

MultiTech[®]
Systems



Multi-Tech Device Manager

Getting Started Guide

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Introduction and Overview

Multi-Tech® Device Manager is a cloud based device management solution that simplifies and scales the management of Multi-Tech’s latest generation of networking devices. It allows users to remotely monitor, upgrade and configure an entire device population from a single location. Whether you have one or more than 10,000 devices to manage, Multi-Tech Device Manager simplifies access to your devices, resulting in lower total cost of ownership and increased operational efficiency.

Highlights:

- Dashboards provide notifications and device group views with simple navigation to easily drill down to detailed device level data for troubleshooting and device status updates
- Firmware and configuration updates can be executed with a few simple clicks on individual devices or user defined groups of devices across entire device populations.
- View managed devices on a map based on GPS location (GPS enabled devices) or a manually defined location.
- Supported products: MultiConnect® rCell 100 Series Routers.

Architecture Overview

This section describes the architectural design of Device Manager and how that relates to the operation of the platform. Figure 1 shows a high level overview of the platform.

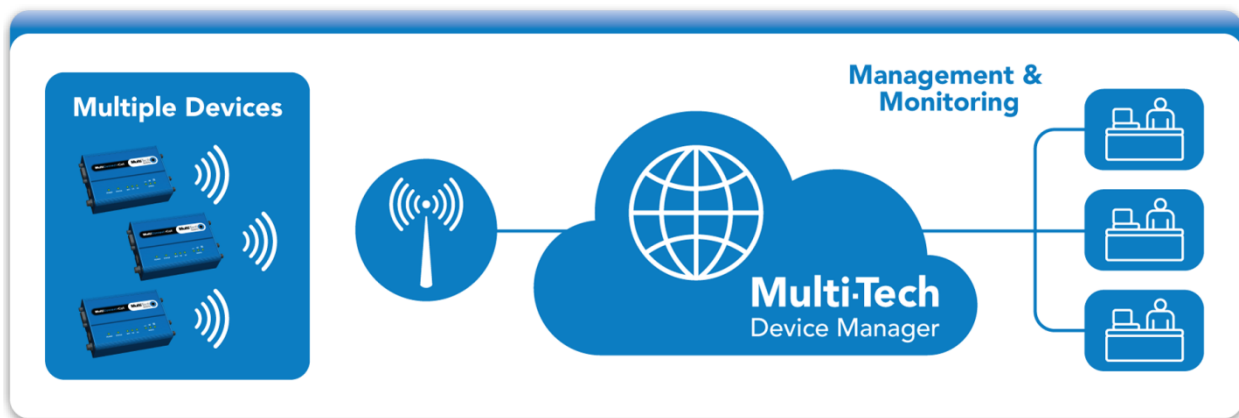


Figure 1

Once a device is configured to communicate with Device Manager, it will periodically send device information and statistics to Device Manager and check for firmware and/or configuration updates to download. The frequency with which devices connect to the platform is configurable on a per-device basis, although Device Manager enforces a minimum check-in interval of once every 240 minutes (4 hours).

It is important to understand that devices do not maintain a persistent connection to Device Manager. Any pending actions, such as firmware and configuration updates, are applied to the device only when it checks in. A “live” connection does not exist and historical device statistics, such as signal level, are recorded at the time the device checks in. The user will sign into the Device Manager to view device statistics and schedule firmware and configuration updates.

Getting Started

There are two basic steps required to begin using Device Manager:

1. Register for a Device Manager account
2. Enable device management on the device

Registering for a Device Manager Account

Prior to utilizing Device Manager, you must register for an account. To begin the registration process, simply navigate to the login page using the link below:

<https://mdm.multitech.com>

You will be presented with the screen shown in Figure 2. If you have already registered for an account, enter your email address and password and click Sign In. If you are a first time visitor and need to register for an account, simply click on the Register Account link and you will be directed to the registration page.

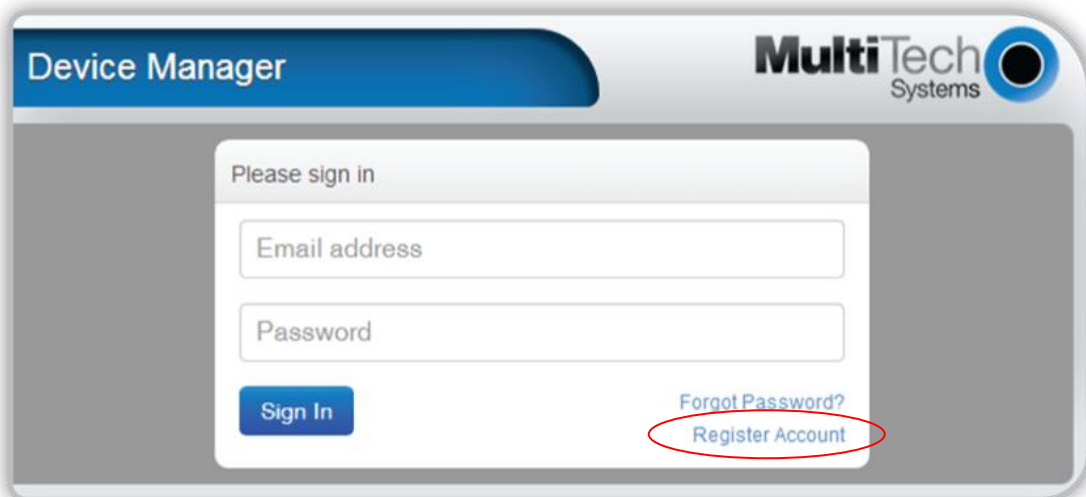


Figure 2
Sign in Screen

Complete all of the fields on the Account Registration page

- (1) Read the End User License Agreement (EULA)
- (2) Accept the EULA by checking the Accept EULA box
- (3) Type in the Captcha text into the text box
- (4) Click on the Create Account button
- (5) You will receive an email confirmation asking you to confirm your new account. To complete the activation process, click on the link provided in the email to finalize your registration.
- (6) You will receive a final email with your registration information. Included in this email will be your unique Account Key that you must program into each device that is to be remotely managed. The account key can also be found on the bottom of the Home page and also by clicking on your email/login in the upper right corner, then clicking Account Info.

Enabling Device Management on Managed Devices

Device Manager currently supports Multi-Tech's MultiConnect® rCell 100 Series of routers (models MTR-xx), firmware release 3.0.9 and higher. Devices are shipped from the factory with device management disabled. To enable device management, you must login into the device's Graphical User Interface (GUI) and navigate to the Administration: Remote Management page as displayed below in Figure 3.

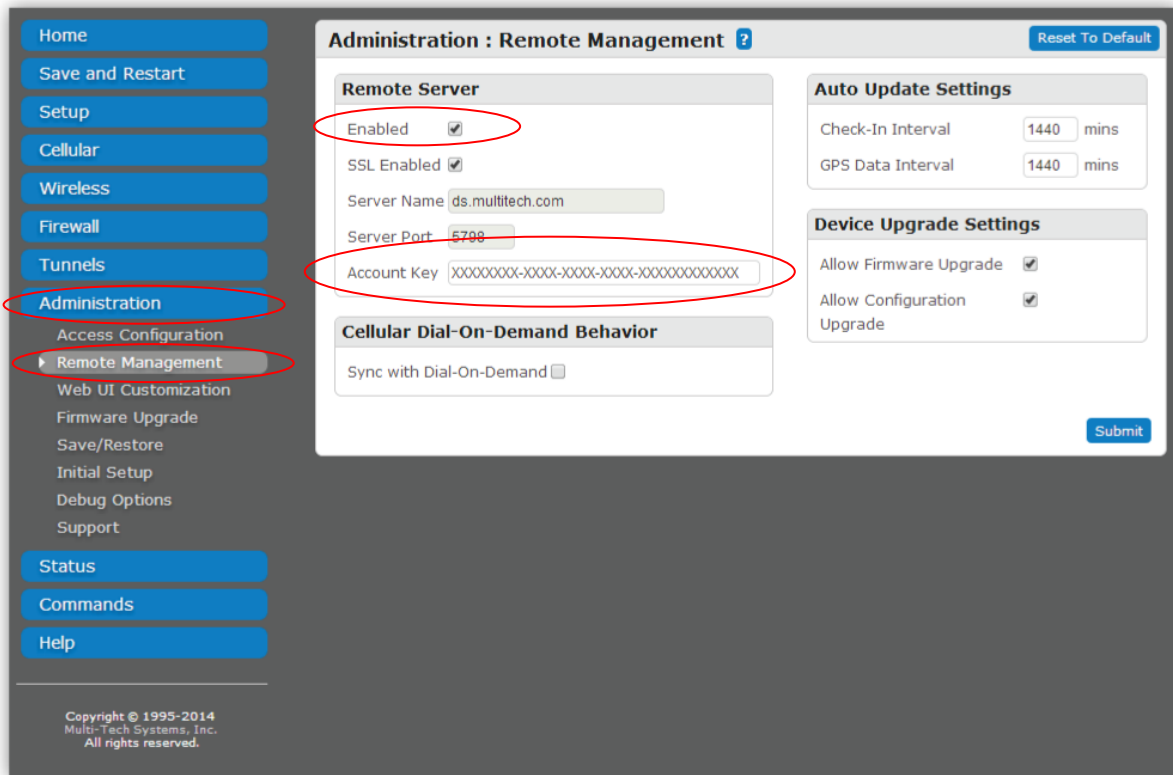


Figure 3
MultiConnect® rCell Graphical User Interface

- (1) Check the Enabled box
- (2) Enter your unique Account Key that you received upon completion of your account registration
- (3) Click the Submit button
- (4) Click the Save and Restart button

Your device will automatically begin to upload its device statistics and check for firmware and configuration updates.

You can now sign in to your Device Manager account to view and manage your device.

Additional Device Settings

Auto Update Settings: These settings determine how often the device checks in and sends GPS data to Device Manager. The default Intervals on the device are set to 720 minutes (12 hours) at the factory. The Intervals can be set to any value by the user. The minimum value is 240 minutes (4 hours). Device Manager will override the setting in the device GUI if it is set to any value less than 240 minutes (4 hours).

SSL Enabled: Check this box to have all device management communications encrypted with SSL. This provides the best security, but uses more cellular data per check-in. Large transactions such as firmware updates will be about the same with or without SSL. See Appendix A for details.

Device Upgrade Settings: Uncheck these boxes to disable remote firmware and configuration upgrades. These settings cannot be changed remotely.

Sync with Dial-on-Demand: This setting only applies if the PPP Dial-on-Demand feature is enabled. When this box is un-checked (default), there will be no restriction on the device check-in process. If this box is checked, the device will only perform a check-in with Device Manager if the PPP link is already established due to LAN traffic demand. If the PPP link is down due to inactivity, the device will wait to check-in until LAN traffic demand causes the PPP link to come up. Please see the device documentation for further details regarding Dial-on-Demand.

Cellular Data Usage: Depending on the configuration settings and the device you are managing, the cellular data usage will vary. Please see Appendix A for details on approximate cellular data usage when device management is enabled.

Device Manager Home Page

The Home page provides a dashboard view of overall device information. The page is broken out into three different categories:

- (1) Notifications
- (2) Map based views
- (3) Device charts

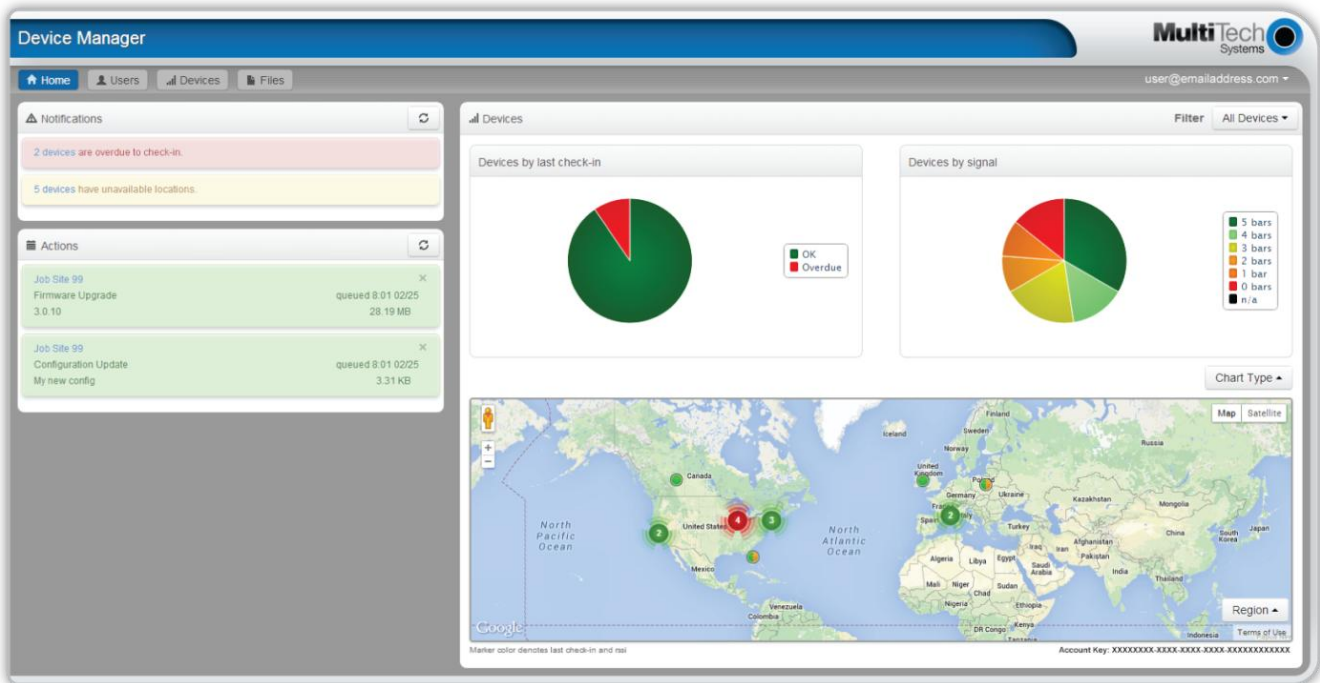


Figure 4
Device Manager Home Page

Notifications

The Notifications area provides the user a quick display of devices that are experiencing issues and may require action including

- (1) Devices that have failed to check into the platform.
- (2) Devices that failed a firmware upgrade.
- (3) Devices with no location information.
- (4) If there are pending or in-progress firmware or configuration updates, an actions area also appears to show their progress. If there are no pending or in progress actions, the actions area is hidden.
- (5) Clicking on a notification will quickly navigate the user to the device specific page or a list of impacted devices for further investigation.


Map Views

The Map View displays devices that have reported their GPS location or have been manually configured in the platform to display their location (devices without GPS functionality).

To interact with Multi-Tech Device Manager's mapping feature:

- (1) Click a device map marker. A device pop-up appears. The pop-up shows basic device identification details and a link to view detailed device information.
- (2) If many devices are located in the same geographical area, the map displays a cluster marker showing the number of devices in that area, rather than displaying all individual markers. To see the individual devices, click the device cluster marker to zoom in.

Device Charts

Device charts represent device statistics and attributes and provide a high level glimpse of the overall performance of the device fleet. Clicking on a colored section of a chart will bring up a list of devices in that particular category or that have that particular attribute. The chart display can be configured to display pie or bar charts and can be changed to show different device information, such as signal level, check-in performance, firmware, type of product or user defined groups. Simply click on the  button to change the device chart settings.

Device Manager Users Page

The Users page lists all users that have access to the account and allows users to be created, modified or deleted. Users have two different permissions levels based on their role: "manager" or "user." A "manager" has full read-write access to the system. This person can add/delete other users, edit/delete devices, and queue firmware/configuration updates for devices. A "user" has read-only access and cannot modify/delete any users or devices.

Adding, Editing and Deleting User Accounts

The Account Registrant will, by default, be the Manager of the account. Additional Managers and Users can be added to the account after it has been created. Managers have full rights to add new Managers and Users to the account, as well as perform tasks such as firmware and configuration updates to devices. Users will have read-only access.

To create, edit or delete user accounts, click Users.

Adding Users

- 1) Click New User. The User list page opens.
- 2) In the Account info drop-down list, select the desired role of the user: User or Manager.
- 3) In the User group, type the users email address in the Email field. Then the user's first name and last name in the respective fields.
- 4) In the Password field, type a password that is at least 8 characters long. Type this same password in the Confirm Password field.
- 5) Make sure Enabled is checked, otherwise the user is simply set up but cannot use Multi-tech Device Manager.
- 6) Click Create User.

Editing Existing User Information

- 1) Click the pencil/edit icon on the line of the user account whose information you want to edit.
- 2) The Editing Users page opens where you can change role, email address and user last and first names.

Deleting User Accounts

- 1) Click the X icon on the line that represents the user account you want to delete.
- 2) A dialog box appears where you can confirm that you really want to delete the user account.

Device Manager Devices Page

The Devices page allows you to browse or search all of your devices that have checked in to Device Manager. The devices table can be filtered to show only devices that match a certain set of attributes. Click the filter button



to show the filter tree. From here you can filter the device table by:

- (1) Action - shows all devices with pending actions
- (2) Firmware - filter by firmware version
- (3) Products - filter by product model
- (4) Groups - filter by user-defined groups of devices

The screenshot shows the Multi-Tech Systems Device Manager interface. On the left, there is a 'Filter' tree with categories: Devices, Actions (Upgrade, Config, Reboot, Failed), Firmware (MTR 3.0.9, MTR 3.0.8), Products (MTR-H5, MTR-CV3, MTR-C2, MTR-H6, MTR-G3), and Groups (unassigned). The main area displays a table titled 'Mike Radovich Test Account Devices' with columns: Description, Product, Serial, Group, Actions, Firmware, Rssi, Checked-in, Interval, and Uptime. The table contains 10 rows of device data. A search bar and a 'Show 10 entries' dropdown are visible above the table.

Description	Product	Serial	Group	Actions	Firmware	Rssi	Checked-in	Interval	Uptime
MTR-H5 - MTS-MR-001	MTR-H5	MTS-MR-001			3.0.9		10 hours ago	4.00 hrs	24 days
Acme warehouse	MTR-H5	MTS-MR-002			3.0.8		2 hours ago	4.00 hrs	24 days
MTR-H5 - MTS-MR-003	MTR-H5	MTS-MR-003			3.0.9		4 hours ago	6.00 hrs	24 days
MTR-H5 - MTS-MR-004	MTR-H5	MTS-MR-004			3.0.8		10 hours ago	12.00 hrs	24 days
MTR-H5 - MTS-MR-101	MTR-H5	MTS-MR-101			3.0.9		2 hours ago	4.00 hrs	24 days
MTR-H5 - MTS-MR-102	MTR-H5	MTS-MR-102			3.0.8		2 hours ago	4.00 hrs	24 days
MTR-H5 - MTS-MR-103	MTR-H5	MTS-MR-103			3.0.9		10 hours ago	6.00 hrs	24 days
Jackson Oil Field	MTR-H5	MTS-MR-104			3.0.8		10 hours ago	12.00 hrs	24 days
MTR-H5 - MTS-MR-105	MTR-H5	MTS-MR-105			3.0.9		6 hours ago	4.00 hrs	24 days
East coast plant	MTR-H5	MTS-MR-106			3.0.8		2 hours ago	4.00 hrs	24 days

Figure 5
Device Page shown with Filter Tree

As long as the filter tree is visible, the table is filtered by the selection made. To show all devices, simply click the filter icon to close the filter tree.

Viewing Individual Device Details

To view an individual device, click on the row for that device in the table. This will bring up a window with detailed information about that device, including:

- (1) Identifying information
- (2) Device status
- (3) Location (if GPS enabled or user-defined)
- (4) When the device has checked-in to the platform
- (5) Signal strength
- (6) WAN and LAN network statistics

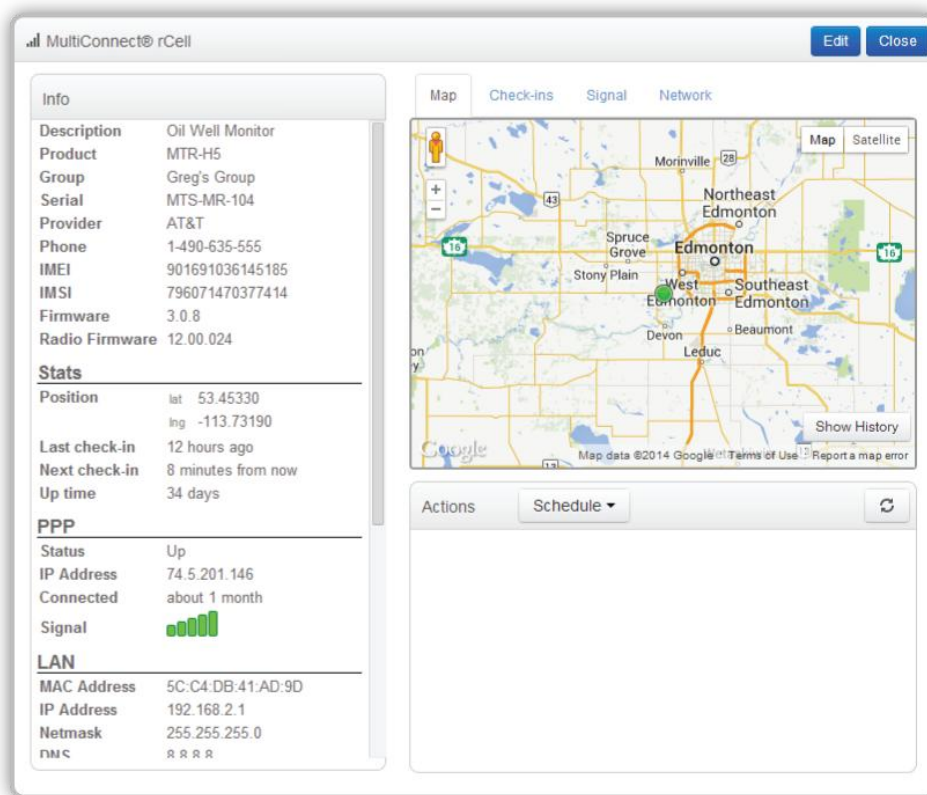


Figure 6
Individual Device View


The individual device view allows the user to schedule firmware upgrades, configuration updates, or a reboot of the device. Select from the Schedule pull down menu to perform these tasks on the device. Any pending action for the device will be applied the next time the device checks in to the platform.

To edit a device, click the Edit button on the individual device view. This allows the user to:

- (1) Set a description for the device
- (2) Set or change the group a device is assigned to

- (3) Manually specify the location of the device. Note that any location set manually is only used if the device is not equipped with a GPS receiver.


To simplify management, devices can be assigned to a user-defined group. There are two ways to group devices from the Devices page:

- (1) Select the devices you wish to group by clicking the check box.
- (2) Click the Actions button .
- (3) Select Group Devices.
- (4) Complete the dialog box to create the new group or enter the name of an existing group.

Or

- (1) Open the filter tree
- (2) Right-click on the Groups selection and click New Group. After naming it, devices can be assigned to that group by being dragged to it from the table.

The Devices page also allows actions such as a firmware or configuration update to be performed on multiple devices. To perform actions on a group of devices:

- (1) Filter the Devices table to the desired set of devices.
- (2) Click the Actions button  and choose the desired action to perform.

Note:

If individual devices were selected using the check boxes, the user is given the option to apply the action to all filtered devices or only the devices individually selected.

Firmware Releases

Firmware releases are uploaded to Device Manager and managed by Multi-Tech Systems.

Configuration Files

Device Manager enables remote device configuration updates to be accomplished on a single device or a user defined group of devices as explained above. This task is accomplished by remotely downloading a configuration file to the device.

The Files tab is where device configuration files are uploaded to Device Manager. Before a new configuration file can be uploaded, it must be created and saved to your computer. To accomplish this task, you must save the configuration from the GUI of a similar device.

Creating and Saving Configuration Files from the GUI of a Device

First, you must login to the local device via the device's GUI and set the desired configuration.

- (1) Select the Administration tab.
- (2) Click on the Save/Restore tab.
- (3) Select the Save button to save a configuration file to your computer.

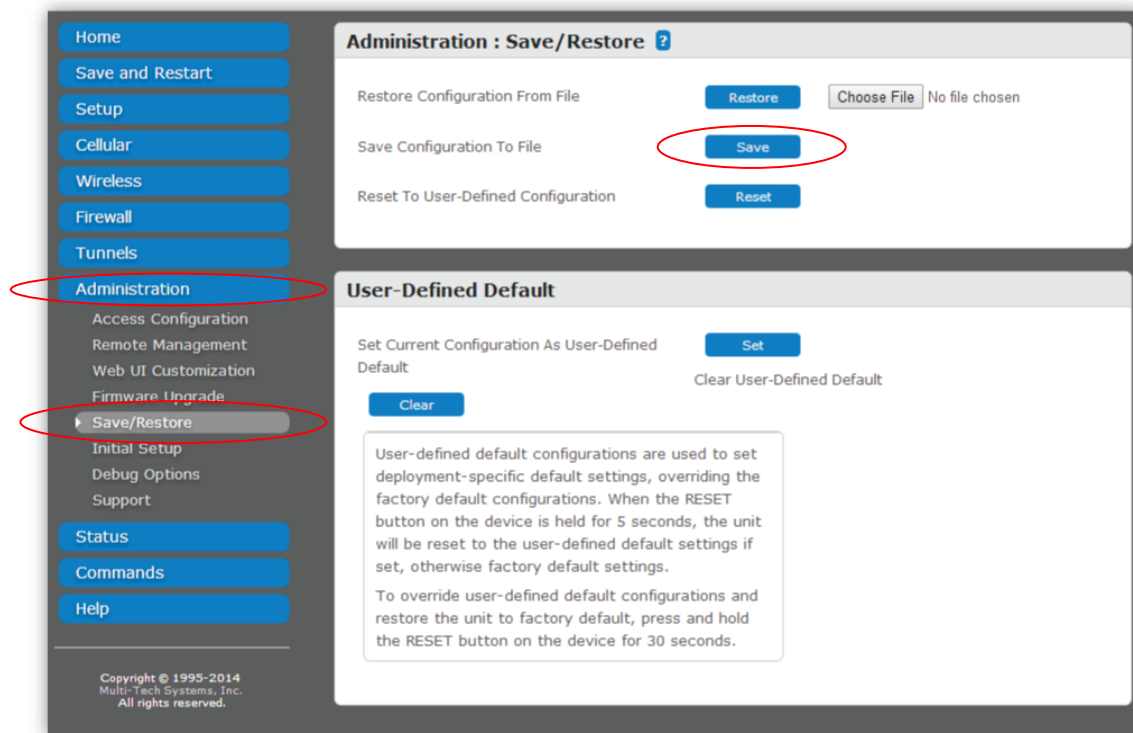


Figure 7
MultiConnect® rCell Graphical User Interface

Depending on your browser settings, the file may be saved automatically to your computer. Many browsers' default location is the Downloads directory. You may be prompted to select the location to save the file. In this scenario, simply navigate to the desired directory location on your computer and select Save.

After you have saved a configuration file to your computer, you are then able to upload it to Device Manager. To accomplish this task

- (1) Sign in to Device Manager.
- (2) Select the Files tab.
- (3) Select the New Configuration button.

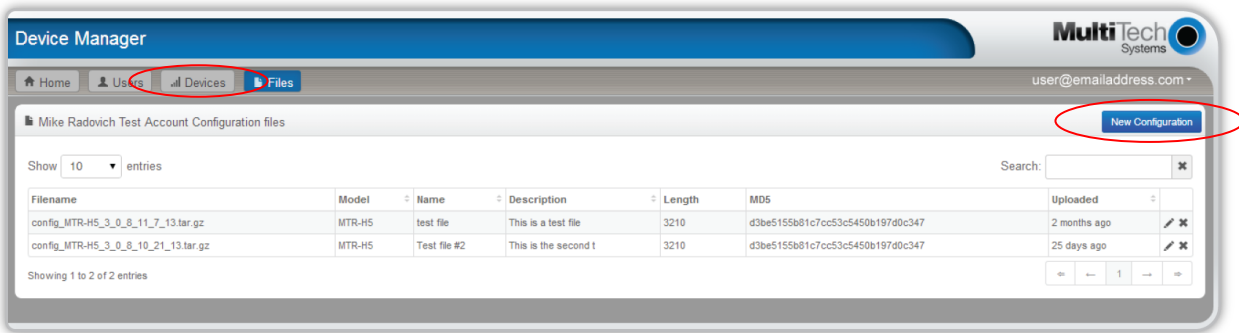


Figure 9

You will be prompted with the following dialog box:

The 'Upload File' dialog box has a title bar with a close button. It contains the following elements:

- File Info** section:
- Name**: A text input field.
- Description**: A text area with a scroll bar.
- File (*.tar.gz)**: A label above a 'Choose File' button.
- Upload**: A blue button at the bottom.

- (1) Enter the name and description that you want to assign to this configuration file in the Name and Description boxes respectively.
- (2) Click on the Choose File button
- (3) Navigate to the directory on your computer where the configuration file is saved and select the file.
- (4) Click the Upload button.

The configuration file will now be displayed on the Files tab on Device Manager. It will be selectable when you are scheduling a configuration upgrade for an individual device or a group of devices.

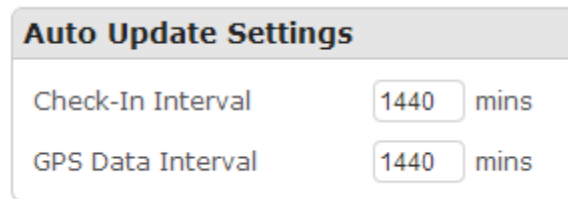
NOTE!:

Before a configuration change is scheduled for a remote device, the configuration should be verified on a local device to ensure it is a valid configuration. If a configuration is remotely applied to a device that disables the device's ability to communicate with Device Manager, a remote site visit may be required to reconfigure the device. If a User-Defined Default configuration is set on the device, the device may be recovered locally by pressing and holding the reset button located on the front panel of the device for 5 seconds. This assumes that the User-Defined Default settings have been set to allow communications to Device Manager. Additionally, if the device has remote LAN access via VPN, the device's GUI could be accessed to change the configuration allowing communications to Device Manager to resume.

Appendix A

Estimated Cellular Data Usage

This section will provide the user the estimated cellular data usage per each remotely managed device. These estimates are based on the variables that contribute to the overall data transmissions needed to support Device Manager. The variables that impact the amount of cellular data usage are primarily the frequency of check-in, security (SSL) configuration and whether the GPS data upload is synchronized with the device check-in interval (e.g. the Auto Update Settings for Check-in interval = GPS Data interval in the device's Remote Management configuration setting). See Figure 10 for an example of a synchronized configuration.



Auto Update Settings

Check-In Interval mins

GPS Data Interval mins

Figure 10
Device Auto Update Settings Example
 Showing synchronized GPS data with device Check-in Interval

	SSL	No SSL
Cellular Data Usage per Check-In (includes synchronized GPS data upload)	3.5 KB	1.5 KB
Unsynchronized GPS data upload	2.5 KB	.5 KB
Configuration Update	6.6 KB	5.5 KB
Firmware Update (Approx)	28,150 KB	29,000 KB

Table 1
Estimated Cellular Data Usage

Note:

If the device does not have Wi-Fi or GPS capabilities, the estimated cellular data usage per check-in will be .2 KB less for no GPS models and .1 KB less for no Wi-Fi models.

*Appendix A Continued***Example Calculation:**

Device model: MTR-H5-B10
 Wi-Fi: Included
 GPS: Included
 SSL: Enabled
 Check-In Interval: 720 minutes
 GPS Data Interval: 720 minutes

Estimated Check-In data usage per month		
Estimated cellular data usage per Check-In	3.50	KB
Check-In Interval	720	minutes
Check-Ins per month = $(24 * 60 / \text{Check-In Interval})$ * 31	62	Check-Ins per month
Estimated Check-In cellular data usage per month (usage per Check-In * Check-Ins per month)	217	KB

Estimated Configuration update data usage per month		
Estimated cellular data usage per Configuration Update	6.6	KB
Updates per month	2	
Estimated Configuration Update cellular data usage per month	13.2	KB

Estimated Firmware Update data usage per month		
Estimated cellular data usage per Firmware Update	28,226	KB
Updates per month	0	
Estimated Firmware Update cellular data usage per month	0	KB

Total estimated data usage per month (Addition of three estimates above)	230.2	KB
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