

Versa™ Buffer Board v1.7

Firmware Version 01

User Manual

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Table of Contents

Introduction	2
General Information	2
Buffer Board Versions and Identification	2
Displays and Controls	3
Start Up	3
Normal Operation	3
Saving Parameter Information	3
Modes	4
Address Mode	4
Size Mode	4
Last Mode	5
Test Mode	5
Display Mode	6
Firmware Mode	6
Calibration Adjustment Mode	6
Type Mode	7
Lock Mode	7
Contacting Element Labs	8

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Introduction

The Versa™ Buffer Board is installed in all Versa TILE panels and in a stand-alone box for use with the Versa TUBE and Versa X1 systems.

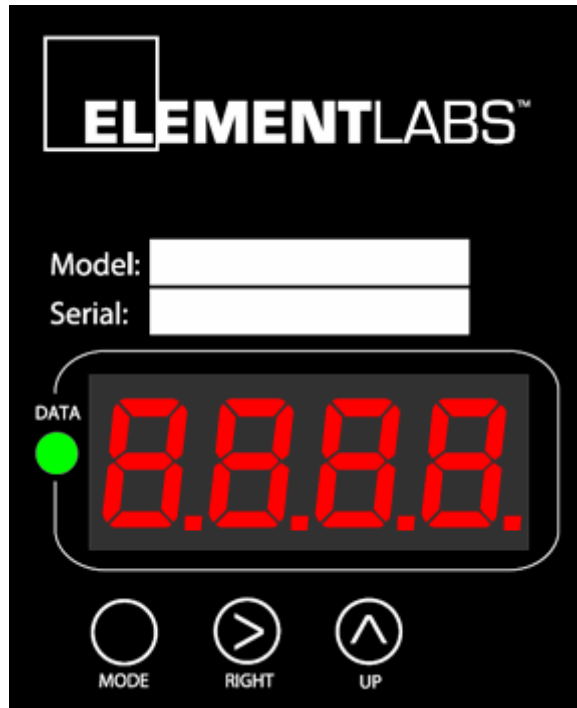
It is a data addressing, conversion, and distribution device that takes the incoming main data (RS-422) and sends the appropriate local data (TTL) to the individual tiles in that panel or pixels in that part of the system. It also actively buffers the main data signal and sends it back to the main data output connector.

New to v1.7 of the Buffer Board is the ability to store calibration data for individual pixels.

General Information

Buffer Board Versions and Identification

The original Buffer Board used on the Versa TILE panel was version 1.5 (v1.5). This is easily distinguished from newer v1.7 model. The v1.5 model has a 3 digit display; MODE, UP, and DOWN buttons, and the DATA LED is on the right. By comparison, the v1.7 model is shown below.



Displays and Controls

- Digital Display: 4 digits that display the modes and parameter values
- DATA LED: Blinking rapidly: RS-422 data input is OK
Steady on or off: RS-422 data input is missing or corrupt
- MODE button: Cycles through modes
- RIGHT button: Used to enter into a mode and step through the adjustable parameters
- UP button: Used to step up through the parameter values

Start Up

When powered on, the Buffer Board takes a few seconds to boot up. The Data LED will come on first, followed by the digital display a few seconds later.

Normal Operation

During normal operation the Buffer Board will be in Lock Mode and the display will alternately show the start address of the Buffer Board and the start address of the next Buffer Board. Assuming that the size parameters are set correctly, this provides an easy way to check that all of the addresses have been properly set. See the Size Mode and Lock Mode sections below for details.

In addition, the Lock Mode is indicated by all four decimal points in the digital display flashing in unison.

Saving Parameter Values

When modifying any of the parameters on the Buffer Board, these changes are not permanently stored in the Buffer Board's EEPROM until the Buffer Board goes into Lock Mode (either manually or automatically). So if any changes are made to the Buffer Board's parameters and the Buffer Board is then powered down before going into Lock Mode, the changes will be lost.

Modes

There are seven main modes available on the Buffer Board:

1. **Addr** (Address): set the start address of Buffer Board
2. **SIZE** (Size): set the number of pixels
3. **LAST** (Last): display the start address of the next Buffer Board
4. **DISP** (Display): turn the digital display and DATA LED off
5. **F-88** (Firmware): display the firmware version
6. **TYPE** (Type): Set the Versa DRIVE type
7. **LOC** (Lock): Lock the Buffer Board

There are two additional modes that can be accessed with special button combinations:

1. **TEST** (Test): Send a test pattern to the pixels
2. **Adj** (Calibration Adjustment): Enable serial communication with Versa BALANCE

Address Mode

To access the Address Mode:

1. Press the mode button until the display shows **Addr**.
2. Press the RIGHT button to step into the Address Mode and display the current address.

To change the address:

1. After the two steps above, press the RIGHT button again, this selects the first digit – it will start blinking. Use the UP button to set that digit.
2. Press the RIGHT button again to select the next digit. Set the next digit using the UP button.
3. Repeat step 3 to set the third and fourth digits.

After setting the fourth digit, pressing the RIGHT button will return you to the beginning of the Address Mode.

Pressing the MODE button at any time will exit the Address Mode and set the display to the Size Mode. If you have made partial changes to the address before pressing the MODE button, they will be kept – pressing the MODE button does not cancel any changes made so far.

Size Mode

The size parameter is used solely to allow the Buffer Board to calculate and display the “Last” pixel address (see “Last Mode” below).

To access the Size Mode:

1. Press the mode button until the display shows **SIZE**.

2. Press the RIGHT button to step into the Size Mode and display the current size.

To change the size:

1. After the two steps above, press the RIGHT button again, this selects the first digit – it will start blinking. Use the UP button to set that digit.
2. Press the RIGHT button again to select the next digit. Set the next digit using the UP button.
3. Repeat step 3 to set the third digit.

After setting the third digit, pressing the RIGHT button will return you to the beginning of the address mode.

Pressing the MODE button at any time will exit the Size Mode and set the display to the Last Mode. If you have made partial changes to the size before pressing the MODE button, they will be kept – pressing the MODE button does not cancel any changes made so far.

Last Mode

As a convenience, the Buffer Board can display the start address of the next Buffer Board. This is useful when initially setting all of the start addresses. The Buffer Board calculates this as follows:

$$\text{Last Address} = \text{Starting Address} + \text{Size} + 1$$

Note: The name of this mode is misleading. The value displayed is actually the first pixel's address on the next Buffer Board, not the "last" pixel on the current Buffer Board.

To access the Last Mode:

1. Press the mode button until the display shows **LAST**.
2. Press the RIGHT button to step into the Last Mode and display the starting address of the next Buffer Board.

Pressing the MODE button at any time will exit the Size Mode and set the display to the Display Mode.

NOTE: In future firmware versions this mode will be called the Next Mode - **NEXT**.

Test Mode

The test mode sends a dynamic test pattern to all the pixels on the local data output. The pattern is a cycle of red, green, blue, uncalibrated white, and calibrated white.

To access the Test Mode:

1. Press the mode button until the display shows **LAST**.
2. Press the RIGHT button to step into the Last Mode and the display starting address of the next Buffer Board.
3. Press and HOLD the RIGHT button for 5 seconds until the display shows **TEST**. The pixels will automatically start to cycle through a test pattern.

Pressing the MODE button at any time will exit the Test Mode and set the display to the Display Mode.

NOTE: In future firmware versions the Test Mode will be accessed from the main MODE button.

Display Mode

The Display Mode allows the digital display and the data LED to be turned off while maintaining normal Buffer Board operation.

To access the Display Mode:

1. Press the mode button until the display shows **d 15P**.
2. Press the RIGHT button to step into the Display Mode.
3. Press the UP button to turn off the display and immediately lock the Buffer Board

The display will stay off as long as the Buffer Board is locked. Pressing the MODE button unlocks the Buffer Board and turns the display back on. The display will then stay on until it is manually turned off in the menu again.

NOTE: In future firmware versions the state of the Display Mode will be saved by the Buffer Board and there will be no need to manually turn off the display after each time the Buffer Board is unlocked.

Firmware Mode

The Firmware Mode displays the current version of the Buffer Board firmware.

To access the Firmware Mode:

1. Press the mode button until the display shows **F-88**, where "88" may be any number. This two digit number is the version of the firmware.

The current firmware version is "01"

Pressing the MODE button will exit the Test Mode and set the display to the Type Mode.

Calibration Adjustment Mode

The Calibration Adjustment Mode allows the internal calibration data to be downloaded, modified, uploaded, and burned to the Buffer Board's EEPROM. This is done via an RS-232 connection on the Buffer Board to a PC running a software utility called Versa BALANCE. Please see the Versa BALANCE manual for details.

To access the Calibration Adjustment Mode:

1. Press the mode button until the display shows **F-88**, where "88" is the firmware version.
2. Press and HOLD the RIGHT button for 5 seconds until the display shows **Adj.**
3. Press the RIGHT button until the display shows the size of the panel – either 25 or 100.
4. Press the UP button and the display will show **[- -]**. This shows that the Buffer Board is ready to receive serial commands from Versa BALANCE.

Pressing the MODE button will exit the Calibration Adjustment Mode. It also will soft-reset the Buffer Board, meaning the display will turn off for about 5 seconds while it resets.

Type Mode

The Versa DRIVE D1 and C1 support 1024 pixels per output. The Versa DRIVE D2 supports 2096 pixels per output. Since these two data structures are different, the Buffer Board must be set according to which Versa DRIVE model is being used.

To access the Type Mode:

1. Press the mode button until the display shows **TYPE**.
2. Press the RIGHT button to step into the Type Mode and display the current type.

To change the type:

1. After the two steps above, press the RIGHT button to alternate the type between **d-01** and **d-02**.

Press either the MODE or UP button to exit the Type Mode and set the display to the Lock Mode.

Lock Mode

The Lock Mode disables the RIGHT and UP buttons. This prevents accidental changes from being made to any of the parameters.

The Buffer Board is automatically unlocked by pressing the MODE button.

The Buffer Board will automatically revert to Lock Mode after about 10 seconds of inactivity.

When in Lock Mode, the display will alternately show the start address of the Buffer Board and the start address of the next Buffer Board. Assuming that the size parameters are set correctly, this provides an easy way to check that all of the addresses have been properly set.

When modifying any of the parameters on the Buffer Board, these changes are not permanently stored in the Buffer Board's EEPROM until the Buffer Board goes into Lock Mode (either manually or automatically). So if any changes are made to the Buffer Board's parameters and the Buffer Board is then powered down before going into Lock Mode, the changes will be lost.

To access the Lock Mode:

1. Press the mode button until the display shows **LOC**.
2. Press the RIGHT button to immediately enter the Lock Mode.
 - a. The display will start to alternate between the start address of the current and next Buffer Boards.
 - b. The four decimal points in the digital display will start flashing in unison.
 - c. The RIGHT and UP buttons will be disabled.

Press the MODE button to exit the Lock Mode and set the display to the Address Mode.

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