

TESCO METERING

TESCO NIGHTHAWK

TESCO's Meter School

TESCOOL

July 20-23, 2025

July 21, 2025

10:30AM – 12:00PM

Jon Scott
Chris Pierce



TESCO METERING

Adaptiv™ AMI



About Nighthawk

- 30-years of utility experience
 - 100+ utilities served
-

About Adaptiv™

- Unique zero-infrastructure network
- Cellular + Mesh Communications
 - Verizon LTE
 - AT&T
 - 1NCE
- **Ideal for either incremental or rapid deployment**
- Lowest total cost of ownership in the industry

**Nighthawk is a
TESCO company.**



-
- TESCO (The Eastern Specialty Company) is a manufacturer and service provider to the meter industry owned by, run by, and staffed by engineers.
 - Headquartered in Bristol, PA
 - Founded in 1904

- Zero Infrastructure

- Adaptiv™ AMI means no costly infrastructure to install / maintain

- Integrated Data Transfer

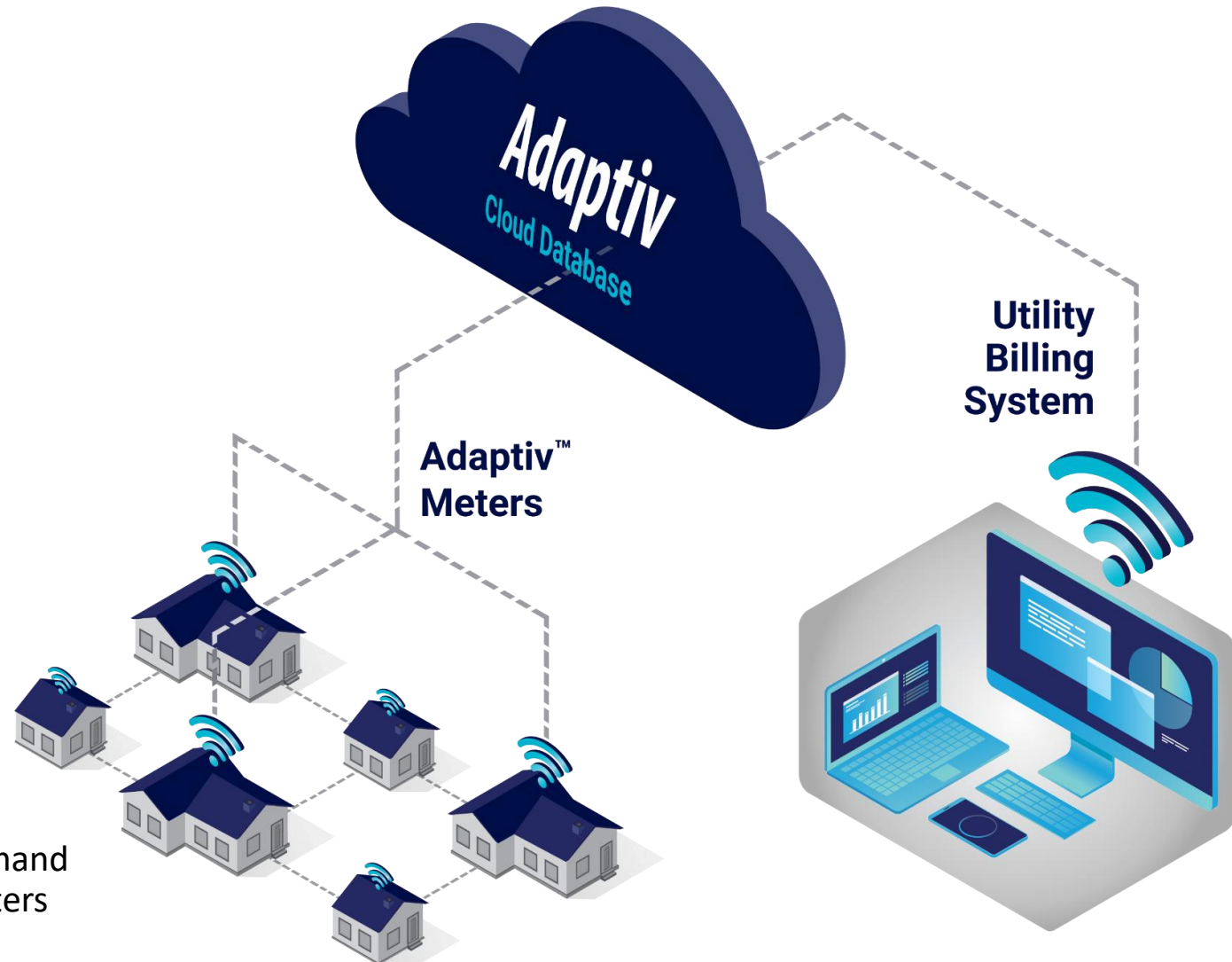
- Standards-based integration to utility billing applications
- Multispeak, MV-RS, CMEP

- Seamless Cloud Software

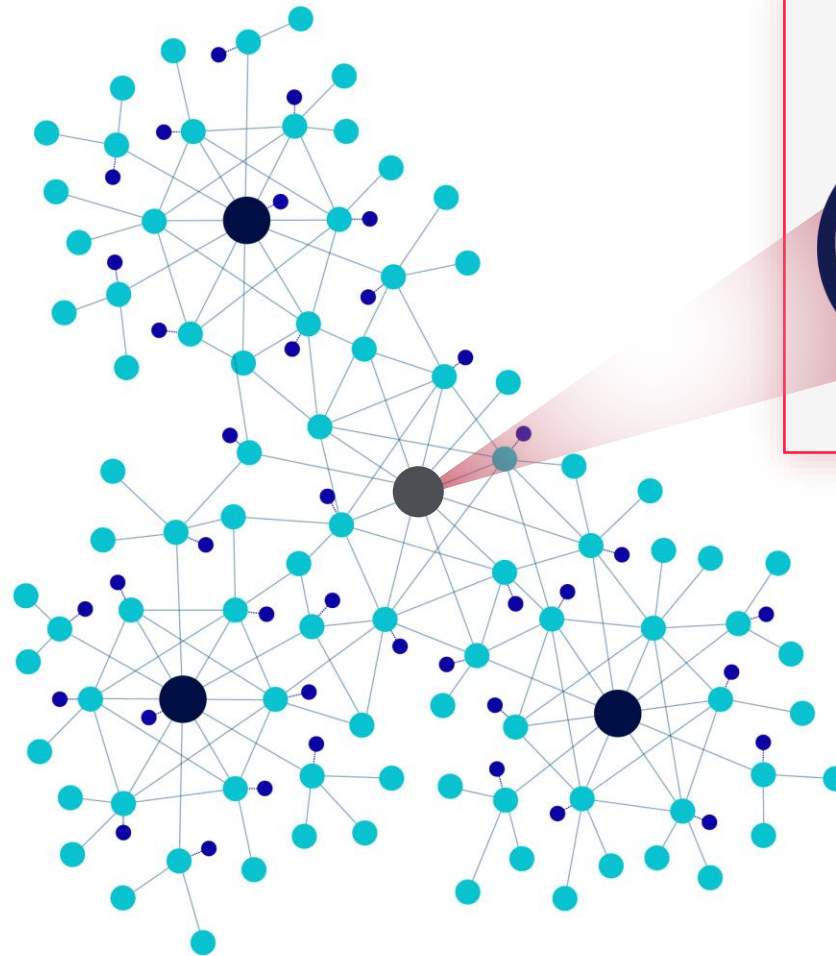
- No hardware to buy or databases to manage

- Secure, Reliable Reads

- Secure communications for on-demand move in/move out reads on all meters



- Scalable, self-healing, self-configuring network
- Next generation high bandwidth cellular-mesh
 - One Hub with cellular modem per cluster
 - Several Leaf meters within range of hub via short-hop RF
- Simple installation and maintenance



-  **Adaptiv™ Hub Meter**
CELLULAR + MESH HUB RADIO
-  **Adaptiv™ Leaf Meter**
MESH HUB RADIO
-  **Adaptiv™ Water Endpoint (WEP)**
MESH RADIO-ENABLED

- Water LINK sends reads via Adaptiv™ smart meters
- Scalable, self-healing, self-configuring mesh network
- Built-in security and redundancy
- Interval data and leak detection with exceptional battery life

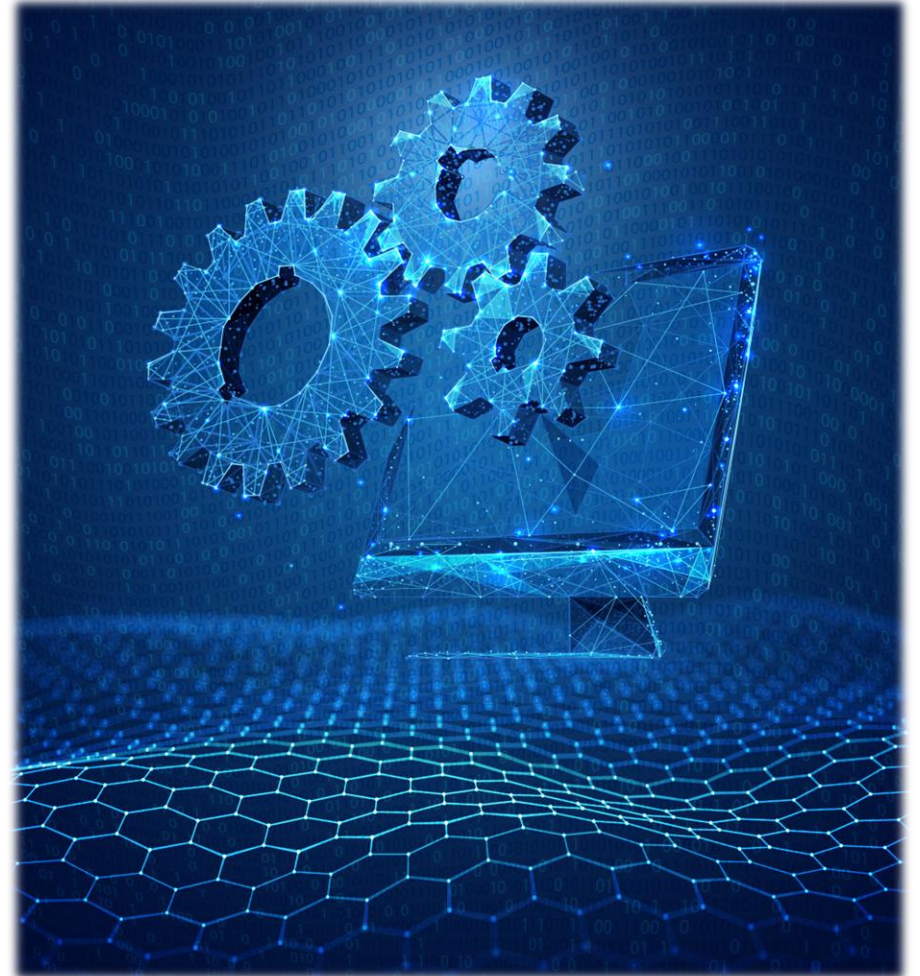


-  **Adaptiv™ Hub Meter**
CELLULAR + MESH HUB RADIO
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MESH HUB RADIO
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MESH RADIO-ENABLED

Adaptiv™ Value for Life

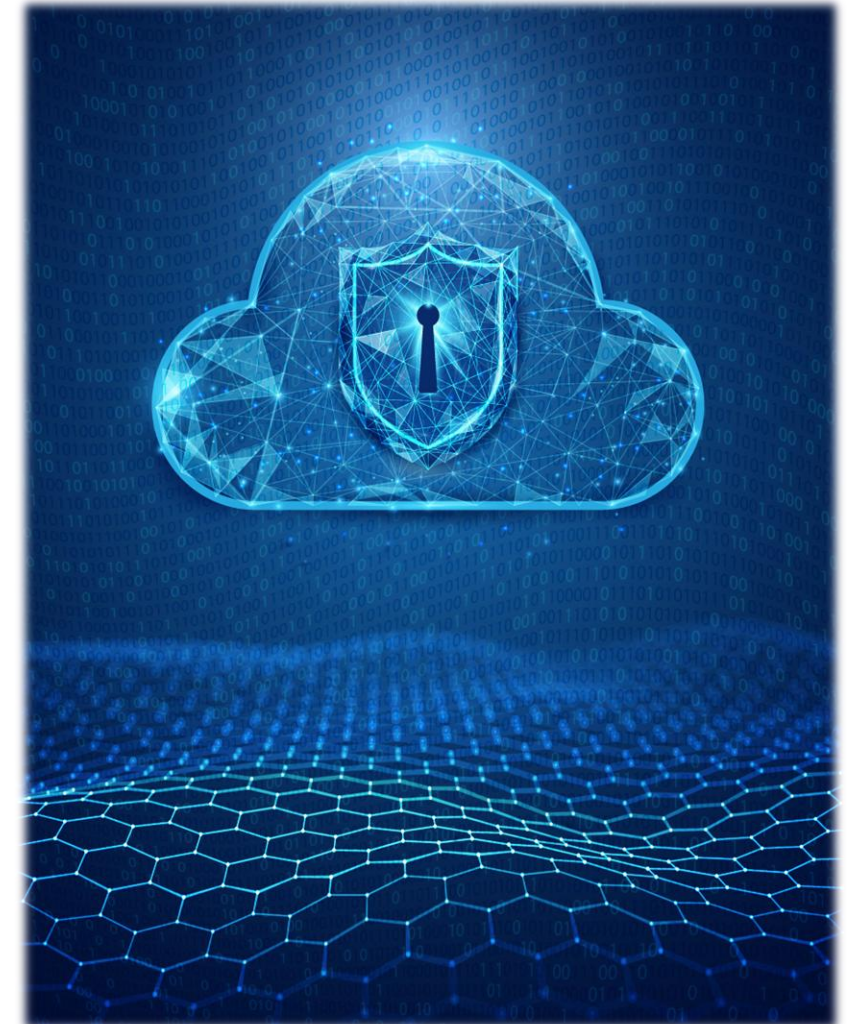
No additional charges for upgrades, maintenance or support for the life of the product

- Over-the-air upgrades to firmware
- Designed to evolve with the changing needs of the utility industry by enabling more features as required



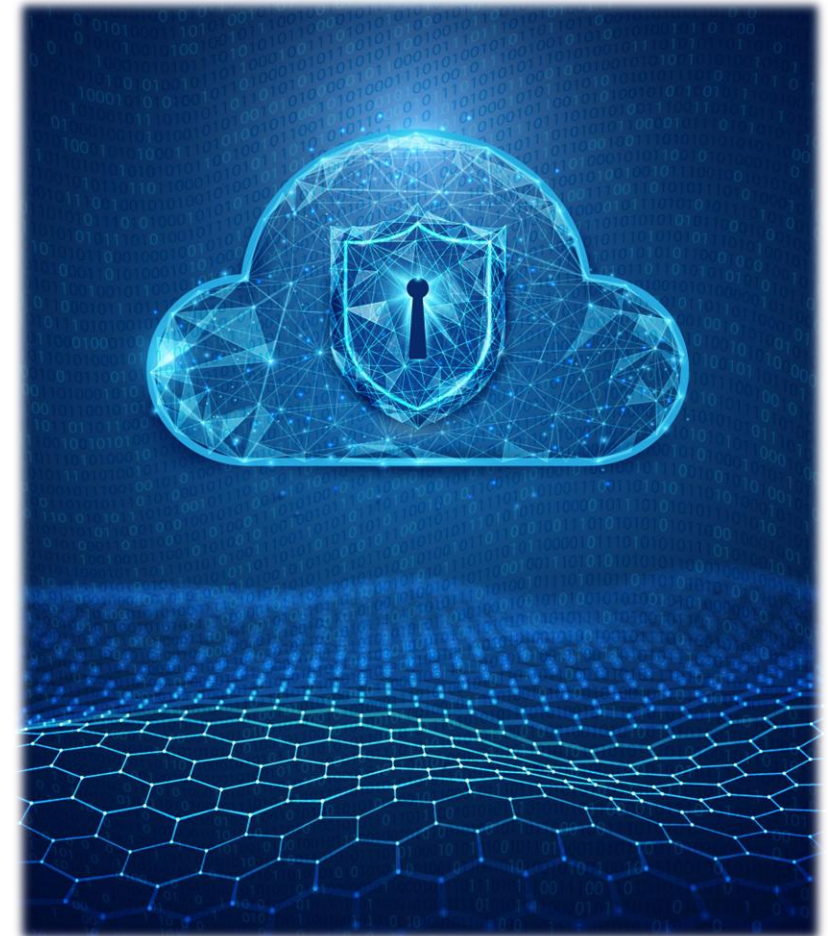
- **Database & Software Security**

- Best-in-class accessibility and security standards
- Secure communication via Thawte SSL
- Available multi-factor authentication capability



- **Network & Device Security**

- 128-bit AES encryption for all mesh-enabled devices
- Unique AES encryption key to partition users' data
- Protects against external tampering via:
 - Content encryption
 - Channel encryption
 - Dedicated private network





- All Adaptiv devices contain a 2.4GHz RF Mesh transceiver connecting all devices, including HUBS
- Cellular Hubs manage multiple LEAF devices
- Population diversity: ~10% HUB to 90% LEAF
- Electric meters available in all S Base form factors and classes

Device Type	Cellular + RF Mesh HUB	ERT Reader Cell+Mesh HUB	RF Mesh only LEAF	Disconnect option
Aclara kV2c	✓	---	---	---
Aclara I-210+c	✓	---	✓	✓
Itron Centron II	✓	✓	---	✓
Water End Point	---	---	✓	---

Lowest Risk Solution

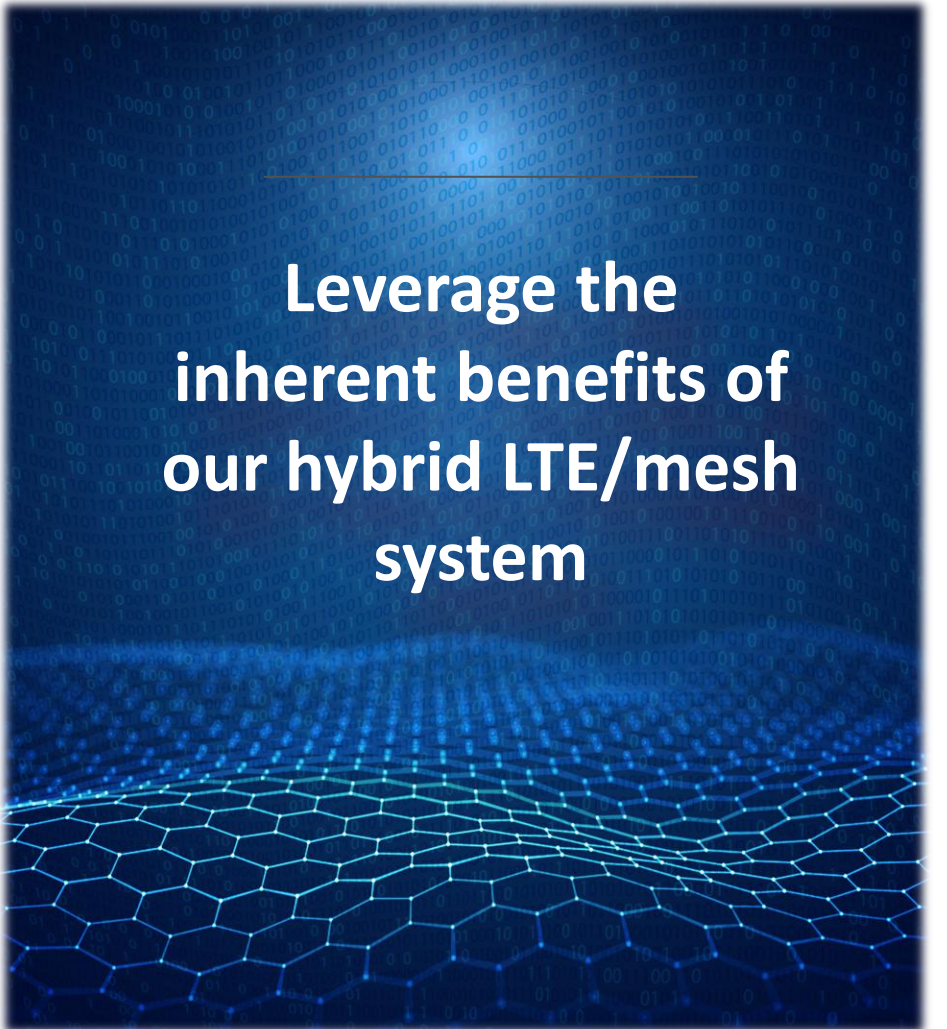
- Zero network infrastructure to install and/or maintain
- Low-cost flexible pilots
- Uses common radio frequencies (LTE and 2.4GHz) found in most households and businesses

Most Flexible Deployment Options

- Flexible deployment strategies based on your priorities and budget
- Solve problems with little effort or cost – disconnect meters (prepay enabled), scope outages, monitor voltage, polyphase first, etc.

Lowest Total Cost of Ownership

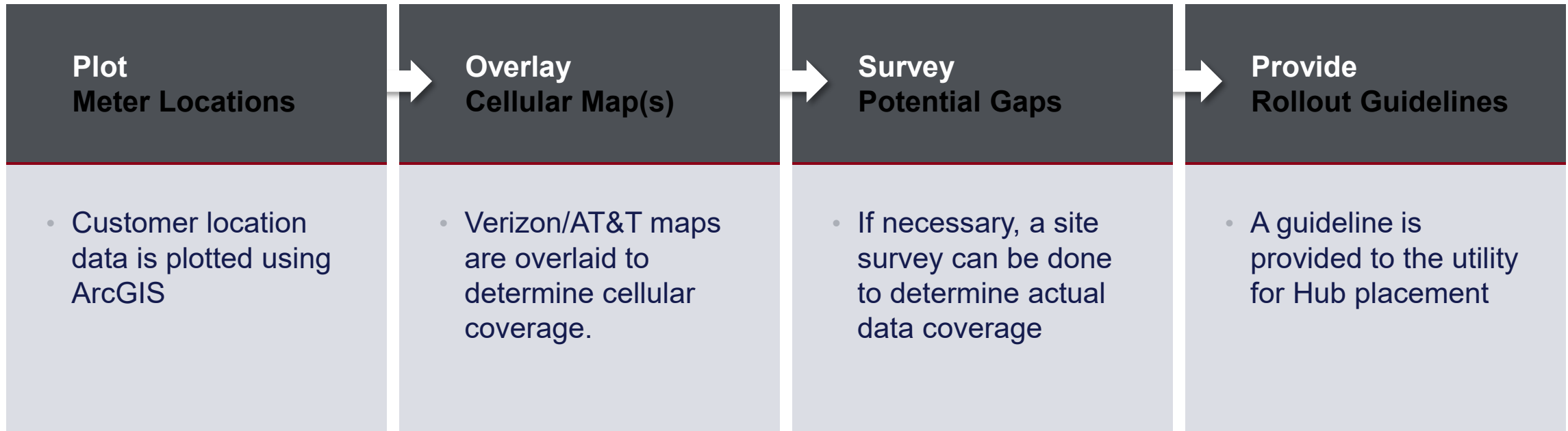
- Zero infrastructure investment or maintenance
- Cost reduction for project management and integration
- Easily train your team to use the solution within hours
- Low recurring costs are predictable and controllable



Leverage the
inherent benefits of
our hybrid LTE/mesh
system

- Full AMI
 - Typically Cell + Mesh
 - Multi-service
 - Full two-way AMI for electric or electric + water (no water only).
 - Gas remote reading is handled through ERT collection using our ERT Collector Hub Meters. NOT full two-way AMI for Gas.
- Gap Fill
 - Typically to fill in gaps in existing AMI systems.
- Tactical/Targeted Solutions
 - Used for targeted applications like remote disconnect, remote reading, Christmas Lights, crypto-mining, etc.
 - When dealing with a utility, can naturally grow into a full AMI system.
- ERT Collection



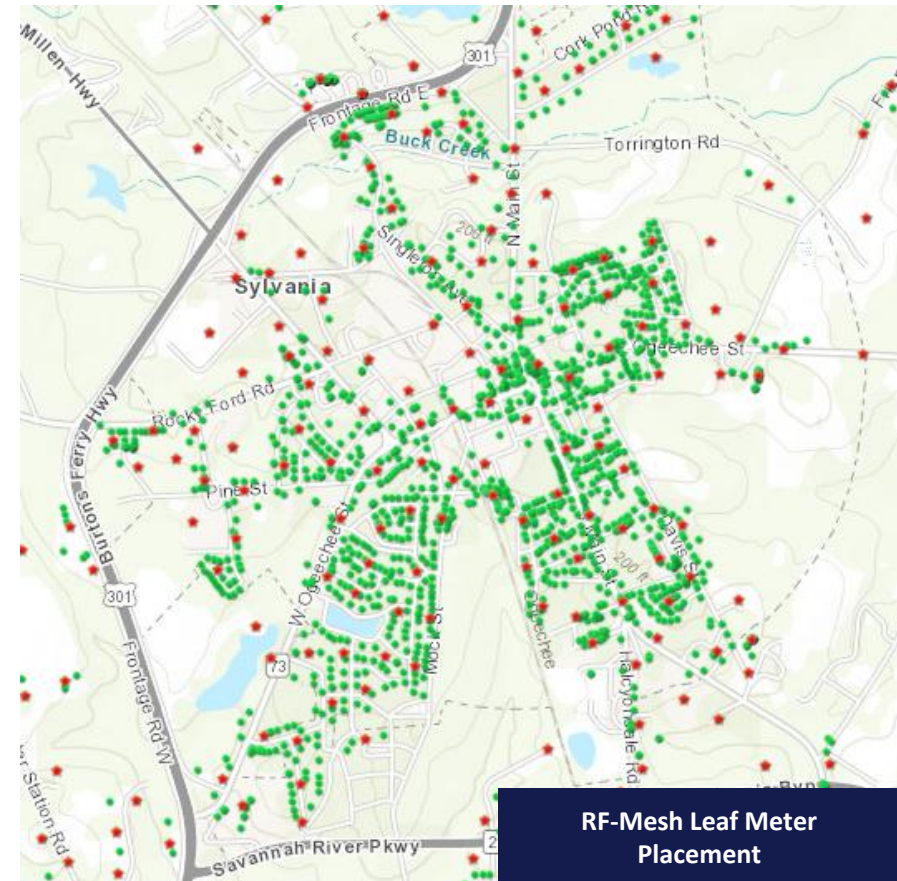
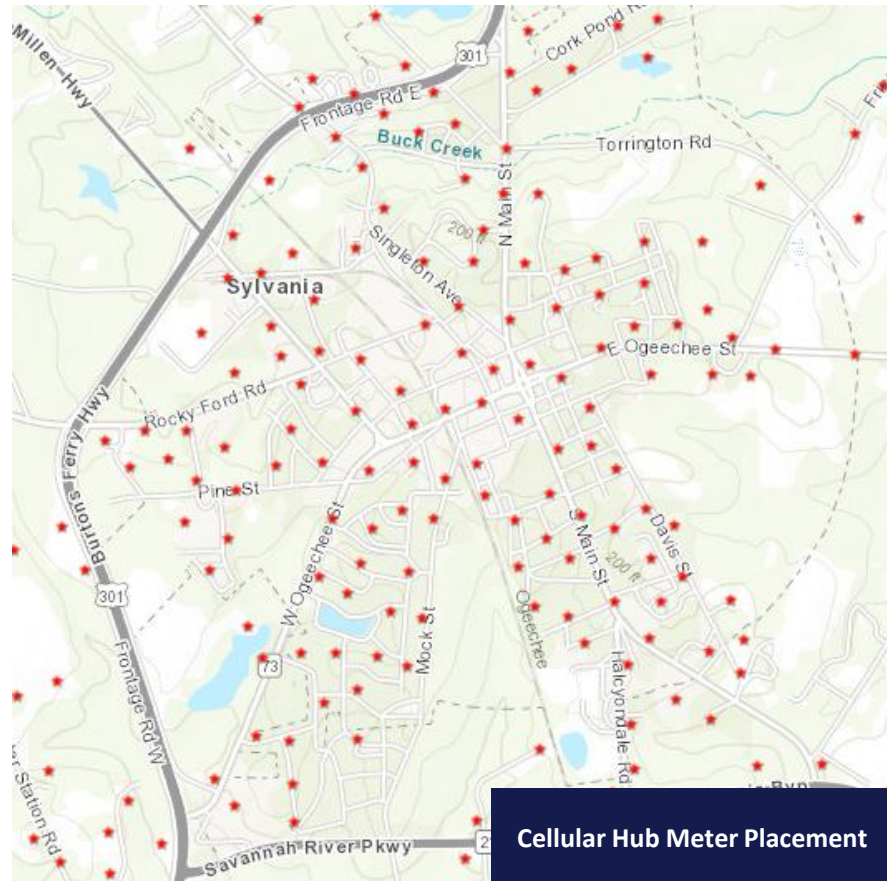


Leverage Deep Utility Experience



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SYSTEM DESIGN

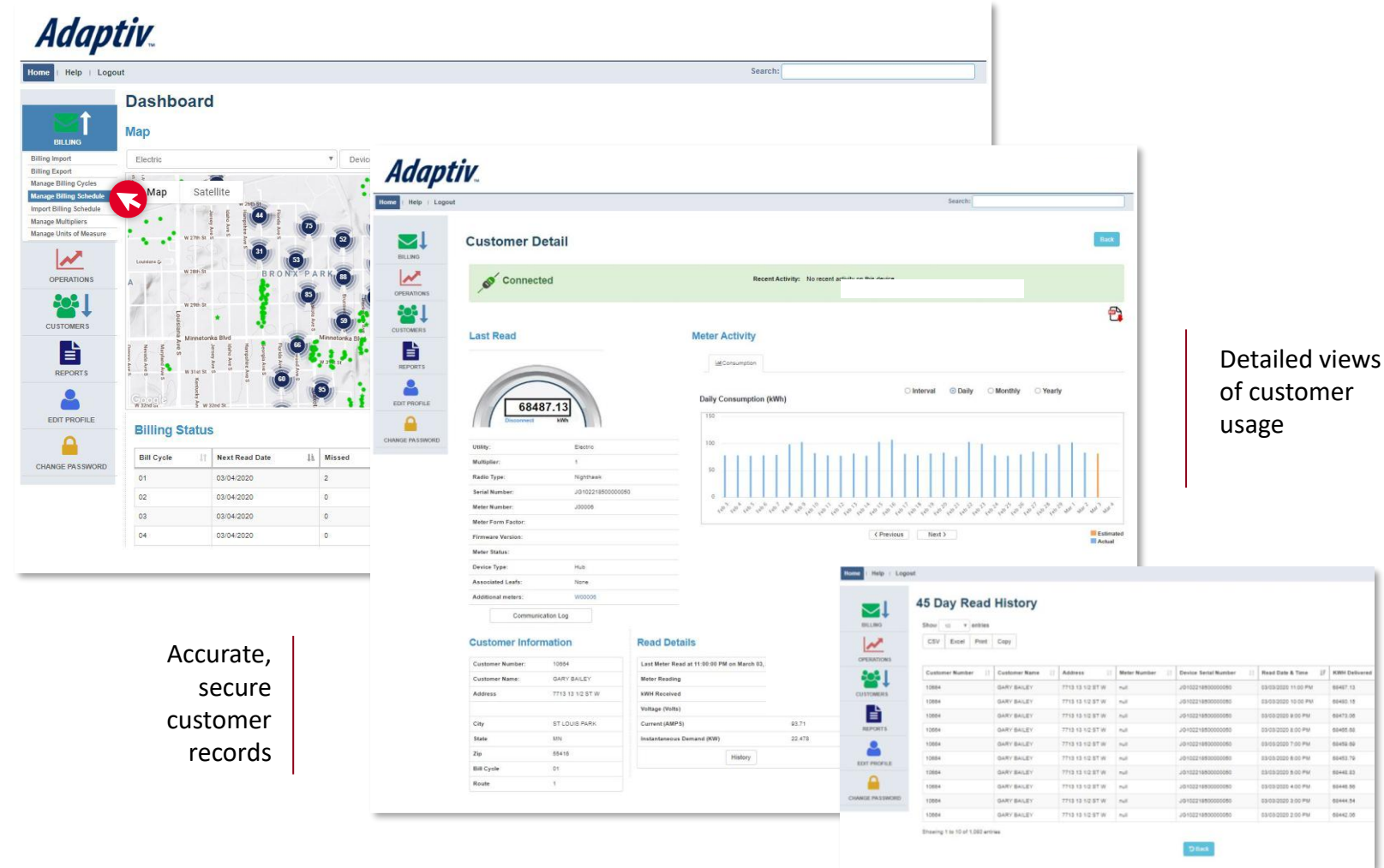


Predictive Billing

Know what's missing before it's too late!



- Immediate access to current customer information
- Detailed views of customer usage by day, month, or year
- Resolve billing concerns quickly and efficiently
- Remotely disconnect and connect meters



The screenshots demonstrate the Adaptiv web interface, which includes a sidebar with navigation options: BILLING, OPERATIONS, CUSTOMERS, REPORTS, EDIT PROFILE, and CHANGE PASSWORD. The main content area shows a Dashboard with a Map of customer locations, a Billing Status table, and a Customer Detail view. The Customer Detail view includes a 'Last Read' section showing a meter reading of 68487.13 kWh, a 'Meter Activity' section with a bar chart of daily consumption, and a '45 Day Read History' table. The 'Billing Status' table is as follows:

Bill Cycle	Next Read Date	Missed
01	03/04/2020	2
02	03/04/2020	0
03	03/04/2020	0
04	03/04/2020	0

The 'Customer Detail' view shows the following information:

- Utility: Electric
- Multiphase: 1
- Road Type: Highways
- Serial Number: J0102218500000000
- Meter Number: J00005
- Meter Form Factor: J00005
- Firmware Version:
- Meter Status:
- Device Type: Hub
- Associated Leash: None
- Additional meters: W00005

The '45 Day Read History' table shows the following data:

Customer Number	Customer Name	Address	Meter Number	Device Serial Number	Read Date & Time	KWH Delivered
10584	GARY BAILEY	7713 13 1/2 ST W	N/A	J0102218500000000	03/03/2020 11:00 PM	55467.13
10584	GARY BAILEY	7713 13 1/2 ST W	N/A	J0102218500000000	03/03/2020 10:00 PM	55465.18
10584	GARY BAILEY	7713 13 1/2 ST W	N/A	J0102218500000000	03/03/2020 9:00 PM	55473.06
10584	GARY BAILEY	7713 13 1/2 ST W	N/A	J0102218500000000	03/03/2020 8:00 PM	55465.88
10584	GARY BAILEY	7713 13 1/2 ST W	N/A	J0102218500000000	03/03/2020 7:00 PM	55466.89
10584	GARY BAILEY	7713 13 1/2 ST W	N/A	J0102218500000000	03/03/2020 6:00 PM	55465.79
10584	GARY BAILEY	7713 13 1/2 ST W	N/A	J0102218500000000	03/03/2020 5:00 PM	55466.83
10584	GARY BAILEY	7713 13 1/2 ST W	N/A	J0102218500000000	03/03/2020 4:00 PM	55466.86
10584	GARY BAILEY	7713 13 1/2 ST W	N/A	J0102218500000000	03/03/2020 3:00 PM	55464.54
10584	GARY BAILEY	7713 13 1/2 ST W	N/A	J0102218500000000	03/03/2020 2:00 PM	55462.06

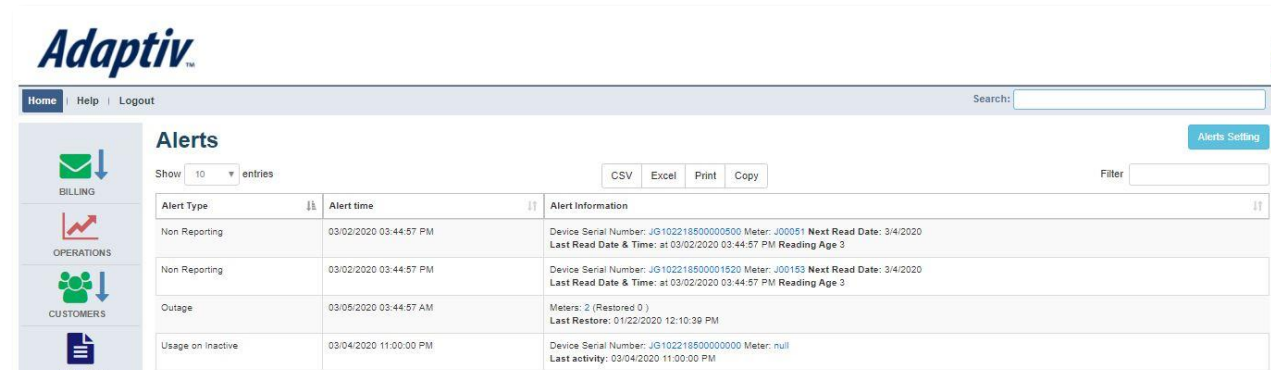
Detailed views of customer usage

Accurate, secure customer records

- Immediately notify utility personnel of a sustained outage
- Effectively monitor blinks and momentary outages with daily reporting
- Provide precise outage data for power quality reporting

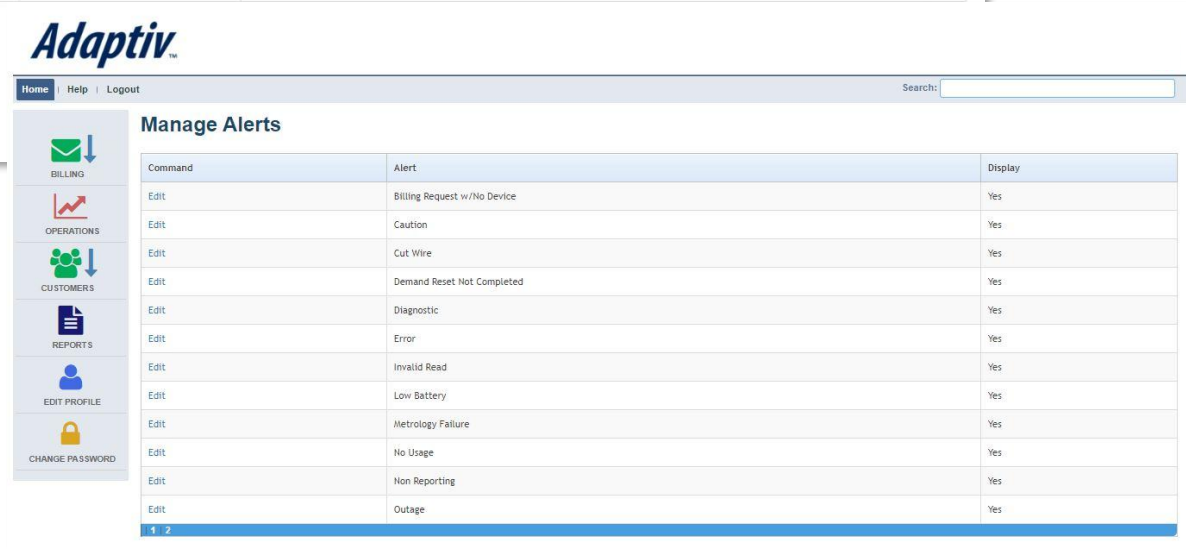
Outages and blinks are monitored daily, managed easily and effectively

Refine your alerts to enhance your OMS



The screenshot shows the 'Alerts' page in the Adaptiv system. It features a sidebar with navigation options: BILLING, OPERATIONS, CUSTOMERS, REPORTS, EDIT PROFILE, and CHANGE PASSWORD. The main content area displays a table of alerts with columns for Alert Type, Alert time, and Alert information. The table shows four entries, including 'Non Reporting', 'Outage', and 'Usage on Inactive'. A search bar and a 'Show 10 entries' dropdown are at the top. Action buttons for CSV, Excel, Print, and Copy are available.

Alert Type	Alert time	Alert information
Non Reporting	03/02/2020 03:44:57 PM	Device Serial Number: JG102218500000500 Meter: J00051 Next Read Date: 3/4/2020 Last Read Date & Time: at 03/02/2020 03:44:57 PM Reading Age 3
Non Reporting	03/02/2020 03:44:57 PM	Device Serial Number: JG1022185000001520 Meter: J00153 Next Read Date: 3/4/2020 Last Read Date & Time: at 03/02/2020 03:44:57 PM Reading Age 3
Outage	03/05/2020 03:44:57 AM	Meters: 2 (Restored 0) Last Restore: 01/22/2020 12:10:39 PM
Usage on Inactive	03/04/2020 11:00:00 PM	Device Serial Number: JG1022185000000000 Meter: null Last activity: 03/04/2020 11:00:00 PM



The screenshot shows the 'Manage Alerts' page in the Adaptiv system. It features a sidebar with navigation options: BILLING, OPERATIONS, CUSTOMERS, REPORTS, EDIT PROFILE, and CHANGE PASSWORD. The main content area displays a table of alert commands with columns for Command, Alert, and Display. The table lists various alert types such as 'Billing Request w/No Device', 'Caution', 'Cut Wire', 'Demand Reset Not Completed', 'Diagnostic', 'Error', 'Invalid Read', 'Low Battery', 'Metrology Failure', 'No Usage', 'Non Reporting', and 'Outage'. A search bar and a 'Show 10 entries' dropdown are at the top. Action buttons for CSV, Excel, Print, and Copy are available.

Command	Alert	Display
Edit	Billing Request w/No Device	Yes
Edit	Caution	Yes
Edit	Cut Wire	Yes
Edit	Demand Reset Not Completed	Yes
Edit	Diagnostic	Yes
Edit	Error	Yes
Edit	Invalid Read	Yes
Edit	Low Battery	Yes
Edit	Metrology Failure	Yes
Edit	No Usage	Yes
Edit	Non Reporting	Yes
Edit	Outage	Yes

***Integration Fees May Be Incurred**



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PRODUCT DEMONSTRATION

Adaptiv

Home | Help | Logout

Dashboard

Map

Electric

Outage

Map Satellite

5024 29TH ST W MN

Status: Outage
Customer No: 1205
Serial No: JG10221850006720
Meter No: J00673

Show Customer Meter Data ...

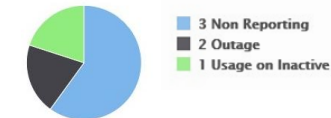
Billing Status

Bill Cycle	Next Read Date	Missed
01	04/24/2020	2
02	04/24/2020	0
03	04/24/2020	0
04	04/24/2020	0

Alert Details

3 Non Reporting
2 Outage
1 Usage on Inactive

Smart billing
integration with
secure mobile access



Over-the-air
configuration
and upgrades on
all Adaptiv™ units

Utility
Billing
System



Dashboard

Map

Electric

Device

All

Map Satellite

5132 29TH ST W MN

Status: Outage
Customer No: 1228
Serial No: JG10221850006770
Meter No: J00678

Billing Status

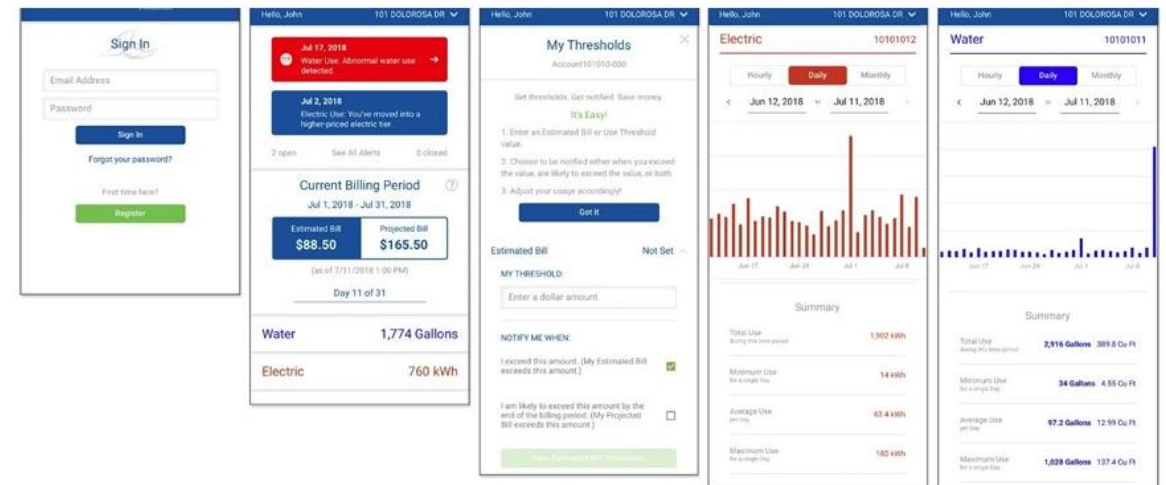
Bill Cycle	Next Read Date	Missed
01	04/30/2020	2
02	04/30/2020	0
03	04/30/2020	0
04	04/30/2020	0

Alert Details



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CUSTOMER PORTAL





Compatible with all data acquisition software that supports TCP/IP connections



MV-90 xi



- Introducing Nighthawk DirectConnect TCP/IP connectivity on the Aclara kV2c
 - Connects directly to the meter's C12.19 data structure
- Connects directly with **Itron MV-90**, **Aclara MeterMate**, **Trilliant PrimeRead**, or **Trilliant UnitySuite** data acquisition software
- Robust, secure, and efficient bidirectional message delivery mechanism
- Utilizes same proven LTE hardware as Adaptiv HUB solutions (less RF mesh module)
 - Cellular devices only
- Full data retrieval
- Features such as last gasp, modem configuration and firmware update supported
- Can use MeterMate to update meter firmware and configuration
- Compatible with Nighthawk kV2c meters – full meter functions supported
- Itron Poly to follow

- Does not require any middleware
 - Stand alone solution that does not require Adaptiv HES or other Adaptiv endpoints
- No recurring fees from Nighthawk. Utilize existing utility private contract with AT&T or Verizon
 - Customer provides SIMs
 - Other carriers can be supported
 - Other carriers can be supported with purchase commitments
 - Requires testing and certification
- Warranty Term: 1 year



Radio Performance

<i>protocols</i>	• TCP/IP
<i>modulation</i>	OFDM (Orthogonal Frequency Division Multiplex)
<i>data rate</i>	LTE Cat-1 (5 Mbps ↑, 10 Mbps ↓)
<i>frequency band</i>	LTE Bands 2, 4, and 12 or 13
<i>transmit EIRP</i>	+20 dBm (including antenna gain)
<i>sensitivity</i>	-103 dBm (@ 1% PER; incl. antenna gain)

Power, Physical, & Environmental

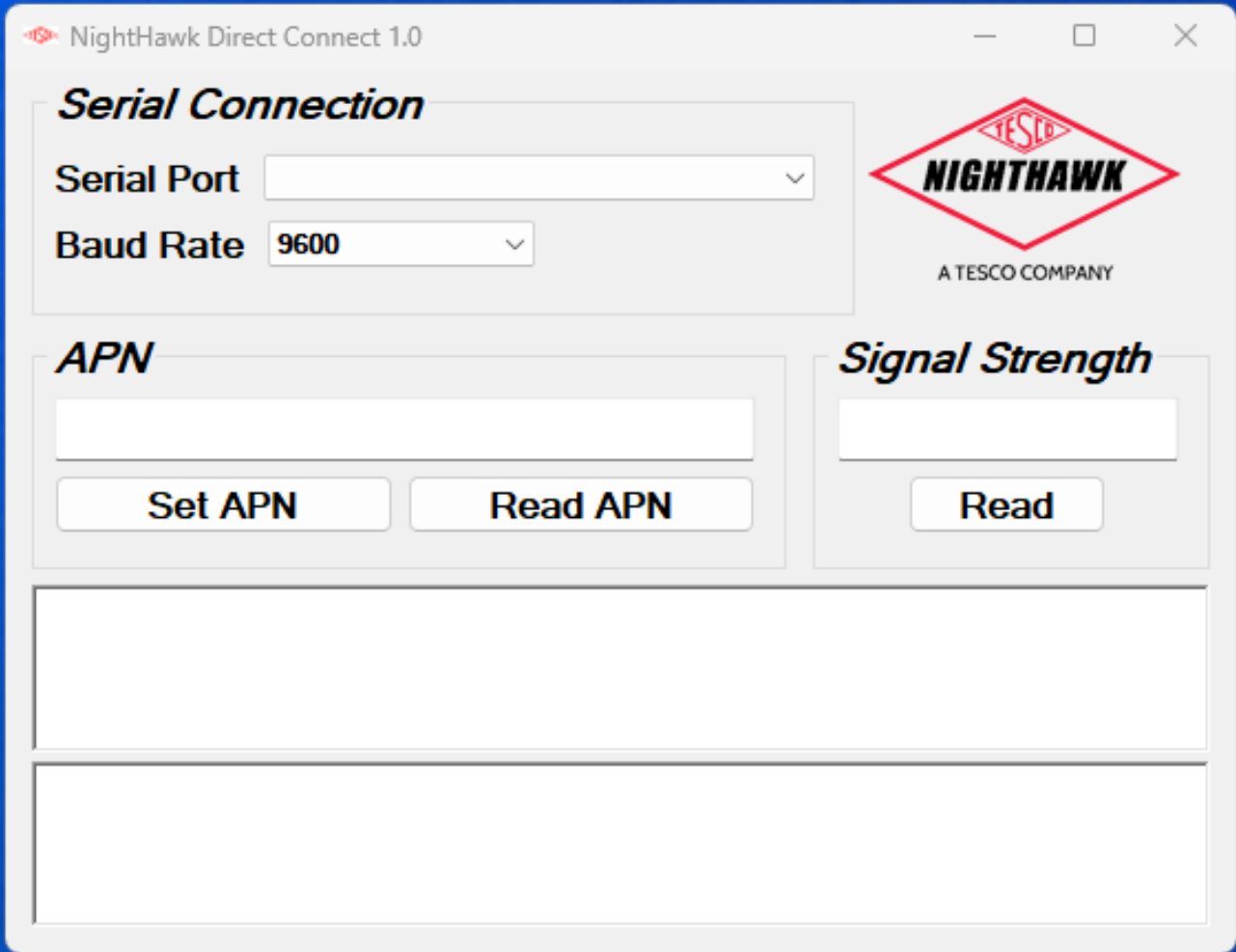
<i>burden (including module)</i>	• 120 V: 1.3 W • 240 V: 1.6 W • 277 V: 1.7 W • 480 V: 2.4 W
<i>S-Base</i>	• 6.95"/17.65 cm (diam). x 4.38"/11.11 cm (D) • 4 lbs / 1.8 kg net
<i>temperature</i>	-22° F / -30° C to +158°F / +70° C
<i>humidity</i>	5 to 95% non-condensing

DirectConnect Functionality

<i>connectivity</i>	AT&T or Verizon LTE cellular
<i>security</i>	ANSI C12.22 128-bit AES/EAX' (combined encryption/authentication)
<i>memory</i>	40 kB
<i>clock synch</i>	to LTE network
<i>firmware</i>	over-the-air upgradable
<i>power outage & restoration reporting</i>	aggregated real-time reporting

Compliance

<i>radio emissions</i>	• FCC Part 15 Class A • Industry Canada ICES-003 Class A
<i>device IDs</i>	• FCC ID: R17LE910NAV2 • IC ID: 5131A-LE910NAV2
<i>safety</i>	• ANSI C37.90.1 • ANSI C62.41
<i>metrology</i>	• ANSI C12.1 • ANSI C12.18 • ANSI C12.19 • ANSI C12.20 • ANSI C12.21



NightHawk Direct Connect 1.0

Serial Connection

Serial Port

Baud Rate

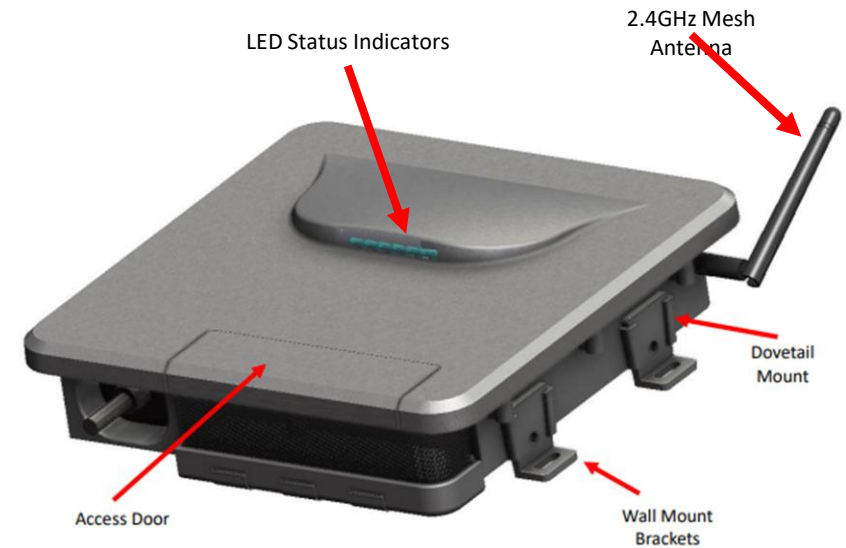
APN

Set APN Read APN

Signal Strength

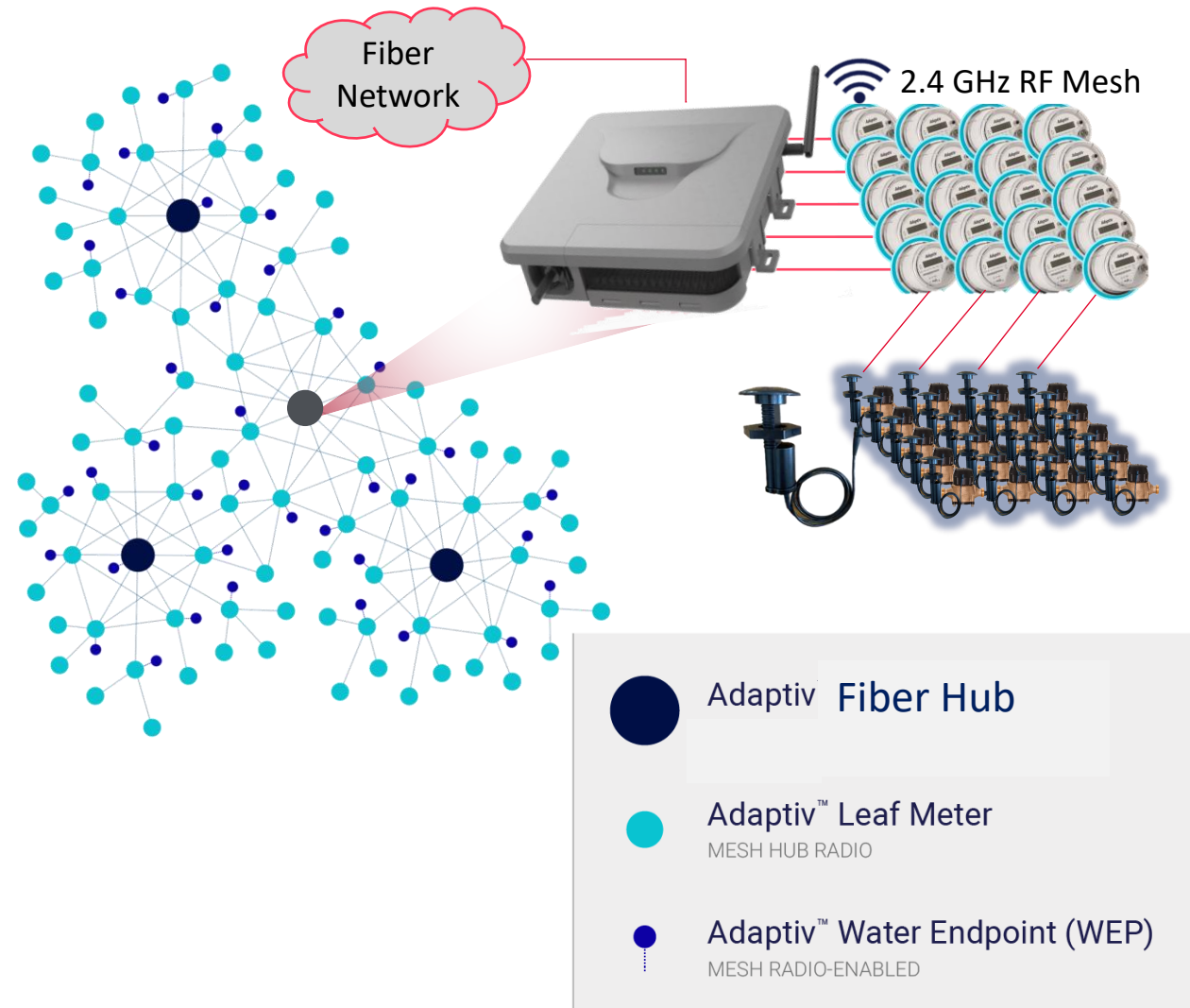
Read

- The Nighthawk Ethernet HUB product is a self-contained mesh HUB device with a wired Ethernet uplink.
 - Fiber hub is Adaptive compatible – uses same Synapse mesh module
 - Acts as a collector for multiple devices
 - Technically an infrastructure device
- “Fiber” is used because the initial product offering has been designed to work with customer deployed PON networks
 - With further development, network uplink could be connected to any copper Ethernet interface
 - Circuitry included to support cellular based version (replaces PON) – reduces operating costs (less cellular outtakes)
- Customer assisted testing and validation ongoing

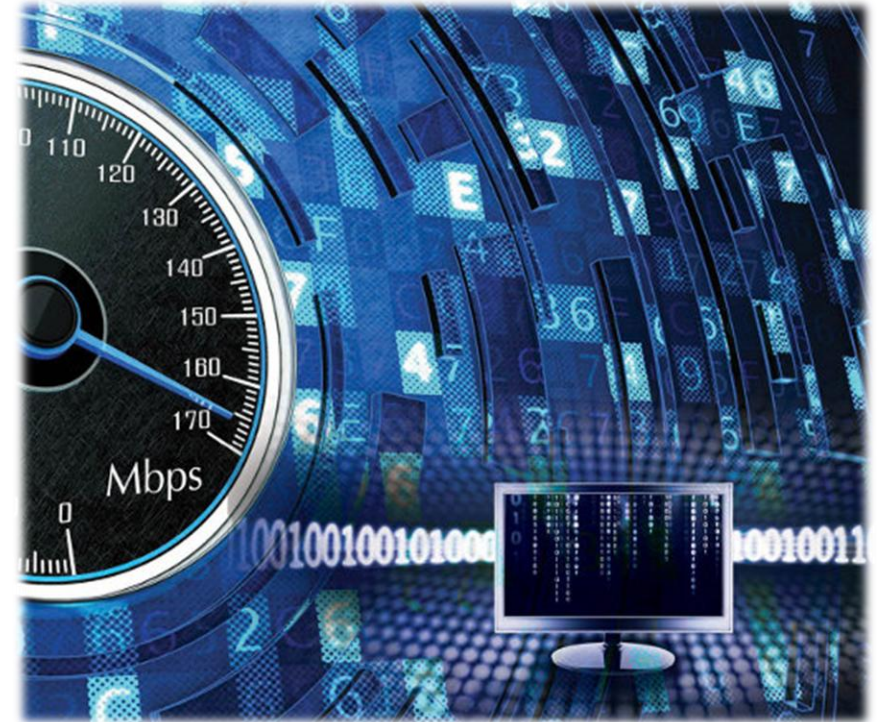


ADAPTIV™ | ONE HUB TO MANY LEAFS

- Scalable, self-healing, self-configuring RF Mesh network
- Utilize High bandwidth Fiber backhaul
 - One HUB per cluster of greater than 20 LEAF devices – electric and water
 - LEAF devices provide up to 4 hops to maximize coverage
- Built-in security and redundancy
- Water interval data and leak detection with exceptional battery life
- Simple installation and maintenance

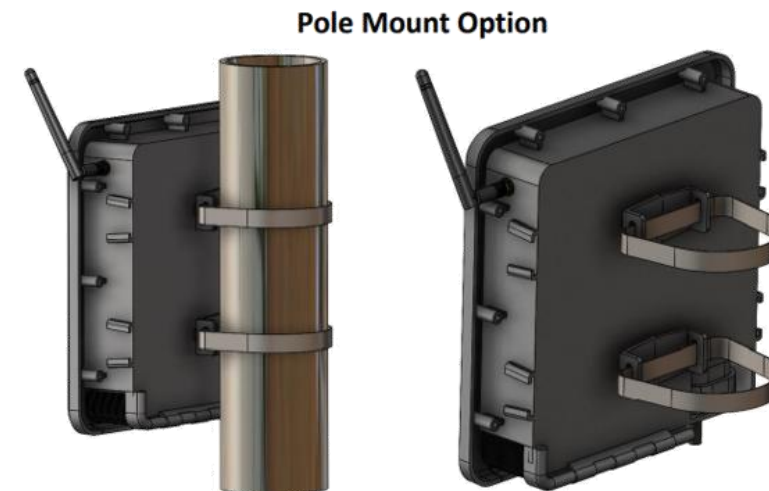
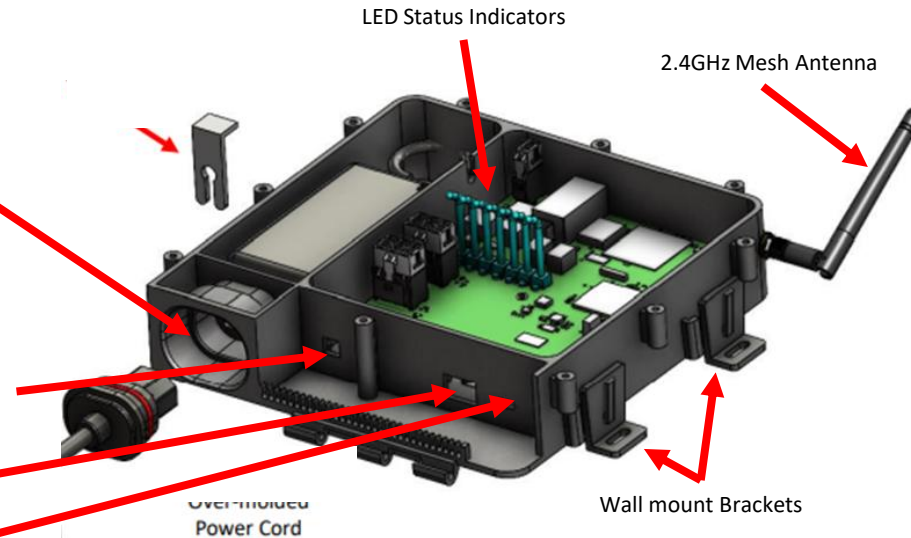


- Ideal for utilities who have mostly fiber throughout service territory
 - Federal government incentivizing rural coop fiber to the home
 - Utilities looking for applications to use the deployed fiber
- Allows for network performance tuning
 - Mounting on a pole improves device connectivity – increased RF range
 - Allow stranded devices network access
- To be confirmed in validation testing:
 - Connect > 50 devices via mesh
 - Height is our friend
 - Standard hub averages up to 10-20 leaf devices
 - Maximum hub capacity 150 leafs

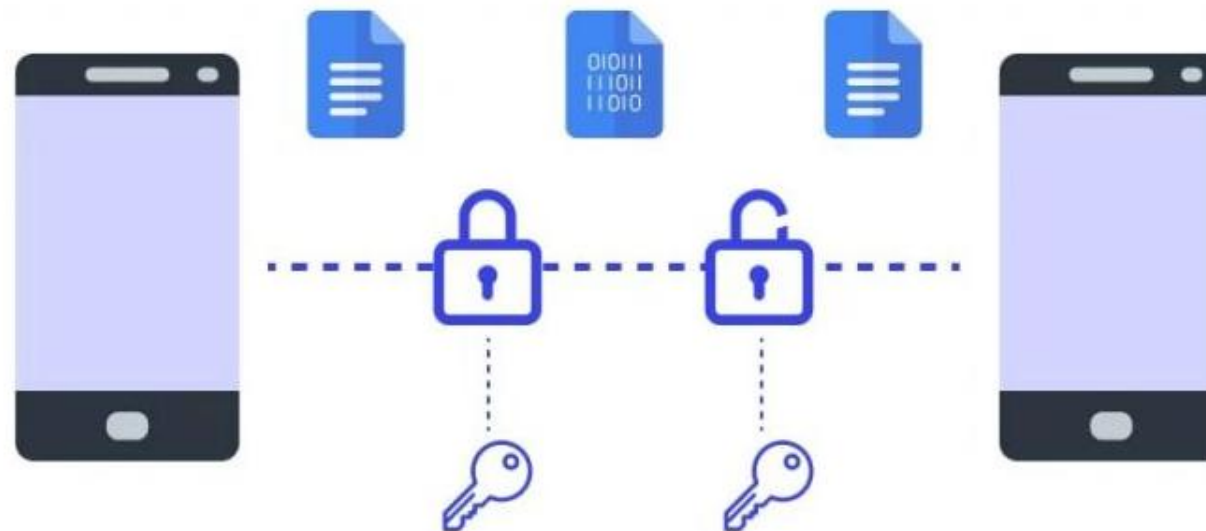


FIBER TO ETHERNET HUB FEATURES

- 120/240 VAC power input
 - Locking power cord
- Size: 7" x 6" x 2.5"
 - Wall or Pole mounting
- Operating Temp: -20C / +65C
- External I/O's:
 - 12 VDC output for downstream devices (optional)
 - RJ-45 sealed connector – 100Base-TX
 - USB-C sealed Terminal Access Port for configuration, diagnostics, and Synapse script upgrades
- LED Status Indicators for power, network uplink, and alarm status
- Microprocessor based to support multiple peripherals
 - ST Micro STM32F767ZIT6
 - Processor firmware OTA upgradable



- Advanced Outage Management power fail detection
 - Configurable blink and sustained outage event thresholds, event logging and data upload
- Rechargeable Battery Backup of 10 minutes to allow for last gasp transmissions
 - Powers internal circuitry only
- Supports OTA firmware upgrades to associated mesh devices
- Robust end to end security and encryption



Please Take a Few
Minutes To Provide
Feedback About The
Course & Instructor

Track 5 - Nighthawk Adaptiv
Technology Overview 72125
10:30AM Scott/Pierce



Jon Scott

TESCO NIGHTHAWK Sales Manager



TESCO – The Eastern Specialty Company

Bristol, PA

404.451.8444

This presentation can also be found under Meter Conferences and Schools on the
TESCO website: tescometering.com

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