Elfin-EE1X

RS232/RS485 to Ethernet

User Manual

V 1.4

Overview of Characteristic

- ✧ **Cortex-M3 MCU with 2MB Flash and 128KB SRAM**
- ✧ **Use FreeRTOS Operation System**
- ✧ **Support TCP/IP/Telnet /Modbus TCP Protocol**
- ✧ **Support RS232/RS485 To 10/100M Ethernet Conversion, Serial Speed Up to 460800 bps**
- ✧ **Support 10/100M Ethernet Auto-Negotiation**
- ✧ **Support Webpage Easy Configuration or PC IOTService Tool**
- ✧ **Support Security Protocol Such As TLS/AES/DES3**
- ✧ **Support Heartbeat and Resister Packet Function**
- ✧ **Support Webpage OTA Wireless Upgrade**
- ✧ **Support Industrial Temperature: -40 to +85˚ C**
- ✧ **Wide DC Input 5~18VDC**
  - ■ **Elfin-EE10, Elfin-EE11: 5~18VDC**
  - ■ **Elfin-EE10A, Elfin-EE11A: 9～36VDC**

- **Size: 61 x 26 x 17.8 mm (L x W x H)**

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HISTORY

Ed. V1.0	07-27-2018	First Version
Ed. V1.1	08-17-2018	Fix pin description.
Ed. V1.2	09-18-2018	Fix LED description. Add more attachedment description.
Ed. V1.3	04-19-2019	Update cable.

1. PRODUCT OVERVIEW

1.1. General Description

The Elfin-EE1X provides a RS232/RS485 interface to Ethernet connectivity to web enable any device. The Elfin-EE1X integrate TCP/IP controller, memory, 10/100M Ethernet transceiver, high-speed serial port and integrates a fully developed TCP/IP network stack and FreeRTOS OS. Elfin-EE1X also includes an embedded web server used to remotely configure, monitor, or troubleshoot the attached device.

The Elfin-EE1X using highly integrated hardware and software platform, it has been optimized for all kinds of applications in the industrial control, smart grid, personal medical application and remote control that have lower data rates, and transmit or receive data on an infrequent basis.

The Elfin-EE1X integrates all serial to Ethernet functionality with 61 x 26 x 17.8mm size.

1.2. Device Paremeters

Table1. Elfin-EE1X Technical Specifications

Item	Parameters
System Information	
Processor/Frequency	Cortex-M3/96MHz
Flash/SDRAM	2MB/128KB
Operating System	FreeRTOS
Ethernet Port	
Port Number	1
Interface Standard	10/100 Base-T Auto-Negotiation
Transformer	Integrated
Network Protocol	IP，TCP，UDP，DHCP，DNS，HTTP Server/Client，ARP, AutoIP，ICMP， Telnet, NTP, Modbus TCP
Security Protocol	TLS 1.2 AES 128Bit DES3
Serial Port	
Port Number	EE10: 1 RS232 EE11: 1 RS485
Data Bits	5,6,7,8
Stop Bit	1,2
Check Bit	None, Even, Odd
Baud Rate	TTL: 600 bps~460800 bps
Flow Control	No Flow Control Software Xon/ Xoff flow control
Software	
Web Pages	Http Web Configuration

	Customization of HTTP Web Pages
Configuration	Web CLI XML import Telnet IOTService PC Software UART Fast Config
Firmware Upgrade	Webpage, IOTService Tools
Basic Parameter	
Size	61 x 26 x 17.8 mm
Operating Temp.	-40 ~ 85°C
Storage Temp.	-45 ~ 105°C, 5 ~ 95% RH（no condensation）
Input Voltage	Elfin-EE10, Elfin-EE11: 5~18VDC Elfin-EE10A, Elfin-EE11A: 9～36VDC
Working Current	~100mA
Power	<400mW

1.3. Key Application

The Elfin-EE1X device connects serial device to Ethernet networks using the TCP/IP protocol:

- Remote equipment monitoring
- Asset tracking and telemetry
- Security Application
- Industrial sensors and controls
- Medical devices
- ATM machines
- Data collection devices
- Universal Power Supply (UPS) management units
- Telecommunications equipment
- Data display devices
- Handheld instruments
- Modems
- Time/attendance clocks and terminals

2. HARDWARE INTRODUCTION

The Elfin-EE1X unit is a complete solution for serial port device connecting to network. This powerful device supports a 10/100BASE-T Ethernet connection, a reliable and proven operating system stored in flash memory, an embedded web server, a full TCP/IP protocol stack, and standards-based (AES) encryption.

Through Ethernet cable connect router with Elfin-EE1X serial server for data transfer, which makes the data transformation very simple.

Figure 1. Elfin-EE10 Appearance

Figure 2. Elfin-EE11 Appearance

2.1. Elfin-EE10 Pins Definition

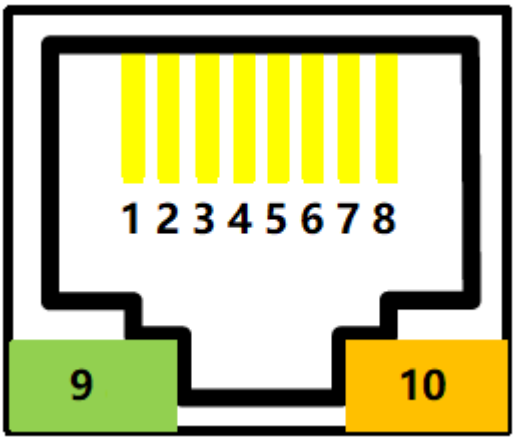

Figure 3. Elfin-EE10 RJ45 Interface Pin

Table2. Elfin-EE10 Interface Definition

Pin	Description	Net Name	Signal Type	Comment
1	Ethernet TX+	TX+	O	Connect to Standard Ethernet RJ45 PIN1
2	Ethernet TX-	TX-	O	Connect to Standard Ethernet RJ45 PIN2
3	Ethernet RX+	RX+	I	Connect to Standard Ethernet RJ45 PIN3
4	Ethernet RX-	RX-	I	Connect to Standard Ethernet RJ45 PIN6
5	UART1_TXD	UART1_TXD	O	RS232 Voltage
6	UART1_RXD	UART1_RXD	I	RS232 Voltage
7	Power VCC	VCC	Power	5～18VDC
8	Power GND	GND	Power	
9	**Green LED** Net Status	Net	O	Boot On: Power is OK. 0.3s Off -> 3s On: Ethernet connection is OK. 0.3s Off ->0.3s On: No Ethernet connection.
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.

2.2. Elfin-EE11 Pins Definition

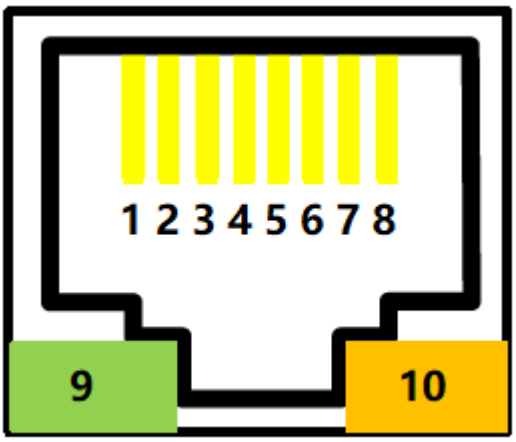

Figure 4. Elfin-EE11 RJ45 Interface Pin

Table3. Elfin-EE11 Interface Definition

Pin	Description	Net Name	Signal Type	Comment
1	Ethernet TX+	TX+	O	Connect to Standard Ethernet RJ45 PIN1
2	Ethernet TX-	TX-	O	Connect to Standard Ethernet RJ45 PIN2
3	Ethernet RX+	RX+	I	Connect to Standard Ethernet RJ45 PIN3
4	Ethernet RX-	RX-	I	Connect to Standard Ethernet RJ45 PIN6
5	UART1_TXD	RS485_A+	IO	RS485 A+
6	UART1_RXD	RS485_B-	IO	RS485 B-
7	Power VCC	VCC	Power	5～18VDC
8	Power GND	GND	Power	
9	**Green LED** Net Status	Net	O	On:Bootup OK. 0.3s Off -> 3s On: Ethernet connection is OK. 0.3s Off ->0.3s On: No Ethernet connection.
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; I/O: Digital I/O; Power—Power Supply

2.3. RS232 Interface

Device RS232 does not support hardware flow control. The physical voltage is about ±7V.

2.4. 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 RS485 device. The cable maximum length is 1200 meters. Need to add 120Ohm terminal resistor for over 300 meters.

2.5. Mechanical Size

The dimensions of Elfin-EE1X are defined as following picture (mm):

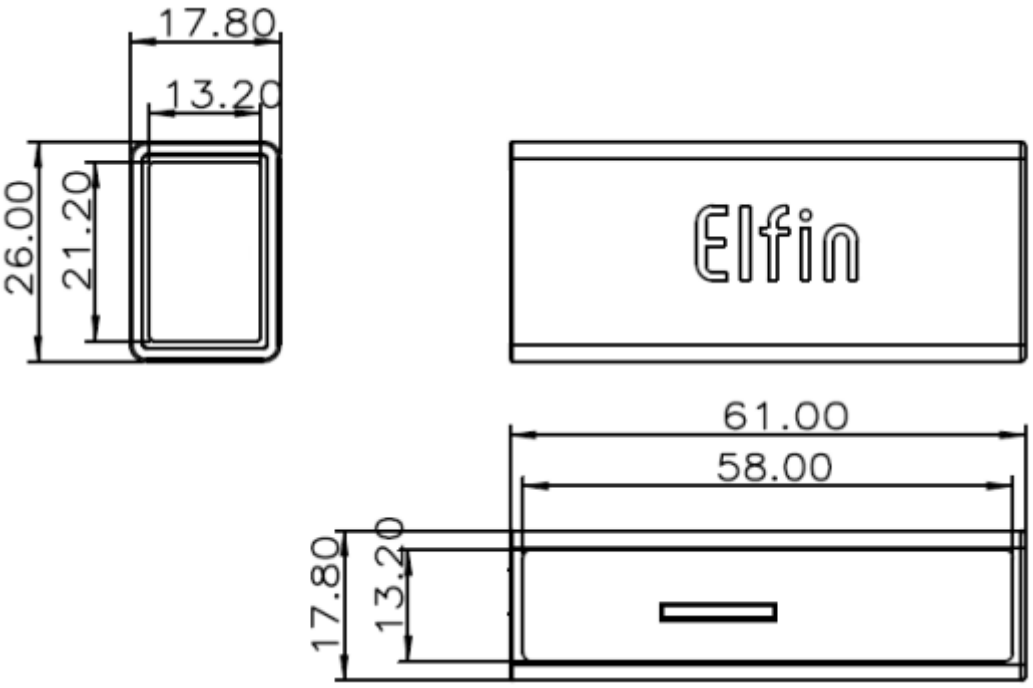

Figure 5. Elfin-EE1X Mechanical Dimension

2.6. RJ45 8PIN Connector

RJ45 8PIN Connector Type Order: 10810001001

Figure 6. RJ45 8PIN Connector

Figure 7. EE10 +8PIN Connector

Figure 8. EE11+8PIN Connector

2.7. EE10 Interface Conversion Cable

Figure 9. Interface Conversion Cable

May also make cable according to the following picture.

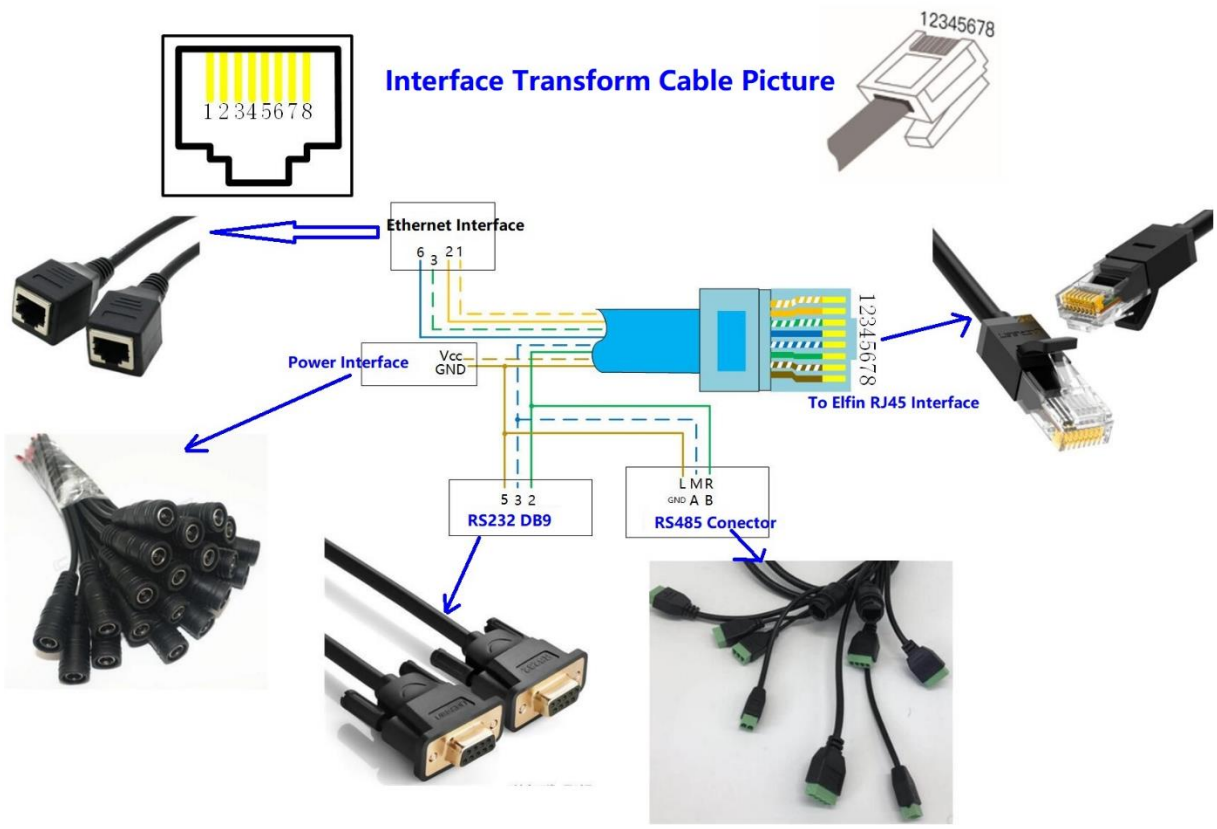

Figure 10. Cable Manufacture Guide

2.8. EE11 Interface Conversion Cable

Figure 11. Interface Conversion Cable

2.9. Fixed Bracket

Bracket Type Order: 10810003001

Figure 12. Fixed Bracket

2.10. Rail Bracket

Bracket Type Order: 10703000003

Figure 13. Rail Bracket

2.11. Bracket

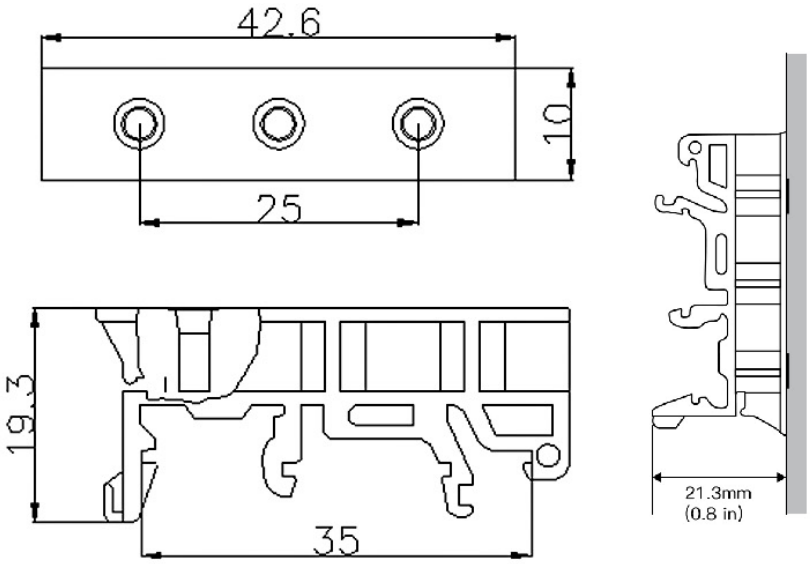

Figure 14. Bracket Size

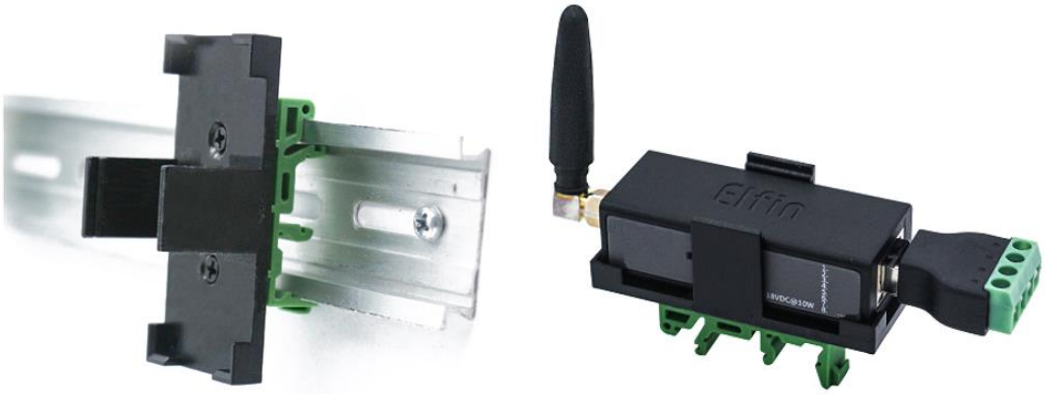

Figure 15. Bracket Install Picture

2.12. Product Installation

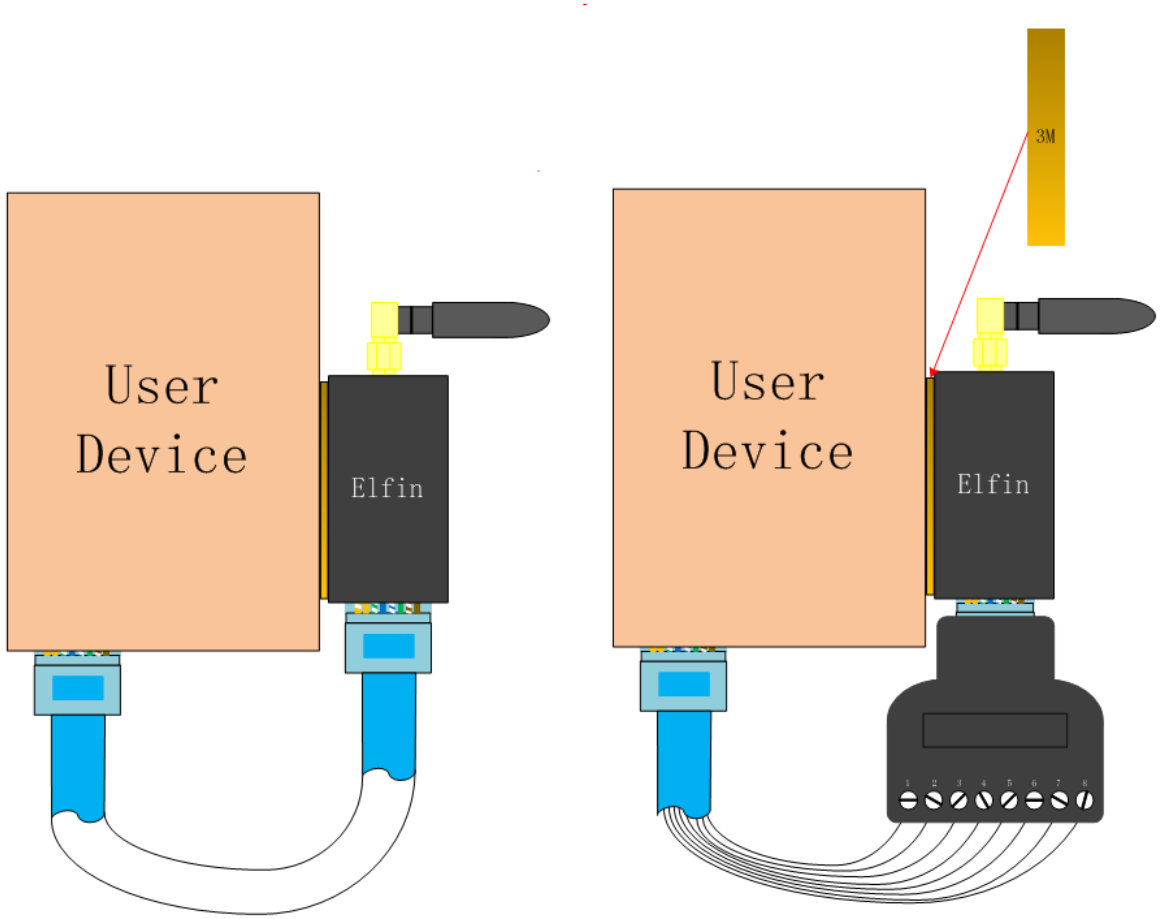

Figure 16. Product Installation

2.13. EVK

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

Figure 17. EVK Package

2.14. Order Information

Base on customer detailed requirement, Elfin-EE1X provide different configuration version, Details as below:

Function / Model	Power Input	Type	UART	UART Number
Elfin-EE10	5~18VDC	Ethernet	RS232	1
Elfin-EE11	5~18VDC	Ethernet	RS485	1
Elfin-EE10A	5~36VDC	Ethernet	RS232	1
Elfin-EE11A	5~36VDC	Ethernet	RS485	1

Figure 18. Elfin-EE1X Product Order Information

APPENDIX A: CONTACT INFORMATION

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