Application Note

64F DC Ground Protection via the BE1-FLEX and FGD-2

Introduction

The purpose of this application note is to explain how the FGD-2 can be used to perform the 64F function for dc ground detection using the BE1-FLEX.

Figure 1 - BE1-FLEX Protection, Automation and Control System

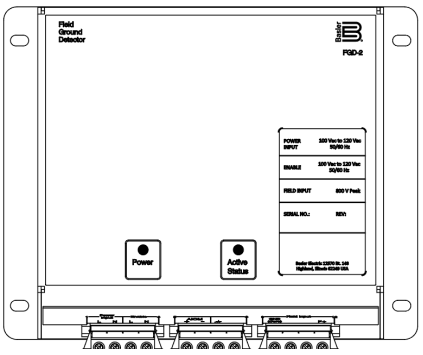

Figure 2 - FGD-2 Field Ground Detector

The FGD-2 (Field Ground Detector Module) is a device that continuously monitors for ground faults and is typically applied to monitor the machine excitation field current. Leakage current to ground is measured, and a voltage signal, proportional to the leakage current level, is received by the BE1-FLEX.

Two versions of the FGD-2 are available. With the BE1-FLEX, the low-voltage version is intended for brush or brushless excitation system applications with a rated maximum generator field voltage of 625 Vdc. The high-voltage version is available for static excitation systems with a rated maximum generator field voltage of 1,500 Vdc.

When selecting a BE1-FLEX style for this application, include a "U4" I/O and auxiliary board to receive the signal from the FGD-2.

Wiring the FGD-2 to the BE1-FLEX

As seen in Figure 3, pins AIOM 5 (+) and AIOM 6 (–) from the FGD-2 are wired to the respective (+) and (–) of the U4 I/O and auxiliary board of the BE1-FLEX.

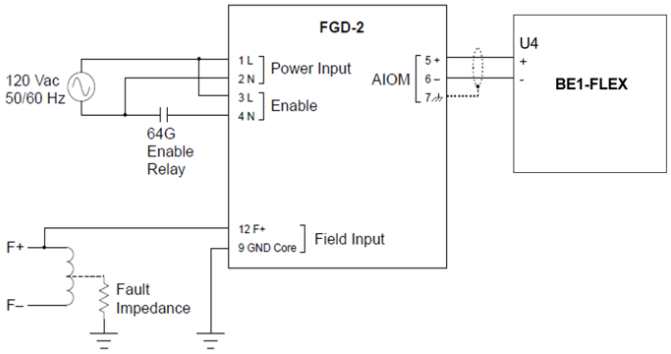

Figure 3 - FGD-2 Wiring to BE1-FLEX

Software on the BE1-FLEX

BESTCOMS*Plus*® can be used in order to utilize the analog signal from the FGD-2. The style code must include the "U4" board as seen in Figure 4. If desired, the 0 to 10 V signal can be scaled to directly reflect the leakage current as shown in Figure 5 by setting the parameter minimum and maximum respective to 0 to 10 V.

To provide protection, a configurable protection element is used. See Figure 6. Once the element is created, set the Function to Analog Input for Parameter 1. Set the Value to Raw Analog Input. The Scaled Analog Input value could alternatively be used if setting directly as leakage current is preferred.Next, Threshold 1 settings are entered to specify the pickup and desired time delay. Mode is typically set to Over. The BE1-FLEX analog inputs are bi-directional, so it is important to wire

polarity correctly. The Configurable Protection elements are processed at the same rate as other protective functions in the BE1-FLEX.

BESTCOMS*Plus*® and HMI metering (both raw and scaled), targets, and fault capture are enabled automatically. Modbus®, DNP, and IEC 61850 metering is created via standard BE1-FLEX communication settings. These functions can be modified as desired.

Once the element is set, it should be implemented to trip outputs in BESTlogic™*Plus* the same as any other protective element in the BE1-FLEX. Please see other documentation for general BE1-FLEX setup as needed.

For More Information

For more information on Basler BE1-FLEX Protection, Automation, and Control System, see www.basler.com or contact Technical Support at 618-654-2341.

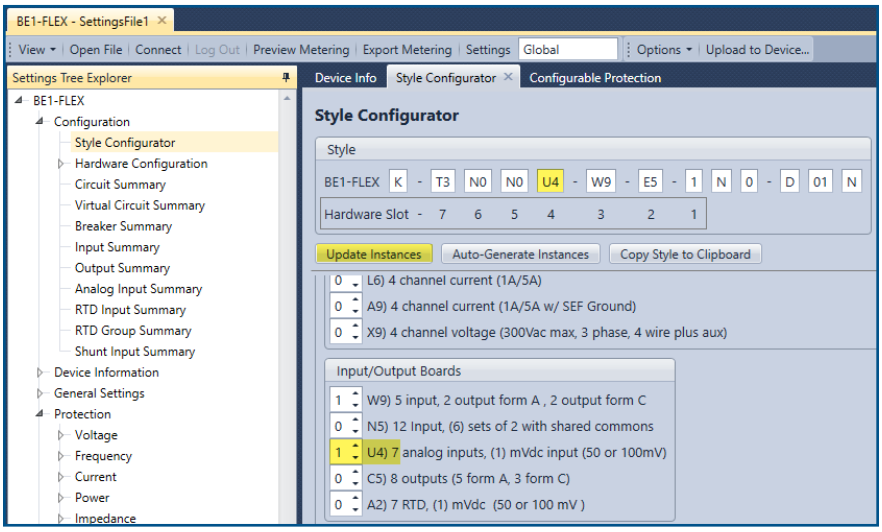

Figure 4 - BESTCOMS*Plus*® Generating Style Code with U4 Card

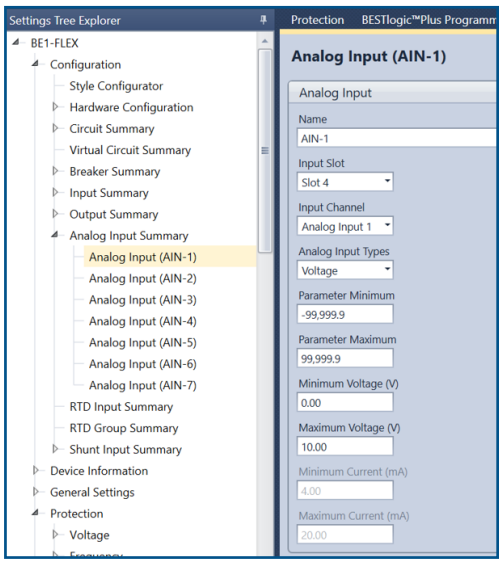

Figure 5 - Analog Input Mapping and Scaling

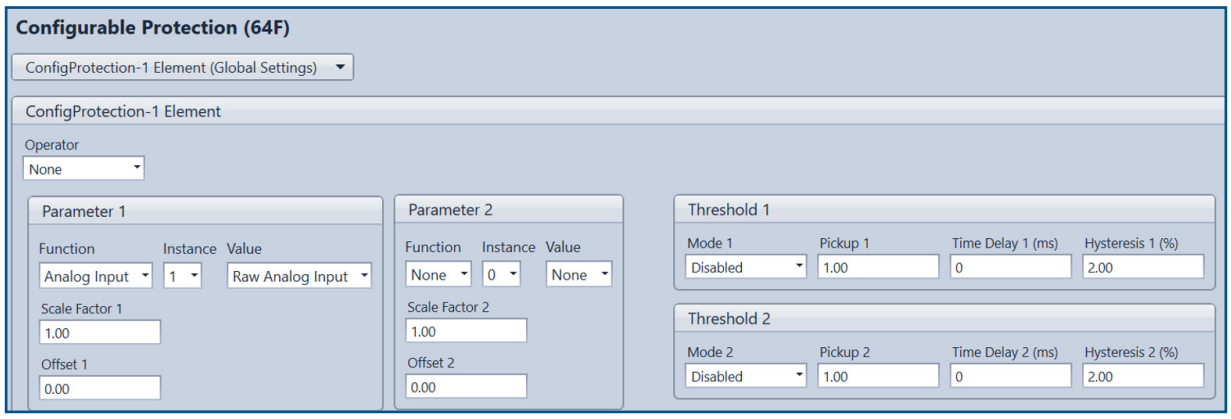

Figure 6 - BESTCOMS*Plus*® Creating a Configurable Protection Element

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