IF9A Reader Active Mode Instruction Set Developer's Guide

An overview of the instruction set

After the reader has set the active working parameters through the configuration tool, the reader will automatically enter the active working mode after being powered on. During active operation, the data that the reader will actively upload include: tag data, GPI status, fault information, and heartbeat data. Since the tag data is important business data, when configuring the active working mode parameters of the reader, you can choose to require the server to enter a confirmation response to the tag data. If the server is required to confirm the tag data, the reader will not upload the next frame of tag data until it receives a response from a certain frame of tag data. Currently, only tag data can be selected for confirmation by the server side for actively uploaded data, and other types of actively uploaded data do not require server-side confirmation and response.

When the reader is actively working, the server can send remote commands to the reader. The currently supported remote commands include: setting the GPO status, restarting the device, etc. After the reader receives and executes the remote command, it will send it to the server. Reply to inform the status of the command execution.

After the reader is powered on, it will try to establish a tcp connection with the server immediately. When an error occurs when the reader transmits data on this tcp connection, it will actively close the current connection and try to establish a new connection.

Second, the reader to server communication format

Fixed header (1 byte)	Reader logical name length (1 byte)	Data segment length (2 bytes)	Command type (1 byte)	Command flag bit (1 byte)）	Status code (4 bytes)	Read and write Logical name of the device (variable length)	Data segment (variable length)	CRC (only exists when uploading through serial port, 2 bytes)

Fixed header: fixed to 0xFF

Reader logical name length: The reader logical name is represented by an ASC2 string, and this field is the byte length of the name

Data segment length: This field is the byte length of the data segment

Reader Logical Name: The logical name of the reader expressed as an ASC2 string

Status code: 0x00000000 indicates that the status of the reader is normal or the remote command is successfully executed. A value other than 0 indicates that the status of the reader is abnormal or the execution of the remote command fails.

Command type: The command is divided into two categories, one is the active upload type; the other is the response to the remote command

Command	Category	Status Code	Description

Type Code			
0x01	Active upload	Fixed to 0x00000000	Tag data upload
0x02	Active upload	Fixed to 0x00000000	GPI status upload (optional configuration)
0x03	Active upload	Fixed to 0x00000000	Tag data is uploaded for the first time (reserved, not supported for now)
0x04	Active upload	Current status of reader/writer	Heartbeat data upload
0x05	Active upload	Current status of reader/writer	Abnormal fault data upload of the reader
0x16	Command response	Command execution status	Get reader GPI status
0x17	Command response	Command execution status	Set the reader GPO status
0x18	Command response	Command execution status	Restart the reader

Instruction flags:

Bit No	Description
0	0 means this command does not require a reply, 1 means this command must be replied.
1	0 means the command does not contain a CRC field, 1 means the command contains a CRC field

Data segment: Different command types have different content in the data segment

Command code	data segment format							
0x01	Number of labels (2 bytes)	N pcs labels data Single tag data format：						
		Antenna number (1 byte)	Number of reads (1 byte)	RSSI（1 byte）	Tag protocol (1 byte)	EPC ID length （1 byte）	EPC ID（variable length）	Bank data length (1 byte)	Bank data (variable length)
0x04	Device board type (1 byte)	Rfid module type (1 byte)	Software version (4 bytes)	Number of connected antennas (1 byte)	Connected antenna number (variable)	Heartbeat count (4 bytes)		
0x05	Error data (24 bytes, reserved for use, currently all 0s)							
0x16	Number of GPIs (1 byte)	N GPI status data						
		single GPI status data format is: GPI No.（1 byte）	GPI status（1 byte）					
0x17	no data segment							

0x18	no data segment

Heartbeat count (4 bytes)

Three. Communication format from server to reader

Fixed header (1 byte)	Reader logical name length (1 byte), fixed at 0x00	Data segment length (2 bytes)	Command type (1 byte)	Command flag bit (1 byte)	Data segment (variable length)	CRC (only exists when the serial port transmits data, 2 bytes)

Fixed header: fixed to 0xEE

Reader logical name length: This field is fixed to 0x00, that is, the command does not include the reader logical name

Data segment length: This field is the byte length of the data segment

Command type: Commands are divided into two categories, one is the remote command sent to the reader to be executed; the other is the response to the reader actively uploading the command

command Type Code	category	description
0x01	Upload response	Confirm that the tag data upload has been received
0x02	Upload response	Confirm receipt of GPI status upload (reserved, not currently supported)
0x16	Remote command	Get reader GPI status
0x17	Remote command	Get reader GPO status
0x18	Remote command	Restart reader

Command flag bit: The meaning is consistent with the command flag bit in the reader-to-server communication format

Data segment: Different instruction types have different content in the data segment

<table>
<tr><td>Command code</td><td colspan="3">data segment format</td></tr>
<tr><td>0x01</td><td colspan="3">no data segment</td></tr>
<tr><td>0x02</td><td colspan="3">no data segment</td></tr>
<tr><td>0x16</td><td colspan="3">no data segment</td></tr>
<tr><td>0x17</td><td>Number of GPO status data (1 byte)</td><td colspan="2">N GPO status data
single GPO status data format is:
<table><tr><td>GPO number (legal value is 1-4, 1 byte)</td><td>GPO status (legal value is 0 or 1, 1 byte)</td><td>GPO state duration (1 byte, in seconds, after the duration expires, the GPO reverts to the state opposite to the setting)</td></tr></table></td></tr>
<tr><td>0x18</td><td colspan="3">no data segment</td></tr>
</table>

Four. Examples

Assuming that the logical name of the reader is silion, and the server does not need to confirm the response tag data, the antenna port 2 of the reader is connected to an antenna, and other ports are not connected to an antenna.

1. Actively uploaded heartbeat data frame

FF	06	00 0C	04	00	00 00 00 00	73 69 6C 69 6F 6E
Fixed header	Reader logic name length	Data segment length	Command type	Command flag bit	Status code	Reader logic name (silion)

01	0A	0A 00 00 00	01	02	00 00 00 00
Device Mainboard Type	Rfid Module Type	Software Version	qty of Connected Antennas	Number of Connected Antennas (Antenna No. 2)	Heartbeat Count

2，Actively uploaded tag data frame

FF	06	00 38	01	00	00 00 00 00	73 69 6C 69 6F 6E
Fixed header	Reader logic name length	Data segment length	Command type	Command flag bit	Status code	Reader logic name (silion)

00 03	02	01	D8	05	0C	E2 00 41 45 31 16 00 38 20 70 3F B7
qty of tags (3)	Antenna number	Read times	RSSI	tag protocol	EPC ID length	EPC ID

00	02	01	C1	05	0C	E2 00 41 45 31 16 00 45 20 70 3F 9B
Bank Data Length	Antenna number	Read times	RSSI	tag protocol	EPC ID length	EPC ID

00	02	01	C2	05	0C	E2 00 41 45 31 16 00 27 20 70 3F E3	00
Bank Data Length	Antenna number	Read times	RSSI	tag protocol	EPC ID length	EPC ID	Bank Data Length

3，Actively uploaded reader failure data frame

FF	06	00 18	05	00	00 00 01 86	73 69 6C 69 6F 6E
Fixed header	Reader logic name length	Data segment length	Command type	Command flag bit	Status code	Reader logic name (silion)

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Error data (reserved for use, currently all 0)

4，Actively uploaded GPI state change data frame

FF	06	00 09	02	00	00 00 00 00	73 69 6C 69 6F 6E
Fixed header	Reader logic name length	Data segment length	Command type	Command flag bit	Status code	Reader logic name (silion)

04	01	01	02	00	03	01	04	01
Number of GPIs	Gpi 1	Gpi 1 status	Gpi 2	Gpi 2 status	Gpi 3	Gpi 3 status	Gpi 3	Gpi 4 status

5，The server sends the set GPO status (set GPO1 to 1 for 7 seconds)

server sends

EE	00	00 04	17	01	01	01	01	07
Fixed header	Reader logic name length	Data segment length	Command type	Command flag bit	GPO state data quantity	GPO number	GPO status	GPO status duration

Reader side reply

FF	06	00 00	17	00	00 00 00 00	73 69 6C 69 6F 6E
Fixed header	Reader logic name length	Data segment length	Command type	Command flag bit	Status code	Reader logic name (silion)