

Elfin-EG4X

RS232/RS485 to 2G/3G/4G

User Manual

V 1.1



Overview of Characteristic

- ◇ Support LTE-TDD, LTE-FDD, WCDMA, TD-SCDMA, cellular network, sub-type to support specific cellular network
- ◇ Support RS232/RS485 to 2G/3G/4G Data Transmission, UART baud rate Up to 460800bps
- ◇ Supports Max 3 Channel TCP/UDP connections, Each Connection Supports 1400 Bytes of Data Cache
- ◇ Support Multiple Working Modes: Network Transparent Transmission Mode, HTTP Mode
- ◇ Support IOTService Tool, Remotely and Dynamically Modify Module Parameters
- ◇ Support SMS AT Command Configuration
- ◇ Supports Registration Packet, Heartbeat Packet Function, and Packet Supports Combination of ICCID, IMEI, IMSI, Software Version, cellular network Connection Status.
- ◇ Support NTP
- ◇ Support Modbus TCP to Modbus RTU

- ◇ Support IOTBridge for Remote Control and Config.
- ◇ Support IOTBridge working time, for example only works from 10:00 to 10:30 to save the data flow charge.
- ◇ Support Serial Port, Network OTA Upgrade Firmware.
- ◇ Size: 68.5 x 35 x 17.8mm
- ◇ 9~18VDC@1A Wide Power Supply

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HISTORY

V 1.0 03-29-2019. First Version

1. PRODUCT OVERVIEW

1.1. General Description

The Elfin-EG4X support LTE-TDD, LTE-FDD, WCDMA, TD-SCDMA, cellular network full network. 4G network support maximum download data rate 150Mbps, upload data rate 50Mbps.

The Elfin-EG4X module support TCP/IP protocol, with its RS232/RS485 interface, it make traditional UART device easy connecting to IOT.

Elfin-EG4X is an RJ45 interface serial server with ultra-small size: 68.5 x 35 x 17.8mm

Elfin-EG4X include different sub-type, as following table.

Table1. Elfin-EG4X Series Definition

Type		EG40	EG41	EG40-D	EG41-D	EG40-G	EG41-G	Note	
说明		RS232 2G+3G+4G	RS485 2G+3G+4G	RS232 CMCC 2G+4G	RS485 CMCC 2G+4G	RS232 4G	RS485 4G		
CMCC	GSM	B3	√	√	√	√	-	-	2G
		B8	√	√	√	√	-	-	2G
	TD-SCDMA	B34	√	√	-	-	-	-	3G
		B39	√	√	-	-	-	-	3G
	TDD-LTE	B38	√	√	√	√	√	√	4G
		B39	√	√	√	√	√	√	4G
		B40	√	√	√	√	√	√	4G
B41		√	√	√	√	√	√	4G	
FDD-LTE	B8	√	√	√	√	√	√	4G	
CTCC	TDD-LTE	B41	√	√	-	-	√	√	4G
	FDD-LTE	B1	√	√	-	-	√	√	4G
		B3	√	√	-	-	√	√	4G
CUCC	WCDMA	B1	√	√	-	-	√	√	3G
		B8	√	√	-	-	√	√	3G
	TDD-LTE	B41	√	√	-	-	√	√	4G
	FDD-LTE	B1	√	√	-	-	√	√	4G
		B3	√	√	-	-	√	√	4G
		B8	√	√	-	-	√	√	4G

1.2. Device Parameters

Table2. Elfin-EG4X Technical Specifications

Item	Parameters
System Information	
Processor/Frequency	Cortex-M3/96MHz
Operating System	FreeRTOS
2G/3G/4G Interface	
Transmit Power	LTE-TDD: Class 3(23dBm+1/-3dB) LTE-FDD: Class 3(23dBm±2dB) WCDMA: Class 3(24dBm+1/-3dB) TD-SCDMA: Class 3(24dBm+1/-3dB) GSM900: Class 4(33dBm±3dB) DCS1800: Class 1(30dBm±3dB) GSM900 8-PSK: Class E2(27dBm±3dB) DCS1800 8-PSK: Class E2(26dBm±3dB)
Receive Sensivity	FDD B1: -96dBm(10M) FDD B3: -96dBm(10M) FDD B5: -96dBm(10M) FDD B8: -96.5dBm(10M) TDD B38: -96dBm(10M) TDD B39: -97dBm(10M) TDD B40: -96.5dBm(10M) TDD B41: -96dBm(10M) WCDMA B1: -110dBm WCDMA B8: -111dBm TDSCDMA B34: -109dBm TDSCDMA B39: -109dBm GSM 900M: -109dBm GSM 1800M: -109dBm
LTE	Maximum Support non-CA CAT4 Support 1.4~20MHz RF Bandwidth Downstream Support Multiple Users MIMO FDD: Maximum Upstream Rate 50Mbpsm Maximum Downstream Rate 150Mbps TDD: Maximum Upstream Rate 35Mbpsm Maximum Downstream Rate 130Mbps
WCDMA	3GPP R8 DC-HSPA+ 16-QAM,64-QAM and QPSK Modulation Maximum Upstream 5.76Mbps Maximum Downstream 42Mbps
TD-SCDMA	CCSA Release 3 Maximum Upstream 2.2Mbps Maximum Downstream 4.2Mbps
GSM/cellular network	R99: CSD Transmission Rate: 9.6Kbps/14.4Kbps cellular network: Support cellular network multi-slot class 12 Code Method: CS-1/CS-2/CS-3/CS-4
Serial Port	
Port Number	1
Interface Standard	EG40: RS232 或 3.3V TTL UART EG41: RS485 或 3.3V TTL UART

Data Bits	7,8
Stop Bit	1,2
Check Bit	None,Even,Odd
Baud Rate	TTL: 1200 bps~460800 bps
Flow Control	No Flow Control Half-Duplex(RS485) Software Flow Control
Software	
Configuration	Serial AT Command IOTService Serial Port Configuration Software IOTService Network Configuration Software
Firmware Upgrade	UART or OTA Upgrade
Basic Parameter	
SIM Card	Nano SIM card(1.8V/3V)
Size	68.5mm x 35mm x 17.8mm
Operating Temp.	-40 ~ 85°C
Storage Temp.	-45 ~ 105°C, 5 ~ 95% RH (no condensation)
Input Voltage	9~18VDC@1A Typical 9V@1A
Average Working Current	~300mA@9V
Peak Current	2A

1.3. Key Applications

The Elfin-EG4X module connects the serial device to the Internet and conforms to the TCP/IP protocol for transmitting serial data.

- Remote device monitoring
- Production asset tracking and monitoring
- Security field
- Industrial sensors and controllers
- Health medical equipment
- ATM equipment
- Data acquisition equipment
- UPS power management equipment
- Telecommunication equipment
- Data display device
- Hand-held device
- Attendance system and terminal equipment

2. HARDWARE INTRODUCTION

Elfin-EG4X is a cellular network solution for serial device networking. Data transmission via cellular network makes product integration very easy. This product meets EMC Class B security level and can pass relevant certification tests in various countries.

2.1. APPEARANCE



Figure 1. Elfin-EG40 Appearance



Figure 2. Elfin-EG41 Appearance

2.2. Elfin-EG40 Pin Definition

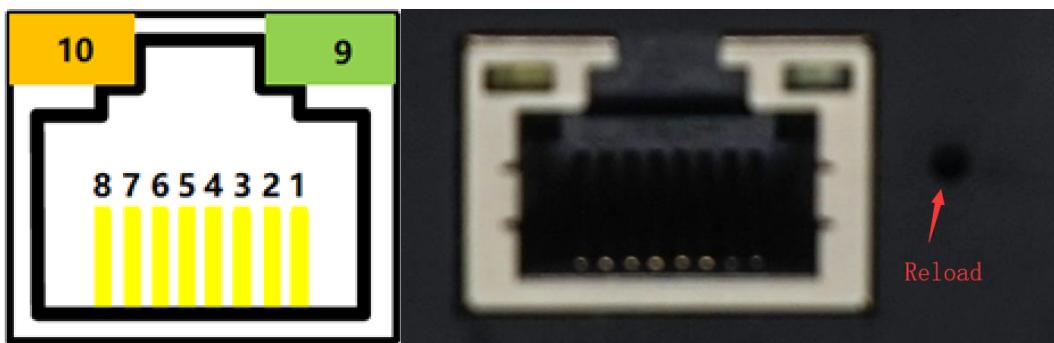


Figure 3. Elfin-EG40 RJ45 Interface Pin

Table3. Elfin-EG40 Interface Definition

Pin	Description	Net Name	Signal Type	Notes
1	UART_TX TTL Voltage	TTL_UART_TXD	O	3.3V TTL UART Output
2	UART_RX TTL Voltage	TTL_UART_RXD	I	3.3V TTL UART Input
3		NC		Please leave it open

Pin	Description	Net Name	Signal Type	Notes
4		NC		Please leave it open
5	UART_TX RS232 Voltage	UART_TXD	O	RS232
6	UART_RX RS232 Voltage	UART_RXD	I	RS232
7	Power VCC	VCC	Power	9~18VDC@1A
8	Power GND	GND	Power	
9	Green LED Net Status	Net	O	Boot On: Power is OK. 2s Off -> 2s On: cellular network Register is OK. 0.1s Off -> 0.1s On: cellular network data is transferring.
10	Amber LED Data Transfer	Active	O	Off: No data transfer 0.3s Off -> 0.9s On: UART TX Output 0.3s Off -> 0.3s On: UART RX Receive On: UART bidirection.
	Restore to Factory	nReload	I	Default high. Long press this button ("Low">3s) and loose to make the module restore to factory setting.

2.3. Elfin-EG41 Pin Definition

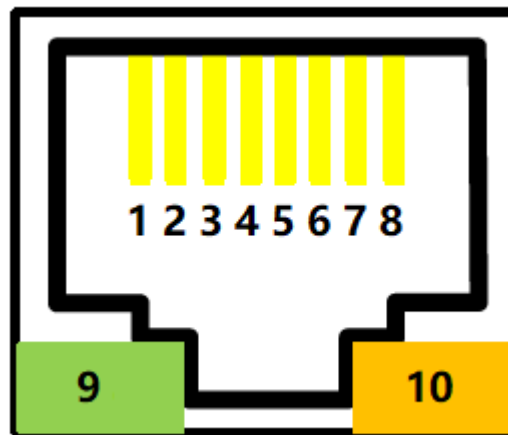


Figure 4. Elfin-EG41 RJ45 Interface Pin

Table4. Elfin-EG41 Interface Definition

Pin	Description	Net Name	Signal Type	Notes
1	UART_TX TTL Voltage	TTL_UART_TXD	O	3.3V TTL UART Output
2	UART_RX TTL Voltage	TTL_UART_RXD	I	3.3V TTL UART Input
3		NC		Please leave it open
4		NC		Please leave it open
5	RS485_A+	RS485_A+	IO	RS485 A+

Pin	Description	Net Name	Signal Type	Notes
6	RS485_B-	RS485_B-	IO	RS485 B-
7	Power VCC	VCC	Power	9~18VDC
8	Power GND	GND	Power	
9	Green LED Net Status	Net	O	Boot On: Power is OK. 2s Off -> 2s On: cellular network Register is OK. 0.1s Off -> 0.1s On: cellular network data is transferring.
10	Amber LED Data Transfer	Active	O	Off: No data transfer 0.3s Off -> 0.9s On: UART TX Output 0.3s Off -> 0.3s On: UART RX Receive On: UART bidirection.

<Notes>:

I — Input; O — Output; Power—Power Supply

Note

PIN1/2 is TTL UART, PIN5/6 is RS232/RS485 interface, it is same UART for internal MCU, just the hardware driver is different. Choose either TTL or RS232/RS485

2.4. RS232 Interface

RS232 don't have hardware flow control function, and the physical voltage is $\pm 8V$.

2.5. RS485 Interface

RS485 use two wire links, A(DATA+), B(DATA-). Connect A(+) to A(+), B(-) to B(-) for communication. Suggest to connect GND together when interference is very severe.

The RS485 interface support maximum 32 485 device, device. The cable maximum length is 1200 meters. Need to add 120Ohm terminal resistor for over 300 meters.

2.6. Mechanical Size

The dimensions of Elfin-EG4X are defined as following pictures(mm):

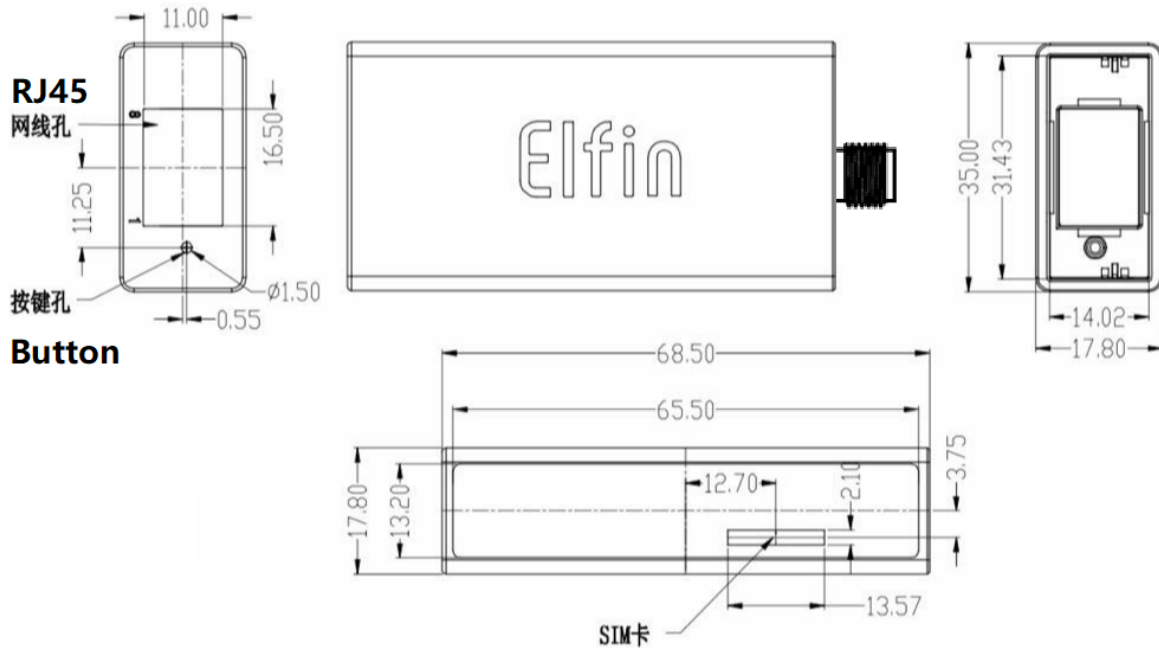


Figure 5. Elfin-EG4X Mechanical Size

2.7. RJ45 8PIN Connector

RJ45 8PIN Connector Type Order: 10810001001



Figure 6. RJ45 8PIN Connector

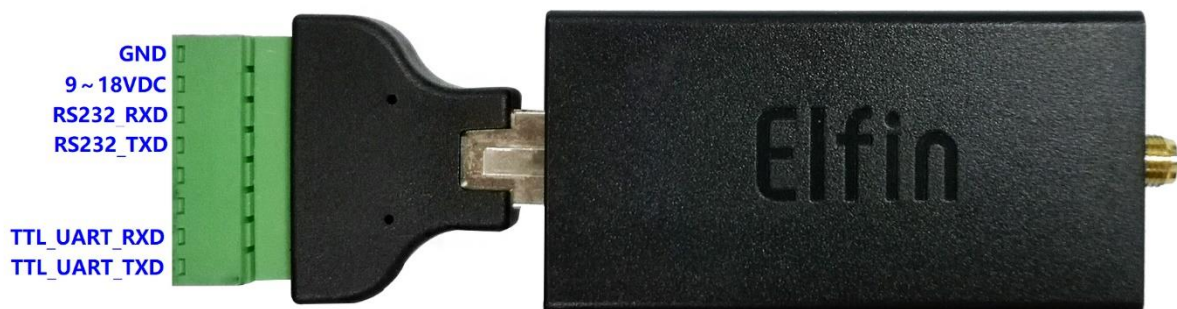


Figure 7. EG40+8PIN Connector

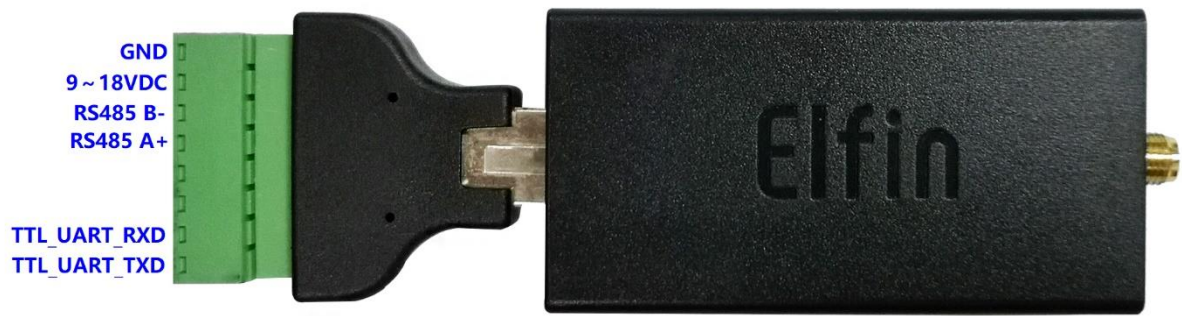


Figure 8. EG41+8PIN Connector

2.8. RJ45 4PIN Connector

RJ45 4PIN Connector Type Order: 10810001002



Figure 9. RJ45 4PIN Connector



Figure 10. EG40 +4PIN Connector



Figure 11. EG41+4PIN Connector

2.9. Interface Conversion Cable



Figure 12. Interface Conversion Cable

May also make cable according to the following picture.

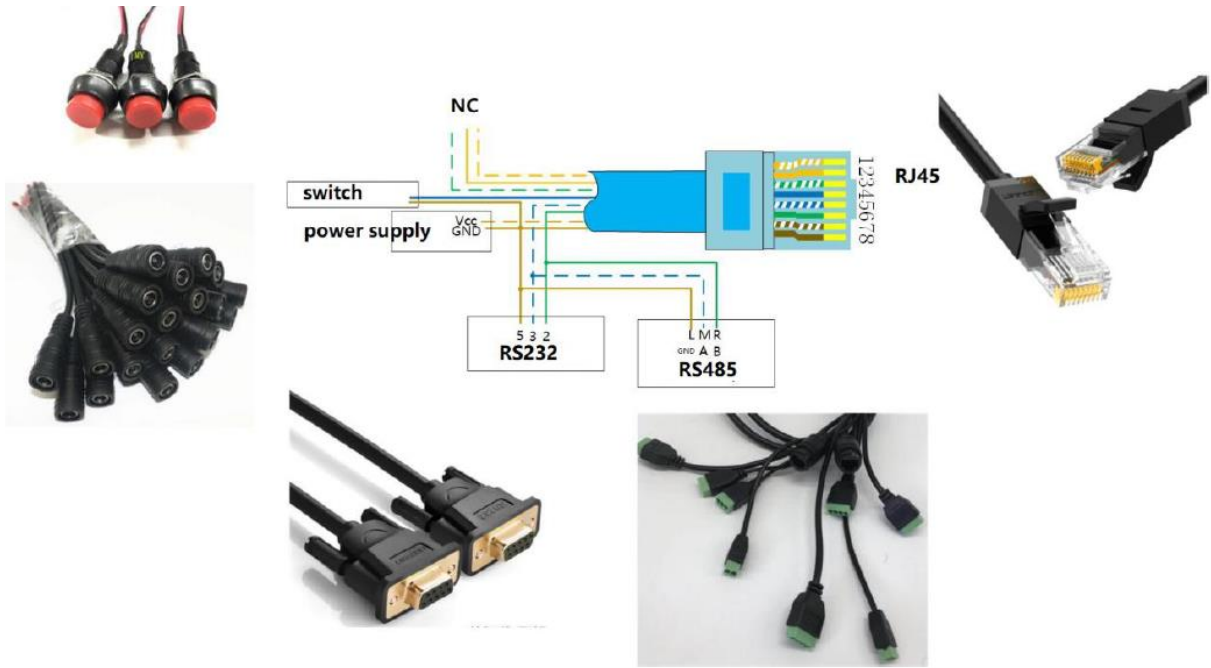


Figure 13. Cable Manufacture Guide

2.10. Fixed Bracket



Figure 14. Fixed Bracket

2.11. Rail Bracket



Figure 15. Rail Bracket

2.12. Bracket

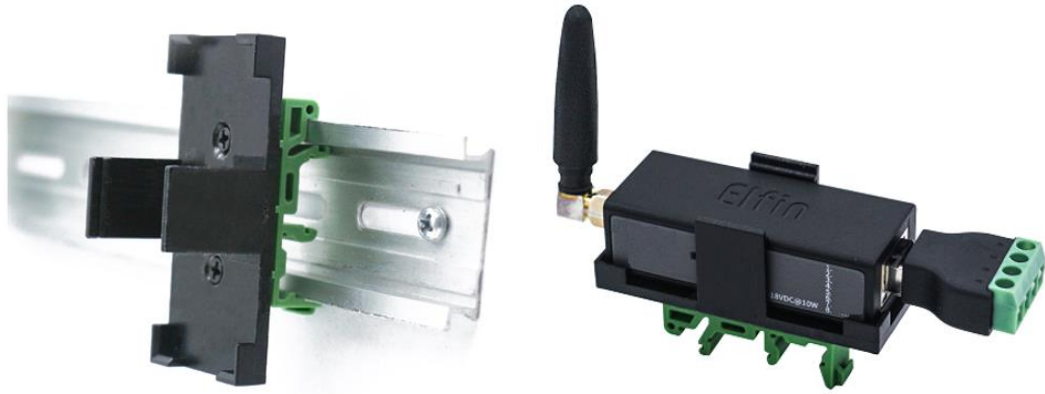


Figure 16. Bracket Install Picture

2.13. RJ45 Transform Connector

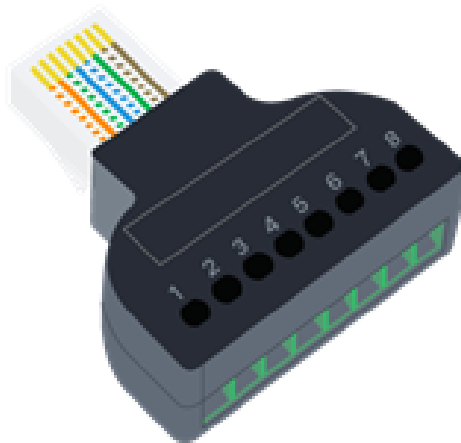


Figure 17. RJ45 Transform Connector

2.14. Product Installation

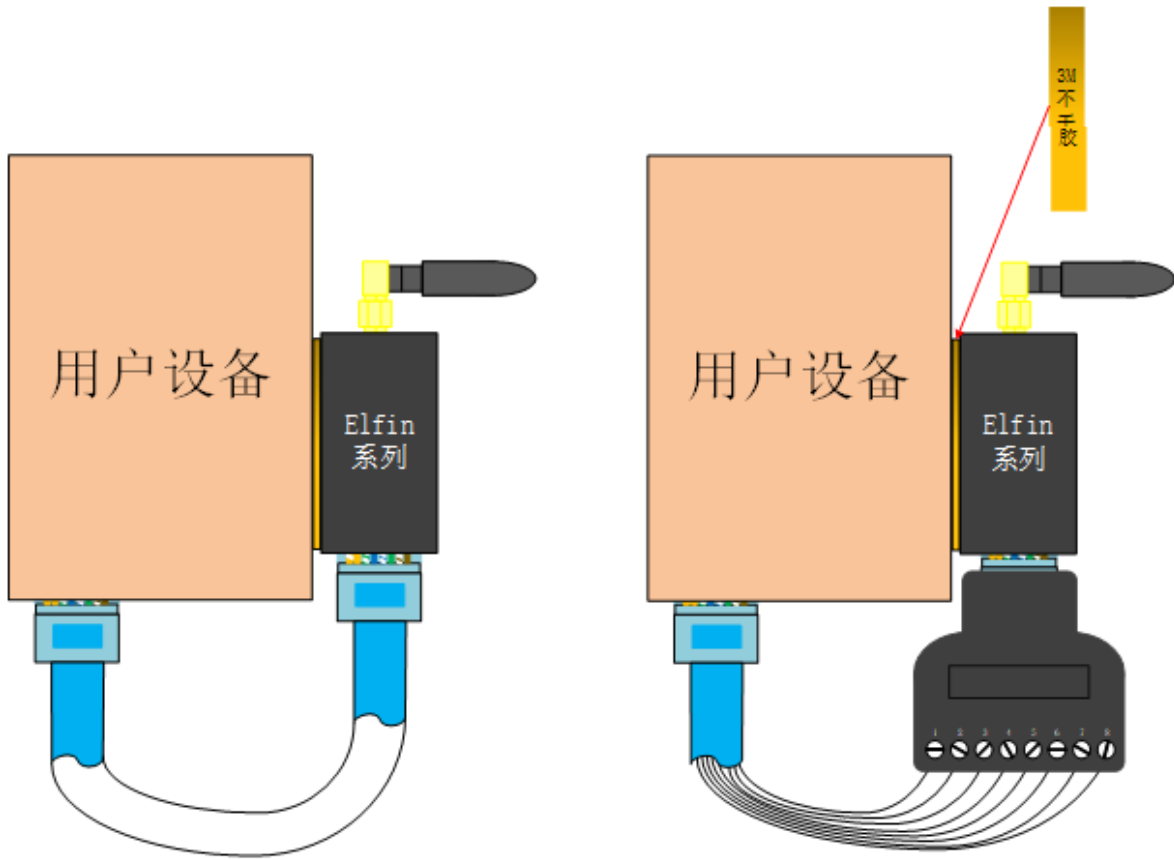


Figure 18. Product Installation

2.15. EVK

EVK include one Elfin device, one RJ45 Connector and one screw driver.



Figure 19. EVK Package

2.16. Product Order Information

Based on customers detailed requirements, we provide different configuration Elfin-EG4X, details as below:

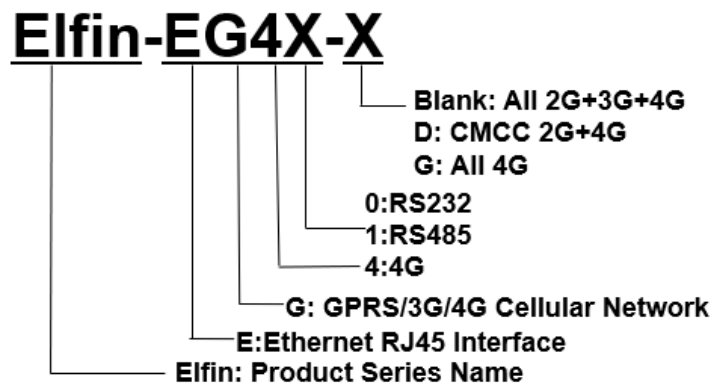


Figure 20. Elfin-EG4X Product Order Information

APPENDIX A: CONTACT INFORMATION

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For more information about us, please visit our website: www.iotworkshop.com

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