Typical Oscillography Settings For the L90

GE Multilin No. GET-8482

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Description

Oscillography records contain waveforms captured at the sampling rate as well as other relay data at the point of trigger. Oscillography records are triggered by a programmable FlexLogic™ operand. Multiple oscillography records may be captured simultaneously. This technical note is meant to serve as an aid to configuring oscillography. For a complete description of the L90 oscillography feature, refer to the product manual.

The oscillography captures serve as a great tool in analyzing faults, determining wiring and/or setting errors. Proper selection of analog and digital channels in the oscillography menu assures capturing of data needed for fault analysis.

Example

The following is only intended to help the user to understand some of the critical pieces of data required to successfully analyze a fault. Channels may be substituted or added at the user's discretion. Here are the recommended digital points.

SETTING	PARAMETER
Number Of Records	5
Trigger Mode	Automatic Overwrite
Trigger Position	30 %
Trigger Source	OSC_TRIG On (VO1)
AC Input Waveforms	32 samples/cycle
Digital Channel 1	SRC1 50DD OP
Digital Channel 2	87L DIFF OP A
Digital Channel 3	87L DIFF OP B
Digital Channel 4	87L DIFF OP C
Digital Channel 5	87L TRIP OP
Digital Channel 6	87L TRIP 1P OP
Digital Channel 7	87L TRIP 3P OP
Digital Channel 8	LINE PICKUP OP
Digital Channel 9	LOAD ENCHR OP
Digital Channel 10	POWER SWING TRIP
Digital Channel 11	POWER SWING BLOCK
Digital Channel 12	BREAKER 1 CLOSED
Digital Channel 13	BREAKER 2 CLOSED
Digital Channel 14	BREAKER 1 OPEN
Digital Channel 15	BREAKER 2 OPEN
Digital Channel 16	87L DIFF KEY DTT
Digital Channel 17	GND DIST Z1 OP
Digital Channel 18	GND DIST Z2 OP
Digital Channel 19	GND DIST Z3 OP
Digital Channel 20	PH DIST Z1 OP

Here is a continuation of the recommended digital points.

SETTING	PARAMETER
Digital Channel 20	PH DIST Z1 OP
Digital Channel 21	PH DIST Z2 OP
Digital Channel 22	PH DIST Z3 OP
Digital Channel 23	87L DIFF RECVD DTT A
Digital Channel 24	87L DIFF RECVD DTT B
Digital Channel 25	87L DIFF RECVD DTT C
Digital Channel 26	SRC1 VT FUSE FAIL OP
Digital Channel 27	POTT OP
Digital Channel 28	OPEN POLE OP
Digital Channel 29	87L DIFF CH1 FAIL
Digital Channel 30	87L DIFF CH2 FAIL
Digital Channel 31	87L DIFF PFLL FAIL
Digital Channel 32	87L DIFF BLOCKED
Digital Channel 33	OFF

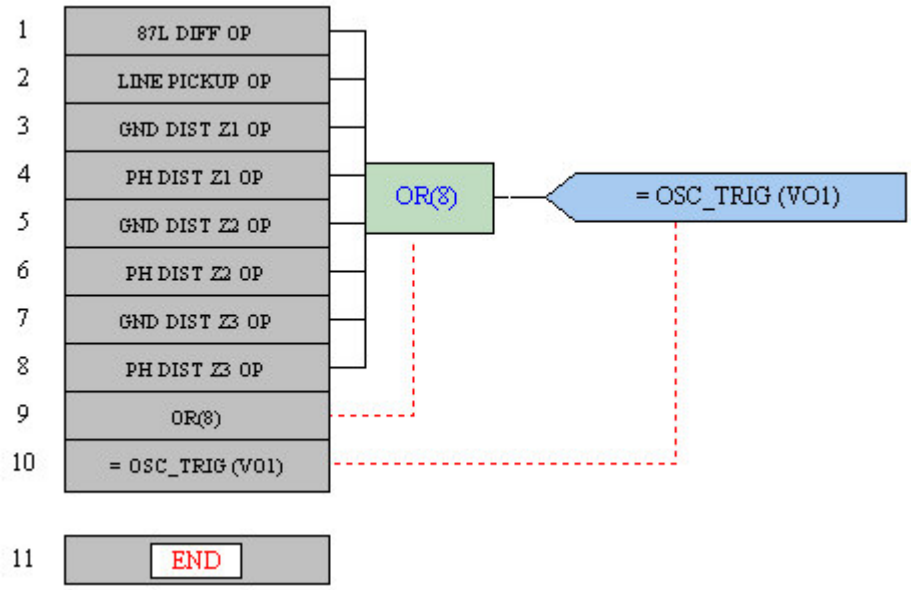
Not all of the possible digital points are included in this example. Other important points include the breaker status contacts (52a, 52b), contact inputs, contact outputs, other desired protection elements (50, 50N/G, 51, 51N/G, UV, OV), virtual inputs/outputs, remote inputs/outputs and direct inputs/outputs. These should be configured depending on the relay and system configurations. Note that all voltages and currents that are configured as sources under the system setup will automatically be included in the oscillography capture.

Here are the recommended analog points.

Digital Channel 63	OFF
Analog Channel 1	Terminal 1 IA Mag
Analog Channel 2	Terminal 1 IA Angle
Analog Channel 3	Terminal 1 IB Mag
Analog Channel 4	Terminal 1 IB Angle
Analog Channel 5	Terminal 1 IC Mag
Analog Channel 6	Terminal 1 IC Angle
Analog Channel 7	Local IA Mag
Analog Channel 8	Local IA Angle
Analog Channel 9	Local IB Mag
Analog Channel 10	Local IB Angle
Analog Channel 11	Local IC Mag
Analog Channel 12	Local IC Angle
Analog Channel 13	Diff Curr IA Mag
Analog Channel 14	Diff Curr IB Mag
Analog Channel 15	Diff Curr IC Mag
Analog Channel 16	Tracking Frequency

The oscillography trigger must also be configured to ensure that the data is captured at the time of the fault. The trigger source can be one of various protection elements, a trip output or a virtual output consisting of multiple protection elements. The following will show a typical FlexLogic™ equation that could drive a virtual output and thus cause an oscillography trigger.

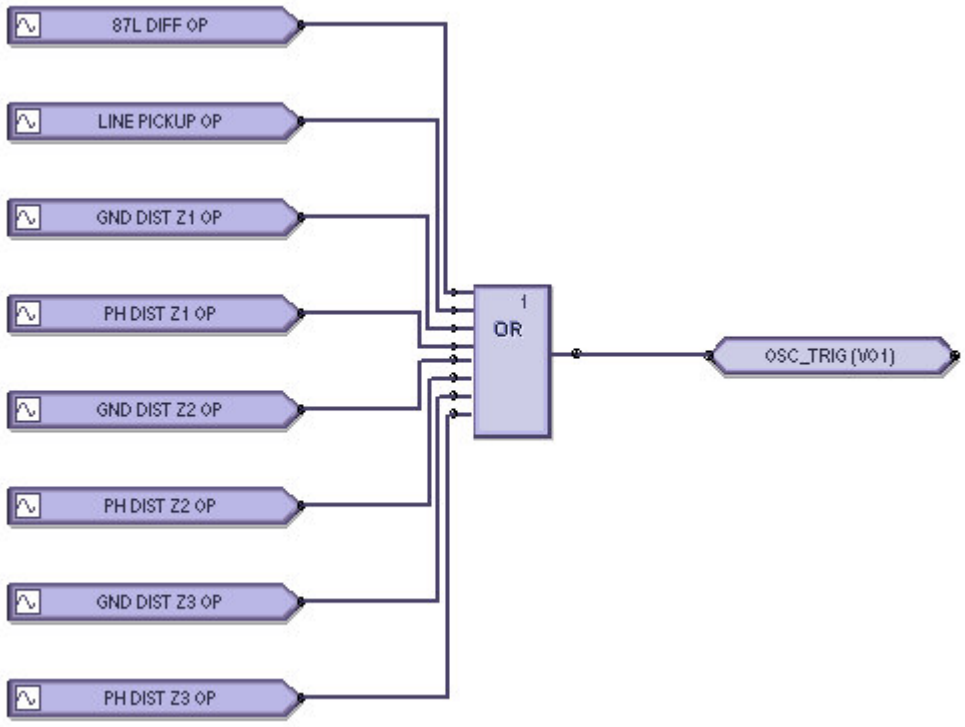
FLEXLOGIC ENTRY	TYPE	SYNTAX
View Graphic	View	View
FlexLogic Entry 1	Protection Element	87L DIFF OP
FlexLogic Entry 2	Protection Element	LINE PICKUP OP
FlexLogic Entry 3	Protection Element	GND DIST Z1 OP
FlexLogic Entry 4	Protection Element	PH DIST Z1 OP
FlexLogic Entry 5	Protection Element	GND DIST Z2 OP
FlexLogic Entry 6	Protection Element	PH DIST Z2 OP
FlexLogic Entry 7	Protection Element	GND DIST Z3 OP
FlexLogic Entry 8	Protection Element	PH DIST Z3 OP
FlexLogic Entry 9	OR	8 Input
FlexLogic Entry 10	Write Virtual Output[Assign]	= Osc_Trig (VO1)
FlexLogic Entry 11	End of List	



These diagrams show the FlexLogic™ equation as seen in Enervista UR Setup.

The FlexLogic™ equation shown here was created using the FlexLogic™ equation editor in the enerVista UR Setup software program. EnerVista UR Setup is GE Multilin's toolset that simplifies the process of Settings Creation, Communicating to and testing of the UR relays.

You can download this software free from our website at:
http://www.geindustrial.com/multilin/software/ur/



This diagram shows the FlexLogic™ equation as seen in Enervista Viewpoint Engineer Logic Designer.

The FlexLogic™ equation shown here was created and documented using the Graphical Logic Designer from the Viewpoint Engineer software package. Viewpoint Engineer is GE Multilin's premium toolset that simplifies the process of Settings Creation, Simulation Testing and Commissioning.

You can download and try this software free for 15 days from our website at: http://www.geindustrial.com/multilin/enervista/viewpoint/engineer.htm

This oscillography trigger and FlexLogic™ equation are only intended as an example and the trigger source for each system should be different. It is important to note that the oscillography trigger is automatically included in the oscillography capture.

The number of records, number of samples per cycle and trigger position should also be adjusted to allow for an adequate amount of data to be captured in the oscillography. For a full explanation of these settings, please refer to the product manual.