



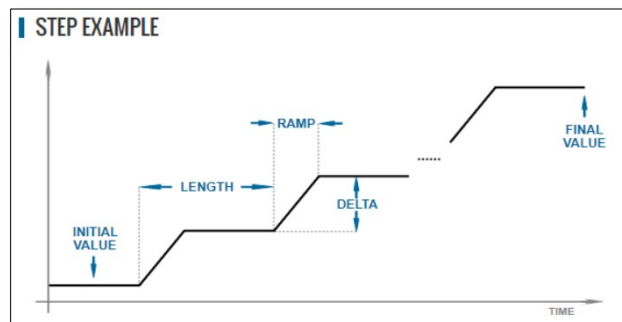
## AFX SERIES - FIRMWARE RELEASE NOTES-V 2.2.0

### Abstract

This note describes the new features that were incorporated in release 2.2.0 of the AFX Series firmware. Existing owners of AFX Series power sources with older firmware versions can upgrade using the front panel or browser interface. Several other improvements and bug fixes not detailed in this bulletin have been incorporated in this release as well.

### New Features

The following new features were added in this release.



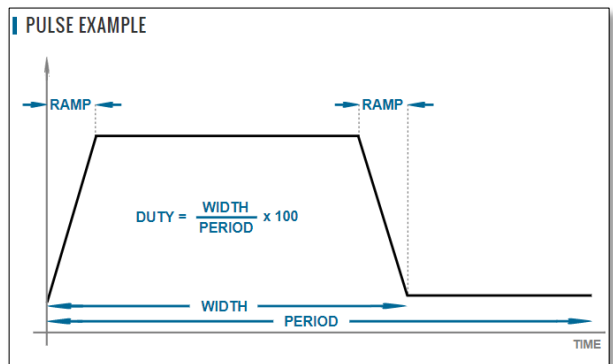
### STEP TRANSIENT MODE

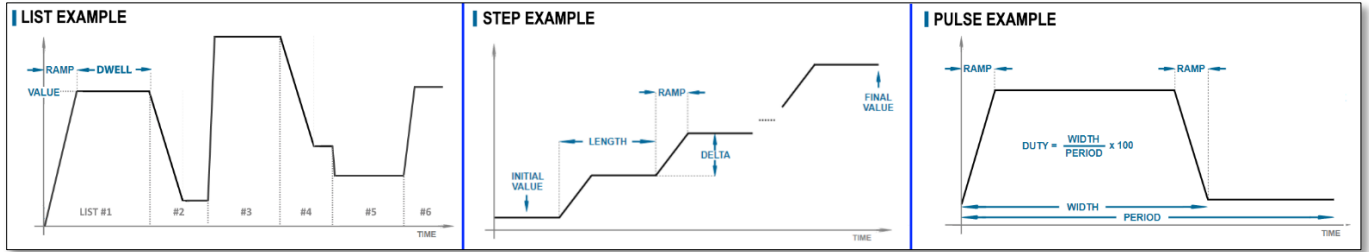
Two new transient data entry mode join the original LIST transient mode that has been part of the AFX Series controller since introduction. The first one of these is the STEP mode. STEP mode

allows the user to set an initial or start value, a FINAL or end value and step size and duration. This defines a stair step type output pattern that runs when the STEP transient is triggered. STEP transients are useful for testing over voltage protection circuits on both AC and DC powered products. A step transient is quickly set up with minimal data entry compared to doing the same output using LIST mode as such a list could have many list steps or segments.

For applications where a smooth ramp is preferred over a stair-step output – for example for DC output applications – the STEP is easily converted to a smooth ramp by setting each step duration to the minimum value of 200 µsec.

### PULSE TRANSIENT MODE





Pulse transient mode has been added in addition to the PULSE mode. A PULSE mode transient changing between two user-defined levels (either voltage and or frequency) and is repetitive in nature. The user sets the duty cycle and period as well as the number of pulses and voila, programming is done. PULSE mode can be used for example for endurance testing of a universal AC input product by pulsing the AFX output voltage between 85Vac and 265Vac with a 50% duty cycle for a 24 hour duration.

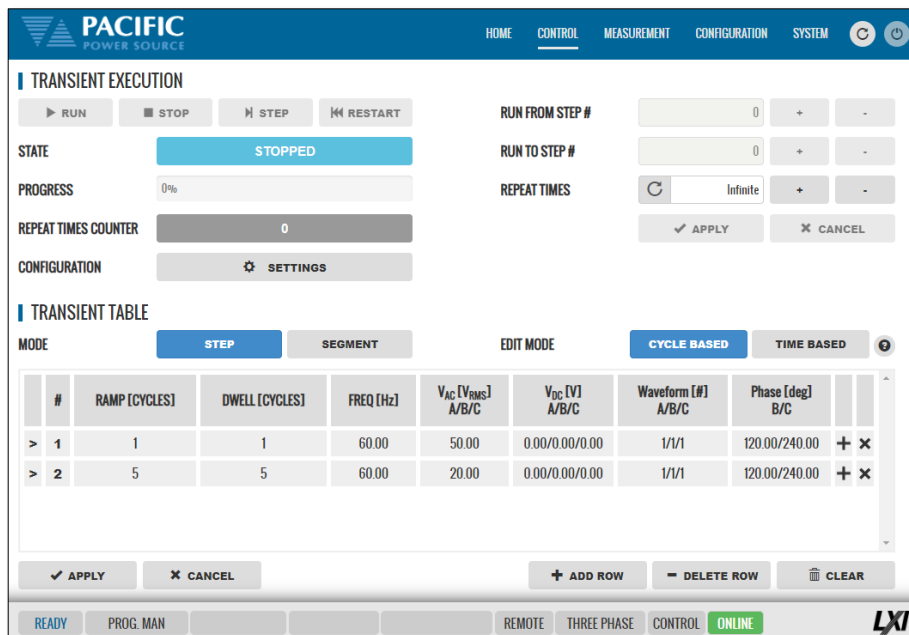
**THREE TRANSIENT MODES:** With the addition of STEP and PULSE, the AFX now offers the three powerful transient modes shown in the illustration at the top of this page. All three run on top of the AFX Series Segment based transient system so they all perform the same way but differ in data entry method to provide maximum convenience for the task at hand.

**CYCLE MODE TIMING:** The transient system has also been upgraded to offer direct support **Cycle** based timing in addition to the standard based timing mode. By selecting CYCLE mode in the web browser LIST mode transient screen, the dwell time will be determined by the no. of cycles based on the frequency setting at the time of execution. Thus, by entering 5, at 50Hz 100 msec will be used and at 60Hz, 83.2 msec will be used. See CYCLE BASED browser transient screen below.

In SCPI commands, the cycles value can be programmed using a negative number in the PROG:DEF command for fields:

- TSEG (time in segment mode)
- RTSTEP (ramp time in step mode)
- DTSTEP (dwell time in step mode)

Using a positive value will set the time as before.



The screenshot shows the Pacific Power Source web interface. The top navigation bar includes HOME, CONTROL, MEASUREMENT, CONFIGURATION, and SYSTEM. The main content area is titled 'TRANSIENT EXECUTION' and includes buttons for RUN, STOP, STEP, and RESTART. The STATE is 'STOPPED'. The PROGRESS is 0%. The REPEAT TIMES COUNTER is 0. The CONFIGURATION button is labeled 'SETTINGS'. Below this is the 'TRANSIENT TABLE' section, which has tabs for 'STEP' and 'SEGMENT' and an 'EDIT MODE' dropdown set to 'CYCLE BASED'. The table has columns for #, RAMP [CYCLES], DWELL [CYCLES], FREQ [Hz], V<sub>AC</sub> [V<sub>RMS</sub>] A/B/C, V<sub>DC</sub> [V] A/B/C, Waveform [#] A/B/C, and Phase [deg] B/C. Two rows are visible in the table:

#	RAMP [CYCLES]	DWELL [CYCLES]	FREQ [Hz]	V <sub>AC</sub> [V <sub>RMS</sub> ] A/B/C	V <sub>DC</sub> [V] A/B/C	Waveform [#] A/B/C	Phase [deg] B/C
> 1	1	1	60.00	50.00	0.00/0.00/0.00	1/1/1	120.00/240.00
> 2	5	5	60.00	20.00	0.00/0.00/0.00	1/1/1	120.00/240.00

At the bottom of the table are buttons for APPLY, CANCEL, ADD ROW, DELETE ROW, and CLEAR. The bottom status bar shows 'READY', 'PROG. MAN', 'REMOTE', 'THREE PHASE', 'CONTROL', and 'ONLINE'.

## New Measurement Functions

**PEAK CURRENT HOLD:** The following new measurement functions and associated SCPI commands were added:

- PEAK CURRENT ABSOLUTE
- PEAK CURRENT ABSOLUTE HOLD
- PEAK CURRENT MAX HOLD
- PEAK CURRENT MIN HOLD

These functions track highest, lowest and absolute peak current values using a track and hold method until reset by the user. This makes it easier to determine worst case inrush current of an EUT.

**KILO WATT HOUR:** This new function measures energy consumption of the unit under test by integrating true power (kW) over time. The integration time can be set by the user.

These new measurement functions will be available from the browser interface as well.

POWER	0.000 kW
WATT-HOUR <input type="button" value="RESET"/>	NaN kWh
APP POWER	0.000 kVA
POWER FACTOR	0.00
CURRENT CF <input type="button" value="v"/>	-
PEAK CURRENT	NaN A
RECORDED PEAK CURRENT <input type="button" value="RESET"/>	NaN A

## New SCPI Commands

The following commands have been reorganized and or added for provide a more logical structure.

- Peak voltage protection commands.
- Peak current protection commands
- Power Protection Commands
- Peak Apparent Power Commands
- Front Panel Control Commands
- **SYSTEM:BEEP** Generates a beep on the unit's front panel. Useful for getting a test

operator's attention during ATE program execution.

- **PROGRAM:TRANSient:HOLD <ON|OFF>**  
**PROGRAM:TRANSient:HOLD?**

If it ON the power source holds the last segment values at steady state after the transient ends. If OFF, the output reverts to the steady state section of the program.

**Note:** Some old protection SCPI commands have been replaced with these new restructured versions and are no longer visible in the browser HOME page command list pull-down. However, they are still supported for legacy programs.

## Firmware Compatibility Requirements

Front panel control firmware v 2.2.0 requires as a minimum that the DSP Firmware of the power stages is at revision 82.1.4 - 78.0.6. Older versions of the DSP firmware will be updated along with the firmware update to support this firmware revision. When updating the AFX firmware, all three sets of firmware will be checked for revision compatibility and upgraded to the latest revision as needed.

To upgrade, use one of two methods:

Webpage: [FIRMWARE UPDATE → DOWNLOAD](#)

Front panel: [SYST → FIRMWARE UPDATE → FROM FTP → UPDATE FIRMWARE](#)

## Customer Support

For application support, contact Pacific Power Source's Customers Service - Toll Free US: +1 (800) 854-2433 / [support@pacificpower.com](mailto:support@pacificpower.com) or your local authorized Pacific Power Source distributor.