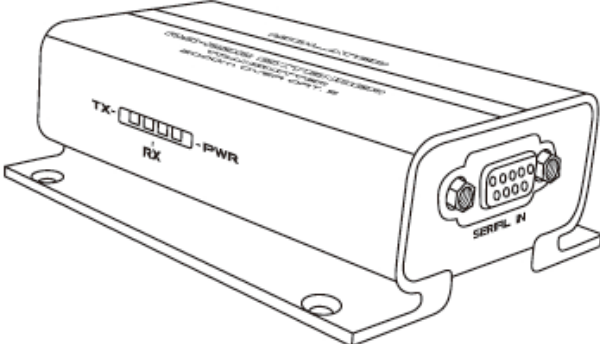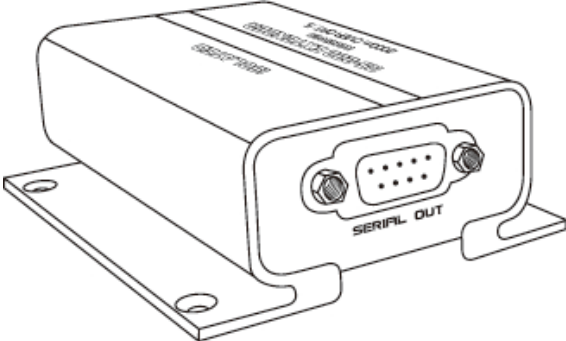# Industrially Isolated
RS-232 Extender Over Cat.5 (2000m)

User's Manual

SEC-112i

1. Introduction

The Industrially Isolated RS-232 Cat.5 extender allows you to increase the distance of your RS-232 Serial connection with 2.5kV isolation by up to 2000 meters (6600 feet). It features 2.5kV isolation to ensure sensitive controls and devices for long extending serial signal won't be damaged. It provides full-duplex remote access and control of any RS-232 protocol device. Perfects for use in industrial monitoring and control, POS, security, medical, and traffic flow applications, the RS-232 Cat.5 extender maintains the RS-232 standard with support for data transfer rates of up to 921.6kbps.

2. Features

- Compatible with all RS-232 protocols; Supports full-duplex data communication
- Extends RS-232 peripherals up to 2000 meters upon transfer rate at 115kbps. (1700m upon 230kbps; 700m upon 921.6kbps)
- Supports transfer rate up to 921.6kbps.
- Supports ±15kV (air), ±8kV (contact) ESD protection; Isolated ground loops
- Supports 40A (5/50ns) & Peak Pulse Power 250 W (8/20 us) Surge and Transient spikes protection
- Supports 2.5kV Isolation
- Rugged & cambered Aluminum shell and wall mountable

3. Specifications

Model No.		SEC-112i		DB-9M Pin Assignment	
Chip		Intersil			
Unit Category		Transmitter	Receiver	Pin No.	Definition
Connector	Host	DB-9 Female	x	1	
	Output	RJ-45 Female	x	2	RXD
	Input	x	RJ-45 Female	3	TXD
	Device	x	DB-9 Male	4	DTR
Interconnection Cable		Standard Cat.5 / 5e / 6		5	GND
LED		3 (TX / RX / PWR)	3 (TX / RX / PWR)	6	DSR
Power Mode		DC5V		7	RTS
Operating/Storage Temperature		-40 to 85°C (-40 to 185°F)		8	CTS
Housing		Aluminum		9	
Dimension (L x W x H)		90 x 73 x 31mm	90 x 73 x 31mm		

4. Package Contents
- Transmitter
- Receiver
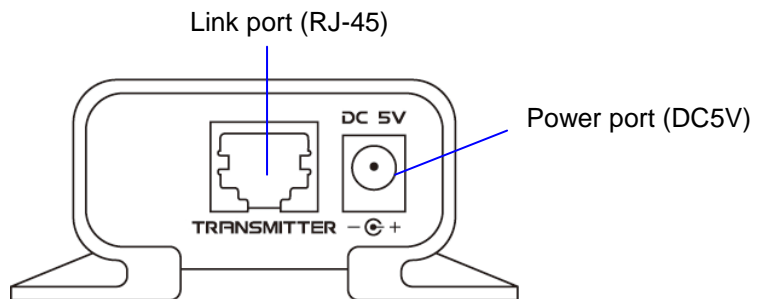- 5VDC Power adapter x 2
- Rack mountable screws
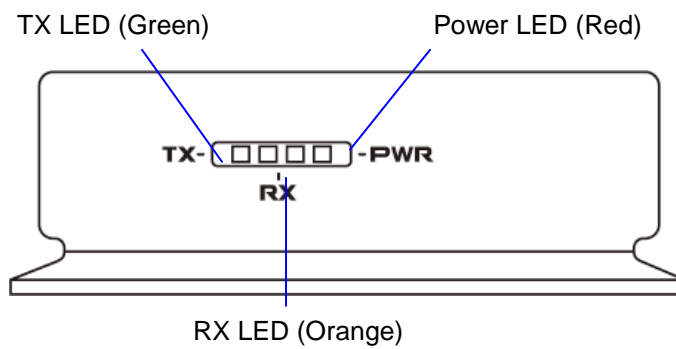
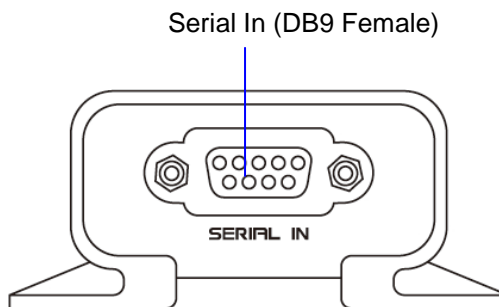# 5. Physical Diagram

5.1 Transmitter (Local Unit)

Top view

ISOLATED

RS-232 EXTENDER
TRANSMITTER
2000m OVER CAT. 5

Front view

Link port (RJ-45)

DC 5V

Power port (DC5V)

TRANSMITTER ─⊝─◉─⊕

Side view

TX LED (Green)

Power LED (Red)

TX-☐☐☐☐-PWR

RX

RX LED (Orange)

Rear view

Serial In (DB9 Female)

SERIAL IN

5.2 Receiver (Remote Unit)
Top view

ISOLATED

RS-232 EXTENDER
RECEIVER
2000m OVER CAT. 5

Front view

Link port (RJ-45)

DC 5V

Power port (DC5V)

RECEIVER
−Ⓒ+

Side view

TX LED (Green)

Power LED (Red)

TX-▢▢▢▢-PWR
RX

RX LED (Orange)

Rear view

Serial Out (DB9 Male)

SERIAL OUT
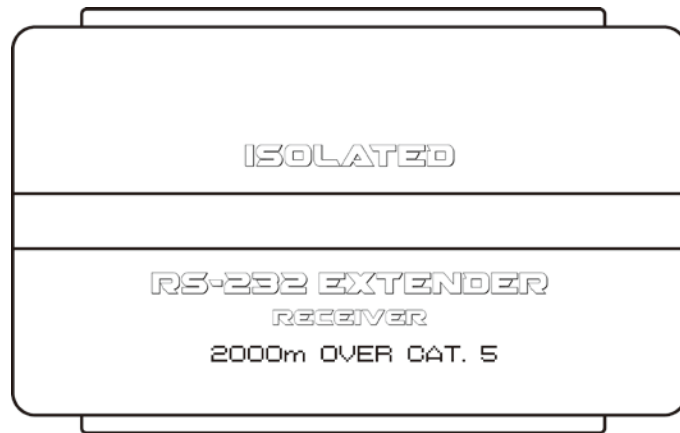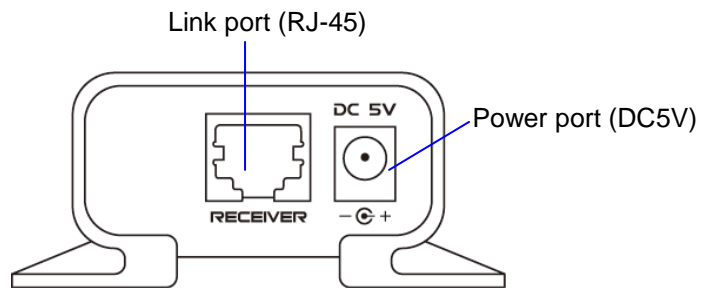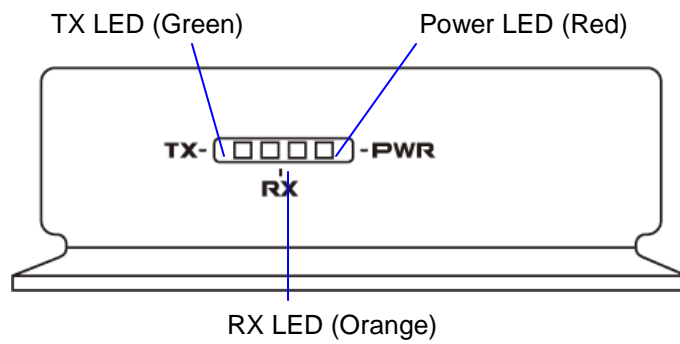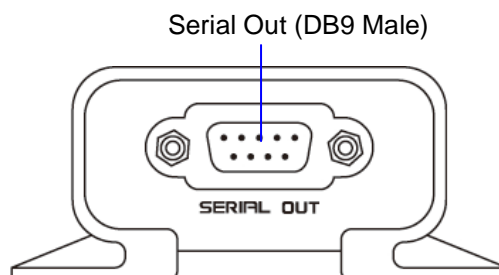
6. Connecting
6.1 Typical Application

PC

DB9 Serial RS-232 Cable

Transmitter

Cat. 5 Cable

Receiver

DB9 Serial RS-232 Cable

Serial Device
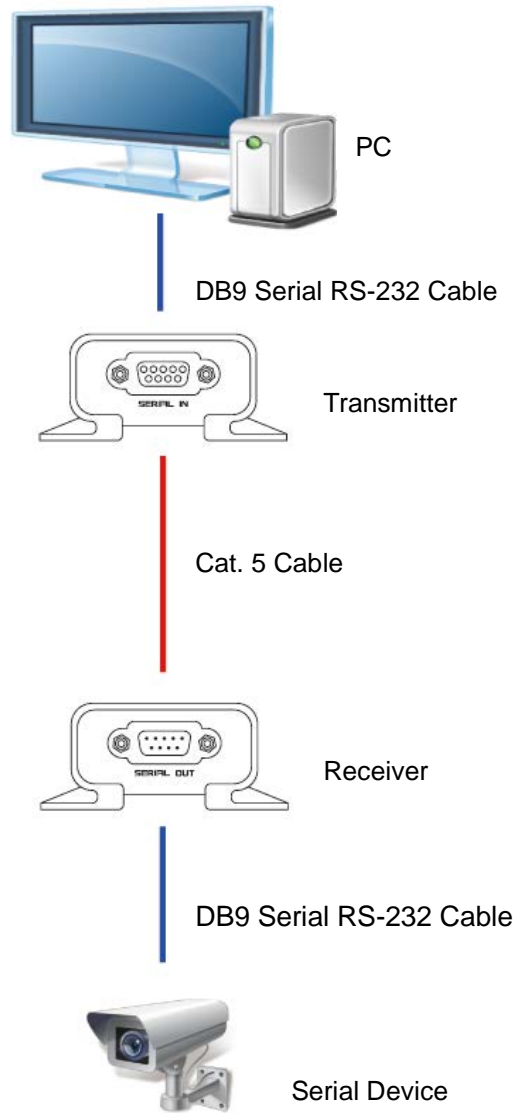
6.2 Installing the Transmitter & Receiver

6.2.1. Preparing for Installation
Follow these steps to prepare your site:

1. Determine where the host computer will be located and set up the computer.
2. Determine where you want to locate the remote Serial device(s).
3. The Isolated serial extender supports a maximum distance of 6600 ft (2000m). Make sure that Cat.5 cabling is installed, with Cat. 5 outlets located near both computer and Serial device. The total length of this cable, including patch cords, must not be longer than 6600 ft (2000m).
Note: If the Cat. 5 cabling is extended over 2000m, the transmission would be affected by signal attenuation and lower the transfer rate under 115kbps.

6.2.2. Installing the Transmitter (Local Unit)

1. Plug the DB9 serial RS-232 cable into the transmitter (Serial In) and connect an available DB9 port of computer.
2. Plug the 5VDC power adapter into the transmitter, and AC plug into the power receptacle.
3. Power LED indicator lights on.
4. Plug one end of the Cat. 5 cable into the Link port (RJ-45) on the transmitter. (Please see **Category cable wiring**)

6.2.3. Installing the Receiver (Remote Unit)

1. Plug the other end of the Cat. 5 cable into the Link port (RJ-45) on the receiver.
2. Plug the 5VDC power adapter into the receiver, and AC plug into the power receptacle.
3. Power LED indicator lights on.
4. Connect the serial device through DB9 serial RS-232 cable into the DB9 port (Serial Out) of receiver.

LED		Status
Definition	Color	
Power	Red	The 5VDC power adapter is plugged in
TX	Green	Either transmitter or receiver is sending data.
RX	Orange	Either transmitter or receiver is receiving data.

7. Category cable wiring

Take precaution selecting the Cat. 5 wires before connecting; use a cable tester to check the wires are correctly terminated. (Incorrect Termination may cause damage to the receiver unit). Recommend to use T568B wiring as shown below

T568B Wiring
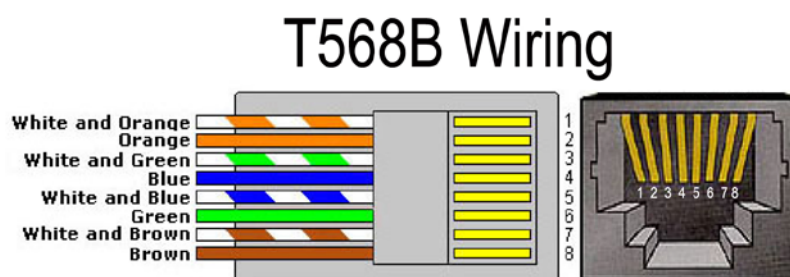
8. Troubleshooting

Table -1 provides troubleshooting tips. The solutions are arranged in the order in which they should be executed in most situations. If you are unable to resolve the problem after following these instructions, contact your distributor for further support.

Table -1 Troubleshooting tips

Problem	Cause	Solution
The serial device is attached but not functioning.	• The serial device requires drivers that were not installed. • The serial device might be failed.	1. Install the required serial device driver on the computer operating system before plug in the serial device to the receiver. Access your serial device's manufacturer's Web site for detail info. 2. In the Ports (COM & LPT) section of Device Manager, check if the serial device is listed.
TX LED on transmitter or receiver is off.	• The receiver is not working with power. • The transmitter is not working with power. • The link cable is failed or damaged. • The extender is not working.	1. Make sure the supplied AC power adapters are properly connected to the transmitter or receiver. 2. Make sure the Cat. 5 cabling between transmitter and receiver is properly installed or replace the link cable. 3. Check that the power adapter is connected and working.
RX LED on transmitter or receiver is off.	• The receiver is not working with power. • The transmitter is not working with power. • The link cable is failed or damaged. • The extender is not working.	1. Make sure the supplied AC power adapters are properly connected to the transmitter or receiver. 2. Make sure the Cat. 5 cabling between transmitter and receiver is properly installed or replace the link cable. 3. Check that the power adapter is connected and working.

Regulatory Compliance

Disclaimer

Information in this document is subject to change without notice. The manufacturer does not make any representations or warranties (implied or otherwise) regarding the accuracy and completeness of this document and shall in no event be liable for any loss of profit or any other commercial damage, including but not limited to special, incidental, consequential, or other damages.

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CE Certification

This equipment complies with the requirements relating to electromagnetic compatibility.
It has been manufactured under the scope of RoHS compliance.

FCC Compliance Statement

This equipment generates and uses radio frequency and may cause interference to radio and television reception if not installed and used properly. This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

You are cautioned that changes or modification not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation

WEEE (Waste of Electrical and Electronic Equipment), Recycling of Electronic Products

In 2006 the European Union introduced regulations (WEEE) for the collection and recycling of all waste electrical and electronic equipment. It is no longer allowable to simply throw away electrical and electronic equipment. Instead, these products must enter the recycling process.

Each individual EU member state has implemented the WEEE regulations into national law in slightly different ways. Please follow your national law when you want to dispose or any electrical or electronic products. More details can be obtained from your national WEEE recycling agency.