Trio E to Trio Q Product Migration Guide

Introduction

Reasons for End of Life
A product can reach the end of its marketing life for a number of reasons: evolving market demands, technology innovation and development that drives change in the product, or the product reaches a stage where it’s been replaced by enhanced technology.

The Trio E has reached the end of the product life cycle due to the development of a compatible replacement product range - the Trio Q data radio.

Suitable Replacements
Common E data radio hardware variants are being replaced with equivalent Trio Q data radios. Suitable replacements shown are indicative only.

Products are interoperable. Application requirements should be validated before substitution.
Product References Included in End of Life

The following part number references are included within the End of Life cycle for the Trio E data radio.

<table>
<thead>
<tr>
<th>E data radio Part number references within End of Life cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBURER450-xxxxxxxxx</td>
</tr>
<tr>
<td>TBURER45e-xxxxxxxxx</td>
</tr>
<tr>
<td>TBUREB450-xxxxxxxxx</td>
</tr>
<tr>
<td>TBUREB45e-xxxxxxxxx</td>
</tr>
<tr>
<td>TBUREH450-xxxxxxxxx</td>
</tr>
<tr>
<td>TBUREH45e-xxxxxxxxx</td>
</tr>
<tr>
<td>TBUREHHSC-00x</td>
</tr>
<tr>
<td>TBURCAB-EH-HSC</td>
</tr>
<tr>
<td>TBURERFDTRAY</td>
</tr>
</tbody>
</table>

Trio Licensed Offer - Overview

<table>
<thead>
<tr>
<th>Item</th>
<th>MR450</th>
<th>QR450</th>
<th>QB450</th>
<th>QP450</th>
<th>QH450</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio Type</td>
<td>Simplex/ Half Duplex</td>
<td>Simplex/ Half Duplex</td>
<td>Full Duplex</td>
<td>Simplex/ Half Duplex</td>
<td>Full Duplex</td>
</tr>
<tr>
<td>Duty Cycle</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Max Tx Power</td>
<td>5 Watts</td>
<td>10 Watts</td>
<td>10 Watts</td>
<td>10 Watts</td>
<td>10 Watts</td>
</tr>
<tr>
<td>Ethernet Ports</td>
<td>N/A</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Serial Ports</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Power Supply</td>
<td>10-16V DC</td>
<td>10-30V DC</td>
<td>11-30V DC</td>
<td>11-30V DC</td>
<td>11-30V DC</td>
</tr>
<tr>
<td>Configuration</td>
<td>TView+</td>
<td>Web/Telnet</td>
<td>Web/Telnet</td>
<td>Web/Telnet</td>
<td>Web/Telnet</td>
</tr>
<tr>
<td>CSA Hazardous</td>
<td>Standard</td>
<td>Standard</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Typical Use</td>
<td>Remote Sites</td>
<td>Remote Sites</td>
<td>Entry Point/ Repeater</td>
<td>Entry Point/Repeater/ Any site requiring redundancy</td>
<td>Entry Point/Repeater/ Any site requiring redundancy</td>
</tr>
</tbody>
</table>

Refer to data sheets for specific details on product specifications
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Trio Q Licensed: QR450 Overview

Diagnostics & Management
- Status LEDs
- RSSI Output
- Factory Reset

RF Ports
- Up to 10W RF Power
- High VSWR Foldback
- -40 to +70 Deg C
- Over Temperature Foldback

Ethernet Ports
- 2 x 10/100 MBps
- Auto MDIX Sensing

Serial Ports
- Dual RS-232 Serial Port
- Shared on single DB-9 Connector
- Break Out cable if two ports required
- RS-485 mode supported

DC Power
- 10-30V DC
- 5W standby
- Reverse polarity tolerant (Radio limits damage)

Trio Q Licensed: QB450 Overview

Mounting Holes
- Flat Panel Mounting
- DIN Rail Mounting

RF Port
- Up to 10W RF Power
- High VSWR Foldback
- -40 to +70 Deg C
- Over Temperature Foldback

Serial Ports
- Dual RS-232 Serial Port
- Shared on single DB-9 Connector
- Break Out cable if two ports required
- RS-485 mode supported

General
- 19” 1RU Rack Mounted
- -40 to +70 deg C
- 100% duty cycle
- Full Duplex Operation

Ethernet Ports
- 3 x 10/100 MBps
- Auto MDIX Sensing

Digital Inputs/Outputs
- 3 DI / 3 DO
- Alarm Output
- Read/Write via SNMP

Status LEDs
- Status LEDs
- RSSI Output
- Factory Reset

DC Power
- 10-30V DC
- 5W standby
- Reverse polarity tolerant (Radio limits damage)
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Trio Q Licensed: Hot Standby Kit QH450

- The Hot Standby Controller monitors each base for alarms and swaps over if an alarm is detected
- Support for Hot Standby Ethernet connections
  - Configurable shared (virtual) IP address
  - Ethernet Link Monitoring
- 100% Tx duty cycle rated
  - Over -30°C to +60°C (-22°F to +140°F)
- 3 x 19” 1RU hot swappable arrangement.
- Integrated Transmitter RF relay with Receiver LNA
  - Supports multiple external duplexer or redundant antenna configurations
- Manual online base over ride switch to facilitate swap out of alternate base
- General purpose digital I/O via SNMP
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E Emulation Mode

The Trio Q is designed as a compatible range replacement for the Trio E. While operating in E Emulation mode, the Trio Q and the Trio E have the following similarities:

- RF and bit error rate performance
- General functionality and operation
- User configurable features and options
- Local and remote diagnostics and network management capability

However, there are some differences that may need to be considered, such as: standby power consumption, form factor, user interface and antenna connector arrangement and local and remote configuration.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Trio Ex450</th>
<th>Trio Ex45e</th>
<th>Trio Q in E Emulation Mode</th>
<th>Trio Q Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modem / Radio</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max Speed (bps)</td>
<td>9600 in 12.5kHz 19200 in 25kHz</td>
<td>9600 in 12.5kHz 19200 in 25kHz</td>
<td>9600 in 12.5kHz 19200 in 25kHz</td>
<td>32000 in 12.5kHz 56000 in 25kHz</td>
</tr>
<tr>
<td>RF Sensitivity/BER</td>
<td>Refer to Trio E Data Sheet</td>
<td>Refer to Trio E Data Sheet</td>
<td>Same as E data radio</td>
<td>Refer to Trio Q Data Sheet</td>
</tr>
<tr>
<td>Dynamic Speed Selection</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Standard</td>
</tr>
<tr>
<td>Collision Avoidance</td>
<td>ChannelShare</td>
<td>ChannelShare</td>
<td>ChannelShare</td>
<td>ChannelShare+</td>
</tr>
<tr>
<td>Link Layer Retries</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Standard</td>
</tr>
<tr>
<td>Max Tx Power</td>
<td>5 Watts (37dBm)</td>
<td>5 Watts (37dBm)</td>
<td>5 Watts (37dBm)</td>
<td>10 Watts (40dBm)</td>
</tr>
</tbody>
</table>

Functionality / Operation

- Embedded eDiags Server: No, Standard, Standard, Standard
- Embedded Terminal Server: No, Standard, Standard, Standard
- SNMP V1/V2 + Traps: No, Standard, Standard, Standard
- Broadcast firmware upgrades: No, Standard, Standard, Standard
- IP Compression: No, Standard, Standard, Standard
- IP Routing / Store & Forward: No, No, No, Standard
- Serial Transport: Packet Based, Packet Based, Packet Based, Encapsulated in IP/Ethernet

Configuration / Diagnostics

- Configuration Method: Local and remote TView+, Local and remote TView+ and eProg, Web/Telnet + Local Console, Web/Telnet + Local Console
- Diagnostics & NMS Method: TView+ & SNMP, TView+ & SNMP, TView+/Web/Telnet/Console & SNMP, TView+/Web/Telnet/Console & SNMP

Note 1: Not available for FCC regulatory regions
Note 2: Some options require Ethernet connectivity
Note 3: For detailed specifications, please review the product datasheets

Power Consumption

ER45x vs QR450 power consumption comparison, refer to the adjacent power consumption figures below:

<table>
<thead>
<tr>
<th>Input Power</th>
<th>ER450</th>
<th>ER45e</th>
<th>QR450</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Power (Tx Typical)</td>
<td>10.5 W @ 30dBm 22 W @ 37dBm</td>
<td>10.5 W @ 30dBm 22 W @ 37dBm</td>
<td>24 W @ 30dBm 37 W @ 37dBm 54 W @ 40dBm</td>
</tr>
<tr>
<td>Input Power (Rx/Standby Typical)</td>
<td>1.75W</td>
<td>2.5W</td>
<td>5W</td>
</tr>
</tbody>
</table>

Tx and Rx power requirements of the QR450 may need to be considered to determine correct rating of external power supply current limits, solar panel size or battery backup capacity.
Remote Hardware Overview

**ER450**
- **Serial Ports**: Two separate DB9 serial ports
- **DC Power Port**: 2 pin, screw terminal power connector
- **RF Port**: N-Type Female RF Connector
- **System Port**: Separate on-line system port

**ER45e**
- **Serial Port**: Single DB9 serial port
- **DC Power Port**: 2 pin, screw terminal power connector
- **RF Port**: N-Type Female RF Connector
- **System Port**: Separate on-line system port

**QR450**
- **Serial Ports**: Two serial ports on shared DB9 serial port
- **RF Port**: TNC Female RF Connector
- **Ethernet**: Two RJ45 Ethernet ports
- **DC Power Port**: 2 pin, screw terminal power connector with lock-in screws
To facilitate the conversion of Trio E to Trio Q, a conversion kit has been created. The conversion kit contains:

- An Trio ER45x form factor mounting bracket
- TNC(m) to N(f) RF Adapter
- A Serial adaptor cable
- A COM2 extender cable

Part number references: **TBURMNTKIT-ERQR** (ordered separately)
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Mounting Dimensions

Trio E to Q Conversion Kit

The conversion kit mounting bracket, is integrated with mounted holes for a Trio QR450 that allows for mounting in the horizontal (flat) or vertical (flat) planes. This means a Trio QR450 can be mounted in the footprint of a Trio ER45x without the need to drill new mounting holes.

**Trio E to Q Conversion Kit Bracket**

- **QR450**
  - Horizontal Orientation
  - ER45x
  - Vertical Orientation

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Configuration

The Trio E data radio is configured via a standalone software application called TView+ Management Suite. This requires a separate download/installation in order to configure the radio. When a Trio Q is operating in E Emulation mode, a serial port can be configured as a system port. This can be used as an entry point to remotely configure E/M series radios via TView+.

Q data radios provide a graphical Web User Interface (WUI) which can be accessed by a web browser to perform configuration changes. This helps to eliminate the requirement for stand-alone configuration software to be installed on a PC. Access to the WUI can be made via HTTP/HTTPS connection. Configuration changes can also be made via Telnet, SSH or via a serial console.

Diagnostics

The Trio E data radio is monitored via a standalone software application called TView+ Diagnostics (part of the TView+ Management Suite). The Q data radio, which can also be monitored via TView+ Diagnostics, comes with additional monitoring features such as: Improved SNMP alarms and embedded alarms/monitoring page within web user interface.
One aspect of configuring Trio E, includes the “modulation type” parameter, which specifies what type of over-the-air modulation to use in the transmitter/receiver.

A variety of common Trio E over-the-air modulation types are available when using a Trio Q in Trio E Emulation mode. (See table below for supported modulation types).

<table>
<thead>
<tr>
<th>E data radio Modulations</th>
<th>M-Series Modulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>9600 12.5 kHz ACA 4 Level (^1)</td>
<td>9600 25.0kHz ACA M-Series (^2)</td>
</tr>
<tr>
<td>19200 25.0 kHz ACA 4 Level (^1)</td>
<td>4800 12.5kHz ACA M-Series (^2)</td>
</tr>
<tr>
<td>9600 12.5 kHz FCC 4 Level (^2)</td>
<td>4800 25.0kHz ACA M-Series (^2)</td>
</tr>
<tr>
<td>19200 12.5 kHz FCC 4 Level (^2)</td>
<td>2400 12.5kHz ACA M-Series (^2)</td>
</tr>
<tr>
<td>19200 25.0 kHz FCC 2 Level (^2)</td>
<td>9600 12.5kHz FCC M-Series (^2)</td>
</tr>
<tr>
<td>9600 12.5 kHz ETSI 4 Level (^2)</td>
<td>4800 12.5kHz ETSI M-Series (^2)</td>
</tr>
</tbody>
</table>

Note 1: Requires firmware version 1.2.x or later
Note 2: Requires firmware version 1.3.x or later

Information

Non-Packet, Bell-202 and Trio D-Series modulations are not offered in the Trio Q. If you are using these modulations types, please speak to your sales representative regarding the last time buy opportunity for the E data radio.
To help match a Trio E product reference with a Trio Q product reference, the following items should be reviewed: Hardware Type, Frequency Band and Regional Regulatory Authority/Bandwidth. Any option can be chosen in places where ‘x’ is shown as noted below. Refer to the Trio Q data sheets for a full description of product reference codes.

- **Hardware Type**:
  - **R**: TBURER45x-xxxxxxx
  - **B**: TBUREB45x-xxxxxxx
  - **H**: TBUREH45x-xxxxxxx

- **Frequency Band**: (Where 'bb' can be:
  - 59, 63, 58, 54, 56, 57, 55, B3, 1, B4, B5, C1)

- **Regional Regulatory Authority/Bandwidth**: (F00, E00, F01, E01, F02, E02)

The table below shows some typical Trio E product references with recommended replacement Trio Q product references.

**Information**

- **Note 1**: B3 Super type lower frequency range is 395MHz, The Q data radio can only operate down to 400MHz.
- **Note 2**: C1 Super type frequency range is 436 to 467MHz, This falls between the frequency ranges of the High and Low variants of the Q data radio.
- **Note**: The E data radio frequency operating range is 380 – 518MHz, where the Q Data radio frequency operating range is 400-518MHz.

#Local country-specific regulatory requirements may determine the performance and suitability of the radio. Additional certification, homologation or importation licenses may be required. It is the responsibility of the buyer to ensure that all regulatory requirements have been satisfied. Contact your local Schneider Electric sales office for more details.
The QB450 full duplex data radio is **NOT** available for the following EB options:

- 20W Tx output power variants of the EB45x
- Internal duplexer variants of the EB45x

<table>
<thead>
<tr>
<th>E data radio Option not supported by Q</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBUREB45x-xxxxxxx1x</td>
<td>Configured for internal duplexer</td>
</tr>
<tr>
<td>TBUREB45x-xxxxxxxA</td>
<td>20W RF power output</td>
</tr>
</tbody>
</table>

**Note:** 20W RF power output was available within Australia only

### Special Note: EB Base Station Options

20W Tx output power and Internal Duplexer variants of Trio EB Base Stations are not offered in the Trio Q. Any customers using these models and who require additional or spare radios will need to purchase additional Trio E units during the last time buy process.

### Special Note: EH Hot Standby Options

The Trio Q Hot Standby Kit is available in Type A and Type B antenna configurations. There is no equivalent replacement for Type C (internal duplexer).

**Example Part number Reference:**

**TBURQH4HH-E00H1L0d**

<table>
<thead>
<tr>
<th>Q data radio Hot Standby Option</th>
<th>E data radio Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>TBUREH45x-xxxxxxxA</td>
</tr>
<tr>
<td>B</td>
<td>TBUREH45x-xxxxxxxB</td>
</tr>
</tbody>
</table>

20W Tx output power and Internal Duplexer variants of Trio EB Base Stations are not offered in the Trio Q. Any customers using these models and who require additional or spare radios will need to purchase additional Trio E units during the last time buy process.
Special Note: Full Duplex Remotes

The Trio Q offers full duplex variants in 19” rack mount form factor only (QB/QH). There is no form factor equivalent replacement for Type ‘Y’ or ‘X’ ER.

Example Part number Reference:

TBURER450-51A01YHO
TBURER450-51A01XHO

Information

Note: Type Y and X (full duplex) variants of Trio ER radios are not offered in the same form factor as Trio Q. For any Trio E option that is not covered by Trio Q, end users should consider their ongoing requirements during the Trio E data radio last time buy process.

More Information

For more information on the E data radio or Q data radio product ranges, please go to the Schneider Electric Telemetry and Remote Scada Solutions web page at:

http://www.schneider-electric.com

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