

Customer Support Tip:

NEC 220.87 – Load Study: Finding the Max 15-Minute Demand for a 30-Day Period Using AEMC® PEL 100 Series or PowerPad® III

By Guy Belliveau

The National Electrical Code NEC article 220.87 for determining existing loads states the following:

The calculation of a feeder or service load for existing installations can be based on:

The maximum demand data for one year.

Exception: If the maximum demand data for one year isn't available, the maximum power demand over a 15-minute period continuously recorded over a minimum 30-day period using a recording ammeter or power meter connected to the highest loaded phase, based on the initial loading at the start of the recording is permitted. The recording must be taken when the building or space is occupied based on the larger of the heating or cooling equipment load.

AEMC® offers a variety of instruments that can record the system's load for the study. These include the PowerPad® III Power Quality Analyzers Models 8333, 8336 and 8435; and the Power and Energy Loggers Model PEL 100 Series.

This tip will show you how to quickly identify the peak 15-minute demand from a 30-day recording from these instruments.

The following steps assume you have already configured each instrument for a 30-day recording period with a 15-minute demand interval. This instructs each instrument to record for 30-days and write a data point every 15-minutes containing the RMS average of all selected channels. We will focus on the Current (I/A) channels in the following examples.

PEL 100 Series

For Models PEL 102, 103, and 105, download the 30-day recording using the DataView® PEL Control Panel. Once downloaded, the recording will appear in the My Open Sessions folder in the Navigation frame. Click on the 15-minute Summary sub-folder of the recording to show the Trend Graph. Then follow these steps (and refer to the illustration below) to find the maximum demand for each leg:

1. Display RMS values by clicking the RMS button.
2. Display Current (I) traces.
3. Turn off Min/Max traces. This will display only the RMS Averages.
4. The Window MAX column will show the Maximum RMS Average Current of all 15-minute samples. Use these numbers for your load calculations as these represent the highest 15-minute demand, per leg, during the entire 30-day recording period.

15 min Summary

Channel	Color	Cursor MIN	Cursor AVG	Cursor MAX	Window MIN	Window AVG	Window MAX
I1	Black	6.696 A	6.7 A	6.703 A	6.508 A	7.567 A	10.36 A
I2	Red	2.457 A	2.473 A	2.5 A	2.405 A	4.324 A	12.58 A
I3	Blue	6.117 A	10.12 A	15.06 A	3.751 A	9.3 A	38.1 A
IN	Green	9.248 A	11.61 A	15.04 A	7.167 A	11.08 A	36.05 A

PowerPad® III

For Models 8333, 8336, and 8435, download the 30-day recording using the PowerPad® III Control Panel. Once downloaded, the recording will appear in My Campaigns. Click on the name of the recording to show the Trend Graph. Then follow these steps (and refer to the accompanying illustration) to find the maximum demand for each leg:

1. Display RMS values by clicking the RMS button.
2. Display Current (A) traces only.
3. Turn off Min/Max traces. This will display only the RMS Averages.
4. The Window MAX column will show the Maximum RMS Average Current of all 15-minute samples. Use these numbers for your load calculations as these represent the highest 15-minute demand, per leg, during the entire 30-day recording period.

The screenshot shows the 'Recording' interface with several buttons and a data table. Four numbered callouts highlight the steps: 1. 'Show RMS values' points to the 'RMS' button. 2. 'Show Current (I) Traces' points to the 'A' button. 3. 'Turns OFF Min/Max Traces' points to the 'Min/Max' button. 4. The 'Window MAX' column in the table is highlighted.

Channel	Color	Cursor AVG	Window MIN	Window AVG	Window MAX
A1 rms	Black	10.91 A	10.88 A	10.92 A	10.95 A
A2 rms	Red	12.22 A	12.19 A	12.24 A	12.26 A
A3 rms	Blue	10.48 A	10.45 A	10.49 A	10.51 A
AN rms	Green	0 A	0 A	0 A	0 A

Using these simple and quick steps, the peak demand for a 15-minute period over a 30-day recording can be found fast and easy.

If you have any questions about this article or any AEMC® instrument, please contact our Technical Support staff at 1-800-343-1391 x351 or techsupport@aemc.com.

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