

RED UTM 2022-05-13

RED Utility User Manual For RED Utility_v4.0.0 or later

Ver 1.0.10 2022-05-13

Contents

1	Revision History	3
2	Introduction	.4
3	GUI Overview	5
3.1	Basic View	.5
4	Start-up Guide	7
5	Inventory	.9
5.1	Reading Tags	.9
5.2	Select a Specific Tag to Read	12
5.3	Read Memory by Selecting Specific Tag	13
5.4	Export Tag List to CSV File	14
5.5	Copy to Clipboard Tag List	15
6	Inventory Settings	16
6.1	Multi-tag Mode	16
6.2	Single Tag Mode	16
6.3	Unique Recognition Mode	16
6.4	Manual Mode	17
6.5	Read Tags by Selection Criteria	19
7	Memory Access	20
7.1	Tag Memory Information View	20
7.2	Procedures for Tag Memory Access	23
7.3	Procedures for Tag Memory Write	25
7.4	Procedures for Locking Tag Memory	27
8	RF Settings	30
8.1	Frequency Control	30
8.2	RF Power Control	32
8.3	RF Control	34
9	Registry Manager	36
9.1	Configuration	36
9.2	Export to file registry Data	36
10	RCP log	38
11	Download	39
12	Tx Leakage RSSI Plot	40
12.1	Measure	40
12.2	Plot	41
12.3	Save and Load	41
13	Read Range Calculator	43
13.1	Read Range Calculator Overview	43
13.2	Read Range Calculator Detail View	44
14	Sensor Tag Demo	45
15	Hotkey Function	46
15.1	Hotkey Function Editor	46
16	Address Information	47

1 Revision History

Version	Date	Description
1.0.0	2015.03.05	Initial Release
1.0.1	2015.03.31	Updated Description of Read Option
1.0.2	2015.06.09	Updated Image & rename
1.0.3	2015.06.29	Update Image and Added Description of New Function
1.0.4	2015.08.05	Updated Description of FH & LBT Setting
1.0.5	2016.01.27	Updated Image Updated Description of the Fast Leakage Cal.
1.0.6	2016.08.17	Added Mention of the Sensor tag function
1.0.7	2019.11.08	Integrated GUI to support all of the REDx products
1.0.8	2020.02.24	Updated Image Added Description of Multi antenna function
1.0.9	2021.11.05	Contents list reorganization according to GUI design change Update Image and Added Description of New Function
1.0.10	2022.05.13	Updated Description of 12.3 Save and Load

2 Introduction

The RED Utility helps the user to start working with REDx-DK RFID reader quickly. From the RED Utility version_v2.6.0, it supports all of the REDx products.

System requirements Microsoft .NET Framework v4.0 or later version OS: Windows (Developed and tested on windows 10)

3 GUI Overview

3.1 Basic View

RED Utility	– 🗆 X
Connection Tools Hotkey Info.	
Inventory Inventory Settings Memory Access RF Settings Registry Manager	Log RCP
Start 🔅	[2021-02-02 11:46:57]
	RSP > Get Tx Power Level 27 [dBm]
Unique Count: II I Iotal Count: I25 I Iotal Read Time: 8.1 sec	[2021-02-02 11:46:58]
PC EPC Count Tag RSSI	CMD > Get FH and LBT Parameters
1 10 00 60 00 00 5 23 23 20 00 00 C C C C C C C C C C C C C C C	[2021-02-02 11:46:58]
2 30 00 000 000 00 00 00 00 00 00 00 00 11 24	RSP > Get FH and LBT Parameters : Success Read Time = 380 [ms]
4 30 00 AA AA 00 00 00 00 00 00 00 00 00 08 4	Idle Time = 100 [ms]
5 30 00 AA AA 11 11 11 11 11 11 11 11 11 11 11	LBT RF Level = -74 [dBm]
6 30 00 FFFFFFFFFFFFFFFFFFFFFFFFFFF 20 7 30 00 00 00 00 00 00 00 00 00 00 77 74 11	Frequency Hopping(Only) Enable
8 30 00 00 00 00 00 00 00 00 00 00 00 1773 18	[2021-02-02 11:46:58]
9 10 00 20 00 00 9 4	CMD > Get Registry Item : 11
10 30 00 00 00 00 00 00 00 00 00 1772 1 11 30 00 50 00 00 00 00 00 00 00 1772 1	[2021-02-02 11:46:58]
2	Active status = Inactive 2
2	Data(Hex) = 30 30 30 30 30 30 30 30 30 30 30
	[2021-02-02 11:47:04]
	Tag Type = type C Tag
	Repeat Cycle = Continuous mode
	[2021-02-02 11:47:04]
	RSP > Start Auto Read2 : Success
	[2021-02-02 11:47:12] CMD > Step Auto Read?
	[2021-02-02 11:47:12] RSP > Stop Auto Read2 : Success
	Asknowledged Tag Count = 11
	Total Tag Count = 125
	Total Read Time = 8.1 [sec] Read Rate = 15.4 [tag/sec]
	· · · · · · · · · · · · · · · · · · ·
OPEN COM3 115200 RED Utility_v4.0.0_BETA9 RED4S_v2.2.0_K_BETA6 412 R4S5ST-K 4 000000000	Ready Sound On

Figure 1 RED Utility Basic Window

✓ The window may not be displayed perfectly in low resolution or high magnification environments.

3.1.1 Menu bar

- Connection: Contains submenu about Module Connection
- Tools: Contains submenu about other tools
- Hotkey: Contains submenu about hotkeys
- Info.: Contains Information about the GUI
- 🧐 : Connect Button
- 🛸 : Disconnect Button
- *: Port Setting Button
- 塗 : Firmware Download Open Button
- : Log Enable Button
- Ex Leakage RSSI Plot Open Button
- : Read Range Calculator Open Button
- 🛸: Reset Button
- : About Info Button

3.1.2 Operation Tab

- Inventory: Provides functions to inventory
- Inventory Settings: Provides functions Inventory settings and select
- Memory Access: Provides functions about access(read, write, lock, kill etc.)

- RF Settings: Provides function about rf power and frequency
- Registry Manager: Provides registry access function

3.1.3 Message Window

This window displays the messages that obtained by decoding the RCP Command.

3.1.4 Status Strip

The Status Strip indicates Comprehensive Information about the Module(Connection state, GUI version, firmware version, Part number, Serial number, Operation status and sound on/off).

4 Start-up Guide

To operate REDx-DK with GUI, follow below step.

STEP1. Connecting REDx-DK

After the device is recognized, connect RFID Antenna, REDx and RED_CTRL. Plug mini-USB of RED_CTRL to PC using mini-USB cable and check whether POWER LED is ON.

STEP2. Start RED Utility

Open GUI to click 'RED Utility.exe'

STEP3. Connect to module REDx

If hardware connection is valid, RED Utility connect module REDx automatically.

If utility cannot connect hardware, please follow below step

Click 'Connection->Connect' to connect to REDx-DK through USB-to-UART at main window GUI will find the Device and synchronize parameters with REDx module automatically. If the GUI cannot find the device automatically, Click 'Connection->Port Setting' and select other Device. Default Baud rate is 115200 bit/s.

Connection	Tools	Hotkey
Connect	A	lt+C
Disconn	ect Al	t+D
Port Set	tings A	lt+P

Figure 2 Connection

R Port Setting	_	×
Serial Port		
Port	COM3	~
Baudrate	115200	~
DataBits	8	\sim
Parity	None	~
StopBits	1	\sim
	ОК	

Figure 3 Port Setting

If the Device connected successfully, status bar will display 'OPEN' state and device number and so on.

OPEN COM3 115200 RED Utility_v4.0.0_BETA9	RED4S_v2.2.0_K_BETA6 412 R4S5ST-K 0000000000	Ready	Sound On
	Figure 4 Status Bar		

If user can not find RED's port, follow below step first, visit silicon labs site and download VCP driver suitable for OS https://www.silabs.com/developers/usb-to-uart-bridge-vcp-drivers

second, install the driver and check connect Device Manager - Ports(COM & LPT)

📇 Device Manager	_	×
<u>F</u> ile <u>A</u> ction <u>V</u> iew <u>H</u> elp		
> Computer		
> Disk anves		
> In Human Interfere Daviese		
		_
> maintenance in the second se		
> 📷 Imaging devices		
> Explored attraction during		
> Write and other pointing devices		
> Monitors		
> III Multifunction adapters		
> Pretvork adapters		
Silicon Labs CP210x USB to UARI Bridge(COM3)		
> Print queues		
> Printers		
> Processors		
> If Security devices		
> En Sensors		
> Software components		
Software devices		
> 🐳 Sound, video and game controllers		
> Storage controllers		
> 🛅 System devices		
> Universal Serial Bus controllers		
USB Connector Managers		*

Figure 5 Device Manager

STEP4. Operate RFID reader

REDx-DK is ready to read tag. Send command to REDx using GUI.

5 Inventory

Inventory	Inventory Settings	Memory Access	RF Settings	Registry Manager			
Start	\$				Easy View	Multiple A	ntenna
Unique Count :	10 Total Count :	97			Total Read Time	∋: 2.1	Sec
Unique Count : PC EPC 1 30 00 30 0 2 30 00 11 2 3 30 00 AA A 4 30 00 BB E 5 30 00 AA A 6 30 00 CC 0 7 30 00 E2 0 8 34 00 10 0 9 30 00 83 6 10 10 00 40 0	10 Total Count : 8 33 B2 DD D9 01 40 00 2 11 22 11 22 11 22 11 2 A 22 22 22 22 22 22 22 22 22 3B 33 33 33 33 33 33 33 33 A 11 11 11 11 11 11 11 C 55 55 55 55 55 55 55 55 10 41 33 00 00 00 00 00 00 10 00 02 00 00 00 00 00 00 10 C5 62 DA 6D 95 6D 5A 10 00 08	97 00 00 00 2 11 22 2 22 22 3 33 33 1 11 11 5 55 55 0 00 04 0 00 52 C9 B2 85			Total Read Time Count 16 18 15 18 16 8 2 2 1 1	9: 2.1 Tag RSSI	Sec

Figure 6 Inventory tab

5.1 Reading Tags

Click 'Start' Button to read tags. PC&EPC of tags are displayed on below text box.

5.1.1 Tag read operation buttons

- Start : Tag Reading Start Button
- Stop : Tag Reading Stop Button
- 🕸: Read Option(with RSSI, with TID, Conditional Read)

5.1.2 Enable Tag RSSI

Enable or Disable Tag RSSI. To enable Tag RSSI, click 'Read Option' Button and check 'with RSSI' before Start Reading tags. If 'with RSSI' is checked, the data for Tag RSSI are received with EPC when reading the tag. RED Utility calculates the Tag RSSI value by using these data. Tag RSSI value is shown in 'Tag Information'. The RSSI unit is dBm.

Ctort				
Unique Coun	t: 0	with RSSI with TID		
PC E	PC	Conditional Read	•	

Figure 7 Tag Information with Tag RSSI Option

- with RSSI : Enable Tag RSSI
- with RSSI : Disable Tag RSSI

5.1.3 Enable TID

Enable or Disable TID. To enable TID, click 'Read Option' Button and check 'with TID' before Start Reading tags. If 'with TID' is checked, the data for TID are received with EPC when reading the tag. TID value is shown in 'Tag Information'.

Inventory	/ In	ventory Settings	Memory Access
S Unique C	tart 🔅 ount : 0	with RSSI with TID	
PC	EPC	Conditional Read	i 🕨

Figure 8 Tag Information with TID Option

with TID : Enable TID with TID : Disable TID

5.1.4 Conditional Read

Activate Read Condition. To activate Conditional Read, click 'Read Option' Button -> Conditional Read and Select Read Condition. Select Read Condition before Start Reading tags. If one of the Read Condition has been selected, Parameter of Read Condition will be activated.



Figure 9 Tag Information with Conditional Read Option

- Seconds: The RFID Reader will read tags for written seconds
- Cycle: The RFID Reader will read tags for written cycle
- Tag Count: The RFID Reader will read tags as much as count

5.1.5 Easy viewing

User can view tag count and read rate more easily. Click 'Easy View' Checkbox. Count and read rate are changed to a large size for easy viewing.



5.1.6 Inventory with Multiple Antenna

To activate Multiple Antenna inventory, click 'Multiple Antenna' Checkbox.

Inventory	Inventory Settings	Memory Access	RF Settings	Registry Manager				
Start S	¢:			Antonna	□ E	Easy View	/ 🗹 Mult	tiple Antenna
					<mark>⊠ S</mark> 4 [<mark>] S</mark> 5 [S6 🗌	S7 🗌 S8
Unique Count :	0 Total Count :	10			Total Rea	d Time :	0.1	sec
Unique Count : PC EPC	0 Total Count :	10			Total Rea	d Time : Count	0.1 Ant.	sec

Figure 11 Tag Information with Multiple Antenna

5.2 Select a Specific Tag to Read

User can read the selected tag. Select tags what you want, right-click Inventory window to select and click 'Select this Tag'.

- If activate select, inventory mode was changed to 'Manual mode' and some parameters are changed saw Figure 13.
- User wants to deactivate select function, click 'Deselect Tag' saw Figure 12.
- It is possible to multi select.
- For detail about select, refer to 6.3 Read Tags by Selection Criteria.



Figure 12 Tag Select

Singu ()	lation Static Q	Dynamic Q Start 4 Min	. 0	~ N	Max. 15	~ Ta	O Toggle (Invento	ry Round)
Sessio	so (SL SL € All	() A	ssert	O Deasse	ert	 A B 	ime)
Select	tion						Get	Set
	Target	Action	Bank	StartPtr	Length	Mask(HEX)		
\checkmark	SO	Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow B	EPC	32	32	20000009		
	S0	Match = InvenFlag: → A, Non-Match = InvenFlag → B	EPC	0	0			
	S0	Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow B	EPC	0	0			
	S0	$Match = InvenFlag : \to A, Non-Match = InvenFlag \to B$	EPC	0	0			
	S0	$Match = InvenFlag : \to A, Non\text{-}Match = InvenFlag \to B$	EPC	0	0			
	S0	$Match = InvenFlag : \to A, Non\text{-}Match = InvenFlag \to B$	EPC	0	0			
	S0	$Match = InvenFlag : \to A, Non\text{-}Match = InvenFlag \to B$	EPC	0	0			
	S0	$Match = InvenFlag : \to A, Non-Match = InvenFlag \to B$	EPC	0	0			
	E .49						0-1	Analy

Figure 13 Set Select Parameters

U	nique Cour	t: 1 Total Count: 33 Total R	ead Time :	16.0	sec
	PC	EPC	Count	Tag RSSI	
1	10 00	20 00 00 09	33		
1		Figure 14 Inventory Result after Tag Select			

5.3 Read Memory by Selecting Specific Tag

To access tag memory with RED Utility, follow sequence as described below.

Step 1. Select target tag in tag list.

Step 2. Click the right mouse button, then click 'View Tag Memory'.

The entire the memory of tag is displayed in the 'Memory Access tab' text box.

Start ch			
	Easy View	w 🗌 Multipl	e Antenna
Unique Count : 19 Total Count : 858 Total	Read Time :	16.6	sec
PC EPC 1 30 00 00 00 00 00 00 00 00 00 00 00 17 74 2 30 00 BB BB 33 33 33 33 33 33 33 33 33 33 33 3	Count 54 61 67 68 53 57 69 59 69 111 13 39 64 33 17 4 16 1 3	Tag RSSI	

Figure 15 View Tag Memory

Inventory	,	Inventory Settings	Memory Access	RF Settings	Registry Man	ager	
Target Tag	(EPC)	1 : 20 00 00 09				~	
Read	Entire M	Not Not	te : It works nomally wher	Access password of R	ead/Write item ma	atches	
Membank	Data (H	IEX)			Data (/	ASCII)	
00 Reserved	00 00 0	0 00 00 00 00 00					
01 EPC	4D 0C	10 00 20 00 00 09			M 위		
10 TID	E2 00 3	34 12 01 36 FE 00 06 (63 CC 8F 14 0D 01 34		4		
10 TID	70 0D 5	5F FB FF FF DC 50			4		
11 USER	00 00 0	0 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00				
11 USER	00 00 0	0 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00				
11 USER	00 00 0	0 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00				
11 USER	00 00 0	0 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00				

Figure 16 Result of View Tag Memory

5.4 Export Tag List to CSV File

To export tag list to CSV file, follow below step.

Step 1. Right click inventory window and click 'Export All Tag List to CSV' Step 2. When location window appears, insert file name and click save. *If user wants to check export file, click Tools \rightarrow Open Export Directory

inventory	Inventory Settings	Memory Access	RF Settings	Registry Manager					
Start	Start 🔅 🗆 Kultiple Antenna								
Unique Count :	10 Total Count :	32			Total Read Tin	ne: 1.3	Sec		
PC EPC					Count	Tag RSSI			
1 10 00 60 0	0 00 05				6				
2 30 00 30 0	8 33 B2 DD D9 01 40 00	00 08 01			2				
3 30 00 30 0	8 33 B2 DD D9 01 40 00	00 09 05			1				
4 30 00 30 0	8 33 B2 DD D9 01 40 00 0 00 02	00 08 06			2				
6 30.00 30.0	0 00 03 8 33 B2 DD D9 01 40 00	00.00.00			2				
7 10 00 40 0	0 00 05	00000			6				
8 30 00 30 0	8 33 B2 DD D9 01 40 00	00 08 02			2				
9 10 00 20 0	0 00 09				4				
10 30 00 30 0	8 33 B2 DD D9 01 40 00	00 09 02			1				
10 30 00 30 0	8 33 B2 DD D9 01 40 00	00 09 02	Deselect Tag Clear Tag List Export All Tag List to Copy to Clipboard All	CSV Tag List	1				

Figure 17 Export All Tag List to CSV

5.5 Copy to Clipboard Tag List

To use 'Copy to Clipboard All Tag List' function, follow below step.

Step 1. Drag tag list what you want to copy.

Step 2. Right click inventory window and click 'Export All Tag List to CSV' (or press Ctrl + C).

Inventory Settings Memory Access RF Settings Registry Mana	ager						
Start 🔅 🗌 Easy View 🗌 Multiple Antenna							
Unique Count : 5 Total Count : 77 Total Read Time : 13.8 se							
PC EPC	Count Tag RSSI						
1 30 00 BB BB 33 33 33 33 33 33 33 33 33 33 33 2 30 00 00 00 00 00 00 00 00 00 00 01 108 Select This Tag	38 3						
3 10 00 20 00 00 09 Deselect Tag	28						
4 34 00 10 00 00 20 00 00 00 00 00 00 52 Clear Tag List	2						
Export All Tag List to CSV	σ						
Copy to clipboard							

Figure 18 Copy to Clipboard

	А	В	С	D	E
1		PC	EPC	Count	Tag RSSI
2	1	30 00	BB BB 33	38	
3	2	30 00	00 00 00 0	3	
4	3	10 00	20 00 00 0	28	
5	4	34 00	10 00 00 0	2	
6	5	14 04	00 00 00 0	6	

Figure 19 Result of Paste to Excel

6 Inventory Settings

Inv	entory	Inventory Settings	Memory Access	RF Set	tings	Registry	Manager		
Multi-tag This algorithm is applied to achieve optimal performance for a large number of tags in the field.									
🔿 Si	ngle Tag Algorithn	applied for maximum	performance. Normal	performan	ce can be	achieved	only when	only one tag exis	sts on the field
 Unique Recognition The same tag is read only once without overlapping 									
Ом	anual —								
Singu	lation						T	larget	
	Static Q	O Dynamic Q	Start 4 ~	Min. 0	~ N	/lax. 15	~	Toggle (In Toggle (D)	well Time)
Sessi	on		SL						weir filliej
	SO () S1 () S2 () S	S3 O ,	All O A	Assert		ert	ОВ	
								Get	Set
Selec	tion								
	Target	Action		Bank	StartPtr	Length	Mask(HEX)	
	S0	Match = InvenFlag: \rightarrow A	, Non-Match = InvenFla	g EPC	0	0			
	S0	Match = InvenFlag: \rightarrow A	, Non-Match = InvenFla	g EPC	0	0			
	S0	Match = InvenFlag: \rightarrow A	, Non-Match = InvenFla	g EPC	0	0			
	S0	Match = InvenFlag: \rightarrow A	, Non-Match = InvenFla	g EPC	0	0			
	S0	Match = InvenFlag: \rightarrow A	Non-Match = InvenFla	g EPC	0	0			
	50	Match = InvenFlag: $\rightarrow A$	Non-Match = InvenFla	g EPC	0	0			
	SO	Match = InvenFlag: $\rightarrow A$	Non-Match = InvenFla	g EPC	0	0			
	80	Match = Inven⊢lag: → A	, Non-Match = InvenFla	g EPC	0	0			
	Edit							Get	Apply
		-							



6.1 Multi-tag Mode

Multi-tag mode automatically sets parameters for multiple tags reading. To set Multi-tag mode, follow sequence as described below.

Step 1. Click 'Inventory Settings' tab.

Step 2. For Change parameter, Click "Multi-tag" mode radio button.

6.2 Single Tag Mode

Single Tag mode automatically sets parameters for single tag reading. To set Single Tag mode, follow sequence as described below.

Step 1. Click 'Inventory Settings' tab.

Step 2. For Change parameter, Click "Single Tag" mode radio button.

6.3 Unique Recognition Mode

Multi-tag mode automatically sets parameters for just one recognition per tag. To set Unique Recognition mode, follow sequence as described below.

Step 1. Click 'Inventory Settings' tab.

Step 2. For Change parameter, Click "Unique Recognition" mode radio button.

6.4 Manual Mode

In Manual mode, User can set query parameters.

To get or set inventory settings in manual mode, follow sequence as described below.

Detail about the Manual Mode is described in [AN035-xx] Configuration of Session for multi-tag and [AN036-xx] Anti-Collision Mode for Multi Tag.

Step 1. Click 'Inventory Settings' tab.

Step 2. Press 'Get' button to display the currently set value.

Step 3. Change parameter and press 'Set' button.

6.4.1 Singulation

Singulation					
Static Q	O Dynamic Q	Start 4 ~	Min. 4 \vee	Max. 4 \sim	
Figure 21 Singulation setting					

- Static Q: Q value was maintained Start Q value in Query.
- Dynamic Q: Q value in Query was changed each inventory cycle.
- Start: Start Q value setting.
- Min.: Minimum Q Value on Dynamic Q mode.
- Max.: Maximum Q Value on Dynamic Q mode.

6.4.2 Session



Figure 22 Session setting

- S0: Inventoried flag is changed by energy.
- S1: Inventoried flag is changed by time.
- S2: Inventoried flag is changed by energy and time.
- S3: Inventoried flag is changed by energy and time.

SL

OL .		
● All ○ J	Assert O	Deassert

Figure 23 SL Flag setting

- ALL: Tags respond to query regardless of the SL flag state.
- Assert: Tags respond to query only in SL flag asserted state.
- Deassert: Tags respond to query only in SL flag not asserted state.

Target

Target
O Toggle (Inventory Round)
Toggle (Dwell Time)
○ A
Ов



- Toggle(Inventory Round): Query target was changed each Inventory round.
- Toggle(Dwell Time): Query target was changed each dwell time.
- A: Tags respond to query only in inventoried flag A.
- B: Tags respond to query only in inventoried flag B.

6.4.3 Selection

Selection

Target	Action	MemBank	StartPtr	Length	Mask(HEX)		
SO	Match = InvenFlag: → A, Non-Match = InvenFlag → B	EPC	0	0			
S0	Match = InvenFlag: → A, Non-Match = InvenFlag → B	EPC	0	0			
S0	Match = InvenFlag: → A, Non-Match = InvenFlag → B	EPC	0	0			
S0	Match = InvenFlag: → A, Non-Match = InvenFlag → B	EPC	0	0			
S0	Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow B	EPC	0	0			
S0	Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow B	EPC	0	0			
S0	Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow B	EPC	0	0			
S0	Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow B	EPC	0	0			
Edit]					Get	Apply



- Target: indicates whether the Select modifies a Tag's SL flag or inventoried flag.
- Action: elicits the Tag behavior whether criteria for matching.
- MemBank: specifies how a tag applies mask.
- StartPtr: specifies a starting bit address for the Mask comparison(HEX unit).
- Length: specifies the length of Mask(DEC unit) ex) if Mask have 4byte length, input 32.
- Mask: a bit string that a tag compares to a memory location.

For detail description, refer to 6.3 Read Tags by Selection Criteria.

6.5 Read Tags by Selection Criteria

To select specific tags, follow sequence as described below.

- Step 1. Click one line in the Selection list, click 'Edit' button.
- Step 2. Set select parameters, click 'OK' button.
- Step 3. Check the checkbox of the set line, click 'Apply' button.
- Step 4. Set suitable parameters of query.

There are 5 tags as below, this example describes reading number 1,2,5 tags.

Un	iique Co	unt : 5 Total Count : 194	Total Read Time : 1.8 sec
	PC	EPC	Count Tag RSSI
1	30 00	AA AA 11 11 11 11 11 11 11 11 11 11	42
2	30 00	AA AA 22 22 22 22 22 22 22 22 22 22 22 2	45
3	30 00	BB BB 33 33 33 33 33 33 33 33 33 33 33	38
4	30 00	CC CC 55 55 55 55 55 55 55 55 55 55	38
5	30 00	BB BB 44 44 44 44 44 44 44 44 44 44	32



Set parameters using 'Edit' like below Figure 27, Click 'Apply' button.

C	lation Static Q	● Dynamic Q Start 4 ~ N	lin. 0	~ N	Max. 15	~ T	Toggle (Inventory Ro	und)
essi (on) S 0 () S1 () S2 () S3 () All	() A	ssert	O Deass	ert	A B	
elec	tion						Get	Set
	Target	Action	Bank	StartPtr	Length	Mask(HEX)		
7	S0	Match = InvenFlag: \rightarrow A. Non-Match = InvenFlag \rightarrow I		22	16			
_				32	10	АААА		
2	S0	Match = InvenFlag: → A, Non-Match = Do nothing	EPC	32	96	BBBB44444	4444444444444	
3	S0 S0	Match = InvenFlag: → A, Non-Match = Do nothing Match = InvenFlag: → A, Non-Match = InvenFlag → I	EPC B EPC	32 0	96 0	BBBB44444	4444444444444	
	S0 S0 S0	Match = InvenFlag: → A, Non-Match = Do nothing Match = InvenFlag: → A, Non-Match = InvenFlag → I Match = InvenFlag: → A, Non-Match = InvenFlag → I	EPC EPC EPC EPC EPC	32 0 0	96 0 0	BBBB44444	4444444444444	
	S0 S0 S0 S0	$ \begin{array}{l} Match = InvenFlag: \to A, Non-Match = Do \ nothing \\ Match = InvenFlag: \to A, Non-Match = InvenFlag \to I \\ Match = InvenFlag: \to A, Non-Match = InvenFlag \to I \\ Match = InvenFlag: \to A, Non-Match = InvenFlag \to I \\ Match = InvenFlag: \to A, Non-Match = InvenFlag \to I \\ \end{array} $	EPC EPC EPC EPC EPC B EPC	32 0 0 0	96 0 0 0	BBBB44444	4444444444444	
]]]]]	S0 S0 S0 S0 S0	$\begin{array}{l} Match = InvenFlag: \rightarrow A, Non-Match = Do nothing\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ \end{array}$	EPC EPC EPC EPC EPC EPC EPC EPC	32 0 0 0 0	96 0 0 0 0	BBBB44444	4444444444444	
	S0 S0 S0 S0 S0 S0	$\begin{array}{l} Match = InvenFlag: \rightarrow A, Non-Match = Do nothing\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ \end{array}$	EPC EPC EPC EPC EPC EPC EPC EPC EPC	32 0 0 0 0 0 0	96 0 0 0 0 0	BBBB44444	444444444444	
	S0 S0 S0 S0 S0 S0 S0	$\begin{array}{l} Match = InvenFlag: \rightarrow A, Non-Match = Do nothing\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ Match = InvenFlag: \rightarrow A, Non-Match = InvenFlag \rightarrow I\\ \end{array}$	EPC EPC EPC EPC EPC EPC EPC EPC EPC EPC	32 0 0 0 0 0 0 0	96 0 0 0 0 0 0	BBBB44444	444444444444	

Figure 27 Select Parameters Settings

Return to 'Inventory' tab and Click 'Start' button. Then, user can see result.

Ur	ique Co	unt: 3 Total Count: 87	Total Read Time	: 1.5	Sec
	PC	EPC	Count	Tag RSSI	
1	30 00	BB BB 44 44 44 44 44 44 44 44 44 44	15		
2	30 00	AA AA 22 22 22 22 22 22 22 22 22 22 22 2	46		
3	30 00	AA AA 11 11 11 11 11 11 11 11 11 11	26		
		Figure 28 Example Result			

PHÝCHIPS

7 Memory Access

Inventory	Inventory Settings	Memory Access	RF Settings Regist	ny Manager	
Target Tag (EPC)	Not Specified				~
Read Entire	Memory [No	te] It works nomally when Acc	cess password of Read/Write it	em matches	
Membank Data	(HEX)			Data (ASCII)	
Data	(ILEX)				
Access Password (H	EX) 00 00 00 00	Kill Password (HEX) 00 0	0 00 00		
Read/Write	Lock	Kill			
Read tag m	emory	Write data	BlockWrite data	BlockErase	
	DELL				
Targe	t Memory				
Start Address (\	Nord Ptr.)	0 Length (Word Co	ount) 0		
Da	ata (HEX)				

Figure 29 Memory Access tab

7.1 Tag Memory Information View

7.1.1 Read Entire Memory

-

Step 1. Change selected tab to 'Memory Access'.

- Step 2. Select the tag you want from 'Target Tag' list.
 - 'Target Tag' list is same as inventoried list
- Step 3. Click 'Read Entire Memory' button.

Inventory	Inventory Settings Memory Access RF Settings Registry Manager	
Target Tag (EPC)	i) Not Specified	~
Read Entire M	> Not Specified fe 1 : 20 00 00 09 2 : 60 00 00 05	
Membank Data (H	HE 3 : BB BB 33 33 33 33 33 33 33 33 33 33 33 4 : CC CC 55 55 55 55 55 55 55 55 55 55	

Figure 30 Select Tag to View Tag Memory

PHÝCHIPS

	Inventor	Inventory Settings Memory Access RF Settings Reg	istry Manager
3	Target Ta	g (EPC) 1:20 00 00 09 Entire Memory Note : It works nomally when Access password of Re	∽ ead/Write item matches
	Membank	Data (HEX)	Data (ASCII)
	00 Rese	00 00 00 00 00 00 00	
	01 EPC	4D 0C 10 00 20 00 00 09	M++
	10 TID	E2 00 34 12 01 36 FE 00 06 63 CC 8F 14 0D 01 34	4
	10 TID	70 0D 5F BB FF FF DC 50	р
	11 USER	00 00 00 00 00 00 00 00 00 00 00 00 00	
	11 USER	00 00 00 00 00 00 00 00 00 00 00 00 00	
	11 USER	00 00 00 00 00 00 00 00 00 00 00 00 00	
	11 USER	00 00 00 00 00 00 00 00 00 00 00 00 00	

Figure 31 Read Entire Memory

7.1.2 More Information / Memory Modification

Tag Memory is possible to check and modify in the textbox of 'Memory Access' tab. To check Tag Memory information, follow sequence as described below.

Step 1. Select target memory bank in tag memory bank list.

Step 2. Click the right mouse button, then click 'More Information / Memory Modification'.

Step 3. To modify data, write data in white text box.

Step 4. Click 'Write'.

	Inventor	y Inventory Settings Memory Access RF Settings Registry Manager
	Target Ta	ag (EPC) 1:20 00 00 09 ~
	Read	Entire Memory Note : It works nomally when Access password of Read/Write item matches
	Membank	Data (HEX) Data (ASCII)
1	00 Rese	00 00 00 00 00 00 00
1	01 EPC 10 TID	4D 0C 10 00 20 00 00 09 2 E2 00 34 12 01 36 FE 00 06 6 More Information / Memory Modification
	10 TID	70 0D 5F BB FF FF DC 50 p
	11 USER	00 00 00 00 00 00 00 00 00 00 00 00 00
	11 USER	00 00 00 00 00 00 00 00 00 00 00 00 00
	11 USER	00 00 00 00 00 00 00 00 00 00 00 00 00
	11 USER	00 00 00 00 00 00 00 00 00 00 00 00 00



Inventor	y Inven	tory Setting	s Memory Access	RF Settings	Registry Manager		
Target Ta	ag (EPC) 1:2	20 00 00 09					~
Read	Entire Memor	R Tag Info	ormation - EPC			×	
Membank	Data (HEX)		CRC				
00 Rese	00 00 00 00	0000h	4B AD				
01 EPC	4B AD 14 00		PC				
10 TID	E2 00 34 12	0010h	14 00				
10 TID	70 0D 5F BE	L	EPC				
11 USER	11 22 12 34	0020h	20 00 00 09				
11 USER	00 00 00 00		20.00.00.00			Write	
11 USER	00 00 00 00	ŀ	20 00 00 09				
11 USER	00 00 00 00	00 00 00 0	0 00 00 00 00 00 00 00	00	****		



R Tag Inf	ormation - EPC	×
	CRC	
0000h	4B AD	
	PC	
0010h	14 00	
	EPC	
0020h	20 00 00 09	Maita
3	40 10 20 30	vvrite

Figure 34 Change EPC

	Inventory	Inventory Settings	Memory Access	RF Settings	Registry Manager						
С	Start 🔅 🗌 Easy View 🗌 Multiple Antenna										
U	nique Co	ount : 4 Total Count :	11			Total Read Time :	2.0 sec				
	PC	EPC				Count Ta	g RSSI				
1	30 00	30 08 33 B2 DD D9 01 40 00	00 00 00			2					
2	10 00	60 00 00 05				4					
3	10 00	40 10 20 30				3					
4	34 00	10 00 00 02 00 00 00 00 00 00	0 00 52			2					

Figure 35 Result EPC Change

7.2 Procedures for Tag Memory Access

7.2.1 Read

To access tag memory with RED Utility, follow sequence as described below.

- Step 1. Select target tag in tag list.
- Step 2. Select Target memory bank.
- Step 3. Give the start address. Start address is word(16-bit) unit.
- Step 4. Give the Length. Length is word(16-bit) unit.
- Step 5. Give the access password.
- Step 6. Click 'Read tag memory'.

RCP flow (log) shows the result in RCP format. To learn more about RCP, please refer to document RED-RCP. Example) RCP RSP BB 01 29 00 08 00 00 00 00 00 00 00 00 7E CE 00 (Read tag process done)

Inventory	Inventory Settings	Memory Access	RF Settings	Registry Manager	
, Target Tag (EPC)	1 : 20 00 00 09				~
Read Entire	Memory [Note	e] It works nomally when	Access password of Re	ad/Write item matches	
Membank Data	a (HEX)			Data (ASCII)	
	5				
Access Password (H	EX) 00 00 00 00	Kill Password (HEX)	0 00 00 00		
Read/Write	Lock	Kill			
6 Read tag m	emory	Write data	BlockWrite da	ta BlockEras	e
-	2 REU	~			
large	3	0 Longth (More	4		
Start Address (
		00 00 00 00 00			

Figure 36 Procedure for Tag Memory Access

7.2.2 Block Erase(Optional Command, This function can be used if Tag IC supports command)

To run tag memory block erase with RED, follow sequence as described below.

Step 1. Select target tag in tag list.

- Step 2. Select Target memory bank.
- Step 3. Give the start address. Start address is word(16-bit) unit.
- Step 4. Give the Length. Length is word(16-bit) unit.
- Step 5. Give the access password.

Step 6. Click 'Block Erase'.

RCP flow (log) shows the result in RCP format. To learn more about RCP, please refer to document RED-RCP. Example) RCP RSP BB 01 48 00 01 00 7E (Block Erase tag process done)

7.3 Procedures for Tag Memory Write

7.3.1 Write

To write data to tag memory with RED Utility, follow sequence as described below.

- Step 1. Select target tag in tag list.
- Step 2. Select Target memory bank.
- Step 3. Give the start address. Start address is word(16-bit) unit.
- Step 4. Give the Length. Length is word(16-bit) unit.
- Step 5. Give the access password.
- Step 6. Click 'Write data'.

RCP flow (log) shows the result in RCP format. To learn more about RCP, please refer to document RED-RCP. Example) RCP RSP BB 01 46 00 01 00 7E (Write tag process done)

Read E	Intire Memory [Not	e] It works nomally when A	ccess password of Re	ead/Write item match	es	
Membank	Data (HEX)			Data (A	SCII)	
00 Reserved	00 00 00 00 00 00 00 00					
01 EPC	4D 0C 10 00 20 00 00 09			М		
10 TID	E2 00 34 12 01 40 F0 00 04	81 AD C5 12 11 01 3E		4@	>	
10 TID	70 04 5F BB FF FF DC 50			p_ P		
11 USER	00 00 00 00 11 22 33 44 00	00 00 00 00 00 00 00		"3D		
11 USER	00 00 00 00 00 00 00 00 00	00 00 00 00 00 00 00				
11 USER	00 00 00 00 00 00 00 00 00	00 00 00 00 00 00 00				
11 USER	00 00 00 00 00 00 00 00 00	00 00 00 00 00 00 00				
ccess Passwo Read/Write	rd (HEX) 00 00 00 00 Lock	Kill Password (HEX) 00	00 00 00			
ccess Passwo Read/Write Read t	rd (HEX) 00 00 00 00 Lock ag memory	Kill Password (HEX) 00 Kill Write data	00 00 00 BlockWrite d	ata	BlockErase	
ccess Passwo Read/Write Read t	ag memory 2 User	Kill Password (HEX) 00 Kill Write data	00 00 00 BlockWrite d	lata	BlockErase	
ccess Passwo Read/Write Read I	ard (HEX) ⁵ 00 00 00 00 Lock ag memory Farget Memory ess (Word Ptr.)	Kill Password (HEX) 00 Kill Write data	00 00 00 BlockWrite d	lata	BlockErase	
Read/Write Read Read	ard (HEX) 00 00 00 00 Lock ag memory 2 Garget Memory 3 ess (Word Ptr.) 3 Data (HEX) 11 22 33	Kill Password (HEX) 00 Kill Write data 2 Length (Word 0	00 00 00 BlockWrite d Count)	lata	BlockErase	
ccess Passwo Read/Write Read to Start Addr	rd (HEX) Lock ag memory Target Memory ess (Word Ptr.) Data (HEX) 11 22 33	Kill Password (HEX) 00 Kill Write data	00 00 00 BlockWrite d Count)	lata2	BlockErase	

Figure 37 Procedure for Tag Memory Write

7.3.2 BlockWrite(Optional Command, This function can be used if Tag IC supports command)

To run tag memory block write with RED utility, follow sequence as described below.

Step 1. Select target tag in tag list.

- Step 2. Select Target memory bank.
- Step 3. Give the start address. Start address is word(16-bit) unit.
- Step 4. Give the Length. Length is word(16-bit) unit.
- Step 5. Give the access password.
- Step 6. Click 'Block Write data'.

RCP flow (log) shows the result in RCP format. To learn more about RCP, please refer to document RED-RCP. Example) RCP RSP BB 01 47 00 01 00 7E (Block Write tag process done)

7.4 Procedures for Locking Tag Memory

7.4.1 Lock

To lock tag memory with RED utility, follow sequence as described below.

Step 1. Select target tag in tag list.

Step 2. Click 'Lock' tab.

Step 3. Give the access password(Access Password should not be zero).

Step 4. Check Lock bit(Action Checked : Lock, Action Unchecked : UnLock).

Step 5. Click 'Lock' button.

RCP flow (log) shows the result in RCP format. To learn more about RCP, please refer to document RED-RCP. Example) RCP RSP BB 01 82 00 01 00 7E (Lock tag process done)

	Kill 19	pwd 18	Acces	s pwd 16	EPC m 15	nemory 14	TID m 13	emory 12	File_0 r 11	nemory 10
Mask	skip/ write	skip/ write	skip/ write	skip/ write	skip/ write	skip/ write	skip/ write	skip/ write	skip/ write	skip/ write
	9	8	7	6	5	4	3	2	1	0
Action	pwd read/ write	perma lock	pwd read/ write	perma lock	pwd write	perma lock	pwd write	perma lock	pwd write	perma lock

Masks and Associated Action Fields

Table 6-50: Lock Action-field functionality

pwd-write	permalock	Description
0	0	Associated memory bank/file is writeable from either the open or secured states.
0	1	Associated memory bank/file is permanently writeable from either the open or secured states and may never be locked.
1	0	Associated memory bank/file is writeable from the secured state but not from the open state.
1	1	Associated memory bank/file is not writeable from any state.
pwd- read/write	permalock	Description
0	0	Associated password location is readable and writeable from either the open or secured states.
0	1	Associated password location is permanently readable and writeable from either the open or secured states and may never be locked.
1	0	Associated password location is readable and writeable from the secured state but not from the open state.
1	1	Associated password location is not readable or writeable from any state.

Figure 38 Lock action-field functionality

Target Tag (E	1 EPC) 1:	20 00 00 09	Memo	y Access	RF Settings	Regis	stry Manage	er (
Read E	Entire Memo	ry [N	lote] It works n	omally when A	Access password of F	Read/Write	item match	es
Membank	Data (HEX))					Data (As	SCII)
00 Reserved	00 00 00 00	0 11 11 11 11						
01 EPC	4D 0C 10 0	0 20 00 00 09)				М	
10 TID	E2 00 34 1	2 01 40 F0 00	04 81 AD C5 1	2 11 01 3F			4@	?
10 TID	70 04 5F BI	B FF FF DC 5)				р_ Р	
11 USER	00 00 00 00	0 11 22 33 44	00 00 00 00 00	00 00 00			"3D	
11 USER	00 00 00 00	0 00 00 00 00	00 00 00 00 0	00 00 00				
11 USER	00 00 00 00	0 00 00 00 00	00 00 00 00 00 0	00 00 00				
HOOLK	00 00 00 00	000000000	00 00 00 00 0					
ccess Passwo	2	11 11 11 11	Kill Passwo		00 00 00 00			
Read/Write		Lock	Kill Passwo Kill		0 00 00 00			
Read/Write [Note] Acce	ss Password	Lock	Kill Passwo Kill e Zero		0 00 00 00			
Read/Write	ss Password	Lock	Kill Passwo Kill		0 00 00 00 Bloc	kPermaloc	k	
Read/Write [Note] Acce	ss Password	Lock I should not be	Kill Passwo Kill Passwo Kill		Bloc	kPermaloc Bank	k	Read/Lock Y
Read/Write [Note] Acce	ss Password Lock	Lock I should not be Kill Acc	Kill Passwo Kill Passwo Kill e Zero		Bloc	kPermaloc	k	Read/Lock
Read/Write [Note] Acce	ss Password Lock Mask	Lock I should not be Kill Acc	Kill Passwor Kill Passwor Zero Zero Ull		Bloc Pr Memory E BlockPtr (H	kPermaloc Bank IEX)	k	Read/Lock BlockRange (DEC)
Read/Write [Note] Acce	ss Password Lock Mask vd/perma)	Lock I should not be Kill Acc	Kill Passwor Kill Passwor zers Ull		0 00 00 00 er Memory E BlockPtr (H Mask (H	kPermaloc lank IEX)	k	Read/Lock BlockRange (DEC)
Read/Write [Note] Acce Action (pw Lock Dat	2 ss Password Lock Mask vd/perma) ta (Binary)	Lock I should not be Kill Acc D D D 00 00 00	Kill Passwi Kill Zero Image: Session Ull Image: Session Ulll <td></td> <td>Bloc er Memory E BlockPtr (H Mask (H</td> <td>kPermaloc lank IEX)</td> <td>k ~</td> <td>Read/Lock BlockRange (DEC)</td>		Bloc er Memory E BlockPtr (H Mask (H	kPermaloc lank IEX)	k ~	Read/Lock BlockRange (DEC)
Read/Write [Note] Acce Action (pw Lock Dat	ss Password Lock Mask vd/perma) ta (Binary)	Lock I should not be Kill Acc 0 0 00 00	Kill Passwe Kill Zero Image: Session Ull Image: Session Ulll <td></td> <td>Bloc er Memory E BlockPtr (H Mask (H</td> <td>kPermaloc Jank JIEX) JIEX)</td> <td>k</td> <td>Read/Lock BlockRange (DEC)</td>		Bloc er Memory E BlockPtr (H Mask (H	kPermaloc Jank JIEX) JIEX)	k	Read/Lock BlockRange (DEC)
Read/Write [Note] Acce Action (pw Lock Dat	ss Password Lock Mask vd/perma) ta (Binary)	Lock I should not be Kill Acc D D D 00 00 00	Kill Passwi Kill Zero		Bloc er Memory E BlockPtr (H Mask (H	kPermaloc Bank IEX) IEX)	k	Read/Lock BlockRange (DEC)
Read/Write [Note] Acce Action (pw Lock Dat	And (HEX)	Lock I should not be Kill Acc D D D 00 00 00	Kill Passwi Kill Zero Wess UII 0 0 0 0 0 0		Bloc er Memory E BlockPtr (H Mask (H	kPermaloc Bank IEX) IEX)	k	Read/Lock BlockRange (DEC)

Figure 39 Procedure for Lock Tag Memory

Read E	intire Memo	ry [N	ote] It works nomally w	hen Access	password of Read/	/Write item	n matche	35
lembank	Data (HEX)					(Data (AS	SCII)
0 Reserved	00 00 00 0	0 11 11 11 11						
1 EPC	4D 0C 10 0	0 20 00 00 09				1	M	
0 TID	E2 00 34 1	2 01 40 F0 00 ()4 81 AD C5 12 11 01	3F			4@	?
0 TID	70 04 5F B	B FF FF DC 50				1	p_ P	
1 USER	00 00 00 0	0 11 22 33 44 0	0 00 00 00 00 00 00 00	0			"3D	
1 USER	00 00 00 0	0 00 00 00 00 00 0	0 00 00 00 00 00 00 00 00	00				
1 USER	00 00 00 0	0 00 00 00 00 00 0	0 00 00 00 00 00 00 00 00	00				
1 USER	00 00 00 0	0 00 00 00 00 00 0	0 00 00 00 00 00 00 00 00 00 00 00 00 0	0				
cess Passwo	ord (HEX) ³	11 11 11 11	Kill Password (HEX) 00 00 00	00			
cess Passwo Read/Write [Note] Acces	ord (HEX) ³	11 11 11 11 Lock	Kill Password (HEX Kill Zero) 00 00 00	00			
cess Passwo Read/Write [Note] Acces	ord (HEX) ³ 2 2 ss Password Lock	11 11 11 11 Lock	Kill Password (HEX Kill Zero) 00 00 00	00 BlockPer	malock		
cess Passwo Read/Write [Note] Acces	ord (HEX) ³	Lock	Kill Password (HEX Kill Zero) 00 00 00	00 BlockPer Memory Bank	malock	~	Read/Lock Y
Read/Write	ord (HEX) ³ 2 ss Password Lock Mask	Lock Should not be Kill Acce	Kill Password (HEX Kill Zero) 00 00 00 User	00 BlockPer Memory Bank	malock		Read/Lock
Cess Passwo Read/Write [Note] Acces	rd (HEX) ³ 2 ss Password Lock Mask d/perma)	Lock I should not be Kill Acce	Kill Password (HEX Kill Zero) 00 00 00 User	00 BlockPer Memory Bank BlockPtr (HEX)	malock		Read/Lock Signal
Cess Passwo Read/Write [Note] Acces	2 2 ss Password Lock Mask d/perma)	Lock I should not be Kill Acce	Kill Password (HEX Kill Zero	User	00 BlockPer Memory Bank BlockPtr (HEX) Mask (HEX)	malock		Read/Lock ✓ BlockRange (DEC)
Read/Write [Note] Acces	2 2 ss Password Lock Mask d/perma) a (Binary)	Lock I should not be Kill Acce	Kill Password (HEX Kill Zero Image: State of the state) 00 00 00 User User	00 BlockPer Memory Bank BlockPtr (HEX) Mask (HEX)	malock	~ 	Read/Lock ✓ BlockRange (DEC)

Figure 40 Procedure for Unlock Tag Memory

7.4.2 BlockPermalock(Optional Command, This function can be used if Tag IC supports command)

To Block Permalock tag memory with RED Utility, follow sequence as described below.

Step 1. Select target tag in tag list.

- Step 2. Click 'Lock' tab.
- Step 3. Give the access password(Access Password should not be zero).
- Step 4. Select Read or Permalock.
- Step 5. Select memory bank.
- Step 6. Give the parameters(block pointer, block range, mask data).
- Step 7. Click 'Lock' button.

RCP flow (log) shows the result in RCP format. To learn more about RCP, please refer to document RED-RCP. Example) RCP RSP BB 01 83 00 01 00 7E (BlockPermalock tag process done)

8 **RF Settings**

Inventory	Inventory Settings	Memory Access	RF Settings	Registry Manager		
Pre-defined	User Defined					
Region Ko	orea v				Get	Set
FHSS CI	hannel Table	Channel 8	✓ 918.500 MHz	<u>.</u>	Get	Set
RF Power Contro	ol					
RF Power 27	.0 ~ dBm					
					Get	Set
RF Control						
Dwell Time	380 ms	🗹 Freq. Ho	pping (Only)	Sense Time	5 ms	
Idle Time	100 ms	Freq. Ho	pping (with LBT)	RF Level	-74.0 dBm	
Du	ty Cycle 79%	Listen Be	efore Talk (Only)			
		Listen Be	efore Talk (with FH)		Current Cha	nnel RSSI
					Get	Set

Figure 41 RF Settings tab

8.1 Frequency Control

8.1.1 Pre-defined

To select operating band, band setting should be required. Select band in combo box and click 'Set' button to set operating band.

Pre-defined	User Defined		
D. I.		0-1	Cat
Region Kor	ea 🗸	Get	Set



8.1.2 User Defined(Support Firmware version RED4S_v2.2.0 or later)

User Defined consist of Start Freq(kHz), Spacing(kHz), number of channels.

Pre-defined	User Defined						
Region K	OREA	~				Get	Set
Code	0 Band	900MHz NARROW	\sim				
Start Freq.	917.300 MHz C	Ch Spacing	600 KHz	Max. Channel	6		

Figure 43 User Defined Region Set

In the RED Utility, 35 Region was defined by default.

Region Code	Region	Band	Start	Spacing	Max.
0	KOREA	900MHz_NARROW	917300	600	6
1	ETSI	800MHz	865700	600	4
2	FCC	900MHz_WIDE	902750	500	50
3	AUSTRALLIA	900MHz_WIDE	920250	500	12
4	BANGLADESH	900MHz_WIDE	952250	500	4
5	BRAZIL	900MHz_WIDE	902750	500	50
6	BRUNEI	900MHz_WIDE	923250	500	4
7	CHINA	900MHz_WIDE	920625	250	16
8	HONGKONG	900MHz_WIDE	920250	500	10
9	INDIA	800MHz	850100	600	4
10	INDONESIA	900MHz_WIDE	923250	500	4
11	IRAN	800MHz	865700	600	4
12	ISRAEL	900MHz_WIDE	916250	500	1
13	JAPAN_1	900MHz_NARROW	916800	1200	6
14	JAPAN_2	900MHz_NARROW	916800	200	34
15	JORDAN	800MHz	865700	600	4
16	MALAYSIA	900MHz_NARROW	919250	500	8
17	MOROCCO	800MHz	867700	200	2
18	NEWZEALAND	900MHz_WIDE	922250	500	11
19	PAKISTAN	800MHz	865700	600	4
20	PERU	900MHz_WIDE	915250	500	25
21	PHILIPPINES	900MHz_NARROW	918250	500	4
22	SINGAPORE	900MHz_WIDE	920250	500	10
23	SOUTH_AFRICA	900MHz_WIDE	915600	200	17
24	TIAWAN	900MHz_WIDE	922250	500	12
25	THAILAND	900MHz_WIDE	920250	500	10
26	URUGUAY	900MHz_WIDE	916250	500	23
27	VENEZUELA	900MHz_WIDE	922250	500	12
28	VIETNAM	900MHz_WIDE	918250	500	10
29	RUSSIA	800MHz	866300	600	3
30	ALGERIA	900MHz_WIDE	915250	500	12
31	EGYPT	800MHz	865700	600	4
32	CHILE	900MHz_WIDE	915250	500	25
33	JAPAN(PHYCHIPS)	900MHz_NARROW	920500	200	13
34	FCC(NARROW, PHYCHIPS)	900MHz_NARROW	917100	200	50

Table 1 Default Region Settings

If user want to create new band, follow below guide.

Step 1. Set 'Region' combo box to 'MANUAL'.

Step 2. Fill 'Start Freq.', 'Ch spacing', 'Max. Channel'.

'Start Freq' means lowest the frequency in the desired band.
'Ch spacing' means the frequency spacing of each channel.
'Max. Channel' means the number of channels.
Step 3. Set 'Band' combo box corresponding to the settings.
900MHz NARROW: 917.1MHz ~ 926.9MHz.

900MHz WIDE: 900MHz Bandwidth what does not belong to '900MHz Narrow'.

800MHz: 800MHz ~ Less than 900MHz.

Example) Start Freq: 918.5MHz, Ch Spacing: 300KHz, Max. Channel: 10.

Frequency of Max channel: 918.5 + 0.3*10 = 921.5MHz.

Frequency band 918.5MHz ~ 921.5MHz, it is corresponding to '900MHz NARROW'.

Pre-defined	User Defined			
Region	MANUAL	~	Get	Set
Code	34 Band	900MHz NARROW ~ Note : 917.1MHz ~ 926.9MHz		
Start Freq.	918.5 MHz C	h Spacing 300 KHz Max. Channel 10		

Figure 44 Manual Frequency Setting Example

8.1.3 FHSS Channel Table

If you click 'FHSS Channel Table' button, current frequency hopping channel table is displayed as follows. User cannot only set channels manually by using 'Add' and 'Remove' buttons but also scan channels that has little Tx Leakage RSSI. To update new channel table, click 'Update Table' button. To Adopt Modified Frequency Hopping Table, User should select 'Modified' in 'Channel Table' Box.

R Frequency Hopp	ing Table			_		×
Manual Add Re	emove	Auto Sca	an	Char Mo De	inel Tabl odified efault	e
Frequency Hoppi	ng Table					
Number	Channel	I				
01	08					
02	17					
03	11					
04	02					
05	14					
06	05					_
				Up	date Tab	le

Figure 45 Frequency Hopping Table

8.2 RF Power Control

To set RF power, select the Output Power combo box and click Set button.



RF Power Contro	ol			
RF Power	27.0 ~	dBm		
			Get	Set

Figure 46 RF Power Set

8.3 RF Control

'RF Control settings' provides functions to set FH and LBT parameters.

RF Control		
Dwell Time 380 ms Idle Time 100 ms	 Freq. Hopping (Only) Freq. Hopping (with LBT) 	Sense Time 5 ms RF Level -74.0 dBm
Duty Cycle 79%	Listen Before Talk (Only)	
	Listen Before Talk (with FH)	Current Channel RSSI
		Get Set

Figure 47 FH and LBT Set

8.3.1 Frequency Hopping (FH)

To enable frequency hopping, follow sequence as described below.

- Step 1. Select 'Freq. Hopping(Only)' or 'Freq. Hopping(with LBT)'
- Step 2. Give the Dwell Time, Idle Time (If you select the 'Freq. Hopping(with LBT)', CW Sense Time and LBT RF Level are also given).

Step 3. Click 'Set'.

'Freq. Hopping(Only)' moves to another channel after using current channel during Dwell Time. (Channel movement follows FHSS Channel Table).

'Freq. Hopping(with LBT)' measures Channel RSSI before using the channel it moved to and if measured value of Channel RSSI is larger than LBT RF Level, it does not use applicable channel but move to another channel.

8.3.2 Listen Before Talk (LBT)

To set LBT parameters, follow sequence as described below.

Step 1. Select Listen Before Talk(Only) or Listen Before Talk(with FH).

Step 2. Give the Dwell Time, Idle Time, CW Sense Time and LBT RF Level.

Step 3. Click 'Set'.



Figure 48 LBT Timing Diagram

Transmitter on-time (Dwell Time) is the duration of the reading process. (1 = 1ms). Transmitter off-time (Idle Time) is the duration of the non-transmission interval. (1 = 1ms). Carrier Sense Time (During CST), RSSI measurement process is done. (1 = 1ms). ramp up / down (RF start / stop time) and processing delay require 0.5ms.

'Listen Before Talk(Only)' measures Channel RSSI before using current channel and wait with not using the channel until next Carrier Sense if there is lager signal than LBT RF Level. 'Listen Before Talk(with FH)' moves to another channel if it cannot use current channel. (Channel movement follows FHSS Channel Table).



8.3.3 Get Current RSSI

To get RSSI of current channel, click 'Current Channel RSSI' button. RSSI is displayed as blow.

Current Channel RSSI is -90.2 dBm

Figure 49 Current Channel RSSI

9 Registry Manager

9.1 Configuration

Registry Manager provides functions to get current registry items.

Inven	tory	Inventory Se	ettings I	Memory Access	RF Settings	Registry Manager	
G	et Registry						Update
Address	Items	Active	Sub Items	Туре	Value (DEC)	Value (F	IEX)
0	version	INACTIVE	ver	uint16	1042	412	
1	f/w	READO	date[3]	uint8	20, 8, 4,	0014, 0	008, 0004,
2	band	INACTIVE	region	uint8	17	11	
			cur_ch	uint8	8	08	
			cur_ch_ext	uint8	0	00	
3	anti-collis	INACTIVE	mode	uint8	3	03	
4	modulati	INACTIVE	mode	uint8	0	00	
5	query	INACTIVE	q	uint8	4	04	
6	partnum	INACTIVE	value[10]	uint8	82, 52, 83, 53, 83, 84, 45, 75	5, 32, 32, 0052, 0	034, 0053, 0035, 0053, 0054, 002D,
7	dev	INACTIVE	dev	uint8	1	01	
в	f/w_version	READO	ver[30]	uint8	82, 69, 68, 52, 83, 95, 118, 5	50, 46, 0052, 0	045, 0044, 0034, 0053, 005F, 0076,
9	leak_mo	INACTIVE	mode	uint8	1	01	
10	session	INACTIVE	session	uint8	240	FO	
11	serial	INACTIVE	item[10]	uint8	48, 48, 48, 48, 48, 48, 48, 48	3, 48, 48, 0030, 0	030, 0030, 0030, 0030, 0030, 0030,
12	beep	INACTIVE	beep_enabl	e uint8	1	01	
13	gpadc	INACTIVE	min	uint8	255	FF	
			max	uint8	0	00	
14	q	INACTIVE	q	uint8	0	00	
15	antenna	INACTIVE	port_bit	uint8	0	00	
16	fh_mode	INACTIVE	mode	uint8	1	01	
			ref_level	uint8	50	32	
17	modulati	INACTIVE	rx_mod	uint8	2	02	
			rx_blf	uint16	250	00FA	
			rx_dr	uint8	1	01	
18	support_r	INACTIVE	default	uint8	17	11	
			support	uint16	223	00DF	
19	gain	INACTIVE	gain	uint8	0	00	
20	report	INACTIVE	report	uint8	1	01	
21	tx_kr_hig	INACTIVE	max_power	int16	270	010E	
			min_power	int16	200	00C8	

Figure 50 Registry Manager

- Get Registry: display information of current registry items.
- Update: update all items to new value. Registry is used as default setting when RED start-up. If registry is changed as wrong value, RED can operate abnormally. Use carefully 'Update' function.

9.2 Export to file registry Data

User can save registry list with 'Export to File' button

Step 1. Right click on registry window.

Step 2. Click 'Export to File' Button.

Step 3. When location window appears, insert file name and click save.

*If user wants to check export file, click Tools \rightarrow Open Export Directory

Inver	ntory Invent	tory Settings	Memory Acces	s	RF Settings Registry Manager	
Get	t Registry					Update
Address	Items	Active	Sub Items	Туре	Value (DEC)	Value (HEX)
0	version	READONLY	ver	uint16	1042	412
1	f/w	READONLY	date[3]	uint8	21, 1, 14,	0015, 0001, 000E,
2	band	ACTIVE	region	uint8	240	F0
			cur_ch	uint8	1	01
			cur_ch_ext	uint8	0	00
3	anti-collision	ACTIVE	mode	uint8	0	00
4	modulation	INACTIVE	mode	uint8	0	00
5	query	ACTIVE	q	uint8	4 Export to File	04
6	partnumber	INACTIVE	value[10]	uint8	82, 52, 83, 53, 83, 84, 45, 75, 32, 32,	0052, 0034, 0053, 0035, 0053, 0054,
7	dev	INACTIVE	dev	uint8	1	01
В	f/w_version	READONLY	ver[30]	uint8	82, 69, 68, 52, 83, 95, 118, 50, 46, 50,	0052, 0045, 0044, 0034, 0053, 005F,
9	leak_mode	INACTIVE	mode	uint8	1	01
10	session	INACTIVE	session	uint8	240	F0
11	serial	INACTIVE	item[10]	uint8	48, 48, 48, 48, 48, 48, 48, 48, 48, 48,	0030, 0030, 0030, 0030, 0030, 0030,

Figure 51 Export to File Registry Data

10 RCP log

User can observe the byte stream of the RCP with RED Utility.



Figure 52 RCP Log Enable

• Move to the 'RCP' and click the checkbox on the left side of 'RCP Log Enabled' to enable the log.

User want save log data in real time, follow these step.

Step 1. Tools \rightarrow RCP Logger Enable click. Step 2. When location window appears, insert file name and click save. *If user wants to check log file, click Tools \rightarrow Open Log Directory



Figure 53 RCP File Logger Enable

11 Download

At Download menu, user downloads firmware through UART IAP(In-Application Programming) without additional hardware. For details about IAP, refer to 'RED-FDM.pdf.

RED Utility		
Connection	Tools Hotkey Info.	
iii 😜 🔩 🚓	Firmware Downloader	1
	Tx Leakage RSSI Plot Read Range Calculator Sensor Tag	Memory Acces
Unique Co	Additional Features	
EPC 1 20 00	RCP Logger Enable Open Log Directory Open Export Directory	

Figure 54 Open Firmware Downloader

R Download		×
File		
Open	Update	
l		

Figure 55 Download Window

Step 1. Tools \rightarrow Firmware Downloader click

Step 2. At Download window, click Open button to open firmware binary file. After selection firmware file(*.hex), click Update.

Step 3. Push **RESET** button or 'Ctrl+R' for system reset.

12 Tx Leakage RSSI Plot

To Run Tx Leakage RSSI Plot, Click Tools -> Tx Leakage RSSI Plot on menu bar.



Figure 56 Open Tx Leakage RSSI Plot Window

12.1 Measure

Make sure that antenna is connected to antenna port of module. Please follow next procedure for Measuring Tx Leakage RSSI.

Leakage RSSI Plot shows Tx leakage RSSI value at Rx path according to leakage calibration method of RED module. When 'measure' is activated, Tx leakage callibration algorithm is started so that calcurate the leakage RSSI value of rx baseband according to DAC1 and DAC2 value.

Step 1. Check the target channels.

Step 2. Click the 'Measure' Button. (GUI set other parameters automatically).



Figure 57 Run Tx Leakage RSSI Plot



Figure 58 Leakage RSSI Plot Process Window

12.2 Plot

After completing 'measure' process, the channel measured is shown in Plot Option area. Check the plot target channels, click 'Plot' button.

- Information show when mouse moved on the plot.
- In Multiple Plot, displayed lower RSSI information.



Figure 59 Result Plot

[Analysis of displayed figure]

If you can see 'BLUE' color on this plot, min. Leakage value has under 30. This means this antenna can be used without any sensitivity loss.

If you can see RED or GREEN instead of BLUE(or BLACK), Tx leakage from Tx path and antenna matching make Rx sensitivity get worse.

It is usually caused by antenna S_{11} (return loss). Generally our Tx leakage calibration algorithm can support over 15dB S_{11} of antenna.

12.3 Save and Load

12.3.1 Save Plot Image

To save plot image, Press 'Ctrl + S' or Click menu 'File - Save Image' Images saved to the directory "{Documents}\Phychips\TxLeakageRSSIPlot"



Figure 60 Save Raw Data

12.3.2 Save & Load Raw Data

User can save or load measured raw data.

To save raw data, Press 'Ctrl + R' or Click menu 'File - Save Data'.

To load raw data, Press 'Ctrl + O' or Click menu 'File – Load Data'.

Raw data saved to the directory "{Documents}\Phychips\TxLeakageRSSIPlot\Rawdata"



Figure 61 Save Plot Image

13 Read Range Calculator



Figure 62 Open Read Range Calculator Window



Figure 63 Read Range Calculator

13.1 Read Range Calculator Overview

Read range Calculator shows the relationship between Tx Output Power and Read Range based on other parameters. In order to set other parameter Click the Details button that indicated by red rectangle in Figure 63 Read Range Calculator.

Read range is related in Reader sensitivity, Reader antenna gain, tag sensitivity, tag antenna gain. This calculator show theoretical results according to these parameter.

X axis show Tx output power at antenna port. This value do not include antenna gain.

Y axis show read range with m.

You can choose antenna type: linear and circulator. Generally RFID use circular type antenna because tag use linear antenna. Tag sensitivity usually depends on tag IC inside tag inlay. Table 1 show sensitivity of some tag ICs.

company	model name	Sensitivity(reading)	Unit
	Higgs-2	-14	dBm
Alien	Higgs-3	-18	dBm
	Higgs-4	-18.5	dBm
	Monza-2	-11.5	dBm
Impini	Monza-3	-15	dBm
impinj	Monza-4	-17.4	dBm
	Monza-5	-17.8	dBm
	UCODE G2XM/G2XL ¹	-15	dBm
	UCODE G2iM/G2iM+ ²	-17.5	dBm
INAF	UCODE G2iL/G2iL+	-18	dBm
	UCODE 7	-21	dBm

Table2 Tag Sensitivity

13.2 Read Range Calculator Detail View

0.0 ***********************************	0 20.0 25.0 30.0
Tx output Powe	r @ antenna port[dBm]
Reader Parameter	Tag Parameter
Reader Sensitivity : -60 🚔 [dBm]	Tag Sensitivity : -17 🏼 🖨 [dBm]
🔘 Linear Antenna 🔿 Circular Antenna	Tag Anatenna Gain : 0 [dBi]
Reader Antenna Gain : -0.5 [dBi]	Details

0.0 0.0 5.0 10.0 15.0 20.0 25.0 30.0 Tx output Power @ antenna port[dBm]							
Reader Parameter	Tag Parameter						
Reader Sensitivity : -60 🖨 [dBm]	Tag Sensitivity : -17 🏮 [dBm]						
🖲 Linear Antenna 🔿 Circular Antenna	Tag Anatenna Gain : 0 [dBi]						
Reader Antenna Gain : -0.5 [dBi]							
∆Lreader : 0 [dB]	∆Ltag: 0 [dB]						
λ: 0,33	Path Loss: 0 [dB]						
🗌 View Reader Limit	View Tag Limit Fold						
·	·						

Figure 64 Read Range Calculator Detail View

In Detail View, Read range Calculator show reader limit and tag limit. Read range can be limited due to reader sensitivity or tag sensitivity. This graph show which is mainly affected to read range according to Tx output power. You can roughly estimate read range when you know some parameter of reader and tag.

14 Sensor Tag Demo

To read AXZON(RF micron) and EM Micro sensor tag, use 'Sensor Tag Demo'.

- Step 1. Click Tool -> Sensor Tag on menu bar.
- Step 2. Select Tag manufacture company, click 'Start' button.



Figure 65 Open Sensor Tag Window

	PC	EPC						Count	Code Type	On-Chip RSSI	Sensor Co	Temp Code	Temperature	
1	30 00	FF FF FF I	FFFF	FFFF	FFF	F FF FF		14	Magnus S2	4	30	2391	34.7 °C	9
2	30 00	00 00 00 0	0 00 0	0 00 0	0 00 0	00 17 74		63	Magnus S3	16	214	2257	24.20 °C	9
3	30 00		0 00 0	0 00 0 0 00 0		0 02 93		2	Magnus 52	31	29	-	-	9
-	40 00		0 00 0	0 00 0		0 17 76	0	2	Magnus 52	16	196	2249	24 5 90	9
6	40 00	00 00 00 0	0 00 0	0 00 0	0 00 0	0 30 8B	1	1	Magnus S2	19	30	-	-	9
7	30 00	00 00 00 0	0 00 0	0 00 0	0 00 0	0 04 11		1	Magnus S2	17	26	-	-	9
< Read	Tags : 7	[Note] Selecti	ng a tag	from th	ne list activa	ates pow	ver modu	ulation(On-Chip	RSSI range 13~1	8) and reads or	nly the target tag). Star	t
< Read	Tags:7 r Tempe	[Note] Selectin	ng a tag	ı from th	ne list activa	ates pow	ver modu	ılation(On-Chip	RSSI range 13~1	8) and reads or	nly the target tag). Star	t
< Read	Tags:7 r — Tempe	[Note] Selectin On Chip F	ng a tag RSSI	ı from th	ne list activa	ates pow	ver modu	ulation(On-Chip	RSSI range 13~1	8) and reads or	Average). Start	t 6
< Read	Tags : 7 r — Tempe 80 —	[Note] Selectin Dn Chip F	ng a tag RSSI) from th	e list activa	ates pow	ver modu	ulation(On-Chip	RSSI range 13~1	8) and reads or	Average Tempera	ture 24.1	t 6
< Read	Tags : 7 r — Tempe 80 — 70 —	[Note] Selectin	ng a tag RSSI	; from th	e list activa	ates pow	ver modu	ulation(On-Chip	RSSI range 13~1	8) and reads or 	Average Tempera On-Chip	u Star ture 24.1 RSSI 16	t 6
< Read	Tags : 7 r Tempe 80	[Note] Selectin	ng a tag RSSI	; from th	ne list activa	ates pow	ver modu	ulation(On-Chip	RSSI range 13~1	8) and reads or 	Average Tempera On-Chip	uture 24.1 RSSI 16	t 6
< Read	Tags : 7 r Tempe 80	[Note] Selectin	ng a tag RSSI) from th	ist activa	ates pow	ver modu	ulation(On-Chip	RSSI range 13~1	8) and reads or 	Average Tempera On-Chip Contorl	uture 24.1 RSSI 16	t 6
< Read '	Tags : 7	[Note] Selectin	ng a tag) from th	ie list activa	ates pow	ver modu	ulation(On-Chip	RSSI range 13~1	8) and reads or -28 -24 -20 B	Average Tempera On-Chip I Contorl Horizoni	ture 24.1 RSSI 16	t 6
< Read lonito	Tags : 7	[Note) Selectin	ng a tag	; from th		ates pow	ver modu	ulation(On-Chip	RSSI range 13~1	8) and reads or 32 -28 -24 -20 16 -27 -28 -24 -20 -24 -20 -21 -21 -21 -21 -21 -21 -21 -21	Average Tempera On-Chip Contorl Horizon	ture 24.1 RSSI 16	t 6
< Read Temperature	Tags : 7	[Note) Selectin	ng a tag	; from th		ates pow	ver modu	Jation(On-Chip	RSSI range 13~1	8) and reads or 32 -28 -24 -20 16 B R -12 S	Average Tempera On-Chip Contorl Horizon	ture 24.1 RSSI 16 tal < 2 Max 5	t 6
< Read lonito	Tags : 7	[Note) Selectin	RSSI	; from th		ates pow	ver modu	Jation(On-Chip	RSSI range 13~1	8) and reads or 32 -28 -24 -20 16 B R -12 S -2 -28 -24 -20 -24 -20 -21 -28 -24 -28 -28 -28 -28 -28 -28 -28 -28	Average Tempera On-Chip I Contorl Horizonl Left Y	ture 24.1 RSSI 16 tal < 2 Max 6 Min 4	t 6 > 85
< Read donito	Tags : 7	[Note] Selectin	RSSI	I from th		ates pow	ver modu	Jation(On-Chip	RSSI range 13~1	8) and reads or 32 -28 -24 -20 16 B R -12 S -8	Average Tempera On-Chip I Contorl Horizonl Left Y	ture 24.1 RSSI 16 tal < 2 Max 6 Min 4	t 6 > 85
Cemberature	Tags : 7	[Note] Selectin	RSSI	from the		ates pow	ver modu	Ilation(On-Chip	RSSI range 13~1	8) and reads or 32 -28 -24 -20 16 B R -12 S -8 -4	Average Tempera On-Chip I Contorl Horizonl Left Y Right Y	ture 24.1 RSSI 16 tal < 2 Max 6 Min -4 Max 3	t 6 > 85 40 32

Figure 66 Sensor Tag Demo Window

Detail about the Sensor Tag Demo is described in [AN111-02] Sensor Tag application.

15 Hotkey Function

RED Utility		
Connection Tools	Hotkey Info.	
i 🎯 🗞 🔶 💁 🏈 i 🚹	Edit	
Inventory	Hotkey 1(Ctrl + Shift + 1) : Leakage cal. report off	Registry Manager
	Hotkey 2(Ctrl + Shift + 2) : Leakage cal. report on	
Start E	Hotkey 3(Ctrl + Shift + 3) : CW turn on	
Unique Count : 0	Hotkey 4(Ctrl + Shift + 4) : CW turn off	
	Hotkey 5(Ctrl + Shift + 5) : Blank	
PC EPC	Hotkey 6(Ctrl + Shift + 6) : Blank	
	Hotkey 7(Ctrl + Shift + 7) : Blank	
	Hotkey 8(Ctrl + Shift + 8) : Blank	

Figure 67 Open Hotkey Edit Window

User can save, load and edit a set of RCP Packet through a User Define Function. In order to edit a set of RCP Packet, Click the 'Edit' Button in Hotkey menu. To make RCP Packet, refer to RED-RCP manual.

15.1 Hotkey Function Editor

R CW turn on				-		×
1 2 3	4	5	6	7		8
Label		Cont	trol			
CW turn on		Sa	ave	Load	Ru	n
Description						
RF CW signal On						^
						~
RCP						
BB 00 17 00 01 FF 7E						^
						~

Figure 68 Hotkey Edit Window

User can save name and description of the Button.

First, select number tab to edit. Write RCP Packet and save.

In this case, a 'CW turn on' Command used for an example. The edited contents apply promptly like Figure 68. To Send Saved RCP Command, Click the 'Run' button in Figure 68 or press hotkey(Ctrl + Shift + Number).



16 Address Information

PHYCHIPS Inc. #104, 187 Techno 2-ro, Yuseong-gu, Daejeon, Korea (Yongsan-dong, Migun Technoworld 2) 34025 http://www.phychips.com sales@phychips.com +82-42-864-2402 +82-42-864-2403

Disclaimer: PHYCHIPS reserves the right to make changes to the information in this document without prior notice. The purchase of PHYCHIPS products does not convey any license under patent rights owned by PHYCHIPS or others. PHYCHIPS does not assume any responsibility for the use of this product. It is the customer's responsibility to make sure that the system complies with regulations.

© 2022 PHYCHIPS, Inc. All rights reserved. The reproduction of this document is NOT allowed without approval of PHYCHIPS Inc.