

Trio E-Series

Licensed Ethernet and Serial Data Radios

ER45e | ER450





Trio E-Series advanced digital data radios provide both Ethernet and serial communications for the most complex and demanding applications in Point-to-Point and Point-to-Multipoint (Multiple Address Radio) Telemetry and remote SCADA systems.

Features such as ChannelShare™, MultiStream™, optional full-duplex operation, and flexible user configuration, together with powerful remote diagnostics and Network Management, make the E-Series the complete licensed radio solution that works with all leading host systems and remote equipment.

Available in Ethernet+serial (ER45e) and serial-only (ER450) versions, the highly successful E-Series is equally suitable for use with the latest SCADA technology as it is for providing a smooth transition from serial-based infrastructure to IP/Ethernet.

Product Data Sheet Trio ER45e | ER450

Specifications



Trio ER45e

Radio

Frequency Range	370-520MHz (various frequency sub-bands available)
Frequency Splits	Various Tx/Rx frequency splits - configurable
Channel Selection	Synthesizer, 6.25kHz channel step
Channel Spacing	12.5 or 25kHz
Frequency Accuracy	±1ppm, -30 to +60°C (-22 to 140°F) ambient
Aging	<= 1ppm/annum
Radio Modes	Simplex, Half duplex or Full duplex (Refer to model number matrix for full duplex model number)
Configuration	All configuration via Windows based software

Transmitter

Tx Power	0.03 to 5W (+15 to +37dBm) +/- 1dB configurable with over-temperature and high VSWR protection
Modulation	Configurable narrow band digitally filtered binary GMSK or 4 level FSK
Tx Keyup Time	<1ms
Timeout Timer	Configurable 0 to 255 seconds
Tx Spurious	<= -37dBm
PTT Control	Auto (Data) / RTS line on Data Port / System Port Override

Receiver

Sensitivity	-118dBm for 12 dB SINAD
Selectivity	Better than 60dB
Intermodulation	Better than 70dB
Spurious Response	Better than 70dB
AFC Tracking	Digital receiver frequency tracking
Mute	Configurable digital mute

Connections

Serial Data Port	1 x RS232 DB9 female DCE. 300-38,400 bps asynchronous
Serial Data Port Flow Control	Configurable hardware / software / 3-wire interface
Serial Data Port DCD Control	Configurable DCD operation : activated on RF carrier or from user data output
System Port	1 x RS232 RJ45, 19,200bps, for configuration and diagnostics
Ethernet Port	1 x RJ45: 10/100 Mbps (auto-MDIX sensing) compliant with IEEE 802.3
Antenna	1 x N female bulkhead (Half-Duplex) or separate N (Tx) and SMA (Rx) connectors (Full Duplex)
Power	2-pin locking, mating connector supplied
LED Display	Multimode Indicators for Pwr, Tx, Rx, Sync, TxD and RxD data LEDs and LAN LEDs

Ethernet

Ethernet Protocols	Ethernet/IP (including UDP, TCP, DHCP, ARP, ICMP, STP, IGMP, SNMP & TFPT)
Ethernet Repeating	Automatic and Self Learning Peer to Peer repeating
Ethernet Traffic Filtering	Configurable: No Filtering / Unicast Traffic & ARP Only / Unicast Traffic Only
Compression	Automatic Ethernet data compression
Terminal Server	Legacy RS-232 serial support via embedded terminal server (UDP/TCP)
DHCP Modes	Auto and Manual
SNMP	SNMP V1/V2c, RFC1213-compliant and Trio Ethernet E-Series radio diagnostics parameters (including alarm generation via traps)
Modbus Gateway	Configurable Modbus TCP/IP to Modbus Serial Gateway

Specifications continue on the next page

Product Data Sheet Trio ER45e | ER450

Specifications



Trio ER45e

Modem

RF Channel Data Rate#	<ul style="list-style-type: none"> • Radio Model F01 : FCC (IC) 9600bps (12.5kHz) & 19200bps (12.5kHz) North America • Radio Model F02 : 19200bps (25kHz) • Radio Model E01 : ETSI 4800bps (12.5kHz) & 9600bps (12.5kHz) Europe • Radio Model A01 : ACMA 4800bps (12.5kHz) / 9600bps (12.5kHz) Australia • Radio Model A02 : ACMA 19200bps (25kHz) Australia
Typical Bit Error Rate#	< 1x10 ⁻⁶ @ -111dBm (4800bps), < 1x10 ⁻⁶ @ -110dBm (9600bps), < 1x10 ⁻⁶ @ -106dBm (19,200 bps)
Operating Modes	Base (Access Point), Remote & Repeater
Channelshare™	Trio's unique supervisory collision avoidance system
MultiStream™	Simultaneous data stream delivery allows for multiple vendor devices/protocols to be transported on the one radio network
Data Turnaround Time	<10mS
Firmware	Local and over-the-air flash-based firmware upgradeable patches with support for broadcast updates

Security

Encryption*	128-bit AES
Password Protection	Password protected configuration sessions

Diagnostics

Diagnostics Overview	<ul style="list-style-type: none"> • TView+ configuration, network management and diagnostic Windows GUI software • Network-wide operation from any remote terminal • Non intrusive protocol – runs simultaneously with the application • SNMP access to radio diagnostics • Serial & Ethernet (eDiags) connectivity for diagnostics and configuration • Over-the-air re-configuration of user parameters. • Storage of data error and channel occupancy statistics • In-built Error Rate testing capabilities • Diagnostics parameters available <ul style="list-style-type: none"> • Transmitter Power • Received Signal Strength • DC Supply Voltage • Received Frequency Error • Radio Temperature • VSWR
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General

Operating Temperature Range	-30°C to +70°C (-22°F to +158°F)
Power Supply	10 to 30 Vdc (13.8Vdc nominal)
Transmit Current	750mA nominal @ 1W, 1600mA nominal @5W
Receive Current	<180mA nominal @ 13.8Vdc
Shutdown Mode	External control, < 10mA
Housing & Dimensions	Rugged die-cast, 170 x 150 x 42mm (6.7 x 5.9 x 1.65in.), with mounting plate 190 x 150 x 47mm (7.5 x 5.9 x 1.85in.)
Mounting	Fitted mounting plate (standard) or DIN Rail mounting (optional)
Weight	1.3kg (2.9lbs.)
Warranty	3 years on parts and labor

Approvals and Certifications

Europe (ETSI)	ETSI EN300113, EN301489, EN60950
FCC	FCC PART 15, PART 90
Industry Canada	IC RS119, ICES-001
Australia	ACMA AS4295-1995 (Data)
Hazardous Locations	CSA Class I, Division II, Groups (A,B,C,D) for Hazardous Locations ANSI/UL equivalent)

* Export restrictions may apply. Contact your local representative for more details.

Local radio regulatory requirements may dictate the actual RF channel data rate and Bit Error Rates available. Contact your local representative for more details

Note: Not all product features are available in every mode of operation.

Disclaimer: Schneider Electric reserves the right to change product specifications. For more information visit www.schneider-electric.com.

Product Data Sheet Trio ER45e | ER450 Specifications



Trio ER450

Radio

Frequency Range	370-520MHz (various sub-frequency bands available)
Frequency Splits	Various Tx/Rx frequency splits - configurable
Channel Selection	Dual synthesizer, 6.25kHz channel step
Channel Spacing	12.5 or 25kHz
Frequency Accuracy	±1ppm, -30 to +60°C (-22 to 140°F) ambient
Aging	<= 1ppm/annum
Radio Modes	Simplex, Half duplex or Full duplex (Refer to model number matrix for full duplex model number)
Configuration	All configuration via Windows based software

Transmitter

Tx Power	0.03 to 5W (+15 to +37dBm) +/- 1dB configurable with over-temperature and high VSWR protection
Modulation	Configurable narrow band digitally filtered binary GMSK or 4 level FSK
Tx Keyup Time	<1mS
Timeout Timer	Configurable 0 to 255 seconds
Tx Spurious	<= -37dBm
PTT Control	Auto (Data) / RTS line (Port A or B) / System Port Override

Receiver

Sensitivity	-118dBm for 12dB SINAD
Selectivity	Better than 60dB
Intermodulation	Better than 70dB
Spurious Response	Better than 70dB
AFC Tracking	Digital receiver frequency tracking
Mute	Configurable digital mute

Connections

Serial Data Port A	RS232 DB9 female DCE. 300-57,600bps asynchronous
Serial Data Port B	RS232 DB9 female DCE. 300-38,400bps asynchronous
Serial Data Port Flow Control	Configurable hardware / software / 3-wire interface
Serial Data Port DCD Control	Configurable DCD operation : activated on RF carrier or from user data output
System Port	1 x RS232 RJ45: 19,200bps, for configuration and diagnostics
Antenna	1 x N female bulkhead (Half-Duplex) or separate N (Tx) and SMA (Rx) connectors (Full Duplex)
Power	2-pin locking, mating connector supplied
LED Display	Multimode Indicators for Pwr, Tx, Rx, Sync, TxD and RxD data LEDs (for both port A and B)

Specifications continue on the next page

Product Data Sheet Trio ER45e | ER450

Specifications



Trio ER450

Modem

RF Channel Data Rate#	<ul style="list-style-type: none"> • Radio Model F01 : FCC (IC) 9600bps (12.5kHz) & 19200bps (12.5kHz) North America • Radio Model F02 : 19200bps (25kHz) • Radio Model E01 : ETSI 4800bps (12.5kHz) & 9600bps (12.5kHz) Europe • Radio Model A01 : ACMA 4800bps (12.5kHz) / 9600bps (12.5kHz) Australia • Radio Model A02 : ACMA 19200bps (25kHz) Australia
Typical Bit Error Rate#	< 1x10 ⁻⁶ @ -111dBm (4800bps), < 1x10 ⁻⁶ @ -110dBm (9600bps), < 1x10 ⁻⁶ @ -106dBm (19,200bps)
Operating Modes	Base, remote, repeater or store n' forward
Data Buffer	16kbyte of on-board RAM
Channelshare™	Trio's unique supervisory collision avoidance system
Multistream™	Simultaneous data stream delivery allows for multiple vendor devices/protocols to be transported on the one radio network
Data Turnaround Time	<10mS
Firmware	Local flash-based firmware updates

Security

Encryption*	128-bit AES
Password Protection	Password protected configuration sessions

Diagnostics

Diagnostics Overview	<ul style="list-style-type: none"> • TView+ configuration, network management and diagnostic Windows GUI software • Network-wide operation from any remote terminal • Non intrusive protocol – runs simultaneously with the application • Over-the-air re-configuration of user parameters. • Storage of data error and channel occupancy statistics • In-built Error Rate testing capabilities • Diagnostics parameters available <ul style="list-style-type: none"> • Transmitter Power • Received Signal Strength • DC Supply Voltage • Received Frequency Error • Radio Temperature • VSWR
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Operating Temperature Range	-30°C to +70°C (-22°F to +158°F)
Power Supply	13.8Vdc nominal (10-16Vdc)
Transmit Current	750mA nominal @ 1W, 1600mA nominal @5W
Receive Current	<125mA nominal @ 13.8Vdc
Shutdown Mode	External control, < 10mA
Housing & Dimensions	Rugged die-cast, 170 x 150 x 42mm (6.7 x 5.9 x 1.65in.), with mounting plate 190 x 150 x 47mm (7.5 x 5.9 x 1.85in.)
Mounting	Fitted mounting plate (standard) or DIN Rail mounting (optional)
Weight	1.27kg (2.8lbs.)
Warranty	3 years on parts and labor

Approvals and Certifications

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Hazardous Locations	CSA Class I, Division II, Groups (A,B,C,D) for Hazardous Locations ANSI/UL equivalent)

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Product Data Sheet Trio ER45e | ER450

Model Code

	TBURER45x-aabbbcd represents the part number matrix
Model	Trio Radio ER450 & ER45e
TBURE	E-Series
Code	Select: Unit Type
R	Remote Station with full enclosure
Code	Select: Generic Frequency Band
45	370 to 518 MHz
Code	Select: Data Ports
0	Two serial ports
E	One Ethernet & one serial port
Code	Frequency (400MHz bands) – Frequencies to be specified at time of order
46	370 to 388 MHz (Tx & Rx)
47	380 to 396 MHz (Tx & Rx)
48	395 to 406 MHz (Tx & Rx)
50	403 to 417 MHz (Tx & Rx)
63	406 to 421 MHz (Tx & Rx)
64	415 to 430 MHz (Tx & Rx)
56	418 to 435 MHz (Tx & Rx)
57	428 to 444 MHz (Tx & Rx)
55	436 to 450 MHz (Tx & Rx)
51	450 to 465 MHz (Tx & Rx)
65	455 to 470 MHz (Tx & Rx)
52	465 to 480 MHz (Tx & Rx)
53	480 to 494 MHz (Tx & Rx)
60	490 to 500 MHz (Tx & Rx)
54	505 to 518 MHz (Tx & Rx)
A6	370 to 400 MHz (Tx & Rx)
B3	395 to 426 MHz (Tx & Rx)
B4	413 to 447 MHz (Tx & Rx)
B5	433 to 450 MHz (Tx & Rx)
C1	436 to 467 MHz (Tx & Rx)
C2	450 to 487 MHz (Tx & Rx)
C3	473 to 518 MHz (Tx & Rx)
Code	Select: RF Channel Data Rate & Bandwidth (Internal Modem)
F01	FCC (IC) 9600 / 19k2bps, 12.5kHz – provides M-Series 003 compatability
F02	FCC (IC) 19k2bps, 25kHz – Not for sale in North America
E01	ETSI 9600bps, 12.5kHz – provides M-Series 004 compatability
A01	ACMA 4800 / 9600bps, 12.5kHz – provides M-Series 001/002 compatability
A02	ACMA 9600 / 19K2bps, 25kHz
Code	Select: Encryption (subject to country of use)
D	No Encryption
X	No Encryption, full duplex option - requires external duplexer
E	Encryption*
Y	Encryption*, full duplex option - requires external duplexer

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Dimensions

Code	Select: Hazardous Area Approvals
H	Hazardous Environment Class 1 Div 2 Groups A, B, C & D
Code	Hot Standby Configuration
0	Not used

Example: TBURER450-A6F01EH0 specifies: Trio ER450 remote station, two serial ports, frequencies to be specified at time of order, FCC (IC) 9600/19k2bps, 12.5kHz, Encryption, Class 1 Div 2.

Communications Standards:

- FCC – Federal Communications Commission (USA)
- IC – Industry Canada
- ETSI – European Telecommunication Standards Institute
- ACMA – Australian Communications and Media Authority

* Export restrictions may apply. Contact your local representative for more details.

Note: Some radio models may not be available in your country. Local and regulatory conditions may determine the performance and suitability of the radio in different countries. It is the responsibility of the buyer to ensure the radio model meets the regulatory conditions required. Contact your local Schneider Electric sales office for more details.

