2.45GHz Active Reader

Communication Protocol

1.1 Application Scope

This protocol applying to RS232 and Ethernet interface as follow :

RS232：1 start bit, 8 data bit,1 stop bit, no even-odd check, Baud rate 115200bps;

EtherNet：10M/100M Ethernet, TCP protocol transmission. The reader worked as server mode and host computer as client-side.

1.2 Data Link Layer

Data link layer specific provision command, types and data formats of response frame.

Frames type divide into command frame, response frame, response frame when reader complete the command.

1.2.1 Command frame format definition

The command frame is the data frame when host operate to reader, format example as below:

Head	Addr	Len	Cmd	Parameter	…	Parameter	Check
0x0A	1 byte	n+2	1 byte	Byte 1		Byte n	cc

Head : symbol of Frame Header, define as 0x0A

Addr : reader's address, common address from 0~240, 255(0xFF)is public address, 254(0xFE)is broadcast address. Reader receiving the command of self address, public address and broadcast address, and makes no respond to broadcast command.

Len : Packet length field, indicates Length field by the numbers of back frame

Cmd : command code field.

Parameter : parameter field of command frame.

Check : checksum field, specify that the check range is the all byte checksum which from frame header field to parameter filed. Reader need calculate the checksum to find error when received the command frame.

1.2.2 Respond frame format definition

Response frame is the data frame when reader returns to PC, response frame is consist of the data that reader need to collect. The format definition show as below:

Head	Addr	Len	Status	Response	...	Response	Check
0x0A	1 byte	n+2	1 byte	Byte 1		Byte n	cc

Head : packet types field, response frame packet types fixed as 0xE0

Addr : reader self address

Len : Packet length field, indicates Length field byte numbers of back frame

Status : indicates command specified result of implementation, 0 indicates correct

Implementation, others indicates abnormity occurred during the implementation

Response : return data of response frame.

Check : check sum field, specify that the check range is the all byte checksum which from packet type field to parameter filed. PC need calculate the checksum to find error when received the command frame.

2 Protocol Description

2.1 Read Version Number

This command is use for read reader version number, get this command and reader start to tag configuration

Head	Addr	Len	Cmd	Check
0x0A		0x02	0x22	cc

After reader received this command frame, it will return a response frame to show command has been received. Response frame as below:

Head	Addr	Len	Status	Response	Response	Check
0x0B		0x04	0x00	Major	Minor	cc

Major is firmware program major version number

Minor is firmware program minor version number

2.2 Tag Identification

This Command enable reader get into tag identify mode:

Head	Addr	Len	Cmd	Check
0x0A		0x02	0x90	cc

After reader received this command frame, it will return a response frame to show command has been received. Response frame as below:

Head	Addr	Len	Status	Check
0x0B		0x02	0x00	Cc

When reader receive this command then get into tag identify condition, after read the tag, it will save the tag data inside of the reader. When it on running of "get data command", Then reader will response tag's data.

2.3 Get data command:

Head	Addr	Len	Cmd	Check
0x0A		0x02	0x9A	cc

Reader get to READ status, then reader send "get data command", reader response card number, data frame format as below:

Head	Addr	Len	Status	Tag count	Data	Check
0x0B		0x07	0x00		10 byte*n	cc

Data: during 10 byte, 1st byte symbol identity bit(0x20 is identify, 0x21is calling, 0x22 is read, 0x23 is write), the 2nd~5th byte is Tag ID Number. The 6th byte is locator's sequence number, the 7th~10th is locator's data (Locator data—makes no sense).

2.4 Tag Calling

This Command enable reader find specified tag, after receive this command reader will get into tag finding status

Head	Addr	Len	Cmd	ID	Check
0x0A		0x06	0x92	4Byte	cc

After reader received this command frame, it will return a response frame to show command has been received. Response frame as below:

Head	Addr	Len	Status	Check
0x0B		0x02	0x00	cc

After search out the matching tag, it's immediately response through latest receiving port. Reader's tag search status is constantly. That means, if user do not stop this status, reader will always searching the match tag, and will not stop when search out the tag. As soon as reader receive the stop command, then will stop calling.

2.5 Tag Read

This commend is use for read the tag data, after received this command, Reader will get into read tag status.

Head	Addr	Len	Cmd	Peremeters	Peremeters	Check
0x0A		0x07	0x93	4byte ID	Read addr.	cc

After reader received this command frame, it will return a response frame to show command has been received. Response frame as below:

Head	Addr	Len	Status	Check
0x0B		0x02	0x00	cc

As soon as read the tag, it will transmit out via latest port which receive the command frame.

Reader read tag status is continuously.

Head	Addr	Len	Status	Response	Check
0x0B		0x07	0x00	5 byte data	cc

There into, during 5 byte data, 1st byte is symbolized bit, last 4 byte is tag data.

2.6 Tag Write (optional function for Read/write version only)

This command is enable reader write the tag data, reader will get into write tag status after received this command. One time write 1 byte only.

Head	Addr	Len	Cmd	Peremeters	Peremeters	Peremeters	Check
0x0A		0x0B	0x94	4byte ID	Write addr.	Write data	cc

Write address including 1 byte, write data including 4 byte

After reader received this command frame, it will return a response frame to show command has been received. Response frame as below:

Head	Addr	Len	Status	Check
0x0B		0x02	0x00	cc

2.7 Query locator Power

This command is use for query locator power

Head	Addr	Len	Cmd	Check
0x0A		0x02	0x99	cc

Reader received the command and response below data:

Head	Addr	Len	Status	POWER	Check
0x0B		0x03	0x00	POWER	cc

POWER is Locator's Power parameter

00 is- 18dBm, 01 is-12dBm, 02 is-6dBm, 03 is- 0dBm

2.8 Set Locator Power

This command is use for set locator power.

Head	Addr	Len	Cmd	POWER	Check
0x0A		0x03	0x98		cc

POWER : 0x00 is-18 dBm, 01 is-12dBm, 02 is -6dBm, 03 is 0dBm

After reader received this command frame, it will return a response frame to show command has been received. Response frame as below:

Head	Addr	Len	Status	Check
0x0B		0x02	0x00	cc

2.9 Set Locator Serial No.

This command is use for set locator serial number.

Head	Addr	Len	Cmd	Fixed value	Number	Check
0x0A		0x04	0x23	0x64	ID	cc

ID is Locator's address serial number: 0-239(00-EF)

After reader received this command frame, it will return a response frame to show command has been received. Response frame as below:

Head	Addr	Len	Status	Check
0x0B		0x02	0x00	cc

2.10 Query Locator Serial Number

This command is use for query locator serial number

Head	Addr	Len	Cmd	Fixed value	Check
0x0A		0x03	0x24	0x64	cc

Reader received and response below data:

Head	Addr	Len	Status	Locator ID	Check
0x0B		0x03	0x00	ID	cc

ID is locator serial number

2.11 End operation(Mandatory)

This command enable reader end up the current operation(including identify, calling, Read, Write , setting etc.) keep default status.

Head	Addr	Len	Cmd	Check
0x0A		0x02	0x91	cc

After reader received this command frame, it will return a response frame to show command has been received. Response frame as below:

Head	Addr	Len	Status	Check
0x0B		0x02	0x00	cc