

# Product Specification

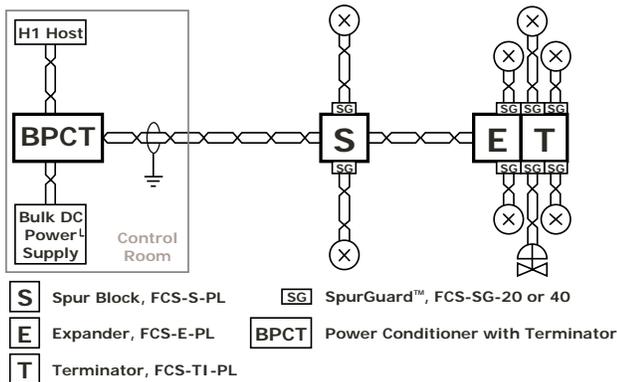
FOUNDATION™ Fieldbus  
Profibus PA

# FCS-SG-xx

For new installations, please see our Megablock Connection Products.

## Short Circuit Protection for Fieldbus

FOUNDATION™ Fieldbus is a digital communications network protocol used in industrial process control. Unlike traditional 4-20 mA communications systems, Fieldbus uses a parallel bus topology with multi-drop wiring (see diagram below). While this offers opportunities for significant cost savings relative to the point-to-point wiring used in 4-20 mA systems, it can also pose a risk to control system reliability and availability. Because transmitters on a Fieldbus network share a single cable run, a failure or short of any individual device has the potential to interrupt data communication across the entire bus segment. Such events can occur due to accidents, instrument failure, or even during routine instrument maintenance.



A SpurGuard™ is a current-limiting device that provides short circuit protection to the Fieldbus segment. By attaching a SpurGuard™ at each point that a field transmitter attaches to the segment home run cable, the network is isolated from individual device failures. A Red LED indicates when a SpurGuard™ is providing over-current protection.

## SpurGuard™ Selection

Because SpurGuards™ draw power from the segment when in short circuit mode, their short circuit current consumption must be taken into account during segment design.

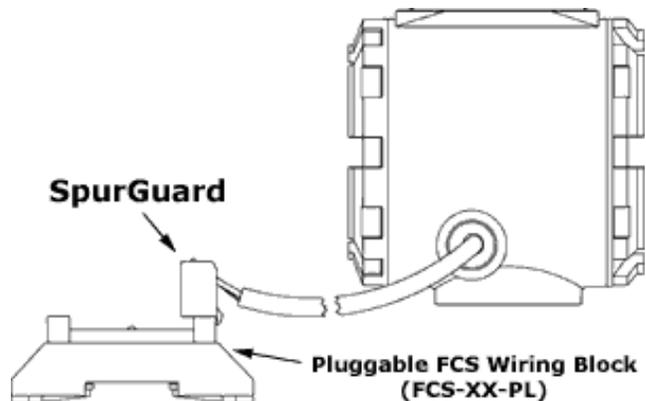
Use of SpurGuards™ with the lowest possible current consumption is recommended. This prevents excessive power from being drawn from the segment under short circuit conditions.

To determine the SpurGuard™ for your application, add the nominal current requirement of the field device connected to the spur, 10mA of signaling current, and about 20mA overhead to allow for temperature variations and the possible attachment of bus-powered test equipment to the spur. If the total current requirement is 50mA or less, the FCS-SG-20 is recommended.



## Installation

SpurGuards™ are connected at each point where a spur attaches to the segment trunk. This is done by connecting the twisted pair cable that leads to the field transmitter to the SpurGuard™ which is then plugged into a Relcom FCS wiring block attached to the trunk - see picture above.



## Mounting Requirements

SpurGuards™ require the use of Relcom FCS wiring blocks with pluggable connectors: FCS-S-PL, FCS-E-PL, or FCS-TI-PL. FCS wiring blocks are installed within a suitable enclosure, such as a field junction box, and are mounted using 35mm DIN rail. Flat panel installation is also possible using the provided mounting screw holes.

(continued on reverse side)

Product specifications are subject to change without notice.

## Installation (continued)

### Voltage Limitations (at 70°C)

To prevent overheating under prolonged short circuit conditions, observe the following voltage\* limitations:

FCS-SG-20	31.0 VDC
FCS-SG-40	19.5 VDC

\*The voltage present at a SpurGuard™ is a function of the power supplied to the segment, the load on the segment, and the length of cable separating the power supply from each SpurGuard™. See the Relcom Fieldbus Wiring Guide for detailed instructions on calculating power distribution on a Fieldbus segment.

**WARNING: Under prolonged short circuit conditions, SpurGuards™ may achieve surface temperatures in excess of 100°C.**

**Use appropriate personal protective equipment when handling a SpurGuard™ that is, or has recently been, in short circuit mode. Short circuit mode is indicated by the red LED on each SpurGuard™.**

## Part Numbers

SpurGuard™	Description
FCS-SG-20	SpurGuard™ for 20mA field devices
FCS-SG-40	SpurGuard™ for 40mA field devices

Wiring Block	Description
FCS-S-PL	Fieldbus Spur Block with pluggable connectors
FCS-E-PL	Fieldbus Expander Block with pluggable connectors
FCS-TI-PL	Fieldbus Terminator with surge suppression and pluggable connectors

## Specifications

### Short Circuit Current Limit\*

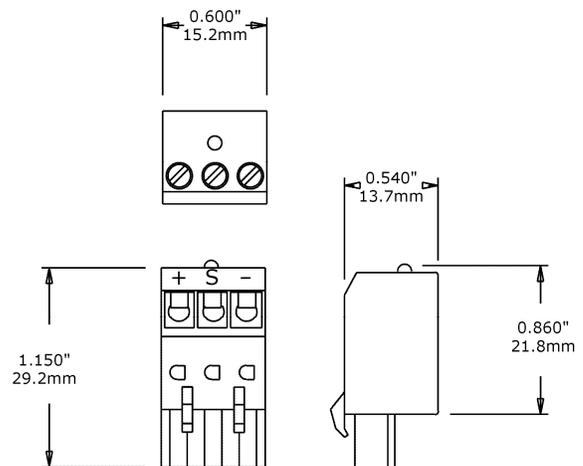
	-40°C	20°C	50°C
FCS-SG-20	60mA	52mA	47mA
FCS-SG-40	91mA	78mA	71mA

\*The current limit decreases under prolonged short circuit conditions due to heating of SpurGuards™.

### Voltage Drop

Trunk to Spur (SpurGuard™ not tripped):  
 Maximum: 0.9 V  
 Typical: 0.2 V (17 mA device current draw)

Temperature Range:	-40 to +70°C
Wire Capacity:	12-24 AWG
Case material:	Lexan Polycarbonate
Weight:	9 g
Dimensions:	15.2 × 13.7 × 29.2 mm



CSA Certified for:

Ex ia; Class I, Division 1, Groups ABCD T3  
 Maximum Ambient = 40°C

Relcom Fieldbus Connection System (FCS) wiring blocks are protected by U.S. Patent 5,775,955

Relcom SpurGuard™ technology is protected by multiple U.S. Patents: 6,366,437 and 6,369,997 and 6,519,125