



**GW3-TRBO®**  
**KPI**  
**Software Version 2.23.5**  
**Module Book**

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***GW3-TRBO®***

**600-2.23.5-UU.1**  
**10/31/2023**



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Refer to the *Troubleshooting & Support* section of the GW3-TRBO Manual Shell (Book 600-2.23.5-AA.1) for complete support and contact information.

### ***Document History***

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### Goals

This manual describes the function and role of the KPI module in the GW3-TRBO solution and provides instructions on using the KPI graphical user interface (GUI).

### Who Should Read This Manual?

This manual is written with an expected audience of novice to mid-level MOTOTRBO radio system users and novice to mid-level PC users.

### How This Manual Is Organized

This manual is organized as follows:

- **Overview:** Describes the KPI module, the KPI GUI and the organization of information within the KPI GUI.
- **Using KPI:** provides instructions on KPI and setting up the GUI to satisfy your viewing needs.

This manual contains the following images, used to indicate that a segment of text requires special attention:



**Additional Information:** Additional information is used to indicate shortcuts or tips.



**Warning:** Warnings are used to indicate possible problem areas, such as a risk of data loss or incorrect/unexpected functionality.






This chapter describes the KPI module, the KPI GUI and the organization of information within the KPI GUI.


This chapter contains the following sections:

- **What is KPI?:** Defines the function and role of the KPI module in the GW3-TRBO solution.

## What is KPI?

The KPI module displays real-time WACN, system, zone and site activity on calls, busies, connections and peak usage on a 5-minute interval. The KPI GUI displays the activities on a Window-Interval or Date-Time configuration.

 KPI adjusts the periods to display 100 or fewer data points on each graph. If it adjusts the periods, then the aggregated values will be computed based on their type and, as a result, the data points on the graphs might not necessarily display 5 minute intervals.

 Intervals between data points are curve-fit and may not represent the actual data. There is a note on the chart grid indicating this.



**Figure 1.1 – KPI GUI**

## Terms

**KPIs:** Key Performance Indicators.



This chapter provides instructions on understanding KPI and setting up the GUI to fulfill your viewing need.

This chapter contains the following sections:

- **KPIs:** Describes the different key performance indicators used in KPI.
- **KPI Charts:** Further explains how the KPI charts display data.
- **Options Window:** Describes how to configure KPI.
- **Resource Tree:** Describes how to use the Resource Tree.
- **Chart Grid View:** Describes how to use the chart grid view.

### Key Performance Indicators

This section describes the different KPIs used in the KPI module. This information is organized in the following areas:

- **Calls:** Describes the different KPIs under *calls* for the specified period.
- **Busies:** Describes the different KPIs under *busies* for the specified period.
- **Connections:** Describes the different KPIs under *connections* for the specified period.
- **Peak Usage:** Describes the different KPIs under *peak usage* for the specified period.

### Calls

Key performance indicators under *calls* are organized in the areas below. Calls are counted on each site where a channel is granted, regardless of the source site.

- **Group Call Count\*:** The amount of talkgroup calls per interval.
  - **Historical Group Call Count:** Average of all intervals for Group Call Count.
- **Group Call Time:** The number of seconds used by talkgroups.
  - **Historical Group Call Time:** Average of all intervals for Group Call Time.
- **Private Call Count\*:** The amount of private calls per interval
  - **Historical Private Call Count:** Average of all intervals for Private Call Count.
- **Private Call Time:** The number of seconds used by private calls.
  - **Historical Private Call Time:** Average of all intervals for Private Call Time.
- **Data Group Call Count\*:** The amount of data group calls per interval.
  - **Historical Data Group Call Count:** Average of all intervals for Data Group Call Count.
- **Data Group Call Time:** The number of seconds used by data group calls.
  - **Historical Data Group Call Time:** Average of all intervals for Data Group Call Time.

- **Data Private Call Count\***: The amount of private data calls per interval.
  - **Historical Data Private Call Count**: Average of all intervals for Data Group Call Count.
- **Data Private Call Time**: The number of seconds used by private data calls.
  - **Historical Data Private Call Time**: Average of all intervals for Data Private Call Time.

\* These counts include calls that started in this interval as well as calls that were active going into this interval. Calls can be counted across multiple intervals.

## Busies

Key performance indicators under *busies* are organized in the areas below.

- **Busy Count\***: The amount of busies per interval.
  - **Busy Historical Count**: Average of all intervals for Busy Count.
- **Busy Time**: The number of milliseconds the channel was busy.
  - **Busy Historical Time**: Average of all intervals for Busy Time.

\* This count includes busies that started in this interval as well as busies that were active going into this interval. Busies can be counted across multiple intervals.

## Connections

Key performance indicators under *connections* are organized in the areas below:

- **Radio Count**: At the end of each 5-minute interval a count of currently affiliated radios is taken.
  - **Historical Radio Count**: Average of all intervals for Radio Count.
- **Group Count**: At the end of each 5-minute interval a count of current groups with at least one affiliated radio is taken. The affiliated group count is the count of affiliated groups per site. Zone, System and WACN level group counts will be sums of all affiliated groups for sites under that level.
  - **Historical Group Count**: Average of all intervals for Group Count.
- **Radio Connections**: The amount of radio connections.
  - **Historical Radio Connections**: Average of all intervals for Radio Connections.

Radio and Group counts are affected by the **Radio ID Timeout Minutes** option in Alias' System settings. Radios are not considered affiliated if their connection has timed out. Most radio-originated activity will renew a radio's connection timeout. Group count is affected because a group is only counted if it has an affiliated radio whose connection has not timed out.



Because radio and group are recorded at the end of each KPI window, if KPI is tasked with back-filling these values into intervals, the values will be 0. This is to prevent KPI from falsely presenting a value that would likely be invalid.



Radio IDs 16776410 and 16776414 will be ignored and not displayed in this module as these are XRCs and not actual radios.



When a radio is inhibited, it is considered disconnected until the inhibit is canceled or the radio issues activity indicating that it is no longer inhibited. Affiliation and registration activity does not qualify. Because IP Console Inhibits are partial radio inhibits, they are not counted as radio inhibits.

## Peak Usage

Key performance indicators under *peak usage* are organized in the areas below. When aggregated, the **maximum** of the data is used for each interval.

- **Peak Channels:** Peak number of channels used.
  - **Historical Peak Channels:** Average of all intervals for Peak Channels.

## KPI Charts

### Data Point Compression

KPI Module adjusts the periods in the KPI charts to display 100 or fewer data points on each graph. If it adjusts the periods, then the aggregated values will be adjusted based on their type and, as a result, the data points on the graphs might not necessarily display 5-minute intervals. To ensure the more readable 5-minute intervals when viewing more than a 6-hour time window, it is best to have the window be increments of 8 hours, 20 minutes. Such as:

- 8 hours 20 minutes = 5-minute data points
- 16 hours, 40 minutes = 10-minute data points
- 25 hours (1 day and 1 hour) = 15-minute data points
- 33 hours, 20 minutes (1 day, 9 hours and 20 minutes) = 20-minute data points
- 41 hours, 40 minutes (1 day, 17 hours and 40 minutes) = 25-minute data points
- 50 hours (2 days and 2 hours) = 30-minute data points

### **Sum Compression**

When compression is used on values aggregated by a **sum**, each value is summed to arrive at the compressed data point value.

Values aggregated by **sum** include:

- Group Call Count
- Group Call Time
- Private Call Count
- Private Call Time
- Data Group Call Count
- Data Group Call Time
- Data Private Call Count
- Data Private Call Time
- Radio Connections
- Busy Count
- Busy Time

### **Maximum Compression**

When compression is used for values aggregated by a **maximum**, a maximum evaluation is performed on each value to determine the compressed data point value.

Values aggregated by a **maximum** include:

- Radio Count
- Group Count
- Peak Channels

### **Historical Value Data Points**

In the KPI charts, historical values are shown as a gray line. Historical values are only shown for data points when archive data exists for the date and time in the data point. For example, if the current date and time is 3/24/2023 13:30 and you choose to view KPIs for a 25 hour range of 3/24/2023 13:00 to 3/25/2023 14:00, you will see historic values for the 3/24/2023 13:15 segment, but not for the 3/25/2023 13:15 segment. This is because the 3/25/2023 13:15 segment is in the future and does not have corresponding archive data.

This also applies to data points consisting of more than one compressed data point (explained above). KPI will only compress the data points that have corresponding archive data.

Regardless of selected time range, historical values show the historical average for all known intervals.

## Options Window

This section describes the different configurations settings use in KPI and the GUI that allow users for modifying the configurations. A user can load up the Options Window GUI by clicking on *Options Window* in the View menu. The *Options Window* section is organized in the following areas:

- **Data Source:** Describes how to set up the KPI data source.
- **Query Options:** Describes how to set up querying the KPI data source for fetching data.
- **Chart Options:** Describes the function of each of the chart options.
- **KPIs To Display:** Describes how to set up the different key performance indicators to display.

The screenshot shows the 'KPI - Options' window with the following settings:

- Data Source:** Server Name: COOKY, Database Name: GET\_KPI\_DB, Test Connection button.
- Query Options:** Window and Interval selected. Window: Two Hour, Interval: Five Minutes.
- Date and Time:** Range: Begin 8/12/2014 9:00 AM, End 8/12/2014 11:00 AM.
- Portion:** Hour: Include checked, Begin 0, End 23; Minute: Include checked, Begin 0, End 59.
- Refresh Interval (Minutes):** 2.
- Chart Options:** Hide Axis Values checked, Chart Type: Line.
- KPIs To Display:** Calls (Group Call Count, Group Call Time, Private Call Count, Private Call Time, Data Group Call Count, Data Group Call Time, Data Private Call Count, Data Private Call Time), Busies (Busy Count, Busy Time), Connections (Radio Count, Group Count, Radio Connections), Peak Usage (Peak Channels).

Figure 2.1 – KPI Options Window

## Data Source

The data source where KPI fetches data from. The following are the connection properties for the data source.

- **Server Name:** The SQL Server instance for KPI.
- **Database Name:** The database instance name for KPI.

A screenshot of a software window titled "Data Source". It contains two text input fields. The first field is labeled "Server Name" and contains the text "CHARGER\SQL2012". The second field is labeled "Database Name" and contains the text "KPI". Below these fields is a button labeled "Test Connection".

**Figure 2.2** – Data Source

Notes about Data Source:

- Click on the **Test Connection** button when enabled to test the connection to the KPI data source. If the connection is successfully made, then a “Successful” message will be displayed otherwise the appropriate error message will be displayed.



## Query Options

Query Options determines how and when data is fetched from the KPI data source. Fetching data can be configured by using *Window and Interval* or *Date and Time*. The default configuration is *Window and Interval*. While one configuration is set the other cannot be modified. Query Options is organized in the following areas:

- **Window and Interval:** Describes using *window* and *interval* configuration to fetch data from the KPI data source.
- **Date and Time:** Describes using *Date and Time* configuration to fetch data from the KPI data source.
- **Refresh Interval (Minutes):** Describes the interval used in fetching data.

The screenshot shows the 'Query Options' configuration window. At the top, there are two radio buttons: 'Window and Interval' (selected) and 'Date and Time'. Below the 'Window and Interval' section, there are two dropdown menus: 'Window' set to 'Two Hour' and 'Interval' set to 'Five Minutes'. The 'Date and Time' section is currently disabled. It contains a 'Range' section with 'Begin' and 'End' date/time pickers, both showing '8/12/2014 9:00 AM' and '8/12/2014 11:00 AM' respectively. Below that is a 'Portion' section with two sub-sections: 'Hour' and 'Minute'. Each has an 'Include' checkbox (checked) and 'Begin'/'End' spinners. The 'Hour' section has 'Begin' at 0 and 'End' at 23. The 'Minute' section has 'Begin' at 0 and 'End' at 59. At the bottom, there is a 'Refresh Interval (Minutes)' spinner set to 2.

**Figure 2.3** – Query Options

## Window and Interval

This configuration uses a window to determine what data is queried from the data source in intervals of five minutes (5 minutes). The window determines the time frame (past) to account for when the KPI data source is fetching data. For example, if the window is set to **Two Hour**, then query results would be based on two hours before the time that the data source is queried.

Valid *Window* values:

- One Hour
- Two Hour (default)
- Six Hour
- Twelve Hour
- One Day
- One Week

## Date and Time

This Configuration uses a date and time range and a date and time portion method to determine what data is queried from the KPI data source. *Range* determines the time frame and *Portion* determines the individual date or time portion to include in the query. A user can check/uncheck the *Include* checkbox to determine whether that *portion* gets included or not in the query.

### Range

- *End* must be greater than or equal to *Begin*

### Portion

- **Hour**
  - Included by default
  - Valid values: 0 to 23
  - Default
    - *Begin* (0)
    - *End* (23)
  - *End* must be greater than or equal to *Begin*
- **Minute**
  - Included by default
  - Valid values: 0 to 59
  - Default
    - *Begin* (0)
    - *End* (59)
  - *End* must be greater than or equal to *Begin*

### Refresh Interval (Minutes)

The *Refresh Interval* determines the minutes KPI takes in fetching data from the data source. The valid range of values for *Refresh Interval* is from two to five minutes and by default it is set to two minutes.



If the query option is set to Date and Time, the Refresh Interval is disabled because there is no new data to continually retrieve.

## Chart Options

This section contains features that effect how the charts are displayed. These features include:

### Hide Axis Values

To maximize each chart's display area, you can choose to remove the vertical axis values from the charts. When this feature is enabled, the axis values are still visible in the zoom window when you double-click on a chart.

### Chart Type

The following chart options are available:

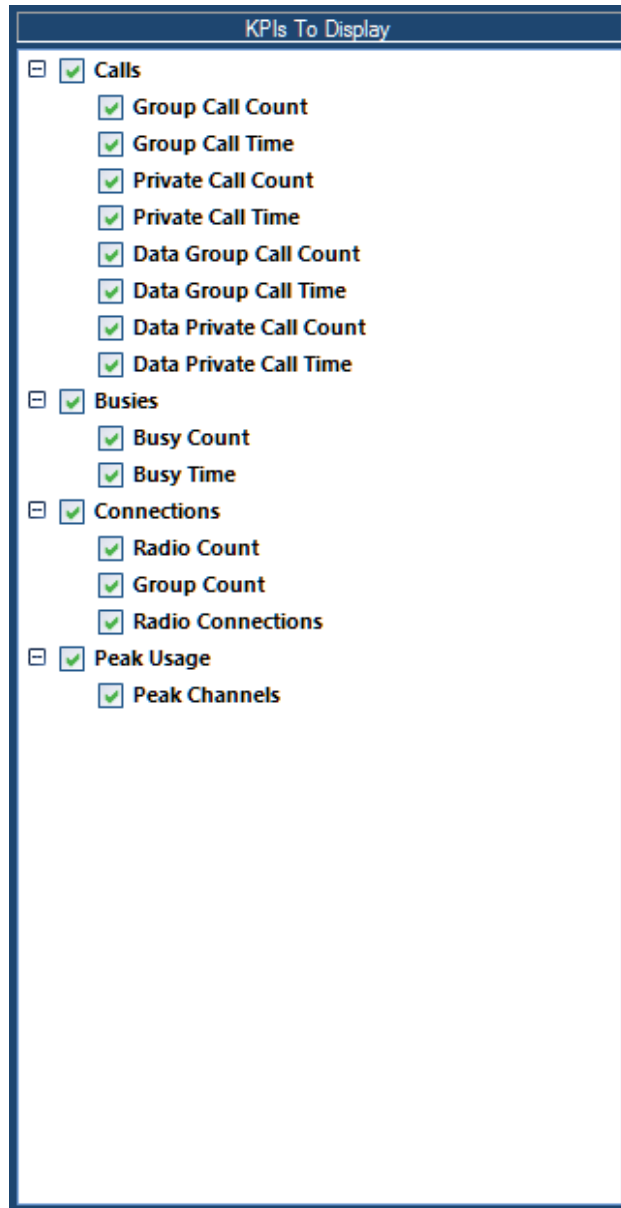
- Area
- Bar
- Line
- Stepline



The Chart Type option of Bar is only available when the Hide Axis Values option is checked.

## KPIs To Display

This determines which KPIs to enable for display in the KPI GUI. KPIs marked as checked and bolded are the ones enabled for display. A user can simply check/uncheck a parent key performance indicator node to enable/disable correspondingly all the KPIs under it.



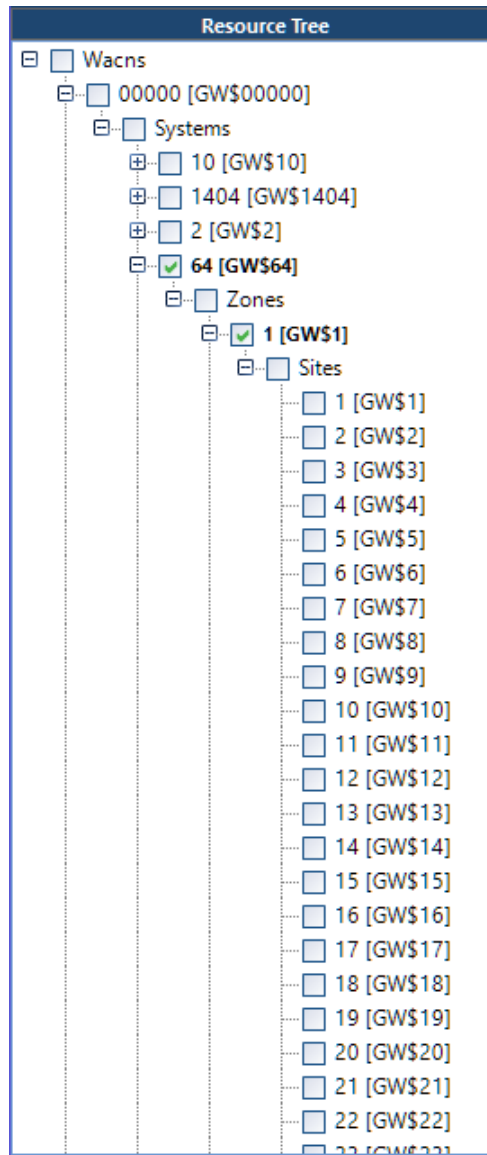
The screenshot shows a window titled "KPIs To Display" with a tree view of KPI categories and their sub-items. All items are checked and bolded.

- ☒ **Calls**
  - ☒ **Group Call Count**
  - ☒ **Group Call Time**
  - ☒ **Private Call Count**
  - ☒ **Private Call Time**
  - ☒ **Data Group Call Count**
  - ☒ **Data Group Call Time**
  - ☒ **Data Private Call Count**
  - ☒ **Data Private Call Time**
- ☒ **Busies**
  - ☒ **Busy Count**
  - ☒ **Busy Time**
- ☒ **Connections**
  - ☒ **Radio Count**
  - ☒ **Group Count**
  - ☒ **Radio Connections**
- ☒ **Peak Usage**
  - ☒ **Peak Channels**

**Figure 2.4** – KPIs To Display

## Resource Tree View

The Resource Tree displays all KPI resources from a WACN to a Site level. Each node in the Resource Tree View contains a check box and checking/unchecking it determines whether KPIs are shown/hidden correspondingly for that resource in the chart grid view. A user can hide/show the Resource Tree View by selecting *Hide Resource Tree/Show Resource Tree* from the View menu.



**Figure 2.5** – Resource Tree View



To ensure that KPI's performance is acceptable, the GUI limits the number of checked resources. This limit is set in your license; to request an increase, contact support.

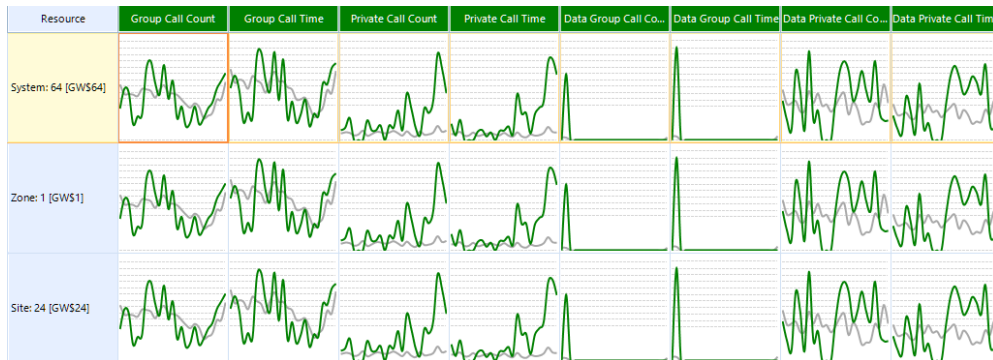
## Chart Grid View

The Chart Grid View displays the Resource alias and KPIs (charts) for each enable resource on the *Resource Tree View* based on the user's configuration setting in the *Options Window*. Each column on the Chart Grid View (except **Resource**) corresponds to the individual key performance indicator selected in the *KPIs To Display* in the user's Options Window. Charts in the Grid get refreshed base on the Refresh Interval settings. Depending on the number of enabled resources it might take a bit of time to refresh accordingly.

Data last refreshed: 9:14:09 AM | Charts last refreshed: 9:17:49 AM

**Figure 2.6** – Refresh display

The **Refresh display** at the top of the window shows when the data was fetched from the database / when it was displayed. The Chart Grid View can be renewed with the latest data by clicking the **Refresh Charts** button.

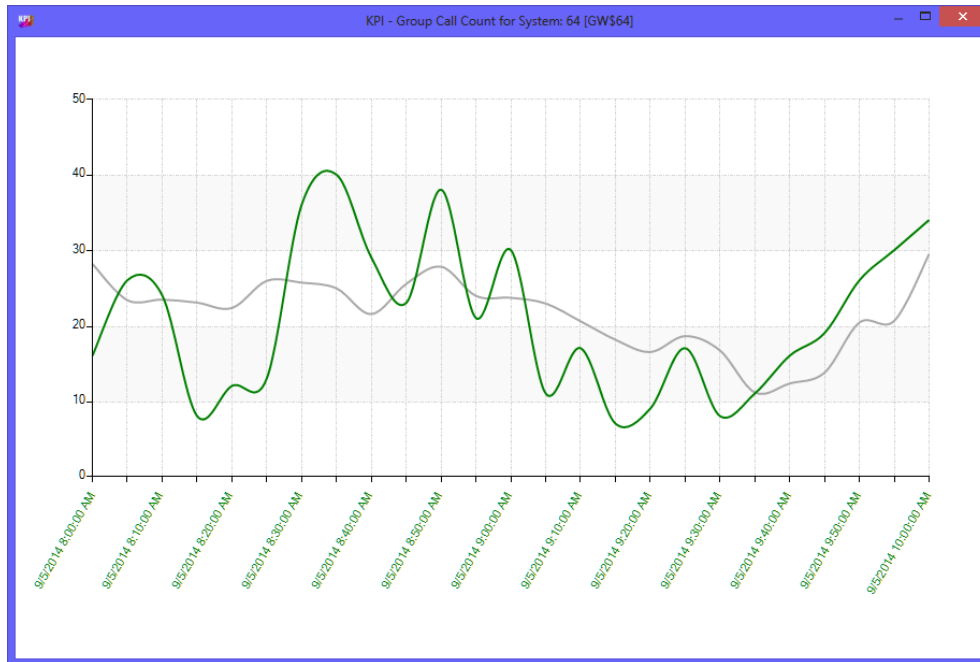


**Figure 2.7** – Chart Grid View

- **Column Reordering**
  - Columns in the Chart Grid View can be reordered by clicking and dragging on the column header.
- **Column Resizing:**
  - Columns in the Chart Grid View can be resized by dragging on the column handle.
- **Row Resizing:**
  - Rows in the Chart Grid View can be resized by dragging on the row handle.

## Chart Window

Double-clicking on a chart displays the chart window. The chart window displays the corresponding chart in a zoomed form to allow for easy readability.



**Figure 2.8** – Chart Window



## Status View

The *Status View* displays current KPI user configuration. It is organized in the following areas:

- **Data Source:** Displays the current KPI data source (Data Source: Server Name->Database Name).
- **Query Option:** Displays the currently selected query option.
- **Legend:** Displays the default colors for the different key performance indicators use as column header back color in the *Chart Grid View*.



**Figure 2.9** – Status View

### Data Source

The *Data Source* label in the status view displays the current KPI data source. Red fore color indicates that the KPI data source is not being accessible due to an error and it will display the error message below (double-clicking on the label will load a message box displaying the entire error message):

**Data Source: Server Name->Database Name (Double-click to display error).**

### Query Option

The *Query Option* label in the status view displays the currently selected Query Option (Query Option: *Five Minutes interval on a Two-Hour window*).

### Legend

The *Legend* displays the default colors for the different key performance indicators (Calls, Busies, Connections and Peak Usage). The column header background color and chart color on the *Chart Grid View* corresponds to the color on Legend. Legend colors cannot currently be changed, and the following list defines the ones being used in KPI.

- **Green** = Calls
- **Red** = Busies
- **Blue** = Connections
- **Tan** = Peak Usage
- **Gray** = Historical values