Industry Leading Innovation

The Allegro Under-the-Glass (UTG™) Universal Endpoint for Advanced Meter Infrastructure (AMI) is an industry-leading innovation in durable endpoint design technology featuring no external connecting wires or antennas. The Allegro UTG Endpoints are built on our patented programmable Interpreter® register platform that enables placement anywhere on most any meter. This exclusive endpoint technology is flexible, migratable, and able to operate in both fixed network and drive-by environments.

Operating in the FCC licensed 450-470 MHz frequency spectrum, our family of Allegro Universal Endpoints communicate to the fixed network backbone via a proprietary 2-way, time-synchronized RF protocol. The Allegro AMI Fixed Network architecture offers exceptional propagation, eliminates network RF signal collision, provides superior stability (agnostic of the number of endpoints), and is intrinsically secure and protected.

The UTG Universal Endpoints transmit at 2 watts of output power and can communicate with the Allegro Base Station from up to 2 miles away, with priority given to the Base Station for greater network efficiency.

The Allegro Wall Endpoint offers an extended range up to 5 miles. Allegro Endpoints are engineered to automatically revert to an AMR drive-by mode in the event of a network disruption, always allowing for data collection.

Allegro incorporates a patented, dual-frequency 'Smart Antenna' within our UTG Endpoints, ideal for submerged pit or vault environments. This proprietary design matches the RF shift as radio waves travel through water, providing consistent reliable performance irrespective to the level of humidity and water conditions within the harsh pit environment.

Allegro Endpoint Family

Each utility environment presents special technical challenges. That's why Master Meter created three unique application specific AMI Endpoints to provide optimal communication between the meter, RF network, and the utility.

UTG Endpoint

Our flagship product - the UTG Register Endpoint - is ideal for use in pit or indoor situations that are located within approximately 2 miles of an Allegro Base Station or repeater. This fully integral design features no connections or external antennas allowing a quick plug-in-play solution that keeps deployment schedules short, and implementation costs down.

Allegro Pit Endpoint

This UTG endpoint provides an external low profile antenna, making it a choice solution for deep pits or vaults, or where the Base Station distance may compromise performance. The only wired connection is an IP68-rated push-pull connector that is coupled to our ruggedized low-profile omnidirectional antenna. This boosts the total range of the Endpoint by up to 250%, providing an extended reliable performance.

- "Smart" Detection of Major Manufacturer Encoder Register Brands.
- In-field Activation LED Indicator to simply and accelerate deployment
- Large Cell Battery for enhanced product life

Allegro Wall Endpoint

The Allegro Wall Endpoint provides complete flexibility in AMI communication and is ideal for basement located meters, or commercial meter settings located in dry, deep vaults. This endpoint works with any wired make or model encoder register that uses the industry standard UI-1203 communication protocol. It is ideal for retrofitting and upgrading older systems with today's most advanced AMI technology. The Wall Endpoint is universal, programmable, and provides the same robust two-way communication found with our UTG Endpoints.

UTG Encapsulation Technology:

Winner of the Frost & Sullivan Market Engineering Award, Master Meter's innovative UTG (Under-the-Glass) Encapsulation Technology is a proprietary manufacturing design, which fully encloses both RF circuitry, battery, antenna, and the solid-state meter register into a hermetically sealed, IP68-rated hardened glass and stainless steel enclosure. With millions of UTG designed AMR and AMI endpoints installed globally, the elimination of external wires and/or connections has proven a formidable, highly durable, and weather resistant product design ideal for submersible, pit-set environments where the protection of sensitive AMR/AMI electronics is paramount.

SONATA OCTAVE — ALLEGRO — HARMONY

Features & Benefits:

Universal Interpreter Register — The Allegro Wall Endpoint provides complete flexibility in AMI communication and is ideal for basement located meters, or commercial meter settings located in dry, deep vaults. This endpoint works with any wired make or model encoder register that uses the industry standard UI-1203 communication protocol. It is ideal for retrofitting and upgrading older systems with today's most advanced AMI technology. The Wall Endpoint is universal, programmable, and provides the same robust two-way communication found with our UTG Endpoints.

Rugged Long-Life Cycle Design — We designed Allegro to make sure your technology investment will last. Allegro is engineered to reduce lifetime ownership costs by providing a ruggedized extended life-cycle product design and future firmware upgradeability so that Allegro grows with

technology. Exclusive environmental design assures longevity in harsh submerged environments.

- IP68 Environmental Rating (in most cases) for utmost protection against damaging moisture and dust ingress.

- Under-the-Glass (UTG) Encapsulated Wireless Design for elegant, simplified installation and no external wires or connections.

- Ultra-compact form factor provides an elegant quality design with a minimal footprint and opportunity for tamper.

- Full 10 Year Battery Warranty with additional 10 Year Prorated Coverage.

- 100% Solid-State design with no moving parts provides exceptional accuracy, granular data resolution, and zero wear.

MIGRATABLE BETWEEN AMR AND AMI — The Allegro Endpoint easily migrates between drive-by and fixed network modes to ensure reliable meter reading operations regardless of network status. By automating routine tasks and operations, utilities gain efficiencies and can provide an enhanced customer service experience to all customer segments.

- Seamless, smart sensing network architecture provides a flexible, cost-effective network rollout by automatic communication between the endpoint and base station.

- Redundant Operating Modes for enhanced system reliability.

- Smart sensing algorithms automate and improve communications.

- Data redundancy in endpoint, with built-in storage of 72 hourly reads.

TWO-WAY COMMUNICATION — With a need to respond immediately to the shifting priorities of a fast paced water utility, the Allegro AMI Fixed Network incorporates advanced end-to-end true 2-way communication. The system operates on a secure, encrypted, channel and time specific proprietary protocol. The Time Synchronous RF Protocol operates by assigning each endpoint a specific time slot to listen for the base station. Because of this efficient design, IP packet collisions are all but eliminated offering increased reliability and better performance.

- On Demand Reads for accurate, remotely available answers to billing inquiries.

- The Lowest Latency Response Time to empower utility personnel with timely information for their customers.

- Near Real Time Alert Monitoring ensures more responsive customer service.

- Remote Firmware Upgradability protects today's investment and allows the AMI endpoints to grow with future technology.

- End-to-End Encryption for secure, protected data transmission privacy.

- Anytime Network Commands puts the utility in touch with field assets.

- Flexible transmission interval scheduling with either every 12 hours, or once per day (for extended battery performance).

- 15 Minute consumption granularity reading.

PLUG-AND-PLAY DESIGN — The UTG Universal Endpoints are Proactive, Preemptive, and Intuitive. We engineer our endpoints with the idea that utilities don't have freely available resources to be spent on lengthy training and complex installation procedures just to move forward with technology migration. Allegro installation is quick and painless, reducing costs while requiring little to no technical expertise.

- Automatic Network Communication for immediate startup and implementation

- Endpoints are available pre-configured at the factory for immediate deployment.

- Ultra-compact form factor provides an elegant quality design with a minimal footprint and opportunity for tamper.

- Barcode labels help reduce human error in the administrative integration of installation data

- Fully integral UTG design requires no installation of antennas or connection to encoder registers* for quick deployment.

  *applicable to the fully integral UTG register. This does not apply to the Allegro UTG with External Antenna or Allegro Wall Endpoint.

Architecture

The simplicity found in nature inspired the overarching architectural design for Allegro and Harmony. Maximizing Allegro's RF footprint through efficient use and design of network components, while synchronizing communication between endpoint and collector result in today's most cost-effective and efficient AMI system available.

Harmony MDM software enables utilities to clearly visualize the robust, detailed consumption information delivered through the Allegro network. Together, Allegro and Harmony allow the utility to analyze, manage, and precisely account for system-wide water consumption. Smartly designed smartphone apps and web portals create an interactive customer engagement that improves customer satisfaction, reduces calls to City Hall, and empowers the ratepayer to responsibly and confidently make informed decisions about their personal usage.
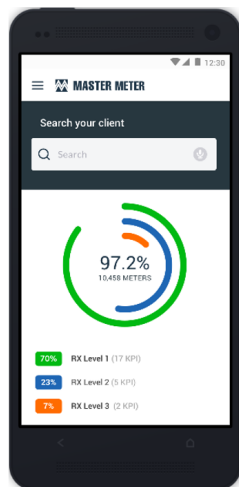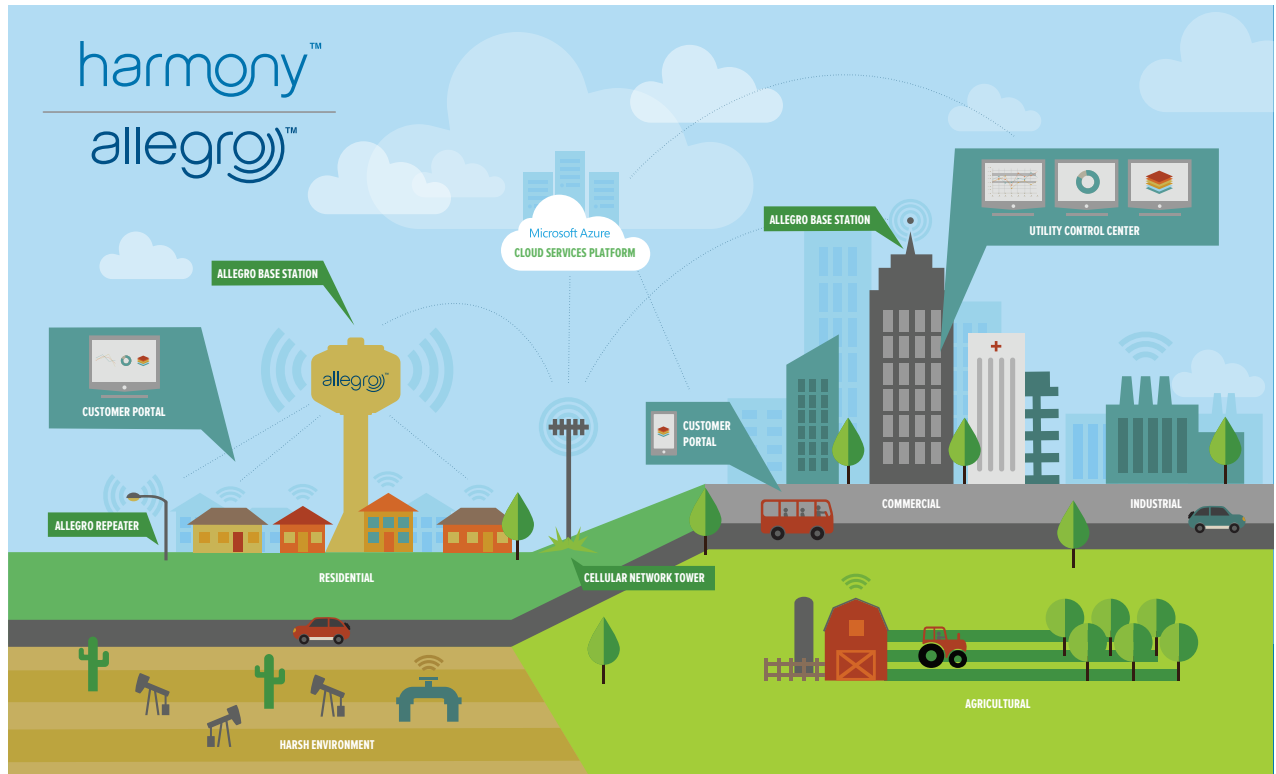
Allegro Mobile Tech Tool

Android field tool helps verify installation success in the field and speeds and streamlined the deployment process. Available Q4 2020.

Allegro Pit Endpoint

The Allegro Pit Module provides a solution for meters located in damp, deep vaults/pits and is used to interface with Master Meter's Octave® Commercial & Industrial Ultrasonic Meter, AccuLinx™ and eLinx™ encoder registers, or most any brand water meter with an encoder output using the standard communications protocol for water, UI-1203.

PHYSICAL CHARACTERISTICS		ALLEGRO PIT ENDPOINT
Pit Module w/Bracket Dimensions	Height x Length x Width (in)	5.12" x 3.15" x 2.36"
	Weight (lbs)	2.2 lb
	1.75" body/shaft circumference, Pit Lid Antenna total width to be 4" or less in circumference, Antenna height above the pit to be 0.5" or less	
ENVIRONMENT		
IP Rating	RF Endpoint with Cable (Outdoor Use)	IP68 Outdoor Rated
IP Rating Details		Rain / Snow / Salt
Temperature	Operating Temperature	-4F – 149F
Humidity	Maximum Humidity at Temperature of 65°C	95%
RADIO		
Frequency Band	Licensed Spectrum	450-470 MHz
Antenna Type		External Omni-Directional Antenna
	Cable Length	1.31 feet
	Connector Type	NICOR Connector
Scheduled Transmission		12hr or 24hr Configurable
DATA LOGGER		ALLEGRO PIT ENDPOINT
Number of Reads	Read Storage Capacity	5,760
Read Granularity	Default time between reads (configurable)	15 minute
TRANSMISSIONS		ALLEGRO PIT ENDPOINT
Alerts	Low Battery	Yes
	Tamper	Alert in case the serial data wire is cut / no communication to encoder
Encoder Compatibility		Master Meter Acculinx E Linx all sizes. Sensus ICE, Iperl AccuStream digital encoder all sizes, Mueller Translator register all sizes Neptune ARB II – VI

Specifications

PHYSICAL CHARACTERISTICS		UTG REGISTER	WALL ENDPOINT
Endpoint Dimensions	Diameter x Height (in)	3.15" x 2.56"	7.09" x 5.91" x 2.36"
Weight		0.62 lbs.	2.2 pounds
Antenna Connection		Internal	wired
ENVIRONMENT		**UTG REGISTER**	**WALL ENDPOINT**
IP Rating	RF Endpoint withCable (Outdoor Use) IP68	IP68	Outdoor, IP66 (non pit installation)
Temperature	Operating Temperature Range	-4 F to 149 F	-4 F - 149 F
Humidity	Maximum Humidity at Temperature of 149° F	95%	95%
RADIO		**UTG REGISTER**	**WALL ENDPOINT**
Frequency Band	Licensed Spectrum	450-470 MHz	450-470 MHz
Security	AES256 Encryption	Yes	Yes
DISPLAY (LCD)		**UTG REGISTER**	**WALL ENDPOINT**
Max Consumption	Max Consumption	999999999	N/A
Measurment Units	Gallon / Meter^3 / Feet^3	Gallon / Meter3 / Feet3	N/A
Reading Resolution	Highest Read	0.1 Gallon	N/A
DATA LOGGER		**UTG REGISTER**	**WALL ENDPOINT**
Number of Reads	Read Storage Capacity	5,760 reads	5,760 reads
Read Granularity	1 Hour Default	15 minute	15 minute
ALERTS		**UTG REGISTER**	**WALL ENDPOINT**
Tamper	Magnetic Sabotage, Tamper	YES	YES
Battery	Low Battery	YES	YES
Leak		YES	YES
Encoder Compatibility	Master Meter Acculinx eLinx all sizes	Sensus ICE, Iperl AccuStream digital encoder all sizes, Mueller Translator register all sizes Neptune ARB II – VI	
Scheduled Transmission	12hr or 24hr Configurable		
Supported Meter Bodies	Master Meter, Badger, Neptune, Sensus, Hersey, Elster		
Regulations / Certifications	FCC ID: NTA2W4GB1, UL Industry Canada: 4732A-2W4GB1, 4732A-2WBS1		

allegro®

Moving At The Speed of Technology

Master Meter is a high-service solutions provider specializing in advanced digital water metering, data delivery, and Utility Intelligence (UI) software. Master Meter's portfolio of new and innovative smart water technologies continues to expand in support of today's dynamic water utility business environment, and the water department's rapidly evolving role within a Smart City strategic plan. Join us.

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