Rainy RFID UHF module user guide
V2.3.3

Version record

Version	Day	Description
V1.1	October 15, 2013	Instructions for firmware instructions
V1.2	December 19, 2013	Add I0 control instruction
V2.0	May 20,2014	Modify Read, Write, Lock, Kill and other instructions without PC and EPC data segments, modify the response format of corresponding instructions
V2.1	July 16,2014	Add lmpinj Monza tag QT instruction
V2.2	August 20, 2014	Add module sleep instructions
V2.3	August 26,2015	Add Block Permlock instruction
V2.3.1	January 1, 2016	Add the command toget the Select parameter
V2.3.2	May 16, 2016	Add insert working channel instruction
V2.3.3	August 22, 2017	Add thecommandforthemodule toenter IDLE mode

Baud Rate setting

Type	Baud Rate(bps)
0xB0	9600
0xB1	19200
0xB2	28800
0xB3	38400
0xB4	57600
0xB5	115200

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1.Introduction to firmware instructions

1.1 Command frame format

Firmware instructions arecomposedofframeheader, frametype, instructioncode, instructiondata length, instructionparameter, checkcodeandframetail, all of which are hexadecimal. For example:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	00	07	00	01	01	09	DD

Frame header: 0xAA
Frame type: 0x00
instruction code
Command: 0x07
instruction Parameter
length PL:
0x0001
Command parameter
Parameter: 0x01 Checksum:
0x09 frame
X-tail End: 0xDD
Checksum isthesumofthesum fromtheframetype tothelastinstruction parameter
Parameter: and only the lowest byte (LSB) of the sum is taken.

1.2 Command frame type

Type	Description
0x00	Command frame: sent by upper computer to M100 chip
0x01	Responseframe: sent back to upper computer by M100 chip
0x02	Notification frame: sent back to upper computer by M100 chip

Each instruction frame has a corresponding response frame, which indicates whether the instruction has been executed.

The single polling instruction and multiple polling instruction also have corresponding notification frames. The number of sending notification frames is automatically sent to the upper computer by MCU accordingtothereading situation. When the reader reads a tag, it sends a notification frame, and when the reader reads multiple tags, it sends multiple notification frames.

2. Firmware command definition

2.1 Get reader/writer module information

2.2 Command frame definition obtains module information such as hardware version, software version and manufacturer information.

Frame type: 0x00
Command code: 0x03
Parameter:0
Hardware version: 0x00
Software veron: 0x01
Manufacturer： 0x02

Example: Get the hardware version of the reader/writer

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	00	03	00	01	00	04	DD

Frame type: 0x00

Command code: 0x03

Command parameter length PL: 0x0001

Command parameter Parameter: 0x00 (get hardware version)

Checksum: 0x04

2.3 Response frame definition

Frame type: 0x01

Command code: 0x03

Data: variables (ASCII code representation)

The first byte of the response data is the module information type:

Hardware version: 0x00

Software version: 0x01

Manufacturer: 0x02

The following data is ASCII code of module information. The response to obtain the module hardware version is as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Info Type	Info	
AA	01	03	00	0B	00	4D ('M')	31 ('1')
30 ('0')	30 ('0')	20 (' ')	56 ('V')	31 ('1')	2E ('.')	30 ('0')	30 ('0')
Checksum	**End**						
22	DD						

Frame type: 0x01

Command code: 0x03

Command parameter length PL: 0x000B

Module information type Info Type: 0x00 (hardware version)

Version information Info: 4D 31 30 30 20 56 31 2E 30 30 (ASCII code of "M100 V1.00")

Checksum0x

3. Single polling instruction

3.1 Command frame definition

Complete the polling inventory operation in the EPC Class1 Gen2 protocol once. This instruction does not contain the Select operation. The power amplifier will be automatically turned on and off before and after each polling instruction is executed. In the single polling inventory instruction, the Query operation parameter is configured by another instruction, and the firmware has an initial value. The single polling inventory instruction is as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Checksum	End
AA	00	22	00	00	22	DD

Frame type: 0x00

Instruction code Command: 0x22

Instruction parameter length PL: 0x0000

Checksum: 0x22

3.2 Notification frame definition

After the chip receives the single polling instruction, if it can read the correct label verified by CRC, the chip MCU will return the data containing RSSI, PC, EPC and CRC. EPC will return one instruction response when reading one tag, and multiple instruction responses when reading multiple tags. As follows:

Header	Type	Command	PL(MSB)	PL(LSB)	RSSI	PC(MSB)	PC(LSB)
AA	02	22	00	11	C9	34	00
EPC(MSB)							
30	75	1F	EB	70	5C	59	04
			EPC(LSB)	CRC(MSB)	CRC(LSB)	Checksum	End
E3	D5	0D	70	3A	76	EF	DD

Frame type: 0x02

Instruction code Command: 0x22 Instruction parameter length PL: 0x0011

RSSI: xC9

PC:0x3400 EPC:0x30751FEB705C5904E3D5D70

CRC:0x3A76

Checksum: 0xEF

3.3 Response frame definition

If no label return is received or data CRC verification error is returned, error code 0x15 will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	FF	00	01	15	16	DD

Frame type: 0x01
Instruction code Command: OxFF
Instruction parameter Length PL: 0x01
Instruction parameter Parameter: 0x15
Checksum: 0x16

The instruction requires the chip MCU to poll the inventory operation for multiple times. The number of polling times is limited to 0-65535. If the number of polling times is 10000, the instruction is as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Reserved	CNT(MSB)	CNT(LSB)
AA	00	27	00	03	22	27	10
Checksum	End						
83	DD						

Frame type: 0x00

Instruction code Command: 0x27

instruction parameter length PL: 0x0003

Reserved bit Reserved: 0x22

Polling times CNT: 0x2710

Checksum: 0x83

3.4 Notification frame definition

The format of multiple polling inventory instruction response frame is the same as that of word polling inventory response frame, as follows

Header	Type	Command	PL(MSB)	PL(LSB)	RSSI	PC(MSB)	PC(LSB)
AA	02	22	00	11	C9	34	00
EPC(MSB)							
30	75	1F	EB	70	5C	59	04
			EPC(LSB)	CRC(MSB)	CRC(LSB)	Checksum	End
E3	D5	0D	70	3A	76	EF	DD

Frame type: 0x02
Instruction code Command: 0x27
Instruction parameter length PL: 0x0011
RSSI: 0xC9
PC:0x3400
EPC:0x30751FEB705C5904E3D50D70
CRC:0x3A76
Checksum: 0xEF

3.5 Response frame definition

If no label return is received or data CRC verification error is returned, error code 0x15 will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	FF	00	01	15	16	DD

Frame type: 0x01
Instruction code Command: 0xFF
Instruction parameter length PL: 0x01
Instruction parameter Parameter: 0x15
Checksum: 0x16

4. Stop multiple polling instructions

4.1 Command frame definition

During the process of multiple polling inventory operations by the MCU inside the chip, you can immediately stop multiple polling operations and not pause multiple polling operations. The instructions are as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Checksum	End
AA	00	28	00	00	28	DD

Frame type: 0x00
Instruction code Command: 0x28
Instruction parameter length PL: 0x0000
Checksum: 0x28

4.2 Response frame definition If the stop multiple polling instructions are executed successfully, the firmware will return the response as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	02	00	01	00	2A	DD

Frame type: 0x01
Instruction code Command: 0x28
Instruction parameter length PL: 0x0001
Instruction parameter Parameter: 0x00
Checksum: 0x2A

5. Set Select parameter instruction

5.1 Command frame definition

Set the Select parameter, and set the Select mode to 0x02 (send the Select command before polling the tag). In the case of multiple tags, you can only poll, read and write specific tags according to the Select parameter. For example:

Header	Type	Command	PL(MSB)	PL(LSB)	SelParam	Ptr(MSB)	
AA	00	0C	00	13	01	00	00
	Ptr(LSB)	**MaskLen**	**Truncate**	**Mask(MSB)**			
00	20	60	00	30	75	1F	EB
							Mask(LSB)
70	5C	59	04	E3	D5	0D	70
Checksum	**End**						
AD	DD						

Frame type: 0x00
Command: 0x0C
Command parameter length PL: 0x0013

SelParam: 0x01 (Target: 3 "'b000, Action: 3'b000, MemBank: 2'b01) Ptr: 0x00000020 (in bit, not word) starts from the EPC storage bit
Mask length MaskLen: 0x60 (6 words, 96bits)
Truncate: 0x00 (0x00 is Disable truncation, 0x80 is Enable truncation)
Mask:0x30751FEB705C5904E3D50D70
Checksum: 0xAD
SelParam has a total of 1 Byte, of which Target accounts for the highest 3 bits, Action accounts for the middle 3 bits, and MemBank
It accounts for the last two bits.
MemBank has the following meanings:
2'b00: Sign RFU data storage area
2'b01: tag EPC data storage area
2'b10: label TID data storage area
2'b11: Label User data store
See the EPC Gen2 agreement for the detailed meaning of Target and Action.
When the length of the Select Mask is greater than 80 bits (5 words), sending the Select command will first set all labels in the field to the status of Inventoried Flag as A SL Flag as~SL, and then operate according to the selected Action. When the length of the Select Mask is less than 80 bits (5 words), the label status will be set to the status of Inventoried Flag as A and L Flag as~SL in advance through the Select command.

5.2 Response frame definition

When the Select parameter is set successfully, the firmware returns as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Data	Checksum	End
AA	01	0C	00	01	00	0E	DD

Frame type: 0x01

Instruction code Command: 0x0C

Instruction parameter length PL: 0x0001

Return Data: 0x00

Checksum: 0x0E

6. Get Select parameter

6.1 Command frame definition

Gets the Select command vector parameter in the firmware. The instructions are as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Checksum	End	
AA	00	0B	00	00	0B	DD	

Frame type: 0x00

Command: 0xOB

Command parameter length PL: 0x000

Checksum: 0x0B

6.2 Response frame definition

Get the Select command parameter in the firmware. The expected frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	SelParam	Ptr(MSB)	
AA	01	0B	00	13	01	00	00
	Ptr(LSB)	MaskLen	Truncate	Mask(MSB)			
00	20	60	00	30	75	1F	EB
							Mask(LSB)
70	5C	59	04	E3	D5	0D	70
Checksum	End						
AD	DD						

Frame type: 0x01

Command: 0x0B

Command parameter length PL: 0x0013

SelParam: 0x01 (Target: 3'b000, Action: 3'b000, MemBank: 2'b01)

Ptr: 0x00000020 (in bit, not word) Mask length from EPC storage bit

Start Mask Length MaskLen: 0x60 (6 word96bits)

Truncate: 0x00 (0x00 is Disable truncation, 0x80 is Enable truncation)

Mask:0x30751FEB705C5904E3D50D70

Checksum: 0XAD

If the Select parameter has been set, execute the command to set the Select mode. For example, if you want to cancel the Select directive:

Header	Type	Command	PL(MSB)	PL(LSB)	Mode	Checksum	End
AA	00	12	00	01	01	14	DD

Frame type: 0x00

Instruction code Command: 0x12

instruction parameter length PL: 0x0001

Command parameter Select mode: 0x01

Checksum: 0x14

Meaning of Select mode:

0x00: Send the Select command to select a specific label before all operations on the label.

0x01: The Select command is not sent before the label operation.

0x02: Send the Select command before the tag operation other than polling inventory, and select specific tags through Select before reading, write, lock, and ill.

6.3 Response frame definition

When the Cancel command is successfully set or the Select command is sent, the firmware returns as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Data	Checksum	End
AA	01	0C	00	01	00	0E	DD

Frame type: 0x01

Command: 0x0C command parameter

Length PL: 0x0001

Return data Data: 0x00 (execution successful)

Checksum: 0xOE

For a single label, read the data of the specified address and length in the label data storage area Memory Bank. Read the label data area address offset SA and read the label data storage area length DL. Their units are Word, that is, 2 Bytes/16 Bits. Before this command, you should set the Select parameter to select the specified label to read the label data area. If Access Passwords are all zero, no access instructions will be sent.

Header	Type	Command	PL(MSB)	PL(LSB)	AP(MSB)		
AA	00	39	00	09	00	00	FF
AP(LSB)	MemBank	SA(MSB)	SA(LSB)	DL(MSB)	DL(LSB)	Checksum	End
FF	03	00	00	00	02	45	DD

Frame type: 0x00

Command: 0x39

Instruction parameter length PL: 0x0009

Access Password: 0x0000FFFF

Label data storage area MemBank: 0x03 (User area)

Read label data area address offset SA: 0x0000

Read label data area address length DL: 0x0002

Checksum: 0x45

6.4 Response frame definition

After reading the data in the specified label storage area and the CRC verification is correct, the following will be returned:

Header	Type	Command	PL(MSB)	PL(LSB)	UL	PC(MSB)	PC(LSB)
AA	01	39	00	13	0E	34	00
EPC(MSB)							
30	75	1F	EB	70	5C	75	04
			EPC(LSB)	Data(MSB)			Data(LSB)
E3	D5	0D	70	12	34	56	78
Checksum	End						
B0	DD						

Frame type: 0x01

Instruction code Command: 0x39

Instruction parameter length PL: 0x0013 Operation label PC+EPC

Length UL: 0xOE

Label PC for operation: 0x3400

Label for operation EPC: 0x30751FEB705C5904E3D50D70

Return data: 0x12345678

Checksum: 0xB0

If the tag has no field or the specified EPC code is incorrect, the error code 0x09 will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Error Code	Checksum	End
AA	01	FF	00	01	09	0A	DD

Frame type: 0x01

Command: 0xFF

Command parameter length PL: 0x0001

Command parameter Error Code: 0x09

Checksum: 0x0A

If the AccessPassword is incorrect, the error code 0x16 will be returned, and the PC+EPC of the label will be returned,

As follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Error Code	UL	PC(MSB)
AA	01	FF	00	10	16	0E	34
PC(LSB)	EPC(MSB)						
00	30	75	1F	EB	70	5C	59
				EPC(LSB)	Checksum	End	
04	E3	D5	0D	70	75	DD	

Frame type: 0x01

Command: 0xFF

Command parameter length PL: 0x0010

Command parameter Error Code: 0x16

PC+EPC length UL: 0x0E

PC: 0x3400

EPC:0x30751FEB705C5904E3D50D70

Checksum: 0x75

If the operation tag returns the error codes specified in the EPC Gen2 protocol, because the error codes specified in the EPC Gen2 protocol are only valid in the lower 4 bits, the response frame will return the error codes returned by the tag after adding 0xAO. For example, if the address offset or data length in the sending command parameter is incorrect, and the read data length exceeds the length of the tag data storage area, according to the EPC Gen2 protocol, the tag will return error code 0x03 (Memory Overrun), and the response frame will return error code 0xA3, and return the PC+EPC of the tag being operated, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Error Code	UL	PC(MSB)
AA	01	FF	00	10	A3	0E	34
PC(LSB)	EPC(MSB)						
00	30	75	1F	EB	70	5C	59
				EPC(LSB)	Checksum	End	
04	E3	D5	0D	70	02	DD	

Frame type: 0x01

Command: 0xFF

Command parameter length PL: 0x0010

Command parameter Error Code: 0xA3

PC+EPC length UL: 0x0E

PC: 0x3400

EPC:0x30751FEB705C5904E3D50D70

Checksum: 0x02

7.Write label data storage area

7.1 Command frame definition

Write the data with the specified address and length in the label data storage area Memory Bank for a single label. The label data area address offset SA and the label data length DL to be written are in Word, that is, 2 Bytes/16 Bits. Before this command, you should set the Select parameter to select the specified label to write the label data area. If the Access Password is all zero, the Access command will not be sent.

The data length DT written to the label data storage area should not exceed 32 words, i.e. 64Byte bytes/512Bit bits.

Header	Type	Command	PL(MSB)	PL(LSB)	AP(MSB)		
AA	00	49	00	0D	00	00	FF
AP(LSB)	**MemBank**	**SA(MSB)**	**SA(LSB)**	**DL(MSB)**	**DL(LSB)**	**DT(MSB)**	
FF	03	00	00	00	02	12	34
	DT(LSB)	**Checksum**	**End**				
56	78	6D	DD				

Frame type: 0x00

Command: 0x49

Instruction parameter length PL: 0x000D

Access Password: 0x0000FFFF

Label data storage area MemBank: 0x03

Label data area address offset SA: 0x0000 data

Length DL: 0x0002 write

Data DT: 0x12345678

Checksum: 0x6D

7.2 Response frame definition

Header	Type	Command	PL(MSB)	PL(LSB)	UL	PC(MSB)	PC(LSB)
AA	01	49	00	10	0E	34	00
EPC(MSB)							
30	79	1F	EB	70	5C	59	04
				EPC(LSB)	**Parameter**	**Checksum**	**End**
E3	D5	0D	70	02	A9	DD	

After writing the data into the tag data storage area, if the tag return value received by the reader/writer chip is correct, the response frame is as follows:

Frame type: 0x01

Command: 0x49 Command parameter

Length PL: 0x0010 PC+EPC

length UL: 0xOE PC: 0x3400

EPC:0x30751FEB705C5904E3D50D70

Instruction parameter Parameter: 0x00 (execution succeeded)

Checksum: 0xA9

If the tag has no field or the specified EPC code is incorrect, error code 0x10 will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	FF	00	01	10	0A	DD

Frame type:

0x01 Command:

0xFF

Command parameter length PL: 0x0001

Instruction parameter

Parameter: 0x10

Checksum: 0x0A

Header	Type	Command	PL(MSB)	PL(LSB)	Error Code	UL	PC(MSB)
AA	01	FF	00	10	16	0E	34
PC(LSB)	**EPC(MSB)**						
00	30	75	1F	EB	70	5C	59
				EPC(LSB)	**Checksum**	**End**	
04	E3	D5	0D	70	75	DD	

If the Access Password is incorrect, theerrorcode 0x16 will be returned, and

the PC+EPC of the label to be operated will be returned, as follows:

Frame type: 0x01

Command: 0xFF

Command parameter

Length PL: 0x0016

Command parameter Error Code: 0x1 6

PC+EPC length UL: 0x0E

PC: 0x3400

EPC:0x30751FEB705C5904E3D50D70

Checksum: 0x75

If the operation tag returns the error codes specified in the EPCGen2 protocol, the response frame will return the error code returned by the tag or 0xB0. For example, if the address offset or data length in the sending command parameter is incorrect, and the length of the written data exceeds the length of the tag data storage area, according to the EPC Gen2 protocol, the tag will return error code 0x03 (Memory Overrun). Then the response frame returns the error code 0xB3 and the PC+EPC of the tag being operated, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Error Code	UL	PC(MSB)
AA	01	FF	00	10	B3	0E	34
PC(LSB)	**EPC(MSB)**						
00	30	75	1F	EB	70	5C	59
				EPC(LSB)	**Checksum**	**End**	
04	E3	D5	0D	70	12	DD	

Frame type: 0x01

Command: 0xFF

Command parameter length PL: 0x0010

Command parameter Error Code: 0xB3

PC+EPC length UL: 0x0E

PC: 0x3400

EPC:0x30751 FEB705C5904E3D50D70

Checksum: 0x12

8. Lock Lock Label Data Store

8.1 Command frame definition

For a single label, lock or unlock the data store of the label. Before this command, set the Select parameter to select the specified label for lock operation. For example, to lock the Access Password, the command is as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	AP(MSB)		
AA	00	82	00	07	00	00	FF
AP(LSB)	**LD(MSB)**		**LD(LSB)**	**Checksum**	**End**		
FF	02	00	80	09	DD		

Frame type: 0x00

Command: 0x82

Instruction parameter length PL: 0x0007

Access Password: 0x0000FFFF

Lock operand LD: 0x02080

Checksum: 0x09

The high 4 bits of the Lock operation parameter LD are reserved bits, and the remaining 20 bits are Lock operation Payload, including Mask and Action, which are 10 bits from high to low respectively. For details, please refer to Section 6.3.2.11.3.5 of EPC Gen2 Protocol Version 1.2.0. Mask is a mask. Only Action with Mask bit 1 is valid. The Action of each data area has 2 bits, 00~11, which correspond to Open, Permanently Open, Locked, and Permanently Locked. For example, if the Kill Mask is 2bits 00, no matter what the Kill Action is, the Kill Action will not take effect. If the Kill Mask is 2bits 10, the Kill Action is 2bits 10, which means that the Kill Password is locked (not Perma Lock), and can only be read and written through a valid Access Password.

The meaning of each of Mask and Action is shown in the following table.

Lock-Command Payload

19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Kill Mask		Access Mask		EPC Mask		TID Mask		User Mask		Kill Action		Access Action		EPC Action		TID Action		User Action	

Masks and Associated Action Fields

	Kill pwd		Access pwd		EPC memory		TID memory		User memory	
	19	18	17	16	15	14	13	12	11	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

pwd-write	permalock	Description
0	0	Associated memory bank is writeable from either the **open** or **secured** states.
0	1	Associated memory bank is permanently writeable from either the **open** or **secured** states and may never be locked.
1	0	Associated memory bank is writeable from the **secured** state but not from the **open** state.
1	1	Associated memory bank 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.

8.2 Response frame definition

If the Lock command is executed correctly and the return of the tag is valid, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	UL	PC(MSB)	PC(MSB)
AA	01	82	00	10	0E	34	00
EPC(MSB)							
30	75	1F	EB	70	5C	59	04
			EPC(LSB)	**Parameter**	**Checksum**	**End**	
E3	D5	0D	70	00	E2	DD	

Frame type: 0x01

Command: 0x82

Command parameter length PL: 0x0010

PC+EPC length UL: 0xOE PC: 0x3400

EPC:0x30751FEB705C5904E3D50D70

Instruction parameter Parameter: 0x00 (execution succeeded)

Checksum: 0xE2

If the tag has no field or the specified EPC code is incorrect, error code 0x13 will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	82	00	10	0E	34	00

Frame type: 0x01

Instruction code Command: 0xFF

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x13

Checksum: 0x14

If the Access Password is incorrect, theerrorcode 0x16 will be returned, and

the PC+EPC of the label to be operated will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Error Code	UL	PC(MSB)
AA	01	FF	00	10	16	0E	34
PC(LSB)	EPC(MSB)						
00	30	75	1F	EB	70	5C	59
				EPC(LSB)	Checksum	End	
04	E3	D5	0D	70	75	DD	

Frame type: 0x01

Command: 0xFF

Command parameter length PL: 0x0016

Command parameter Error Code: 0x16

PC+EPC length UL: 0x0E PC: 0x3400

EPC:0x30751FEB705C5904E3D50D70

Checksum: 0x75

If the operation tag returns the error codes specified in the EPCGen2 protocol, the response frame will return the error codes returned by the tag or 0xC0.

For example, if the TID area of the tag has been permanently locked, and then the TID area is set to open by the Lock command, according to the EPC Gen2 protocol, the tag will return error code 0x04 (Memory Locked), and the response frame will return error code 0xC4, and the PC+EPC of the tag being operated will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Error Code	UL	PC(MSB)
AA	01	FF	00	10	C4	0E	34
PC(LSB)	EPC(MSB)						
00	30	75	1F	EB	70	5C	59
				EPC(LSB)	Checksum	End	
04	E3	D5	0D	70	23	DD	

Frame type: 0x01

Command: 0xFF

Command parameter length PL: 0x001

Command parameter Error Code: 0xC4

PC+EPC length UL: 0x0E

PC: 0x3400

EPC:0x30751 FEB705C5904E3D50D70

Checksum: 0x23

9. Kill tag

9.1 Command frame definition

Before this command, the Select parameter should be set to select the specified tag for inactivation Kill operation and inactivation of single tag.

Header	Type	Command	PL(MSB)	PL(LSB)	KP(MSB)		
AA	00	65	00	04	00	00	FF
KP(LSB)	Checksum	End					
FF	67	DD					

Frame type: 0x00

Command: 0x65

Command parameter

length PL: 0x0004 Kill

Password: 0x0000FFFF

Checksum: 0x67

9.2 Response frame definition

If the Kill command is executed correctly and the return CRC of the tag is correct, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	UL	PC(LSB)	PC(MSB)
AA	01	65	00	10	0E	34	00
EPC(MSB)							
30	75	1F	EB	70	5C	59	04
			EPC(LSB)	Parameter	Checksum	End	
E3	D5	0D	70	00	C5	DD	

Frame type: 0x01

Command: 0x65

Command parameter length PL: 0x0010

PC+EPC length UL: 0xOE

PC: 0x3400

EPC:0x30751FEB705C5904E3D50D70

Instruction parameter Parameter: 0x00 (execution succeeded) Checksum:

0xC5

If the tag has no field or the specified EPC code is incorrect, error code 0x12 will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	FF	00	01	12	13	DD

Frame type: 0x01

Command: 0xFF

Command parameter length PL: 0x0001

Instruction parameter Parameter: 0x12

Checksum: 0x13

If the operation tag returns the error codes specified in the EPCGen2 protocol, the response frame will return the error code returned by the tag or 0xD0.

Note: If the label has not set the Kill Password password, that is, the Kill Password password is all 0 For Gen2 protocol, the tag will not be killed. At this time, the error code 0xD0 is returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Error Code	UL	PC(MSB)
AA	01	FF	00	10	D0	0E	34
PC(LSB)	EPC(MSB)						
00	30	75	1F	EB	70	5C	59
				EPC(LSB)	Checksum	End	
04	E3	D5	0D	70	2F	DD	

Frame type: 0x01

Command: 0xFF

Command parameter length PL: 0x0010

Command parameter Error Code: 0xD0

PC+EPC length UL: 0xOE

PC: 0x3400

EPC:0x30751FEB705C5904E3D50D70

Checksum: 0x2F

After connecting the reader and writer, set the communication baud rate, for example, set the 19200 command frame as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	POW(MSB)	POW(LSB)	Checksum
AA	00	11	00	02	00	C0	D3
End							
DD							

Frame type: 0x00

Command: 0x11

Command parameter length PL: 0x0002

Power parameter Pow: 0x00C0 (baud rate/100 hexadecimal, such as 19200, 19200/100=192=0xC0) Checksum: 0xD3

9.3 Response frame definition

The command has no response frame. After the reader/writer executes the command to set the communication baud rate, the reader/writer will communicate with the upper computer with the new baud rate, and the upper computer needs to reconnect the reader/writer with the new baud rate.

10. Get Query Parameters

10.1 Command frame definition

Get the query command laughing parameter in the firmware. The instructions are as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Checksum	End	
AA	00	0D	00	00	0D	DD	

Frame type: 0x00

Instruction code Command: 0x0D

Instruction parameter length PL: 0x0000

Checksum: 0x0D

10.2 Response frame definition If the instruction is executed

If the line is correct, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	Para(MSB)	Para(LSB)	Checksum
AA	01	0D	00	02	10	20	40
End							
DD							

Frame type: 0x01

Instruction code Command: 0x0D

Instruction parameter length PL: 0x0002

Query Parameter: 0x1020

Checksum: 0x40

The parameter is 2 bytes, with the following specific parameters spliced by bit. The Query parameters corresponding to the above response frame are:

DR=8,M=1,TRext=Use pilot tone,Sel=00,Session=00,Target=A,Q=4

Among: DR (1 bit): DR=8 (1 "b0), DR=64/3 (1'b1) only supports DR=8 mode

M (2 bit): M=1 (2 b00), M=2 (2'b01), M=4 (2'b10), M=8 (2'b11) only supports the mode of M=1

TRext (1 bit): No pilot tone (1'60), Use pilot tone (1'b1) only supports Use pilot tone (1'b1) mode

Sel(2 bit):ALL(2'b00/2'b01),-SL(2'b10),SL(2'b11)

Session(2 bit):S0(2'b00),S1(2'b01),S2(2'b10),S3(2'b11)

Target(1 bit):A(1'b0),B(1'b1) Q(4 bit):4' b0000-4'b1111

11. Set Query parameters

11.1 Command frame definition

Set the laughing parameter in the Query command. The parameter is 2 bytes, with the following specific parameters spliced by bit:

DR (1 bit): DR=8 (1'b0), DR=64/3 (1'b1) only supports the mode of DR=8

M (2 bit): M=1 (2'b00), M=2 (2'b01), M=4 (2'b10), M=8 (2'b11) only supports the mode of M=1

TRext (1 bit): No pilot tone (1'b0), Use pilot tone (1'b1) only supports Use pilot tone (1'b1) mode

Sel(2 bit):ALL(2'b00/2'b01),~SL(2'b10),SL(2'b11)

Session(2 bit):S0(2'b00),S1(2'b01),S2(2'b10),S3(2'b11)

Target(1 bit):A(1'b0),B(1'b1)

Q(4 bit):4'b0000-4'b1111

Header	Type	Command	PL(MSB)	PL(LSB)	Para(MSB)	Para(LSB)	Checksum
AA	00	0E	00	02	10	20	40
End							
DD							

If DR=8, M=1, TRext=Use pilot tone, Sel=00, Session=00, Target=A, Q=4, the instructions are as follows:

Frame type: 0x00

Command: 0x0E

Instruction parameter length PL: 0x0002

Query parameter Parameter: 0x1020

Checksum: 0xC6

11.2 Response frame definition

If the command to set the Query parameter is executed correctly, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	Para(MSB)	Para(LSB)	Checksum
AA	01	0E	00	01	00	10	DD

Frame type: 0x01

Instruction code Command: 0xOE

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x00

Checksum: 0x10

12. Set work area

12.1 Command frame definition

Set the working area of the reader and writer. If it is the 900MHz frequency band in China, it is as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Region	Checksum	End
AA	00	07	00	01	01	09	DD

Frame type: 0x00

Command: 0x07

Command parameter length PL: 0x0001

Region: 0x01

Checksum: 0x09

The codes of different countries and regions are as follows:

Region	Parameter
China 900Mhz	01
China 800Mhz	04
US	02
EU	03
Korea	06

12.2 Response frame definition

If the locale is executed correctly, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	0E	00	01	00	10	DD

Frame type: 0x01

Instruction code Command: 0x07

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x00

Checksum: 0x09

13. Get work area

13.1 Command frame definition

Get the working area of the reader and writer. The command definition is as follows

Header	Type	Command	PL(MSB)	PL(LSB)	Checksum	End
AA	00	08	00	00	08	DD

Frame type: 0x00

Command code: 0x08

Command parameter length PL: 0x0000

Checksum: 0x08

13.2. Response frame definition

If the execution is correct, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	08	00	01	01	0B	DD

Frame type: 0x01

Instruction code Command: 0x08

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x01

Checksum: 0x0B

The codes of different countries and regions are as follows:

Region	Parameter
China 900Mhz	01
China 800Mhz	04
US	02
EU	03
Korea	06

14. Set working channel

14.1 Command frame definition

If it is the 900MHz band in China, set the working channel of the reader and writer to 920.375MHz, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	CH Index	Checksum	End
AA	00	AB	00	01	01	AC	DD

Frame type: 0x00

Command: 0xAB

Command parameter length PL: 0x0001

Channel code ChannelIndex: 0x01

Checksum: 0xAC

China 900MHz channel parameter calculation formula, Freq_____CH is the channel frequency:

CH_ Index=(Freq_ _CH-920.125M)/0.25M

China 800MHz channel parameter calculation formula, Freq_____CH is the channel frequency:

CH_ Index=(Freq_ CH-840.125M)0.25M

US channel parameter calculation formula, Freq_ CH is the channel frequency: CH_

Index=(Freq_ CH-902.25M)/0.5M

European channel parameter calculation formula, Freq_____CH is the channel frequency:

CH_ Index=(Freq_ _CH-865. 1M)/0.2M

Korean channel parameter calculation formula, Freq_ CH is the channel frequency:

CH_ Index=(Freq_ _CH-917.1M)/0.2M

14.2 Response frame definition If the channel is set

If the setting is executed correctly, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	AB	00	01	00	AD	DD

Frame type: 0x01

Instruction code Command: 0xAB

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x00

Checksum: 0Xad

15. Get working channel

15.1 Command frame definition

In the current reader/writer working area, obtain the reader/writer working channel, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Checksum	End
AA	00	AA	00	00	AA	DD

Frame type: 0x00

Instruction code Command: 0xAA

Instruction parameter length PL: 0x0000

Checksum: 0xAA

15.2 Response frame definition

If the acquisition channel is executed correctly, the command frame response is:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	AA	00	01	00	AV	DD

Frame type: 0x01

Command: 0xAA

Command parameter length PL: 0x0001

Instruction parameter Parameter: 0x00 (Channel_Index is 0x00)

Checksum: 0Xac

China 900MHz channel parameter calculation formula, Freq_ CH is the channel frequency:

Freq_ CH=CH_ Index*0.25M+920.125M

China 800MHz channel parameter calculation formula, Freq_ CH is the channel frequency:

Freq_ CH=CH_ Index*0.25M+840.125M

The channel parameter calculation formula in the United States, Freq CH is the channel frequency:

Freq_ CH=CH_ Index*0.5M+902.25M

European channel parameter calculation formula, Freq_ CH is the channel frequency:

Freq_ CH= CH_ Index*0.2M+865.1M

Korean channel parameter calculation formula, Freq_ CH is the channel frequency:

Freq_ CH=CH_ Index*0.2M+917.1M

16. Set automatic frequency hopping

16.1 Command frame definition

Set the automatic frequency hopping mode or cancel the automatic frequency hopping mode. In the automatic frequency hopping mode, if the user has executed the insert working channel instruction, the reader and writer will randomly select the channel frequency hopping from the channel list set by the user. Otherwise, the channel frequency hopping will be randomly selected according to the internal preset channel list. The instruction format is as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	00	AD	00	01	FF	AD	DD

Frame type: 0x00

Command: 0xAD

Command parameter length PL: 0x0001

Instruction parameter Parameter: 0xFF (0xFF is to set automatic frequency hopping, 0x00 is to cancel automatic frequency hopping) Checksum: 0xAD

16.2 Response frame definition

If the automatic frequency hopping line is set or the automatic frequency hopping is canceled correctly, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	AD	00	01	00	AF	DD

Frame type: 0x01

Instruction code Command: 0xAD

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x00

Checksum: 0Xaf

17. Insert working channel

17.1 Command frame definition

Inserting the working channel allows the user to set the frequency hopping channel list independently. After executing this command, the reader and writer will randomly select the channel frequency hopping from the channel list set by the user. The command definition is as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	CH Cnt	CH list (MSB)	
AA	00	A9	00	06	05	01	02
		CH list (LSB)	Checksum	End			
03	04	05	C3	DD			

Frame type: 0x00
Command: 0xA9
Command parameter length PL: 0x0006
Channel Count: 0x05 (if it is 0, clear the frequency hopping channel list, reader and writer, and random frequency hopping from all available channels)
Channel list (represented by CH Index): 0x01 0x02 0x03 0x04 0x05 Checksum: 0xC3

17.2 Response frame definition

If the execution is correct, the response frame KXX is:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	A9	00	01	00	Ab	DD

Frame type: 0x01

Instruction code Command: 0xA9

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x00

Checksum: 0xAB

18. Acquire transmit power

18.1 Command frame definition

Obtain the transmit power of the current reader and writer, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Checksum	End
AA	00	B7	00	00	B7	DD

Frame type: 0x00

Instruction code Command: 0xB7

Instruction parameter length PL: 0x0000

Checksum: 0xB7

18.2 Response frame definition

If the execution is correct, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	Para(MSB)	Para(LSB)	Checksum
AA	01	B7	00	02	07	D0	91
End							
DD							

Frame type: 0x01

Command: 0xB7

Command parameter length PL: 0x0002

Power parameter Pow: 0x07D0 (current power is decimal 2000, i.e. 20dBm)

Checksum: 0x91

19. Set transmit power

19.1 Command frame definition

Set the transmit power of the current reader and writer as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Pow(MSB)	Pow(LSB)	Checksum
AA	00	B6	00	02	07	D0	8F
End							
DD							

Frame type: 0x00

Command: 0xB6

Command parameter length PL: 0x0002

Power parameter Pow: 0x07D0 (current power is decimal 2000, i.e. 20dBm)

Checksum: 0x8F

19.2. Response frame definition

If the acquisition channel is executed correctly, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	B6	00	01	00	BB	DD

Frame type: 0x01

Instruction code Command: 0xB6

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x0O

Checksum: 0xB8

20. Set transmit continuous carrier

20.1 Command frame definition

Set to transmit continuous carrier or close continuous carrier, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	00	B0	00	01	FF	B0	DD

Frame type: 0x00

Command: 0xB0

Command parameter length PL: 0x0001

Command parameter Parameter: 0xFF (0xFF is open continuous wave, 0x00 is vector closed continuous wave)

Checksum: 0xB0

20.2 Response frame definition

If the settings are executed correctly, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	B0	00	01	00	B2	DD

Frame type: 0x01

Instruction code Command: 0xB0

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x00

Checksum: 0xB2

21. Get the parameters of receiver demodulator

21.1 Command frame definition

Obtain the current reader/writer receiver demodulator parameters The demodulator parameters include Mixer gain, IF AMP gain and signal demodulation threshold, for example:

Header	Type	Command	PL(MSB)	PL(LSB)	Checksum	End
AA	00	F1	00	00	F1	DD

Frame type: 0x00

Command: 0xF1

Command parameter length PL: 0x0000

Checksum: 0xF1

21.2 Response frame definition

If the execution is correct, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	Mixer_ G	IF_ G	Thrd(MSB)
AA	01	F1	00	04	03	06	01

Thrd(LSB)	Checksum	End					
B0	B0	DD					

Frame type: 0x01

Command: 0xF1

Command parameter length PL: 0x0004

Mixer gain Mixer_ G: 0x03 (Mixer gain is 9dB)

IF amplifier gain IF_ G: 0x06 (IF AMP gain is 36dB)

Signal demodulation threshold Thrd: 0x01B0

Checksum: 0xB0

混频器 **Mixer** 增益表

Type	Mixer_G(dB)
0x00	0
0x01	3
0x02	6
0x03	9
0x04	12
0x05	15
0x06	16

中频放大器 **IF AMP** 增益表

Type	IF_G(dB)
0x00	12
0x01	18
0x02	21
0x03	24
0x04	27
0x05	30
0x06	36
0x07	40

22. Set receiving demodulator parameters

22.1 Command frame definition

Set the current reader-writer receiver demodulator parameters The demodulator parameters include Mixer gain, IF amplifier IFAMP gain and signal demodulation threshold, for example:

Header	Type	Command	PL(MSB)	PL(LSB)	Mixer_G	IF_G	Thrd(MSB)
AA	00	F0	00	04	03	06	01
Thrd(LSB)	Checksum	End					
B0	AE	DD					

Frame type: 0x00

Command: 0xF0

Command parameter length PL: 0x0004

Mixer gain Mixer_ G: 0x03 (Mixer gain is 9dB)

IF amplifier gain IF_ G: 0x06 (IF amplifier, IF AMP gain is 36dB)

Signal demodulation threshold Thrd: 0x01B0

Checksum: 0Xae

混频器 **Mixer** 增益表

Type	Mixer_G(dB)
0x00	0
0x01	3
0x02	6
0x03	9
0x04	12
0x05	15
0x06	16

中频放大器 **IF AMP** 增益表

Type	IF_G(dB)
0x00	12
0x01	18
0x02	21
0x03	24
0x04	27
0x05	30
0x06	36
0x07	40

22.2 Response frame definition

If the acquisition channel is executed correctly, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	F0	00	01	00	F2	DD

Frame type: 0x01

Instruction code Command: 0xF0

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x00

Checksum: 0xF1

23. Test RF input blocking signal

23.1 Command frame definition

Test the RF input blocking signal Scan Jammer, which is used to detect the blocking signal size of the reader antenna in each channel in the current region. For example:

Header	Type	Command	PL(MSB)	PL(LSB)	Checksum	End
AA	00	F2	00	00	F2	DD

Frame type: 0x00

Instruction code Command: 0xF2

Instruction parameter length PL: 0x0000

Checksum: 0xF2

23.2 Response frame definition

If there are 20 channels in total in the 900MHz frequency band of China, and the ScanJammer channel of the RF input blocking signal is tested to be executed correctly, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	CH_ L	CH_ H	JMR(MSB)
AA	01	F2	00	16	00	13	F2
F1	F0	EF	EC	EA	E8	EA	EC
EE	F0	F1	F5	F5	F5	F6	F5
		JMR(LSB)	Checksum	End			
F5	F5	F5	DD	DD			

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Frame type: 0x01

Command: 0xF2

Command parameter length PL: 0x0016

Test start channel CH_ 50: 0x00 (test start channel index is 0)

Test end channel CH_ H: 0x13 (Test end channel index is 19)

Channel blocking signal JMR: 0xF2F1FOEFECEAE8EAECEEFOF1F5F5F6F5F5F5F5 (blocking of each channel

The signal JMR is represented by - signed Bytes, where 0xF2 is - 14dBm)

Checksum: 0xD

24. Test channel RSSI

24.1 Command frame definition

Test the RSSI signal size at the RF input end to detect whether there is a reader or writer working in the current environment. For example:

Header	Type	Command	PL(MSB)	PL(LSB)	Checksum	End
AA	00	F3	00	00	F3	DD

Frame type: 0x00

Command: 0xF3

Command parameter length PL: 0x0000

Checksum: 0xF3

24.2 Response frame definition

If there are 20 channels in total in China's 900MHz frequency band, and the RSSI channel of each channel is detected to be correctly executed, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	CH_ L	CH_ H	JMR(MSB)
AA	01	F3	00	16	00	13	BA
BA	BA	BA	BA	BA	BA	BA	BA
BA	BA	BA	BA	BA	BA	BA	BA
		JMR(LSB)	Checksum	End			
BA	BA	BA	A4	DD			

Frame type: 0x01

Command: 0xF3

Command parameter length PL: 0x0016

Test start channel CH_ 50: 0x00 (test start channel index is 0)

Test end channel CH_ H: 0x13 (Test end channel index is 19)

Channel signal strength RSSI: OxBABABABABABABABABABABABABABABABABABABABABABA

RSSI is represented by a signed Byte, where 0xBA is - 70dBm, which is the minimum RSSI that can be detected by the reader/writer)

Checksum: 0xA5

Parameter0	Parameter0	describe
0x00	0x00	I0 is configured as input mode
0x00	0x01	I0 is configured as outputmode
0x01	0x00	Set I0 output to low power flat
0x01	0x01	Set IO outputto high power flat

25. Control I0 port

25.1 Command frame definition

Set the direction of I0 port, read I0 level and set 10 level, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter0	Parameter1	Parameter2
AA	01	1A	00	03	00	04	01
Checksum	**End**						
22	DD						

Frame type: 0x00

Command: 0x1A

Command parameter length PL: 0x0003

Command parameter Parameter: 0x00 0x04 0x01

Checksum: 0x22

Parameter description:

Number	Describe	Length	Explanation
0	Parameter 0	1 byte	Operation type selection: 0x00: set I0 direction; 0x01:Set I0 level; 0x02: Read I0 level, pintobeoperatedisspecifiedinparameter 1
1	Parameter 1	1 byte	Parametervalues rangefrom 0x01 to 0x04, which correspond to the ports to be operated I01~104

2	Parameter 2	1 byte	Parametervalueis 0x00 or0x01 Whenparameter 0 is0x02, this parameter is meaningless.

25.2 Response frame defines the response frame as:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter0	Parameter1	Parameter2
AA	01	1A	00	03	00	04	01
Checksum	**End**						
23	DD						

Command parameter length PL: 0x0003

Command parameter Parameter: 0x00 0x04 0x01

Checksum: 0x23

Number	Describe	Length	Explain
0	Parameter 0	1 byte	Operation type selection: 0x00: Set IO direction; 0x01:Set I0 level; 0x02: Read I0 level, pintobeoperatedisspecifiedinparameter 1
1	Parameter 1	1 byte	Parameter values rangefrom 0x01 to 0x04, which correspond to the ports to be operated I01~104
2	Parameter 2	1 byte	Parametervalueis 0x00 or 0x01 Parameter0 Parameter0 Description 0x00 0x00 indicates IO configurationfailure 0x00 0x01 indicates IO configurationsucceeded 0x01 0x00 means setting I0 output fail 0x01 0x01 means setting I0 output success 0x02 0x00 indicates that the corresponding port is low level 0x02 0x01 indicates that the corresponding port is high level

26. Module sleep

26.1 Command frame definition

The module sleep instruction can keep the module in a low-power sleep mode. After the block sleeps, it can wake up the module by sending any byte through the serial port, but the byte will be discarded. The first instruction received after the module sleeps will not respond, because the first character of the first instruction will be discarded. This command will cause the chip to power down and reset. After the block wakes up, it will immediately download the firmware to the chip and reset some parameters to the module (these parameters include the power, frequency, frequency hopping mode, sleep time, receive demodulator parameters, including Select mode, select parameters, etc.). Therefore, some parameters may need to be reset. The instructions are as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Checksum	End
AA	00	17	00	00	17	DD

Frame type: 0x00

Command: 0x17 Command parameter length PL: 0x0000

Checksum: 0x17

26.2 Response frame definition

If the execution is successful, the response frame is as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	seventeen	00	01	00	nineteen	DD

Frame type: 0x01

Instruction code Command: 0x17

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x00

Checksum: 0x19

27. Module idle sleep time

27.1 Command frame definition

This command can set how long the module has not operated. After the module enters the sleep state, it can wake up the module by sending any character through the serial port. The first command received after the block sleeps will not respond, because the first character of the first command will be discarded, the command will reset the chip, and the firmware will be downloaded to the chip immediately after the block wakes up, Reset some parameters into the module (these parameters include the power, frequency, frequency hopping mode, sleep time, receiver demodulator parameters configured before sleep, excluding Select mode, Select parameters, etc.), so some parameters may need to be reset. The instructions are as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	00	1D	00	01	02	20	DD

Frame type: 0x00

Command: 0x1D

Command parameter length PL: 0x0001

Command parameter Parameter: 0x02 (sleep after 2 minutes of no operation, range 1~30 minutes, 0x00 means no automatic sleep)

Checksum: 0x20

27.2 Response frame definition

If the execution is successful, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	1D	00	01	02	21	DD

Frame type:

0x01 Command:

0x1D

From instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x02 (set idle time)

Checksum: 0x21

28. Module ILDE mode

28.1 Command frame definition

This command allows the module to enter the IDLE operation mode. In the IDLE mode, except for the digital part and the communication interface, all analog and RF power supplies are turned off to reduce the power consumption in the case of non-operation. After the module enters the IDLE mode, it can still communicate with the module normally, the set parameters are still saved, and the module can respond to the instructions of the upper computer normally. After entering IDLE mode, the first count (or reading and writing tag data and other instructions that need to interact with the tag) will restore the module to the normal state. However, the first count may reduce the success rate due to the unstable power state of the RF part, and the subsequent count and other operations will return to normal. The instructions are as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Enter	Reserved	IDLETime
AA	01	04	00	03	03	06	01
Checksum	**End**						
0C	DD						

Frame type: 0x00

Command code: 0x04

Command parameter length PL: 0x0003

Whether to enter IDLE mode Enter: 0x01 (enter IDLE mode, 0x00: exit IDLE mode) command parameter Reserved: 0x01 (reserved, fixed to 0x01)

IDLE mode idle time IDLE Time: 0x03

Checksum: 0x0C

28.2 Response frame definition

If the execution is successful, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	04	00	01	00	06	DD

Frame type: 0x01

Command code: 0x04

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Command parameter length PL: 0x0001

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Instruction parameter Parameter: 0x00 (indicates successful execution)

Checksum: 0x06

29. NXP ReadProtect/Reset ReadProtect directive

NXP G2X labels support the ReadProtect/Reset ReadProtect command. When the label executes the ReadProtect command successfully, the ProtectEPC and Protect TID bits of the label will be set to 1, and the label will enter the data protection state. If the label returns from the data protection state to the normal state, the Reset ReadProtect command needs to be executed. Before this command, the Select parameter should be set to select the specified label for operation.

29.1 Command frame definition

ReadProtect/Reset ReadProtect instruction frame is defined as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	AP(MSB)		
AA	00	E1	00	05	00	00	FF
AP(LSB)	**Rest**	**Checksum**	**End**				
FF	00	E4	DD				

Frame type: 0x00

Command code: 0xE1

Instruction parameter length PL: 0x0005

Access Password: 0x0000FFFF

ReadProtect/Reset ReadProtect: 0x00 (0x00 means to execute ReadProtect, 0x01 means to execute Reset ReadProtect)

Checksum: 0x0B

29.2. Response frame definition

IftheReadProtect command is executed correctly, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	UL	PC(MSB)	PC(LSB)
AA	**01**	**E1**	**00**	**10**	**OE**	**30**	**00**
EPC(MSB)							
30	**75**	**1F**	**EB**	**70**	**5C**	**59**	**04**
			EPC(LSB	**Parameter**	**Checksu**	**End**	

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			)		m		
E3	D5	0D	70	00	3D	DD	

Frame type: 0x01

Command: 0xE1

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Command parameter length PL: 0x0010

PC+EPC length UL: 0x0E

PC: 0x3000

EPC:0x30751FEB705C5904E3D50D70

Instruction parameter Parameter: 0x00 (execution succeeded)

Checksum: 0x3D

If the Reset ReadProtect command is executed correctly, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	UL	PC(MSB)	PC(LSB)
AA	01	E2	00	10	0E	30	00
EPC(MSB)							
30	75	1F	EB	70	5C	59	04
			EPC(LSB)	Parameter	Checksum	End	
E3	D5	0D	70	00	3E	DD	

Frame type: 0x01

Command: 0xE2 Command parameter length PL: 0x0010

PC+EPC length UL: OxOE

PC: 0x3000

EPC:0x30751FEB705C5904E3D50D70

Instruction parameter Parameter: 0x00 (execution succeeded)

Checksum: 0x3E

When the ReadProtect (Set/Reset parameter is 0x00) command is executed, the tag does not have a field, the specified EPC code is incorrect, or the tag does not respond, the error code 0x2A will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	FF	00	01	2A	2B	DD

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	**01**	**FF**	**00**	**01**	**2B**	**2C**	**00**

If the tag is not in the field or the specified EPC code is incorrect when the Reset ReadProtect (Set/Reset parameter is 0x01) command is executed, the error code 0x2B will be returned, as follows:

Frame type: 0x01

Instruction code Command: 0xFF Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x2B

Checksum: 0x2C

Header	Type	Command	PL(MSB)	PL(LSB)	ErrorCode	UL	PC(MSB)
AA	01	FF	00	10	16	0E	34
PC(LSB)	EPC(MSB)						
00	30	75	1F	EB	70	5C	59
				EPC(LSB)	Checksum	End	
04	E3	D5	0D	70	75	DD	

If the Access Password is incorrect, the error code 0x16 will be returned, and the PC+EPC of the label to be operated will be returned, as follows:

Frame type: 0x01

Command: 0xFF

Command parameter length PL: 0x0016 Command parameter Error Code: 0x16

PC+EPC length UL: 0xOE

PC: 0x3000

EPC:0x30751 FEB705C5904E3D50D70

Checksum: 0x75

30. NXP Change EAS Instruction

NXP G2X label supports the Change EAS command. When the label executes the Change EAS command successfully, the PSF bit of the label will change to '1' or '0' accordingly. When the PSF position of the label is' 1 ', the label will respond to EAS_ Alarm instruction, otherwise the tag will not respond to EAS_ Alarm instruction. Before this instruction, set the Select parameter to select the specified label for operation.

30.1 Command frame definition

Change EAS instruction frame is defined as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	AP(MSB)		
AA	00	E3	00	05	00	00	FF
AP(LSB)	PSF	Checksum	End				
FF	00	E7	DD				

Frame type: 0x00

Command: 0xE3

Instruction parameter length PL: 0x0005

Access Password: 0x0000FFFF

Set/Reset: 0x01 (0x01 means to set the PSF bit to '1', 0x00 means to set the PSF bit to '0')

Checksum: 0xE7

30.2 Response frame definition

If the Change EAS command is executed correctly, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	UL	PC(MSB)	PC(LSB)
AA	01	E3	00	10	0E	30	00
EPC(MSB							

)							
30	75	1F	EB	70	5C	59	04
			EPC(LSB)	Parameter	Checksu m	End	
E3	D5	0D	70	00	3F	DD	

Frame type: 0x01

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Command: 0xE3

Command parameter length PL: 0x0010

PC+EPC length UL: 0x0E

PC: 0x3000

EPC:0x30751FEB705C5904E3D50D70

Instruction parameter Parameter: 0x00 (execution succeeded)

Checksum: 0x3F

If the tag is not in the field when executing the Change EAS command, the specified EPC code is incorrect or the tag does not respond, the error code 0x1B will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	FF	00	01	1B	1C	DD

Frame type: 0x01

Instruction code Command: 0xFF

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x1B

Checksum: 0x1C

If the Access Password is incorrect, the error code 0x16 will be returned, and the PC+EPC of the label to be operated will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Error Code	UL	PC(MSB)
AA	01	FF	00	10	16	0E	34
PC(LSB)	EPC(MSB)						
00	30	75	1F	EB	70	5C	59
				EPC(LSB)	Checksum	End	
04	E3	D5	0D	70	75	DD	

Frame type: 0x01

Command: 0xFF

Command parameter length PL: 0x0016

Command parameter Error Code: 0x16

PC+EPC length UL: 0xOE

PC: 0x3000

EPC:0x30751 FEB705C5904E3D50D70

Checksum: 0x75

31. NXP EAS_ Alarm instruction

NXP G2X label supports EAS_ Alarm command, when the tag receives EAS_ After the Alarm command, the tag will immediately return to 64bits EAS_ Alarm code Note that the tag responds to EAS only when the PSF position of the tag is' 1 '_ Alarm instruction, otherwise the tag will not respond to EAS_ Alarm command, which is

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applicable to the electronic goods anti-theft (theft) system.

31.1 The command frame defines the EAS Alarm instruction.

Header	Type	Command	PL(MSB)	PL(LSB)	Checksum	End
AA	00	E4	00	00	E4	DD

Frame type: 0x00

Command: 0xE4

Command parameter length PL: 0x0000

Checksum: 0xE4

31.2. Response frame definition

If the EAS Alarm command is executed successfully, there is a tag response and the correct 64bits EAS-Alarm code is returned, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	EAS-Alarm code(MSB)		
AA	01	E4	00	08	69	0A	EC
				EAS-Alarm code(LSB)	Checksum	End	
7C	D2	15	D8	F9	80	DD	

Frame type: 0x01

Instruction code Command: 0xE3

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x00

Checksum: 0xE5

If you are executing EAS_ When there is no response from the alarm command, the error code 0x1D will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	FF	00	01	1D	1E	DD

Frame type: 0x01

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Instruction code Command: 0xFF

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x1D

Checksum: 0x1E

32. NXP ChangeConfig directive

Some series of NXP G2X labels, such as G2iM and G2iM+, support the ChangeConfig command, which can read or modify the 16bits Config-Word of NXP G2X labels. The Config-Word of NXP G2X labels is located at the address 20h (word address) of the label storage area Bank01 (i.e. EPC area), which can be read through the ordinary Read command. When the label is in the secured state (secure state), the Config-Word of the label can be overwritten, It should be noted that overwriting Config-Word is to flip the corresponding data bit of Config-Word, that is, write the corresponding bit of '1' to flip

('1 'becomes' 0', '0' becomes' 1 ') The corresponding bit written to' 0 'remains unchanged. This command should be set before

Select parameter to select the specified label for operation.

32.1 Command frame definition ChangeConfig command frame definition is as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	AP(MSB)		
AA	00	E0	00	06	00	00	FF
AP(LSB)	Config(MSB)	Config(LSB)	Checksum	End			
FF	00	00	E4	DD			

Frame type: 0x00

Command: 0xE0

Instruction parameter length PL: 0x0006

Access Password: 0x0000FFFF

Config-Word: 0x0000 (when all 0, the label returns unchanged Config-Word, equivalent to reading)

Checksum: 0xE4

32.2 Response frame definition

If the ChangeConfig command is executed correctly, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	UL	PC(MSB)	PC(LSB)
AA	01	E0	00	11	0E	30	00
EPC(MSB)							
30	75	1F	EB	70	5C	59	04
			EPC(LSB)	Config(MSB)	Config(LSB)	Checksum	End
E3	D5	0D	70	00	41	7E	DD

Frame type: 0x01

Command: 0xE0 Command parameter length PL: 0x0011

PC+EPC length UL: 0xOE

PC: 0x3000

EPC:0x30751FEB705C5904E3D50D70

Command parameter Config-Word: 0x0041

Checksum: 0x7E

If the tag is not in the field when the ChangeConfig command is executed, the specified EPC code is incorrect or the tag does not respond, the error code 0x1A will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	FF	00	01	1A	1B	DD

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Frame type: 0x01

Instruction code Command: 0xFF

instruction parameter length PL: 0x0001

instruction parameter Parameter: 0x1A

Checksum: 0x1B

If the Access Password is incorrect, the error code 0x16 will be returned, and the PC+EPC of the label to be operated will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Error Code	UL	PC(MSB)
AA	01	FF	00	10	16	0E	34
PC(LSB)	EPC(MSB)						
00	30	75	1F	EB	70	5C	59
				EPC(LSB)	Checksum	End	
04	E3	D5	0D	70	75	DD	

Frame type: 0x01

Command: 0xFF Command parameter length PL: 0x0016

Command parameter Error Code: 0x16

PC+EPC length UL: 0x0E

PC: 0x3000

EPC:0x30751 FEB705C5904E3D50D70

Checksum: 0x75

33. Impinj Monza QT Instruction

The Impinj Monza4 QT tag supports the QT command, which can modify the QT control word of the tag, where QT is set_ The SR bit can shorten the operating distance of the label when it is in the Open and Secured states or when it is about to enter the Open and Secured states, and modify the QT_ The MEM bit can switch whether the label uses Public Memory Map or Private Memory Map. Before that, you should set the Select parameter to select the specified label for operation.

33.1 Command frame definition

The QT instruction frame is defined as follows. In this example, QT is set_ MEM bit is 1 and written to label nonvolatile storage area:

Header	Type	Command	PL(MSB)	PL(LSB)	AP(MSB)		
AA	00	E5	00	08	00	00	FF
AP(LSB)	Read/Write	Persistence	Payload0	Payload1	Checksum	End	
FF	01	01	40	00	2D	DD	

Frame type: 0x00

Command: 0xE5

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Instruction parameter length PL: 0x0008

Access Password: 0x0000FFFF

Read/Write:0x01(0x00:Read,0x01:Write)

Persistence: 0x01 (0x00: write to label volatile storage area, 0x01: write to non-volatile storage area) Payload: 0x4000 (QT Contract's maximum two bits are QT_SR and QT_MEM respectively)

Checksum: 0x2D

33.2 Response frame definition

If the QT command is executed correctly, when the Read/Write data field is 0x00, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	UL	PC(MSB)	PC(LSB)
AA	01	E6	00	ten	0E	30	00
EPC(MSB)							
30	75	1F	EB	70	5C	59	04
			EPC(LSB)	Parameter	Checksum	End	
E3	D5	0D	70	00	42	DD	

Frame type: 0x01

Command: 0xE6 Command parameter length PL: 0x0010

PC+EPC length UL: 0xOE

PC: 0x3000

EPC:0x30751FEB705C5904E3D50D70

Instruction parameter Parameter: 0x00 (execution succeeded)

Checksum: 0x42

If the tag is not in the field when executing the QT command, the specified EPC code is incorrect or the tag does not respond, the error code 0x2E will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	FF	00	01	2E	2F	DD

Frame type: 0x01

Instruction code Command: 0xFF

Instruction parameter length PL: 0x0001

Instruction parameter Parameter: 0x2E

Checksum: 0x2F

Header	Type	Command	PL(MSB)	PL(LSB)	Error code	UL	PC(MSB)
AA	01	FF	00	10	16	0E	34
PC(LSB)	EPC(MSB)						

If the Access Password is incorrect, error code 0x16 will be returned and the PC+EPC, as follows:

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00	30	75	1F	EB	70	5C	59
			EPC(LSB)	Checksum	End		
04	E3	D5	70	75	DD		

Frame type: 0x01

Command: 0xFF

Command parameter length PL: 0x0016

Command parameter Error Code: 0x16

PC+EPC length UL: 0x0E

PC:0x3000 EPC:0x30751FEB705C5904E3D50D70

Checksum: 0x75

34. BlockPermlock Instruction

The BlockPermlock instruction can permanently lock some blocks in the user area or read the lock status of the blocks. Before this instruction, you should set the Select parameter to select the specified label for operation.

34.1 Command frame definition

The BlockPermlock instruction frame is defined as follows. In this example, the BlockPermlock state is written and the fifth, sixth and seventh blocks are permanently locked:

Header	Type	Command	PL(MSB)	PL(LSB)	AP(MSB)		
AA	00	D3	00	0B	00	00	FF
AP(LSB)	Read/Lock	MemBank	BlockPtr1	BlockPtr0	BlockRange	Mask(MSB)	Mask(LSB)
FF	01	03	00	00	01	07	00
Checksum	End						
E8	DD						

Frame type: 0x00

Command: 0xD3

Instruction parameter length PL: 0x0009

Access Password: 0x0000FFFF

Read/Lock:0x00(0x00:Read,0x01:Lock)

BlockPtr: 0x0000 (Mask's superstart block address, in 16 blocks)

BlockRange: 0x01 (16 blocks as unit)

Mask: 0x0700 (When the Read/Lock data field is 0x00, that is, the data field is omitted)

Checksum: 0xE8

34.2 Response frame definition

If the BlockPermlock instruction is executed correctly, when the Read/Lock data field is 0x00, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	UL	PC(MSB)	PC(LSB)
AA	01	D3	00	12	0E	30	00
EPC(MSB)							
E2	00	30	16	66	06	00	69
			EPC(LSB)	BlockRange	Data(MSB)	Data(LSB)	Checksum
11	60	9F	94	01	07	00	CD
End							
DD							

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Frame type: 0x01

Command: 0xD3 Command parameter length PL: 0x0012

PC+EPC length UL: 0xOE

PC: 0x3000

EPC:0xE200301 66606006911609F94

BlockRange: 0x01

BlockPermlock status: 0x0700

Checksum: 0Xcd

If the BlockPermlock instruction is executed correctly, when the Read/Lock data field is 0x01, the response frame is:

Header	Type	Command	PL(MSB)	PL(LSB)	UL	PC(MSB)	PC(LSB)
AA	01	D4	00	10	0E	30	00
EPC(MSB)							
E2	00	30	16	66	06	00	69
			EPC(LSB)	Parameter	Checksum	End	
11	60	9F	94	00	C4	DD	

Frame type: 0x01

Instruction code Command: 0xD4 (note that it is different from the return instruction code with Read/Lock 0x00)

Instruction parameter length PL: 0x0010

PC+EPC length UL: 0x0E

PC: 0x3000

EPC:0xE200301 66606006911609F94

Instruction parameter Parameter: 0x00 (execution succeeded)

Checksum: 0xC4

If the tag does not have a field when executing the BlockPermlock command, the specified EPC code is incorrect or the tag does not respond, the error code 0x14 will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	FF	00	01	14	15	DD

Frame type: 0x01

Instruction code Command: 0xFF

Instruction parameter length PL: 0x0001

Instruction Parameter: 0x14

Checksum: 0x15

If the operation tag returns the error code specified in the EPC Gen2 protocol when executing the BlockPermlock command, because the error-codes specified in the EPC Gen2 protocol are only valid in the lower 4 bits, the response frame will return the error code returned by the tag or after 0xE0. For example, if the sending command

parameter BlockPtr exceeds the block range of the tag data storage area, the tag will return error-code0x03 (memory overrun), The response frame returns the error code 0xE3 and the PC+EPC of the tag being operated, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Error Code	UL	PC(MSB)
AA	01	FF	00	10	E3	0E	30
PC(LSB)	EPC(MSB)						
00	E2	00	30	16	66	06	00
				EPC(LSB)	Checksum	End	
69	11	60	9F	94	D2	DD	

Frame type: 0x01

Command: 0xFF

Command parameter length PL: 0x0010

Command parameter Error Code: 0xA3

PC+EPC length UL: 0x0E

PC: 0x3400

EPC:0xE200301 66606006911609F94

Checksum: 0xD2

If the Access Password is incorrect, the error code 0x16 will be returned, and the PC+EPC of the label to be operated will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Error Code	UL	PC(MSB)
AA	01	FF	00	10	16	0E	34
PC(LSB)	EPC(MSB)						
00	E2	00	30	16	66	06	00
				EPC(LSB)	Checksum	End	
69	11	60	9F	94	05	DD	

Frame type: 0x01

Command: 0xFF

Command parameter length PL: 0x0016

Command parameter Error Code: 0x16 PC+EPC length UL: 0x0E

PC: 0x3000

EPC:0xE200301 66606006911609F94.

Checksum: 0x05

35. Summary instructions

Code	Description
0x03	Get reader/writer module information
0x22	Single polling instruction
0x27	Multiple polling instructions
0x28	Stop multiple polling instructions
0x0C	Set Select parameterinstruction
0xOB	Get Select parameterinstruction
0x12	Set Send Select Instruction
0x39	Read label data storage area
0x49	Write label data storage area
0x82	Lock Lock Label Data Store
0x65	Kill tag
0x0D	Get Query Parameters
0xOE	Set Query parameters
0x07	Set work area
0xAB	Set working channel
0xAA	Get working channel
0xAD	Set automatic frequency hopping
0xB7	Acquire transmit power
0xB6	Set transmit power
0xB0	Set to transmit continuous carrier
0xF1	Get the parameters of receiver demodulator
0xF0	Set receiving demodulator parameters
0xF2	Test RF input blocking signal
0xF3	Testchannel RSSI
0x1A	Control I0 port
0x17	Module sleep
0x1D	Set module idle sleep time
0xEO	NXP ChangeConfig directive
0xE1	NXP ReadProtect/Reset ReadProtect directive
0xE3	NXP Change EAS Instruction
0xE4	NXP EAS-Alarm Instruction
0xE5/0xE6	Impinj Monza 4 QT Instruction
0xD3/0xD4	BlockPermlock Instruction

36. Summary of response frames for command frame execution failure

If the execution of the command frame fails, the M100 chip sends the response frame with execution failure to the upper computer. The response frame with execution failure shares the command code 0xFF. If the EPC of the tag is not obtained before the execution failure, the command parameter is fixed as an error code of 1 byte. If the EPC of the tag is obtained before the execution failure, the response frame parameter is an error code of 1 byte plus the PC+EPC data of the tag. For example, If the execution of the polling command frame fails and the tag is not returned or the data CRC check error is returned, the error code 0x15 will be returned, as follows:

Header	Type	Command	PL(MSB)	PL(LSB)	Parameter	Checksum	End
AA	01	FF	00	01	15	16	DD

Frame type: 0x01

Command code: 0xFF (0xFF represents command frame execution failure)

Command parameter length PL: 0x01

Instruction parameter Parameter: 0x15 (error code returned after execution failure)

Checksum: 0x16

The error codes are summarized as follows:

Type	Code	Description
Command Error	0x17	Command code error in command frame.
FHSS Fail	0x20	Frequency hopping search channel timeout, all channels in this section The time is occupied.
Inventory Fail	0x15	Polling operation failed, no label returned or returned CRC checkerrorofreturndata.
Access Fail	0x16	Failed to access the tag, possibly the access password The password is incorrect.
Read Fail	0x09	Failed to read the tag data storage area. The tag is not returned Return or return data CRC checkerror.
Read Error	0xA0|Error code	Error reading label data storage area, return code

		Itisobtained from 0xA0 bitor Error Code.
Write Fail	0x10	Failed to write the tag data storage area. The tag did not return Return or return data CRC checkerror.
Write Error	0xB0|Error code	Error writing label data storage area, return code Itisobtained from 0xB0 bitor Error Code.
Lock Fai	0x13	Failed to lock label data storage area. No label Return or return data CRC checkerror.
Lock Error	0xC0|Error code	Error locking label data store, generation returned The code is obtained from 0xC0 bit or Error Code. See the following table for error code information.
Kill Fail	0x12	Failed to inactivate the tag. The tag did not return or return CRC checkerrorofreturndata.

Kill Error	0xD0|Error code	Deactivation taerror, the returned code is 0xC0 Or error code information See tag return error in EPC Gen2 protocol for details code
BlockPerma lockFail	0x14	BlockPermlock failed to execute. The label does not have Return or return data CRC check error.
BlockPermalockError	0xE0|Error code	BlockPermlock error. The returned code is 0xEO bit or Error Code is obtained.

NXP G2X label specific instruction error code:

ChangeConfig Fail	0x1A	The ChangeConfig command failed, the tag did not return data or returned data, and CRC verification error.
ReadProtect Fail	0x2A	The ReadProtect command failed, the tag did not return data or returned data, and CRC verification error.
Reset ReadProtect Fail	0x2B	Reset ReadProtect command failed. The tag did not return Data or return, data CRC check error.
Change EAS Fail	0x1B	Change EAS command failed. The tag did not return data or returned data, and CRC verification error.
EAS_ Alarm Fail	0x1D	EAS_ Alarm command failed, no label returned correctly Alarm。
Error code returned by special instruction tag	0xE0 | Error code	The error code returned by the special instruction label is obtained from 0xE0 or the error code returned by the upper

Lmpinj onza QT tag specific instruction error code:

QT Fail	0x2E	QT command failed,label did not return data or returned data CRC checkerror
Special instruction label return Error code for	0xE0 | Error code	The error code returned by the special instruction tag is 0xE0 or the ErrorCode returned fromthelabel.

Error code returned by tag in EPCGen2 protocol:

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Tag error-code

Error-code Support	Error Code	Error code Name	Error Description
Error-specific	000000002	Other error	All other items not stated in this table Error.
	000000112	Memory overrun	The specified label data store does not exist In; Or the tag does not support EPC of specified length, such as XPC.
	000001002	Memory locked	The specified label data store is locked and/or permanently locked, and the locking status is non-writable or non-writable Read.
	000010112	Insufficient power	The tag did not receive enough energy to Write.
Non-specific	000011112	Non-specific error	Label does not support Error-code return o