TView+ Diagnostics
User Manual

Trio Radio Diagnostics Software
E, M, K, J & Q Data Radios

TView+ Management Suite
E, M, K, J & Q data radios

Schneider Electric
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Part A – Preface

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Related Documentation

TView+ Diagnostics Quick Start Guide

Revision History

Issue: 09-14 - (September 2014) Added Q UHF
Issue: 05-17 - (May 2017) Added Q VHF

Related Products

ER450 Remote Data Radio
EB450 Base/Repeater Station
EH450 Hot Standby Base Station
ER45e Ethernet Radio
EB45e Ethernet Base Station
EH45e Hot Standby Base Station
MR450 Remote Data Radio
KR900 | KR240 Data Radio
JR900 | JR240 Ethernet Radio
QR150 | QR450 Data Radio
QB150 | QB450 Data Radio
QP150 | QP450 Data Radio
QH150 | QH450 Data Radio
Part B – TView+ Diagnostics

Introduction

This section covers the installation and operation of TView+ Diagnostics software. Version 3.25.0 onwards should be used.

Overview

The Diagnostic Controller is a Windows® based program, that can be run on a standard desktop or laptop PC.

The software runs in the 32 or 64 bit Windows environment and offers many options and configurations which are easily accessible via pop-up windows. These include group or timed polling, remote switching of duplicated base stations, viewing of data bases, logging and trending of real time parameters, etc.

The Diagnostic Controller is installed to run as a stand-alone package, or as part of the TView+ Management Suite (See E, M, J, K or Q product user Manuals for more product specific details relating to TView+ Management Suite).

TView+ facilities allow retrieval of diagnostic parameters and statistical performance indicators from each radio. This helps to provide users tools for maintenance, commissioning and system diagnosis in a single package.

The general operating parameters that can be obtained from most radio models are:

- Last RSSI level.
- Last transmitted power level.
- Receive frequency offset.
- Power supply voltage level.
- Current internal temperature.
- VSWR

TView+ creates a virtual diagnostics controller to allow radio devices to add destination addressing in order
Retrieved diagnostics are displayed on the controller’s screen in a “quick read” format of bar graphs, as well as detailed response listings.

Trio radios will only work with TView+ Diagnostics software, if the ‘Diagnostics option’ was ordered upon purchase. To check this, review the radio model number against the model number matrix within the product data sheet. The Diagnostics option is generally included with new products shipped, however, in some cases it may not be installed. It can be installed at a later stage via the configuration programmer (E & K Series only). Contact your supplier for further details.

For radios with a system port, the TView+ configuration programmer can be used to verify the diagnostics option is installed in the radio. If the diagnostics option is installed, it will be stated in the Unit Information dialogue box when the radio is “Read”.

For Ethernet radios, the model number is shown within the products web user interface.

Features

- 32/64 Bit Windows Based User Software.
- Graphical presentation.
- SCADA style features such as database, trending, networking, etc.
- Able to interrogate and display operating parameters of each radio.
- Provides performance data of Trio radio good/bad frames received, packet transmission test results, transmitted packet sizes, channel usage, etc.
- Perform statistical packet transmission test to remote Trio radios.
- Provides powerful network tools such as channel occupancy statistics, average received transmission duration, etc.
- Can be set to background poll radio system for continuous system monitoring and logging.
- Provides time/date stamped Status and event logging/reporting. A relational database is created and managed using Microsoft Jet database engine Ver3.5. The database file, which is an “mdb” file, can be accessed with external programs such as Microsoft Access.
Installation & Start-up

Programmer and Diagnostics Utilities

The TView+ Diagnostics software is normally shipped as part of the TView+ Management Suite which includes the E, M & K Series programmers. It can be downloaded from the support section of the Schneider Electric website as a zipped executable package. This user manual covers the installation as part of the TView+ Management Suite.

The installation of this Software Suite is a 2 step process.

Step 1 involves the typical installation of the TView+ Management Suite and will install the E,M & K Series Programming Software together with documentation for relevant products.

Step 2 installs the TView+ Diagnostics Software and is optional.

STEP 1: Installation - TView+ Management Suite

If a previous version of the TView+ Management Suite has been installed on your PC, un-install it via Control Panel “Add/Remove Programs”.

• Close other programs currently running.
• Place the CD-ROM in the drive on the PC. (or extract files from zip package)
• In Windows Explorer browse and double click on the file called TView+ Management Suite_Rxxx_Installer.exe
• After the installer starts follow the directions.

STEP 2: Installation - TView+ Diagnostic Software

If a previous version of the “TView+” software has been installed on your PC, un-install it via Control Panel “Add/Remove Programs”.

• Close other programs currently running.
• Place the CD-ROM in the drive on the PC. (or extract files from zip package)
• Double click on the file called setup.exe
• After the installer starts follow directions.

Diagnostics Auto Start-up (Windows)

Diagnostics can automatically start upon boot-up of Windows.

To do this, create a shortcut on your desktop with the following Location: “C:\Program Files (x86)\Trio Datacom\TViewDiagnostics\TrioWinDiags.exe” (If TView Diagnostics has been installed within a custom location, use that directory instead).

Locate the Startup folder in windows: To locate the current user’s startup folder, click on Start>All Programs and then right click on the startup folder. Choose open from the menu.

Drop the new shortcut from the desktop into this folder and restart your computer. TView Diagnostics should now load and begin group polling at Windows boot up.

TView+ Front Panel

When started the TView+ front panel appears. The larger buttons permit each of the three utilities to be started. Diagnostics will start when you click on the “Diagnostics” button.

Access to local help and an exit facility are provided by the remaining 2 buttons.
Part C – Setup Instructions

Introduction (Polled Diagnostics)

The diagnostics process is based on a series of polls being transmitted to the remote radio with each having its own unique assigned address (based on the serial number) which is factory preset.

When a diagnostic poll is received by a radio, it checks to see if it is addressed to itself, and if so, it responds with its diagnostic data back to the TView+ Diagnostics software. If it is not addressed to itself, the radio simply “passes the message on”, and does not respond to the diagnostics software. In a multi-layer system, several “pass on’s” may occur before the destination radio is reached.

The radio’s diagnostic response message is addressed to the TView+ Diagnostics software (Controller Address), and as each radio in the “chain” decodes this message it will “pass it back”, eventually the message reaches the TView+ software for processing.

The TView+ software uses a database to store each radio’s associated data (i.e. Serial number, assigned name, location, alarm detection limits, SID code address, IP Address (e-Diags only), radio pairing information (Hot Standby), status poll response data, alarm detection, etc).

The radio’s address is the serial number of the radio which is factory preset. The name is any name that the user wishes to attach to the radio. This name is then used to address the unit for access to diagnostic facilities.

Diagnostic values within responses from each radio should have boundary limits placed on them. If a value received is outside of these limits, an alarm can be detected and reported. For instance, the DC supply volts can have a lower limit of 12V, and an upper limit of 16V. Should a response value report the DC volts is at 11V DC, then TView+ will detect an alarm and report it.

A radio can be excluded from a poll sequence by removing it from the poll group. Intensive polling of a single radio is possible using the Individual polling facility.

A poll “run” can be set up. A time can be designated for the controller to poll each of the radios in the system. This may be useful for systems that have a low traffic period where diagnostics could be “skipped in”, thereby spreading the data throughput of the system more efficiently.

The screen is divided into three main scrolling sections – Status Polls, Local Alarms and Base Station Activities. The status poll section displays the current poll activity while the local alarm section displays any detected alarms. The Base Station activity section displays any changeovers that have occurred to Hot Standby Units — if no Hot Standbys are within the database, this section will remain blank.

A database is created and managed using Microsoft Jet database engine. The database file, which is an “.mdb” file, can be accessed with external programs such as Microsoft Access. Polls and detected alarms are time and date stamped and saved to the database. Database entries can be sorted and printed.

For some multi-layer systems, Stream Identifier (SID) codes can be used to route diagnostics messages to specific locations. Serial only Trio radios can be assigned a custom SID address (while SID 0 is permanently enabled).

Trio radios store packet statistics available for retrieval. The TView+ Diagnostics controller can poll for these values and calculate packet and BER rates, network efficiency, bandwidth utilisation, and radio link integrity. These network analysis features are an invaluable tool for larger networks.

Introduction (Automatic Diagnostics)

Applies to E, M (Q operating in E/M compatibility mode) & K Only.

Automatic diagnostics allows the monitoring of radios in a network without the need to generate a poll.

The data returned in automatic diagnostics is fixed in nature and includes the 5 standard parameters. Automatic diagnostics works by appending an unsolicited fixed format diagnostic data packet to the end of a user data message. Subsequently, automatic diagnostics can only work when user data is being transferred by the radio.

Automatic diagnostics can be useful where polled diagnostics could interfere with user data transfer and cause collisions. For more information on configuration of automatic diagnostics refer to the product user manual.

For automatic diagnostic messages to be processed by the TView+ software the unit should be configured in the database. Automatic diagnostic response can be identified in the “status poll” window as they are Cyan colored text.

Radio Connection

There are two methods of connecting to the diagnostics driver within a Trio radio:

Serial - connects via a COM port on the controller PC and the “System Port” on the radio (Port “A & B” can be used if required).

Ethernet (eDiags) - connects via Ethernet from the controller PC, either directly into an Ethernet capable radio, or into a Serial terminal server.

When “Settings” is selected, the controller will interrogate the computer’s com port and display the available ports. Possible valid com ports are 1–99 or “None”. Choose the desired port. Exit TView+ Diagnostics if it is required to free the com port for use with other programs.

The radio port should have its SID codes enabled, and have the SID code set to the system diagnostics SID (normally this is set to “00”).

The data format used is the SLIP protocol, running at 19200 baud. No parity, 8 data bits and 1 stop bit. More details on “SLIP Protocol” can be found in Tech-Note 8.
Main Menu

When the Diagnostic controller starts, a presentation screen is displayed which will then lead you into the main diagnostics screen. This is where the major functions of the controller are accessed.

The main screen presents the operator with the typical Windows pull down type menu bars - "File", "Settings", etc. Icons of the commonly used selections are also provided across the top of the screen.

This screen is divided into 3 main sections:
1. Status reports screen which displays the poll results obtained.
2. Local Alarms screen which displays detected alarms.
3. Base Station Activity screen which displays any changeovers that occur with Hot Stand-by Base Stations within the system.

Each column of these sections can be individually reordered left to right. By default the unit serial number follows the Unit Name but, for example, RSSI could be moved next to the Unit Name to make results clearer when checking antenna alignment.

Automatic Diagnostics “Status Polls” appear as CYAN in colour.

The line above Status Polls is a “Processing Status Bar”. It can display messages about error detection and poll processing.

The bottom row of the screen also displays a summary of the configured parameters such as which COM port is being used, whether SID codes are on or off, whether polling is enabled or disabled, current database path and file name, etc.

Menu Selection

File Menu

To utilise the Remote Diagnostics facilities, create a database which includes the individual serial numbers, alarm detection parameters and various other parameters of each radio (this applies to both polled and automatic diagnostics).

Some options are only available for particular types of radios.

New/Open

These options allow you to create a new database or open an existing database file. When creating a new database, supply the name of the new database file. After creation the software will automatically swap to the File - Add/Edit/Delete menu.

Add/Edit/Delete

After creating a New database or Opening an existing database, the Add/Edit/Delete menu can be accessed.
Selected Unit

Selected Unit is a pull down selection box, for selecting a radio from the database to view or edit. This will be blank if no radios exist in the database.

Unit Name and Location

When entering a radio into the database, give it a unique name for identification purposes (This parameter is required, max. 20 characters). Location allows the user to enter descriptions of sites and their locations (This parameter is optional, max. 20 characters).

Unit Serial Number

This is the factory preset unique serial number of the radio. This can be obtained from the label located on the radio or read from the radio using the Programmer or web user interface.

SID Code (Diagnostic Stream Identifier)

This is the SID code address number being used by the radio for the diagnostics stream and is normally set to 0. Match the diagnostics stream ID with the diagnostics SID configured in the radio (SID 0 is always enabled).

In complex systems, units in a network can be separated into different areas by using different SID codes for each area.

In systems using Automatic Diagnostics, this SID code should match the SID code as configured in the radio configuration.

Model

This allows you to select the radio type being added to the database.

Select D, E, M, Q, K or J Series as required. Then select from the following presented options:

- M Series: Remote
- D Series: Remote or Base
- E Series: Remote or Base
- K Series: Master or Remote or Bridge
- J Series: Access Point or Remote or Bridge
- Q Data Radio: Remote or Base

Communications Port

Select either serial (RS-232 serial data communications using COM1, etc) or eDiags (Ethernet) mode. When in serial mode, the standard serial communications port is used (See Settings Menu -> Controller Settings for more configuration options).

When eDiags mode is selected, specify the remote IP address and port number. This will normally be the IP address and destination port number for a J-Series, Q Data Radio, terminal server or similar devices like the J Series operating in UDP connection mode. (See Settings Menu -> eDiags port settings for more options).

Alarm Limits

These configuration options allow the user to set thresholds for each radio. If the thresholds are exceeded then the diagnostics software will declare that the radio has detected an alarm. Default settings are provided.

The alarm limits available for custom configuration are:

- Temp = Internal Modem Temperature (-40 to +70)
- RxSig = Receiver RF Signal Strength (-150 to -20)
- TxPwr = Transmitter RF Power (0 to 45)
- DC Volts = Radio Supply Voltage (8V to 30V)
- AFC Freq (E & Q data radios Only) = Radio Frequency offset (-6000Hz to +6000Hz)
- VSWR (E, K, J & Q Only) = Antenna Voltage Standing Wave Ratio (2.1 to 5.1)

Get defaults

To set the alarm limits back to default, select either the “Get Remote Defaults” or “Get Base Defaults” button (available for licensed radios only). If you wish to override the default limits, adjust the limits as required and then click “Save Custom Limits”. The default values for the type of unit selected (i.e.: either base station or remote) will now be updated with the new limits.

Base Inputs (Base Stations & HSC Only)

Base stations have digital inputs which can be monitored for a change in state and will indicate alarm detection accordingly.

Hot Standby Base Pairing (HSC Only)

In a Hot Stand-by configuration two base stations are connected to one Hot Stand-by controller. In the TView+ diagnostics database setup both base stations should be paired together for correct operation of diagnostics. In a hot stand-by configuration, only one base station can be on-line (i.e.: able to transmit) at any one time. Diagnostics is still available from the off-line base stations (via the on-line base station).

This option is only available if more than one base is configured in the database.

Add New Button

Click this button to add a new radio to the database. The Selected Radio, Name, Location, Radio Serial numbers and Hot Stand-by Base Pairing fields will be cleared, ready for the entry of a new radio. After filling in the details click the “Apply Changes To Database” button to complete entry.

Apply Changes to Database Button

Can apply changes that have been made to selected radios in the database. Additions and changes made on the screen require the selection of this button, to be saved into the database. This should be done before selecting a new serial number/unit.
Delete Button

Allows deletion of radios from the database. Deleting a radio from the database will also delete the associated status poll and alarm detection history of that radio.

A selection list of serial numbers will appear. Select one or a group at a time and then press the “Delete” button on the selection box.

Esc Key

Press this key on the keyboard to clear a new entry before it has been applied to the database.

Exit Button

Press this button to exit the Add/Edit/Delete menu area.

Advanced

Click this button to modify advanced radio unit settings.

Alarm Priority : Radios can be configured as either High or Low priority. See Settings -> E-mail and Local Alarm Reporting menus for more information on unit priority and alarms.

Poll Attempts : This parameter specifies the number of times a diagnostics poll (from the diagnostics software) is not answered by a radio unit before a No Ack alarm is generated.

Poll Response Timeout : This parameter specifies the time (in seconds) the diagnostics software will wait for a response to a diagnostics poll.

Radio Control Data :

Firmware : The radio’s current firmware version.
Control Data Rx’ed : Indicates calibration status of diagnostics.
Paired Unit : Serial No of other base in a Hot Stand-by Configuration (HSC Only)
Paired State: Indicates if paired base is currently the on-line or off-line unit (HSC Only)

System Status :

Diagnostics : Enabled or Disabled
Base Station : Indicates if unit is a Remote or Base Station
Firmware Packs : (Base and HSC Only)
  - Radio : Base Station Firmware Version
  - Display : Base Station Display controller firmware version

Last Poll Results :

Temp : Radio Temperature
Rx Sig : RX Signal Strength
Fwd PWR : Forward TX Power
Rev PWR : Reverse TX Power
VSWR : Voltage Standing Wave Ratio
  - VSWR has white background when less than 2.0:1
  - VSWR has yellow back ground when greater than 2.0:1 but less than 3.0:1
  - VSWR has red background when greater than 3.0:1
DC Volts : Supply Voltage
Freq Offset : RX Freq Offset
Date : Date of Last Poll
Time : Time of Last Poll
Database Utilities

View Unit Summary List

This screen shows a summary of units within the database. This list can also be printed for future reference. The listed radios can be sorted using any of the three columns.

 mdb File Size Limitation

Over time, the TView database can grow large enough to become slow to respond. It is recommended that once the database reaches 60 MB in size, a database archive is performed. (A message is presented to the user once the database reaches 60 MB in size).

Archive Between Dates

Make copy of database (radio info only)

This facility will make a copy of the database with only radio information. Previous diagnostic results (logged information) will be removed from the existing database and then copied to a new file name.

This is useful when you want to copy a database from one PC to another as it results in a significantly smaller file size or as a backup file.

Compact and Repair Current Database

This facility will compact and repair the database currently loaded in diagnostics.

Compact and Repair Other Database

This facility will compact and repair a database that is too corrupt to be loaded into diagnostics.
Settings Menu

Under this menu system, configurable parameters for the TView+ Diagnostics software can be customized.

Controller Settings

The controller settings menu allows the user to configure various setup parameters as divided into four sections.

Polling

Controller Address
Normally set to 1 (default). When radio networks have multiple TView+ diagnostics software applications active, use different controller addresses or system performance may be impacted. The range of controller address can be 1 to 999.

For systems using Automatic Diagnostics, match this address with the diagnostics controller address as configured in the E, M & K Series configuration programmer.

Enable Trunk Stream Connection
Enabled or disabled (Default enabled). Typical E, M, K, J & Q diagnostics connections require this to be enabled. While, typical D series diagnostics connections require this to be NOT enabled.

Auto Logging ON
When enabled collected radio data will be stored in the database when polling is turned on.

Communications Port

Com Port
With the pull down box, select the required communications port. Com 1 to Com 99 are supported.

Speed
Select the required com port speed (9k6 or 19k2bps). Default is 19k2bps.

Alert Tones
When enabled will emit a tone from the PC speaker or sound card when status poll alarms are detected and/or Base Station changeovers occur.

Poll Repetition Time

Is the time in seconds (2 to 3600 secs) between each status poll of the group poll cycle. Each unit in the poll group will be polled in turn, at this time interval.

Timed Polling

Allows the user to schedule a period when the group poll will commence. This is a useful feature for systems that have times of minimal traffic loading such as the early hours of the morning.

Start Time
Time at which the Timed poll cycle will commence. The time format will be as per the regional settings of the operating system.

Number of Cycles
This is the number of times the controller will cycle through the poll group when the Timed Group poll commences. Each unit in the poll group will be polled this number of times.

HSC Group Polling (HSC Only)
This is the time in seconds (2-3600) between consecutive polls for each Hot Standby Controller status display. When a single data base is being used to manage multiple radio networks, it may be preferable to open more than one HSC status window at a time. Diagnostics allows for up to 50 instances of the HSC status window. The poll repetition time is the time waited between each window, (ie: 3 HSC status windows with a time of 2 secs would take 6 seconds to complete an update over the three windows).

Base Digital I/O Polling (Base Only)
Is the time in seconds (2-3600) between consecutive polls for each base station digital I/O display. The timer behaves in the same way as the HSC group polling time.

Apply Changes
Applies the changes made to configuration items in this menu.
Poll Group Select

This dialog box enables the adding and removing of radios in the automatic poll group. Units in the Selection list box are available for adding to the poll group. These units will not be polled during a group poll cycle.

Units in the Poll Group list box will be polled during a group poll cycle.

Clicking the Save button will save any changes in the poll group to the database.

E-mail Alarm Reporting

This section allows the configuration of diagnostics e-mail alarm reporting. This facility allows detected diagnostics alarms to be sent to a recipient via e-mail.

General

Enable E-mail Alarm Reporting
If checked (ticked) enables detected diagnostics alarms to be sent via e-mail.

Maximum Alarm E-mails per 24 hours
Specifies the maximum numbers of E-mails that the diagnostics software will generate in a 24 hour period.

E-mail alarm reset time
The time at which “maximum e-mail” counters are reset. Default value is 00:00 (Midnight).

Reset E-mail Alarm counters
Allows the manual reset of E-mail alarm counters.
High and Low Priority Units

The E-mail alarm reporting system can apply different rules for units that are defined as High or Low priority in the database. Typically, a base station or other unit that is key to the entire operation of the network is normally defined as high priority. Other units are defined as low priority. The E-mail alarm reporting rules can then be defined so that technical support personnel can receive notification of high priority units when an alarm is detected.

High and Low Priority unit rules are implied in the same way. This section of the user manual is applicable to both.

Alarm Event Counters

Each time TView+ Diagnostics polls a radio for its parameters it compares the returned result against the alarm detection limits as defined for that unit in the database. For each instance where the result is outside the defined limits an alarm can be detected. This parameter specifies the number of alarms (events) which can be detected for a specific radio before an E-mail alarm can be generated.

Send E-mail after (n) alarms events

Specifies the number of individual radio (unit) alarm detection events before an E-mail alarm can be generated.

Reset Alarm counters after (n) successful poll events.

Specifies the number of successful radio polls before the e-mail alarm counters are reset. Some radios can detect alarms intermittently. In order to capture detected alarms from intermittent radios and generate e-mail’s, this parameter can be set so that multiple successful polls are required before the e-mail alarm reporting system declares the radio is no longer detecting alarms.

E-mail Generation

These parameters specify the rules associated with generating e-mails on a per unit basis (i.e.: specific to one particular unit).

Enable verbose content in e-mail.

When checked (ticked) e-mail alarms will contain all diagnostics parameters. When not checked, e-mail alarms will only contain the radio parameters that caused the alarm detection.

Minimum time between alarm E-mails (per unit)

Specifies the minimum time to expire before another e-mail will be generated for the same unit.

Maximum e-mails per day per unit.

Specifies the maximum number of e-mails per day for any one specific unit which has detected an alarm. This parameter is specified to prevent a flood of e-mails when a radio has detected an alarm for a long period of time.

E-mail Addressing

SMTP Server

Specifies the SMTP server IP address.

Sender Address

Specifies the e-mail address a diagnostics alarm will use as the “sender” when reporting an alarm detection to recipients.

Sender Name

As per “Sender Address” but specifies the sender’s name.

Recipient(s)

Specifies the e-mail address where e-mail alarms will be sent to. Multiple e-mail addresses can be specified, each one separated with a comma.

CC(s)

As per Recipient(s). See above.

Login Authentication

When checked diagnostics will login to the SMTP server using secure authentication.

Username & Password

Specifies the username and password to use when secure authentication is enabled (see above).
Local Alarm Reporting Setup

Local alarms are detected diagnostics alarms that are displayed in the alarms output window on the PC screen. Diagnostics provides a configurable set of rules for displaying local alarms in the alarm window.

High and Low Priority Alarms

The rules associated with local alarms can be specified for both high and low priority units.

Alarm Event Counters

**Display Alarm after (n) alarm event(s)**

Each time diagnostics polls a radio for its parameters it compares the returned result against the alarm detection limits as defined for that unit in the data base. Each instance where the result is outside the defined limits is declared an alarm. This parameter specifies the number of alarms (events) for a specific radio before an local alarm will be detected.

**Sound alarm after (n) displayed alarm event(s)**

This parameter allows an audible sound to be triggered after a configurable number of detected alarms. The audible sound can help indicate to PC or console operators an alarm has been detected.

Acknowledged Alarms

When detected alarms are displayed in the “Local Alarms” window they will initially NOT be acknowledged. This is shown above. To acknowledge a detected alarm, the check box (tick box) in the left column of the local alarm reporting window should be checked (ticked).

**Do not acknowledged alarms**

When ticked, acknowledged alarms will not be displayed in the local alarm output window. When not ticked, acknowledged alarms with be displayed as black in the local alarm output window.

**Do not sound alarm**

Acknowledged alarms will not cause the audible sound to be triggered.

Clear Acknowledged Alarms

Users should be careful of acknowledging alarms if the “Do not display acknowledged alarms” option is ticked. Units that are alarming may disappear from the system if acknowledged alarms are not regularly reset to unacknowledged.

This option specifies the period after which acknowledged alarms return to the unacknowledged state.

Set Defaults

This parameter returns each configuration parameter within the window to default values.

Clear All Acknowledged Button

When pressed this button clears each acknowledged alarm. It provides a manual mechanism to reset the acknowledged alarms to unacknowledged.
eDiags Port Settings

This menu is used in conjunction with the settings configured in the J-Series, Q Data Radio, terminal server or other Ethernet device that TView diagnostics is communicating with.

Computer Name

This is the network name of the computer that the diagnostics software is running on. It is provided for management purposes only.

Local IP

This is the IP address of the computer that the diagnostics software is running on. It should match the destination IP address set in the J-Series, Ethernet E-Series, terminal server or Ethernet device (The Q Data Radio will respond dynamically). Use a static IP address (i.e.: Not DHCP assigned addresses).

Many servers will have two or more network ports available. The Local IP entry box allows the user to specify which network port to use.

eDiags Port Number

This is the UDP port number TView+ Diagnostics uses for Ethernet responses from the J-Series, Q Data Radio or terminal server. Match the destination port as configured in the J-Series, Q Data Radio, terminal server or similar device.
Polling

Overview

In order to obtain diagnostics information, the diagnostics controller provides a number of automatic polling facilities, which include: Group polling, Timed polling and Individual polling. The Group and Timed poll facilities will automatically cycle through a selected group of units at a predetermined interval as specified in the Polling Setup menu. The Individual poll facility permits intensive polling of a single unit at a selectable rate, independent of any Group polling that may be active at the time. Individual polling also displays results in a bar graph format.

When a radio is polled for the first time, the controller will poll (ask) the radio for its calibration constants and firmware revision (these can be viewed in the “View” window under the File menu). When this initialization procedure is complete, status polling can commence. If the radio were to perform a “cold boot” (e.g. No power, cold boot command received, etc), the controller will detect this and initiate the above initialization procedure again and display “cold boot” alarm detection in “other”.

During group status polling which includes a Hot Standby unit, both radios will be polled. The offline unit is highlighted with an asterisk (*) prefix.

Status reports begin with information about the radio responding to the status poll requests:
- Unit Name
- Serial Number
- Location
- Model
- Type

The status poll requests that are reported and displayed on the main screen are:
- Temperature
- Received Signal Strength
- Transmitter Power
- DC Supply Volts
- Received Frequency Offset (D, E & Q Only)
- VSWR (KR900, JR900, E & Q Only)

Alarm Detection

If the controller receives a status poll where the result (Temp, Rx Sig, Tx PWR, DC Volts or Freq Off) is outside the user defined alarm detection limits, the poll is declared to be an alarm and the information is displayed in the “Local Alarms” area. By default, alarms are detected after three consecutive polls. This helps to reduce detection of erroneous alarms. The number of non-acknowledged poll attempts before an alarm is detected can be configured in the “Advanced -> Unit Settings” area of the unit database setup.

Other detected alarms (not related to those mentioned above) may also cause an alarm condition. These polls are also displayed in the Local Alarm window with further details shown in the “Other” column. This includes:

No Ack: No response to a diagnostics poll
Dags Not Installed: Diagnostics has not been installed on the unit being polled.
Re-Boot: Radio has been re-booted since the last received diagnostics poll.
Ports Halted: Radio ports have been disabled.
Not Remote: Radio has been configured in the database as a remote but is detected as a base.
Not Base: Radio has been configured in the database as a base but is detected as a remote.
ERROR: Unknown or unexpected event.
Switch Base: A Hot Standby Controller change over event has occurred.

Group Polling

In Group Polling mode, radios that are part of the Poll Group (See Settings - Poll Group select) are polled in succession. When diagnostics reaches the last radio in the poll group it returns to the top of the list.

Results are displayed in the “Status Polls” window along with the Unit Name and Time of the poll.

Timed Poll

In Timed Poll mode, TView+ diagnostics waits until the specified Poll Time (see Settings - Polling Setup) and then performs a group poll as per above. If configured, the group poll will be repeated until done and then TView+ waits for another 24 hours until the time expires again.
Individual Poll

In Individual Poll mode, a specific unit is selected and polling (updating) can be manually controlled. Results are displayed in a bar graph and numerical format. Individual polling may be performed simultaneously with Group or Timed polling in progress.

Data Logging

This menu item allows advanced analysis of diagnostics data.

Log Status Polls

When ticked, status poll results are stored in the database.

Log Alarms

When ticked, detected alarm values are stored.

View History

The view history facility provides a facility to inspect diagnostics poll data for a specific unit.

From To or ALL Fields

These fields determine the time span you wish to view. For example, if you have collected several months of data, and only wish to view a 24 hour period, then adjust the From: and To: fields accordingly and select the unit.

When the History window first appears, the From: and To: fields will contain the last 24 hours of data.

If “ALL” is selected it will display the start and end dates of the database. The Date/Time format will be as per the regional settings short date format.

The smaller the time span you select, the faster the database search will be.

Sorting

Each of these tables can be sorted in ascending order by: unit, date or poll parameter. To sort, just click on the required column header.

To show the status of a single report in the “Alarm History” click on the box at the left by the unit name. This only works on valid poll results not “NoAck”.

Printing

A printout of each table is possible by clicking on the associated Print button. The table data will be sent to the default printer and formatted as per your default printer configuration set up.

View Trend

The logged status poll data can be viewed in graph format, which allows viewing of status trends over selectable time spans. This provides a very effective and fast method of analyzing a unit’s operating parameters over time.

Select “View Trend” under the Data Logging menu item or click the associated toolbar button.

Features available include:

• Scaling of graph(s).
• View individual poll results using the cursor.
• Automatically scroll through the group poll database, unit by unit at a selectable time interval.
• No Acknowledge messages are displayed by a gap in the graphed data and a “NoAck” in the “Other” box on the Time Line.

Vertical Scale Setting

• Manually set the vertical scales by typing in the new level(s), then either press “Enter” or click on the “Re Draw” button, or select a new unit.
• Click the “Default Ranges” button to set the vertical scales back to the default levels.
• Click the “Set Ranges to Alarm Limits” button to set the vertical scale limits to the selected unit alarm detection limits.
From: & To: Fields

These fields determine the time span you wish to view. For example, if you have collected several months of data, and only wish to view a 24 hour period, then adjust the From: and To: fields accordingly.

When the Trending window first appears, the From: and To: fields will contain the last 24 hours of data.

If “ALL” is selected it will display the start and end dates of the database.

The smaller the time span you select, the faster the database search and draw. This will also depend on the poll rate that was used during that time span.

Use the “ALL” button to set the From: and To: fields to the maximum and minimum dates found in the data in the database.

Poll Group Cycle

When toggled ON, this will step through each radio in the poll group and display the trend graph. Set the step interval in the “Step Every (Sec)” field. Default = 2 seconds.

Cursor: Use the slider control, found at the bottom of the display to move the cursor. The cursor box displays the parameter data of the status poll at the current cursor position.

Use the “Set From” button to set the From: field to the current cursor position.

Use the “Set To” button to set the To: field to the current cursor position.

Tools

The tools menu provides useful system tools for diagnosing and maintaining a radio network using TView+ Diagnostics.

Statistical Performance

Under the statistical performance menu, three separate tools are provided.

Packet Transmission Test

This tool provides a useful way to commission a radio communications link.

Packet transmission testing works by sending a known packet of information to the selected unit and looking for a response. Each time a response is not heard (or a response is received but is corrupted) the facility counts this as a lost packet. As soon as a response is heard from the remote unit, TView+ Diagnostics will wait the specified time between, then send another packet.

It is recommended that this test is run for at least 500 packets in order to get a meaningful result that is statistically valid. It is best that no other data is being transmitted on the radio network during the test as this may skew results.

To use the packet transmission test facility, choose the unit you wish to test the link quality to by using the “Selected Unit” drop down box.

Activate the start button and the test will commence.

Tx Packets

This indicates the number of packets TView+ Diagnostics has transmitted to the remote unit.

Rx Packets

This indicates the number of packets TView+ Diagnostics has received from the remote unit.

Lost Packets

This indicates the number of packets TView+ Diagnostics has declared as lost.

Error Percentage

This indicates the calculated Packet Error Rate in %. It is calculated from the ratio of Tx Packets to Rx Packets.

Normalised BER

This indicates the normalised BER (Bit Error Rate) based on the number of bits per packet assuming only one bit was corrupted. It is only an estimate since two corrupted bits in one packet will only be counted as one corrupted bit.

Commissioning Record

For system commissioning and future records it is recommended to print a commissioning record.
**Performance Counters**

Schneider Electric Trio radios store packet statistics for later retrieval and analysis. These are viewed by selecting Tools > Statistical Performance > performance Counters (E Series Counter Window shown below)

Counters for Trio radios are listed below:

- **Lost Synch** - An event where RX cannot be decoded
- **Lost RxSig** - An event where Rx data is incomplete
- **Good Frames** - A frame that contains received Data
- **Bad Frames** - A frame that has had the Checksum calculated incorrectly
- **Time Ticker** - Time period of counter data collection
- **RSSI Ticker** - Time period of received radio signal
- **Channel Occupancy**
- **Channel OCC Sliding**
- **Channel Utilisation**
- **Retry count**
- **Abandoned Packets**
- **Abandoned Tokens**

Some counters are hardware specific.

*Receiver Channel Utilisation is not available in Q data radios. This counter is designed for use with E-Series only. The TVIEW+ diagnostics software can use these statistics to help calculate network efficiency, bandwidth utilisation and radio link integrity. These network analysis features are an invaluable tool for larger networks.

**Update Counters:** updates the statistical performance counters by reading them from the currently selected unit.

**Reset Counters:** resets the statistical performance counters in the radio.

**RF Data Rate:** Select from the pull down menu 4800, 9600 or 19200 bps, depending on your system settings (some radio types auto-populate this box).

**Status Bar**
Reports any poll processing in progress or can display un-expected events that may have occurred.

**Auto Poll**
When ticked, this option automatically updates the statistical performance counters for the selected unit (time between updates depends on type of radio)

**Log Counters**
When ticked, this option logs the counters every time they are updated. These can be viewed on the “Counter Poll History” Tab.

**Notes:**
- The controller will attempt a series of polls when either resetting or retrieving the counters. A user should monitor the status window for the poll process to be complete. If an un-expected event occurs, this may be due to conditions like packet collisions on a busy network, diagnostic controller trying to perform too many poll functions (i.e. group polling, individual polling), etc.
- E, M, J & K Series data radios have 32 bit counters and will count for 1 year, 4 months & 10 days if no reset occurs.
- If an HSC Base is selected, the counters displayed only correspond to that base (whether offline or online). Select the alternate base to read the counters from it. With D Series pairs, data can only be collected from the online unit.

**Counter Poll History Tab**
This is a database viewing facility. Enabled by ticking “Log Counters”, each time the counters are retrieved they will be written to the database. Adjust the From: & To: fields to view a specified time span or press ALL to obtain complete database period.

**Statistical Performance Formulae**

| **Timers:** |  
| --- | --- |
| Real Time Ticker (RTT) [10mS] | timer that increments by one every 10mSec |
| Elapsed Time | Total elapsed time in hh:mm:ss from reset calculated from RTT |

| **Receive Channel:** |  
| --- | --- |
| Good Frames | Good frames received by radio. The frame CRC was correct. |
| Bad Frames | Bad frames received by radio. The frame CRC was incorrect. |
| Good Bytes | Good byte received (from good frames) |
| Average Frame Size | GoodByteCnt / GoodFrameCnt |
| Average Frame Rate (mSec) | (GoodFrameCnt + BadFrameCnt) / RTT * 0.01 |
| Channel Occupancy (%) | RSSigoodTicker / RTT * 100 |
| Channel Occupancy Sliding | RSSigoodTicker / (time since last poll) * 100 |
| Rx Channel Utilisation (%) | (GoodByteCnt * 8) / (RTT * RFChannelBitRate) |

| **Transmit Channel:** |  
| --- | --- |
| Tx Frames | Number of Tx HDLC frames. |
| Tx Byte | Number of Tx bytes |
| Average Frame Size | TxByteCnt / TxFrameCnt |
| Average Frame Rate (mSec) | TxFrameCnt / RTT * 0.01 |
| Tx Channel Utilisation (%) | (TxByteCnt * 8) / (RTT * RFChannelBitRate) |
Alarm Status

The alarm status information provides a reflection of the active alarms on a hot standby radio’s controller, therefore this is only displayed in the ‘Hot Standby Base/Repeater Controller (HSC)’ window.

Hot Standby Base/Repeater Controller (HSC)

Hot Standby radios implement a specific set of features and controls that can be accessed via this menu system.

When this option is selected, TView+ Diagnostics shows a list of available Hot Standby Controllers available from within the database (if not hot standby radios have been entered and pair, a message will be displayed).

Select the Hot Standby Controller you wish to access using the drop down selection box.

Once selected, the diagnostics software will attempt to connect to the radio. If successful, the ‘Hot Standby Base/Repeater Controller (HSC)’ window will open.

Base Select

This indicates the online status of each unit.

<table>
<thead>
<tr>
<th>LED Colour</th>
<th>Switch Select State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Channel not selected (Offline)</td>
</tr>
<tr>
<td>Green</td>
<td>Online (Automatic). Automatic changeovers will be actioned by the HSC in response to detected alarms.</td>
</tr>
<tr>
<td>Green Blinks</td>
<td>Change Over Pending. Waiting for one minute time-out period before switching to offline base.</td>
</tr>
<tr>
<td>Red</td>
<td>Selected by TView+ (Remotely). Auto changeovers will not occur.</td>
</tr>
<tr>
<td>Amber</td>
<td>Selected by Switch on HSC (On site). Auto changeovers will not occur.</td>
</tr>
</tbody>
</table>

Providing either of the bases is not forced online by the switch, the user can force either of the bases online remotely by pressing Base Select button 1 or 2. The user can revert back to Automatic mode by clicking on the Base Select Auto button.

If the user attempts to switch bases within one minute of a base changeover event, the change pending indication will appear (i.e. Online Unit LED Blinking Green). The user should then wait until the change over event occurs.

Change Over Events

This is a counter which indicates the number of automatic change over events initiated by the HSC due to detected alarms. This can be reset using the ‘Reset Alarms - Base A/B’ button (on the corresponding radio).

Alarm Status

The current alarm detection status (since the last alarm status poll) for the attached Base units is displayed below.

<table>
<thead>
<tr>
<th>LED colour</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Unknown. Has not been tested.</td>
</tr>
<tr>
<td>Green</td>
<td>No Alarm detected.</td>
</tr>
<tr>
<td>Red</td>
<td>Active Alarm detected.</td>
</tr>
<tr>
<td>Amber</td>
<td>Recovered Alarm. Alarm detected previously but has since recovered.</td>
</tr>
</tbody>
</table>

Latched Alarms

Latched alarms are those that will not reset back to a recovered state, but will remain in an active alarm state until they have been reset.

Reset Alarms - Base A/B

Pressing this button will clear the change over event counter and the alarms status displayed For the corresponding radio.
Changeover Pending. Wait up to one minute.

A change over attempt has been made by either the HSC or a remote TView+Diagnostic controller within one minute of a previous change over event. A change over to the offline unit will not occur until the one minute time period has expired.

Base 1 and Base 2 connection state corrected. Up until the first time an HSC is communicated with, the Diagnostic controller doesn't know which of the paired bases in connected to HSC ports One and Two. So the paired Bases are displayed in alphanumerical order. The display is corrected on reception of the first message from either Base.

### Digital I/O Status

The digital I/O status is available within the following windows:

- Hot Standby Base/Repeater Controller (HSC) [Which is shared with the Alarm Status Window]
- Base/Repeater Digital I/O
- Remote Digital I/O

Example of Base Repeater Digital I/O Window:

**Digital I/O Status**

Displays digital I/O input and output status.

Depending on the radio model, 2 or 3 Digital I/O will be available.

**Digital I/O Toggle Buttons**

Clicking these buttons will toggle the associated output state.

Toggling the outputs of a HSC is a good way to determine if the HSC is still online. If the toggled output state doesn't change, this will be indicated in the status message bar at the bottom of the HSC window.

**Logging Toggle**

When logging is ON, status data including digital I/O is stored in the database.

- **No Acknowledge**
  
  The Hot standby has not responded to diagnostic polls. Typically, both bases are tried 3 times each (as configured in database).

- **Re-Booted**
  
  The online Base connected to the HSC has been re-booted.

- **Unit is a remote**
  
  The Unit has been entered in the database as a Base, but is factory set as a Remote.

- **Un-expected Event**
  
  Unforeseen events can be captured, with relevant data stored in the 'Error.log' file.

  **<Base Name> [<Serial>] is Forced Online by switch**

  When a base is forced online by the switch, remote switching of bases is not possible using TView+ Diagnostics.

  **Base1/Base2 already forced online**

  An attempt was made to force a base online that has already been forced online remotely by TView+ Diagnostics.

  **Already in Auto mode**

  The Auto button was pressed when the HSC was already in auto mode.

  **Output Toggle Process Indication.**

  The Digital window can indicate when digital output state toggling has been successful or not. An indication of a non successful digital output toggle can help diagnose the online status of the HSC.
Trace Route (J & K Series Only)

The Trace Route facility allows you to view the radio path your messages are taking. This is most useful in networks including SmartPath (redundant) networks.

The Trace Route Tool can be found under -> Tools, Trace Route...

Once you have selected the Trace Route Tool, a separate window will appear.

Selected Unit

This parameter allows you to select which Unit you want to see a trace route of. Typically remote units will be selected.

Model

The Model window displays which type of radio the selected unit is, i.e. J-Series or K-Series etc.

Type

The type window displays what type the selected model is in, i.e an E-Series can be either a remote type or a base type and a K-Series can be a Master, Bridge or remote type.

Last Successful Poll

The Last Successful Poll window displays the date/time of the last successful poll of the selected unit.

Poll Repetition Time

This parameter allows the user to select the frequency of the trace route polls. This is measured in seconds, i.e using a value of 10, will poll the selected unit every 10 seconds.

Polling

This parameter allows the user to toggle the trace route polling ON or OFF.

The Trace route facility will display the radios in the selected unit’s radio path. This is displayed in text in the main window of the trace route window.

Example: This example has been taken of a K-Series remote, from a master type K-Series, through four Bridge type K-Series.
Interpreting Poll Results

General

The results returned by the poll requests can help give an indication of system performance. When a new radio is added to the database, default values are assigned for the limits of the returned results. The user can assign different values to these limits as required, which is determined by the tolerance of their system.

RSSI

The default RSSI limits are set at -30 to -105 dBm (-110 dBm for Base/Repeater Station). Above -30 dBm the front end of the receiver will saturate and it is unlikely that signal levels much higher than this will ever be reported.

RSSI alarm detection limits should be set for radios based on the values within the commissioning report. If during commissioning a remote site was found to have a signal strength of -75 dBm, then it would be a sensible idea to set the alarm detection limits to -70 dBm and -80 dBm.

There is generally no point in setting tight alarm detection limits for radios which receive signals from many remote sites, such as Base/Master/Repeater radios.

The RSSI level is taken from the unit’s last successfully received message. Keep this in mind when you are trying to interpret the RSSI level of a master radio in a PTMP system.

Transmitter power

For a J/K radio, the transmitter alarm limits are set at between 27 dBm and 33 dBm. The radios will normally be operating at a power level of 30 dBm.

The reported transmit power is a value of the last transmission made by the radio. When the PTT is ON a periodic measurement is made of the transmit power. The radio stores this away and reports it when requested.

If no transmission has occurred since power up or reset, the radio will report 0dBm.

Temperature

Alarm detection limits for this option may be configured to meet the individual requirements for each site, but in general it is recommended to set an upper limit that matches the maximum acceptable temperature.

The temperature alarm detection limit may also be set based on an air-conditioned environment. Should the air conditioning stop, an alarm could be detected when the radio exceeds the temperature specified in the alarm detection limit.

Supply Voltage

The DC supply voltage alarm detection limits should be set according to the operating range of the radio and the DC power supply in use. For details on the operating range of each radio consult the appropriate data sheet (which can be found towards the end of the User Manual).

The lower DC Supply Voltage alarm detection limit can also be set such that if mains power is lost at a site with battery backup, diagnostics can indicate a detected alarm.

Frequency Offset

Available in E & Q Data Radios.

The frequency limits are set to 3000 Hz. This is the difference between the different ends of a data link. If the difference gets much greater than this, radio link performance may be affected.

The radio will have a degree of long term frequency drift of 1 ppm (0.8 ppm for Q data radios) / annum due to the physical properties of internal components.

VSWR

Available in E, Q, KR900 & JR900 Data Radios.

Voltage standing wave ratio (VSWR) indicates how well the RF load (antenna/filter/cables) is impedance matched to the radio transmitter. A value approaching 1.0 will result in good transmit performance. If the connection between the antenna and the radio is poor then a high VSWR will be reported by diagnostics. The default high VSWR alarm detection is set to 3.0
Part D – Appendices

Microsoft Excel Database Query Example

This query will list status data (i.e. Temperature, Volts, Rx Signal Strength, Rx Frequency Offset, Tx Forward Power, and Tx Reverse Power) for a specified serial number occurring between specified date ranges.

Two database queries will be required. The first; to retrieve one record from the RadioTable containing the radio name and location for the specified serial number. The second; to retrieve a range of records from the StatusPoll table for the specified serial number, between and including the specified dates.

1. Open a new workbook in Excel.
2. In cell A1 enter the following text: “Serial Number”
3. In cell A2 enter a serial number that exists in the database: e.g. 20061
4. In cell A4 enter the text: “Start Date:”
5. In cell A5 enter the text: “End Date:”
6. Highlight cell B4 and B5 and set the number format to: “dd-mm-yy hh:mm:ss”
7. In cell B4 enter a suitable start date, e.g. 23-04-03 14:57:00
8. In cell B5 enter a suitable end date, e.g. 23-04-03 15:00:00

The date range fields can limit the query result to a manageable number of rows. In this case the query result will contain records between and including the dates 23-04-03 14:57:00 to 23-04-03 15:00:00.

9. From the Data Menu, select ‘Import External Data —> New Database Query..’
10. Uncheck the ‘Use the Query Wizard to create/edit queries’ box.
11. Select the DNS ‘Schneider Electric’, which was created in Data Sources earlier.

The Choose Data Source window will appear:

12. Click OK. The Microsoft Query Application appears, with the Add Tables selection box on top.


The Radio Table will appear on the Microsoft Query screen.

14. Click on the Close button.

15. In the Radio table, find the ‘UnitName’ field and double click on it to add this field to the query.

16. Similarly, add the ‘Location’ field to the query.

17. From the view menu select ‘Criteria’, to view the criteria window.

18. In the criteria field of the first column, enter field name ‘Serial’ (use the pull down selection list).

19. In the value field, enter the following text: “[Enter serial Number]”. When the query is run, a prompt will appear containing this message. You need to enter an existing serial number for the query to work.

20. From the Records menu choose ‘Query Now’ to run the query. Your screen should appear something like this:
21. Save the query as ‘Get Radio Detail.dqy’
22. From the File menu select ‘Return Data to Microsoft Excel’
23. Back at the spreadsheet, an ‘Import Data’ window appears prompting for a cell location. Put the cursor in cell B1.

24. Click on the ‘Parameters’ button.
25. Click on the ‘Get the value from the following cell’ button.
26. Place the cursor on the serial number in cell A2.
27. Review the ‘Refresh automatically when cell value changes’ check box is ticked, then press OK.

28. Press OK on the ‘Import Data’ window. The Spreadsheet should appear something like the following:

You can do another query with a different serial number simply by changing the number in cell A2. The Unit Name and Location data will automatically update.

---

**Query Status Poll data**

The next Query will list the status data for the unit serial number in A2, occurring between and including the dates specified in cells B4 and B5.

1. To query the StatusPoll table, return to step 9 and follow each step until you have completed step 12, then return here. The Microsoft Query Application appears, with the Add Tables selection box on top.

2. Select and Add the ‘StatusPoll’ table. The StatusPoll Table will appear on the Microsoft Query screen.
3. Click on the Close button.
4. In the StatusPoll table, find the ‘Epoch’ field and double click on it to add this field to the query.
5. Similarly, add the Volts, Temp, RSSI, FreqErr, TxPWR and TxPWRrev fields to the query.
6. From the view menu select ‘Criteria’, to view the criteria window.
7. In the criteria field of the first column, enter field name ‘Serial’ (use the pull down selection list).
8. In the value field, enter the following text: “[Enter Serial Number]”.
9. In the criteria field of the second column, enter field name ‘Epoch’
10. In the value field under Epoch, enter the following text: “>=[Enter First Date] AND <=[Enter Last Date]”
11. From the Records menu choose ‘Query Now’ to run the query. You will be prompted for an existing serial number, start date, and end date.

Your screen should appear something like this:
12. Save the query as ‘Get Status Data.dqy’
13. From the File menu select ‘Return Data to Microsoft Excel’
14. Back at the spreadsheet, an ‘Import Data’ window appears, prompting for a cell location. Put the cursor in cell D1.
15. Click on the ‘Parameters’ button.
16. Select ‘Enter Serial Number’ from selection list box.
   a. Click on the ‘Get the value from the following cell.
   b. Place the cursor on the serial number in cell A2 and select.
17. Select ‘Enter First Date’ from selection list box.
   a. Click on the ‘Get the value from the following cell.
   b. Place the cursor on the date in cell B4 and select.
18. Select ‘Enter Last Date’ from selection list box.
   a. Click on the ‘Get the value from the following cell.
   b. Place the cursor on the date in cell B5 and select.
19. Review the ‘Refresh automatically when cell value changes’ check box is ticked for each field, then press OK.
20. Place the cursor in cell D1, then press OK.

The Spreadsheet should appear something like the following:

Changing the Serial Number in cell A2 will automatically update the displayed data. Similarly, changing either the Start or End Dates will automatically update the Status Poll Data.

In the figure below, see that the columns have been averaged using the spreadsheet AVERAGE function, and an additional query has been included.

The new query selects the last received poll for the specified serial number and displays the associated data.
The Max query function is used on the Epoch field to get the last poll date. This query has been configured to refresh every minute.

An additional element has been added to the spreadsheet, which calculates the VSWR from the last poll data.

To fine tune, or to generate more complex queries you can display and edit the SQL statements corresponding to the queries previously created in Microsoft Query by selecting ‘SQL...’ from the view menu.
This figures shows the SQL select statement corresponding to the query described in steps 29 to 40.
### Microsoft Access (.mdb) Structure

#### Table Definitions

**Table 1.0 - Radio**

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial</td>
<td>Long Integer</td>
<td>Unique serial number</td>
</tr>
<tr>
<td>UnitName</td>
<td>Text (21)</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>Text (21)</td>
<td></td>
</tr>
<tr>
<td>SID_Code</td>
<td>Byte</td>
<td>Stream Identification number</td>
</tr>
<tr>
<td>Freq_Sense</td>
<td>Yes/No</td>
<td>D-Series only</td>
</tr>
<tr>
<td>Pair_Mode</td>
<td>Yes/No</td>
<td>Yes = Hot Standby</td>
</tr>
<tr>
<td>Pair_Unit</td>
<td>Long Integer</td>
<td>Unit serial number to which this unit is paired, if in hot standby config.</td>
</tr>
<tr>
<td>Poll_Resp_Time</td>
<td>Single</td>
<td>Time to wait for response before time-out</td>
</tr>
<tr>
<td>Poll_Group</td>
<td>Yes/No</td>
<td>Yes = in Status Poll Group</td>
</tr>
<tr>
<td>Alarm_Retries</td>
<td>Yes/No</td>
<td>No longer used</td>
</tr>
<tr>
<td>Temp_High</td>
<td>Integer</td>
<td>Degrees Celsius</td>
</tr>
<tr>
<td>Temp_Low</td>
<td>Integer</td>
<td>Degrees Celsius</td>
</tr>
<tr>
<td>RSSI_High</td>
<td>Integer</td>
<td>dBrm</td>
</tr>
<tr>
<td>RSSI_Low</td>
<td>Integer</td>
<td>dBrm</td>
</tr>
<tr>
<td>TxC_PWR_High</td>
<td>Integer</td>
<td>Milli Watts</td>
</tr>
<tr>
<td>TxC_PWR_Low</td>
<td>Integer</td>
<td>Milli Watts</td>
</tr>
<tr>
<td>Volts_High</td>
<td>Single</td>
<td>Volts</td>
</tr>
<tr>
<td>Volts_Low</td>
<td>Single</td>
<td>Volts</td>
</tr>
<tr>
<td>Freq_High</td>
<td>Integer</td>
<td>Hz</td>
</tr>
<tr>
<td>Freq_Low</td>
<td>Integer</td>
<td>Hz</td>
</tr>
<tr>
<td>Dev_High</td>
<td>Integer</td>
<td>Not used</td>
</tr>
<tr>
<td>Dev_Low</td>
<td>Integer</td>
<td>Not used</td>
</tr>
<tr>
<td>Check_Summ</td>
<td>Yes/No</td>
<td>Yes = E Series radio Checksums ON. Use this field to determine if unit is E or D series</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No = D Series radio checksums OFF</td>
</tr>
<tr>
<td>Base</td>
<td>Yes/No</td>
<td>Is this a Base Unit?</td>
</tr>
</tbody>
</table>
### Table 2.0 - Status Poll

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epoch</td>
<td>Date/Time</td>
<td>Time and date received</td>
</tr>
<tr>
<td>Serial</td>
<td>Long Integer</td>
<td>-</td>
</tr>
<tr>
<td>Temp</td>
<td>Integer</td>
<td>Degrees Celsius</td>
</tr>
<tr>
<td>RSSI</td>
<td>Integer</td>
<td>dBm</td>
</tr>
<tr>
<td>TxPWR</td>
<td>Integer</td>
<td>milli Watts</td>
</tr>
<tr>
<td>Volts</td>
<td>Single</td>
<td>Supply Volts</td>
</tr>
<tr>
<td>FreqErr</td>
<td>Integer</td>
<td>Hz</td>
</tr>
<tr>
<td>TxFrErr</td>
<td>Integer</td>
<td>milli Watts</td>
</tr>
</tbody>
</table>

### Table 3.0 - Alarm

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epoch</td>
<td>Date/Time</td>
<td>Time received</td>
</tr>
<tr>
<td>AlarmCode</td>
<td>Byte</td>
<td>See AlarmCode table contents</td>
</tr>
<tr>
<td>Serial</td>
<td>Long Integer</td>
<td>-</td>
</tr>
<tr>
<td>Valvle</td>
<td>Single</td>
<td>Value in error</td>
</tr>
</tbody>
</table>

### Table 4.0 - AlarmCode

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>AlarmCode</td>
<td>Byte</td>
<td>See Table 4.1 - AlarmCode</td>
</tr>
<tr>
<td>AlarmCodeName</td>
<td>Text (20)</td>
<td>See Table 4.1 - AlarmCode</td>
</tr>
</tbody>
</table>
### Table 4.1 - AlarmCode

<table>
<thead>
<tr>
<th>AlarmCode</th>
<th>AlarmCode Name</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Temp</td>
<td>Temperature out of Alarm limits range</td>
</tr>
<tr>
<td>1</td>
<td>Rx Sig</td>
<td>Received Signal out of Alarm limits range</td>
</tr>
<tr>
<td>2</td>
<td>Tx PWR</td>
<td>Tx Power out of Alarm limits range</td>
</tr>
<tr>
<td>3</td>
<td>DC Volts</td>
<td>DC supply volts out of Alarm limits range</td>
</tr>
<tr>
<td>4</td>
<td>Freq Err</td>
<td>Rx Frequency Error out of Alarm limits range</td>
</tr>
<tr>
<td>5</td>
<td>No Ack</td>
<td>Failed poll attempt three times</td>
</tr>
<tr>
<td>6</td>
<td>Cold Boot</td>
<td>Radio has been cold booted since the last received status poll (D-Series)</td>
</tr>
<tr>
<td>7</td>
<td>Switch Base</td>
<td>HSC channel over event has occurred</td>
</tr>
<tr>
<td>8</td>
<td>Deviation</td>
<td>Not used</td>
</tr>
<tr>
<td>9</td>
<td>Diags Not Installed</td>
<td>Diagnostics has not been installed on the unit being polled.</td>
</tr>
<tr>
<td>10</td>
<td>Re-Boot</td>
<td>Radio has been rebooted since the last received status poll (E-Series)</td>
</tr>
<tr>
<td>11</td>
<td>Ports Halted</td>
<td>Radio is in Halted state. User ports will not function.</td>
</tr>
<tr>
<td>12</td>
<td>Not Remote</td>
<td>Radio has been entered in the database as a remote but appears to be a base</td>
</tr>
<tr>
<td>13</td>
<td>Not Base</td>
<td>Radio has been entered in the database as a base but appears to be a remote</td>
</tr>
</tbody>
</table>

### Table 5.0 - Retries

<table>
<thead>
<tr>
<th>Retries</th>
<th>Epoch</th>
<th>Date/Time</th>
<th>Time received</th>
</tr>
</thead>
<tbody>
<tr>
<td>PollType</td>
<td>Byte</td>
<td>Refer Table 5.1 - Poll Type</td>
<td></td>
</tr>
<tr>
<td>Serial</td>
<td>Long integer</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

### Table 5.1 - Poll Type

<table>
<thead>
<tr>
<th>PollType</th>
<th>PollType Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>Asset Param</td>
</tr>
<tr>
<td>66</td>
<td>Warning Boot</td>
</tr>
<tr>
<td>67</td>
<td>Calib</td>
</tr>
<tr>
<td>70</td>
<td>Set Synth</td>
</tr>
<tr>
<td>71</td>
<td>GetParam</td>
</tr>
<tr>
<td>72</td>
<td>Halt</td>
</tr>
<tr>
<td>76</td>
<td>Learn PGM</td>
</tr>
<tr>
<td>77</td>
<td>Port Mode</td>
</tr>
<tr>
<td>80</td>
<td>Param Set</td>
</tr>
<tr>
<td>81</td>
<td>SR UART Version</td>
</tr>
<tr>
<td>82</td>
<td>Param Read</td>
</tr>
<tr>
<td>83</td>
<td>Status</td>
</tr>
<tr>
<td>84</td>
<td>Watch Dog</td>
</tr>
<tr>
<td>85</td>
<td>SR UART</td>
</tr>
<tr>
<td>86</td>
<td>Get Rev</td>
</tr>
<tr>
<td>87</td>
<td>Param Write</td>
</tr>
<tr>
<td>100</td>
<td>Power Up</td>
</tr>
</tbody>
</table>
### Table 6.0 - Poll Type

<table>
<thead>
<tr>
<th>PollType</th>
<th>Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poll Type</td>
<td>Byte</td>
<td>Refer Table 5.1 - PollType</td>
</tr>
<tr>
<td>PollType Name</td>
<td>Text (20)</td>
<td>Refer Table 5.1 - PollType</td>
</tr>
</tbody>
</table>

### Table 7.0 - Counter

<table>
<thead>
<tr>
<th>Counter</th>
<th>Field Name</th>
<th>Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Epoch</td>
<td>Date/Time</td>
<td>Time received</td>
</tr>
<tr>
<td>Serial</td>
<td>Long Integer</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>RealTicker</td>
<td>Long Integer</td>
<td>Real time (centi-seconds)</td>
<td></td>
</tr>
<tr>
<td>RSTicker</td>
<td>Long Integer</td>
<td>RSTicker (centi-seconds)</td>
<td></td>
</tr>
<tr>
<td>TxFrameCnt</td>
<td>Long Integer</td>
<td>Number of Frames Tx'd</td>
<td></td>
</tr>
<tr>
<td>TxByteCnt</td>
<td>Long Integer</td>
<td>Number of Bytes Tx'd</td>
<td></td>
</tr>
<tr>
<td>BadFrameCnt</td>
<td>Long Integer</td>
<td>Number of Bad Frames Rx'd</td>
<td></td>
</tr>
<tr>
<td>GoodFrameCnt</td>
<td>Long Integer</td>
<td>Number of Good Frames Rx'd</td>
<td></td>
</tr>
<tr>
<td>GoodByteCnt</td>
<td>Long Integer</td>
<td>Number of Good Bytes Rx'd</td>
<td></td>
</tr>
<tr>
<td>LastSynchronCnt</td>
<td>Long Integer</td>
<td>Synchronisation Last count</td>
<td></td>
</tr>
<tr>
<td>RSSI</td>
<td>Long Integer</td>
<td>RSSI Last count</td>
<td></td>
</tr>
</tbody>
</table>

### Table 8.0 - HSC

<table>
<thead>
<tr>
<th>HSC</th>
<th>Field Name</th>
<th>Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial</td>
<td>Long Integer</td>
<td>HSC serial number</td>
<td></td>
</tr>
<tr>
<td>Base1_Serial</td>
<td>Long Integer</td>
<td>Base1 serial number</td>
<td></td>
</tr>
<tr>
<td>Base2_Serial</td>
<td>Long Integer</td>
<td>Base2 serial number</td>
<td></td>
</tr>
</tbody>
</table>

### Table 9.0 - HSCAlarmState

<table>
<thead>
<tr>
<th>HSCAlarmState</th>
<th>Field Name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Byte</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Text (20)</td>
<td></td>
</tr>
</tbody>
</table>
Table 10.0 - HSCchannelState

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No Data</td>
<td>Text not yet performed</td>
</tr>
<tr>
<td>1</td>
<td>Active Alarm</td>
<td>An alarm has occurred and is still current</td>
</tr>
<tr>
<td>2</td>
<td>No Alarm</td>
<td>No Alarms have occurred</td>
</tr>
<tr>
<td>3</td>
<td>Recovered Alarm</td>
<td>An alarm has occurred but has recovered</td>
</tr>
</tbody>
</table>

Table 9.1 - HSCAlarmState

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No Data</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Active Alarm</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>No Alarm</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Recovered Alarm</td>
<td></td>
</tr>
</tbody>
</table>

Table 11 - HSCstatus

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial</td>
<td>Long Integer</td>
<td>HSC serial number</td>
</tr>
<tr>
<td>Epoch</td>
<td>Date/Time</td>
<td>Time received</td>
</tr>
<tr>
<td>Channel</td>
<td>Byte</td>
<td>See HSCchannelState table</td>
</tr>
<tr>
<td>ChangeCount</td>
<td>Long Integer</td>
<td>Changeover counter</td>
</tr>
<tr>
<td>ChangePending</td>
<td>Yes/No</td>
<td>Changeover to occur in up to a minute</td>
</tr>
<tr>
<td>UserInput1</td>
<td>Yes/No</td>
<td>Yes = Transistor ON</td>
</tr>
<tr>
<td>UserInput2</td>
<td>Yes/No</td>
<td>Yes = Transistor ON</td>
</tr>
<tr>
<td>UserOutput1</td>
<td>Yes/No</td>
<td>Yes = Transistor ON</td>
</tr>
<tr>
<td>UserOutput2</td>
<td>Yes/No</td>
<td>Yes = Transistor ON</td>
</tr>
<tr>
<td>Base1Supply</td>
<td>Byte</td>
<td>See HSCAlarmState table</td>
</tr>
<tr>
<td>Base1Tx:Power</td>
<td>Byte</td>
<td>See HSCAlarmState table</td>
</tr>
<tr>
<td>Base1Data</td>
<td>Byte</td>
<td>See HSCAlarmState table</td>
</tr>
<tr>
<td>Base1Rx:Sig</td>
<td>Byte</td>
<td>See HSCAlarmState table</td>
</tr>
<tr>
<td>Base1Freq</td>
<td>Byte</td>
<td>See HSCAlarmState table</td>
</tr>
<tr>
<td>Base2Supply</td>
<td>Byte</td>
<td>See HSCAlarmState table</td>
</tr>
<tr>
<td>Base2Tx:Power</td>
<td>Byte</td>
<td>See HSCAlarmState table</td>
</tr>
<tr>
<td>Base2Data</td>
<td>Byte</td>
<td>See HSCAlarmState table</td>
</tr>
<tr>
<td>Base2Rx:Sig</td>
<td>Byte</td>
<td>See HSCAlarmState table</td>
</tr>
<tr>
<td>Base2Freq</td>
<td>Byte</td>
<td>See HSCAlarmState table</td>
</tr>
</tbody>
</table>

Table 10.1 - HSCchannelState

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Byte</td>
</tr>
<tr>
<td>Description</td>
<td>Text (40)</td>
</tr>
</tbody>
</table>

Table 12.0 - EBaseStatus

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial</td>
<td>Long Integer</td>
<td>HSC serial number</td>
</tr>
<tr>
<td>Epoch</td>
<td>Date/Time</td>
<td>Date/Time received</td>
</tr>
<tr>
<td>UserInput1</td>
<td>Yes/No</td>
<td>Yes = Transistor ON</td>
</tr>
<tr>
<td>UserInput2</td>
<td>Yes/No</td>
<td>Yes = Transistor ON</td>
</tr>
<tr>
<td>UserOutput1</td>
<td>Yes/No</td>
<td>Yes = Transistor ON</td>
</tr>
<tr>
<td>UserOutput2</td>
<td>Yes/No</td>
<td>Yes = Transistor ON</td>
</tr>
</tbody>
</table>

Table 13.0 - Alarm Status

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Type</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial</td>
<td>Number</td>
<td></td>
</tr>
<tr>
<td>Epoch</td>
<td>Date/Time</td>
<td>Time Received</td>
</tr>
<tr>
<td>Temp</td>
<td>Text</td>
<td>Active/Clear</td>
</tr>
<tr>
<td>Vois</td>
<td>Text</td>
<td>Active/Clear</td>
</tr>
<tr>
<td>Frequency Error</td>
<td>Text</td>
<td>Active/Clear</td>
</tr>
<tr>
<td>RSSI</td>
<td>Text</td>
<td>Active/Clear</td>
</tr>
<tr>
<td>Tx Power</td>
<td>Text</td>
<td>Active/Clear</td>
</tr>
<tr>
<td>VSWR</td>
<td>Text</td>
<td>Active/Clear</td>
</tr>
</tbody>
</table>
Part E – Support Options

When e-mailing questions to our support staff, please provide 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 including radio configuration files, diagnostic database and system diagrams, also any tests that you have done which may help us to better understand the issue. If possible, include your telephone contact information should we wish to further clarify any issues.

Technical Support: The Americas, Europe, Middle East, Asia
Available Monday to Friday 8:00am - 6:30pm Eastern Time
Toll free within North America: 1-888-226-6876
Direct Worldwide: +1-613-591-1943
Email: SupportTRSS@schneider-electric.com

Technical Support: Australia
Inside Australia: 1300 369 233
Email: au.help@schneider-electric.com