch_test_credentials	u	**credentials :** 1 : test ID,PAC 0 : module ID, PAC	Set test credentials 1=On, 0=Off
set_payload_encryption	u	**enc** : encryption enable : 1 disable : 0	Payload encription
switch_pa	u	**pa** : set external power amplifiler (1 if a PA, 0 if not.).	Instructs the library to configure the S2-LP for a external PA (Power Amplifier).
set_smps_voltage	u	**smps**: smps voltage of the device (1.2V=1…. 1.8V=7) The default is to use the S2-LP at 1.8V	Instructs the library to configure the S2-LP with a user defined smps frequency
get_smps_voltage		None	Get SMPS voltage
set_rssi_offset	u	**rssi_value** : Rssi offset value in dB	Set an RSSI offset for the RSSI. Very useful if the RF frontend has an LNA or to calibrate the RSSI measurement.
get_rssi_offset		None	Get the RSSI offset for the RSSI
set_xtal_frequency	w	**xtal** : xtal value in Hz	Sets the XTAL frequency of the S2-LP in Hertz (default is 50MHz).
get_xtal_frequency		None	Get xtal frequency
set_xtal_frequency_offset	w	**freq_offset**: RF offset value in Hz	Sets the RF frequency offset in Hertz (default is 0 Hz).
get_xtal_frequency_offset		None	Get xtal frequency offset
reduce_output_power	v	**o_pwr**: power reduction in half dB	Reduces the output power of the transmitted signal by a facor (reduction*0.5dB against the actual value)
get_reduce_output_power		None	Get reduce output power
set_lbt_thr_offset	u	**lbt** : LBT threshold offset	Set LBT threshold offset
get_lbt_thr_offset		None	Get LBT threshold offset
get_id		None	ID stored in the current node
get_pac		None	PAC stored in the current node
get_rcz		None	RCZ stored in the current node
get_lib_version	u	**lib_ver** : 0 : Sigfox, 1 : MCU_API 2 : RF_API, 5 : MONARCH_API 6 : DEVICE_CONFIG_API	Get version of specified module
_set_rcz	u	**rc**: pointer to sfx_rc_t type representing the RC number (RC1=1, RC2=2, RC3C=3, RC4=4, RC5=5 or RC6=6).	Set rc