

RKE Firmware Update Instructions

1.1 Product

ReefKeeper Elite



Updating a modules firmware **will not** affect any stored user settings. This includes user settings within the RKE Head unit and the calibration data within modules.

1.2 Required Items

- RKM-SID (included with RKE system)
- 1ft Bus Cable (included with RKE system)
- 6' USB cable (included with RKE system)
- **RKE Programming Application 1.07**
- Ability to disconnect the module completely from the system

1.3 Installing the Programmer Application

Installation of the Programmer application is very straight forward.

1. Download and run the newest RKE Programming Application from our support forum or from the provided software CD.

<http://forum.digitalaquatics.com/viewtopic.php?f=4&t=14>

2. Proceed through the installation by pressing next and answering the questions.
3. Click "Close" after the installation has indicated that it is complete.

1.4 Firmware Filename

There are three main sections to the structure of the firmware filenames. The format is as follows:

WWW - X - YYZZ . hex

The first section, indicated by a WWW, displays the three product letters for the specific product. For example, this would display a PC4 to indicate the RKM-PC4 product.

The second section, indicated by a X, displays the hardware revision number.

The third section, indicated by a YY and ZZ, displays the major and minor revision numbers respectively.

All firmware files will be of the .hex file format.



1.5 Calibration Filename

Calibration files are generated by the programming application to allow for easy recovery of a module. These files will have the following format:

WWW-XXXXXXXXX.cal

The first section, indicated by a "WWW", displays the three product letters for the specific product. For example, this would display a PC4 to indicate the RKM-PC4 product.

The second section indicated by eight "X" characters, displays the serial number for the module.

1.6 Updating Firmware

The following instructions will walk through the process of updating the firmware for any RKE module. All modules except for the RKM-SID, including the RKE Head Unit are updated this way.

Please read the below notes before updating firmware:



It is very important that the module being updated is fully removed from the RKE Bus system. The only connection from the module should be a single bus cable running directly to the RKM-SID device.



When updating the RKM-PC4 the AC power must be turned off. This can be done by either setting the breaker switch to the off position or by simply unplugging the primary AC plug.



*During programming, the status light on the module connected to the RKM-SID should **not** light up. If by chance this does happen, please close and re-open the programming application.*

1. Connect the RKM-SID to a computer system using the provided USB cable.
2. Once the computer has recognized the RKM-SID the blue light on top will turn on. This indicates that the RKM-SID is now powered up and ready to use.
3. Connect the bus cable between the RKM-SID and the module in which you would like to program. A diagram of an example programming setup is shown below:



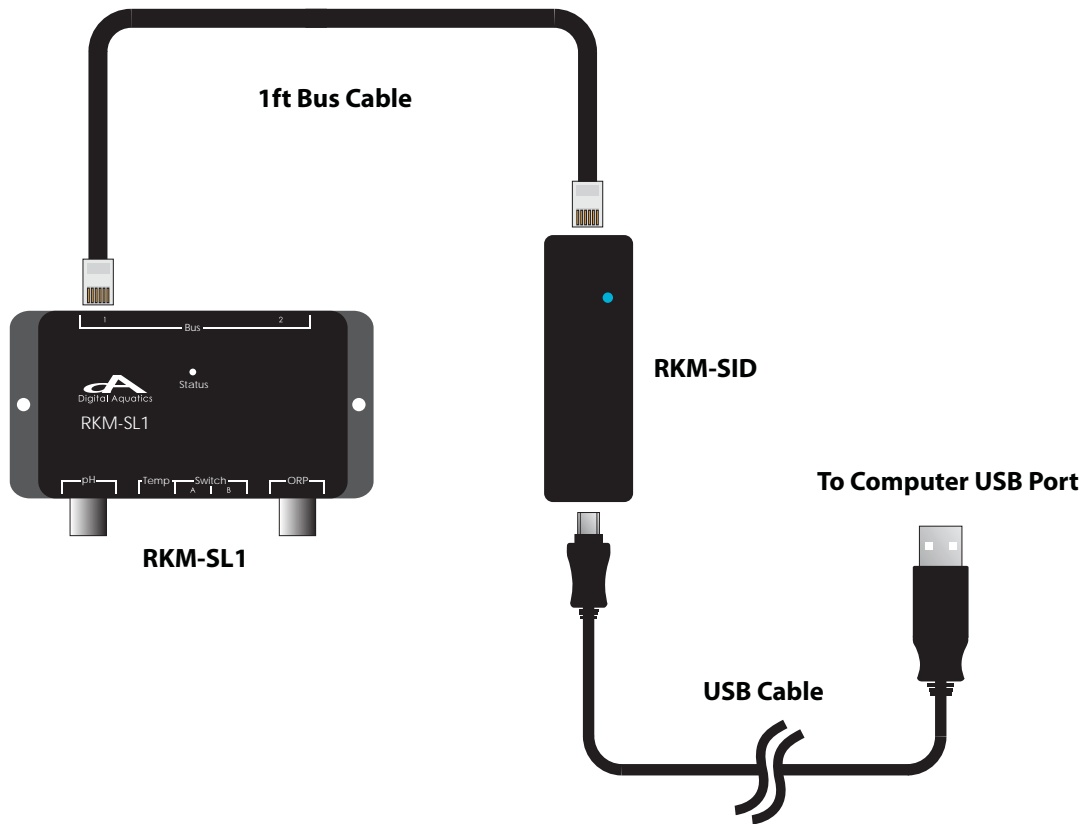


Figure 1a: Example programming setup

Once the RKM-SID is connected to both the computer and the module, the system is ready to program.

4. Start the RKE Programming Application by going to:

Start >> Programs >> Digital Aquatics >> Programmer

- The programming application will open and will display the message below indicating that the RKM-SID is connected and functioning.

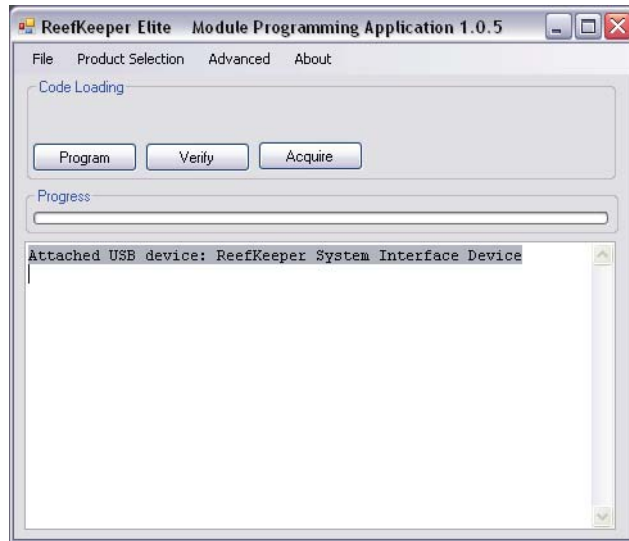


Figure 1b: Screenshot of Step 5

- Select the product that you are updating from the "Product Selection" menu.

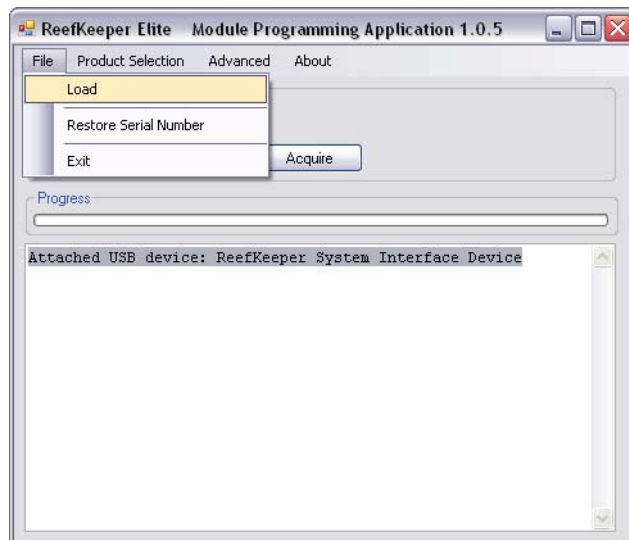


Figure 1c: Screenshot of Step 6

7. Next, go to File >> Load.

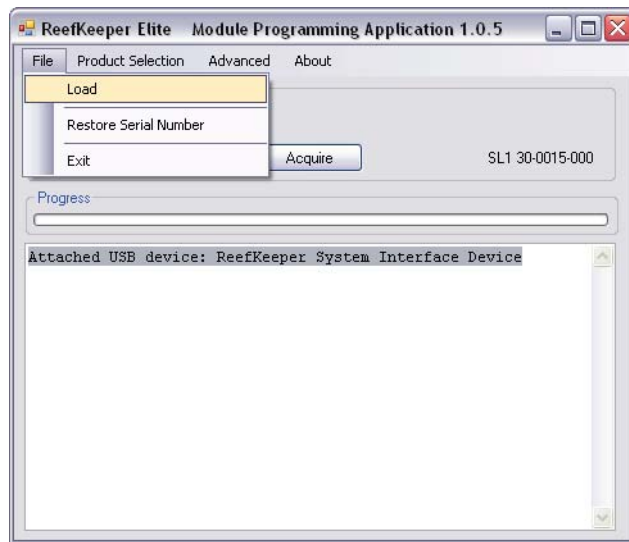


Figure 1e: Screenshot of Step 7

8. Step 7 will bring up a File Open dialogue box. If, for example, the product selected is the SL1, the dialogue will automatically open to the folder location of that products firmware.

Select the firmware file you would like to load and click "Open". Information on the firmware file naming format can be found at the beginning of this document.

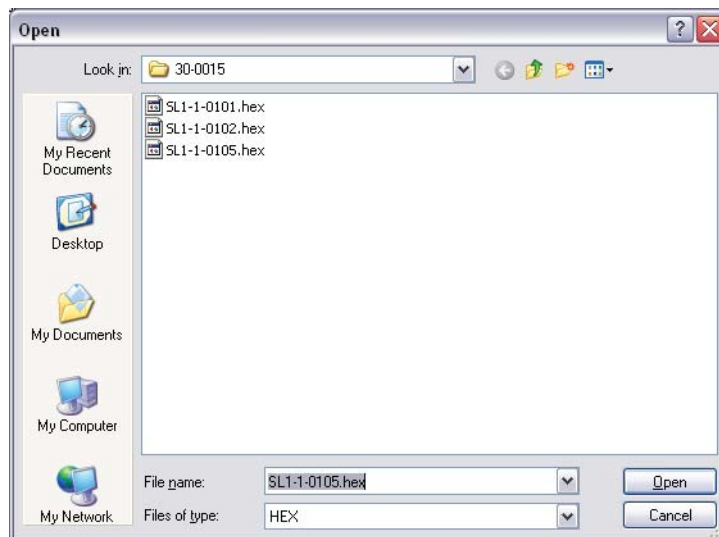


Figure 1f: Screenshot of Step 8

- Next, click the “Program” button to begin programming the unit.

A dialogue box will then appear displaying a checklist of items that must be verified before programming starts. Once all of the checkboxes have been checked the “Proceed” button should enable.

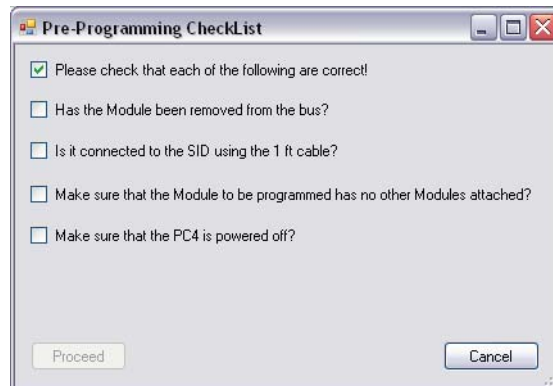


Figure 1g: Pre-Programming Checklist

Click “Proceed” to continue. In some cases the dialog box will appear explained that the firmware does not need to be updated. The option will be given to proceed anyways or cancel. This message will only occur when the user is attempting to update the firmware to the same version that resides on the module.

The current programming status will be displayed by the progress bar.

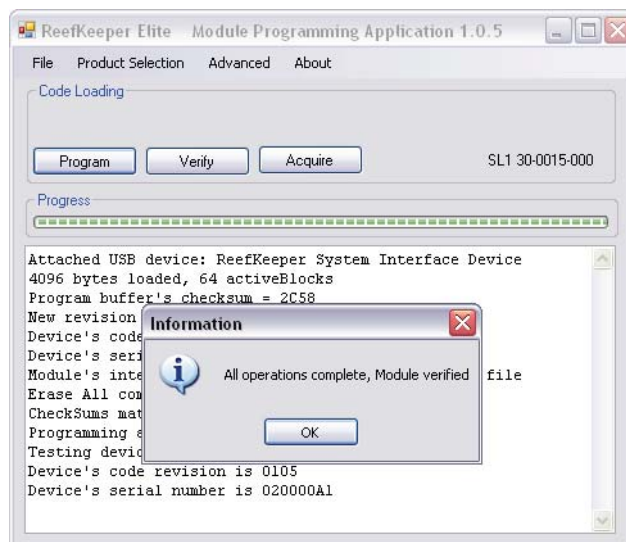


Figure 1h: Screenshot of Step 10

- Once programming is complete, a dialogue window will display “All operations complete, Module verified”. Click “OK” to continue.

Programming is now complete. Repeat these procedures for all RKE modules. In some cases, the software may continue with step 11 below. If the programming has completed please disregard step 11.



11. In some cases the following message will appear prior to the “All operations complete, Module verified” message.

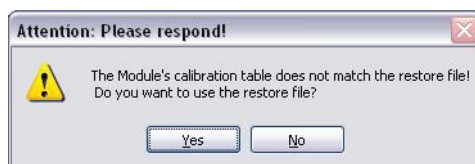


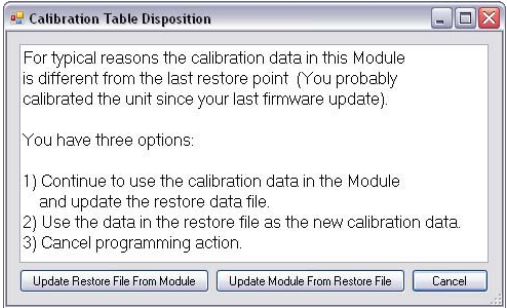
Figure 1i: Calibration restore window

This message indicates that the calibration table currently on the module is different than the backup calibration file created when the module was first plugged in. In most cases, the user should continue by clicking “No” to program the device using the calibration information currently inside the unit. Clicking “Yes” is often used only when the calibration data inside the module is corrupt and must be restored.

1.7 Messages

This section describes the error messages and possible resolutions within the programming application.

Message Dialogue	Description
	<p>This error message normally occurs when the RKM-SID is unable to communicate with the module it is trying to program. This is often caused by the bus cable not being properly seated.</p> <p>Possible Resolution Disconnect and reconnect the bus connection between the RKM-SID and the module being programmed.</p>
	<p>This error message normally occurs when the programming of the module does not complete correctly.</p> <p>Possible Resolution Attempt to reprogram the device again.</p>
	<p>This error message normally occurs when programming is attempted on a device that has been corrupted. Corruption can cause the loss of a units serial number, revision number and or calibration information.</p> <p>Possible Resolution Follow the directions shown in the “Recovering a Module” section.</p>
	<p>This message appears when a module currently has the newest firmware available and it is unnecessary to update.</p>

Message Dialogue	Description
	<p>This message appears when the calibration data inside the module being programmed is different than the calibration data stored in the recovery file (.cal file). This is usually means that the module was calibrated since the last time the recovery file was created.</p> <ul style="list-style-type: none"> • If you would like to continue updating the firmware and retain the calibration data inside the unit, click “Update Restore File From Module”. This will than program the device and update the restore file with the current calibration data. • If the calibration data is corrupt or inaccurate you can click the “Update Module From Restore File” which will retain the current restore file and update the calibration data on the module to it. This will permanently delete the calibration data inside the module so this option should be used with caution.

1.8 Recovering a Module

If a module’s programming becomes corrupt in any way the programming application will automatically attempt to recover the module. This is done by loading the serial number, revision number and calibration table from a backup file that is made and stored by the programming application.



Recovering a module is usually initiated by the software application after it has identified a module that requires it. Version 1.0.4 of the programming application has added the ability for the user to initiate a recovery of calibration data and serial numbers. Be advised that using this feature without the direction of a DA support technician is not recommended.



It is not required for the user to make backups (.cal files) of module information. The programming application will do this automatically when it identifies a new module connected to the RKM-SID for the first time.

The below message is shown when the programmer has detected a corrupted module.

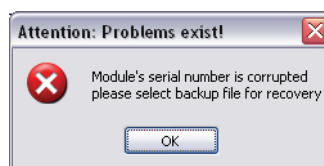


Figure 1j: Error Message caused by a corrupted module

1. Click “OK” to proceed with module recovery.
2. A file open dialogue box will open displaying the available module backups. There will be a backup file for each module that has previously been connected to the RKM-SID and acquired by the programming application. If more than one file is displayed



When a new module is plugged into the RKM-SID and the programming application is open, the acquire button can be pressed to display the units serial number. We recommend that the user records this serial number for each of his modules for use in recovery and or support.

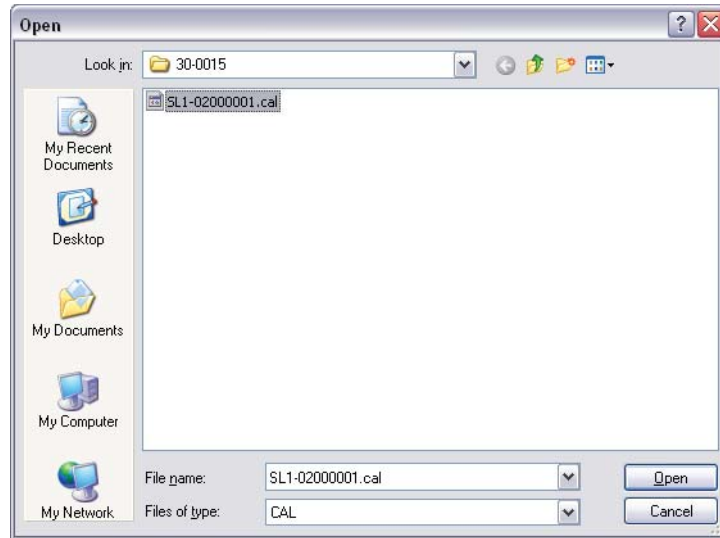


Figure 1k: File Open dialogue for module recovery

3. Module recovery has now completed and will display the “All operations complete, Module verified” message.