

Trilliant Communications Hub



Trilliant helps utilities and energy retailers successfully deploy a broad set of smart grid initiatives – from advanced metering to distribution automation to consumer applications such as demand response and distributed energy resources. The breadth and depth of the Trilliant® Communications Platform deliver the flexible and proven smart grid solutions needed for utilities and energy retailers to deploy mission-critical applications to achieve their business goals.

The innovative Trilliant Communications Hub (“the Trilliant Hub” or “the Hub”) solution and Interoperability Group, bring the industry together to a common solution that helps energy providers and consumers realize the tremendous benefits of the Smart Grid.

The Trilliant Hub is a communications platform that connects to the Trilliant UnitySuite™ Head-End Software (HES) using public wireless networks and creates a secure communications link to electric and gas meters. It is also compatible with in-home displays and other innovative in-home energy management products.

Proven Solutions for a Secure, Safe, Low-Carbon and Affordable Energy System

The Trilliant Hub is deployed along with an electricity meter, a gas meter, and in-home display to create the consumer engagement side of a smart meter deployment. The Hub provides secure wireless connectivity to the datacenter of an energy provider, and ZigBee connectivity to the meters and other devices in the home. Intelligent algorithms on the Hub coordinate communication and data transfer with the various devices in the home and Trilliant’s UnitySuite Head-End Software in the provider’s datacenter. With local storage and configurability, the Hub keeps airtime charges on the wireless network to a minimum, while ensuring scalable performance to support tens of millions of meters. The Hub is an innovative technology with its roots in Trilliant’s metering technology which operates in millions of meters in North America as well as Trilliant’s CellReader® technology that has been deployed at more than 200 energy providers worldwide.

- **High return on investment.** Leveraging proven systems that are standards-based, future-proof, and very reliable, based on decades-long energy communications and networking expertise.
- **Easy to deploy, flexible, enhanced deployment.** Utilizes standards-based business processes for deployment. Commissioned locally via ZigBee. Enables over-the-air configuration and upgrades to reduce expenses and allow advanced, value-added services
- **End-to-end security.** Built-in proven technology that satisfies the highest standards of security requirements

Proven Solutions

- Utilizes public cellular networks for high-reliability WAN connectivity
- Supports industry standard metering protocols; DLSM/ COSEM and ZigBee Smart Energy Profile
- Scalable platform: Extensible, field upgradeable, and secure

Standards-based and Secure

- Pioneering standards in Europe and beyond
- Supports open-standard protocols with flexibility for feature enhancements
- Built-in proven security technology that satisfies the highest industry standards

Consumer Focused

- Enables true consumer engagement
- Empowers consumers to make smarter decisions about energy use
- Offers value-added benefits to increase consumer satisfaction

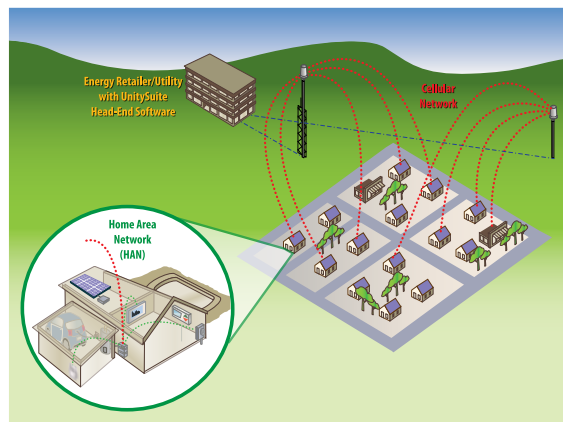
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Trilliant Communications Hub: Solutions Overview

The Trilliant Communications Hub is a smart metering infrastructure component that connects a Home Area Network (HAN) of metering devices, information displays, and other smart energy devices to Trilliant's UnitySuite™ Head-End Software (HES) via a Wide Area Network (WAN) connection over GSM cellular data services. Using the ZigBee Smart Energy Profile (SEP), the Hub operates as a central point in a HAN of as many as 16 Smart Energy devices. The Hub compiles metering data from multiple devices and reports the data back to the UnitySuite Head-End Software as configured, typically during non-peak periods. Communications via the WAN are minimized so that power consumption is very low even while maintaining connections with all associated HAN devices.



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The Communications Hub connects a ZigBee-based Home Area Network (HAN) to the Head-End Software (HES)

Communications Bridge

- Dual radio design integrates both HAN and WAN connectivity
- Connects electric meters, gas meters, in-home display units, and smart energy devices

Reliable Wide Area Network (WAN) Connectivity

- Leverages widely deployed GPRS networks
- Sophisticated roaming capabilities

HAN Device Support

- ZigBee Smart Energy Profile 1.1 (with support of Smart Specification Working Group metering extensions)
- Connects to multiple smart energy devices

Simple Installation and Deployment

- Attaches directly to meter board, powered from the electric meter
- Commissioned locally via ZigBee with a handheld terminal

Configurable and Upgradeable

- Configurable over-the-air from the head-end
- Supports over-the-air firmware upgrades for itself and all associated HAN devices

Security

- Built-in proven security technology
- Authenticates all devices on the network and secures all data communications

Management Software for Smart Grid Network Products

Trilliant's UnitySuite™ Head-End System (HES) enables utilities to operate and control their Smart Grid network infrastructure. Collaborating with our partners, the UnitySuite HES is capable of supporting millions of endpoints, which can include multiple device types, models, firmware versions and communication protocols from various device manufactures. The UnitySuite HES provides a secure management platform that acts as a control plane for all device interactions.

UnitySuite HES supports a multi-tier architecture comprising of a web server tier, a multi-component application tier and a database tier. Redundancy is built into the system at all tiers to ensure high availability. Each deployment of UnitySuite HES delivers rock solid performance and security at a relatively low cost. Trilliant understands that every deployment of UnitySuite HES is part of a larger ecosystem consisting of MDM, CIS, Outage Management, DMS and other back office/front office enterprise systems. Thus, UnitySuite has been built from the ground up to support integration with other applications in the ecosystem via a robust set of interfaces for virtually all data maintained by the UnitySuite HES.

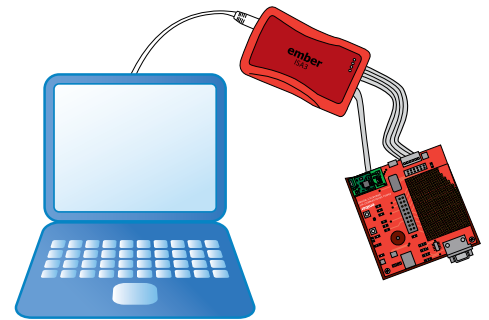
The key components of the UnitySuite HES include a metering component, Demand Side Management (DSM) component and a platform component.

- **UnitySuite Metering.** This component maintains a comprehensive set of information for all meters in the network. The component supports a variety of different formats to export the meter read information including CMEP, MultiSpeak and a number of proprietary MDM formats. In addition to supporting features that most utilities would expect, such as meter commissioning, firmware upgrades, configuration management, on-demand reads and meter specific operations disconnect/reconnect, it also supports additional functionality such as Pre-Payment and debt management (for both meters and IHD). Furthermore, it also provides comprehensive dashboards and reports to help monitor the performance of the Smart Grid infrastructure.
- **UnitySuite Demand Side Management (DSM).** This component allows utilities to operate and control Home Area Network (HAN) devices such as thermostats, Remote Appliance Controllers (RACs) and In-Home Displays (IHDs). The DSM component is capable of sending curtailment event messages to the appropriate devices as part of a direct load control program.



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- **UnitySuite Platform.** This component provides a set of shared services to the UnitySuite Metering and DSM components. The platform is a highly scalable task execution engine that incorporates sophisticated PKI based security architecture. The platform also provides support for a variety of tariffs such as Time-of-Use (TOU), Block and Blended rate programs.



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