

Sensor Tag Application

For RED Utility_v4.0.0 or later



Revision History

Version	Date	Description	Person in charge
01	2016-05-17	Initial Release	wsyang
02	2016-08-17	Updated Image Updated RCP Packet	wsyang
03	2021-11-03	Updated Image Updated New Function	mwjang

Document Summary

- RED series supports custom command of sensor tag IC
 - *From firmware ver 2.5.1*

- Available Tag IC

- AXZON(RF Micron)

- Magnus®-S
Magnus S2 : Sensor code
Magnus S3 : Temperature



- EM Micro electronic

- EM4325 : Temperature

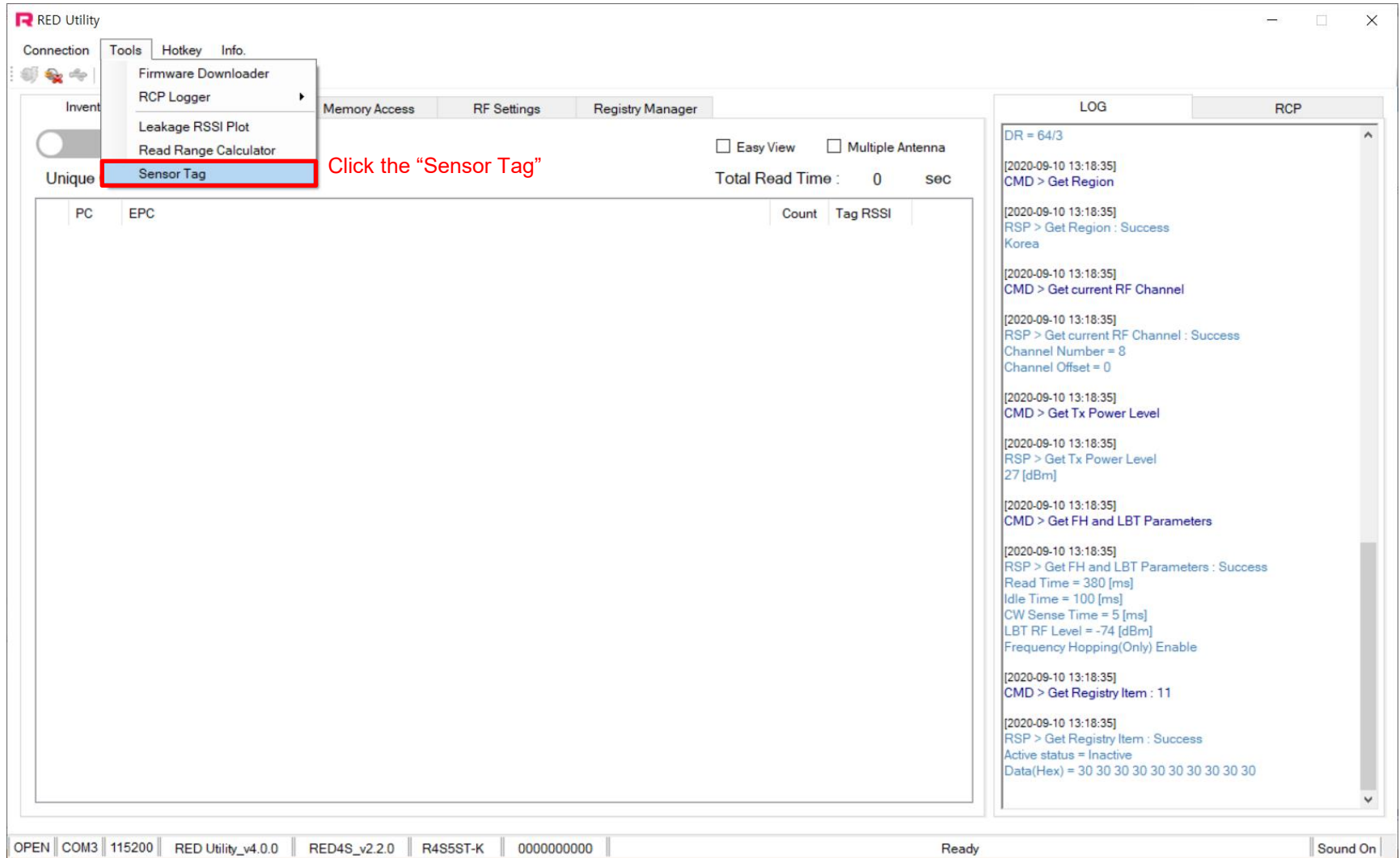


- This document contains how to use sensor function of RED utility and RCP

AXZON(RF MICRON) TAG

MAGNUS-S

How to use RED utility : Sensor Tag Function



How to use RED utility : AXZON Sensor Tag Function (1/3)

RED Sensor Tag

AXZON EM Micro

Tag List

PC	EPC	Count	Code Type	On-Chip RSSI	Sensor Co...	Temp Code	Temperature	F
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Read Tag : 0 [Note] Selecting a tag from the list activates power modulation(On-Chip RSSI range 13~18) and reads only the target tag. **Start**

Monitor

Just Click the "Start"

— Code Value — On Chip RSSI

Average

Code Value	—
On-Chip RSSI	—

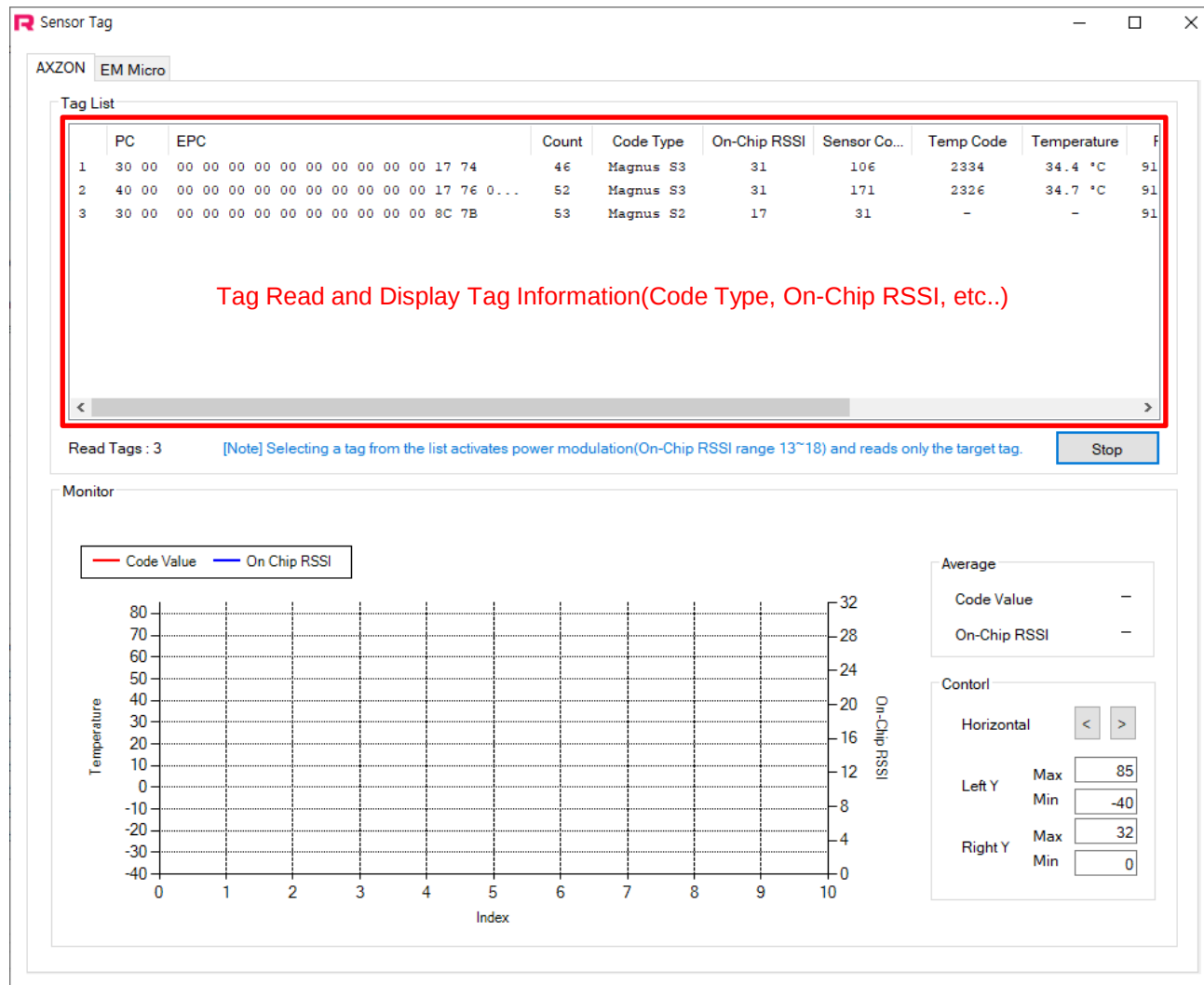
Control

Horizontal < >

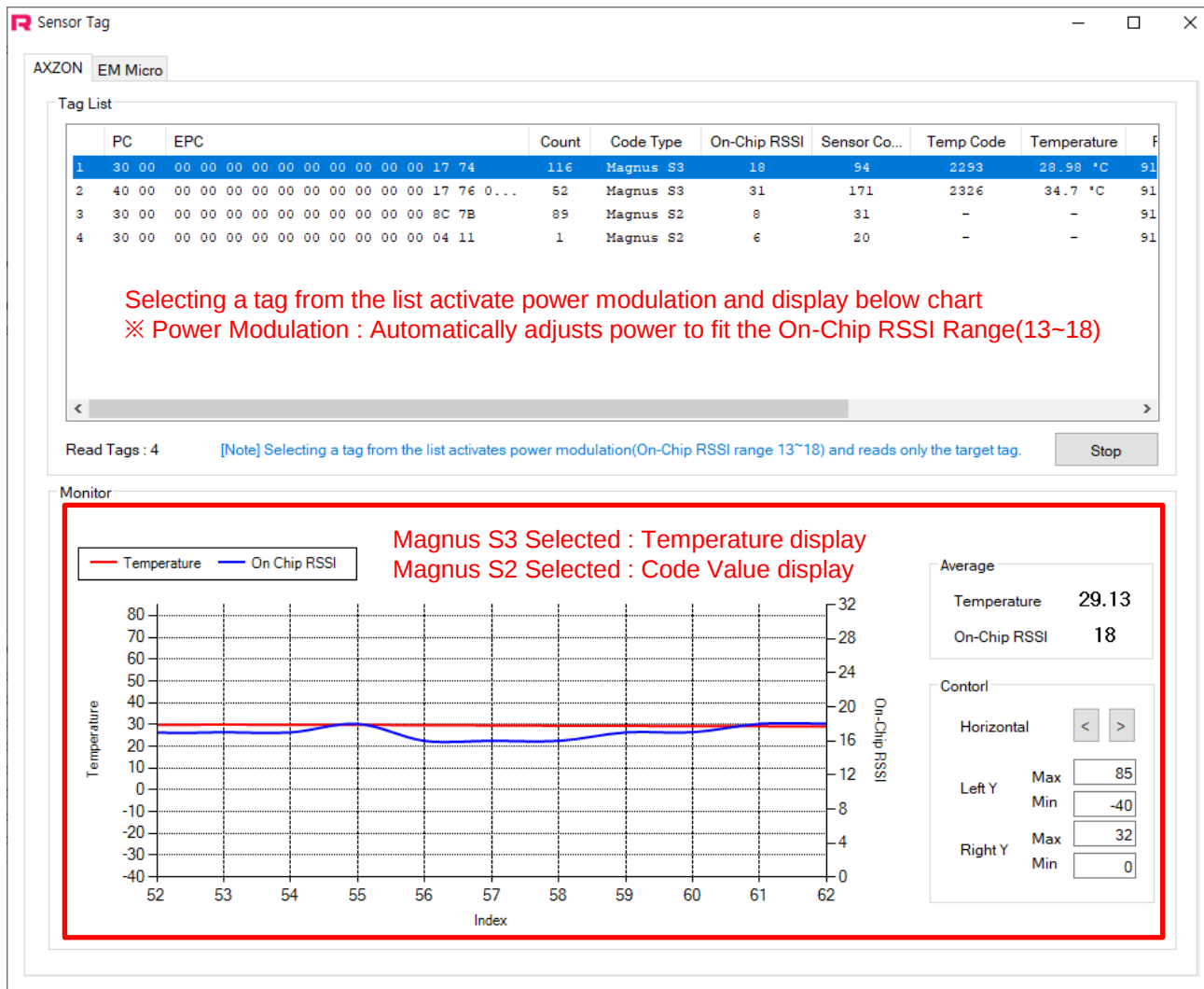
Left Y Max 85 Min -40

Right Y Max 32 Min 0

How to use RED utility : AXZON Sensor Tag Function (2/3)



How to use RED utility : AXZON Sensor Tag Function (3/3)



RCP for AXZON (1/7)

- **Start Auto Read AXZON**

Start an automatic AXZON tag read operation, tag IDs and sensor data are sent back to user through notification packet.

Command

- Message Type: Command (0x00)
- Code: Start Auto Read AXZON (0x3B)
- Arguments
 - CT (8-bit): code type. all code (0x00), sensor code (0x02), temperature code (0x03)
 - MTNU (8-bit): maximum number of tag to read
 - MTIME (8-bit): maximum elapsed time to tagging (sec)
 - RC (16-bit): repeat cycle (how many times reader perform inventory round)
- Example) CT = Temperature code (0x03), MTNU = 0, MTIME = 0, Repeat Cycle = 100

Preamble	Msg Type	Code	PL(MSB)	PL(LSB)	CT	MTNU	MTIME	RC(MSB)	RC(LSB)
0xBB	0x00	0x3B	0x00	0x05	0x03	0x00	0x00	0x00	0x64
End Mark	CRC-16								
0x7E	0xNNNN								

Response

- Message Type: Command (0x01)
- Code: Start Auto Read AXZON (0x3B)

RCP for AXZON (2/7)

- Arguments
 - Success (0x00)
- Example) Success

Preamble	Msg Type	Code	PL(MSB)	PL(LSB)	Arg	End Mark	CRC-16
0xBB	0x01	0x3B	0x00	0x01	0x00	0x7E	0xNNNN

Notification

- Message Type: Command (0x02)
- Code: Start Auto Read AXZON (0x3B)
- Arguments
 - EPC Block (variable): PC + EPC
 - COP (16-bit): current output power information
 - CFQ (32-bit): current frequency information. MHz part(16-bit) + kHz part(16-bit)
 - CT (8-bit): chip type. for all (0x00), for Magnus S2 (0x02), for Magnus S3 (0x03)
 - CD (variable): code data
 - If chip type is Magnus S2, Sensor code (2byte) + On-Chip RSSI code (2byte)
 - If chip type is Magnus S3, Sensor code (2byte) + On-Chip RSSI code (2byte) + Temperature code (2byte) + Calibration data (8byte)
- Example) PC = 0x3000, EPC = 0x000000000000000000001975, COP = 250 (25.0 dBm), CFQ = 920.125 MHz, CT = for Magnus S3 (0x03), CD = 0x001F000008E0DFEA8D382D4E7900

RCP for AXZON (3/7)

Preamble	Msg Type	Code	PL(MSB)	PL(LSB)	PC(MSB)	PC(LSB)	EPC (MSB)		
0xBB	0x02	0x3B	0x00	0x23	0x30	0x00	0x00	0x00	0x00
								EPC (LSB)	COP(MSB)
0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x19	0x75	0x00
COP(LSB)	CFQ(MSB)			CFQ(LSB)	CT	CD(MSB)			
0xFA	0x03	0x98	0x00	0x7D	0x03	0x00	0x1F	0x00	0x0C
									CD (LSB)
0x08	0xE0	0xDF	0xEA	0x8D	0x38	0x2D	0x4E	0x79	0x00
End Mark	CRC-16								
0x7E	0xNNNN								

Notification (Read Complete)

- Message Type: Command (0x02)
- Code: Start Auto Read AXZON (0x3B)
- Arguments
 - Read Complete (0x1F)
- Example)

Preamble	Msg Type	Code	PL(MSB)	PL(LSB)	Arg	End Mark	CRC-16
0xBB	0x02	0x3B	0x00	0x01	0x1F	0x7E	0xNNNN

- **AXZON Select**

Command

- [illegible]

RCP for AXZON (5/7)

Response

- Message Type: Command (0x01)
- Code: AXZON Select (0x9E)
- Arguments
 - Success (0x00)
- Example) Success

Preamble	Msg Type	Code	PL(MSB)	PL(LSB)	Arg	End Mark	CRC-16
0xBB	0x01	0x9E	0x00	0x01	0x00	0x7E	0xNNNN

Notification

- Message Type: Command (0x03)
 - Code: Start Auto Read AXZON (0x3B)
 - Arguments
 - COP (16-bit): current output power information
 - CFQ (32-bit): current frequency information. MHz part(16-bit) + kHz part(16-bit)
 - CD (variable): code data
- If chip type is Magnus S2, Sensor code (2byte) + On-Chip RSSI code (2byte)
- If chip type is Magnus S3, Sensor code (2byte) + On-Chip RSSI code (2byte) + Temperature code (2byte)
- Example) COP = 250 (25.0 dBm), CFQ = 920.125 MHz, CT = Magnus S3 (0x03), CD = 0x00A1001208D2

RCP for AXZON (6/7)

Preamble	Msg Type	Code	PL(MSB)	PL(LSB)	COP(MSB)	COP(LSB)	CFQ(MSB)		
0xBB	0x03	0x3B	0x00	0x0C	0x00	0xFA	0x03	0x00	0x00
CFQ(LSB)	CD(MSB)					CD(LSB)	END Mark	CRC-16	
0x7D	0x00	0xA1	0x00	0x12	0x08	0xD2	0x7E	0xNNNN	

RCP for AXZON (7/7)

- **AXZON Deselect**

Deactivate target selection and power modulation.

Command

- Message Type: Command (0x00)
- Code: AXZON Deselect (0x9F)
- Arguments
 - None

- Example)

Preamble	Msg Type	Code	PL(MSB)	PL(LSB)	End Mark	CRC-16
0xBB	0x00	0x9F	0x00	0x00	0x7E	0xNNNN

Response

- Message Type: Command (0x01)
- Code: AXZON Deselect (0x9F)
- Arguments
 - Success (0x00)

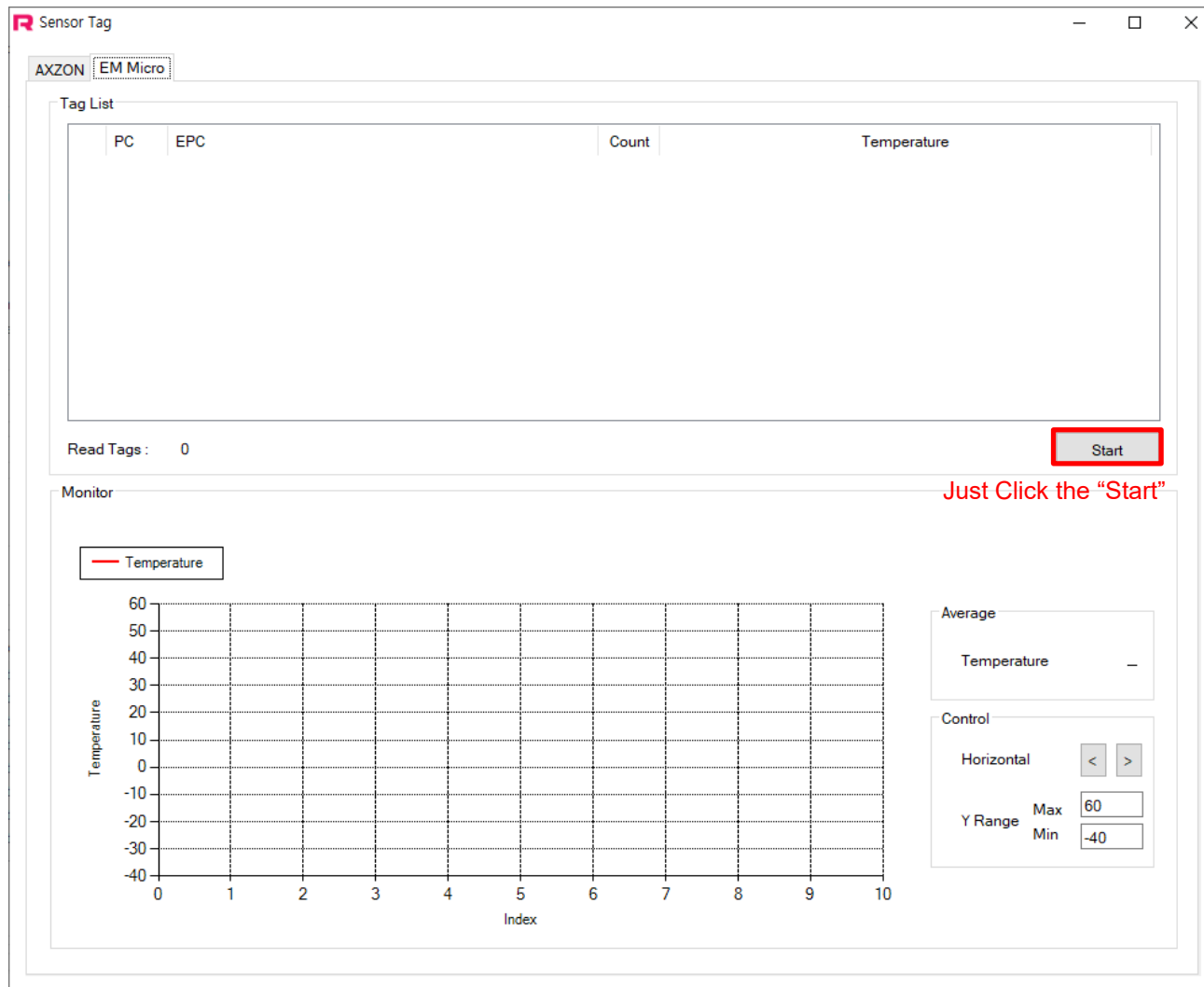
- Example) Success

Preamble	Msg Type	Code	PL(MSB)	PL(LSB)	Arg	End Mark	CRC-16
0xBB	0x01	0x9F	0x00	0x01	0x00	0x7E	0xNNNN

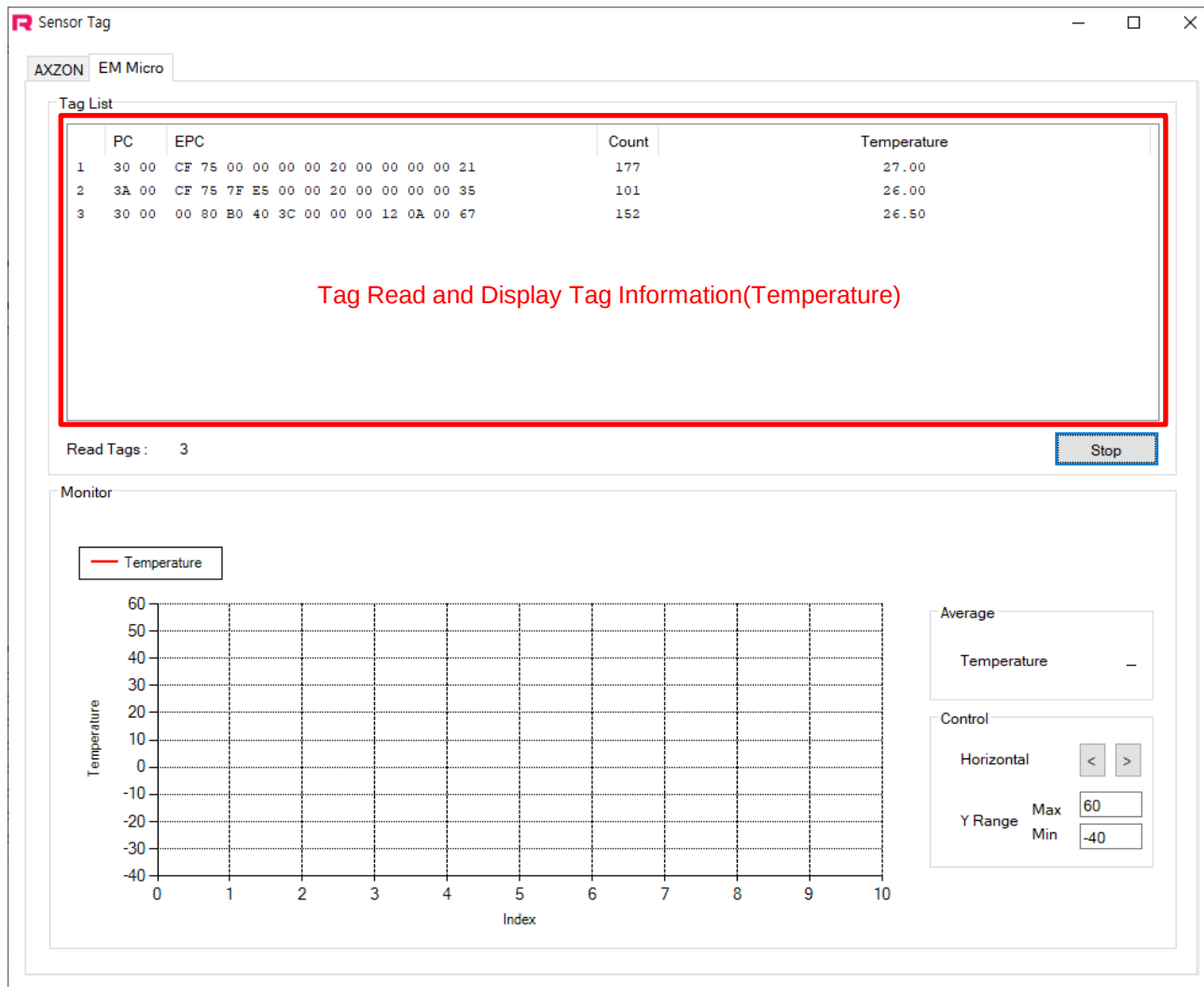
EM MICRO TAG

EM4325

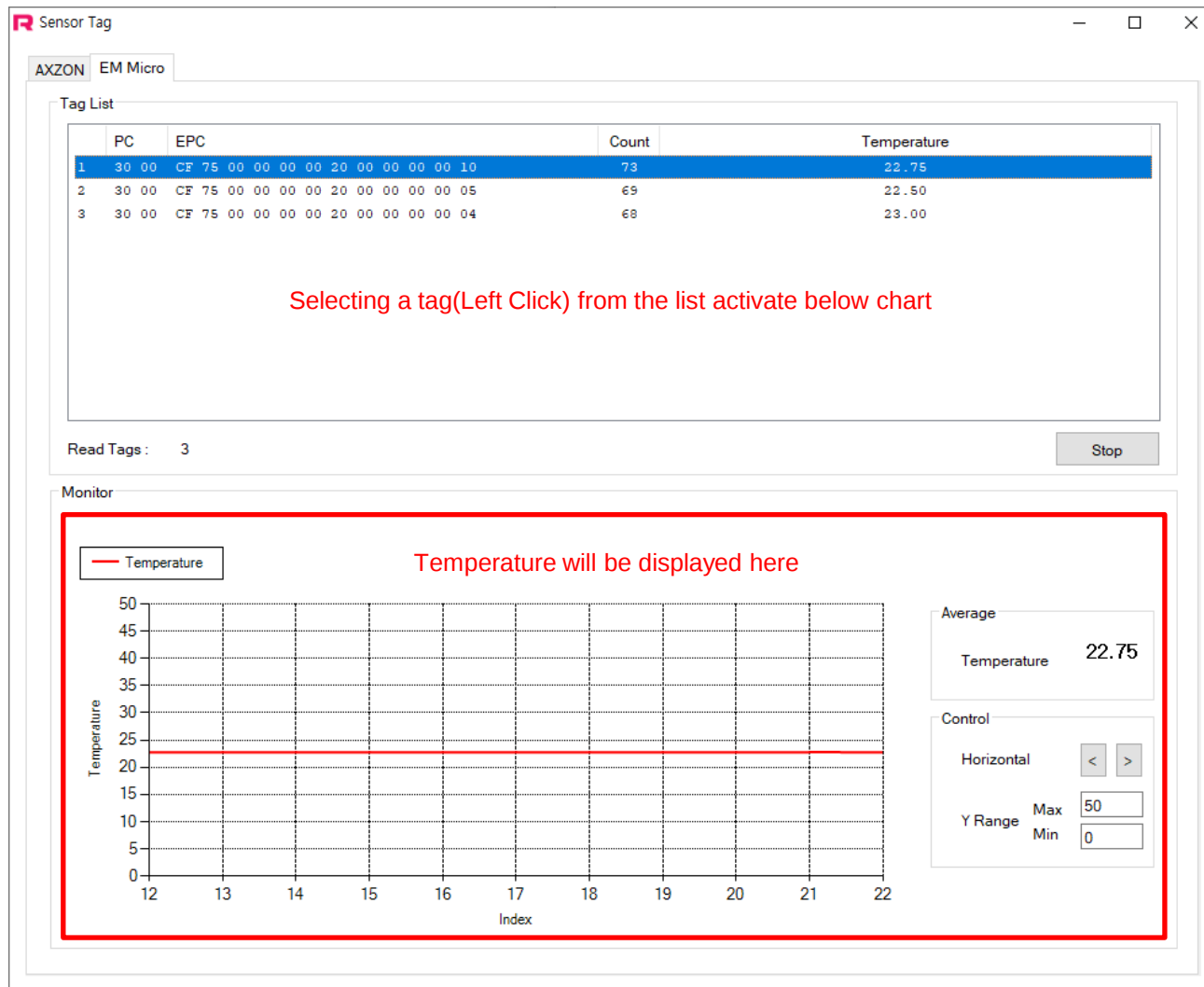
How to use RED utility : EM Micro Sensor Tag Function (1/3)



How to use RED utility : EM Micro Sensor Tag Function (2/3)



How to use RED utility : EM Micro Sensor Tag Function (3/3)



RCP for EM Microelectronic (1/3)

- **Start Auto Read EM4325**

Start an automatic EM4325 tag read operation, tag IDs and sensor data are sent back to user through notification packet.

Command

- Message Type: Command (0x00)
- Code: Start Auto Read EM4325 (0x3C)
- Arguments
 - MTNU (8-bit): maximum number of tag to read
 - MTIME (8-bit): maximum elapsed time to tagging (sec)
 - RC (16-bit): repeat cycle (how many times reader perform inventory round)
- Example) MTNU = 0, MTIME = 0, Repeat Cycle = 100

Preamble	Msg Type	Code	PL(MSB)	PL(LSB)	MTNU	MTIME	RC(MSB)	RC(LSB)	End Mark
0xBB	0x00	0x3C	0x00	0x04	0x00	0x00	0x00	0x64	0x7E
CRC-16									
0xNNNN									

Response

- Message Type: Command (0x01)
- Code: Start Auto Read EM4325 (0x3C)
- Arguments
 - Success (0x00)

RCP for EM Microelectronic (2/3)

- Example) Success

Preamble	Msg Type	Code	PL(MSB)	PL(LSB)	Arg	End Mark	CRC-16
0xBB	0x01	0x3C	0x00	0x01	0x00	0x7E	0xNNNN

Notification

- Message Type: Command (0x02)
- Code: Start Auto Read EM4325 (0x3C)
- Arguments
 - EPC Block (variable): PC + EPC
 - SD (32-bit): sensor data

- Example) PC = 0x3000, EPC = 0x0080B0403C000000120A0090, SD = 0x005A0000

Preamble	Msg Type	Code	PL(MSB)	PL(LSB)	PC(MSB)	PC(LSB)	EPC(MSB)		
0xBB	0x02	0x3C	0x00	0x12	0x30	0x00	0x00	0x80	0xB0
								EPC (LSB)	SD (MSB)
0x40	0x3C	0x00	0x00	0x00	0x12	0x0A	0x00	0x90	0x00
COP(LSB)	CFQ(MSB)			CFQ(LSB)	CT	CD(MSB)			
0xFA	0x03	0x98	0x00	0x7D	0x03	0x00	0x1F	0x00	0x0C
		SD (LSB)	End Mark	CRC-16					
0x5A	0x00	0x00	0x7E	0xNNNN					

RCP for EM Microelectronic (3/3)

Notification (Read Complete)

- Message Type: Command (0x02)
- Code: Start Auto Read EM4325 (0x3C)
- Arguments
 - Read Complete (0x1F)

- Example)

Preamble	Msg Type	Code	PL(MSB)	PL(LSB)	Arg	End Mark	CRC-16
0xBB	0x02	0x3C	0x00	0x01	0x1F	0x7E	0xNNNN

RCP for AXZON & EM Microelectronic

- **Stop Auto Read**

Stop an automatic read operation.

Command

- Message Type: Command (0x00)
- Code: Stop Auto Read 2 (0x37)
- Arguments
 - None

- Example)

Preamble	Msg Type	Code	PL(MSB)	PL(LSB)	End Mark	CRC-16
0xBB	0x00	0x37	0x00	0x00	0x7E	0xNNNN

Response

- Message Type: Command (0x01)
- Code: Stop Auto Read 2 (0x37)
- Arguments
 - Success (0x00)

- Example) Success

Preamble	Msg Type	Code	PL(MSB)	PL(LSB)	Arg	End Mark	CRC-16
0xBB	0x01	0x37	0x00	0x01	0x00	0x7E	0xNNNN

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