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## **DART on the way to standardization**

### **Experts discuss new intrinsic safety solution**

**DART is the new buzzword for the process industry. Experts consider Dynamic Arc Recognition and Termination (DART) to be one of the most important innovations to pave the way for completely new intrinsic safety applications. DART is a dynamically acting, intrinsically safe electric circuit and represents a completely new approach to eliminating the strict power limitations of today’s applications in explosion hazardous areas. During a recent workshop at the German Physikalisch Technische Bundesanstalt, experts discussed the technical details and the cooperation of the hardware industry that are necessary to achieve a coordinated market introduction of this technology. One major factor along the way is the fact that procedures for IS certification for DART are available, but they still need to be proven for introduction into IEC standards.**

Dynamic Arc Recognition and Termination (DART) is a new technology developed by Pepperl+Fuchs that has met widespread recognition within the process control scene. Recently, interested process control experts met at the Physikalisch Technische Bundesanstalt (PTB) in Braunschweig, Germany to discuss the technical details of the new approach to intrinsic safety and agree on coordinated efforts for its introduction to the global process market.

Present solutions for intrinsically safe electric circuits strictly limit the power available to operate field devices inside explosion hazardous areas in order to prevent sparks that are hot enough to trigger an ignition. DART follows a completely different approach and is defined as a “dynamically acting intrinsically safe circuit.” This technology detects the current and voltage development typical of the formation of a spark and switches off the power source within milliseconds. With DART, present power limitations are obsolete, and current

flow is now possible above the levels defined in IEC 60079-11 within the ex zone. All other aspects defining intrinsic safety, such as utilization, redundancy and general fault considerations remain untouched.

The participants of the PTB workshop agreed that DART is a viable technology for electric explosion protection in the future. That is why the issue at the workshop was not whether the development of this technology should continue to drive toward general market acceptance but rather, how to achieve this goal. At the center of discussions was a common and coordinated approach to turn DART into a breakthrough technology in the field of intrinsic safety and gain global acceptance from the process industry. However, reaching this goal still requires the clarification of certain details. One of them is how to achieve a standard-compatible proof of the effectiveness of DART.

### **Financial and professional cooperation**

The PTB relies on financial backing from the industry, in order to introduce DART to the market. Besides Pepperl+Fuchs, a number of leading companies in the field of automation technology have agreed to provide the needed funds for the PTB to continue with the project. In particular, this includes the definition of safety-related parameters, as well as interoperability issues.

The PTB is working with a leading institution in the field of technical thermodynamics to complete the basic research still required to establish DART as an industry standard. This project requires simulation of the chemical processes triggered by a spark under special conditions. The results will enable specific conclusions to be formulated for the evaluation of dynamic electric circuits.

### **Licensing at limited costs**

Pepperl+Fuchs has applied for international patents for their DART technology under the description “electrical circuit with incentive arc prevention means” (WO 2006/003445). Using this technology, therefore, will require a license with both a one-time and an annual license fee. However, the company emphasizes that such costs will be required only until the technology has reached international standardization. As soon as this goal is achieved, the patent will be licensed free of charge to all interested companies.

In other words, all switches are posed and there are no more obstacles preventing the introduction of DART as a future technology for explosion hazardous areas. That is why the participants of the PTB workshop are convinced that DART will be the enabling technology to pave the way for an intrinsically safe, Power-over-Ethernet concept. As far as ATEX

certification is concerned, the PTB sees no basic problems, although the required documentation still needs to be completed.

Since the required standard-compatible evaluation of DART is not possible until the research is complete, the next step will be the development of an IEC Technical Specification (TS). There are still quite a few steps on the way to IEC standardization. However, it is only a matter of time until this technology is part of the technical standard of the global process industry and opens completely new applications within the hazardous area.

**Key words:** Explosion protection, intrinsic safety, DART, Dynamic Arc Recognition and Termination, PTB, Pepperl+Fuchs, Workshop, IEC standard, standardization

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	DART Fieldbus	DART Power
<b>High-Power Field Instrumentation</b>		
Valve control	■	■
Mag-flow meters	■	■
Coriolis flow meters	■	■
Fire and gas detectors		■
<b>Other Equipment</b>		
Optical and acoustical signals		■
Servos and drives		■
Lighting		■
Analytic equipment	■	■
Scales		■
PCs and HMI-terminals		■

Fig 1: Additional applications for DART with Power-over-Ethernet. During the PTB workshop, flow measurement and valve control were specifically discussed as relevant applications for the process industry.

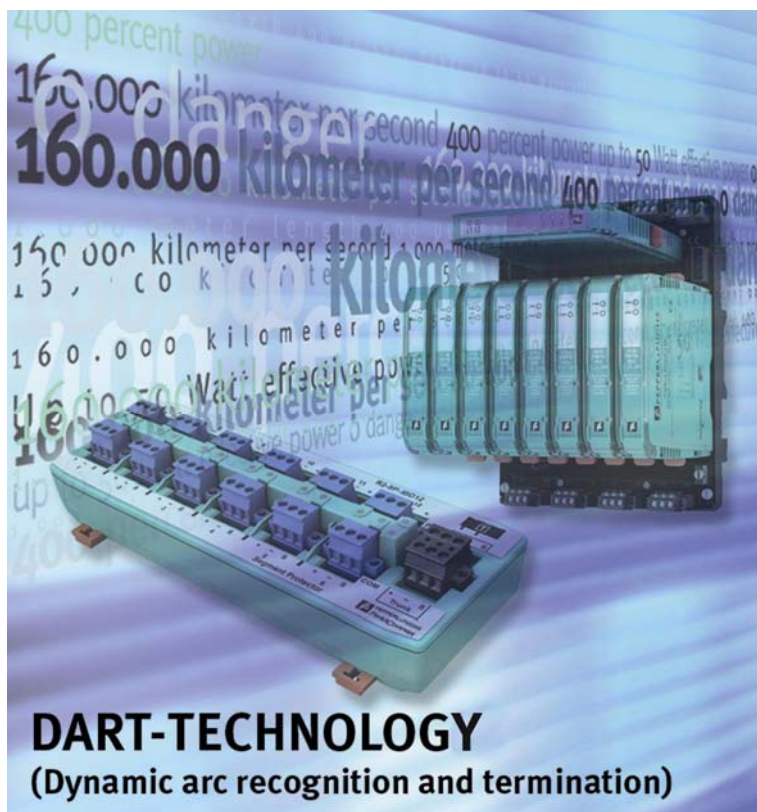


Fig 2: Progressing from an idea to an application ready for the market: DART offers more intrinsically safe power for explosion hazardous areas.