Typical Oscillography Settings For the T60

GE Multilin No. GET-8483

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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^{TM} 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 T60 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	RESTD GND FT1 OP
Digital Channel 2	SRC1 50DD OP
Digital Channel 3	XFMR INST DIFF OP
Digital Channel 4	XFMR PCNT DIFF OP
Digital Channel 5	XFMR INST DIFF OP A
Digital Channel 6	XFMR INST DIFF OP B
Digital Channel 7	XFMR INST DIFF OP C
Digital Channel 8	XFMR PCNT DIFF 2ND A
Digital Channel 9	XFMR PCNT DIFF 2ND B
Digital Channel 10	XFMR PCNT DIFF 2ND C
Digital Channel 11	XFMR PCNT DIFF OP A
Digital Channel 12	XFMR PCNT DIFF OP B
Digital Channel 13	XFMR PCNT DIFF OP C
Digital Channel 14	VOLTS PER HERTZ 1 OP
Digital Channel 15	VOLTS PER HERTZ 2 OP
Digital Channel 16	PHASE TOC1 OP
Digital Channel 17	PHASE TOC2 OP
Digital Channel 18	GROUND IOC1 OP
Digital Channel 19	GROUND IOC2 OP
Digital Channel 20	OFF

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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.
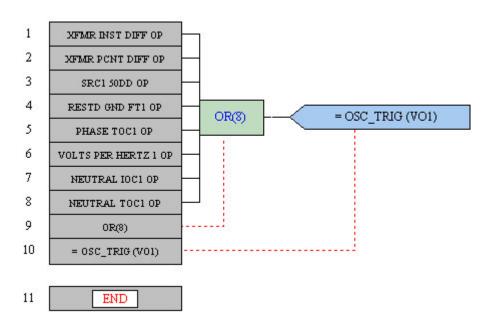
Here are the recommended analog points.

Digital Channel 63	OFF
Analog Channel 1	Xfmr Iad Mag
Analog Channel 2	Xfmr Iar Mag
Analog Channel 3	Xfmr Harm2 Iad Mag
Analog Channel 4	Xfmr Ibd Mag
Analog Channel 5	Xfmr Ibr Mag
Analog Channel 6	Xfmr Harm2 Ibd Mag
Analog Channel 7	Xfmr Icd Mag
Analog Channel 8	Xfmr Icr Mag
Analog Channel 9	Xfmr Harm2 Icd Mag
Analog Channel 10	RGF 1 Igd Mag
Analog Channel 11	RGF 1 Igr Mag
Analog Channel 12	SRC1 In Mag
Analog Channel 13	SRC1 Ig Mag
Analog Channel 14	SRC1 V_0 Mag
Analog Channel 15	Volts Per Hertz 1
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.

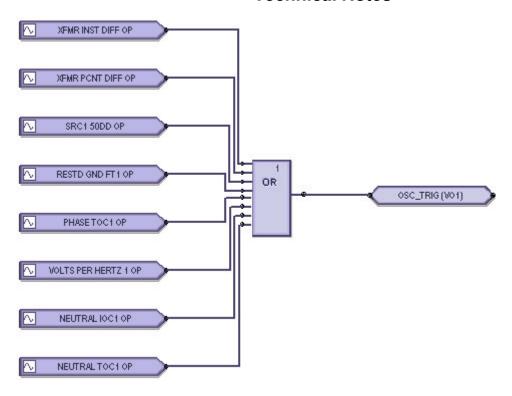| FLEXLOGIC ENTRY	TYPE	SYNTAX
View Graphic	View	View
FlexLogic Entry 1	Protection Element	XFMR INST DIFF OP
FlexLogic Entry 2	Protection Element	XFMR PCNT DIFF OP
FlexLogic Entry 3	Protection Element	SRC1 50DD OP
FlexLogic Entry 4	Protection Element	RESTD GND FT1 OP
FlexLogic Entry 5	Protection Element	PHASE TOC1 OP
FlexLogic Entry 6	Protection Element	VOLTS PER HERTZ 1 OP
FlexLogic Entry 7	Protection Element	NEUTRAL IOC1 OP
FlexLogic Entry 8	Protection Element	NEUTRAL TOC1 OP
FlexLogic Entry 9	OR	8 Input
FlexLogic Entry 10	Write Virtual Output[Assign]	= Osc_Trig (VO1)
FlexLogic Entry 11	End of List	

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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.