

EB45e Quick Start Guide



Ethernet E-Series Radios

1.0 Introduction

Welcome to the Quick Start Guide for the EB45e Base/ Repeater Ethernet Radio. This guide provides step-by-step instructions for 5W and 20W versions, with simple explanations to get you up-and-running. For detailed information, please refer to the Ethernet E-Series User Manual.

Contents

1.0 Introduction	1
2.0 Mounting and Environmental Considerations	2
3.0 Connecting Antennas and RF Feeders.....	3
4.0 Communication Ports.....	4
5.0 Power Supply Requirements.....	5
6.0 TVIEW+ Management Suite.....	6
7.0 Optimising the Antenna for VSWR.....	6
8.0 LED Indicators, Tests and Factory Default.....	6
9.0 Bar Graph Indicators.....	7
10.0 Support Options	8

Related Products and Documentation

- Remote Data Radio ER45e
- Hot Standby Base Station EH45e
- Duplexers
- TVIEW+ Management Suite
- E Series Ethernet User Manual

Fig 1



2.0 Mounting and Environmental Considerations

The EB45e Base Station is housed in a 2RU 19" rack enclosure. The 4 mounting holes on the front panel should be used to secure the unit to the rack.

The radio should be mounted in a clean and dry location, protected from water, excessive dust, corrosive fumes, extremes of temperature and direct sunlight. Please allow sufficient passive or active ventilation to allow the radio modem's heatsink to operate efficiently.

All permanent connections are made at the rear of the unit. This includes: Power, Antenna, Data Port, LAN Port, Digital I/O and System Port. The front panel has an additional System Port connection point for easy access. (see Fig 1 for details)

2.1 Typical Radio Setup

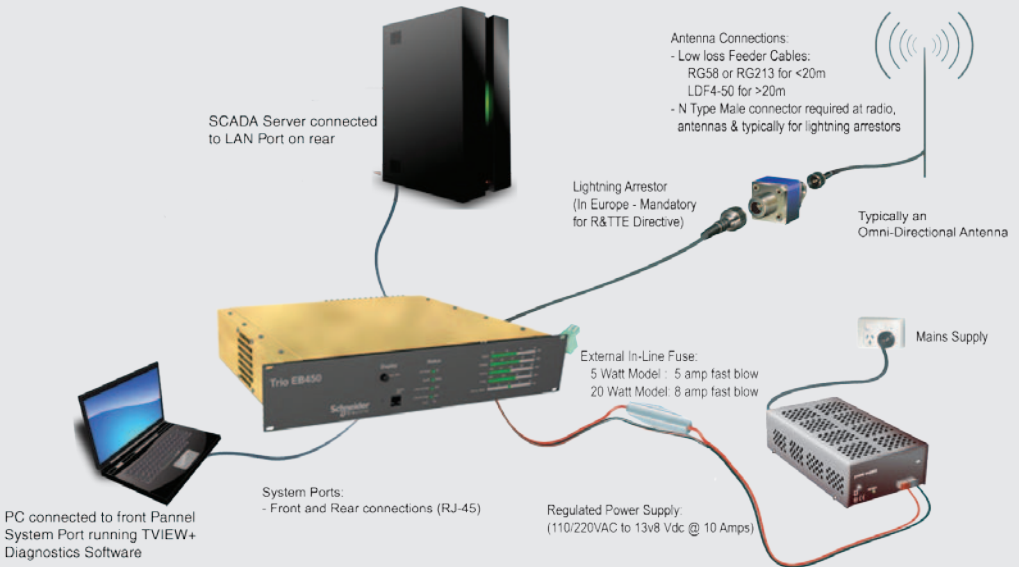


Fig 2

2.2 Compliance Notices

Do not operate the EB45e at a higher TX output power than allowed. Consult with your local regulatory authority if you are unsure of the maximum limit for TX power.

2.3 Full Duplex Considerations

The EB45e is designed for continuous full duplex transmission. An automatic thermostatically controlled fan will operate whenever the internal temperature exceeds 40 degrees Celsius and turn off again when the temperature goes below 35 degrees Celsius.

2.4 External Duplexer Considerations

The EB45e is normally supplied with separate Tx and Rx ports for connection to an external duplexing system. Depending on the frequency band of operation and the Tx/Rx frequency split, internal band reject duplexers are available. At least 75dB of duplexer isolation is required.

3.0 Connecting Antennas and RF Feeders

The RF antenna system should be installed in accordance with the manufacturers notes.

The RF connectors used on the EB45e radio are N Type female connectors. Always use good quality low loss feeder cable, selected according to the length of the cable run. Ensure all external connections are waterproofed using amalgamating tape and then cover with PVC tape.

Preset directional antennas in the required direction using a compass, GPS, or visual alignment and ensure correct polarisation (vertical or horizontal) or RSSI output.



Fig 3

4.0 Communication Ports

4.1 System Port - RJ45

The System Port (available at the front and rear of the unit) is a multi-function interface used for:

- Programming / Configuration of the radio
- Remote Diagnostics connections

To access these functions use the standard TVIEW+ E&K cable (RJ45 Cable and RJ45 to DB9 Adaptor).

Special user pinouts:

- External PTT (Pin 8) - Provides a manual PTT override facility for enabling the transmitter. For testing this can be activated by connecting PTT (Pin 8) to Gnd (Pin 7).

System Port	Description	DB9 Female
Pin 1	System port data out (RS232)	Pin 2
Pin 2	System port data in (RS232)	Pin 3
Pin 3	Factory Use Only - Do not connect	No Connection
Pin 4	Shutdown	No Connection
Pin 5	Programming Use Only (Grounded)	Pin 5
Pin 6	Factory Use Only - Do not connect	No Connection
Pin 7	Ground	Pin 5
Pin 8	External PTT	No Connection

Fig 4



Fig 5

Warning: The EB45e will go into shutdown mode if LAN connectivity is applied into the system port. Take the cable out to recover from shutdown mode.

4.2 Serial RS232 Port - Data Port

The Data Port is wired as a RS232 DCE, configurable for no handshaking (3-wire) interface, or for hardware or software (X-on/X-off) flow control. In most systems flow control is not required, in which case only 3 wires need to be connected between the radio and the application device.

4.3 Typical pins used:

- Pin 2 (RxD) - data output from the radio modem,
- Pin 3 (TxD) - data input to the radio modem,
- Pin 5 (SG) - signal ground.

Refer to the Ethernet E-Series User Manual for further details of other cable configurations.

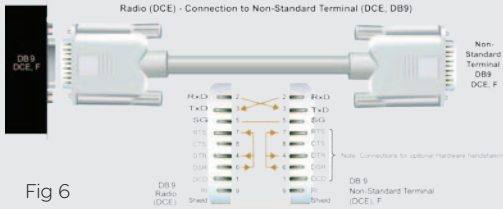


Fig 6

RS232 Connector Pin outs (DCE) for Data Port, Female DB9

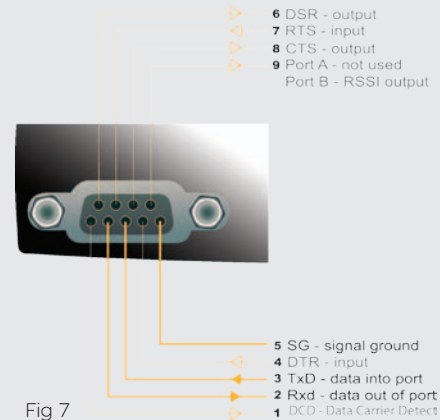


Fig 7

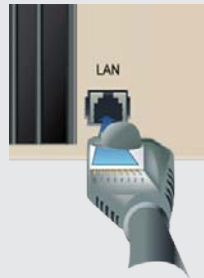
The radio modem can be configured to transmit whenever an external RTS signal (Pin 7) is applied to one (or either) user ports. (To simulate an external RTS input, loop pins 6 to 7). To operate in these modes, the radio must be configured via the programming software.

CAUTION

Caution: When the radio is configured to transmit continuously, ensure an RF load is present BEFORE applying power to the unit.

4.4 Local Area Network port - LAN

The LAN port is a 10/100 Base-T compliant port using an RJ-45 connector. These ports support both TIA/EIA-568-A & B wiring as they have Auto MDI/MDIX Auto Sensing. This means you can use both straight-through and cross-over type CAT-5 or better patch cables. All RJ45 connectors must utilize mating plugs that include an integral locking tab.



Pin	Pair	Wire	Color
1	3	tip	white/green
2	3	ring	green
3	2	tip	white/orange
4	1	ring	blue
5	1	tip	white/blue
6	2	ring	orange
7	4	tip	white/brown
8	4	ring	brown

If termination of a cable is required, then the following wiring arrangement should be followed (Compliant with TIA/EIA-568-A). Note: Maximum differential voltage : 5v, 50mA max through each differential pair.

Note: If 100-BaseT connection speed is required, CAT-6 Shielded cable should be used for installation to comply with ETSI EMC directives.

5.0 Power Supply and Protection

The EB45e radio modem is designed and calibrated to operate from a 13.8Vdc regulated supply, but will operate from 11-16 volts (filtered) DC.

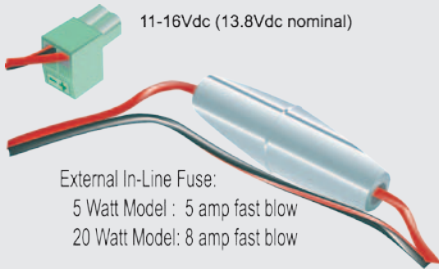
The current requirement is typically 350mA in receive mode, and will vary in transmit mode according to RF output power level (typically 2.5 amps for the 5W model and typically 5 amps for the 20W model).

NOTE: Allow an additional 80mA (approx.) for LED bar graph indicators

CAUTION

Caution: There is NO internal replaceable fuse, and therefore the radio modem MUST be externally fused with the fuse holder provided.

Fig 7



The radio is designed to self protect, and will blow the external fuse if the voltage exceeds 16Vdc, or if reverse polarity is applied.

The radio modem can also be damaged if there is any potential difference between the chassis-ground, RS232 signal ground, power (-) input, or antenna coaxial shield. Before connecting any wiring, ensure all components are earthed to a common ground point (please pay particular attention to 24V PLC power systems where converters are used).

Connect the antenna, RS 232 plug and LAN plug BEFORE applying power to the unit.

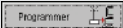

Lastly, before inserting the power plug, please re-check that the polarity and voltage on the DC power plug is correct using a multimeter.


6.0 TVIEW+ Management Suite - Radio Configuration

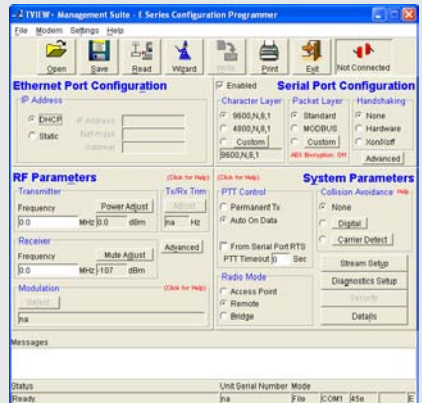
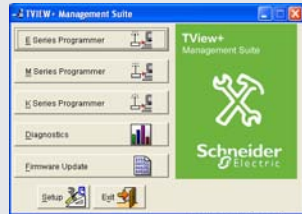
This TVIEW+ Management Suite allows a number of features including: Configuration (Local - serial, or Remote - over-the-air), Remote Diagnostics Facilities and Front Panel Firmware Upgrades.

The configuration wizard can be used to provide Quick Start generic templates for the type of system architecture you wish to employ.

Example: Local configuration session -

- 1 Attach the programming cable from the PC to the System Port of the radio (see fig 4 & 5)
- 2 Launch TVIEW & Select "Programmer"
- 3 Select "Read" and Local Unit, OK. 
- 4 Change the configuration as required 
- 5 Select "Write" the parameters back to the radio

Refer to the Ethernet E-Series User Manual for detailed operation of advanced features. 

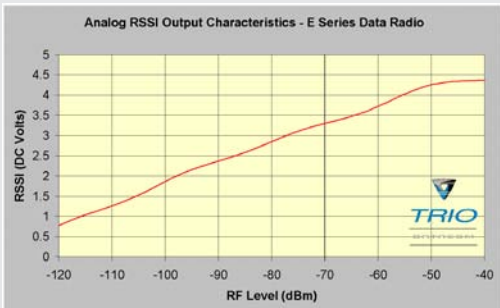
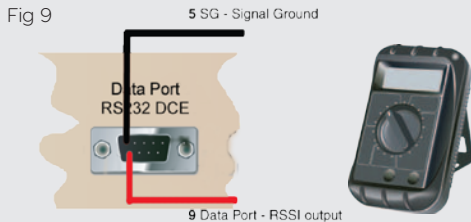


7.0 Optimising the Antenna for VSWR and best RX signal

Once the unit is operational, it is important to optimise the antenna tuning.

In the case of a directional antenna, it will be necessary to align the antenna for the best received signal.

This can be done by using the (0-5Vdc) output on Pin 9 (see fig 9) of the Data Port to indicate signal strength (RSSI). This voltage can be converted to dBm using the chart below.



VSWR testing is achieved by activating the radio's transmitter using a system port PTT plug as described in Section 4.1

To test VSWR you can use Trio diagnostics software or you can use an external meter.

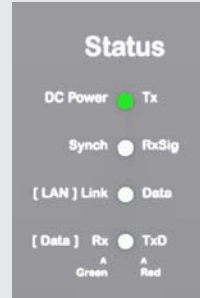
VSWR levels should not exceed 2:1 and is typically 1.5:1

Refer to the Ethernet E-Series User Manual for further details of VSWR testing.

8.0 LED Indicators & Test outputs

8.1 Radio is Powered

If all the LEDs are off, no power is reaching the radio modem. Successful power-up is indicated by the "DC Power" LED indicating a continuous (healthy) GREEN state after a Sequences of Green DC power flashes which is indicating modem boot up. This can take up to 45 seconds. Note: This LED is turned RED when the transmitter is active.



8.2 Voltage Error

If the voltage is too high (>16Vdc) or too low (<1.0Vdc), an error message will be displayed on the status LED's by illuminating all four (4) LED's RED followed by a single GREEN illumination on the DC power LED.

8.3 LED Error indications

The EB45e can Indicate errors using various LED sequences. If your EB45e appears to be indicating an error, refer to the Ethernet E-Series user manual for a detailed list of error indications.

8.4 Factory Default

To Perform a factory default on an EB45e you must:

- Depress the Display ON/OFF button until the front panel Bar Graph LED indicators begin to flash. (Approx 15 seconds)
- Release the Display ON/OFF button for at least 1 Second.
- Depress the Display ON/OFF button again until the front panel Bar Graph LED indicators stop flashing. (Approx 15 seconds)

8.4 Received Signal Indicator

The "RX/SYNC" LED indicates the state of the receiver.

If the LED is off, no signal is being received.

A RED indication shows that an RF carrier is being received, but no data stream can be decoded.

This may indicate the presence of interference, or another user on the channel.

A GREEN indication shows that the modem is locked and synchronised to the incoming signal, and has excellent Bit Error Rate (BER). Any losses of synchronisation (BER errors) are shown as a visible RED flicker of the LED.

Note: This might only be apparent on a PTMP slave when only receiving.



8.5 Data Flow "breakout" LEDs

LAN Port - The "Active/Link" LED is used to indicate the state of the LAN port. If the LED is OFF, there is no activity at all on the LAN port. A GREEN indication shows an established Ethernet link between the device connected and the ethernet base port. The LED will flash AMBER to indicate Ethernet data traffic is occurring.

Data Port - The Rx/D/TxD LED indicates data flow in/out of the data port. Data being sent to the port for transmission is indicated by a RED flash, and data being received over the air and then sent from the port is shown as a GREEN flash. If both instances occur at the same time it is indicated with an AMBER flash. The User ports are Full duplex.

9.0 Bar Graph Indicators

The bar graph indicators on the front panel provide variable information regarding the performance of the Base Station. To enable / disable the bar graph display depress the Display ON / OFF button. The display will turn off automatically after 5 minutes.

DC Supply:

Indicates the supply input voltage at the exciter module. Typically 13.8Vdc.

Indication: <10Vdc no LED's on, 10-10.9Vdc LED's RED, 11-15.6Vdc all LED's GREEN, >=15.7Vdc last LED RED.

Tx Power:

Indicates forward RF power output as measured at the TX antenna port. Typically +37dBm. (will vary for 20W option).

Indication: <20dBm no LED's on, 20-40.6dBm (11.5W) LED's GREEN, >=40.7dBm last LED RED. (will vary for 20W option).

Tx Drive:

Indicates exciter drive level. Typically +20dBm.

Indication: <10dBm no LED's on, 10.0-25.9dBm LED's GREEN, >=26.0dBm last LED RED.

Rx Sig:

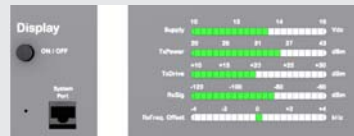
Indicates receive signal strength. Typically -85 to -65dBm.

Indication: <-120dBm no LED's on, -120 to -110.1dBm LED's RED, >=-110dBm LED's GREEN.

RxFreq. Offset:

Indicates offset of receiver AFC - useful in determining frequency drift or some interferences. Typically 0kHz.

Indication: Single GREEN LED to indicate current value, <-3.6kHz or >+3.6kHz LED is RED. No signal, all LED's OFF. Note: 5 second peak hold circuitry.



9.1 Test Mode

The Bar Graph indicators have a Test Mode, which cycles all LED's for correct operation (before returning to their normal operation). To activate this mode, simply depress the Display ON / OFF button while applying power to the unit.

E-mail Technical Support

When e-mailing questions to our support staff, make sure you tell us the exact model number (and serial number if possible) of the Trio equipment you are working with. Include as much detail as possible about the situation, and any tests that you have done which may help us to better understand the issue. If possible, please include your telephone contact information should we wish to further clarify any issues.

Technical Support: Europe, Africa, Middle East

Available: Monday to Friday 8:30am - 5:30pm
Central Europe Standard Time
Direct Worldwide: +31 (71) 579 1650
Email: euro-support@controlmicrosystems.com

Technical Support: The Americas

Available: Monday to Friday 8:00am - 6:30pm
Eastern Standard Time
Toll free within North America: 1-888-226-6876
Direct Worldwide: +1 (613) 591-1943
Email: technicalsupport@controlmicrosystems.com

Technical Support: Asia Pacific

Available: Monday to Friday 8:30am - 5:30pm Australian
Eastern Standard Time
Direct Worldwide: +61 3 8773 0100
Email: support@triodatacom.com



Issue: 10-11

Information subject to change without notice.
© Copyright 2011 Trio Datacom Pty Ltd. All rights reserved.