HV System Application Guide
Instek GPT-12003 Addendum

Dynalab Test Systems

Dynalab
TEST SYSTEMS

Overview

The HV System can provide the below additional features when an Instek GPT-12003 unit is used instead of an Instek GPT-9803 unit.

- Voltage Ramp Down function
- IR resistance maximum from 10GΩ to 50 GΩ
- IR test voltage maximum from 1000VDC up to 5000VDC

This document highlights in RED the required parameter changes between the Instek GPT-9803 and the Instek GPT-12003 Units.

Required Changes:

- Add parameters for Ramp Down function.
- Add IR resistance units of measure value (“M” or “G”) This is a mandatory value which means that NX Editor programs created for Instek GPT-9808 units are NOT compatible with programs for Instek GPT-12003 units.

Any syntax, value ranges or rule discrepancies will result in an “Error 671: Invalid Parameters” message.

Test Parameter Settings

DC - Dialectic Withstand Settings

Command	Default Value	Units	Description	Options / Ranges
MANU:EDIT:MODE	DCW	N/A	**Operation Mode** Set test mode to DCW (DC - Dialectic Withstand Test)	DCW / ACW / IR
MANU:UTIL:ARCM	ON_STOP	N/A	**Arc Detect Mode** The ON_STOP setting is required for proper operation with the Dynalab NX Tester.	ON_STOP, ON_CONTinue, OFF
MANU:DCW:TTIM	0.5	Sec.	**Test Time** Duration voltage is applied. Recommend shortest time unless customer specification requires longer value. Longer test times will potentially find Dielectric Withstand failures that would not be detected with a shorter test time.	0.5 to 999.9
MANU:RTIM	0.1	Sec.	**Ramp Time (Up)** Duration of ramping up to set voltage. A value of 0.1 is recommended for maximum productivity unless harness test specification requires higher value. If the capacitance of the harness is too high, then erroneous arc errors might occur. Increasing the ramp time will potentially eliminate these arc errors from occurring.	0.1 to 999.9
MANU:DCW:VOLT	1.000	kV	**Test Voltage** Sets test voltage based on specification requirement. The higher the test voltage, the larger the gap (distance between the two conductors) will be discovered with an arc. Though not common, it is possible for test voltages to lower the dielectric withstand characteristics or damage the wire insulation. However, it is not easy to determine which voltage levels will alter the wire insulation characteristics. Higher test voltages can be more dangerous to humans.	0.050 to 6.100
MANU:DCW:CLOS	0.00	mA	**Test Current - Low Threshold** The low current threshold is always set to 0.0 for wire harness applications.	0.00 to 10.90

MANU:DCW:CHIS	2.00	mA	**Test Current - High Threshold (Maximum Leakage Current)** This setting establishes the maximum amount of current (leakage current) applied during a test. If the capacitance of the harness is too high, then erroneous arc errors might occur. Increasing this test current threshold will potentially eliminate these arc errors from occurring. The only reason for keeping this value low is that higher currents can be more dangerous to humans. A value of 2.0 should work for most wire harness testing applications.	0.01 to 11.00
MANU:DCW:ARCC	3.00	mA	**Arc Current Threshold Setting** The setting determines the value of current required for the arc to be detected. If this is set too high, arcs may not be detected in some cables. If it is set too low, a corona affect may cause nuisance intermittent arc failures. Corona is small discharges occurring to the surrounding air space that happens when conductors are energized with high voltage. *If ARCC is set lower than CHIS, then this could result in reporting an ARC failure due to excessive leakage rather than an actual arc occurring (an arc did not occur).* *Value is limited to 2X the "MANU:DCW:CHIS" setting, regardless of value entered.*	1.00 to 20.00
MANU:DCW:REF	0.00	mA	**Current Reference Setting** The Current Reference Setting is typically set to 0.00 for wire harness applications since test equipment and test fixtures typically have low leakage current and capacitance. The current specified in this setting is the estimated, calculated, or measured leakage current of the test equipment and test fixture. This leakage current value will be subtracted from current thresholds, hence eliminating (nulling) the leakage current of the test equipment/fixturing from the test.	0.00 to 10.90
MANU:DCW:GRO	ON	N/A	**Ground Mode Setting** The ON setting is required for proper operation with the Dynalab NX Tester.	ON
MANU:DCW:RAMPDOWN	0	Sec.	**Ramp Down** Set based on specification requirement. Duration to decrease from test voltage to zero volts. Feature has unknown benefit for production wire harness testing applications.	0 (No ramp) 0.1 to 999.9

Copy and then paste these commands directly into a HV Workflow item:

```
MANU:EDIT:MODE DCW
MANU:UTIL:ARCM ON_STOP
MANU:DCW:TTIM 0.5
MANU:RTIM 0.1
MANU:DCW:VOLT 1.000
MANU:DCW:CLOS 0.0
MANU:DCW:CHIS 2.0
MANU:DCW:ARCC 3.0
MANU:DCW:REF 0.0
MANU:DCW:GRO ON
MANU:DCW:RAMPDOWN 0
```

AC - Dialectic Withstand Settings

Command	Default Value	Units	Description	Options / Ranges
MANU:EDIT:MODE	ACW	N/A	**Operation Mode** Set test mode to ACW (AC - Dielectric Withstand Test)	DCW / ACW / IR
MANU:UTIL:ARCM	ON_STOP	N/A	**Arc Detect Mode** The ON_STOP setting is required for proper operation with the Dynalab NX Tester.	ON_STOP, ON_CONTinue, OFF
MANU:ACW:TTIM	0.5	Sec.	**Test Time** Duration voltage is applied. Recommend shortest time unless customer specification requires longer value. Longer test times will potentially find Dielectric Withstand failures that would not be detected with a shorter test time.	0.5 to 999.9
MANU:RTIM	0.1	Sec.	**Ramp Time** Duration of ramping up to set voltage. A value of 0.1 is recommended for maximum productivity unless harness test specification requires higher value.	0.1 to 999.9
MANU:ACW:FREQ	60	Hz	**Frequency** Sets the frequency of the AC sine waveform.	50 or 60
MANU:ACW:VOLT	4.200	kV RMS	**Test Voltage** Sets test voltage based on specification requirement. The higher the test voltage, the larger the gap (distance between the two conductors) will be discovered with an arc. Though not common, it is possible for test voltages to lower the dielectric withstand characteristics or damage the wire insulation. However, it is not easy to determine which voltage levels will alter the wire insulation characteristics. Higher test voltages can be more dangerous to humans.	0.050 to 5.000
MANU:ACW:CLOS	0.0	mA	**Test Current - Low Threshold** The low current threshold is always set to 0.00 for wire harness applications.	0.00 to 41.9

MANU:ACW:CHIS	2.0	mA	**Test Current - High Threshold (Maximum Leakage Current)** This setting establishes the maximum amount of current applied during a test. Set per wire harness testing specification, otherwise a value of 2.0 should work for most applications. ACW testing draws current continuously during the test. This is primarily due to harness and fixture capacitance. This value must be high enough to drive the necessary current into the harness to achieve the set voltage. The reason for keeping this value low is that higher currents can be more dangerous to humans.	0.01 to 42.0
MANU:ACW:ARCC	3.0	mA	**Arc Current Threshold Setting** The setting determines the value of current required for the arc to be detected. If this is set too high, arcs may not be detected in some cables. If it is set too low, a corona affect may cause nuisance intermittent arc failures. Corona is small discharges occurring to the surrounding air space that happens when conductors are energized with high voltage. *If ARCC is set lower than CHIS, then this could result in reporting an ARC failure due to excessive leakage rather than an actual arc occurring (an arc did not occur).* *Value is limited to 2X the "MANU:ACW:CHIS" setting, regardless of value entered.*	1.00 to 40.00
MANU:ACW:REF	0.0	mA	**Current Reference Setting** The Current Reference Setting is typically set to 0.00 for wire harness applications since test equipment and test fixtures typically have low leakage current and capacitance. The current specified in this setting is the estimated, calculated, or measured leakage current of the test equipment and test fixture. This leakage current value will be subtracted from current thresholds, hence eliminating (nulling) the leakage current of the test equipment/fixturing from the test.	0.00 to 41.9
MANU:DCW:GRO	ON	N/A	**Ground Mode Setting** The ON setting is required for proper operation with the Dynalab NX Tester.	ON
MANU:DCW:RAMPDOWN	0	Sec.	**Ramp Down** Set based on specification requirement. Duration to decrease from test voltage to zero volts. Feature has unknown benefit for production wire harness testing applications.	0 (No ramp) 0.1 to 999.9

Copy and then paste these commands directly into a HV Workflow item:

```
MANU:EDIT:MODE ACW
MANU:UTIL:ARCM ON_STOP
MANU:ACW:TTIM 0.5
MANU:RTIM 0.1
MANU:ACW:FREQ 60
MANU:ACW:VOLT 1.000
MANU:ACW:CLOS 0.0
MANU:ACW:CHIS 2.0
MANU:ACW:ARCC 3.0
MANU:ACW:REF 0.0
MANU:DCW:GRO ON
MANU:DCW:RAMPDOWN 0
```

IR - Insulation Resistance Settings

Command	Default Value	Units	Description	Options / Ranges
MANU:EDIT:MODE	IR	N/A	**Operation Mode** Set test mode to IR (IR – Insulation Resistance Test)	DCW / ACW / IR
MANU:IR:TTIM	0.5	Sec.	**Test Time** Duration voltage is applied. Recommend shortest time unless customer specification requires longer value. If the measured value is below the Low Threshold (IR:RLOS), then the test time may not go to the set duration. Reported IR value is measured at the end of the test time setting.	0.5 to 999.9
MANU:RTIM	0.1	Sec.	**Ramp Time** Duration of ramping up to set voltage. A value of 0.1 is recommended for maximum productivity unless harness test specification requires higher value.	0.1 to 999.9
MANU:IR:VOLT	1.000	kV	**Test Voltage** Sets test voltage based on specification requirement. Higher test voltages can be more dangerous to humans.	0.050 to 1.000 (Steps of 0.05)
MANU:IR:RLOS	1000M	MΩ	**Insulation Resistance - Low Threshold** The low IR threshold is the minimum IR the harness is allowed to have.	1M to 9999M OR 1G to 50G
MANU:IR:RHIS	NULL	MΩ	**Insulation Resistance - High Threshold** This setting establishes the upper limit of IR. An ideal perfect harness has an IR of infinity (∞). Setting this value too low can cause good harnesses to fail.	2 to 9999 Or NULL (Sets to ∞)
MANU:IR:REF	0.00	MΩ	**IR Reference Setting** The IR Reference Setting is typically set to 0 for wire harness applications since test equipment and test fixtures typically have high leakage resistance. The IR specified in this setting is the estimated, calculated, or measured leakage resistance of the test equipment and test fixture. This value will be subtracted from IR thresholds, hence eliminating (nulling) the leakage resistance of the test equipment/fixturing from the test.	0 to 9999
MANU:DCW:GRO	OFF	N/A	**Ground Mode Setting** The ON setting is required for proper operation with the Dynalab NX Tester.	OFF
MANU:DCW:RAMPDOWN	0	Sec.	**Ramp Down** Set based on specification requirement. Duration to decrease from test voltage to zero volts. Feature has unknown benefit for production wire harness testing applications.	0 (No ramp) 0.1 to 999.9

Copy and then paste these commands directly into a HV Workflow item:

```
MANU:EDIT:MODE IR
MANU:IR:TTIM 0.5
MANU:RTIM 0.1
MANU:IR:VOLT 1.000
MANU:IR:RLOS 1000M
MANU:IR:RHIS NULL
MANU:IR:REF 0
MANU:DCW:GRO OFF
MANU:DCW:RAMPDOWN 0
```