

NEEA TV Test Method Kit Evaluation Information

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Introduction

This memo aims to provide overview information needed to engage in evaluation of new TV test method approaches developed by the Northwest Energy Efficiency Alliance (NEEA), using test equipment provided by Pacific Crest Labs (PCL). The new camera-based test method is intended to be paired with a new policy metrics that reflect a TVs ability to efficiently deliver light as measured from the viewer’s perspective.

NEEA’s efforts to work with external partners to evaluate its test method innovations are intended to support several broader activities including:

- Development of ENERGY STAR® Version 9.0 TV Program Requirements.
- A recently announced [*Voluntary Agreement to Promote a New Test Method for Measuring the Energy Usage of Televisions*](#), which states that “The Parties agree that consumers and stakeholders are best served by consistent use of the same test method to measure the energy use of televisions, and each commit, once the Proposed Test Method is finalized, to use best efforts, including joint coordinated advocacy, to ensure the adoption of the Proposed Test Method by at least ENERGY STAR, IEC, and American National Standards Institute (ANSI)/Consumer Technology Association (CTA), and, if they mandate the use of any test method, by the Department of Energy (DOE), Natural Resources Canada (NRCan) and state and provincial authorities. The Proposed Test Method is also intended for use in any Voluntary Agreement between the Parties to improve television energy efficiency.”

The memo will:

- Provide context relative to the test method
- Explain what equipment you need for testing
- Outline engagement goals and plans

Test method context

NEEA worked with engaged stakeholders to champion many elements of the proposed test method. NEEA is now engaged in a broader activity to vet the test method with test labs and manufacturers and achieve acceptance by standards bodies and propagate its use by policymakers, along with associated modifications to policy metrics to focus on how efficiently TVs generate light.

The NEEA TV test method proposal, provided as a separate document, represents a major revision to current TV test methods, which are grounded in IEC 62087: 2015. It is based on elements of the following test methods:

- **IEC 62087** (2015 parts 1, 2, and 3) and committee drafts of parts 2 and 3 that provide the following key updates:
 - HDR video clips
 - An updated ABC test method based on overhead, LED light
 - Use of USB thumb drives inserted into TV for test clip play
- **CTA 2037-B**: We primarily pull persistence requirements from this spec.
- **ENERGY STAR v9**: We pull definitions and basic requirements from v9. It is important to note that the NEEA test method is intended to be paired with a new policy metrics that reflect a TV's ability to efficiently deliver light as measured from the viewer's perspective.

Test kit

PCL is providing evaluation test kits free of charge. However, by end of year, PCL will ask evaluation partners to either return the kit or pay for it.

Pricing

Preliminary price sheet

Camera assembly*, laptop, PoE inserter for camera, test clips, thumb drives, calibration files, instruction manual and cables	8,150.00	Basic Kit
LabView License	450.00	
Wattman power meter	400.00	
NEEA automation software	1,000.00/yr **	
<i>1-year limited warranty</i>	Included	
Total	10,000.00	

Must acquire separately

Camera stand

ABC test equipment (lamp, dimmer, lamp stand, reflective card)
AC power supply
Accurate luminance and lux meters (see test method for new requirements relative to IEC 62087)

* Periodic calibration needed, price TBD, less than Radiant charges for Y29 calibration

** It is possible that a commitment to share data would reduce this fee (TBA by NEEA).

PCL will send complete kits out for round robin testing. If a manufacturer only wants the basic kit thereafter, they can return the power meter (in the provided Wattman box), and we will disable the automated test software. The purchased kit would include upgrade to new lenses and filters as needed to accommodate a larger measurement distance for post-round-robin test rounds. It would also include any other hardware or software refinements we make during late 2020/early 2021 test method evaluation period. In other words, PCL bears the risk of needed hardware and software improvements in the near future when refinements are most likely.

Manual mode would include the following features:

- Screen configuration (i.e. identify the outline of the TV screen and make basic geometry corrections)
- Color Correction Factor (CCF) measurements using camera 1% peak window
- Log 1-second interval luminance data (not power) until the user hits abort

Automated mode would include the following additional features:

- Ability to make custom test sequences that involve user prompts and flexible peak window sizes
- Automated TV stabilization test (<2% power deviation between consecutive test clip runs)
- Option to measure lum profile (a tests that provides an x, y plot of all camera pixel values)
- Pre-defined, adaptive test scripts for ENERGY STAR and VA test sequences
- Automated generation of summary csv files and PDF reports

The test script PCL is providing for round robin testing would require Automation Software after the initial round robin eval period. Automated mode will save a lot of time for testers, several hours per TV.

The test kit would include vignette calibrations for the 10-14 most common HD and UHD screen sizes, which accounts for 98-99% of US TV sales. For an odd size, using a vignette file for a nearby size will introduce a limited amount of additional error, estimated < 1%. [This may change as we move to larger

lenses to achieve a camera distance to TV of 1.52 times screen diagonal. The larger lens has less vignette effect.]

If a manufacturer would like to use their own power meter (e.g. Yokogawa) with the automates software, we would write the drives to enable that for a modest fee and timeline that is TBD.

Must be purchased separately

Below we provide examples of the type of equipment test labs will need for testing. These examples may not be available globally, but we provide them in order to help you select locally available equipment that meets the requirements of the NEEA test method (attached document).

- Camera stands to hold the Basler camera and luminance measurement device. Here is an [example](#).
- ABC test equipment (lamp, dimmer, lamp stand, reflective card)
 - Stand Setup:
 - [Mounting Clamp](#)
 - [Tripod Adjustable Ball Head](#)
 - [8.53ft Camera Stands w/ 1/4in Screw](#)
 - Bulb Setup:
 - [Dimmer Switch](#)
 - [Philips](#) lamp that meets the drafted spec
 - [Cord + Bulb Socket](#)
 - [1 gang wall box \(optional, any wall box will do for the dimmer switch\)](#)
- AC power supply (e.g. Chroma). No new power supply requirements.
- Accurate luminance and lux meters (see test method for new requirements relative to IEC 62087). Examples include KM LS150/CS150 and JADAK PR-655. Either of these devices, fitted with a cosine receptor, can be used to self-calibrate a T10 illuminance meter for ABC testing (i.e. identifying CCF for chosen LED lamp).

Engagement goals & plans

- Review test method and test kit manual for clarity
An initial draft test method is complete. A draft product manual, which will include photos and links to instructional videos, will be complete this week.
- Review camera technical write-up – available now. This document provides the technical justification for the design choices PCL made when developing this capability and an assessment of worst-case and expected accuracy of the camera photometer.
- Conduct round robin testing using VA automated test script (comes with the software) and share data with PCL and CTA.

Requested information

- What power meter does your lab plan to use so that we can begin to scope National Instrument LabVIEW drivers?