

# TRUNKSAFE™ “In An Eggshell”

## What's the problem?

One difficulty still remains with fieldbus technology: each segment's operation is dependent upon the health of the single twisted wire pair that connects all of the field devices to the host control system. While there are strategies for implementing a redundant fieldbus network, they typically involve a complete duplication of segment elements. They are often complex, and are always very expensive.

## What's the solution?

The MooreHawke TRUNKSAFE Fault-Tolerant Fieldbus System provides a cost-effective and simple, yet highly reliable, way to provide redundancy for FOUNDATION fieldbus™ H1 and PROFIBUS PA networks.

TRUNKSAFE is a turnkey fieldbus wiring system comprised of two redundant DC power conditioners and a specially-engineered device coupler equipped with “Automatic Segment Termination”. In combination, they provide a secure and redundant fieldbus physical layer without the need to duplicate all segment elements.

## What does TRUNKSAFE provide?

- The ONLY fault-tolerant physical layer for FOUNDATION fieldbus H1 and PROFIBUS PA.
- The EASIEST way (short of complete duplication) to make fieldbus redundant.
- Complete user-confidence in placing even process-critical loops in multi-device segments.



- **Now You can put all your eggs in one basket!**

## What makes TRUNKSAFE work?

A fieldbus segment must always have a terminator on each side of the data link to prevent signal reflections in bus communications. TRUNKSAFE provides for this, even if the twisted wire pair is compromised anywhere along its run. The key is MooreHawke's patented “Automatic Segment Termination”, which can automatically switch the location of the fieldbus terminator to bypass trouble on the twisted wire pair that has been short-circuited, broken or accidentally disconnected.

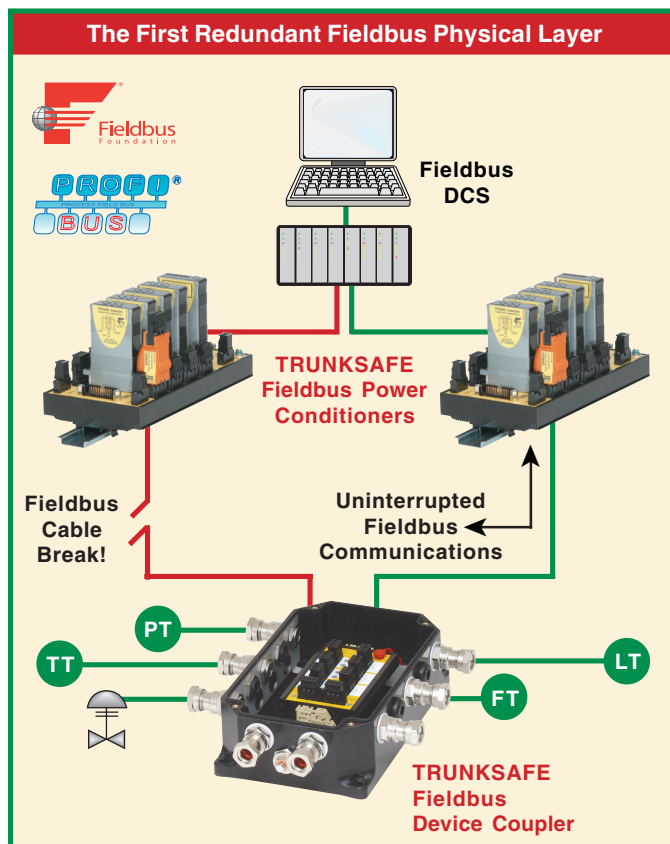
TRUNKSAFE utilizes two trunk cables (or “legs”) for physical layer redundancy to ensure no single point of failure will shut down the network. Under normal operation, the fieldbus segment is terminated at each end at the TRUNKSAFE Redundant Power Conditioners.

TRUNKSAFE maintains fieldbus communications throughout the entire segment until a fault (open- or short-circuit) is detected. Upon fault detection, the TRUNKSAFE Device Coupler initiates its automatic segment termination so that the healthy leg is properly terminated. The automatic fault detection and termination allows uninterrupted fieldbus communications throughout the segment.

Because of the patented “Automatic Segment Termination”, TRUNKSAFE is the ONLY fieldbus system that can perform an automatic switching of terminator location or that can automatically switch terminator location.

## Where does TRUNKSAFE fit best?

TRUNKSAFE is most appropriate for high-availability and process-critical segments where it is worth a reasonable amount more in up-front hardware costs to keep a process reliably up and running, or to keep it safe.



The special design of the system's dual Advanced Power Conditioners and the Device Coupler is slightly more expensive than our standard units. But in use, TRUNKSAFE actually lowers overall costs because you can use the full capability of each and every segment. Fieldbus engineering guidelines currently recommend that you only put one Level 1 critical loop on a segment, but with TRUNKSAFE you can use each segment to whatever extent you wish.

TRUNKSAFE is also cost-effective for “everyday” applications. Because TRUNKSAFE dramatically reduces the cost of implementing a redundant fieldbus segment, it is appropriate not only for critical segments, but also for segments where it is going to be expensive to lose communications.

These loops are commonly referred to as “high-availability”. In high-availability loops, the downtime can usually be stated in loss of revenue per time period. For this reason, TRUNKSAFE is an ideal solution when uptime is of utmost importance.

### What does “Fault-Tolerant” mean?

It means that the fieldbus segment using TRUNKSAFE will continue to work normally in spite of any single failure: H1 card, systems connection cable, DC power supply, fieldbus power conditioner and field cable.

### Do I need anything special to use TRUNKSAFE?

No. There is no need for special software or DCS hardware changes. All that is extra is another field trunk cable.

### Does TRUNKSAFE work with every DCS?

We have tested and confirmed operation with the following control system vendors:

- Emerson
- Honeywell
- Yokogawa
- Invensys
- ABB
- Siemens

Since there is no software in TRUNKSAFE, it will work with any system that has FOUNDATION fieldbus H1 or PROFIBUS PA communications. A MooreHawke fieldbus interface may be required for specific DCSs.

### How reliable is TRUNKSAFE?

Extremely reliable since everything is hardware based, and there is no special software. In normal operation, both field trunk cables are continuously active. TRUNKSAFE does not use ‘switch-to-standby’ redundancy.

### Can TRUNKSAFE help me with safety systems?

Yes. TRUNKSAFE is being used by the FOUNDATION fieldbus Safety Instrumented Functions (SIF) Demonstration Group to support the roll-out of FOUNDATION fieldbus SIF technology.



### We've lived so far without redundancy, why bother now?

Redundancy is a common practice on every other type of communications network, why should fieldbus be any different? The only reason redundancy hasn't been implemented before is that no one had the MooreHawke patented “Automatic Segment Termination”.

The physical layer is where most installation and commissioning problems arise. As such, a wide range of solutions have been developed to reduce these problems including short-circuit proof power conditioners, spur short-circuit protection, automatic segment termination and segment diagnostics. TRUNKSAFE provides the solution for segment fallouts caused by cable failures and accidental disconnections.