



Preface & Declaration

Thank you for your selection of R301 Fingerprint Identification Module of GROW.

The Manual is targeted for hardware & software development engineer, covering module function, hardware and software interface etc. To ensure the developing process

goes smoothly,

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The Manual

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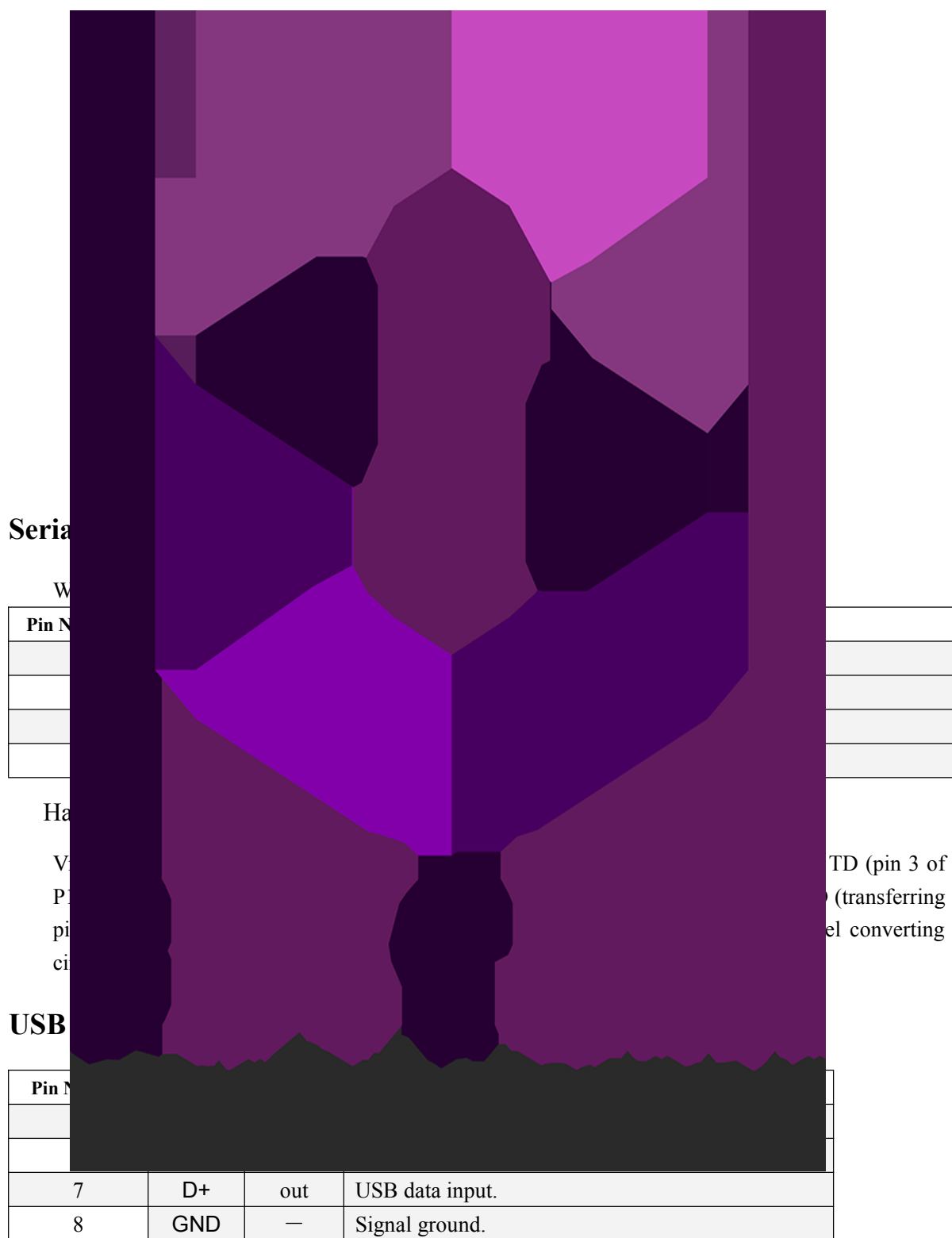
I Introduction

Power	DC 4.2V-6.0V	Interface	UART(TTL logical level)/ USB 2.0
Working current			
Baud rate			
Image resolution			
Storage capacity			5(highest))
FAR			
Average time			
Working temperature			- +85℃

Ope

II Hardware Interface

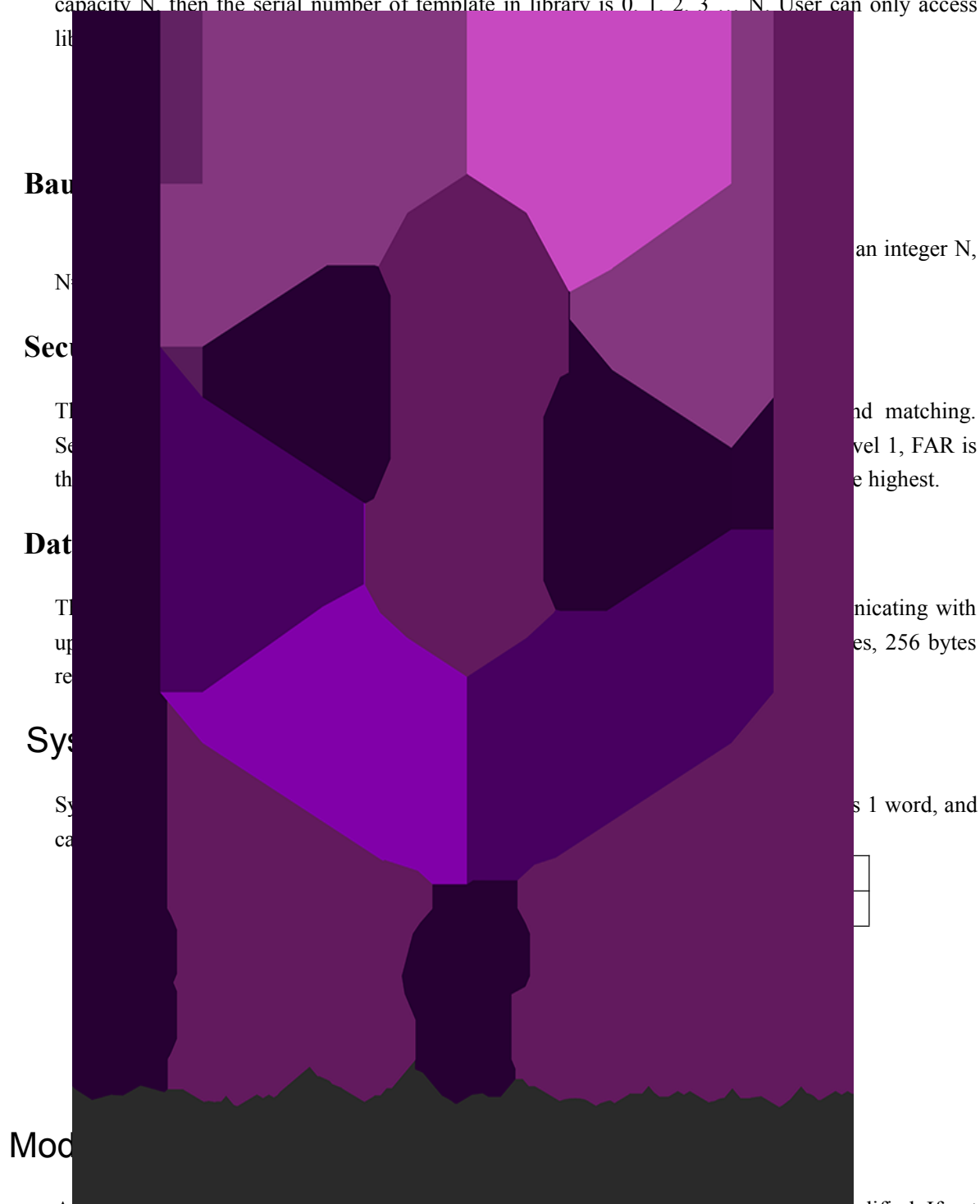
Exterior Interface



Fingerprint Library

System sets aside a certain space within Flash for fingerprint template storage, that's fingerprint library. Contents of the library remain at power off.

Capacity of the library changes with the capacity of Flash, system will recognize the latter automatically. Fingerprint template's storage in Flash is in sequential order. Assume the fingerprint capacity N, then the serial number of template in library is 0, 1, 2, 3, ..., N. User can only access lib



At power-on reset, system first checks whether the handshaking password has been modified. If not, system deems upper computer has no requirement of verifying password and will enter into normal operation mode. That's, when Module password remains the default, verifying process can be jumped. The password length is 4 bytes, and its default factory value is 0FFH, 0FFH, 0FFH, 0FFH. Should the password have be modified, *refer to instruction SetPwd*, then Module (or device)

handshaking password must be verified before the system enter into normal operation mode. Or else, system will refuse to execute and command.

The new modified password is stored in Flash and remains at power off.

Module address

Each module has an identifying address. When communicating with upper computer, each module will send its identifying address to the system. Module address is used to identify the module. The system will not modify the address.

Range

Module address range is 00H to FFH (256 addresses). Via RS485, the system can address up to 256 modules (not seed). Via RS485, the system can address up to 256 modules (not seed).

The system will send the module address to the upper computer when the system is in the communication mode. For the system, the module address is especially in the first byte of the command packet.

5.1D

When the system is in the communication mode, the data will be wrapped in the command packet.

<p>D</p>						Checksum
<p>D</p>						
						first.
						be modified by
						wrong adder value,
						module will reject to transfer.
Package	PID	1 byte	01H	Command packet;		

identifier			02H	Data packet; Data packet shall not appear alone in executing processs, must follow command packet or acknowledge packet.
			07H	Acknowledge packet;
			08H	End of Data packet.
				command packets and (2 bytes). Unit is transferred first.
				' s parameters, er value, template
				ckage length and itted. high byte is

Check

Note:
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0A
0E
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01
0E
0E

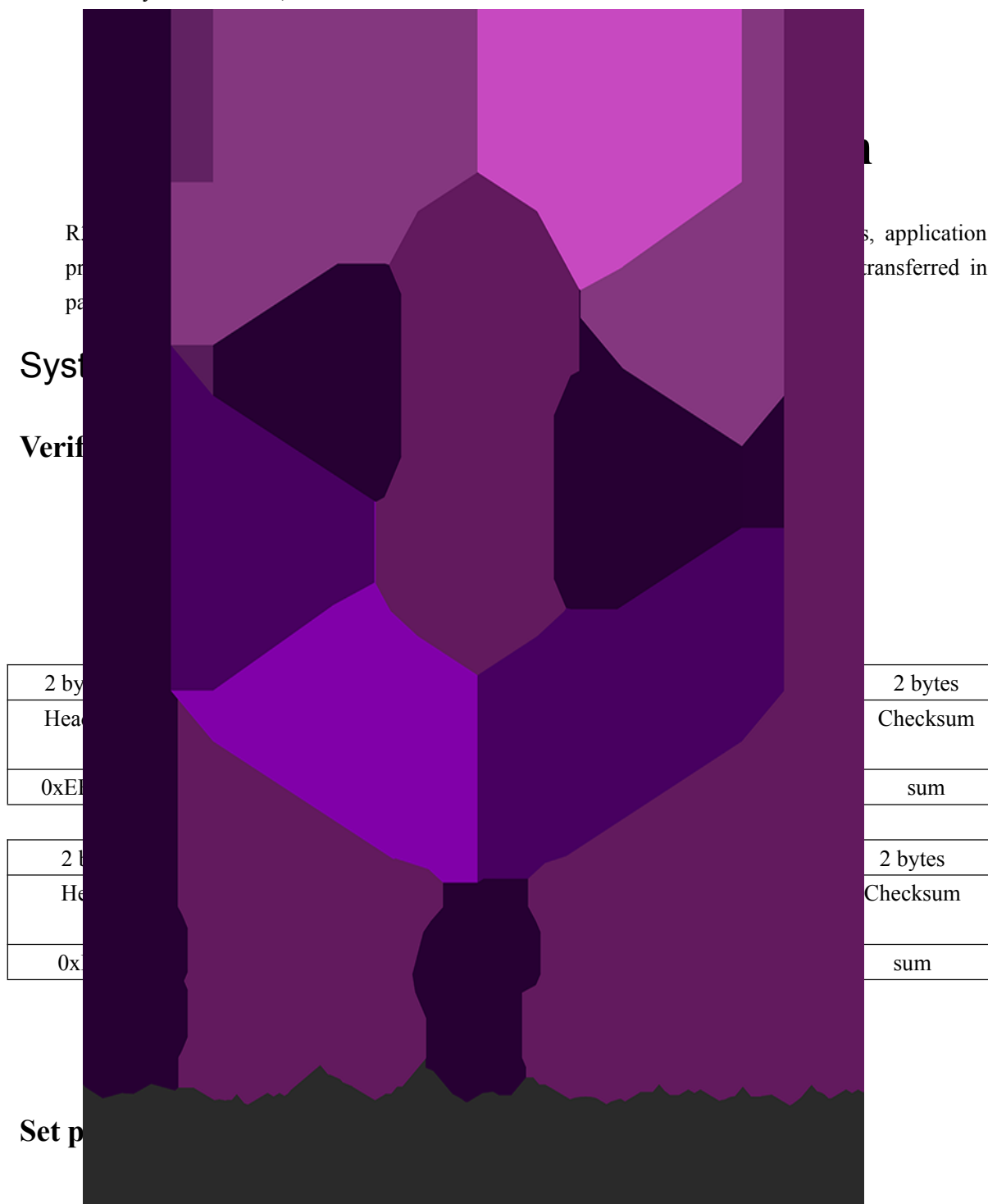
the Module

results to upper
ay also have
ing status or
Acknowledge

smallness of

- 10h: fail to delete the template;
- 11h: fail to clear finger library;
- 13h: wrong password!
- 15h: fail to generate the image for the lackness of valid primary image;

- 18h: error when writing flash;
- 19h: No definition error;
- 1Ah: invalid register number;
- 1Bh: incorrect configuration of register;
- 1Ch: wrong notepad page number;
- 1Dh: fail to operate the communication port;
- others: system reserved;



Input Parameter: PassWord (4 bytes)

Return Parameter: Confirmation code (1 byte)

Instruction code: 12H

Command (or instruction) package format:

2 bytes	4bytes	1 byte	2 bytes	1 byte	4 byte	2 bytes
Header	Module address	Package identifier	Package length	Instruction code	Password	Checksum
0xEF01	xxxx	01H	07H	12H	PassWord	sum

Acknowledge package format:

2 bytes	4 byte	2 bytes	1 byte	2 bytes
Header	Module address	Package length	Confirmation	Checksum
0				Sum

Set M

2 bytes					2 bytes
Header					Checksum
0xEF					sum
A					
2 b					2 bytes
Hea					Checksum
0xE					Sum

Set n

2 bytes					2 bytes
Header					Checksum
0xEF01	Xxxx	01H	05H	0eH	4/5/6
					XX
					sum

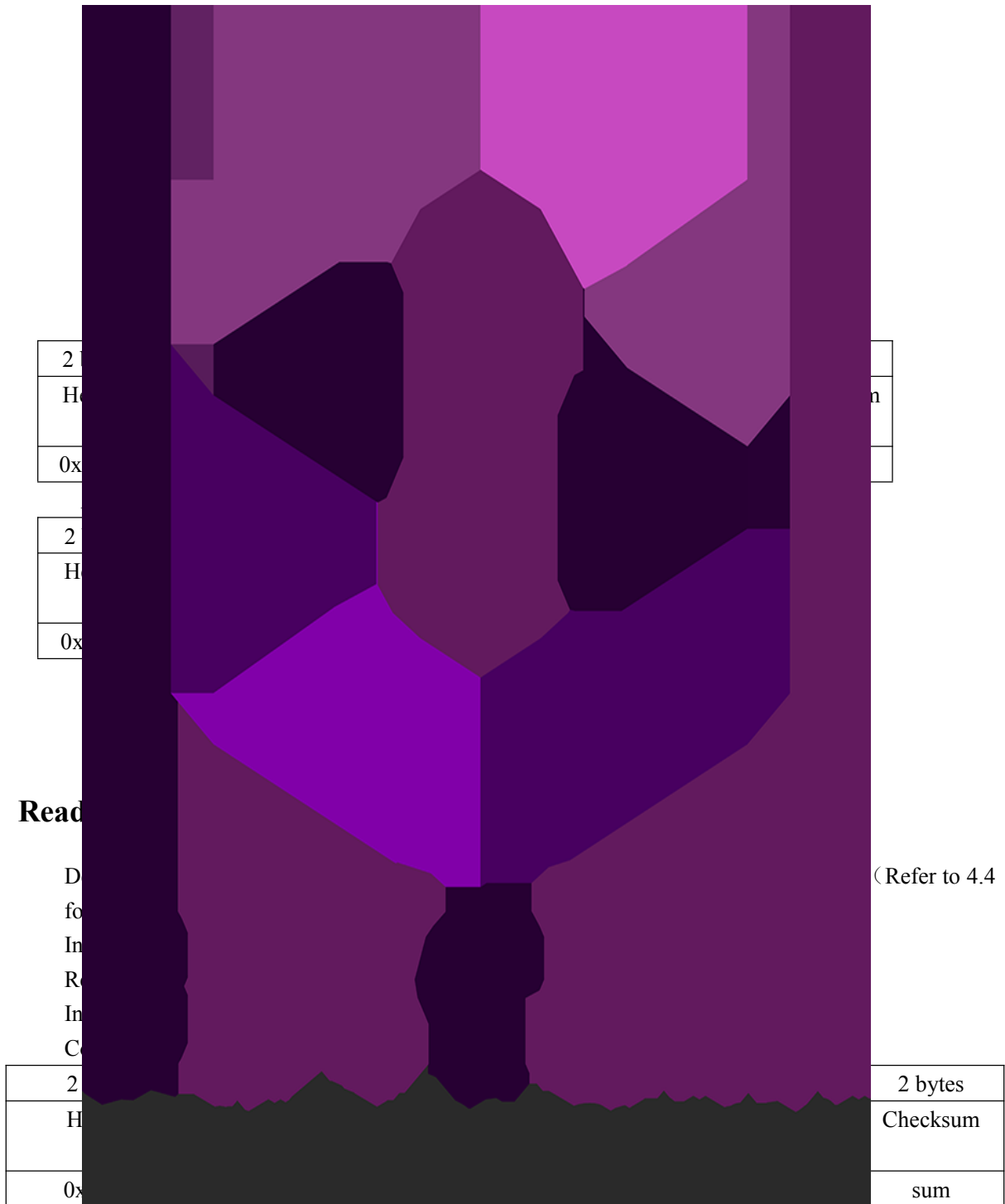
Acknowledge package format:

2 bytes	4bytes	1 byte	2 bytes	1 byte	2 bytes
Header	Module address	Package identifier	Package length	Confirmation code	Checksum

0xEF01	Xxxx	07H	03H	xxH	Sum
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Note: Confirmation code=00H: parameter setting complete;
Confirmation code=01H: error when receiving package;
Confirmation code=1aH: wrong register number;

Port Control	Control
1	1
2	2
3	3
4	4
5	5
6	6
7	7
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10	10
11	11
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97	97
98	98
99	99
100	100



Acknowledge package format:

2 bytes	4bytes	1 byte	2 bytes	1 byte	16 bytes	2 bytes
Header	Module address	Package identifier	Package length	Confirmation code	Basic parameter list	Checksum
0xEF01	xxxx	07H	3+16	xxH	See following	sum

					table	
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Note: Confirmation code=00H: read complete;

Confirmation code=01H: error when receiving package;

Name	Description	Offset (word)	Size (word)
Status register	Contents of system status register	0	1
System identifier code	Fixed value: 0x0009	1	1
Finger library size	Finger library size	2	1
Se			1
De			2
Dat			1
Be			1

Read

D			
In			
R			
In			
C			
2			2 bytes
F			Checksum
0			0021H
A			
2 by			2 bytes
Head			Checksum
0xEF			sum

Fing

To co

Buffer while
information code

Command (or instruction) package format:

2 bytes	4bytes	1 byte	2 bytes	1 byte	2 bytes
Header	Module address	Package identifier	Package length	Instruction code	Checksum

0xEF01	Xxxx	01H	03H	01H	05H
--------	------	-----	-----	-----	-----

Acknowledge package format:

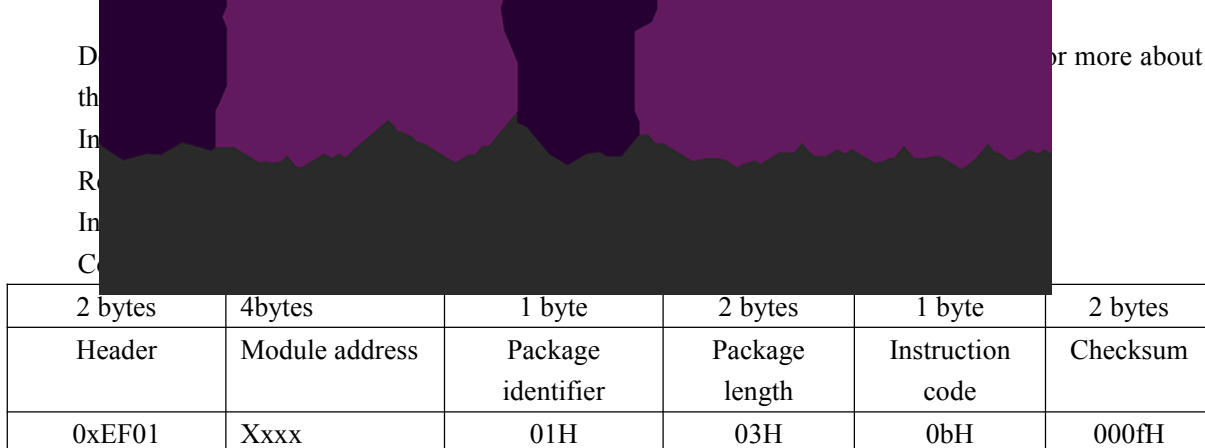
2 bytes	4bytes	1 byte	2 bytes	1 byte	2 bytes
Header	Module address	Package identifier	Package length	Confirmation code	Checksum
0xEF01	Xxxx	07H	03H	xxH	Sum

Note: Confirmation code=00H: finger collection success;

Upload



Download



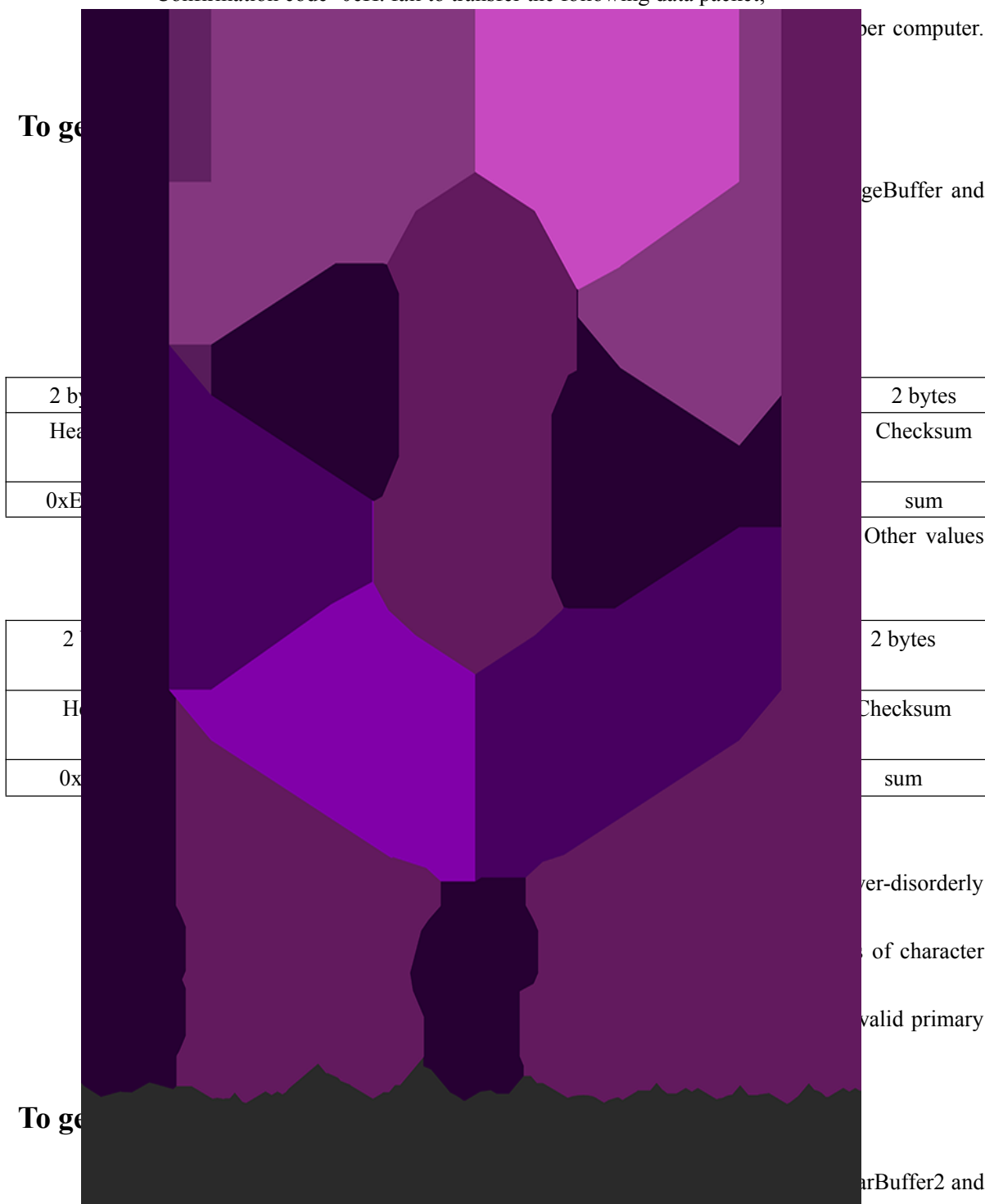
Acknowledge package format:

2 bytes	4bytes	1 byte	2 bytes	1 byte	2 bytes
Header	Module address	Package identifier	Package length	Confirmation code	Checksum
0xEF01	Xxxx	07H	03H	xxH	sum

Note: 1: Confirmation code=00H: ready to transfer the following data packet;

Confirmation code=01H: error when receiving package;

Confirmation code=0eH: fail to transfer the following data packet;



generate a template which is stroed back in both CharBuffer1 and CharBuffer2.

Input Parameter: none

Return Parameter: Confirmation code (1 byte)

Instuction code: 05H

Command (or instruction) package format:

2 bytes	4bytes	1 byte	2 bytes	1 byte	2 bytes
Header	Module address	Package identifier	Package length	Instruction code	Checksum
0xEF01	xxxx	01H	03H	05H	09H

Acknowledge package format:

2 bytes	4bytes	1 byte	2 bytes	1 byte	2 bytes
Header	Module	Package	Package	Confirmation	Checksum



Describe the module; ified buffer of
 Module;
 Input Parameter: BufferID (buffer number)
 Return Parameter: Confirmation code (1 byte)
 Instruction code: 09H
 Command (or instruction) package format:

2 bytes	4bytes	1 byte	2 bytes	1 byte	1 byte	2 bytes
Header	Module address	Package identifier	Package length	Instruction code	buffer number	Checksum
0xEF01	xxxx	01H	04H	09H	BufferID	sum

Note: BufferID of CharBuffer1 and CharBuffer2 are 1h and 2h respectively. Other values (except 1h, 2h) would be processed as CharBuffer2.

Acknowledge package format:



Description: to load template at the specified location (PageID) of Flash library to template buffer CharBuffer1/CharBuffer2

Input Parameter: BufferID(buffer number), PageID (Flash location of the template, two bytes with

high byte front and low byte behind).

Return Parameter: Confirmation code (1 byte)

Instuction code: 07H

Command (or instruction) package format:

2 bytes	4bytes	1 byte	2 bytes	1 byte	1 byte	2 bytes	2 bytes
Header	Module address	Package identifier	Package length	Instruction code	buffer number	Page number	Checksum
0xEF0							sum

N values (except

11

A

2

2	2 bytes
Header	Checksum
0x	sum

N

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Costs

2 bytes		2 bytes
Header		Checksum
0xEF0		sum

A

2

H

2	2 bytes
Header	Checksum
0x	sum

0x

To empty finger library

Empty

Description: to delete all the templates in the Flash library

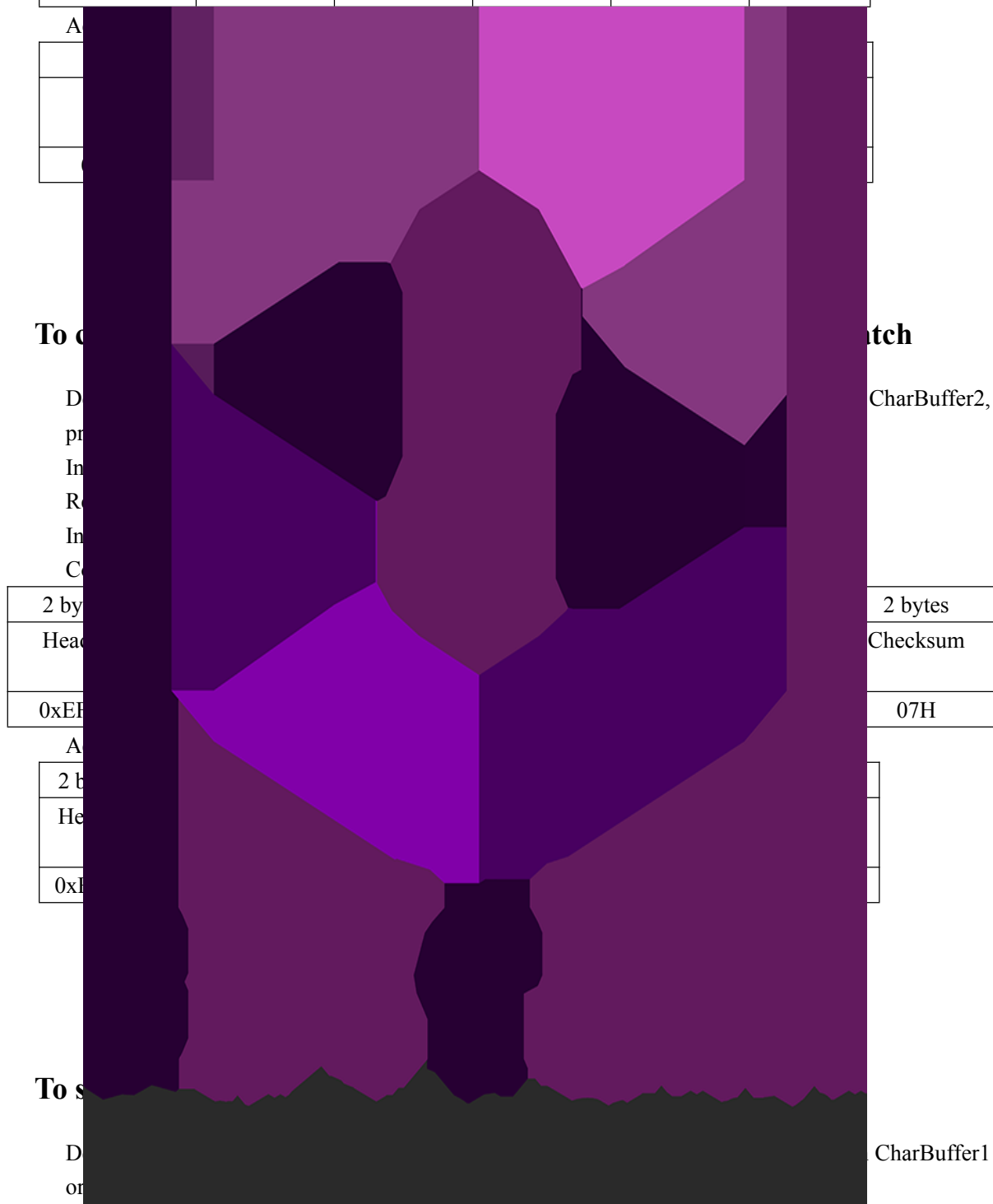
Input Parameter: none

Return Parameter: Confirmation code (1 byte)

Instuction code: 0dH

Command (or instruction) package format:

2 bytes	4bytes	1 byte	2 bytes	1 byte	2 bytes
Header	Module address	Package identifier	Package length	Instruction code	Checksum
0xEF01	Xxxx	01H	03H	0dH	0011H



Input Parameter: BufferID, StartPage (searching start address), PageNum (searching numbers)

Return Parameter: Confirmation code (1 byte), PageID (matching templates location)

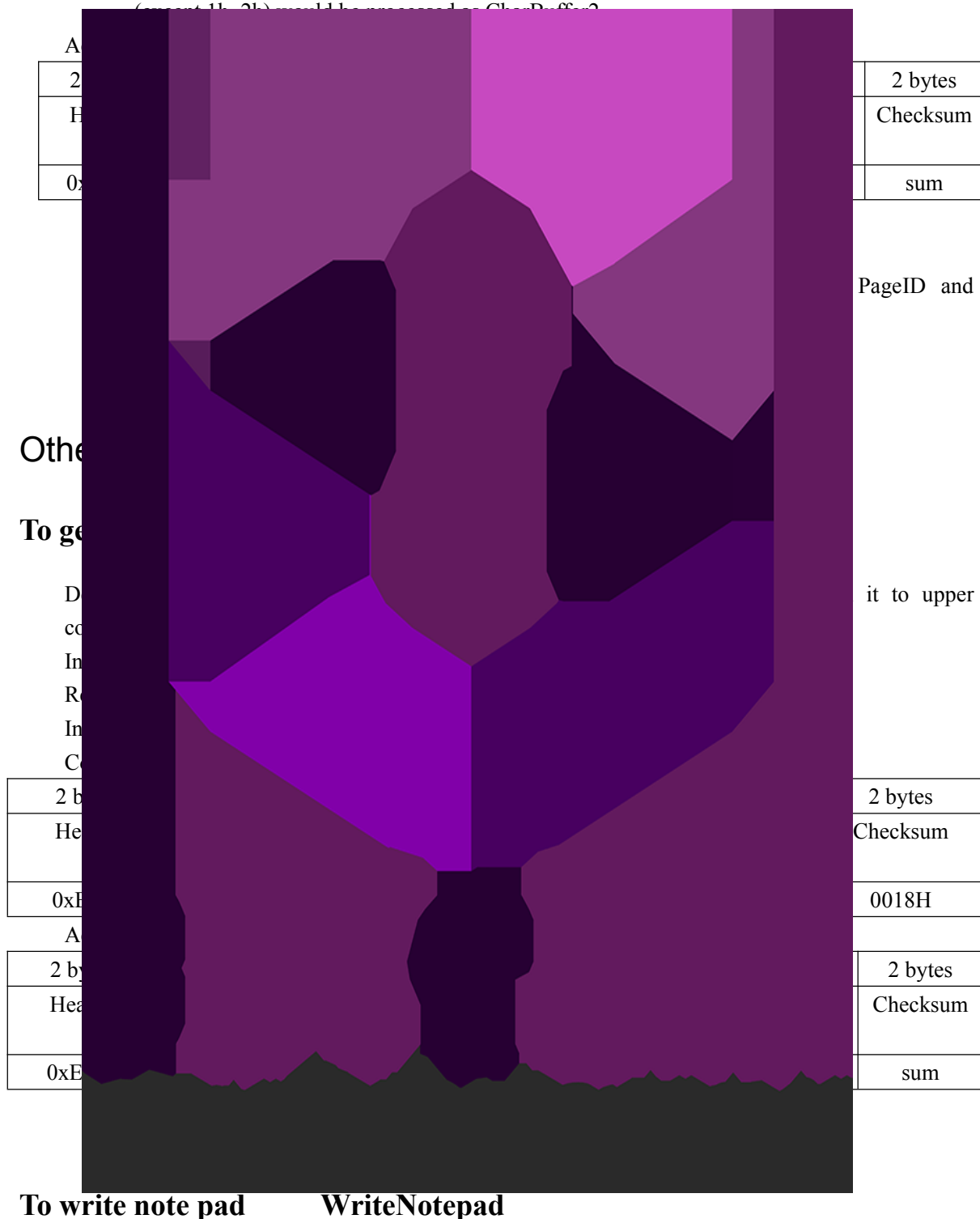
Instuction code: 04H

Command (or instruction) package format:

2 bytes	4bytes	1 byte	2 bytes	1 byte	1 byte	2 bytes	2 bytes	2 bytes
Header	Module address	Package identifier	Package length	Instruction code	buffer number	Parameter	Parameter	Checksum
0xEF01	xxxx	01H	08H	04H	BufferID	StartPage	PageNum	sum

Note: BufferID of CharBuffer1 and CharBuffer2 are 1h and 2h respectively. Other values

(except 1h, 2h) would be processed as CharBuffer2



Description: for upper computer to write data to the specified Flash page (refer to 4.1 for more about Note pad). Also see **ReadNotepad**;

Input Parameter: NotePageNum, user content (or data content)

Return Parameter: Confirmation code (1 byte)

Instuction code: 18H

Command (or instruction) package format:

2 bytes	4bytes	1 byte	2 bytes	1 byte	1byte	32 bytes	2 bytes
Header	Module address	Package identifier	Package length	Instruction code	Page number	Data content	Checksum
0xEF01	xxxx	01H	36	18H	0~15	content	sum

A							
2 b							2 bytes
He							Checksum
0xEF							sum

To re

D ser note pad.

A

In

R

In

C

2 by							2 bytes
Head							Checksum
0xEF							xxH

A

2 by							2 bytes
Head							Checksum
0xEF							sum

Instruction Table

Classified by functions

type	num	code	description	Type	num	Code	description
System-related	1	13H	To verify password		13	08H	to upload template
	2	12H	To set password		14	09H	To download template
							template;
							template
							updates
Finerprint processing							library
							at precise
							of two
							nger library
							m code
							pad
							pad
Class							
	code						description
	01H						e library
	02H						m Parameter
	03H						d system
	04H						word
	05H						ssword
	06H						m code
	07H						e address
	08H						
	09H	DownChr	to download template	18H	WriteNotepad		to write note pad
	0AH	UpImage	To upload image	19H	ReadNotepad		To read note pad
	0BH	DownImage	To download image	1BH	HiSpeedSearch		Search the library fastly
	0CH	DeletChar	to delete tempates	1DH	TemplateNum		To read finger template

					numbers
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