

RasterMAPPER™
User's Guide

RasterMAPPER™ User's Guide

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INTRODUCTION

General Information

RasterMAPPER™ has three main functions:

- Create a map which defines the relationship between pixels on the video source (typically a computer screen) and the actual Element Labs fixtures. After creating the map in RasterMAPPER it is downloaded and stored on the processor.
- Control and adjust the processor as needed.
- Create patterns for use with the C1 processor.

Terminology

- **EL** – Element Labs
- **C1** – Versa DRIVE C1 video processor
- **D2** – Versa DRIVE D2 video processor
- **RM** – RasterMAPPER software
- **Map** – A map that defines the assignment of incoming video pixels to outgoing Versa DRIVE pixels. The map is a graphical tool used to create the actual Pixel List.
- **Pixel List** – a list of “mapped” pixels that is sent from RM to the D2.
- **Pattern** – A sequence of frames played back through the Versa system. Usually this refers to a pattern created for playback on the C1.
- **CF** – Compact Flash card used on the C1.
- **Screen Pixel** – A single pixel on the computer monitor that RM is running on.
- **Work Grid Pixel** – A single square on the work grid – it represents a fixture pixel in the real world – its size varies depending on the zoom level.
- **Fixture Pixel** – one pixel in an Element Labs LED fixture. For example – a standard Versa TUBE has 16 pixels inside.
- **Scan Order** – The physical wiring of the pixels inside an LED fixture. This, combined with the fixtures origin, is required to generate the pixel list in the proper order.
- **D2 Output / Port** – Any of the four serial data outputs (A, B, C, or D) on the back of the D2.

System Requirements

- Microsoft Windows® XP
- Mac OS X v10.4 (or higher)
- 1024 x 768 display (or larger)
- 10 MB of Disk Space Minimum
- A serial port (RS232) is required to connect the PC to a D2 Processor.
- A USB or RS232 to RS485 adapter is required to connect multiple D2 Processors simultaneously.
- A USB to RS232 adaptor is required to connect RasterMAPPER to the D2 Processor under Mac OS X

Adobe® Reader® must be installed on your PC in order to use the RasterMAPPER **Help** menu item. Adobe® Reader® can be downloaded from www.adobe.com/products/acrobat/readstep2.html.

Installation

Follow the steps below to install and run RasterMAPPER.

NOTE The downloaded .ZIP files must be extracted to the same folder to run properly.

Windows





1. Download RasterMAPPER software for Windows from the Element Labs website (<http://www.elementlabs.com/support>).
2. Extract/un-zip the files to the same folder.
3. Double-click the file named **RasterMAPPER.exe**.

Macintosh

1. Download RasterMAPPER software for Mac OS X from the Element Labs website (<http://www.elementlabs.com/support>).
2. Extract/un-zip the files to the same folder.
3. Double-click the file named **RasterMAPPER**.

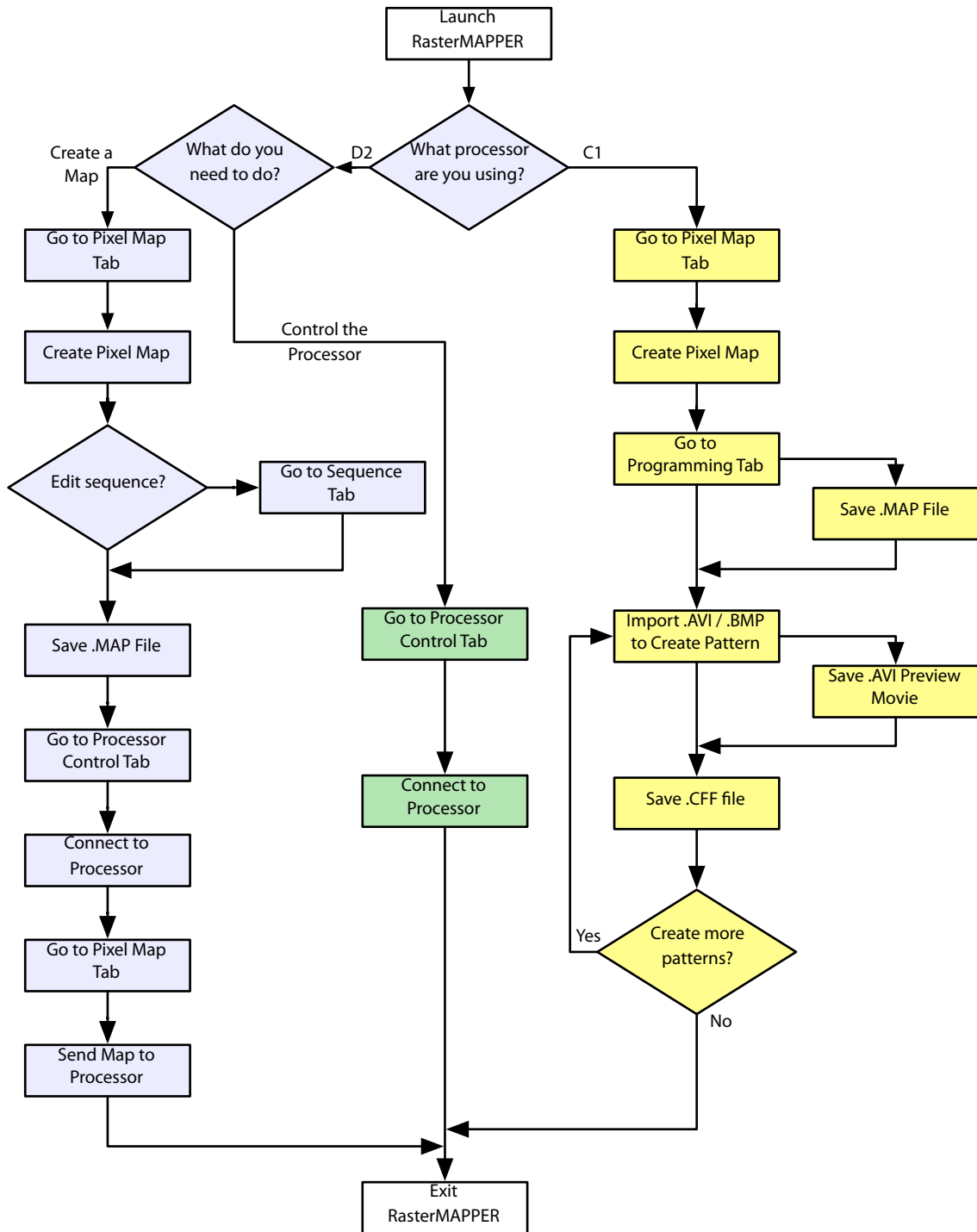
Quick Start

The following example shows the basic steps required to create a pixel map for a system of eight 10x10 Versa TILE panels arranged in a wall that is two meters high and four meters wide:

1. Open a new document and make sure that you are in Pixel Map mode.
2. Choose a fixture from the Fixture Select drop-down menu (i.e. Versa TILE 10x10).
3. Click in the grid area to add fixtures.
4. Select the Sequence tab, select fixtures and press the  button, and assign the eight fixtures to addresses 1 through 8 using the  tool.
5. For the D2 processor, go to the Processor Control tab and connect to the drive.
6. Return to the Pixel Map, Pixel List tab. The pixel list is generated automatically.
7. Press  to upload the pixel list to the D2 processor.
8. Test to confirm everything is working properly.
9. Go to the Programming tab.
10. Use the Insert and Add buttons to add media files to the list (the compressed/encoded media files may be imported only if the appropriate codec is installed on the computer).
11. Preview the pattern by using the Play  button.
12. Export the pattern in the .CFF format. Copy that file to a Compact Flash card for use in a C1. The file should have a 3 number prefix that is the pattern ID number on the C1 processor (i.e. 012_fire.cff).

RasterMAPPER Basic Workflow

The flowchart below shows the basic RasterMAPPER workflow.



File Formats

RasterMAPPER uses the following file formats

.MAP

In the Pixel Map mode, map files are saved as a .MAP file. A .MAP file includes the fixture map, sequence information, and any custom user-defined fixtures created for that map.

.PTN

In Programming mode, the list of .AVI and .BMP items can be saved as a .PTN file. Note that .MAP and .PTN files are independent; you can mix and match them while using RM.

.VDC

For Versa DRIVE D2, when in Processor Control mode, a .VDC file saves all of the control parameters in the "Connection Settings" area and the "Output" area.


.LST

In the Pixel List tab, you can save (and open) the pixel list as an .LST file

.GWB

In the Group White Balance area of the Processor Control tab, you can save (and open) a list of pixels and values as a .GWB file.

General Information

RasterMAPPER allows you to open existing data files directly from your Desktop or any folder by simply double-clicking them. Also you can open files in standard way using **Open** menu command (or a  button).

RasterMAPPER Help

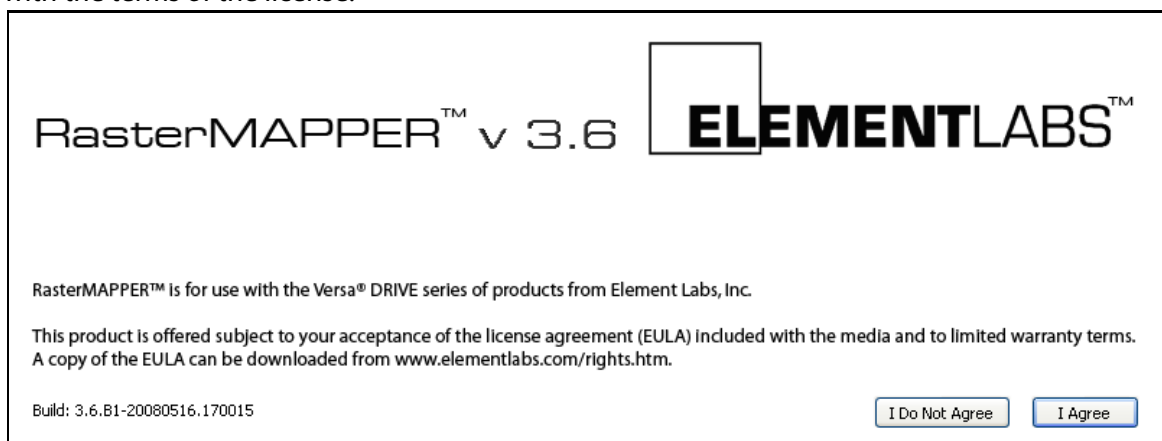
Windows: In order to get the **RasterMAPPER Help** menu item to work, the file RMHelp.pdf (this manual) must be in the same folder as the RasterMAPPER program file. If you move or delete this file, RasterMAPPER will not be able to find it.

Mac: In order to get the RasterMAPPER **Help** menu item to work, the file RMHelp.pdf (this manual) must be in the **Resources** folder inside **RasterMAPPER.app** bundle. This is only visible when you control+click on the RasterMAPPER application file and choose “Show Package Contents” from the contextual menu.

Adobe® Reader® must be installed on your PC in order to use the RasterMAPPER **Help** menu item. Reader can be downloaded from www.adobe.com/products/acrobat/readstep2.html.

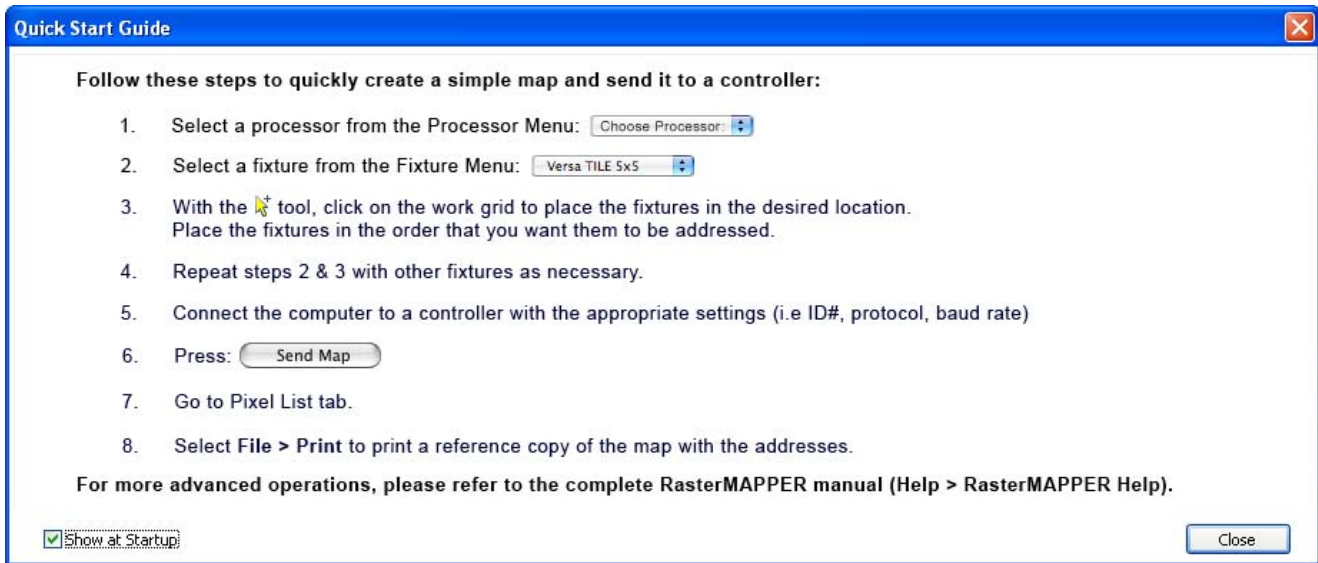
Splash

When the RasterMAPPER application is started, the following splash screen is displayed. The splash screen contains the RasterMAPPER licensing information. To proceed, you must agree with the terms of the license.



Quick Start

On first run, after the splash screen, RM displays the dialog box shown below. You have the option to continue to show the dialog every time the application is launched via the check box at the bottom. This dialog is also available through a menu item (see [Help menu](#), p. 1-10 for more details).



Menus

RasterMAPPER has 3 menus: **File**, **Edit** and **Help**.

File menu

New...	Ctrl+N
Open...	Ctrl+O
Save	Ctrl+S
Save As...	Shift+Ctrl+S
Revert	
Page Setup	Shift+Ctrl+P
Print...	Ctrl+P
Exit	Ctrl+Q

The File menu options include **New**, **Open**, **Save**, **Save As**, **Revert**, **Page Setup**, **Print** and **Exit**. The three commonly used menu commands for opening and saving files are duplicated as buttons: (from left to right) **New**, **Open**, **Save**.



Select **Save As** to save the changed data to another file/folder. Select **Revert** to revert your changes and get back to the initial state.

NOTES The **File** menu items: Open, Save, Save As, Revert are mode-dependant.
 If **Pixel Map** mode is active, these items correspond to the .MAP files
 If **Programming** mode is active, these items correspond to the .PTN files
 If **Processor Control** mode is active and Versa DRIVE D2 processor is selected, these items correspond to the .VDC files

Page Setup gives you the standard dialog box to setup the page for printing. **Print** should be used to print out the work grid from any of the four tabs that show the grid:

- Pixel Map/Fixture Info
- Pixel Map/Sequence
- Pixel Map/Pixel List
- Programming

NOTE For all printing, the current view of the workgrid is what is printed. This means the current view at the current Zoom Level, including the background image and port/sequence/address info if selected – will be printed.

Select **Exit** to quit RasterMAPPER.

Tip: keyboard shortcuts are given for most of the menu commands.

Edit menu

Undo	Ctrl+Z
Redo	Ctrl+Y
<hr/>	
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Clear	Del
<hr/>	
Group	Ctrl+G
Ungroup	Ctrl+U
<hr/>	
Duplicate	Ctrl+D
Duplicate Array	Ctrl+Shift+D
Flip	Ctrl+F
Select All	Ctrl+A

The Edit menu items include **Undo, Redo, Cut, Copy, Paste, Clear, Group, Ungroup, Duplicate, Duplicate Array, Flip, Select All.**

The **Cut, Copy, Paste, Undo, Redo** items are duplicated as buttons: (from left to right) **Cut, Copy, Paste, Undo, Redo.**



Using **Undo/Redo** you can go back and forth between all the changes you made after opening the file.

Cut/Copy/Paste in the **Pixel Map** mode work according to standard conventions on either single fixture, multiple fixtures, or a group (see [Selecting Fixtures](#), p. 2-12, [Grouping/Ungrouping fixtures](#), p. 2-7, and [Selecting Fixtures](#), p. 2-12).

When a fixture is Cut, the sequence (see [Sequence Tab](#), p. 2-12 for more details on sequences) is modified according to the same rules as if it was deleted. When a fixture is **Pasted**, the sequence is modified in the same way as if a fixture was inserted into a new location (as described in the “Sequence” section below).

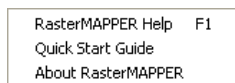
In **Pixel Map** mode, **Clear** allows you to delete the selected fixtures or fixture groups. See [Deleting Fixtures](#) (p. 2-6) for more details on fixture deletion.

Using **Group/Ungroup** in **Pixel Map** mode fixtures may be grouped/ungrouped. See [Grouping/Ungrouping fixtures](#) (p. 2-7) for more information about groups.

Using **Flip** in **Pixel Map** mode fixtures may be flipped (see [Rotating Fixtures — Flip](#), p. 2-7 for more information on flip)

Using **Select All** in **Pixel Map** mode all the fixtures on the Work Grid may be selected (see [Selecting/Deselecting fixtures](#), p. 2-6, [Selecting Fixtures](#), p. 2-12 for more information on fixture selection).

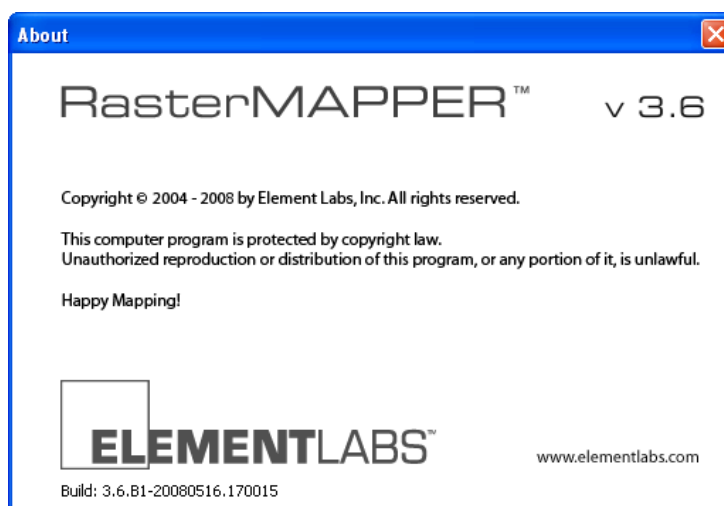
Help menu



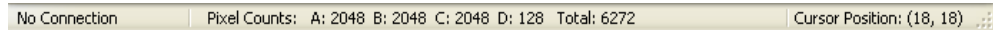
The Help menu items include **RasterMAPPER Help**, **Quick Start Guide**, **About RasterMAPPER**.

Selecting **RasterMAPPER Help** launches a copy of this manual in Adobe Acrobat. In order for this to work, *RMHelp.pdf* file needs to be in the specified location (see [RasterMAPPER Help](#), p. 1-7 for more detail). You can press **F1** (Win) or **Cmd+?** (Mac) as a shortcut.

About RasterMAPPER displays a dialog box that includes the current RM version number.



Status Bar



The status bar has three sections:

Left: General information area for minor alerts and notifications.

Center: **Pixel Counts** - Each port (A through H) shows the number of active pixels. The **Total** shows the total number of active pixels.

Right: **Cursor Position** – Whenever the cursor is over the work grid in the **Pixel Map** mode the current location is shown here. This is the location of the cursor on the work grid, not the computer screen.

Operating Modes

RasterMAPPER has three different major operating modes: **Pixel Map** ([Pixel Mapping](#), p. 2-1), **Programming** ([Programming Mode](#), p. 3-1), and **Processor Control** ([Processor Control Mode](#), p. 4-1). These are represented by the three main tabs in the upper left corner (Win) or middle (Mac) of the program window.



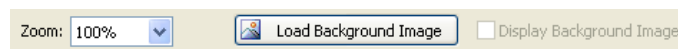
Work Grid

The **Work Grid** is the large gray grid area used to build the pixel map in **Pixel Map** mode and display the build/preview the pattern in the **Programming** mode.


The origin (0,0) of the work grid is the upper left-hand corner. The X axis is horizontal and the Y axis is vertical. Positive X and Y values are to the right and below the origin, respectively.

At the default zoom level, each gray square is one work grid pixel and represents one pixel in a real Element Labs LED fixture. For example – “Versa TUBE v2 SD 1.0 m” has 16 pixels inside, so it is represented by 16 squares on the work grid.

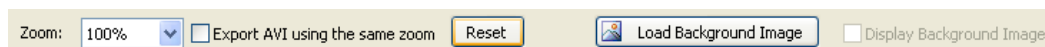
In the **Pixel Map** mode on the Work Grid toolbar, there are controls for Zoom and Background Image.



The **Zoom** drop down menu can be used to change from 8% to 800% in seven fixed increments. At 100%, each Versa TILE or Versa TUBE pixel is a 5x5 pixel square on the work grid. At 8%, each fixture pixel is at a 1 to 1. You also may change the current zoom using the mouse wheel when the Hand tool is active.

 **Load Background Image** is used for building fixtures over existing images. To load a background, click on this button and select a graphic file via a standard “open file” dialog box. Once the image is loaded, fixtures may be placed over the background. The Background Image can be toggled on and off by checking or unchecking the **Display Background Image** box.

In **Programming** Mode on the Work Grid Toolbar there are also controls that influence the process of exporting the pattern to the video files for preview. (see [Programming Mode](#), p. 3-1 for details).

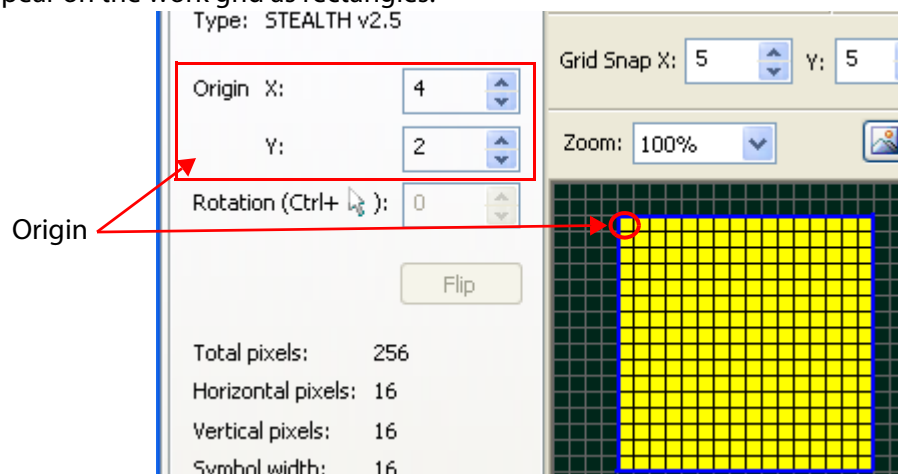


PIXEL MAPPING

Fixtures

Rectangular fixtures

STEALTH panels, Versa TILES and rectangular user-defined fixtures (see [Custom Fixtures](#), p. 2-10) appear on the work grid as rectangles.



The pixel in the upper left corner of the rectangle is the origin of the fixture, the coordinates of the origin are displayed in the Fixture Info tab in the corresponding fields.

Rectangular fixtures cannot be rotated or flipped. The pixel size of the fixture and the size of its symbol in RasterMAPPER may be different.

Linear fixtures

Versa TUBEs and other linear, user-defined fixtures (see [Custom Fixtures](#), p. 2-10 for more details) appear on the grid with a black dot and an arrow at one end.

The black dot is pixel #1 in the fixture (the input) and is the origin of the fixture.

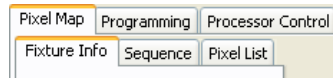


The arrow clarifies the direction of the data in the tube. The black dot always lands on a pixel in the work grid. The number of pixels in the linear fixture and length of its symbol in RM may be different.

Pixel Map Mode

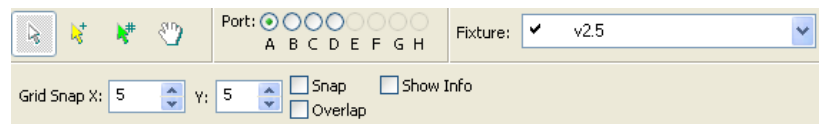
All processors require a pixel map that defines the relationship of the pixels in your source video to the pixels in the fixtures. The Pixel Map mode is used to create this map. Once the map is created, it is sent to a D2 processor or saved for future use in the Programming tab to prepare a CFF file for a C1 processor.



The Pixel Map mode includes three tabs: **Fixture Info**, **Sequence**, and **Pixel List**.






Work Grid Tools

To the right of the control tabs are **Work Grid tools** and the **Fixture Select** menu:



- **Arrow** (white) 
The **Arrow** (white) tool is used for selecting and moving objects.
 - When a fixture is selected, the fixture border turns blue.
 - Clicking on an empty area of the work grid deselects all fixtures.
- **Arrow +** (yellow) 
The **Arrow +** (yellow) tool is used for adding and removing fixtures. (see [Adding Fixtures](#), p. 2-5, [Deleting Fixtures](#), p. 2-6 for more information).
 - Right-clicking with this tool prompts you to delete the fixture under cursor.
 - Left-clicking adds selected fixture to the grid, if possible.

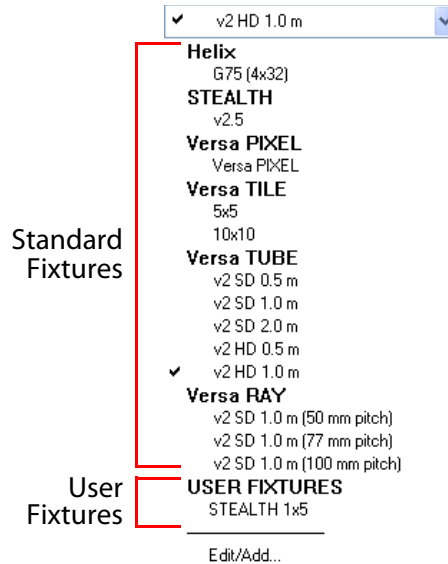
Also when the **Arrow +** tool is being used, a floating screen hint appear to the lower right of the cursor showing the current location on the work grid.

- **Arrow #** (green) 
The **Arrow #** (green) tool is used to address fixtures and re-sequencing.
By default, fixtures are automatically addressed as they are placed on the Work Grid, but the addresses can be modified by using this tool. The detailed description is given in [Modifying a Sequence](#), p. 2-13.
- **Hand** 
The **Hand** tool is used for moving the entire work grid within the window.
- **Port** 
When the **Arrow +** (yellow) tool is active, the Port radio group specifies the output

port for the fixture being appended. When the **Arrow #** (green) tool is active, the Port radio group specifies the port that is assigned to the fixture being clicked.

- **Fixture**

Fixture is a drop down menu that displays standard fixtures (i.e. Versa TILES/TUBES/ RAYs/ Helix/STEALTHs...) and user-defined custom fixtures.



- **Grid Snap**

Grid Snap sets how many pixels a fixture snaps to when placed. By adjusting the value and checking the Snap box, fixtures snap to a certain space when placed on the work grid.

- **Overlap**

By default, fixtures are not allowed to be placed on top of each other. When the **Overlap** feature is checked, fixtures may be placed on top of each other on the grid while adding fixtures.

When Overlap is turned off, fixtures can be dragged over other fixtures while moving them, but if you try to place them on another fixture it springs back to its original location.

- **Show Info**

The Show Info check box allows the Port/Sequence and Address information to be shown on top of each fixture in the map. It can be turned on and off (see [Sequence Tab](#), p. 2-12 for more details on sequences).

At certain zoom levels, some fixtures may be too small to allow the info to be shown within the symbol. In those cases, the information is not displayed and you must zoom in to a larger view in order for the information to appear.

Fixture Info Tab

The Pixel Map section is divided into three areas: Fixture Info, Sequence, and Pixel List. The Fixture Info tab is the first step in the process of creating a map. Here you can see information about currently selected fixtures or groups.

Fixture Information

The Fixture Info tab displays a fixture's parameters. Only the Origin and Rotation (for linear fixtures) can be edited, the rest of the information is just for reference.

- **Fixture Type** displays the name for the selected fixture. This is useful when many custom fixtures are being used.
- The coordinates under **Origin (X,Y)** are automatically generated when you place the fixture. They dynamically update when the fixture is moved. You can also move the fixture by changing the values in these fields.
- **Rotation** is only used with the Versa TUBEs or custom linear fixtures. The number reflects the fixture angle in Cartesian degrees measured similar to the angle in standard polar coordinates.

It can be adjusted with the mouse (see [Rotating Fixtures — Flip](#), p. 2-7 for details) or directly by entering a new angle in the Rotation field.

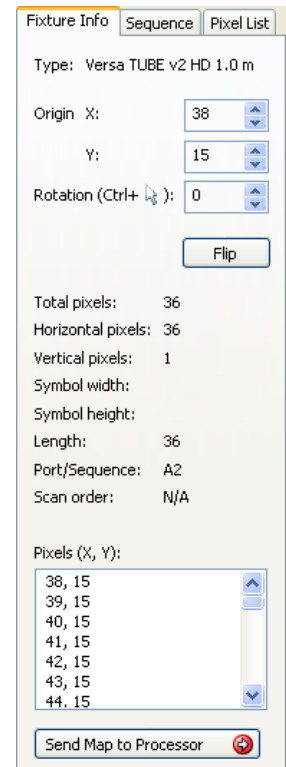
Note: When a fixture is rotated the pixels no longer fall on exact locations in the work grid. The rule for determining how to map a rotated fixture is the following: the work grid pixel is used that is closest to a pixel in the symbol. The exact list of work grid pixels covered by the fixture is displayed in the **Pixels (X,Y)** field.

- Using button, you can change the ends of linear fixtures (see [Rotating Fixtures — Flip](#), p. 2-7 for more details).
- **Horizontal Pixels** and **Vertical Pixels** define the overall number of pixels in the fixture.
- **Symbol Width** and **Symbol Height** define the size of the symbol used on the work grid. If the symbol height and width are the same as the Horizontal and Vertical Size of the fixture, then all the pixels are in one-to-one mapping. If the symbol is of a different size than the fixture, certain pixels need to be skipped in the mapping.

While mapping the following principles are used:

- pixels should be as evenly distributed as possible
- pixels are always distributed in the same way
- skipped pixels are not averaged, they are simply ignored.

- **Scan Order** defines the order in which the pixels are connected internally in the fixture – the order in which they are actually hard-wired.



- The **Pixel (X,Y)** list shows the list of mapped pixels for the selected fixture. This list is the order of the pixels as defined by the Origin (X,Y) values and the Scan Order.

NOTE All information in the Fixture Info tab pertains to the currently selected fixtures only.

If multiple fixtures are selected: the **Type** field displays “Multiple Fixtures”, all other fields contain information on the upper left selected fixture.

- **Send Map to Processor** (Versa DRIVE D2 only)


When the  button is pressed the following occurs:

1. The Pixel List is created (in the background)
2. A progress box appears that shows the progress of the following three steps:
 1. RM checks for a current connection to a processor. If there is no connection, it tries to create one. The status is displayed in the progress box.
 2. After a positive connection is made, RM downloads the Pixel List to the processor.
 3. When the download is complete (or fails), the progress box shows the status.

Pressing the **Send** button on the **Pixel List** tab results in the same operations. (See [Sending the Pixel List to the Processor](#), p. 2-15 for more details).

Fixture Operations in Pixel Map mode

Adding Fixtures

The **Arrow +** (yellow)  tool is used to add fixtures to the map. To add a fixture, simply follow these steps:

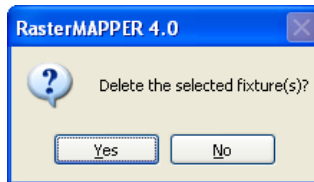
- Choose a fixture from the drop down menu.
- Move the tool to a position on the grid. An outline of the fixture is visible as an aid in placing the fixture. Click to place a fixture.

If **Overlap** is turned off, the outline turns red when the fixture is overlapping an existing fixture – indicating that you cannot place a new fixture there.

- An icon representing the fixture appears on the grid and information relating to that fixture appears on the left hand sidebar of the **Fixture Info** tab.
- If a fixture is placed that has more pixels than are available in the current port, it is placed in the beginning of the next port.
 - When this happens, the radio button automatically changes to reflect the new port.
 - If there is not enough room left on any port, the dialog box warns you that it is not possible to place this fixture.

Deleting Fixtures

To **Delete** a fixture from a map, select the **Arrow +** tool and right-click on the fixture. A prompt appears asking you if you wish to delete the fixture. Select “Yes” to delete.



Also, a selected fixture, or multiple fixtures are deleted by using the **Delete** key or choosing **Clear** from the Edit menu. The same dialog box appears.

NOTE When a fixture is deleted, the remaining fixtures on that port are re-sequenced to fill in the numerical gaps in the sequence. The remaining fixtures are NOT physically moved on the map. Fixtures on other ports remain unaffected.

Selecting/Deselecting fixtures

The following ways may be used to select one or multiple fixtures, both in the list (in the **Sequence** tab) and on the work grid:

- **Shift + Click** for multiple fixtures in a series
- **Ctrl + Click** for multiple, non-sequential fixtures
- Press **Ctrl + A** (Win) or **Cmd + A** (Mac) to select all of the fixtures on the map
- Draw a bounding box with the arrow cursor

Selecting one or more fixtures on the work grid also highlights these fixtures in blue in the **Sequence** list. See [Selecting Fixtures](#), p. 2-12 for more details on fixture selection in the Sequence list.

If the cursor's focus is on the workgrid and no fixture is currently selected, pressing any of the four arrow keys on the keyboard selects the nearest fixture in the corresponding direction.

If there are selected fixtures, clicking with the arrow tool in an arbitrary free place on the work grid deselects all the fixtures.

If a fixture is selected, and that fixture is a part of a group, the entire group is selected. See [Grouping/Ungrouping fixtures](#), p. 2-7 for more details.

Moving Fixtures

Using the **Arrow** tool, click and drag to move the selected fixtures to the desired location.

If a single fixture is selected, it is moved using the **Origin (X,Y)** fields in the **Fixture Info** tab. Enter X,Y values directly into these fields and press **Enter** or **Tab**.



The selected fixture may be nudged in 1 pixel increments using the keyboard arrows.

Rotating Fixtures — Flip

Only Linear fixtures may be rotated/flipped. To do this, **Ctrl-Click** (Win), **Cmd + Click** (Mac) the linear fixture and drag on the cursor.

You can also use the **Rotation** field in the **Fixture Info** tab. When a linear fixture is rotated, the black tip (pixel #1) is the anchor point.

The **Flip** button flips a linear fixture 180° (exchanges the position of the black dot) so that the data is running through the fixture in the opposite direction.

- Normal Fixture: 
- Flipped Fixture: 

NOTE The position of the linear fixture on the work grid may change after flip, because the fixture origin must always be located over a Work Grid pixel.

If you selected multiple linear fixtures, you can rotate them to the equal angle with **Ctrl-Click** (Win), **Cmd+ Click** (Mac) on one of the linear fixtures or using the Rotation field on the Fixture Info tab.

While moving several selected fixtures (if the move was started by clicking on the linear fixture) you can also rotate them before dropping on the work grid using **Ctrl-Click** (**Cmd+ Click** Mac) or by using mouse wheel.

NOTE Grouped fixtures may not be rotated.

Grouping/Ungrouping fixtures

Multiple selected fixtures can be combined into a group for easy moving, copying, etc.

Individual fixtures and groups can be combined into another larger group (nested). Any fixture can belong to only one group at a time. If a fixture is selected, and that fixture is part of a group, the entire group is selected.

Operations performed on a group work the same as if all of the individual fixtures in that group were selected together (i.e. – as if they were all selected but not part of a group).

Grouped fixtures may not be rotated.

To group several fixtures,

1. Select the fixtures
2. Press **Ctrl+G** (**Cmd+G**) or use the **Group** item from the **Edit** Menu.

To ungroup fixtures,

1. Select the group
2. Press **Ctrl+U** (**Cmd+U**) or use the **Ungroup** item from the **Edit** menu.

Cut/Copy/Paste Fixtures

Standard OS conventions are used for **Cut, Copy, Paste** on either single fixtures, multiple fixtures, or groups.

When a fixture is Cut, the sequence is modified according to the same rules as if it was deleted. (see [Deleting Fixtures](#), p. 2-6 for details).

When a fixture is Pasted, the sequence is modified in the same way as if a fixture was inserted into a new location (see [Adding Fixtures](#), p. 2-5 for details).

If the fixture was cut/copied and then the corresponding fixture type was deleted, pasting this fixture adds its type to the list.

Duplicating Fixtures

Duplicate makes a copy of the selected fixture(s) and assigns the next available sequence numbers. The newly created, duplicate fixtures are created in the first available free space to the right of the original fixture. If there is no space to the right, then it is created below. If there is no space below, then it is created in an arbitrary available free place.

If there is not enough available space to create the new fixtures, a warning dialog appears and the Duplicate operation is cancelled.

After duplication, the newly created fixtures are selected and the original fixtures are deselected.

To duplicate a fixture, select it and press **Ctrl+D (Cmd+D)** or use the Duplicate item in the Edit menu.

Duplicate Array

Using Duplicate Array functionality, you can create several copies of the selected fixture that are placed according to one of three algorithms

1. Linear array
2. Rectangular array
3. Circular array.

Linear array places the specified number of copies of the selected fixture on the Work grid. The duplicates are placed at the specified X and Y steps from each other and the original fixture.

Rectangular array places the specified number of copies of the selected fixture on the Work grid. The duplicates are placed in rows and columns at the specified X and Y steps from each other.

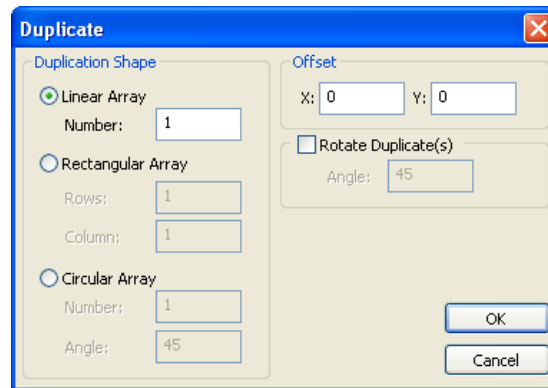
Circular array places the specified number of copies of the selected fixture along the circle with the specified center at the specified angles.

For all 3 algorithms, the following is true:

- If there is not enough available space to create the new fixtures a warning dialog appears and the operation is cancelled.
- The newly created fixtures are selected and the originals are deselected.
- If “Grid Snap” is enabled, then the newly created fixtures are placed according to the current Grid Snap spacing.

To start any of three algorithms,

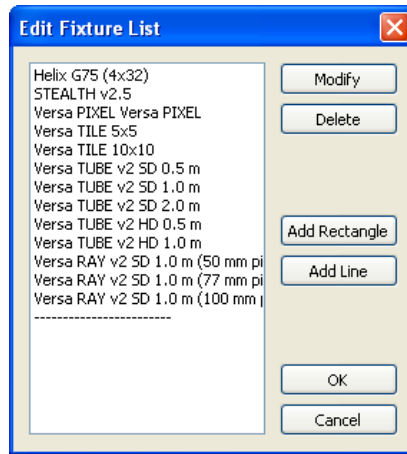
1. Select a fixture to be duplicated
2. Press **Ctrl+Shift+D** (**Cmd+Shift+D** under Mac OS X) or use **Duplicate Array** item from the **Edit** menu. This brings up the dialog box below.



3. Select the desired algorithm.
4. Enter the parameters of the algorithm (X and Y coordinates follow the work grid conventions where positive Y values go down; angle values are Cartesian) The Rotate duplicate box allows rotation of the duplicates to the specified angle if the duplicates may be rotated.
Note: For the **Circular Array** the **Offset** fields changes to **Center** and corresponds to the absolute coordinates of the circle center (the circle radius is determined by the position of the initial fixture).
5. Click OK. If the duplicated fixture can not be placed on the Work Grid the corresponding Dialog box appears.

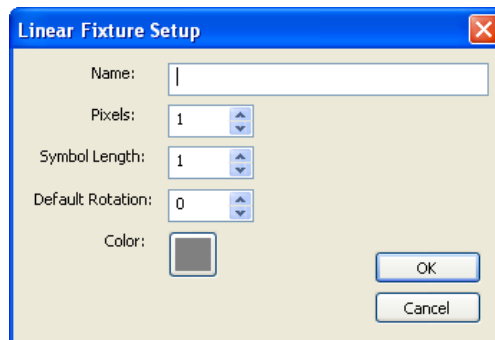
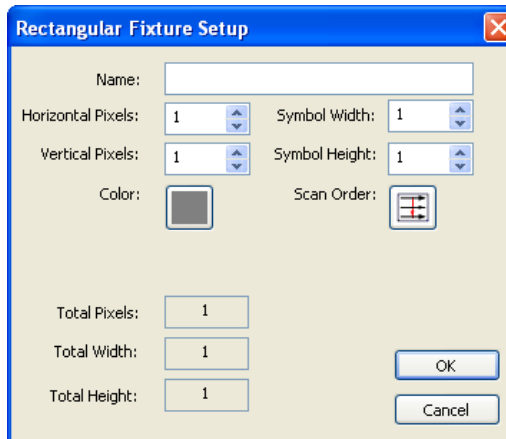
Custom Fixtures

The **Edit/Add...** option in the **Fixture** drop down list allows you to modify or create a fixture. It brings up the following dialog box:



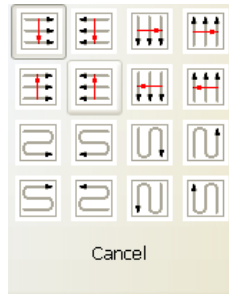
Adding/Modifying Custom Fixtures

The **Add Rectangle** and **Add Line** buttons bring up the following dialog boxes which is used to create new fixtures:



The same dialog appears when clicking **Modify** button and when rectangular or linear fixture is selected.


- A **Name** can be entered for unique fixtures. It can not be modified for default and user fixtures.
- **Horizontal** and **Vertical Pixels** (rectangular fixtures) or **Pixels** (linear fixtures) is used to define the number of actual pixels in the fixture.
- **Symbol Width** and **Symbol Height** (rectangular fixtures) or **Symbol Length** (linear fixtures) is used to define the size of the fixture symbol in RasterMAPPER.
- **Scan Order** defines the direction and order in which the pixels are connected in the fixture. Clicking on this button brings the following menu from where the fixture scan order is selected.



- **Color** is used to distinguish between two similar looking fixtures within a map. The color button brings up the standard OS color picker dialog.

Deleting Fixtures

Only user defined fixtures may be deleted from within RM.

Delete a fixture type by selecting the fixture title from the menu and pressing the  button.

NOTE You cannot delete a fixture type if there are fixtures of this type on the Work Grid.

Sequence Tab

As fixtures are placed on the work grid, RM automatically assigns them a Port/Sequence number. The **Port** is determined by which port is selected in the radio buttons on the toolbar (A, B, C, D, E, F, G or H, depending on the processor). **Sequence** is simply a numerical order starting at 1 for each port. The **Port/Sequence** info looks like this: A1, A2, B18, etc...

Show Info check box on the toolbar toggles on and off labels on each fixture that display the current **Port/Sequence** info. Hovering over any fixture in the work grid for more than one second displays the screen hint with the fixture's Port/Sequence and Address.

If a fixture is placed that has more pixels than are available in the current port, it is placed in the beginning of the next port. When this happens, the radio button automatically changes to reflect the new port. If there is not enough room left on any port, a dialog box warns you that it is not possible to place this fixture.

NOTE It is possible to manually specify the Port and the Sequence number as described in [Modifying a Sequence](#), (p. 2-13).

The Port/Sequence information is shown in the Sequence tab:

- **Clear Selection** clears the sequence information for any selected fixtures.
When a fixture has its sequence information cleared, the color of the fixture's symbol color changes to red to show that there is no sequence.
- The **Address** column is automatically filled in by RasterMAPPER. The address of a fixture is the number of its first pixel. It is calculated by adding up the size of all the fixtures before it on that port. The address numbering always starts at 1 for the first fixture on each port.

Port/Sequence	Address
A1	1
A2	37
A3	73
A4	109
B1	1
B2	37
B3	73
B4	109
B5	145
B6	181
C1	1
C2	37
C3	73
C4	109

Selecting Fixtures



Selecting a fixture on the work grid also highlights that fixture in the **Sequence List**.

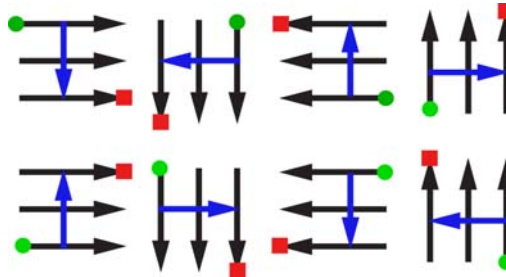
While the information in the **Sequence List** cannot be modified directly in the list, the list may be used to select fixtures – i.e. selecting a fixture in the list also selects and highlights the same fixture on the work grid.

If the cursor's focus is on the Sequence List, then the up and down arrow keys on the keyboard select the next fixture up or down in the list.

Creating a Sequence from Scratch

Often, it is convenient to clear all of the existing sequence information and start from scratch. There are a number of options to assign new sequence numbers. After clearing all (or some) of the sequence info:

1. Use the **Arrow #**  tool to click on the fixtures in the order that you want them sequenced. They are assigned in numerical order (1, 2, 3, 4,) on the port that is currently selected on the tool bar radio buttons. If there are already other fixtures with sequence numbers, the sequencing starts on the next available number on that port.
2. Use the **Arrow #**  tool to click and drag over a series of fixture. When the mouse is released all of the fixtures that were covered by the bounding box are automatically numbered in sequence starting with the next available sequence number.
 - If the bounding box includes only a single row (X axis) or column (Y axis) of fixtures, the fixture that is first clicked on is the lowest number and the fixture that the mouse is released on is the highest numbered fixture.
 - If the bounding box includes an array of fixtures in both axis, then they are assigned sequence numbers in any of the following orders, depending on the bounding box proportions and Mouse Down / Up coordinates. In the following examples Green = Mouse Down and Red = Mouse Up.

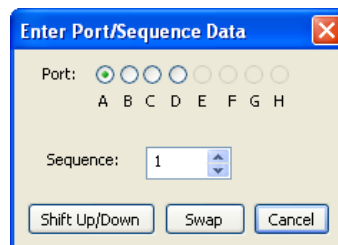


NOTE Whenever an unsequenced fixture is assigned a sequence number, its symbol color reverts to its normal color. Immediately after having a new sequence number assigned to it, the fixture's border is blue.

Modifying a Sequence

The sequence determines the order of the pixels output from the processor. Individual fixtures are assigned an address as they are added to the grid. But the sequence may be changed after the fixtures have been placed on the work grid.

To change the address of one fixture, select the **Arrow #** tool and right-click on the fixture you want to change. The following dialog appears:



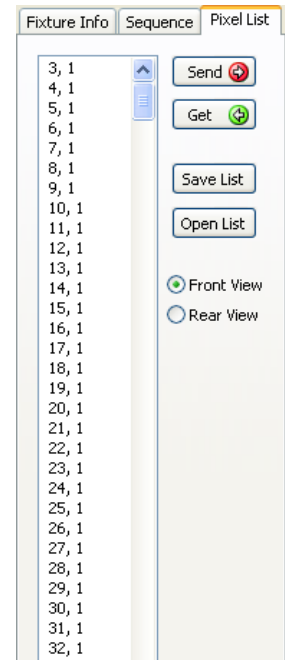
Changing a sequence number of an existing fixture usually affects other fixtures. There are two choices to determine what happens:

- **Shift Up/Down** – the newly sequenced fixture is “inserted” into its new sequence location and all of the other fixtures between the two locations are shifted up or down one position.
- **Swap** – the newly sequenced fixture replaces a fixture that already had that port/sequence information. The replaced fixture is re-assigned to the old location.

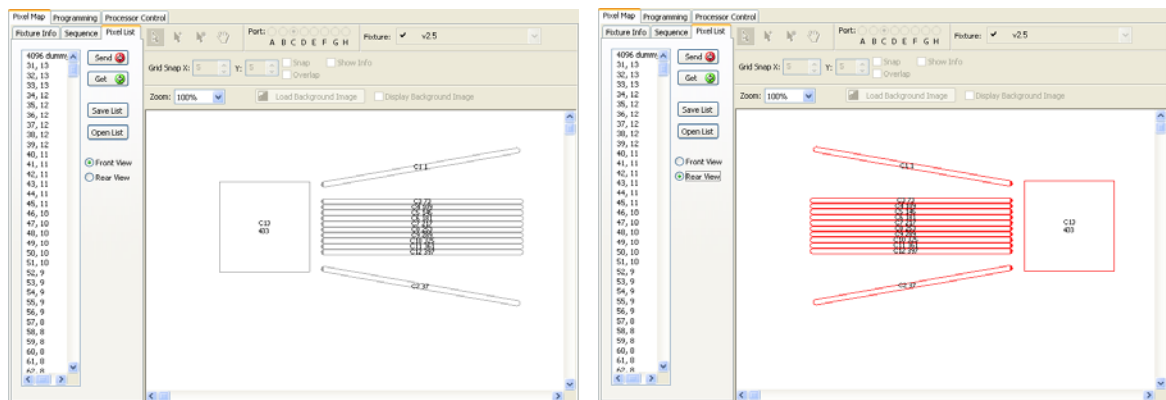
Pixel List Tab

Once the map has been created and the sequence defined, this information is used to generate a Pixel List, which is then sent to the processor. This is done in the Pixel List tab:

- **Pixel List**
When the **Pixel List** mode is selected the coordinates of all the fixtures in the map are collected in a single list.
- **Send button**
Send the current pixel list to the processor by clicking the **Send** button. See [Sending the Pixel List to the Processor](#), p. 2-15 below for more details).
- **Get button**
Receive the pixel list from the processor by clicking the **Get** button. See [Retrieving the Pixel List from the Processor](#), p. 2-16 below for more details.
- **Save List button**
Once a Pixel List has been created or downloaded from a D2, it can be saved into *.LST file.
- **Open List button**
This opens an existing *.LST file and loads it into the **Pixel List** tab.
- **Front/Rear view switch**
Since most the technical work in setting up a system is performed from the rear of the system a pair of radio buttons is implemented that allows the view to be changed from “Front” view to “Rear” view.




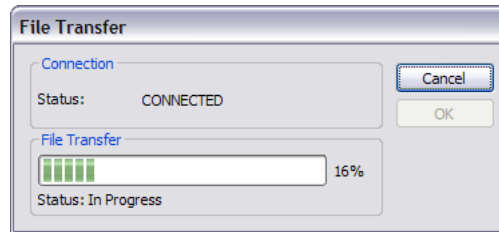
The screenshots below show the map in ‘Front View’ (left) and “Rear View” (right).



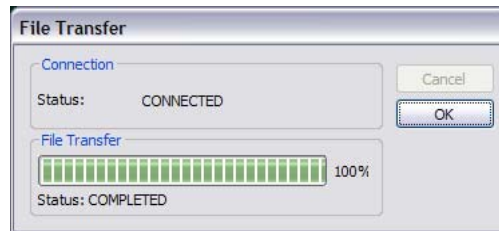
Sending the Pixel List to the Processor

To send the current pixel list to Versa DRIVE D2:

- Connect your computer to the processor using the Processor Control tab settings (see [Processor Control Mode](#), p. 4-1).
- Press the  button in the Pixel List tab to transfer your map to the processor via the RS232 connection. This process typically takes a few seconds – large maps can take longer. During this process, a dialog appears as follows:



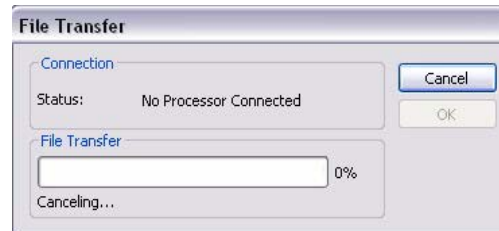
When the transfer completes successfully, the following dialog box is displayed:




During transfer you can cancel it by clicking on **Cancel** button:




When the operation is canceled, the following dialog box is displayed:




The same dialog box is displayed if you do not have any processor connected.

It is possible to verify that the correct data has been sent using the  button in the Pixel Count section of the Processor: Control mode. This number should be the same as the total number of pixels that you sent to the processor.

Retrieving the Pixel List from the Processor

The  button retrieves the current Pixel List from a connected D2 processor and is shown in the list area of the Pixel List tab.

NOTE Getting a list from the processor does not re-create the original map. The map is filled with individual pixels. It is not possible to recreate the original map without a .MAP file.

When using the  button, RM asks you if you want to save changes to the current map (.MAP file) and then clear the current map before downloading the new Pixel List from the D2. This avoids any confusion between a map and pixel list that do not match. During the “get” process you see progress bar of operation.

Saving/opening .LST files

The current pixel list may be saved using **Save List** button to the tab-delimited .LST file, that later may be opened using **Open List** button and its data be imported to the **Pixel List**.

NOTE The structure (type and position of the fixtures) of the current map is not saved in the .LST file and it is not restored when the .LST file is opened.

PROGRAMMING MODE

Overview

The **Programming** mode is used for creating patterns for the C1 controller and AVI files for D2 controllers. The C1 does not have an internal video processor, or a video input, so the video file and the map information are combined within RM to create a .CFF file that is used by the C1.

NOTES The C1 Processor can only use 1024 or 2048 pixels max.
Before using the Programming Mode, you must create a map in the Pixel Map tab. See [Ch. 2: Pixel Mapping \(p. 2-1\)](#), for more information.

Programming Tab

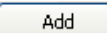
- **Add Button**




Press the **Add** button and a standard OS Open File dialog box appears. You can import either picture files (individual frames of varying formats) or movies.

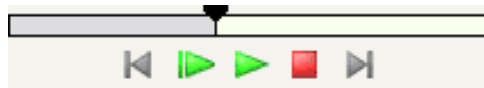
Note: The compressed/encoded video files (AVI, MOV, MPEG etc.) may be imported only if the appropriate codec is installed on the computer.

You can import several files at a time. Each imported file appears as a single item in the **Frame List**, i.e. pictures (BMPs or others) appears individually in the **Frame List**, video and picture files appear in the **Frame List** as a single item.






Note: If the imported frame dimensions are larger than the existing map dimensions, any extra pixels are disregarded. If the imported frame is smaller than the map, the extra mapped pixels are black for that frame. The imported image is NOT scaled to fit the map.


If there are existing frames in the list, the  button appends the new files to the end of the list.

- The  button inserts any new frame(s) before the currently selected frame.
- The  button deletes any currently selected frames.
- The  button deletes everything in the Frame List.
- At the bottom of the tab there are standard transport controls:



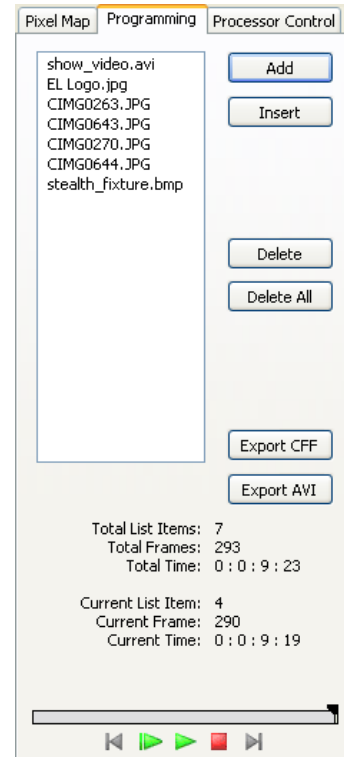
From left to right these controls are:

-  Go to the beginning and pause
-  Play from the beginning
-  Play from the current location
-  Stop in the current location (the **Esc** keyboard button may be also used)
-  Go to the next item in the list and pause

The playback head () on top of the progress bar can be moved with the mouse to rapidly shuffle back and forth through the movie.

The Pattern playback is at 30 fps regardless of the initial fps of the imported files.

When the pattern is stopped, selecting any item in the list displays that Item in the work grid. If a media file item is selected, its first frame is displayed.



- There are 6 lines of information about the current pattern displayed at the bottom of the tab:

```
Total List Items: 1
Total Frames: 287
Total Time: 0 : 0 : 9 : 17

Current List Item: 1
Current Frame: 54
Current Time: 0 : 0 : 1 : 23
```

List items equals the number of line items in the pattern list (each media file is represented with one list item)

Frames equals number of each individual video frame. A BMP is 1 frame. An AVI is usually multiple frames.

Operations in Programming mode

Creating/Editing a Pattern

The pattern may be created or edited using the **Add**, **Insert**, **Delete**, and **Delete All** buttons described above.

Exporting a CFF File

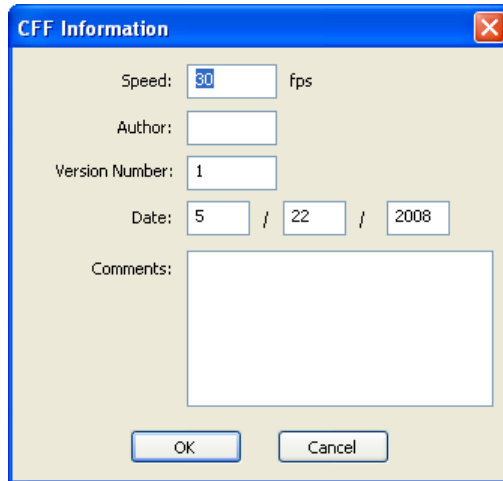
When a pattern is complete, it may be exported to a .CFF file (this is the format that is required on the Compact Flash card by the Versa DRIVE C1)

To export a pattern to .CFF:

1. Click button to create a .CFF file.
2. The standard OS "Save File" dialog appears. Name the file, choose the location, and click Save.

NOTE The first three characters must be digits 001 through 253 (corresponding to the desired pattern number) for the file to work properly on the C1. The rest of the characters can be anything. For example: *017redstripes.cff*

3. The following dialog box appears. In this dialog you can specify the file header information:

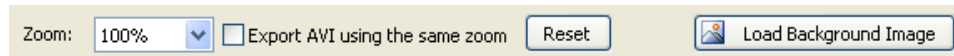


4. Click OK to close the dialog box.

Exporting a Video File

The purpose of exporting a video file is to create a preview movie of the pattern (for client presentations, etc.).

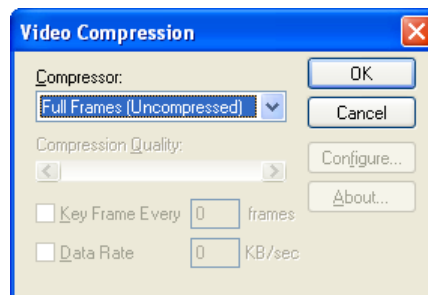
You can specify the desired area that is exported by dragging a box around it using the right button of the mouse. You can reset the rounding box to the whole map by clicking on the **Reset** button in the Work Grid toolbar.



By default, the selected area is exported in one-to-one mapping (8% zoom). If the **Export AVI using the same zoom** box is selected, the selected area is exported as it is displayed in the workgrid.

To export an AVI file:

1. Select the desired area for export
2. Click **Export AVI** button. This displays the OS standard 'Save File' dialog.
3. Name the file and click Save.
4. The following dialog box appears, where you can select the compression options of the file to be exported.





5. Click OK.

Saving/Opening .PTN Files

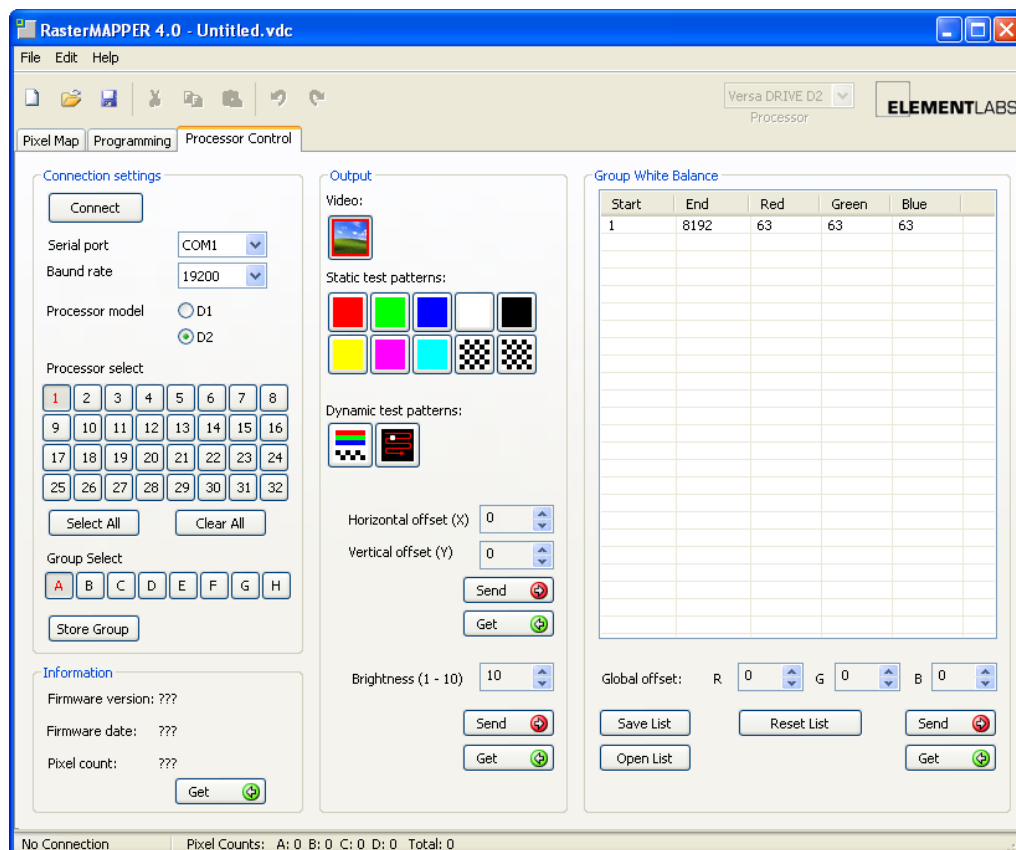
- In the Programming Mode, the Pattern List can be saved as a .PTN file.
- Existing .PTN files are opened instead of importing new frames with the Add or Insert buttons.
- .PTN files are completely independent of .MAP files. So after a .PTN file is created or opened, you can open or create a different .MAP file for use with the existing .PTN file.

PROCESSOR CONTROL MODE

Overview

This mode provides control over many of the Versa DRIVE D2 Processor's parameters. Values set in the various boxes are sent to the Processor using the  button or retrieved by using the  button.

While in the Processor Control Mode, the file Open and Save buttons are used for .VDC files only. The .VDC file only saves the information in the "Connection Settings" and "Output" areas.



Connection Settings

- The **Serial Port** should be set to whatever port you are using on your computer, usually COM1.
- The **Baud Rate** should be set to 19200. Other speeds are not currently supported.
- **Connect** button. To connect to the Processor, set the port accordingly and press the **Connect** button.

If the selected port is not available, a dialog box appears stating "Open COM PORT failed." If the selected port is available, it is displayed in the status bar at the bottom of the program window.

RM checks for the valid communication to and from the D2 before indicating a positive connection. If the test passed OK, then RM displays "connected" in the Status Bar. If the connection test failed, RM displays a dialog stating whether the failure was in the computer (i.e. com port not available, etc.) or in the connection with the D2 itself (i.e. processor not responding).

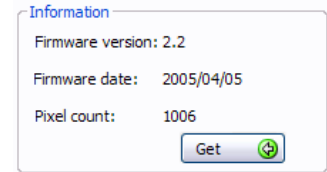
The screenshot shows a 'Connection settings' dialog box. At the top is a 'Connect' button. Below it are two dropdown menus: 'Serial port' set to 'COM1' and 'Baud rate' set to '19200'. Under 'Processor model', there are two radio buttons: 'D1' (unselected) and 'D2' (selected). A 'Processor select' section contains a 4x8 grid of buttons numbered 1 through 32. Below the grid are 'Select All' and 'Clear All' buttons. A 'Group Select' section contains buttons for letters A through H, with 'A' highlighted in red. At the bottom is a 'Store Group' button.

- **Processor Model**
Select which Processor Model is receiving your map: D1 or D2.
- **Processor Select**
RS485 communication with the D2 allows up to 32 D2s to be connected together.
If using RS232, you must select Processor #1 in order to communicate with it. (assuming the ID on that Processor is set to #1). The default is for only #1 to be selected.
- **Group Select**
Processors can be divided into groups to aid in larger installations. To group the Processors:
 1. Click on the drive numbers to group.
 2. Choose a **Group Select** letter.
 3. Press the **Store Group** button.

Information

When you press the  button, the D2 returns the **Firmware Version**, the Firmware version **date** and total **Pixel count**.


Pixel Count is the number of pixels in the Processors current Pixel List. It's a quick way to confirm that you have sent the correct size Pixel List to the Processor.

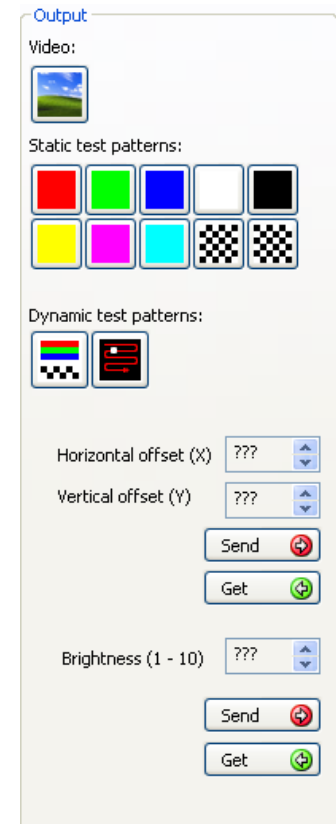


Output

Video, **Static Test Patterns**, and **Dynamic Test Patterns** switch the D2's output among the following choices:

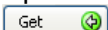
- **Video** selects the DVI input on the D2.
- **Static Test Patterns** include static patterns.
- **Dynamic Test Patterns** are moving test patterns that are useful when testing individual pixels on a Processor panel. The two Dynamic Test Patterns can only be used with the D2 Processor.



All 13 buttons for the above options are mutually exclusive. You can only select one at a time. When an output button is pressed, the command is immediately sent to the Processor (there is no need for a  button)



- **Horizontal offset, Vertical offset**

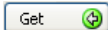
The image **Horizontal offset** and **Vertical offset** values shift the entire map horizontally and vertically. The screen origin is at the upper left hand corner. Positive **Horizontal offset** values shift the map to the right. Positive **Vertical offset** values shift the map down.

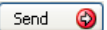
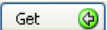
Since the **Image Offset** can be set independently via the front panel of the D2, there is the  button to retrieve the current values from the D2.

The  and  buttons below the Image Offset fields apply only to the image offset parameters.

- **Brightness**

Sets the output level of the D2 on a scale from 1 to 10.

Since the **Brightness** can be set independently via the front panel of the D2, there is a  button to retrieve the current value from the D2.

The  and  buttons below the **Brightness** field only apply to the image offset parameters.

