



OpenADR Summit

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Water Heating Demand Response



What is CTA 045

OLD School DR (on/off) with Water Heaters

We don't want this anymore

- 240V switch (pictured in the red circles)
- About \$400 installed. Can lead to stranded investment
- Requires a permit, an electrician, a truck roll, customer inconvenience
- Cycling voltage to a HPWH is not good for the electronics inside the unit
- Higher risk of customer possibly running out of hot water



Introducing CTA 2045

A modular, open source, demand response (DR) specific communications port and command language

- Consumer Technology Association (CTA) published the standard in 2013 and was updated in 2018, Created CTA-2045-A
- The standard is now ANSI approved and used internationally
- **Oct 2020 updated to CTA-2045-B**
- Two form factors:
 - DC (3V) and AC (120-240V)



Tomorrow's Standard Appliance Socket

- **Advantages of a Standard Socket = Lower Cost**

CTA-2045 is analogous to USB

- Standard Physical Socket
- Standard format for data packets
- Standard initial exchange of information
- Does not depend on DR language
- Widespread adoption by manufacturers





CTA-2045 Appliance Family



Hot Water Heaters



Pool Pumps



PTACs



EV Chargers



Heat Pump HVAC Mini-splits



*Legislative requirements /
Regulatory consideration*

The West Coast is leading with CTA 2045



- NEEA Advanced Water Heating Specification requires CTA 2045 on tier 3 and above
- Washington State (40-120gallons) under 12kW (SB1444)
 - HPWH January 2021
 - Electric Resistance January 2022
- Oregon (Executive Order 2020-04)
 - HPWH and Electric Resistance 2022
- California
 - Under review for T-24 and T-20 and incorporating
 - JA 13 points to AWHs 7.0 tier 3 or greater

Who Else is working on Flexible Load Management

- NE States – Reviewing and following the WA model
- ENERGY STAR® - Voluntary Standard next version 4.0
- DOE – Developing test Procedure for listing
- The Advanced Water Heating Initiative – Connectivity Group – CTA 2045 Dual Pathway
- AHRI 1380 OpenADR and or CTA 2045 (HVAC)
- AHRI 1430 just getting started – CTA 2045 for water heating



OEMs are getting on board

On Board

- Rheem Proterra
- AO Smith
- Eco2
- Mitsubishi Mini-splits
- Siemens Car Charger
- Pentair – Pool pumps (OpenADR and CTA 2045)

Under Consideration

- Mitsubishi – Central water heating
- Bradford White – Water heaters
- General Electric – Water heaters
- Many more



Pentair



SIEMENS



CTA-45 Status

CTA-2045 Certification Program

- Components of a Certification Program
 - Test plan & test tool
 - Accredited test house
 - Documentation & Certification → Certificate
 - Branding and product listing
- CTA-2045 certification program will be very similar to OpenADR certification*
- Test plan: Will be finalized based on EPRI recommendation
- Initially for Water Heater profile, further appliance profiles can follow
- CTA Just Published 2045 B (November 6th)

*compare to <https://www.openadr.org/certification-process>

Next Steps: CTA-2045 Certification Program (2)

Timeline to Certification Program Launch

- Test plan & Test tool development in December 2020
- Initial validation tests and first certified products during test tool development in Q4 2020 and Q1 2021
- Product listing page completed January 2021
- Test house available for certification testing in Q1 2021

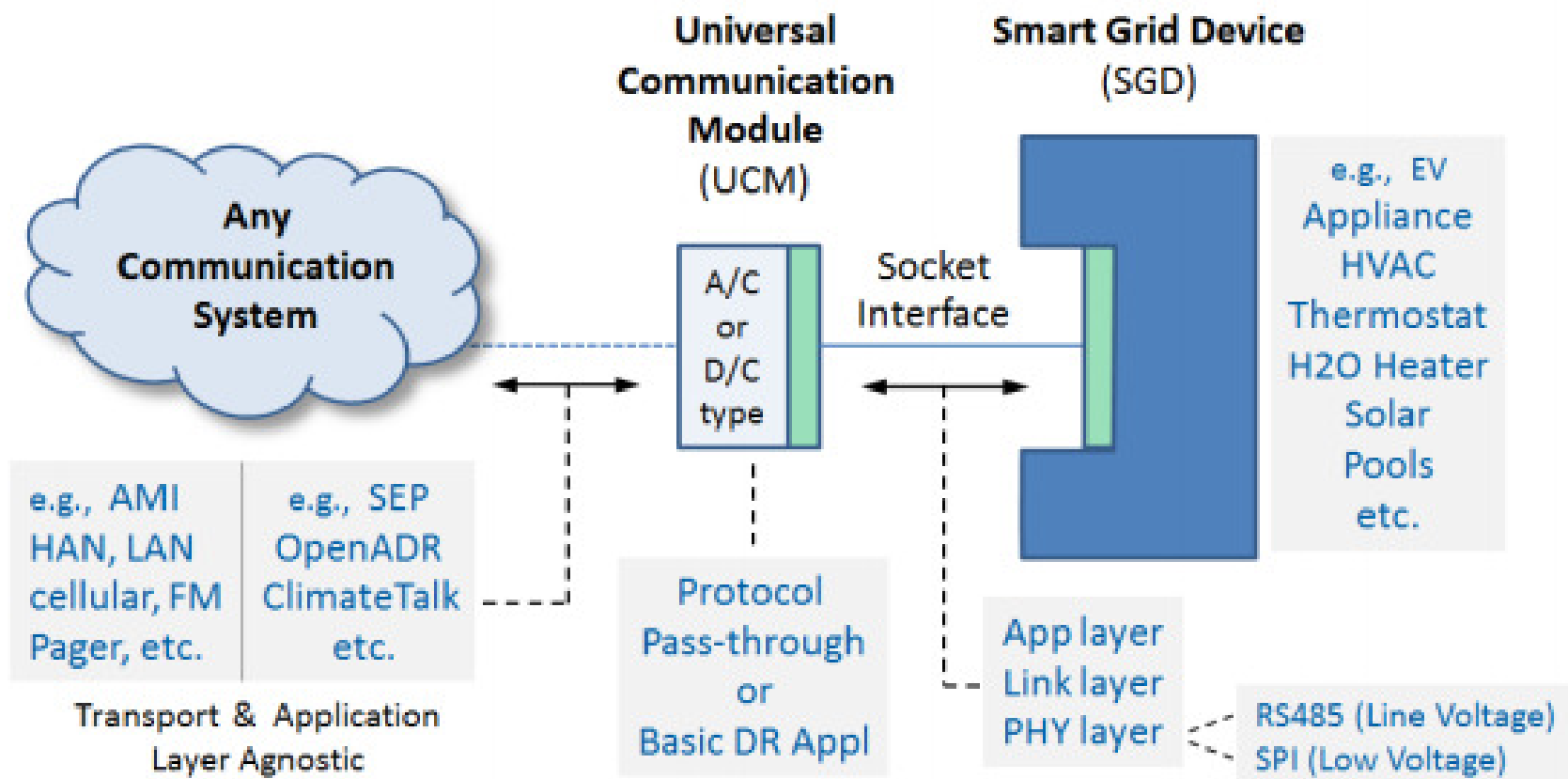




*How does STA-2145 work
with OpenDR*



Physical port on the appliance





Overview of grid signals to devices

