Product Specification

FOUNDATION™ Fieldbus Profibus PA

FCS-BPCx-yy

The **FCS-BPCx-yy** series Balanced Power Conditioners are used to connect a conventional power supply to a Fieldbus* segment. DC power is applied to one or both sets of power terminals, ports 1 and 2 (they are connected in parallel internally). The typical input voltage range is 14 to 30 VDC. An impedance control circuit in the Power Conditioner block prevents the conventional power supply from absorbing the Fieldbus signal or otherwise interfering with the operation of the Fieldbus. Conditioned Fieldbus power is provided at two sets of terminals, ports 3 and 4, and the expansion connector. The Power Conditioner drops about 6 volts worst case. For example, if the input supply is 24 volts, the Fieldbus voltage is at least 18 volts.

A Power Conditioner-Terminator, FCS-BPCT-yy series, provides both the power supply conditioning and a terminator in the same package. Two terminators are required for each Fieldbus segment, one at each end of the trunk or "homerun" cable.

By using a terminated Power Conditioner block at the control room end of the Fieldbus segment, no external terminating devices are needed at this end of the segment. This arrangement provides for the most common Fieldbus configuration, a control room block, which provides power for the segment, near end termination, a connection point for the H1 host, and a connection point for the trunk cable. If more than two Fieldbus connection points are needed, an Expander block (FCS-E-xx series) may be plugged into the power conditioner block to provide four additional cable connection points.

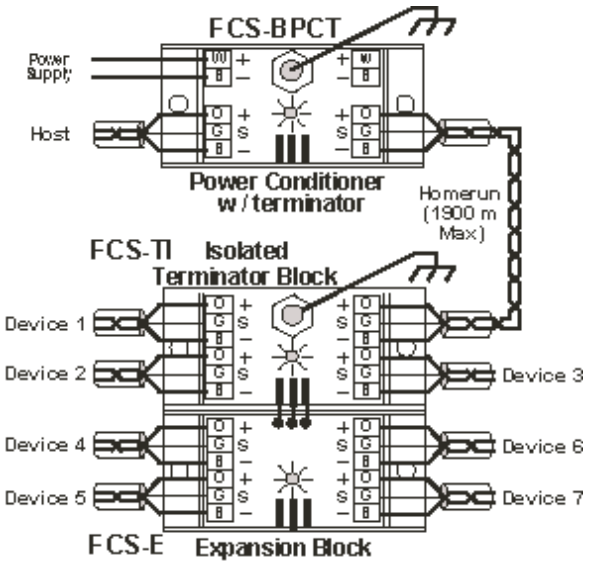
The Power Conditioner blocks are internally current limited, allowing the use of a single power supply for multiple Fieldbus segments. If a short circuit or over current condition exists on one of the segments, it will not affect the operation of the other segments as long as the total current capability of the power supply is not exceeded

A Power Conditioner with two Terminators, FCS-BPCT2-yy series, is used on very short networks where there may not be any home run cable. In this case, all devices, the controller, and the power supply are connected to a central hub. The power conditioner with two terminations provides all the Fieldbus termination and power supply conditioning requirements. This configuration is typically useful in a demo or laboratory test environment.

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

*Fieldbus is defined in ISA standard 50.02, Section 24. There are several types of Fieldbusses described in this standard. The product described in this data sheet is used in 31.25 kbps (H1) systems.

Sample Topology



The segment topology shown above uses a power supply at the control room end of the Fieldbus segment. Using a Power Conditioner with a Fieldbus terminator built into it, the number of connector blocks is minimized. If Fieldbus devices need to be in or near the control room, an Expander Block (FCS-E-series) can be plugged into the Power Conditioner to expand the number of Fieldbus connection points by four (4). The shields of the segment wiring are grounded by attaching the ground bolt on the Power Conditioner to a local earth ground. Grounding the bolt on the Isolated Terminator Block (FCS-TI-series) provides protection from shield currents induced by near lightning strikes without causing a ground loop in the shield. This is because a spark gap (gas discharge tube) is the only DC connection between the grounding bolt and the shield in the Isolated Terminator Block.

Eliminating Crosstalk

The "B" in BPC stands for "Balanced". These power conditioners have impedances in both the positive and negative legs to the Fieldbus. This causes the fieldbus segment to remain balanced even if multiple segments are connected to a single 24VDC power supply.

Isolated Power

We require connecting isolated 24VDC power to the FCS-BPC-series power conditioners. This is to eliminate a ground fault in the field from causing the segment to be unbalanced (subject to crosstalk).

Product specifications are subject to change without notice.

Relcom Inc.
INDUSTRIAL LAN | WIRING COMPONENTS AND TESTERS

2221 Yew Street
Forest Grove, Oregon 97116 USA
(503) 357-5607 or (800) 382-3765
FAX (503) 357-0491
www.relcominc.com

Current Limiting

Current limiting in the Power Conditioner is achieved by monitoring the current flow in the segment. When the current flow exceeds the maximum allowable current (420mA), the power to the field is quickly turned off. About two tenths of a second later, the power is ramped back up. If the short or overload is still present, the power is again turned off. This "restart" process is repeated until the short or overload is cleared, at which point the Power Conditioner will power the segment normally. Using this method, there is no appreciable power dissipation in the block even under a short circuit condition.

CAUTION

Use of a grounded input power source may result in failure of SpurGuards™ to protect spurs from short circuits in the field. The entire segment would also be at risk from a single ground fault on the positive trunk wire.

Installation

FCS-BPC series wiring blocks can be mounted vertically or horizontally within a suitable enclosure, such as a field junction box. They can be mounted directly or by using 35 mm DIN rail. They are secured to DIN rail by means of two extendable locking tabs. Use of DIN rail end stops is recommended to prevent sliding in vertical installations.

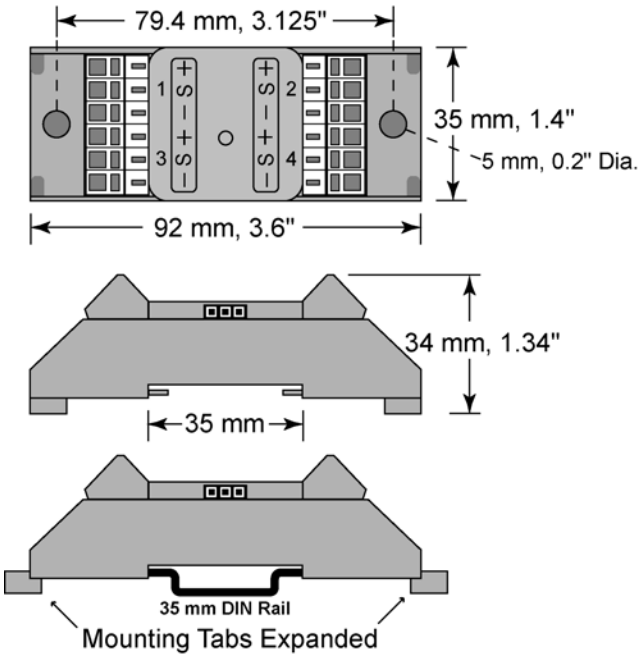
Specifications (Revision F3)

Temperature Range:	-40 to +70°C
Input Voltage:	12 to 30 VDC (ground isolation required)
Output Voltage:	Input – 6V worst case (load dependent)
Fieldbus Current:	350 mA min.
Current Limit:	420 mA
LED Current:	2.1 mA max. at 32 VDC
Surge Limit Start:	39 Volts (differential)
Surge Limit (Hard):	43 Volts (differential)
Expansion connector:	One set female (gold plated)
Wire Capacity:	12-24 AWG
Case material:	Lexan Polycarbonate
Weight:	95 g
Short Circuit Withstand:	indefinite (internally protected)
Terminator, FCS-BPCT-yy series:	100 ohm 1% 1 uF 50 V
Terminator, FCS-BPCT2-yy series:	50 ohm 1% 2.2 uF 50 V

C US

CSA approved Non-Incendive Equipment for use in Hazardous Locations.

Class I, Division 2, Groups A, B, C, and D;
Ex nA IIC T4
AEx nA IIC T4



FCS Package Outline (FCS-S-CC)

Part Numbers

FCS-BPC Series	Part Number
Balanced Power Conditioner with cage clamp type connectors	FCS-BPC-CC
Balanced Power Conditioner with pluggable screw terminal connectors (SpurGuard™ compatible)	FCS-BPC-PL
Balanced Power Conditioner with screw terminal connectors	FCS-BPC-ST
Balanced Power Conditioner with cage clamp type connectors and one integrated terminator	FCS-BPCT-CC
Balanced Power Conditioner with pluggable screw terminal connectors and one integrated terminator (SpurGuard™ compatible)	FCS-BPCT-PL
Balanced Power Conditioner with screw terminal connectors and one integrated terminator	FCS-BPCT-ST
Balanced Power Conditioner with cage clamp type connectors and two integrated terminators	FCS-BPCT2-CC
Balanced Power Conditioner with pluggable screw terminal connectors and two integrated terminators (SpurGuard™ compatible)	FCS-BPCT2-PL
Balanced Power Conditioner with screw terminal connectors and two integrated terminators	FCS-BPCT2-ST