

Trio E-Series

Licensed Ethernet and Serial
Hot Standby Radios

EH45e | EH450





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.

Base/Repeater stations are key elements in radio communication systems and are subject to high duty-cycle operational stresses. Trio EH45e, with Ethernet+serial interfaces, and EH450 with serial-only interfaces, are redundant 1+1 Hot Standby full duplex digital radio Base/ Repeater stations with automatic changeover specially designed for installation at critical sites and to complement Trio ER45e and ER450 remote digital data radios by reliably delivering continuous duty operation at maximum rated output power in ambient temperatures up to +60°C (140°F).

A major feature of the EH45x and EH450 is their modular design comprising two identical EB45e or EB450 Base/ Repeater station units linked to a central, monitoring and change-over Hot Standby Controller (HSC). Any of these units may be taken out for maintenance without the need for any system down time. Automatic change over is triggered by out-of-tolerance (alarm) conditions in either user data throughput or radio hardware operating parameters.

The EH450 may be user-configured for operation in either E-Series or M-Series modes.

Product Data Sheet Trio EH450 & EH45e Specifications



Trio EH450

Radio

Frequency Range	380-520MHz (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	Full Duplex
Duplexer	Optional external duplexer available for single antenna operation
Configuration	All configuration via Windows based software

Transmitter

Tx Power	<ul style="list-style-type: none"> 5W Model : 1W to 5W (+30 to +37dBm) +/- 1dB configurable with over-temperature and high VSWR protection 20W Model : 5W to 20W (+30 to +43dBm) +/- 1dB configurable with over-temperature and high VSWR protection
Modulation	Configurable narrow band digitally filtered binary GMSK or 4 level FSK
Tx Keyup Time	< 2mS
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	Programmable digital mute

Connections

(for each Base within the Hot Standby configuration)

Serial Data Port A	RS232 DB9 female DCE. 600-57,600bps 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	2 x RS232 RJ45 (Front & Rear): 19,200bps, for configuration and diagnostics
Digital I/O	2 Inputs monitored by TView+ Diagnostics Software, 2 outputs user-configurable by TView+ Diagnostics Software
Antenna	2 x N female bulkhead (separate Tx and Rx ports)
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) Bargraphs Indicators for Supply Volts, Tx Power, Drive Power, Receive Signal Strength and Frequency Error

Specifications continue on the next page

Product Data Sheet Trio EH450 & EH45e Specifications



Trio EH450

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
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

Hot Standby Controller

Change-over control	Manual (forced) / automatic / remote (software driven)
Alarm Monitoring	Tx Power Failure / Receiver Failure / Received Signal Frequency Error / Data Corruption / DC Power Supply Fail

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
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General

Operating Temperature Range	-30°C to +60°C (-22°F to +140°F)
Power Supply	13.8Vdc nominal (11-16Vdc)
Transmit Current	<ul style="list-style-type: none"> • 5W Version: 2.0A nominal @ 1W, 3.2A nominal @ 5W • 20W Version: 3.4A nominal @ 5W, 5.4A nominal @ 20W
Receive Current	< 1A nominal @ 13.8Vdc
Dimensions	Hot Standby is configured using 2 x EB45x (19" 2 RU each) plus 1 x Hot Standby Controller (19" 1 RU each) for a total of 19" 5RU's <ul style="list-style-type: none"> • 5W: 19" 5 RU rack mount 485 x 225 x 420mm including heat-sink (19 x 8.9 x 16.5in.) • 20W: 19" 5 RU rack mount 485 x 225 x 446 mm including heat-sink (19 x 8.9 x 17.5in.)
Weight	12.7kg (28lbs) excluding optional duplexer

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)

* 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.triodatacom.com.

Product Data Sheet Trio EH450 & EH45e

Specifications



Trio EH45e

Radio

Frequency Range	380-520MHz (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	Full Duplex
Duplexer	Optional external duplexer available for single antenna operation
Configuration	All configuration via Windows based software

Transmitter

Tx Power	<ul style="list-style-type: none"> 5W Model : 1W to 5W (+30 to +37dBm) +/- 1dB configurable with over-temperature and high VSWR protection 20W Model : 5W to 20W (+30 to +43dBm) +/- 1dB configurable with over-temperature and high VSWR protection
Modulation	Configurable narrow band digitally filtered binary GMSK or 4 level FSK
Tx Keyup Time	< 2mS
Timeout Timer	Configurable 0 to 255 seconds
Tx Spurious	<= -37dBm
PTT Control	Auto (Data) / RTS line (Port A or B) / System Port Override

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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	Programmable digital mute

Connections (for each Base within the Hot Standby configuration)

Serial Data Port	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	2 x RS232 RJ45 (Front & Rear): 19,200bps, for configuration and diagnostics
Ethernet Port	1 x RJ45: 10/100 Mbps (auto-MDIX sensing) compliant with IEEE 802.3
Digital I/O	2 Inputs monitored by TView+ Diagnostics Software, 2 outputs user-configurable by TView+ Diagnostics Software
Antenna	2 x N female bulkhead (separate Tx and Rx ports)
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) Bargraphs Indicators for Supply Volts, Tx Power, Drive Power, Receive Signal Strength and Frequency Error

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/V2 RFC 1213-compliant
Modbus Gateway	Configurable Modbus TCP/IP to Modbus Serial Gateway

Specifications continue on the next page

Product Data Sheet Trio EH450 & EH45e

Specifications



Trio EH45e

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Operating Modes	Base, 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

Hot Standby Controller

Change-over control	Manual (forced) / automatic / remote (software driven)
Alarm Monitoring	Tx Power Failure / Receiver Failure / Received Signal Frequency Error / Data Corruption / DC Power Supply Fail

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Power Supply	13.8Vdc nominal (11-16Vdc)
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Receive Current	< 1A nominal @ 13.8Vdc
Dimensions	Hot Standby is configured using 2 x EB45x (19" 2 RU each) plus 1 x Hot Standby Controller (19" 1 RU each) for a total of 19" 5RU's <ul style="list-style-type: none"> • 5W: 19" 5 RU rack mount 485 x 225 x 420mm including heat-sink (19 x 8.9 x 16.5in.) • 20W: 19" 5 RU rack mount 485 x 225 x 446 mm including heat-sink (19 x 8.9 x 17.5in.)
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Product Data Sheet Trio EH450 & EH45e

Model Code

	EH45x-aabbb-cde represents the part number matrix
Model	Trio Radio ER450 & ER45e
E	E-Series
Code	Select: Unit Type
H	Hot Standby Base / Repeater
Code	Select: Generic Frequency Band
45	370 to 518 MHz
Code	Select: Data Ports
O	Two serial ports
E	One Ethernet & one serial port
Code	Frequency (400MHz bands)
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) - Frequencies to be specified at time of order
B3	395 to 426 MHz (Tx & Rx) - Frequencies to be specified at time of order
B4	413 to 447 MHz (Tx & Rx) - Frequencies to be specified at time of order
B5	433 to 450 MHz (Tx & Rx) - Frequencies to be specified at time of order
C1	436 to 467 MHz (Tx & Rx) - Frequencies to be specified at time of order
C2	450 to 487 MHz (Tx & Rx) - Frequencies to be specified at time of order
C3	473 to 518 MHz (Tx & Rx) - Frequencies to be specified at time of order
Code	Select: RF Channel Data Rate & Bandwidth (Internal Modem)
F01	FCC (IC) 9600 / 19k2bps, 12.5kHz – provides M-Series compatability
F02	FCC (IC) 19k2bps, 25kHz – Not for sale in North America
E01	ETSI 9600bps, 12.5kHz
A01	ACMA 4800 / 9600bps, 12.5kHz - provides M-Series compatability
A02	ACMA 9600 / 19k2bps, 25kHz
Code	Select: Diagnostics & Encryption
D	Diagnostics Only (No Encryption)
E	Diagnostics & Encryption*
Code	Select: Options
0	Separate Tx & Rx Antenna Ports
A	20W RF Power Output
Code	Hot Standby Configuration
A	Separate Tx & Rx Antenna ports with RF switching via Hot Standby Controller
B	Dual Redundant External Duplexers (not included) with no RF switching via Hot Standby Controller

Example: EH450-51F01-E0A specifies: Trio EH450 hot standby base / repeater, two serial ports, 450 to 465MHz (Tx & Rx) band, FCC (IC) 9600/19k2bps, 12.5kHz, Diagnostics & Encryption, separate Tx & Rx Ports

Contact your local sales office for accessories

* Export restrictions may apply. Contact factory for details.

Product Data Sheet Trio EH450 & EH45e Dimensions

