GUIDEFORM SPECIFICATIONS

Transmission line protection, fault location, control, monitoring, and metering shall be supplied as a digital relay system. It shall use one or more microprocessors and waveform sampling of the current and voltage inputs to provide the features described below. The sampling rate of the relay shall be at least 16 samples per cycle. The typical operating time of the relay (excluding the output relay) shall be 1.5 cycles or less.

Three phase tripping logic or single phase tripping logic shall be available. With single phase tripping logic the relay shall trip only the faulted phase for a single-phase-to-ground fault. The relay shall trip three-phase for all other fault types.

Protection functions shall include:

- Four zones of phase and ground distance functions
- Phase selector function to determine the faulted phases
- Out of step blocking
- Ground directional overcurrent functions
- Ground overcurrent backup, both IOC and TOC with 4 time curves
- Phase overcurrent backup, instantaneous function
- Overvoltage and potential fuse failure
- Line pickup function
- Setting selectable scheme logics: step distance, POTT, PUTT, blocking, hybrid

An optional built-in reclosing function shall be available. The reclosing function shall provide one or two reclosing attempts and allow the selection of eight different modes of operation for single pole and four modes of operation for three pole.

Provision to manually trip and close up to two local breakers via the relay shall be provided.

Four separate groups of settings shall be provided, with the active group selectable either locally or remotely.

To provide flexible use of the relay user configurable digital inputs and outputs shall be provided. At least 3 of the inputs and 6 of the outputs shall be user configurable.

Fault location shall be provided by a single-ended fault location algorithm which shall display the distance from the relay to the fault in miles, kilometers, or percent of line impedance. A digital to analog interface shall be available to provide an analog output proportional to the fault location estimate. Four normally open contacts shall be provided to indicate the phases involved in the fault.

A trip circuit monitor shall be provided which shall monitor the continuity of the breaker trip circuit.

RMS metering shall include:

- Individual phase currents and voltages (magnitude and angle)
- Watts
- Vars

Flexible oscillography (instantaneous values of current and voltage) storage shall be provided. Sufficient memory shall be present to permit storage from 2 events of 72 cycles each to 14 events of 9 cycles each.

Oscillography storage shall always be triggered when the relay trips and can also be triggered via other internal signals or an external contact.

Self tests shall be performed at start-up and run in the background during operation. Self test failures shall be split into critical failures, which shall disable the relay, and non-critical failures. The two types of failures will operate separate alarm contacts.

An events log shall be maintained containing the last 100 events time stamped to the nearest millisecond. A fault report shall be generated for each detected fault.

A 20 button keypad and 16 character LED display shall be located on the front of the unit. Three RS232 serial ports shall be provided, one on the front and two on the rear of the unit. The front port and one of the rear ports use GE Modem protocol, and communication software shall be provided. The second rear port uses ASCII protocol and shall be used to retrieve fault and metering data and to view settings. Password protection shall be provided for both keypad and computer communication. An IRIG-B input shall be available for time synchronization.

The relay shall be packaged in a three RU high 19 inch rack mount case. Vertical and horizontal models shall be available. The unit shall be available with drawout construction.

ORDERING

To order select the basic model and the desired features from the Selection Guide below.

DLP   *   *   *   *   *   *   *

DLP	1/3	1/5	0/1/2	1/2	C/J/K	D	H/V	Description
DLP								Basic unit digital line protection system
	1							Single phase tripping logic
	3							Three phase tripping logic
		1						1 Amp rated current
		5						5 Amp rated current
			0					48 VDC battery voltage
			1					110/125 VDC battery voltage
			2					220/250 VDC battery voltage
				1				SCR trip outputs and contact channel interface
				2				Contact trip outputs and contact channel interface
					C			Three phase tripping without recloser
					J			Single Phase tripping without recloser
					K			Single or three phase tripping with recloser
						D		Revision Level
							H	Horizontal mounting
							V	Vertical mounting