

# The Trilliant Communications Platform

## SecureMesh® for Smart Grid

Trilliant helps utilities and energy retailers successfully deploy a broad range of smart grid initiatives – from smart metering to smart distribution and smart consumer capabilities. The breadth and depth of the Trilliant Communications Platform delivers the flexible and proven smart grid solutions needed for utilities and energy retailers to deploy mission-critical applications to achieve their business goals, and deliver consumers the best energy experience possible.

### Key Benefits

- **Reliability** – delivers a truly self-healing wireless mesh network
- **Remote Control Capability** – provides two-way communications to enable full remote control functions such as disconnect and load control switches
- **Ease of Installation** – enables end nodes that are self-forming and self-balancing
- **Highly Configurable** – provides various options regarding configuration of meter and diagnostics data exchange
- **High-bandwidth, Low-latency Network** – supports connectivity for various applications including advanced metering, DA devices, substation monitoring, video surveillance, and work-force management applications
- **Smart Consumer Application** – supports DSM applications including load control switches, programmable communicating thermostats (PCTs), and in-home displays (IHDs)
- **Cost Efficient** – flexible network enables a range of technology to be easily installed, from basic to advanced energy meters, with and without remote disconnects, that provide two configurable channels of load profile, up to two register reads, and synchronized voltage data

Trilliant's SecureMesh Network — a RF mesh network and part of the Trilliant Communications Platform — provides a state-of-the-art, two-way communications infrastructure that enables various smart grid applications that improves the efficiency and reliability of power delivery. The full monitoring and control capabilities enabled by the SecureMesh network support Advanced Metering Infrastructure (AMI), Distribution Automation (DA), and Demand-Side Management (DSM) applications. Critical functions such as disconnect switch control and load control are made available from the command center. For smart metering applications, metering and diagnostic data are sent over the SecureMesh network back to the command center where the Trilliant's UnitySuite™ Head-End Software resides. UnitySuite can display and report the information back to utilities' existing application.

### A True Mesh Network that Supports All Smart Grid Applications

SecureMesh is a true mesh network where endpoints (meters and other devices in the distribution network) communicate in a peer-to-peer manner. As more endpoints are added, the network reliability improves and coverage expands.

The network is self-forming, self-balancing and self-healing. Endpoints in the network will autonomously form a mesh and exchange messages with neighboring endpoints. Endpoints will determine the optimal path back to the gateway. In the event of interference (be it a temporary event – failure or noise) or permanent (foliage or construction), the network will self-heal as endpoints discover a new route back to the Gateway.

The network consists of three main system components as shown below: the meter, the extender bridge and the gateway. The products use multi-channel communications architecture to ensure the highest possible reliability. Extender bridges communicate directly with the meters while the gateway is capable of supporting up to 100,000 meters. The SecureMesh network provides both high-bandwidth and low-latency and supports not only smart metering, but also

## A Forward Looking Smart Grid Network

Trilliant understands that investment in a smart metering network is a major commitment of time, resources and money. It is critical that such a network support both the immediate and longer term objectives of the utility. Based on this fundamental understanding, Trilliant has developed the SecureMesh network to be:

- **Robust and Reliable:** SecureMesh has been proven to be robust and reliable over many years, avoiding the need for constant upgrades and maintenance
- **Forward Looking:** SecureMesh meets the varying requirements of different smart grid applications. Whether a utility chooses to implement smart metering today and DA and/or DSM later, the SecureMesh network can handle the requirements of all smart grid applications in one platform
- **Secure:** SecureMesh offers end-to-end security including encryption and authentication that is compliant with the latest industry standards
- **Highly Configurable and Upgradable:** SecureMesh network nodes are easy to provision and configure. When a network upgrade is desired, nodes can be remotely upgradable, avoiding costly on-site maintenance
- **Easy to Integrate:** The UnitySuite Head-End Software is an open platform, easy to integrate and accessible to existing utility applications
- **Global, Standards-based:** The Trilliant SecureMesh leverages open, global standards to ensure future-proof, interoperable solutions for all smart grid applications and long-term viability of deployments
- **Proven:** Given the criticality of the investment and the network, the SecureMesh network is a proven solution that has been chosen by leading utilities around the world



## A Complete Range of Meters

Choosing a communications system goes beyond metering and deep into overall grid management. Choosing the right system is the very foundation of not only a solid smart metering system, but also fundamental for the ever-increasing applications where critical data is essential for state-of-the-art smart grid implementation and management.

Allowing a utility to fully utilize the metering and monitoring assets purchased as part of a communications network allows for the utmost in flexibility, and provides peace of mind that today's metering technologies can be fully leveraged with the SecureMesh Communications network now and in the future.

The SecureMesh Communication network is unique in that meter functionality and available data are not limited in any way. Utilities own these meters and they should not be limited in how they can utilize them.

Moreover, Trilliant offers a variety of advanced commercial and industrial (C&I), and residential meters from major manufacturers such as General Electric, Itron, Landis+Gyr, ELO, and others, giving utilities the freedom to choose meters and vendors.



Because Trilliant provides complete, unrestricted access to all meter data, each SecureMesh-enabled smart meter deployed can effectively serve as a grid sensor capable of reporting not only consumption data, but also power quality information needed to make informed grid management decisions. Here are some of the basic and fundamental system capabilities:

**Power Outage & Restoration:** Utilities will be fully informed of their grid status at all times. The SecureMesh takes advantage of a unique, aggregated reporting method to provide reliable, real-time outage reporting, ensuring successful reporting of more endpoints than any other solution. Network infrastructure stays powered for up to eight hours after an outage to provide network communications and troubleshooting. Outage and restoration detection is included with every SecureMesh meter.

**Power Quality:** Because the SecureMesh solution leverages the full capabilities of the smart meter, critical power quality data such as voltage, frequency, power factor, and harmonic content are available in real time or in scheduled reporting modes. Use real-time alarm reporting processes to support CVR and generation optimization applications while using daily historical data for compliance reporting, grid modeling, and contingency planning purposes.

**Demand Response:** Unrestricted use of a SecureMesh advanced meter means utilities can utilize all available channels and interval settings in the meter. No longer are utilities restricted to active energy profile data. Reactive energies, per-phase voltage, per-phase current and frequency are all available to monitor. Data collected are used to manage and structure pricing programs, including Time of Use (TOU), demand, and prepay.

**Remote Disconnect:** Every residential meter platform offered by Trilliant offers an optional disconnect to help utilities manage high turnover areas safely and effectively while optimizing field resource availability. Additionally, remote disconnects are essential components for implementing demand and prepay billing programs.

**Beyond Electricity:** Trilliant's SecureMesh solution has been designed from the ground up with utility applications as the focus. From substation automation devices to SecureMesh gas and water solutions, Trilliant provides complete end-to-end coverage for all utility applications. Every node deployed on the network is an independent two-way communication access point that requires no pairing to be recognized within the network.

**Consumer Engagement:** Home area networking is key to educating and empowering consumers with information they need to make informed decisions on how they consume electricity. The SecureMesh solution offers ZigBee Sep 1.0 and 2.0 support as well as other options that remove risk from the ever-changing landscape of standards and the possible product obsolescence as this emerging market continues to develop.

**Software Integration:** Trilliant's UnitySuite Head-End Software applications are designed to easily adapt and integrate into third-party management systems. UnitySuite's SOAP-based API facilitates easy integration with existing Enterprise Resource Planning (ERP), Customer Information System (CIS), Meter Data Management (MDM), and Outage Management System (OMS) applications. UnitySuite's high level of integration capability improves deployment speeds and provides immediate benefits.



1100 Island Drive  
Redwood City, CA 94065  
t 650-204-5050  
f 650-508-8096  
www.trilliantinc.com

Trilliant®, CellReader®, CellGateway™, SecureMesh®, SerViewCom®, UnitySuite™, SkyPilot®, SyncMesh™, the Trilliant logo, and the SkyPilot logo are trademarks and/or tradenames of Trilliant Holdings, Inc. and/or its subsidiaries or affiliates. All other trademarks are the property of their respective owners. This material is provided for informational purposes only; Trilliant assumes no liability related to its use and expressly disclaims any implied warranties of merchantability or fitness for any particular purpose. All specifications, descriptions, and information contained herein are subject to change without prior notice. Copyright © 2009-2013 Trilliant Holdings, Inc. ALL RIGHTS RESERVED.