OpenADR Webinar: How AHRI 1380 will impact OEMs in 2026: Flexible load balancing for HVAC

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March 11, 2026

Agenda

1. Housekeeping
2. Intro of the panelists
3. Overview of OpenADR and Demand Response
4. Introduction to AHRI and the 1380 standard
5. AHRI anticipated evolution and testing details
6. Q&A session

Housekeeping

- The webinar is being recorded
- Slides and Recording will be made available on https://www.openadr.org/webinar-series
- All attendees are in listen only mode
- To ask questions, please enter them in the Questions tab of the Webinar Tool
  - We will field as many questions as possible at the end of the presentations

Q&A

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Today’s panelists

Rolf Bienert
Technical Director
of the OpenADR Alliance

Rolf Bienert is the Managing and Technical Director of the OpenADR Alliance. In this capacity, he oversees all aspects of the non-profit organization, including strategy, technical developments, and certification programs. Rolf has been an active member of many industry organizations since over 20 years, driving the development of new technologies with a specific focus on standardization, certification, and interoperability. Rolf holds a master’s degree in EE.

Spencer Borison
US President
Codibly
spencer.borison@codibly.com

Spencer Borison is the US President for Codibly, a global IT services firm that has been supporting clients in the Renewable Energy industry for 15 years. His projects focus on Demand Response, Grid Communication, Standards and Interoperability, and Smart Home EMS. Codibly is a Contributing Member of the OpenADR Alliance and has relationships with many of the leading DR Aggregators.

Eric Olson
Sr Product Manager, Grid
Flexible Tech, Northwest
Energy Efficiency Alliance

Eric Olson is a product and technology leader at the Northwest Energy Efficiency Alliance (NEEA), an alliance of more than 140 Northwest utilities and energy efficiency organizations serving over 14.5 million consumers to accelerate the adoption of energy-efficient products. His work focuses on product management, emerging grid flexibility technologies, communications standards, and load flexibility testing to support interoperable solutions and advance end-use energy innovation.

Codibly - expert in e-Mobility & renewable energy

Codibly is passionate about driving positive change in transportation and energy. The company brings together expertise in software development with an in-depth understanding of e-Mobility and Renewable Energy to offer innovative solutions that empower businesses and individuals to embrace eco-friendly practices.

15
years of experience

1800+
domain experts in the Group

100+
delivered projects

openADR ALLIANCE
Official Implementation Partner

EnergyHub
Technical Implementation Partner

AHRI
we make life better®
Expert Practicioner

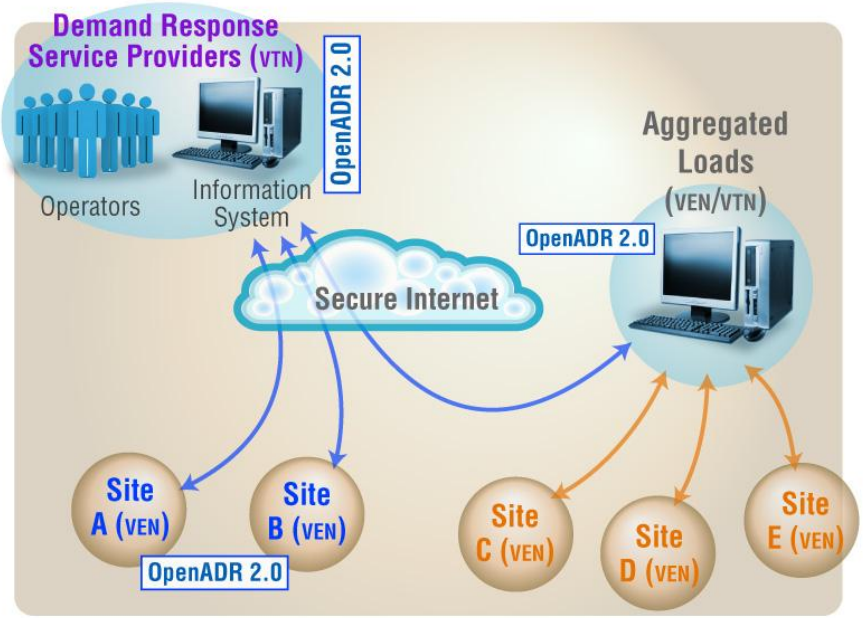

Energy Industry / Sustainability Expertise


Global Presence and Client List within the Spyrosoft Group


Broad Software and Technical Dev Capabilities

OpenADR in a nutshell

OpenADR (also IEC 62746-10-1) provides a non-proprietary, open standardized Demand Response (DR) & Distributed Energy Resources (DER) interface that allows DR service providers to communicate DR, DER, and TE (Transactive Energy) signals directly to existing customers using a common language and existing communications such as the Internet.



The ‘Entities’ of OpenADR

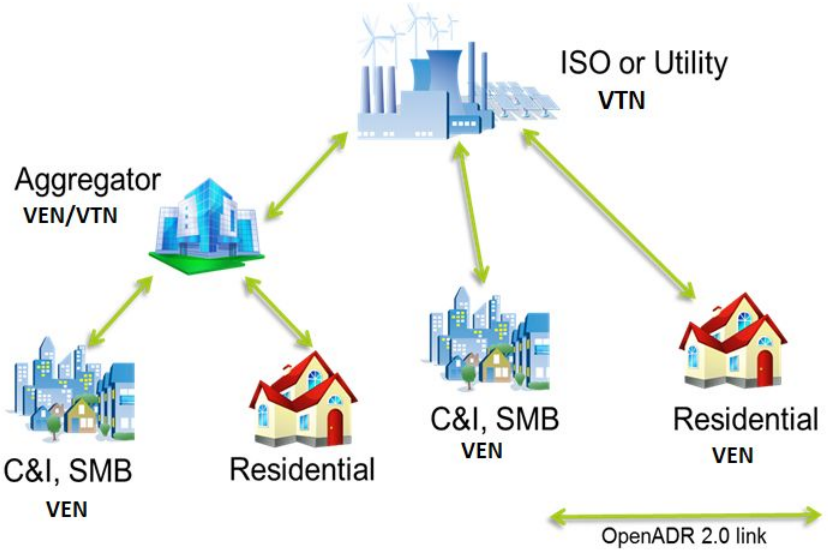
OpenADR is a message exchange protocol with two primary actors, aka ‘entities’

Virtual Top Nodes (VTN)

- Manages Resources
- Creates/Transmit events
- Request Reports

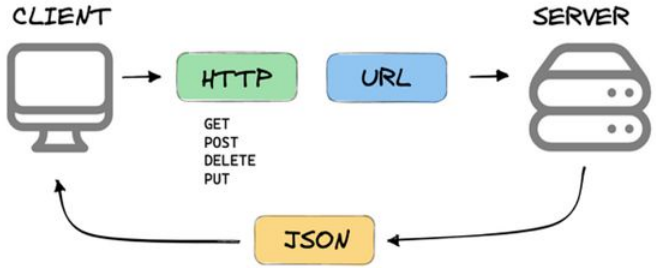
Virtual End Nodes (VEN)

- Receive events and respond to them
- Generate reports
- Control demand side resources



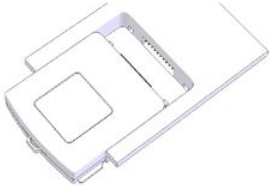
A new addition – OpenADR 3.0

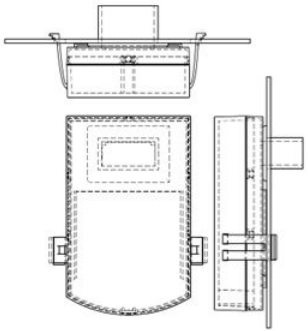
- Created in addition, instead of changing the existing 2.0 standards
  - Maintain interop, 2.0 remains in place
- REST API for simpler implementation
- JSON
- Maintains concepts of OpenADR (inform & motivate) but simplifies and increases flexibility
  - E.g., could be resource server in building gateway



EcoPort™ in a Nutshell

- CTA-2045 modular communications standard approved 2021.
- EcoPort is the brand name for devices that passed testing to CTA-2045-B requirements
- First certified products – October 2021
- EcoPort Site: for information and certified products list: openadr.org/ecoport





Product Listing – some select listings
ecoport.openadr.org

ECOPORT

CERTIFIED PRODUCTS

UNIVERSAL COMMUNICATION MODULES

Steffes – Ethernet EcoPort UCM

The Steffes Universal Communications Module (UCM) connects to consumer smart home assets like water heaters, heat pumps, and electric thermal storage heaters. The UCM connects EcoPort Smart Grid Devices (SGDs) to a powerful device management head-end with best-in-class cybersecurity. Steffes UCMs enable rapid deployment of load-up and load-down programs to maximize customer participation in the latest Time-of-Use, DR+, and price-based load control strategies.

e-Radio USA Inc. – P2DFMLTEM2045AC

e-Radio's AC form factor UCM offers privacy-preserving and zero-congestion FM radio broadcast technology to receive real-time low-latency advisory information combined with long-range low-cost LTE-M cellular and Wi-Fi/Bluetooth for two-way connectivity as needed. The hybrid network system can minimize LTE data usage and the FM radio also can also provide automatic two-factor authentication of the LTE path for the industry-leading cybersecurity. The UCM has power-outage-safe local storage for future and repeating schedules and implements local intelligence to respond to FM signals or local Wi-Fi and Bluetooth networks with minimal or no cloud access. e-Radio's cloud services provide a convenient DR event scheduling web portal or API access for third party integration and there are existing integrations to Virtual Peaker, CEC's MIDAS, WattTime GHG and TeMix RATES for transactive energy. OpenADR 2.0b support is planned.

SkyCentrics – P2DFMLTEM2045AC

SkyCentrics' AC form factor Cellular CTA-2045 EcoPort UCM is an industry leading long-range low-cost LTE-M cellular UCM with advanced cybersecurity. The Cellular UCM has local storage for buffering of data during power outages and for future and repeating schedules.

SkyCentrics' cloud services provide access through our DR event scheduling web portal (DREAM), our REST API and our certified OpenADR 2.0b VEN. Existing integrations include OADR VTN's from OATI, Itron, AutoGrid, Honeywell, and Smarter Grid Solutions; CEC's MIDAS, and WattTime GHG. Additional integrations will be added in the future.

SkyCentrics provides a variety of services for easy customer sign-on, customer management, and fleet management and optimization so that utilities and aggregators can get the most benefit while customers can easily save money and time.

The UCM comes pre-provisioned. Simply install the UCM as per the appliance manufacturers instructions. The UCM will automatically connect and is ready to communicate to the grid.

Information about the EcoPortCM technology and the certification program can be found at http://www.openadr.org/EcoPort

Full list of certified products at https://ecoport.openadr.org

The EcoPort™ logo may only be used on, or in association with, tested and certified products. The certification process is detailed at: https://www.openadr.org/ecoport-cert-brand

openADR

SMART GRID DEVICES

Rheem

The new degree of comfort™

ARISTON

The home of sustainable comfort

Intellihot – Electron Series iE1

Intellihot offers a unique electric heat pump water heating system that is healthy and sustainable.

Our Electron series is the world's first electric tankless heat pump water heater that heats water on-demand by using energy stored in a thermal battery. It produces clean, healthy, and efficient hot water without storage while providing the utmost reliability. No compromise between health or efficiency unlike others. The iE1 is EcoPort (CTA 2045) compliant.

Rheem – ProTerra

Rheem® has expanded the ProTerra® family of heat pump water heaters, the most efficient and most advanced solutions available, with new 120-volt plug-in models. ProTerra Plug-ins are a sustainable, smart and easy replacement with uncompromising performance.

American Standard – Hybrid Heat Pump Water Heater

The American Standard Water Heaters Hybrid is modern heat pump water heater that delivers maximum energy savings, quality you can trust, intelligence and connectivity, and maximum ease of installation. Product is built to respond to Demand Response commands through the CTA-2045 protocol and it is ready to optimize energy consumption based on Time of Use Rates. The heat pump also features WiFi/app remote control, scheduling, energy reports and diagnosis. The Hybrid was designed for quick install, universal replacement, rapid set-up, and app connection. The following models include EcoPort:

ASHPWH-50 ASHPWH-50-JA13
ASHPWH-65 ASHPWH-65-JA13
ASHPWH-80 ASHPWH-80-JA13

HTP Water Heaters

HTP water heaters that are EcoPort (CTA-2045) enabled.

Water heaters applicable:
EVR040C2X045NDR
EVR052C2X045NDR
ELV055C2X045NDR

Ariston Water Heaters

Ariston water heaters that are EcoPort (CTA-2045) enabled.

Water heaters applicable:
ARIER040C2X045NDR
ARIER052C2X045NDR
SUP#??????????

INNOVATIVE PRODUCTS

SkyCentrics – SkyBox EcoPort to Modbus AC SGD Adaptor

SkyCentrics' AC form factor SkyBox EcoPort to Modbus AC SGD Adaptor (MA01-EP) is an industry innovation enabling OEMs to rapidly go to market with a certified grid-interactive EcoPort CTA-2045 solution. We work with the following products and OEMs to enable their certified EcoPort CTA-2045 solution. The SkyBox EcoPort will accept and function with any EcoPort certified AC UCM. When using the SkyCentrics UCM, the products below are also certified OpenADR 2.0b compliant through the SkyCentrics OpenADR 2.0b certified VEN cloud.

SkyCentrics will assist any OEM interested in making their product Grid-Interactive using the open standards OpenADR 2.0b, OpenADR 3.0, and CTA-2045 EcoPort.

Harvest Thermal, Inc. – Harvest Pod

The Harvest Pod leverages software and thermal energy storage to make heat pumps smarter. Harvest Pod operates the heat pump at times when when electricity is abundant, cheap, and clean, stores that clean energy in a hot water tank, and delivers it as heating and hot water whenever needed, without running the heat pump at times when grid electricity is more expensive and dirtier. Harvest Pod optimizes your energy bills per your time-of-use rate and can respond to grid events or hourly price signals via the EcoPort (CTA-2045) communication port and protocol.

www.openadr.org/EcoPort

ECOPORT

Who is the AHRI?

The Air-Conditioning, Heating, and Refrigeration Institute (AHRI) is the primary trade association representing manufacturers of HVACR and water heating equipment across North America.

It focuses on advancing equipment performance, safety, and interoperability through industry standards, certification programs, and market research.

AHRI develops consensus-based technical standards that guide product design, testing, and communication capabilities across residential and commercial systems.

Importantly for today's conversation, AHRI leads the development of demand response communication standards such as AHRI 1380, which defines how HVAC systems receive, interpret, and execute load flexibility signals.

AHRI 1380 establishes requirements for grid-responsive operation, including standardized event messaging, performance validation, and interoperable control strategies to enable scalable utility demand response and grid services integration.

The background for AHRI 1380

AHRI Standard 1380 (I-P) was published in 2019 to define Demand Response through variable-capacity HVAC systems in residential and small commercial applications (≤ 65,000 Btu/hr).

It is a performance standard that establishes definitions, operating requirements, test methods, published ratings data, marking/nameplate requirements, and conformance conditions for “DR-ready” HVAC equipment.

AHRI 1380 focuses on communication, infrastructure, and system functionality needed for predictable grid services, like customer enrollment/override and standardized DR actions.

The standard supports two primary DR communication pathways: OpenADR 2.0b (VTN/VEN messaging) and CTA-2045-A (modular energy management interface), providing utilities and aggregators a consistent integration target.

By aligning manufacturers, utilities, and solution providers, AHRI 1380 supports grid flexibility goals, reduces peak system costs, and helps with integrating more flexible, clean devices.

The requirements for AHRI 1380

Summary

AHRI 1380 defines what it means for variable-capacity residential and small commercial HVAC to be “DR-ready,” including required communications, operating behavior, testing, published ratings data, and conformance conditions.

Required certification

Equipment must support standard DR signaling via OpenADR 2.0b, CTA-2045-A, or both.

The system must respond predictably to defined DR event types, including General Curtailment (limit to 70% of Rated Load Power), Critical Curtailment, and Off Mode (grid emergency), while honoring customer-configured constraints such as a Maximum Temperature Offset and allowing customer override/opt-outs.

All implementations must be certified by the OpenADR Alliance (OpenADR) or the USNAP Alliance (CTA-2045).

Utility (VTN)

Sending and receiving commands to facilitate demand flexibility

HVAC (VEN)

What else to think about

Details

HVAC OEMs should consider delivering solutions that:

- Support reliable connectivity (Wi-Fi, Ethernet, Cellular, or CTA-2045) with monitoring of communication health.
- Provide visibility into customer overrides and operational status for program measurement and verification.
- Support pre-conditioning strategies (pre-cooling / pre-heating) ahead of events to optimize shed potential while maintaining occupant comfort.
- Incorporate cybersecurity, data privacy, and firmware management capabilities to support utility-scale deployments.

The Current Regulatory Landscape

AHRI 1380 is currently an industry performance standard, not a universally mandated federal requirement, but it is increasingly referenced in utility programs and emerging state policy discussions.

At the state level, **California** is the primary market driving adoption, where regulators and utilities are aligning flexible demand appliance initiatives with standardized HVAC DR capabilities. The California Energy Commission and demand flexibility rulemakings tied to building and appliance standards — are evaluating AHRI 1380 as a pathway to verify HVAC load flexibility performance.

Several California investor-owned utility programs (e.g., HVAC DR pilots, virtual power plant initiatives, and technology demonstration efforts) reference AHRI 1380 for interoperability and performance validation.

Other states are starting to act too

- Pacific Northwest, through the Northwest Energy Efficiency Alliance — is evaluating load flexibility, and grid-interactive efficient building technologies, including variable-capacity HVAC with standardized DR comms.
- New York and Massachusetts are studying flexible load integration through virtual power plant programs, clean heat initiatives, and building electrification strategies that could leverage AHRI 1380-aligned capabilities.
- Colorado and Minnesota are also advancing demand flexibility roadmaps and beneficial electrification policies where HVAC load control standards are under consideration for future program scalability.

Steps to follow for compliance

Given regulatory shifts, it is important that HVAC leaders begin planning NOW

Step 1 - Assess whether your equipment currently meets full requirements for an approved standard (OpenADR 2.0b or CTA-2045) for flexible demand capabilities.

Step 2 - Consider the trade-offs of from-scratch development versus pre-built solution implementation, based on your internal expertise and the capacity of your technical team

Step 3 - Build your development schedule to achieve certification from OpenADR Alliance. Also consider which Demand Response programs and aggregator partners you can work with to add value to your customers and recoup your investment.

Step 4 - Begin development or licensing of necessary solution, leveraging a technical partner as needed.

Options for compliance

From scratch

OpenADR 2.0b and CTA-2045 standards are publicly available. Development time ranges from 4-6 months for full solution requirements from scratch, assuming there are telemetry gathering and device control services in place. All code is yours to extend as needed in the future. Certification process with third-party testing lab takes 2-4 weeks.

Pre-built solutions

There are firms that have developed pre-built solutions for common protocols, like OpenADR and CTA-2045. These solutions vary from 4-8 week solution implementation, and often are pre-certified, meaning that you can skip certification processes.

Code ownership varies, some solutions are a simple, restrictive license agreement, others offer full code base access and IP rights, meaning you can use the solution for other opportunities in the future.

Helpful links

- Final AHRI 1380 text
  - https://www.ahrinet.org/system/files/2023-06/AHRI_Standard_1380_I-P_2019.pdf
- OpenADR Alliance and Codibly websites
  - https://www.openadr.org/
  - https://shop.cta.tech/products/cta-2045
  - https://codibly.com/

AHRI-1380 I-P-2019 Today

2026

- Manufacturers may self-comply
- AHRI Directory is active and notes models that meet CEE Tier 1

2027

- AHRI 1380 certification must be done by an AHRI-approved lab such as UL, CSA, or ETL

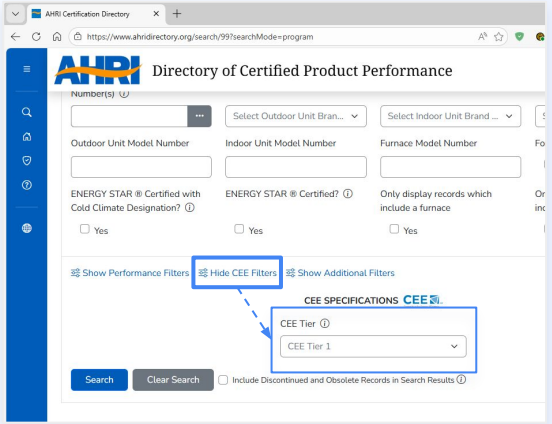
2026 CEE Split ASHP Specification

CEE Level	SEER2	EER2	HSPF2	COP at 5°F*	Capacity Ratio~	Load Management†
CEE Tier 1						
Path A	≥ 16.0	≥ 9.8	≥ 8.5	≥ 1.75	≥ 65% at 5°F/47°F	AHRI 1380
Path B	≥ 16.0	≥ 11.0	≥ 8.0	≥ 1.75	≥ 50% at 5°F/47°F	AHRI 1380
CEE Advanced Tier						
Refer to the DOE Cold Climate Heat Pump Challenge Specification (see Note below)						

2026 CEE Packaged ASHP Specification

CEE Level	SEER2	EER2	HSPF2	COP at 5°F*	Capacity Ratio~	Load Management†
CEE Tier 1	≥ 15.2	≥ 10.0	≥ 7.2	≥ 1.75	≥ 45% at 5°F/47°F	AHRI 1380

* Variable speed equipment must pass a Controls Verification Procedure (CVP). This may be either the ENERGY STAR Cold Climate Heat Pump CVP for models meeting the ENERGY STAR cold climate heat pump requirements, or the DOE CVP as specified at 10CFR429.134, paragraph (k)(4). After July 7, 2026, all variable speed equipment must pass the DOE CVP.
~ Heating capacity ratio is calculated as heating capacity at 5 °F to the heating capacity at 47 °F, which for variable speed systems is the H1Nom heating capacity and for all other systems is the H1Full heating capacity.



AHRI 1380-202X

Drafting is underway.

What's changing with communication protocols?

- CTA-2045-A has been proposed to be updated to CTA-2045-B
- OpenADR 3.1 has been proposed as an additional non-proprietary protocol
- Home Connectivity Alliance (HCA) has been proposed as an additional non-proprietary protocol

OpenADR 2.0b remains.

What else?

- Improve how dual fuel heat pump systems can participate in load flex.
- Maximize comfort so customers participate more often.
- Reduce snapback when the curtailment event ends

Improve and clarify lab testing requirements for certification.

AHRI-1380 OpenADR Test Tool

- Jim Zuber, CTO, QualityLogic, Inc
- Will share a few slides about our just released AHRI-1380 OpenADR Tester
  - Why we developed it
  - What it does
  - Impact of AHRI-1380 future updates

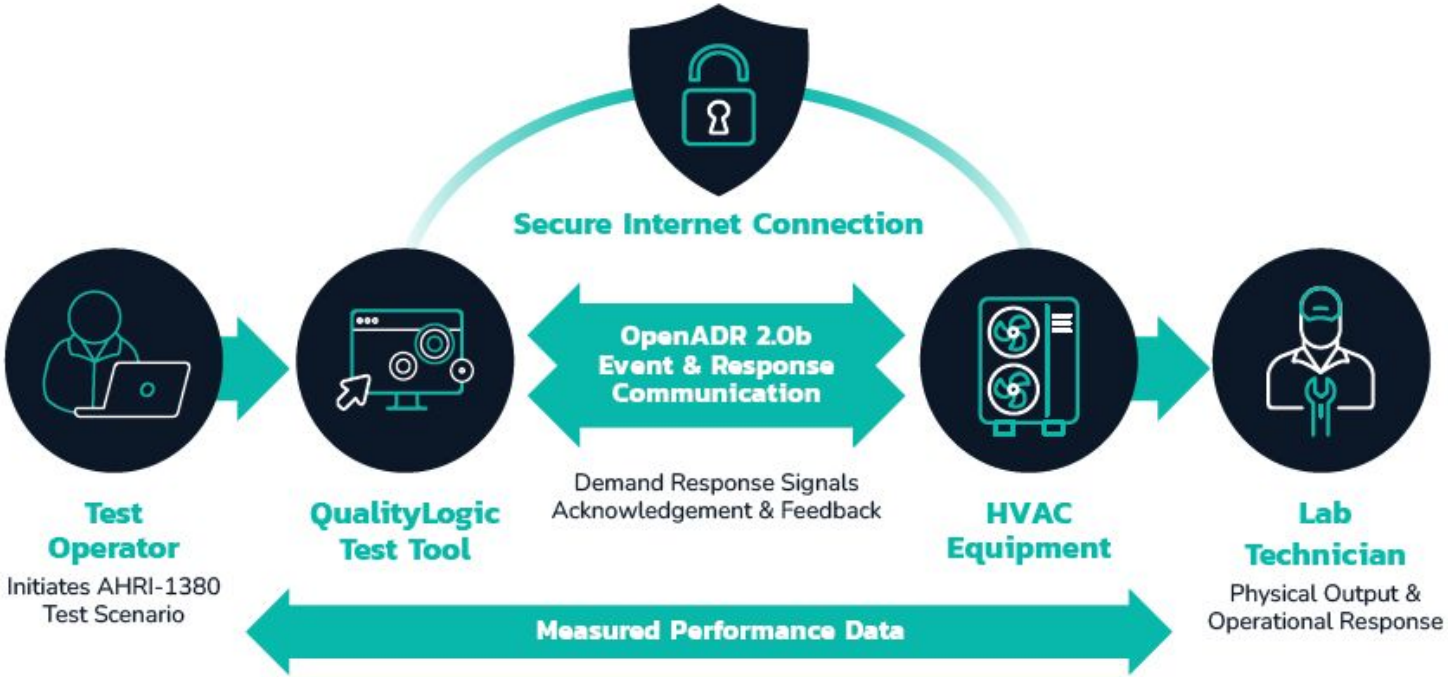
- **QualityLogic Snapshot**
  - Developer of test products & services
  - Major contributor to the OpenADR 2.0
  - Wrote OpenADR 2.0 test tpecs
  - Developed OpenADR test harnesses
  - Provide consulting and training around the world on OpenADR 2.0

QualityLogic
Putting Technology to the Test

The Need for a AHRI-1380 Tester

- HVAC manufacturers looking for way to self-comply
- Obtaining access to an OpenADR 2.0 VTN can be challenging
- Test labs and customers asked us to develop a testing solution
- OpenADR certification test harness is not the right solution
- Best effort at implementing test scenarios despite some notable gaps in AHRI-1380 requirements
- Primary need is sending required DR signaling while operator takes measurements

Big Picture - Test Scenario Actors



Key Features, Updates, More Info

AHRI-1380 Key Features

- Test cases that set up all 12 required DR signalling scenarios
- Maintains session with DUT during measurements
- Configurable test parameters
- Transport security profiles
- Include both test and production certs
- Built-in VEN self test
- Standalone deployment
- Extensive logging for problem isolation
- Modestly Priced ($5K)

Impact of future AHRI-1380 updates

- Will bring tester into alignment with future AHRI-1380 changes that impact OpenADR 2.0's ability to initiate required test scenarios

More information

- Technical: Jim Zuber, jimzuber@qualitylogic.com
- Sales: Jacob Flores, jflores@qualitylogic.com

Q&A session

Thanks for joining!

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