



Meta-Alert™ Solutions for Transmission Networks

Who is EGM?

EGM is a technology company committed to making the world's biggest machine better. By adding telemetry to the existing T&D grid in a non-disruptive way, we give the utility accurate and timely information to optimize the operation of the entire Grid. We collect, securely transmit, and analyze the data in real-time giving the utility insights into the true performance of the Grid.

EGM & FERC 881

The rapid growth of renewables and the increasing frequency of extreme weather events has FERC reexamining the operational state of the transmission system. On Dec. 16, 2021, FERC issued Order 881 concerning transmission line ratings. The changes re-define the calculation of ratings to include assumptions about ambient temperature and other environmental characteristics. The Meta-Alerts system provides the parameters necessary to meet Order 881.

EGM's suite of **3rd Generation sensors** combine fault detection and current measurement capabilities found in earlier line sensors with **precise voltage** measurement, advanced physical environment measurements, and a secure communications network providing the industry's first holistically designed grid monitoring solution for the entire T&D network.



MSU-1
self-powered for
overhead Transmission

Importance of Accurate and Timely Measurements

The next generation of Transmission applications will demand much more accurate data than in the past. Utilities are facing the prospect of an immense amount of new renewable power, frequent congestion in strategic parts of the grid and, of course, increased scrutiny of outages both planned and unplanned. These applications will require more data, delivered and analyzed in near real-time, protected with industrial-strength encryption, and available within existing operational systems such as EMS.

Benefits of Precision Measurement & Data

Electrical

- Precise Voltage
- Precise Current
- Power Factor
- Phase Angle
- Frequency
- Power & Energy
- Harmonics
- Corona discharge
- EMF
- Current "Leakage"

Physical

- Cable Movement
- Vibration
- Cable Angle
- Cable Temp.

Environmental

- Ambient Temp.
- Humidity

Analytics Engine

Transmission Operations

- Dynamic Line Ratings (DLR)
- Ice Accretion
- Line Galloping
- Casual Contact
- Cable Health

Distribution Operations

- Fault Location (OH+UG Feeder, UG Loop)
- Broken Wire Detect
- Dist. Power Flow, FLISR Enhancements

Power Quality

- Momentary Location (OH+UG Feeder, UG Loop)
- Voltage Issues
- Pre-Failure Detection

DERs & Micro-Grid

- Phase Synchronization
- Distribution DLR
- Current Direction
- Total Harmonic Distortion

What Makes EGM Different?

In today's operational applications, many utilities are forced to rely on "estimates" or derived values because accurate measurements are not available. At EGM, we believe that precise, cost-effective measurement capability should not be available only for the Distribution Grid. Our Meta-Alert platform supports high voltage applications from 33kV to 1,200kV offering the same precision measurement capability and transmission-focused advanced applications.

Contact Us

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We look forward to discussing the state of the utility industry and the changing energy landscape with you. Additionally, we would welcome an opportunity to share with you how our technology provides increased safety, reliability and benefits while reducing costs

For more information:
info@egm.net.

Data Security

The EGM system is a fully secured solution from gathering data by the sensors, through secure communications from the field, and ultimately to the presentation of information to the user. Our security strategy is guided by NIST's Cybersecurity Framework Smart Grid Profile (Tech Note 2051), which provides the structure for the design, development, testing, and documentation of the EGM solution.

Operating Conditions and Conductor Health

EGM's Meta-Alert system provides near real-time operating characteristics such as Power (MW, MVA, MVAR), conductor temp, and EMF emissions as well as fault detection and vegetation contact. Meta-Alert warns of potentially dangerous situations (ice accretion, galloping) and tracks historical overload events where cable temperatures have exceeded limits and may have resulted in annealing.

Dynamic Line Ratings (DLR)

Dynamic Line Rating is the calculation of a transmission line's actual current carrying capacity. DLR is presented in real time but also as a set of forecasted values. DLR is becoming increasingly important as utilities face an increased amount of renewables on the Grid and chronic congestion in specific locations. DLR is an advanced application available as part of the Meta-Alert platform.

Line Ratings

Operating Voltage	33kV - 240kV (Phase-to-Phase)
Operating Current	14 - 1000A
Conductor Sizes Supported	1/0 - 1590 AAC (0.398" - 1.454" diam.)

Electrical & Physical Measurements

Voltage	± 1% V
Operating Current (14A - 1000A)	± 0.1% A
Current Harmonics (I, V)	Up to 63rd
Conductor Temp (Max)	± 1 C (120C)
Conductor Sag	± 1% ft
Conductor Swing	± 1 Hz
Conductor Tension	± 2% N
Ambient Temperature	± 1 C
Wind speed (Calculated)	± 1% m/sec

Sensor Characteristics

Primary Power Source	Self-powered, Induction (14A)
Expected Lifespan	15 yrs.
Installation	Manual or Hot Stick

Applications Available

Fault Detection & Location (± 150')	Dynamic Line Rating
Ice Accretion Detection	Broken Wire Detection
Conductor Health Report	Conductor Clearance
Device Pre-failure Detection	EMS Integration

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