

3M™ Sensored Cable Accessories  
for Medium Voltage Grid Automation



# Visibility in Real Time

An effective solution for monitoring your  
underground distribution system



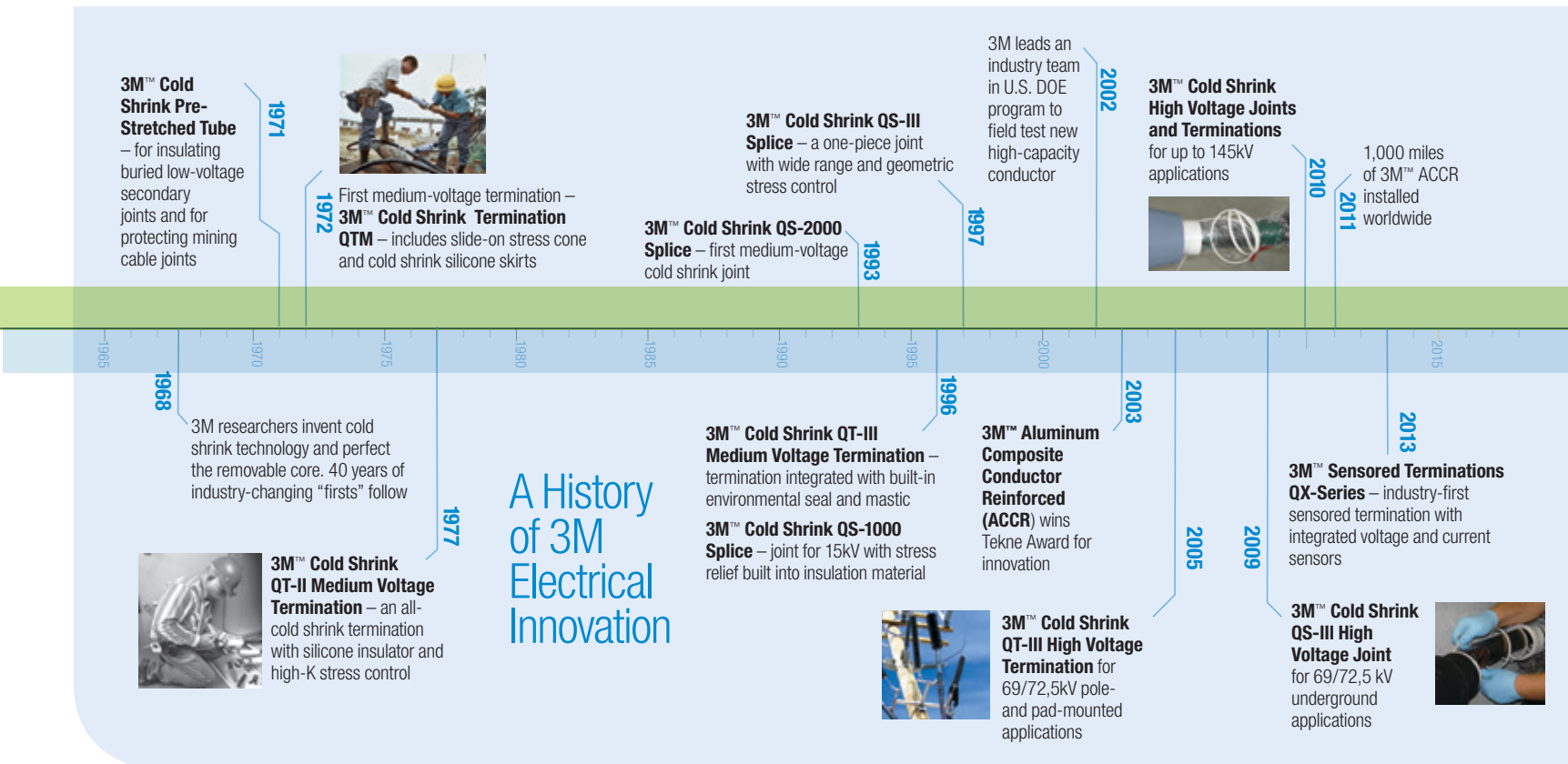
3M is a global technology company, manufacturing over 50,000 products for markets ranging from industrial and electronics to healthcare. These products are derived from 40 core technologies which we continually combine in novel ways to develop innovative customer solutions such as 3M Sensored Cable Accessories.

## Putting 3M Innovation to work for You

3M cable accessories are offered through the 3M Electrical Markets Division (EMD). EMD develops, manufactures and markets products for electrical utilities, electrical construction and maintenance and electrical device manufacturers. Customers can benefit from EMD's 60+ years of experience in supplying innovative, highly reliable products, including:

- Underground cable splices and terminations (including 3M-invented Cold Shrink technology) for low, medium and high voltage installations
- Cold Shrink sealing and insulating tubes
- Vinyl, rubber and mastic electrical tapes
- Heat shrinkable tubing and molded shapes for electrical insulation
- Cable arc- and fire-resistant tapes
- Electrical wire connectors
- Wire terminals and tools
- Wire marking products
- Cable ties
- Aluminum Conductor Composite Reinforced (ACCR)
- Electromagnetic shielding and absorbing materials

For more information, visit: [www.3M.com/electrical](http://www.3M.com/electrical)



### Seeing the whole picture

Situational awareness is critical in the underground medium voltage distribution grid, as faults in this segment can potentially impact large numbers of customers downstream. This can be compounded by the wide-scale integration of renewables, which places additional demands on aging equipment and compromises network efficiency. Although distribution automation and control solutions have evolved to tackle these issues, acquiring key grid parameter data with high accuracy – and in real time – continues to be a major challenge, especially for underground medium voltage systems.

Now, 3M brings you advanced Sensored Cable Accessories that provide highly accurate voltage and current data, and can be deployed throughout your underground medium voltage system with low capital investment. When coupled with your existing communication infrastructure, 3M™ Sensored Cable Accessories enable real-time monitoring, giving you better visibility throughout your underground MV distribution system.

Accurate information about the state of your MV grid can help protect your customers – and your reputation – against the steep costs of outages, repair work and lost productivity. Better information drives better decisions: rapid fault diagnosis, fast and accurate response, and precise load control all depend on grid visibility.

# More visibility More control



## 3M™ Sensored Cable Accessories for MV Grid Automation

3M Sensored Cable Accessories consist of passive sensors that provide highly accurate analog voltage and current waveforms. Your existing power equipment can be retrofitted with these accessories, which are both easy and economical to install.

- **A fast, economical solution**

Ability to retrofit power equipment allows installation at your chosen locations

- **Highly-accurate readouts**

Provides voltage accuracy of  $\pm 0.5\%^*$  and current accuracy of  $\pm 1\%^*$ , giving you real-time data that can be used in advanced automation and control applications

- **No field calibration**

Factory-calibrated sensors provide reliable, accurate data, without need for calibration in the field.

- **Underground system data**

Enables real-time monitoring of your underground system when integrated with your communication infrastructure

- **No external power source required**

Enables a simpler, faster, more economical installation

- **Constructed with 3M Cold Shrink technology**

For a safe, reliable seal that requires no special tools, sealants, adhesives, torches or other heat sources to install

\* Refer to the 3M Sensored Termination Datasheet for detailed accuracy information.

# Knowledge is power





# A technology breakthrough, designed to give you more:

### Flexibility

#### Upgrade your key locations

Depending on geographic location, load profile, regulatory requirements and legacy equipment, your key locations may be different from those of other utilities. 3M Sensored Cable Accessories and interfaces are engineered to give you the flexibility to monitor key parameters at critical points in your network. This retrofit solution can be installed in your existing power equipment with minimal effort, and integrated into your existing communication infrastructure.

### Accuracy

#### Analog waveforms for advanced analytics

Automatic distribution and control systems require highly accurate, real-time information about key grid parameters, such as voltage and current, in order to perform to their full potential. 3M Sensored Cable Accessories provide voltage data accurate to  $\pm 0.5\%$ , and current data accurate to within  $\pm 1\%$ . The bi-directional power flow and intermittent nature of renewable resources makes this data critical to utilities' efforts to manage efficiency, quickly locate and correct faults, and keep end customers online.

### Reliability

#### Consistent performance

3M Sensored Cable Accessories incorporate passive sensors, which do not require an external power source. These sensors are also factory calibrated – with no field recalibration necessary. And 3M's advanced Cold Shrink technology provides a reliable, long-lasting compressive seal, even in challenging environments. These features help reduce installation time and chance of craft error, while also providing the data needed to manage your grid assets proactively.

### Visibility

#### Real-time measurements

Currently available distributed intelligence solutions are generally too expensive to meet return on investment requirements if deployed system-wide. As a result, they are concentrated at just a few nodes – giving only a partial picture of the distribution grid. Since medium voltage cable accessories are typically located close to power equipment, 3M Sensored Cable Accessories can be deployed at strategic locations on the feeder, substations and consumption points throughout the grid – allowing wide-scale deployment and coverage.



### Smart grid applications for 3M™ Sensored Cable Accessories

- Volt/VAR Optimization (VVO), including Conservation Voltage Reduction (CVR)
- Fault detection, isolation and restoration (FDIR)
- Asset management
- Load balancing

### Your trusted connection

At 3M, we understand your greatest challenges. You can't afford power outages and losses; every minute of downtime damages your bottom line and your brand. You need to efficiently integrate intermittent generation resources into a grid that was not designed for them. You need to prioritize the replacement of aging equipment. And you need solutions that are applicable to the specific features of your network.

3M is the technology collaborator you can trust to help adapt your facilities for changing business needs. We work with your team to add value to your existing infrastructure, reduce operating costs, and give you a competitive edge.

We're  
with you  
in the  
trenches



Learn how 3M™ Sensored Cable Accessories could help you manage your medium voltage underground system more effectively – and for less cost.

**Call today for more information:  
800-517-0482**

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