SOFTWARE (designed for) AOT SYSTEM Upgrade USER MANUAL

(Version 6.94)

(2007)



Copyright Note

The Duplication of this Manual and its accompanying Software is restricted. Unless authorization was made, duplication for whatever reasons (except to backup or for archival purpose) cannot indemnify the party against the Copyright Laws of the Country.

Whenever there is dispute in points of Law, the decision would be referred to a Singapore Court and its affiliate which is final.

The Authorized User is allowed the use of materials herein for operation purposes only. No other use/s is/are intended.

It is deemed that the User had accepted the above conditions upon using the material herein and the Software.

Serial No:

CONTENTS

ITEM PA	AGE
1. SYSTEMS DEFINITIONS	[4]
2. SYSTEM INSTALLATION	[5]
 SYSTEM OPERATION User Interface	 [6] [7] [8] [10] [11] [12] [13] [14] [16] [17] [21] [22] [23] [24] [25] [26] [27] [30] [40] [42] [43] [44]
6. System Test Flow	[46]
5 PCLCONTROLLED TESTER	[+/]
J. I GI GUNINULLU ILGIER	[4 0]
6. ADDENDUM	[49]

1. SYSTEM DEFINITIONS

This Software is written for the PC loaded with the Windows XP Operating System. It is recommended that the PC should have an equivalent Pentium 4/5 CPU with 128M Bytes of memory and above. It MUST have at least 2G Bytes of Hard disk free space. It MUST have a S/VGA monitor of resolution 1024 x 768.

The PC contains a PCI Bus Digital I/O card. There is a 100-pin connector that connects to an external 100-pin cable. The other end of the cable then connects to the AOT System CCI Card cage.

The System provides full automatic control of the various cards that are contained in the AOT Test System. Functions like calibration, set up and Programming are provided. It also provides an interactive environment for the building up of Test Programs. Different debugging modes are supported.

Test Summary and Datalogging are features that are also available. They can be printed or saved. Test results are displayed when debugged. Binning for Failed or Passed are selectable plus the capability to jump to different Test Limits to different Binning Numbers.

Production based Test Programs are easily loaded via dialog.

<< IMPORTANT! Test Program/Summary/Log File names MUST be UNIQUE to prevent it being overwritten >>

2. SYSTEM INSTALLATION

You should have a CD System Software for the Windows XP Operation System. A hard key is provided for Software Security. It is plugged into to the LPT1 printer port at the rear of the working PC.

The PCI DI/O card should be plugged into a PCI slot in the PC. The 100-pins cable should be plugged to the DI/O card's connected to the rear of the PC. The other end should be plugged to the CCI connector of the AOT System.

The installation begins by loading the CD into the CDROM drive. The default directory is 'C:\ADDT' (DO NOT change it). Installation is automatic and is completed when the CD is executed without error.

Selecting the `AOT System Upgrade'' menu and then the 'AOT System Upgrade' icon under the Programs menu to start the Program.

- Note: 1) If the hard key is not available, then the Program will run in Demo Mode, no actual data will taken place from and to the Test System.
 - WARNING! By Loading the System Software in your system, you have indicated that you HAVE AGREED to abide by the Copyright Laws of your country. In the case of dispute, the Copyright Laws of the Republic of Singapore will prevail.

Advanced Discrete Device Tester REV 6.9.4 7/	27/2007 4:37:40 PM
——— Torquil	
System & Service	
LOAD MANUAL HANDLER DEBUG STOP ON STOP ALL CALIBRATE SETUP	
SUMMARY DATALOG SINGLE TEST LOOPING CONFIGURE SAVE	
Display	
	BIN 4 O BIN 20
	BIN 5 O BIN 21
	BIN 6 🔿 BIN 22
	BIN 7 🔿 BIN 23
	BIN 8 🔿 BIN 24
	BIN 9 () BIN 25()
	BIN 10 BIN 26
· · · · · · · · · · · · · · · · · · ·	
Exit	START TEST

3.1 USER INTERFACE

The above shows the User Interface for which the User will be seeing after starting the Program.

Note: 1) If the hard key is unavailable, the message 'Missing or Bad Key, will run on Demo Mode' will be shown. When this appears, there will NOT be real data during test.

<< >>

Advanced Discrete Device Tester REV 6.9.4 7	//27/2007 4:37:40 PM
—— Torquil	
System & Service	
	BIN 1 () BIN 17()
Display	BIN 2 O BIN 18
	BIN 3 () BIN 19()
	BIN 4 O BIN 20
	BIN 10 BIN 26
	BIN 12 BIN 28
	BIN 13 BIN 29
	BIN 14 BIN 30
	BIN 15 BIN 31
I	BIN 16 BIN 32
	CTART
Exit	TEST
	1231

3.1.1 INPUT AND COMMAND BUTTONS

Descriptions as below:-

[LOAD]	[MANUAL]	[HANDLE]	R] [DEBUG]	[STOP ON REJECT]] [STOP ALL TEST	S] [CALIBRATE]	[SETUP]
(Note: 1)	(Note: 2)	(Note: 3)	(Note: 4)	(Note: 5)	(Note: 6)	(Note: 7)	(Note: 8)
[SUMMA	RY] [DATA	LOG]		[SINGLE TEST]	[LOOPING]	[CONFIGURE]	[SAVE]
(Note: 9 14)) (Note:	: 10)		(Note: 11)	(Note: 12)	(Note: 13)	(Note:
[E <u>x</u> it] (Note: 15	0					[START TES (Note: 16)	T]
(11010.10)					(11000.10)	
Notes: 1) Use to lo	ad an exist	ing Test Pi	ogram.			
2) Use to te	rminate the	e Testing w	hen looping tests is	s performed.		
3) Use for c	onnection	to Handler.				
4) Use for s	etting the l	Debug mod	le and displaying va	alues measured/ca	alculated.	
5) Use for s	etting, in the	he Debug r	node, to stop only o	on Reject Tests.		
6) Use for s	etting, in th	he Debug r	node, to stop on Al	l Tests.		
7) Use to se	elect to star	t the System	m Calibration with	the Standard Cali	bration Board.	
8) Use to Pr	rogram Nev	w Test setu	p and sequence.			
9) Use to sh	now/save/p	rint the cur	rent test summary (data.		
10)) Use to L	og Failed/	Passed/All	test parameter cour	nts.		
1	1) Use for s	setting, in t	he Debug	mode, to do a test o	on each command		
12	2) Use to d	o continuo	us cycle te	sting.			
13	3) Use to se	et up the L	ine Matrix.	-			

14) Use to save the Test Program during the New Test setup.

15) Exit the Program.

16) Use to do the testing after loading a Test Program.

Open				? 🛛		7/28/2007 2:07:47 PM
Look in:	DATA		- te 💣 🎟			
My Recent Documents Desktop My Documents My Computer My Network Places	Image: An additional state of the state	4N25FULL Test Files(*,t\$t) Open as read-only	v	Open Cancel	SAVE	BIN 1 BIN 17 BIN 2 BIN 18 BIN 3 BIN 19 BIN 4 BIN 20 BIN 5 BIN 21 BIN 6 BIN 22 BIN 7 BIN 23 BIN 8 BIN 24 BIN 9 BIN 25 BIN 10 BIN 26 BIN 11 BIN 27 BIN 12 BIN 28 BIN 13 BIN 29 BIN 14 BIN 30 BIN 15 BIN 31
					×	BIN 16 BIN 32
E <u>x</u> it						START TEST
		AI	DDT C:\ADDT\DATA\4N: OK	25FULL.t\$t		

3.2.1 LOADING

The above will be shown when the [LOAD] button is clicked. This function will load a Test Program into the System memory.

The default directory for this command is the 'C:\ADDT\DATA'. In this directory the Filenames have the 'xxxxx.t\$t' format, where xxxxxx is the filename and the '.t\$t' is the filename extension. The above shows a filename '4N25FULL.T\$T' By clicking on the filename and then the [Open] button will load the file into the System.

Click [OK] to close the dialog.

Advanced Discrete Device Tester REV 6.9.4	7/28/2007 2:09:34 PM
——— Torquil	
System & Service LOAD MANUAL HANDLER DEBUG STOP ON REJECT STOP ALL TESTS CALIBRATE SETUP SUMMARY DATALOG SINGLE TEST LOOPING CONFIGURE SAVE Display	BIN 1 BIN 17 BIN 2 BIN 18 BIN 3 BIN 19 BIN 4 BIN 20 BIN 5 BIN 21 BIN 6 BIN 22 BIN 7 BIN 23 BIN 8 BIN 24
	BIN 9 BIN 25 BIN 10 BIN 26 BIN 11 BIN 27 BIN 12 BIN 28 BIN 13 BIN 29 BIN 14 BIN 30 BIN 15 BIN 31 BIN 16 BIN 32
Egit	START TEST

3.2.2 START TEST

The above show the result of a Test after a DUT (Device under Test) is loaded into the Load Board and the [START TEST] button is clicked. (Following the previous action of loading a device test program.)

The result is a Bin 1, which is a pass (good) unit. (Refer to section 3.3.2 for the Binning setup)

At this stage, testing can continue either manually or by enabling the [DEBUG] feature for various analysis requirements.

Advanced Discrete Device Tester REV 6.9.4	7/28/2007 2:10:13 PM
——— Torquil	
System & Service LOAD MANUAL HANDLER DEBUG STOP ON REJECT STOP ALL TESTS CALIBRATE SETUP SUMMARY DATALOG SINGLE TEST LOOPING CONFIGURE SAVE Display Display	BIN 1 🔵 BIN 17) BIN 2 🔵 BIN 18)
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	BIN 3 BIN 19 BIN 4 BIN 20 BIN 5 BIN 21 BIN 6 BIN 22
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	BIN 7 0 BIN 23 BIN 8 BIN 24 BIN 9 BIN 25
	BIN 10() BIN 26() BIN 11() BIN 27() BIN 12() BIN 28() BIN 13() BIN 29()
	BIN 14 BIN 30 BIN 15 BIN 31 BIN 16 BIN 32
E <u>x</u> it	START TEST

3.2.3 DEBUG MODE

The above is shown when the [DEBUG] button is activated. This allows measured/calculated values of each Test Parameter to be shown.

The format of the display (e.g. for Line #1) is as follows:-



Note: 1) For Test No: if the particular test fails then there will be an asterisk (*) attached to the left of the letter T (e.g. if T1 fail the test then it will display *T1.)

Advanced Discrete Device Tester REV 6.9.4 7	7/28/2007 3:24:10 PM
Torquil DO.1	
System & Service	
LOAD MANUAL HANDLER DEBUG STOP ON STOP ALL CALIBRATE SETUP	
SUMMARY DATALOG SINGLE TEST LOOPING CONFIGURE SAVE	
Display Summary	
No of Passes 2 66.67% Duick •	
T 1: KELVIN = 0.000 Null No of Failures 1 33.33%	BIN 4 O BIN 20
$\frac{\mathbf{T} \cdot \mathbf{I} \cdot \mathbf{I}}{\mathbf{T} \cdot \mathbf{I} \cdot \mathbf{I}} = \frac{1 \cdot 3 \cdot 1 \cdot \mathbf{U} \cdot \mathbf{U}}{1 \cdot 1 \cdot \mathbf{I} \cdot \mathbf{U}}$	BIN 5 () BIN 21()
$\frac{1 4: 10E0}{T 5: HFE} = 783.849 \text{ R} \pm TO$	BIN 6 () BIN 22()
$\frac{T \ 6: \ IC = 14.555 \ MA}{T \ 7: \ ITR = 149.000 \ \%}$	BIN 7 🔿 BIN 23 🔿
$\frac{T 8: \forall CE SAT = 2.777 \forall}{T 9: \forall CE ON = 1.774 \forall}$	BIN 8 🔿 BIN 24
1000000000000000000000000000000000000	BIN 9 🔿 BIN 25
	BIN 10 BIN 26
	BIN 11 BIN 27
	BIN 12 BIN 28
	BIN 13 BIN 29
× .	
	CTADT
E <u>s</u> it	TEST

3.2.4 TEST SUMMARY(QUICK)

The above shows the current Test Summary when the [SUMMARY] button is clicked.

This display is a quick summary of the test results. It has only three sets of data that is No. Pass, No. Fail and Total Tested.

This data can be Printed on a Printer or Saved for later retrieval.

Click the $[E\underline{x}it]$ to close the display.

Note: This display will not affect any testing operation.

Advanced Discrete Device Tester REV 6.9.4	7/28/2007 3:24:29 PM
System & Service	
LOAD MANUAL HANDLER DEBUG STOP ON STOP A REJECT TEST	ALL CALIBRATE SETUP
SUMMARY DATALOG SINGLE TEST LOOPI	PING CONFIGURE SAVE
Display	BIN 2 () BIN 18()
No of Passe	BIN 3 BIN 19
$T 1 \cdot KFT T N = 0.000 Nm 11$	es 1 33 332 Quick BIN 4 BIN 20
$\frac{T 2: FV}{T 2: FV} = 1.324 V$ Total Tested	
$\frac{T 3: IR}{T 4: ICEO} = 1.140 UA$ Exit	Print Save
T 5: HFE = 783.849 RATIO	BIN 6 BIN 22
$\frac{T \ 6: \ 1C}{T \ 7: \ TTR} = 149 \ 000 \ \% $	BIN 7 BIN 23
$\frac{T 8: \forall CE SAT = 2.777 \forall B3}{T 8: \forall CE SAT = 2.777 \forall B3}$	
$\frac{T 9: \forall CE ON = 1.774 \forall}{T10: \forall BE ON = 1.316 \forall} B4$	
B5	
B6	BIN 10 BIN 26
B7	B23 BIN 11 BIN 27
B9	B25 BIN 12 BIN 28
B10	B26
B11	B27 BIN 13 BIN 29
B12	B28 BIN 14 BIN 30
B13	B29 BIN 15 BIN 31
B14 B15	
B16 1	33 337 B32
F.A.	START
	TEST

3.2.5 TEST SUMMARY (FULL)

The above show the Full Summary. The display is a detailed record of the Test results. The Bins are counted from each Test qualified/rejected. There is also a percentage calculation based on the total units tested. This Summary is interactive.

The data can be save as in the Quick Summary as before.

Click the $[E\underline{x}it]$ to close the display.

Note: This display will not affect any testing operation.

Save As					? 🛛
Save in:	C SUMMARY		•	⊨ 🗈 💣 🎟-	
My Recent Documents Ocsktop					
My Documents					
My Computer					
My Network Places	File name: Save as type:	TEST-01 Test Files(*.sum)		•	Save Cancel

3.2.6 SAVE TEST SUMMARY

The above dialog appears when the [Save] button is clicked. This function will allow the Test Summary to be save into a file for later retrieval. The directory is automatically set at 'C:\Addt\SUMMARY' and the file extension is '.sum'

From the above, the filename will be 'TEST-01.sum'. Click the [Save] button to complete the activity.

📮 Test02 - Notepad			
File Edit Format View Help			
No of Passes No of Failures Total Tested	18 19 37	48.65% 51.35%	
			≥ .::

The above is a sample of the data in a Summary File.

Advanced Discrete Device Tester REV 6.9.4	7/28/2007 3:25:08 PM
Torquil DO.1	
System & Service SUMMARY DATALOG SINGLE GFF © Failed © Passed © All © Display T 1: KELVIN = 0.000 Null T 2: FV = 1.324 V T 3: IR = 11.319 UA T 4: ICEO = 1.140 UA T 5: HFE = 783.849 RATIO T 6: IC = 144.555 MA T 7: ITR = 149.000 % T 8: VCE SAT = 2.777 V T 1: 316 V I 1: 316 V	BIN 1 BIN 17 BIN 2 BIN 18 BIN 3 BIN 19 BIN 4 BIN 20 BIN 5 BIN 21 BIN 6 BIN 22 BIN 7 BIN 23 BIN 8 BIN 24 BIN 9 BIN 25 BIN 10 BIN 25 BIN 11 BIN 25 BIN 12 BIN 23 BIN 13 BIN 23 BIN 14 BIN 30 BIN 15 BIN 31 BIN 16 BIN 32
E <u>x</u> it	START TEST

3.2.7 DATALOG

The above display when the [DATALOG] button is clicked. This is for Datalogging of test results. There are four selections to choose from OFF / Failed / Passed / All. These functions can work together with the Debug mode.

The OFF function cancels the datalog function. The Failed function logs all the failed tests. The Passed function logs all the passed tests. The All function logs all tests.

The functions are mutually exclusive i.e. only one type is allowed to be selected at one time. Data collection starts immediately once selected. There will be a counter where the unit numbering will be automatic. Data collected is stored into a temporary file. The data can be retrieved only if 'OFF' function is selected. When this mode is selected, the [Print] / [Save] will be enabled for data retrieval. The other three selections will not enable these two buttons.

File Edit Format View Help Unit No: 1 1 1 KELVIN *=0.000 T 1 KELVIN *=0.000 7 7 T 1 RELVIN *=0.000 7 7 T 1 RE 3.202 7 1 T 1 RE = 3.202 7 1 T 4 ICEO = 0.168 7 5 T 5 HFE = 338.191 7 6 T 7 ITR = 98.810 7 8 7 T 7 ITR = 98.810 7 9 7 9 7 9 7 9 7 9 7 9 8 7 9 7 9 0.085 7 9 7 9 7 9 7 9 7 9 7 9 7 9 7 9 7 9 7 9 7 9 7 9 7 1	SAMPLES-02	Notepad	
Unit No: 1 T 1 KELVIN *= 0.000 T 2 FV = 1.181 T 3 IR = 3.202 T 4 ICEO = 0.168 T 5 HFE = 338.191 T 6 IC = 9.881 T 7 ITR = 98.810 T 8 VCE_SAT = 0.085 T 9 VCE_ON = 0.055 T10 VBE_ON = 0.644 *===================================	File Edit Format	View Help	
Unit No: 2 T 1 KELVIN = 0.000 T 2 FV = 1.179 T 3 IR = 3.199 T 4 ICEO = 0.099 T 5 HFE = 460.085 T 6 IC = 10.101 T 7 ITR = 101.062 T 8 VCE_SAT = 0.082 T 9 VCE_ON = 0.047 T10 VBE_ON = 0.641 *====================================	Unit No: 1 T 1 KELVIN T 2 FV T 3 IR T 4 ICEO T 5 HFE T 6 IC T 7 ITR T 8 VCE_SAT T 9 VCE_ON T10 VBE_ON	<pre>*= 0.000 = 1.181 = 3.202 = 0.168 = 338.191 = 9.881 = 98.810 = 0.085 = 0.055 = 0.644</pre>	
<pre>*====================================</pre>	Unit No: 2 T 1 KELVIN T 2 FV T 3 IR T 4 ICEO T 5 HFE T 6 IC T 7 ITR T 8 VCE_SAT T 9 VCE_ON T10 VBE_ON	= 0.000 = 1.179 = 3.199 = 0.099 = 460.085 = 10.101 = 101.062 = 0.082 = 0.047 = 0.641	
7	<pre>* Unit No: 3 T 1 KELVIN T 2 FV T 3 IR T 4 ICEO T 5 HFE T 6 IC T 7 ITR T 8 VCE_SAT T 9 VCE_ON T10 VBE_ON *</pre>	= 0.000 = 1.179 = 3.199 = 0.081 = 454.740 = 9.197 = 92.011 = 0.085 = 0.047 = 0.641	

The above shows a typical datalog file.

Advanced Discrete Devi	e Tester REV 6.	9.4		-	7/28/2007 3:26:31 PM
——— Tor	'quil 🛛				
S	ystem & Servic	e =====			
LOAD MANUAI	. HANDLER	DEBUG STOP ON REJECT	STOP ALL TESTS CALIBRA	ATE SETUP	
SUMMARY DATALO	3	SINGLE TEST		JRE SAVE	BIN 1 BIN 17
INSTRUMENT PANEL					
				TEST NO 1	BIN 3 BIN 19
CAL C					BIN 4 BIN 20
VMU C				Dei ins	BIN 5 🌰 BIN 21 🌑
🔽 S1 V/I 204 🔿				Previous	
🔽 S2 V/I 204 🔿				- Next	BIN 6 BIN 22
S3 V/I 204 O				Keep	BIN 7 🌑 BIN 23 🜑
				PAGE NO 1	BIN 8 🖨 BIN 24
S5V/I1000 C				FAGE NO JI	
				Del Ins	BIN 9 🔴 BIN 25
RM2001-4 C				Previous	BIN 10 BIN 26
RM200 5-8 C				Next	
M RM200 9-12 C				Keep	BIN 11 BIN 27
				TEST DESC C	BIN 12 BIN 28
				VARIABLES C	
				KELVIN O	BIN 13 BIN 23
					BIN 14 BIN 30
				FAIL BIN	
				PASS BIN 🕥	BIN 16 BIN 32
	1			SEQ END C	
	1				
Evit	1				SET BINS
	1				
	1				

3.3.1 <u>SETUP PANEL</u>

The setup panel is used for Test Analysis and Programming. Below is the description to the above picture: -

Instrument Panel

OPTO (Note: 1) CAL (Note: 2) VMU (Note: 3) S1 V/I 204 (Note: 4) S2 V/I 204 (Note: 4) S3 V/I 204 (Note: 4) ____ S5 V/I 1000 (Note: 4) ----RM200 1-4 (Note: 5) RM200 5-8 (Note: 5) RM200 9-12 (Note: 5) RM200 13-16 (Note: 5) THD RLY (Note: 6) ------___ ---

TEST NO (Note: 7) Del / Ins (Note: 8) Previous (Note: 9) Next (Note: 10) Keep (Note: 11) PAGE NO (Note: 12) Del / Ins (Note: 13) Previous (Note: 14) Next (Note: 15) Keep (Note: 16) TEST DESC (Note: 17) VARIABLES (Note: 18) DELAY (Note: 19) MEASURE (Note: 20) FORMULA (Note: 21) FAIL BIN (Note: 22) PASS BIN (Note: 23) SEQ END (Note: 24)

[E<u>x</u>it](Note: 25)

[SET BINS](Note: 26)

Notes: 1) Display a visual picture of the Opto Interface Board.

- 2) Display a visual picture of the Calibration Standard Board.
- 3) Display a visual picture of the Voltage Measurement Board.

- 4) Display a visual picture of the V/I Source Model 204 / 1000 etc.
- 5) Display a visual picture of the Relay Matrix. Pins 1 to 16
- 6) Display a visual picture of the Test Head Relay.
- 7) Display the current Test No.
- 8) Del = Delete current Test No. Ins = Insert a Test.
- 9) Display the Previous Test No.
- 10) Display the Next Test No.
- 11) Keep the current Test No. (temporary storage)
- 12) Display the current Page No.
- 13) Same as 8) but applies to Page No.
- 14) Same as 9) but applies to Page No.
- 15) Same as 10) but applies to Page No.
- 16) Same as 11) but applies to Page No.
- 17) For Test Description, Id and Unit for the test
- 18) Defines the Variables that are to be used in measurement, calculations and result comparison.
- 19) Setting of Delay Times for V/I, VMU and Relays. In milliseconds.
- 20) Assignment of measurements to variables as defined in 18)
- 21) Calculations of variables and/or constants to get the value for comparison.
- 22) Define the Reject Bin when failed. Binning is immediate.
- 23) Define the Accept Bin when passed. Binning is made at the end of the Test Sequence.
- 24) Define the end of current Test No. setup.
- 25) Exit the System.
- 26) Enable set up the Bins colour.

Advanced Discrete Device Tester REV 6.9.4 7/28/2007 3:26:31 PM							
——— Torquil							
System & Service							
LOAD MANUAL HANDLER DEBUG STOP ON STOP ALL CALIBRATE SETUP							
SUMMARY DATALOG SINGLE TEST LOOPING CONFIGURE SAVE							
INSTRUMENT PANEL							
BINS SET UP	BIN 3 🔵 BIN 19						
	BIN 4 🌑 BIN 20						
	BIN 5 🌰 BIN 21						
S1 V/I 204 BIN 1 O BIN 9 O BIN 17 O BIN 25 O Previous Next							
Image: S2 V/I 204 O BIN 2 O BIN 10 O BIN 26 Next	BIN 6 BIN 22						
S3 V/I 204 C BIN 3 C BIN 11 C BIN 19 C BIN 27 C	BIN 7 🔴 BIN 23						
S5 V/L1000 C BIN 4 C BIN 12 C BIN 20 C BIN 28 C PAGE NO 1	BIN 8 🌑 BIN 24						
	BIN 9 🌰 BIN 25						
Previous	BIN 10 BIN 25						
Image: RM200 5-8 BIN 6 BIN 14 BIN 22 BIN 30 Next							
M HM200 9-12 C BIN 7 C BIN 15 C BIN 23 C BIN 31 C Keep	BIN 11 BIN 27						
THD BLY C BIN 8 C BIN 16 C BIN 24 C BIN 32 C TEST DESC C	BIN 12 BIN 28						
VARIABLES	BIN 13 BIN 29						
	BIN 14 BIN 30						
	BIN 15 BIN 31						
PASS BIN O	BIN 16 BIN 32						
Exit	SET BINS						

3.3.2 SETTING OF BINNING

The above will be shown if the [SETUP] button is Clicked followed by the [SET BINS] button. This operation is used to setup the colour of the Bins for test result.

Color	? 🔀	7/28/2007 3:26:59 PM
Basic colors: Custom colors: Define Custom Colors >> DK Cancel BIN 7 C BIN 15 C BIN 23 C	¢ 255 ; 0 ; 0 ; 0 ; 0 ; 0	ALL DIS CALIBRATE SETUP PING CONFIGURE SAVE BIN 1 BIN 17 BIN 3 BIN 18 BIN 3 BIN 19 BIN 4 BIN 20 BIN 5 BIN 21 BIN 5 BIN 21 BIN 5 BIN 21 BIN 7 BIN 22 BIN 7 BIN 23 BIN 8 BIN 23 BIN 9 BIN 25 BIN 10 BIN 25 BIN 10 BIN 25 BIN 10 BIN 25 BIN 10 BIN 25 BIN 11 BIN 27
FM200 13-16 BIN 8 BIN 16 BIN 24 F C UNCLASSIFIED BIN 0	C BIN	32 • TEST DESC C VARIABLES C KELVIN C DELAY C MEASURE C FORMULA C FAIL BIN C PASS BIN C SEQ END C SET BINS

Upon clicking say BIN 32, the colour dialog appears. Select the required colour by clicking on to the colour box. Another way is to change the colour by using the mouse cursor and click on the colour spectrum for the new colour. Clicking the [OK] button completes the setup. The Bin colour on the Bin display will show the colour. The rest of the Bins are set in the same way.

Note: 1) The UNCLASSIFIED BIN refers to a default Bin that failed the PASSING BIN limits.

Advanced Disc	rete Device T	ester REV 6.9	9.4					7/28/2007 3:28:57 PM
	= Torq	uil						
	Syste	em & Service						
LOAD	MANUAL	HANDLER	DEBUG	STOP ON REJECT	STOP ALL TESTS	CALIBRATE	SETUP	
SUMMARY	DATALOG			SINGLE TEST	LOOPING	CONFIGURE	SAVE	
CONFIGURE								
-V/I Sour	ces to Matrix							
	Source Name	Source	Туре	Address				
S1	•	 V/I 204 	•	C0 💌	<u>E</u> nable			BIN 5 O BIN 21
S1		МПН		Beserved	Г	LINE 1	C	BIN 6 O BIN 22
S2		VMUL		Reserved		LINE 2	õ	BIN 7 () BIN 23()
53					M	LINE 3	0	
35						LINE 4	0	
						LINE 5	C	
DSG		DSG		Reserved	<u></u>	LINE 6	0	BIN 10 BIN 26
					<u>v</u>	LINE 7	0	
					<u></u>	LINE 8	0	
		_				LINE 9	C	
S5 V	/I L	S5 V/I L		Reserved	Г	LINE 10	0	BIN 13 BIN 29
S5 V	/I H	S5 V/I H		Reserved		LINE 11	0	
					$\overline{\lor}$	LINE 12	0	
						<u>S</u> a	ve	BIN 16 BIN 32
Exit								SET BINS

3.3.3 CONFIGURE LINE(RELAY MATRIX)

The above is displayed when the [CONFIGURE] button is clicked.

This function is used to configure the System Matrix Relays to the VI Sources, the VMU and the System Ground for connections to the Device Under Test (DUT.) The System scans a list of available VI Sources before opening this dialog. The above select the Source Name S1.

Advanced Disc	rete Device Te	ester REV 6.9	.4					7/28/2007 3:29:53 PM
	= Torq	uil do,	1					
	Syste	m & Service						1
LOAD	MANUAL	HANDLER	DEBUG	REJECT	TESTS	CALIBRATE	SETUP	
SUMMARY	DATALOG			SINGLE TEST	LOOPING	CONFIGURE	SAVE	
CONFIGURE								
_−V/I Sour	ces to Matrix							BIN 3 O BIN 19
	Source Name	Source	Tune	Address				BIN 4 O BIN 20
51	•••••••••••••••••••••••••••••••••••••••	V/I 204	•	C0 -	Fushis			BIN 5 () BIN 21()
]		
MU MAU	H	- V/I 204		Reserved		LINE 1	0	
IVMO	<u> </u>	V/I 204		Ineserved		LINE 3	č	
j j		- 1000		Í	M	LINE 4	С	
		_				LINE 5	C	
DSG		DSG		Reserved	V	LINE 6	0	BIN 10 BIN 26
						LINE 7	0	BIN 11() BIN 27()
					M	LINE 8	0	
				-		LINE 9	0	
S5 V	//L //U	S5 V/I L		Reserved		LINE 10	0	
55 4	// 11	33 1/11		rieserveu	V	LINE 12	č	BIN 14 BIN 30
· · ·		,		,				BIN 15 BIN 31
						<u>S</u> a	ve	BIN 16 BIN 32
E <u>x</u> it								SET BINS

The above shows the select for Source Type, which is V/I 204, type.

Advanced Discrete Device Tester	REV 6.9.4					7/28/2007 3:30:18 PM
——— Torqui	D0,1					
System &	& Service ———	otop ov. 1	aton au	1	1	
LOAD MANUAL HAI	NDLER DEBUG	REJECT	TESTS		SETUP	
SUMMARY DATALOG		SINGLE TEST			SAVE	
CONFIGURE						BIN 2 O BIN 18
─ V/I Sources to Matrix —						BIN 3 () BIN 19()
Source Name	Source Tupe	Address				BIN 4 () BIN 20()
S1	V/I 204					
			<u>E</u> nable			
VMU H	VMU H	C0		LINE 1	0	
VMUL	VMUL	140		LINE 2	C	
		100	 ▼	LINE 3	0	BIN 8 O BIN 24
· · · · · · · · ·					~	BIN 9 🔿 BIN 25
DSG	DSG	Beserved	V V	LINE 5	6	
			<u>.</u>	LINE 7	C	
j j			$\overline{\nabla}$	LINE 8	C	
				LINE 9	C	BIN 12() BIN 28()
S5 V/I L	S5 V/I L	Reserved	Г	LINE 10	C	BIN 13 BIN 29
S5 V/I H	S5 V/I H	Reserved		LINE 11	0	BIN 14 BIN 30
		J	\lor	LINE 12	0	
				Sav		
				<u></u> av		
5.5						SET BINS
						SE, BINS

The above shows the Address selection as &hC0.

Advanced Discrete Device Test	dvanced Discrete Device Tester REV 6.9.4 7/28/2007 3:30:47 PM						
——— Torqu	D0,1						
LOAD MANUAL H	ANDLER DEBUG	STOP ON REJECT	STOP ALL TESTS	CALIBRATE	SETUP		
SUMMARY DATALOG		SINGLE TEST	LOOPING	CONFIGURE	SAVE	BIN 1 () BIN 17() BIN 2 () BIN 18()	
V/I Sources to Matrix						BIN 3 O BIN 19	
Source Name	Source Type V/I 204	Address	(newstater)			BIN 4 () BIN 20() BIN 5 () BIN 21()	
VMU H	VMU H	Reserved		LINE 1	C	BIN 6 O BIN 22	
		Reserved		LINE 2 LINE 3	00	BIN 7 () BIN 23() BIN 8 () BIN 24()	
			v V	LINE 5	C	BIN 9 O BIN 25	
	DSG	Reserved		LINE 6 LINE 7	0	BIN 10() BIN 26() BIN 11() BIN 27()	
			v V	LINE 8	C		
S5 V/I L S5 V/I H	S5 V/I L S5 V/I H	Reserved		LINE 10 LINE 11	0	BIN 13() BIN 29() BIN 14() BIN 30()	
, , ,	J]	10	LINE 12		BIN 15 BIN 31	
				<u></u>	ve	BIN 16() BIN 32()	
Egit						SET BINS	

The above shows the [Enable] being clicked.

- Note: 1) This operation is System Specific i.e. the configuration follows the physical wiring of the Tester wiring and the VI Sources that are designed for that Tester. This dialog is to allow the user to define the Line Number accordingly so that it allows the proper programming command when used in a Test Program.
 - 2) Some of the Lines are already predefined during Tester manufacture these are listed as 'Reserved' these should NOT be redefined.
 - 3) The [Enable] button is for redefinition of the Lines, but this is NOT encouraged.
 - 4) Clicking the [Save] button will save the configuration settings.

Advanced Discrete Device	Tester REV 6.9.4			8/11	/2007 11:39:00 AM
——— Tore	quil				
LOAD MANUAL SUMMARY DATALOG INSTRUMENT PANEL INSTRUMENT PANEL IV OPTO C IV CAL C IV VIU C IV S1 V/1 204 C IV S2 V/1 204 C IV S5 V/1 1000 C IV RM200 5-8 C IV RM200 1-4 C IV RM200 3-12 C IV RM200 1-4 C IV R C	HANDLER DEBUG	STOP ON STOP A REJECT TEST SINGLE TEST LOOPI	NG CONFIGURE	SETUP SAVE B NO 1 B Vevious Next Geep B NO 1 B Sevious No 1 B B Sevious B No 1 B B Sevious B Sevious B Sevious B Sevious B S B S B S B B C C E S B B S B B C C B B B B B B B B B B B B	IIN 1 BIN 17 IIN 2 BIN 18 IIN 3 BIN 19 IIN 4 BIN 20 IIN 5 BIN 21 IIN 6 BIN 22 IIN 7 BIN 23 IIN 8 BIN 24 IIN 9 BIN 25 IIN 10 BIN 25 IIN 10 BIN 26 IIN 12 BIN 28 IIN 13 BIN 29 IIN 14 BIN 30 IIN 15 BIN 31 IIN 16 BIN 32
E <u>x</u> it					START TEST

3.4 CALIBRATION OF BOARDS

The above picture is displayed when the [CALIBRATE] button is clicked. This selection allows the System to calibrate the Measurement Unit and the Sources. The Tester will make use of the Calibration Standard Board's Voltage and Resistor Reference to ensure the specifications of the measurement and the voltage/current supplies.

The Calibration Standard Board MUST have been previously verified by a known verification/calibration method to ensure that the calibration is accurate.

- INSTRUMENT P	ANE	L
		- CAL
I OPTO	0	Serial Number Output select Cal
✓ VMU ✓ S1 V/I 204 ✓ S2 V/I 204	000	Revision Cal + to L Ground L Cal Bus A
Image: S2 v/1 204 Image: S3 v/1 204 <		Resistor Reference 1 V 0.979279 2 V 1.959269 5 V 4.910136 25M ohm 25032716 2 V 1.959269 25M ohm 2499789 5 V 4.910136 250K ohm 249996.06 10 V 9.773334 25K ohm 25005.821 2 5 V 19.526987 250 ohm 250.28228 2 50 ohm 250.28228 25 ohm 250.28228 2 5 ohm 25.016696 10 ohm 10.00053 10 ohm 10.00053 2.5002718 2.5002718 RESET SAVE CLEAR 2.5002718

3.4.1 CALIBRATION STANDARD BOARD

The above show the picture of the Calibration Standard Board. The Board should have been calibrated prior to this selection. The purpose for this picture is to allow the Board to be used as the System Standard to calibrate the VMU and the V/I Sources. This is the first step in the calibration of the Tester Measurement and Power Supplies.

In each field, calibrated values for that range is typed in and this will become the Standard for the System. E.g. On the Voltage Reference table, click on the (1 V) option, then enter 0.979279, then click on the (2 V) option to enter the next and so on. Do so for the Resistor Reference Table.

Once all values are entered, clicked on the [SAVE] button to update the System References. If there were any previous data, it can be cleared by clicking the [CLEAR] button.

Save References 🛛 🔀					
You want to Sa	ve References?				
ок	Cancel				

Clear References 🛛 🛛 🔀					
You want to clea	ar References?				
ОК	Cancel				

The above dialogs are for [SAVE] and [CLEAR]. Response with the appropriate selection and the data will be updated and saved. This will be used later for the calibration of the VMU and V/I Sources.

3.4.2 VOLTAGE MEASUREMENT UNIT (VMU)

The above picture is shown when the (VMU) option is clicked. In this selection, the calibration is done by clicking on the [Cal] button. It will be done automatically and will be finished in a matter of minutes. (Do NOT uncheck the Calibrated box, it is default.)

INSTRUMENT PANEL				
		_ V/I 204		
🔽 OPTO	0	Forced Value	Clamp Value	Measured Value
🔽 CAL	0	0.00	0	0
MU 📈	0	- Force		
S1 V/I 204	•	Current G	Voltage C	Calibrated 🔽
🔽 S2 V/I 204	0			Cal
S3 V/I 204	0	Current Range	-Voltage Clamp	
	0			
S5 V/I 1000	0		1000V C	
	<u></u>	2UA (C)	500V C	
M RM2001-4	0	2A C	2007 0	
M RM200 5-8	<u>S</u>	200mA (C)	100V C	
M RM200 9-12	0	20mA ()	50V C	
M RM20013-16	2	2mA ()	200 0	
	2	200uA (C)		
	2	2044 (50 0	ON C
	2	200-4	27 0	011
	놀	200nA (•	10 (•	Beset OFF @
	ž			
	ž			
	~			
,				

3.3.3 VOLTAGE/CURRENT (V/I) SOURCES

The above picture is shown when then (S1 V/I 204) option is clicked. Again click on the [Cal] button to start the calibration process. For this, the calibration will perform Force Current, Force Voltage, Measure Current and Measure Voltage calibration on All Ranges. It will take longer than the VMU calibration. (For each V/I Source, select and repeat the steps to finish all of them. Also, if any of the Source Board are swapped or replaced, they MUST be recalibrate.

INSTRUMENT P	ANE	L			
	_	_ V/I 1000			
PTO OPTO	C	Forced Value	Clamp Value	Measured Value	
🔽 CAL	0	0.00	0	0	
VMU 🔽	0	- Force			
🔽 S1 V/I 204	0	Current @	Voltage C		
🔽 S2 V/I 204	0	Culterit	vokage v		
IZ S3 V/I 204	0	Current Bange	– Voltage Clamp –––		
	0		i snage siamp		Call
S2 X/I 1000	•				
	0		1000V C		
MRM2001-4	0	20mA (C)			
MRM200 5-8	0	2mA C	500V C		
M RM200 9-12	2	200 4 0			
	2	200uA (O	200V C		
	2	20uA C			
	놀	2.4 6	100V 📀		ON C
	×.	244 (•			
	X			Reset	OFF 📀
	č				
, _	č				
	~				

The above show another V/I Source to be calibrated.

			0/11/2007 11:30:17 AM
——— Torqui			
System a	& Service —————		
LOAD MANUAL HA	ANDLER DEBUG STOP ON REJECT	STOP ALL CALIBRATE SETUR	
SUMMARY DATALOG	SINGLE TEST	LOOPING CONFIGURE SAVE	
-INSTRUMENT PANEL			
Image: OPTO C Image: OPTO C <td< td=""><td>TEXT BOX</td><td>TEST NO T Del In Previous Next Keep PAGE NO T Del In Previous Next Keep TEST DESC VARIABLES KELVIN DELAY MEASURE FORMULA FAIL BIN PASS BIN SEQ END</td><td>BIN 3 BIN 19 BIN 4 BIN 20 BIN 5 BIN 21 BIN 6 BIN 22 BIN 7 BIN 23 BIN 8 BIN 24 BIN 9 BIN 25 BIN 10 BIN 26 BIN 11 BIN 26 BIN 12 BIN 28 BIN 13 BIN 29 BIN 16 BIN 32</td></td<>	TEXT BOX	TEST NO T Del In Previous Next Keep PAGE NO T Del In Previous Next Keep TEST DESC VARIABLES KELVIN DELAY MEASURE FORMULA FAIL BIN PASS BIN SEQ END	BIN 3 BIN 19 BIN 4 BIN 20 BIN 5 BIN 21 BIN 6 BIN 22 BIN 7 BIN 23 BIN 8 BIN 24 BIN 9 BIN 25 BIN 10 BIN 26 BIN 11 BIN 26 BIN 12 BIN 28 BIN 13 BIN 29 BIN 16 BIN 32

3.5.1 <u>SETTING UP TEST PROGRAM</u>

The above picture will be shown when the [SETUP] button is clicked. There are two sets of options to be used. The Left side consists of the 'hardware' selections namely, VMU, V/I, Relay Matrix and THD RLY (Test Head Relay.) The Right-side consists of command buttons above and function selections namely 'TEST DESC', 'VARIABLES'......

This setup has two feature. The first is to allow interactive setting of test conditions where a DUT can actually be powered up with relay connections and measurement taken. In this way a particular test setup can be evaluated. The other is that during the evaluation, the test conditions can be saved into the System to produce an actual test program for Production use.

The first feature is implemented by selectively clicking the (Left side) VMU, V/I, Relay Matrix and the Test Head Relay (THD RLD) one at a time with the DUT inserted into an appropriate test socket. As the connections build up, the response of the DUT will be displayed in the measured field of the VMU or the V/I Sources. This first feature is interactive as the test conditions can be varied at any time.

The other feature is used to generate Test Programs. The method is straightforward. It consists of using the (Right side) commands/Instruction to provide variable storage, time delay, formula and pass/fail criteria to grade a Test result. In other words the combination of both left and right settings result in a Test Program being generated.

With such a method, there is NO need to actually WRITE a Test Program as the System automatically generate the required code in the Text Box that is at the lower part of the picture. This Text Box will display the codes that will be generated when any of the settings are selected. Together with the [SAVE] button a complete Test Program is saved into a Directory for later use in the Production environment.

In the next pages that follow, a typical sequence of the Programming steps will be shown to illustrate the feature of this method of programming.



3.5.2 PROGRAMMING TEST SEQUENCE

The above show a typical Test Circuit for an Opto-coupler DUT. The DUT is inserted into a test socket that is mounted onto the Test Head. Wiring from the Tester connects it to the various Lines, which are Sources, Ground and Measurement. The labels are described as below: -

S1 = VI Source 1 which is Line 3 of the System Matrix
S2 = VI Source 2 which is Line 5 of the System Matrix
GND = Grounding for S1 & S2 which is Line 6 of the System Matrix
DP1 = Pin 1 of the System Matrix connects to Line 3 (S1)
DP3 = Pin 3 of the System Matrix connects to Line 6 (Ground)
DP4 = Pin 4 of the System Matrix connects to Line 6 (Ground)
DP5 = Pin 5 of the System Matrix connects to Line 5 (S1)
K9 = Test Head Relay connects DP1 to DUT Pin 1 (LED Anode)
K10 = Test Head Relay connects DP4 to DUT Pin 2 (LED Cathode)
K12 = Test Head Relay connects DP5 to DUT Pin 5 (Transistor collector)

In this section, there will be three Tests to be Programmed to illustrate the feature of this method of Programming called 'Visual Programming' offered by the Windows GUI (Graphical User Interface) capability.



3.5.3 KELVIN TEST (TEST NO. 1)

The Test conditions are close K9, K10, K12 & K13. Specify S1 as the measurement and source. Test each pin of 1,2,4,5 & 6 for Kelvin connection. Immediately issued fail Bin of No. 16 to indicate if any or all pins fail Kelvin connection.

-INSTRUMENT PANEL		
	- TEST 1-	
₩ 0PT0 C ₩ CAL C ₩ VMU C ₩ S1 V/1 204 C ₩ S2 V/1 204 C ₩ S3 V/1 204 C ₩ S3 V/1 204 C		TEST NO 1 Del Ins Previous Next Keep
IZ S5V/L1000 €	Description of the Test (Max. 30 characters.)	PAGE NO 1
Image: Solver field C Image: RM200 1-4 C Image: RM200 5-8 C Image: RM200 13-16 C Image: RM200 13-	KELVIN TEST [TEST 1] KELVIN, Unit = NULL, KELVIN TEST	Del Ins Pravious Next Keep TEST DESC • VARIABLES • VARIABLES • KELVIN • DELAY • MEASURE • FORMULA • FAIL BIN • PASS BIN • SEQ END •

Step 1

Click on the (TEST DESC) option and the above is shown. Enter the following: -

LABEL	ENTRY	REMARKS
TEST ID	KELVIN	Used for Debug label
UNIT	NULL	No unit required, just for filling the space
Description of Test	KELVIN TEST	User description for clarity of Test Type
The TEXT BOX will show the message (in Italics) automatically.		
TEXT BOX		REMARKS
[TEST 1]		This is the first test sequence
KELVIN, Unit = NULL, KELVIN TEST		This is the command that will be used for
		System Program

Click the [Keep] button under the PAGE NO section, this means that the statement in the TEXT BOX is to be saved as a step in the Test Program. Also the PAGE NO shows [2], it means that this step is already saved as (1) and then next should be (2)

Click on the (THD RLY) option and the above is shown. Check on the relays of K9, K10, K12, K13 & K14, which are the Kelvin, connected Pins. Then the following in the TEXT BOX will show: -

TEXT BOX	REMARKS
[THD RLY1]	This is the Test Head Relay command
K9, K10, K12, K13, K14	These are the Relays to be connected

Clicks the [Keep] button under the PAGE NO section, this time the PAGE NO shows [3] this means that this statement is step (2) and the count should be (3).

Note: By now step is defined as Page No in this method and it will have 50 Pages for each Test.

₩ OPTO ♥ ₩ OPTO ♥ ₩ CAL ♥ ♥ OPTO ♥ ♥ CAL ♥ ♥ VMU ♥ ♥ S1 V/1 204 ♥ ♥ S1 V/1 204 ♥ ♥ S2 V/1 204 ♥ ♥ S2 V/1 204 ♥ ♥ S3 V/1 204 ♥ ♥ S5 V/1 1000 ♥ ♥ RM200 1.4 ♥ ♥ RM200 3.12 ♥ ♥ RM200 3.12 ♥ ♥ RM200 3.13 16 ♥ ♥ RM200 1.316 ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥	IO 1 Ins ext eep IO 3 Ins vious ext eep DESC C BLES C SURE C VIN C SURE C AULA C L BIN C S BIN C

Step 3

Click on the (KELVIN) option and the above is shown. Click on the (S1 V/I 204) option of the select section and check on Pin 1, 3, 4, 5 & 6 for a completed Kelvin check. Finally, clicks on the Reject Bin section the bin (16). The TEXT BOX will show: -

TEXT BOX	REMARKS	
[KELVIN CHECK]	This is the Kelvin Test command	
<i>S1 V/I 204->1,3,4,5,6, REJECT BIN =16</i>	Use S1 to Test Pins 1,3,4,5,6 for Kelvin contacts	

Click the [Keep] button to save the step.

Click on the (S1 V/I 204) and the above is shown. Then click on the [RESET] button of the V/I 204 Panel. The TEXT BOX will update to below: -

TEXT BOX	REMARKS
[S1 V/I 204]	This is the S1 command
OFF	Switch OFF S1 source after Kelvin Test

Click the [Keep] button to save the step.

Step 5

Click on the (THD RLY) and the above is shown. Then click on the [RESET] button of the THD RLY Panel. The TEXT BOX will update to below: -

TEXT BOX	REMARKS	
[THD RLY]	This is the Test Head Relay command	
OFF	Open All Relays after the test	

Click the [Keep] button to save the step.

-	INSTRUMENT P	ANEL		
1			- SEQ END	
	IV OPTO	0		TEST NO 1
	🔽 CAL	C		Del Ine I
	🔽 VMU	0		Broviouo
	🔽 S1 V/I 204	0		Next
	🔽 S2 V/I 204	0		Next
	S3 V/I 204	0		Keep
	Γ	C		
	S5 V/I 1000	0		PAGE NU 16
	Г	C		Del Ins
	🕅 RM200 1-4	0		Previous
	🔽 RM200 5-8	C		Next
	RM200 9-12	0		Keep
	🔽 RM200 13-16	C		
	THD RLY	•		TEST DESC O
	Г	C		
		C		
	Г	C		MEASURE C
		C		FORMULA 🔘
	Г	C		FAIL BIN
	Г	0	[SEQ END]	SEC END
l				SEG END: **

Click the (SEQ END) and the above is shown. The TEXT BOX will update to below: -

TEXT BOX	REMARKS
[SEQ END]	This command is used to end the Test No.
Click the [Keep] button to save	the step. This is the last step of the Test.

- Click the [Keep] of the Test No section and the Test No. increase to (2)
- Note: 1) As mentioned, the first step (1) start Test No. 1 and it is also the first test condition to be set up. This first step is denoted as Page 1. The next and subsequent steps are denoted as Page 2, 3 When [SEQ END] is clicked, it will mean the end of instructions for the Test No.
 - 2) Since [SEQ END] is issued, the [Keep] button in the Test No. is to be clicked to increase to 2 ready to define the test conditions for Test No. 2



3.5.4 FORWARD VOLTAGE (TEST N0.2)

The Test conditions are close K9 & K10. Specify S1 as the measurement and source. Connect pin1 to S1 and pin 3 to Gnd. Immediately issued fail Bin of No. 16 if the value less than 0 V or more than 2 V. If value within these limits it will be Bin 1 at the end of test.

-INSTRUMENT PANEL		
	TEST 2	
OPTO C		TEST NO 2
CAL C		Dol Inc.
🔽 VMU 🛛 🔿		Der IIIs
👿 S1 V/I 204 🛛 🔿	TESTID FV UNIT VOLIS	Next
🔽 S2 V/I 204 🛛 🔿		
👿 S3 V/I 204 🛛 🔿		Keep
	Description of the Test (May 20 obstactors)	
👿 S5 V/I 1000 🔿	Description of the Lest (Max. 50 characters.)	PAGE NU JI
		Del Ins
🔽 RM2001-4 🔿		Previous
🔽 RM200 5-8 🔿		Next
👿 RM200 9-12 🔘		Keep
🔽 RM200 13-16 🔿		
🖂 THD RLY 🛛 🕥		TEST DESC 💿
E 0		
		MEASURE C
E 0		FORMULA C
Г С		FAIL BIN 📿
Г С	ITEST 21	
	FV, Unit = VOLTS, FORWARD VOLTAGE	SEQ END O

Step 1

Click on the (TEST DESC) and the above is shown.	Then enter the following:
----------------	-----------	---------------------------	---------------------------

Isad for Dahug Jahal	
Jsed for Debug laber	
The unit is in VOLTS	
Jser description for clarity of Test Type	
ge (in Italics) automatically.	
REMARKS	
This is the test 2 sequence	
This is the command that will be used for System Program	
Ds Th Js ge Th Th Sy	

Clicks the [Keep] button on the PAGE NO section. This becomes the first setup for Test No. 2

INSTRUMENT P	PANEI	L			
	_	- PARAMETERS			
PTO 🔽	C	List of Variables	List of Constants	Values	TEST NO 1
🔽 CAL	0	VF	NUM001	1	Doll Inc.
VMU 🖂	0				Der IIIs
🔽 S1 V/I 204	0	VCE_SAT			Nevt
🔽 S2 V/I 204	0				Keen
IZ S3 V/I 204	0				
	0				PAGE NO. 1
S2 1000	0				
	0				Del Ins
RM2001-4	0	· · · · · · · · · · · · · · · · · · ·	,		Previous
RM200 5-8	0				Next
I RM200 9-12	0		o		Keep
MRM20013-16	2	Variable Name	Lonstant Name	_	TEST DESC C
	2	IIC	NUM001	Value of Constant	VARIABLES (
	물		1		KELVIN 🔍
	2				DELAY O
	놀	Delete Contraction	Dalata	A-4-4 [
	2			Auu	FAIL BIN
	X				PASS BIN C
1	<u> </u>	VE		1	SEQ END O
		IR			
		VCE_SAT			
		VCE_ON			
		NUM001 - 1			

- Click the (VARIABLES) option and the above is shown. Usage is as follows: -
- (1) Enter a variable name into the 'Variable Name' field. Click the [Add] button below it. The 'List of Variables' will display it. Double click on the same field enter another name and click [Add] and for the next variable. Repeat if required.
- (2) Enter a constant name in the Constant Name field. Also the value of the constant is entered in the 'Value of Constant' field. Click on the [Add] button below will display in the 'List of Constants' with the Values to the right.

Note: 1) This step is mandatory because (1) & (2) will be used in Test No.2 and beyond.

- 2) If there is not enough variables, return to this step to add more of them. ALL names for variables and constants should be determined before doing this step.
- 3) They can be deleted by clicking on the List Box on the particular name and then clicking on the [Delete] button of the appropriate section.
- 4) Valid characters are A~Z, 0~9, _ there should NOT be any space within the name. The first character of a name MUST be an alphabet.

5) From the above entries the TEXT BOX is updated to	o: -
--	------

TEXT BOX	REMARKS
[PARAMETERS]	This is the Parameters list
VF	These are variables, which are used to
IR	store values from VMU or V/I Sources.
VCE_SAT	For constants the name of the constant is
VBE_ON	followed by an equal sign and then the
IC	value of the constant
NUM001 = 1	e.g. NUM001 = 1

Clicks the [Keep] button on the PAGE NO section. This becomes the second setup or Page No. 2 for Test No. 2

Constant Name Conflict 🚺	<	
Label have been used else where		
ОК		

This alert that a name conflict has occur. A new name is required. Enter another new name to Continue.

Data have been changed 🛛 🕅				
Do you want to keep the changes?				
Yes No				

This alert that the current setting has been changed. Click the [Yes] button to Keep or [No] to ignore.

-INSTRUMENT PANEL		
- INSTRUMENT PANEL	RM200 1 2 3 4 VMU H I I I I VMU L I I I I VMU L I I I I DSG I I I I DSG I I I I I I I I I S5 V/I L I I I I Reset I I I I Reset I I I I [RM200 1-4] [S1) Line 3 to Pin 1 I I I [DSG] Line 6 to Pin 3 I I I I	TEST NO 2 Del Ins Previous Next Keep PAGE NO 3 Del Ins Previous Next Keep TEST DESC C VARIABLES © KELVIN C DELAY C MEASURE C FORMULA C FORMULA C FORMULA C FORMULA C

Click the (RM200 1-4) option will show the above. This is for Matrix connection. The above is updated in the TEXT BOX: -

TEXT BOX	REMARKS	
[RM200 1-4]	This is the first Relay Matrix board with Pins $1 \sim 4$	
(S1) Line 3 to Pin 1	Connect Pin 1 to V/I Source 1	
(DSG) Line 6 to Pin 3	Connect Pin 3 to Ground	

Click the [Keep] button to save. It is saved as Page No. 3.

-1	NSTRUMENT P	ANEL			
	♥ OPTO ♥ CAL ♥ VMU ♥ S1 V/I 204 ♥ S2 V/I 204 ♥ S3 V/I 204 ♥ S3 V/I 204 ♥ S3 V/I 204 ♥ RM200 1-4 ♥ RM200 0-12 ♥ RM200 13-16 ♥ THD RLY		K1 □ K2 □ K3 □ K4 □ K5 □ K6 □ K7 □ K8 □ K10 ♥ K11 □ K12 □ K13 □ K14 □ K15 □ K16 □ RESET □	KA1 KA2 KA3 KA4 KA5 KA6 KA7 KA8 KA10 KA11 KA12 KA13 KA14 KA15 KA16	TEST NO 2 Del Ins Previous Next Keep PAGE NO 4 Del Ins Previous Next Keep TEST DESC C VARIABLES © KELVIN C DELAY C MEASURE C FORMULA C FASS BIN C SEQ END C

Step 4

Click the (THD RLY) option and the above is shown. The TEXT BOX will update with the above selection

TEXT BOX	REMARKS
[THD RLY1]	This is the Test Head Relay command
K9, K10	These are the Relays to be connected

Click the [Keep] button to save. It is saved as Page No. 4.

-INSTRUMENT PANEL		
	- SET DELAY TIME	
♥ OPT0 C ♥ CAL ○ ♥ VMU ○ ♥ S1 V/1 204 ○ ♥ S2 V/1 204 ○	SET DELAY TIME	TEST NO 2 Del Ins Previous Next
▼ S3V/I 204 C	STROBE DELAY TIME 5 m secs.	Keep PAGE NO 5
□ □	[SET DELAY TIME]	Del Ins Previous Next Keep TEST DESC C VARIABLES C VARIABLES C KELVIN C DELAY © MEASURE C FORMULA C FAIL BIN C SEQ END C
	2	

Click the (DELAY) option and the above is shown. The TEXT BOX will update with the entry as above: -

TEXT BOX	REMARKS
[SET DELAY TIME]	This is the System wait time
5	The delay is 5 milliseconds

Click the [Keep] button to save. It is saved as Page No. 5

-INSTRUMENT PANEI	L			
	_ V/I 204			
🔽 OPTO 🛛 🔿	Forced Value	Clamp Value	Measured Value	TEST NO 2
🗹 CAL 🔿	20.00	2	0	Del Ine
✓ VMU ✓ C ✓ S1 V/I 204 ✓ ✓ S2 V/I 204 ✓	Force Current ⓒ	Voltage C		Previous Next Keep
IM \$3 ¥71 204 C	Current Range	Voltage Clamp		
S5V/11000 C		1000V C		PAGE NO 6
	20A C	500V C		Del Ins
🕅 RM2001-4 🔿	2A C	200V O		Previous
🔽 RM200 5-8 🛛 🔿	200mA 🔿	100V C		Next
RM200 9-12 C	20mA 💿	50V O		Keep
RM20013-16 C	2mA C	20V C		TEST DESC C
IN THURLY C	200uA (C)			VARIABLES C
	2004 0	1246	ON C	KELVIN 🤶
	200nA C	1V C		DELAY (*
E č			Reset OFF 🖲	FORMULA
E C				FAIL BIN
<u>п</u> о	[S1 V/I 204]			
	Force Range = 20m/	A, Force Value = 20.00	I, Meas Range = 2V	

Step 6

Click the (S1 V/I 204) option to show the above. After the entry of Force Value and Clamp Value, the TEXT BOX is updated: -

TEXT BOX	REMARKS
[S1 V/I 204]	This is the S1 command
Force Range = 20mA, Force Value = 20.00,	The command is to Force a current of
Meas Range = 2 V	20mA and Measure NOT more than 2 V.

Click [Keep] as the Page No. 6

This step is the same as step 5. Here it is issued for the previous V/I Source to allow the settling of current before measurement is to be taken: -

TEXT BOX	REMARKS
[SET DELAY TIME]	This is the System wait time
5	The delay is 5 milliseconds
Chielt the [Veen] button to serve	It is served as Dess No. 7

Click the [Keep] button to save. It is saved as Page No. 7

■ STRUMENT PANEL ■ OPTO C ■ CAL C ■ VMU C ■ S1 V/1 204 C ■ S2 V/1 204 C ■ S3 V/1 204 C ■ S5 V/1 1000 C	MEASURE Variable Lists	VF VALUE	TEST NO 2 Del Ins Previous Next Keep PAGE NO 8
F S5 V/I 1000 F S5 V/I 1000 F RM200 1-4 C F RM200 5-8 C F RM200 9-12 C F RM200 13-16 C F THD RLY C C C C C C C C C C C C C C C C	▼ \$1 \/I 204 ● ▼ \$2 \/I 204 ● ▼ \$2 \/I 204 ● ▼ \$3 \/I 204 ● ▼ \$5 \/I 1000 ● ▼ \$5 \/I 1000 ● ▼ \$5 \/I 1000 ● ■ USER I/0 ● ■ BUS EXT 1 ● ■ BUS EXT 2 ● ■ BUS EXT 3 ● ■ BUS EXT 4 ● [MEASURE] \$1 \/I 204> \$1 \/I 204> VF		PAGE NO 8 Del Ins Previous Next Keep TEST DESC C VARIABLES C KELVIN C DELAY C MEASURE © FORMULA C FAIL BIN C PASS BIN C

Step 8

Click the (MEASURE) option and the above is shown. Click S1 option of the MEASURE panel. Click the 'Variable Lists' and select 'VF'. The picture shows VF will store the measurement from S1. Below is the TEXT BOX: -

TEXT BOX	REMARKS	
[MEASURE]	This is the S1 Measurement command	
S1 V/I 204 -> VF	This means VF stores the voltage of S1	

Click [Keep] to save as Page 8.

Note: 1) Deleting VF is by typing [Shift] + Right Click on the VF entry.

	INSTRUMENT P	ANEL				
1			_ V/I 204			
	🔽 OPTO	C	Forced Value	Clamp Value	Measured Value	TEST NO 2
	🔽 CAL	C	0.00	1	0	Del Inc.
		0	Force			Previous
	S2 V/I 204	Ċ	Current 📀	Voltage 🔿		Next
	IZ S3 V/I 204	0	Current Range	Voltage Clamp		Keep
	S5 V/I 1000	C		1000V C		PAGE NO 9
	Г	C	20A 🔿	500V C		Del Ins
	💌 RM200 1-4	0	2A O	200V C		Previous
	🔽 RM200 5-8	0	200mA (C)	100V C		Next
	RM200 9-12	0	20mA (C	50V C		Keep
	RM200 13-16	0	2mA C	20V C		TEST DESC C
	THD RLY	0	200uA C	100 0		VABIABLES C
			20uA C	5V C	ON C	KELVIN C
		č	20004	11/ 0		
	Γ	õ			Reset OFF 🖲	FORMULA
	Γ	C				FAIL BIN C
	Г	C	[IS1 V/L204]			
l			OFF			SEQ END O
			1			
_						

Click the (S1 V/I 204) option and the above is shown. Click the [RESET] button. This means switch OFF the source.

TEXT BOX	REMARKS
[S1 V/I 204]	This is the S1 command
OFF	Switch OFF S1 source after measurement

Click [Keep] button to save it as Page No. 9

-INSTRUMENT PANEL	-		
- INSTRUMENT PANEL	- THD RLY K1 K2 K3	KA1 KA2 KA3	TEST NO 2 Del Ins Previous
	K4 K5 K6 K7	KA4	Next Keep PAGE NO 10
	K8 K9 K10 K11 K12 K13 K14 K15 K15 K15 K16 K17 K17 K17 K17 K17 K18 K10 K10	KA9 KA10 KA11 KA12 KA13 KA13 KA14 K	Del Ins Previous Next Keep TEST DESC C VARIABLES C KELVIN C
	K15 K16 (RESET.)	KA14 KA15 KA16	DELAY C MEASURE C FORMULA C FAIL BIN C PASS BIN C SEQ END C

Step 10

Click the (THD RLY) and the above is shown. Click the [RESET] button.

TEXT BOX	REMARKS
[THD RLY]	This is the Test Head Relay command
OFF	Open All relays

Click [Keep] to save it as Page No. 10

-INSTRUMENT P	ANEL				
		_V/I 204			
🔽 OPTO	0	Forced Value	Clamp Value	Measured Value	TEST NO 1
🔽 CAL	0	0.00	0	0	Doll Inc.
CAL VMU S1 V/I 204 S2 V/I 204 S3 V/I 204 S5 V/I 1000 RM200 1-4 RM200 5-8 RM200 9-12 RM200 13-16 THD RLY		0.00 Force Current Range 20A 20A 20MA 200MA 20MA 20MA 20MA 200	Ø Voltage C Voltage Clamp 1000V 1000V C 200V C 100V C 50V C 20V C 100V C 50V C 20V C 10V C 5V C	○ 0	Del Ins Previous Next Keep PAGE NO 4 Del Ins Previous Next Keep TEST DESC C VARIABLES C
	0	2uA O	2V C	UN C	DELAY C
	0000	200nA (* [S1 V/I 204] OFF	10 @	Reset OFF ©	MEASURE C FORMULA C FAIL BIN C PASS BIN C SEQ END C

Click the (S1 V/I 204) option and the above is shown. Click the [RESET] button. The TEXT BOX is updated: -

TEXT BOX	REMARKS
[S1 V/I 204]	This is the S1 source command
OFF	Switch OFF Power of the source

Click [Keep] to save it as Page No. 11

_	INSTRUMENT PANEL				
		- FAILED BINNING			
	I OPTO C	Parameter	Upper Limit	Lower Limit	TEST NO 2
	🗹 CAL 🔿	VF	2	0	Del Ine
	✓ VMU C S1 V/I 204 C	VF 💌			Previous
	IZ S2 V/I 204 C IZ S3 V/I 204 C	Select IR	which to Bin out when fail	ed	Keep
		BVBE_ON	9 🗖 🛛 Bin 17 🗖	Bin 25 🔲	PAGE NO 13
		Billiz , om h	0 🗖 🛛 Bin 18 🥅	Bin 26 🦵	Del Ins
	🔽 RM2001-4 📀	Bin 3 🔲 Bin 1	1 🗖 🛛 🗖 Bin 19 🗖	Bin 27 🦵	Previous
	RM200 5-8 C RM200 9-12 C	Bin 4 🔲 Bin 1	2 🗖 🛛 Bin 20 🗖	Bin 28 🦵	Next Keep
	RM200 13-16 C THD BLY C	Bin 5 🥅 Bin 1	3 🗖 🛛 Bin 21 🗖	Bin 29 🦵	TEST DESC C
	E C	Bin 6 🥅 Bin 1	4 🗖 Bin 22 🗖	Bin 30 🥅	VARIABLES C KELVIN C
	<u> </u>	Bin 7 🔲 Bin 1	5 🗆 Bin 23 🗖	Bin 31 🕅	DELAY C
		Bin 8 🥅 Bin 1	6 🔽 🛛 Bin 24 🗖	Bin 32 🦵	FORMULA C
					PASS BIN C
		[FAILED BINNING] PARA = VF, HIGH = 2, LOW	′ = 0		SEQ END O
		BIN = 16			

Step 12

Click the (FAIL BIN) option to show the above. Click on 'Parameter' and select VF. Enter 2 as upper limit and 0 and the lower limit. Check Bin 16 as the selected result.

TEXT BOX	REMARKS
[FAILED BINNING]	Immediately fail the DUT if comparison fails
PARA = VF, HIGH = 2, LOW = 0	VF is to be compared to values of $2 \sim 0$
BIN = 16	This is the Bin that will be bin out if fail

Click [Keep] to save as Page No. 12

INSTRUMENT PANE	l ———			
	PASSING BIN			
	Parameter	Upper Limit	Lower Limit	TEST NO 2
I CAL O	VF	2	0	Dell Inc.
🔽 VMU 🛛 🔿				Der Ins
🔽 S1 V/I 204 🛛 🔿			Jump to if Fail	Nevt
▼ S2 V/I 204 O	Select the Bins that the Test	t will qualify if Passed the Li	imits NIL	Keep
I S3V/I 204 C		0		
	BIN I M BIN 3	BIN I/	Bin 20 j	PAGE NO 13
	Bin 2 🔲 Bin 1	0 🔲 🛛 🕅 Bin 18 🕅	Bin 26 🦵	Del Ins
RM2001-4 •	Bin 3 🔲 Bin 1	1 🗖 🛛 Bin 19 🗖	Bin 27 🔲	Previous
🔽 RM200 5-8 🔿		2	Dia 20 🗖	Next
🕅 RM200 9-12 🔿	DIFI 4 J DIFI 1.	Z J DIFI ZU J	Diri 20 j	Keep
MR200 13-16 C	Bin 5 🥅 Bin 13	3 🔲 🛛 Bin 21 🕅	Bin 29 🦵	TEST DESC. C
THD BLY C	Bin 6 🔲 Bin 1-	4 🔲 🛛 Bin 22 🔲	Bin 30 🔲	VARIABLES C
	Dia 7 🔲 Dia 11	5 E Dia 22 E	Dia 21 🖂	KELVIN 🥥
	DIN / DIN :	5 J BIT 25 J	binor j	DELAY C
E õ	Bin 8 🥅 Bin 1	6 🔲 🛛 Bin 24 🕅	Bin 32 🦵	FORMULA
E O				FAIL BIN 🔘
п с	IPASSING BIN1			PASS BIN (*)
	PARA = VF, HIGH = 2, LOW	= 0		
	JMP = NIL , BIN = 1			

-INSTRUMENT PANEL

Click the (PASS BIN) option and the above appears. Click the 'Parameter' and select VF as step 12. Enter 2 and 0, as the two limits (could be different from step 12). Check the Bin 1 as the selection. Leave the 'Jump to if Fail' as NIL (default): -

TEXT BOX	REMARKS
[PASSING BINNING]	Select DUT to be Bin in the selected bin if Passed
PARA = VF, HIGH = 2, LOW = 0	VF is to be compared to values of $2 \sim 0$
JMP = NIL, BIN = 1	This is the Bin that will be bin out if ALL tests
	pass

Note: 1) If JMP = NIL and the DUT fail the limits here then the Bin is 'UNCLASSIFIED'

🔽 ОРТО	C		TEST NO 2
🔽 CAL	O		Dell Inc.
VMU 🔽	0		Der ins
🔽 S1 V/I 204	0		Next
🔽 S2 V/I 204	C		- Next
🔽 S3 V/I 204	0		Keep
Г	C		
S5 V/I 1000	0		FAGE NO 114
Γ	C		Del Ins
RM200 1-4	•		Previous
M200 5-8	0		Next
RM200 9-12	0		Keep
RM200 13-16	0		TECT DECC C
THD RLY	0		VADIADIES C
	0		KELVIN O
	0		DELAY C
	0		MEASURE O
	0		
	0		PASS BIN O
	0	[SEQ END]	SEQ END •
		I	

Step 14

Click the (SEQ END) option to show the above. The update as below: -

TEXT BOX	REMARKS		
[SEQ END]	This command is used to end the Test No.		

Click the [Keep] button to save the step. This is the last step of the Test. Click the [Keep] button of the Test No. to save the whole sequence as Test No. 2

Save As					? 🔀] 7	7/29/2007 12:43:49 AM
Save in:	🔁 DATA		• +	🗈 💣 🎟 •			
My Recent Documents Desktop My Documents My Computer	4N25FULL					SETUP SAVE TEST NO 2 Del Ins Previous Next Keep PAGE NO 14 Del Ins Previous Novt	BIN 1 BIN 17 BIN 2 BIN 18 BIN 3 BIN 19 BIN 4 BIN 20 BIN 5 BIN 21 BIN 6 BIN 22 BIN 7 BIN 23 BIN 8 BIN 24 BIN 9 BIN 25 BIN 19 BIN 25 BIN 10 BIN 25
S	File name:	4N25FULL		-	Save	Keep	BIN 11 BIN 27
My Network Places	Save as type:	Test Files(*.t\$t)		_	Cancel	TEST DESC C VARIABLES C KELVIN C DELAY C	BIN 12() BIN 28() BIN 13() BIN 29() BIN 14() BIN 29()
		ND]				MEASURE C FORMULA C FAIL BIN C PASS BIN C ISEQ END •	BIN 15 BIN 31 BIN 15 BIN 31 BIN 16 BIN 32
E <u>x</u> it							SET BINS

3.5.5 SAVING OF TEST PROGRAM

After ALL Test Instructions are save into their respective Test Numbers and Page Numbers, they will be saved into the default Directory 'C:\ADDT\DATA' directory.

Click the [SAVE] button and the above dialog will be shown. The System automatically set to the default data directory. In the Filename field, enter the name '4N25FULL'. Then click the [Save] button. The System append an extension '.t\$t' before saving into the data directory. The Filename will be '4N25FULL.t\$t'.

Save As	\mathbf{X}
♪	C:\ADDT\DATA\4N25FULL.t\$t already exists. Do you want to replace it?
	Yes No

The above will be shown if a same filename is already stored in the directory. Click the proper selection to ensure no overriding of Test Programs.

ADDT DEMO	×
C:\ADDT\DATA\4N25FULL.t	:\$t
ОК	

The above will be shown once the Test Program is saved correctly.

Note: 1) Test Program MUST be saved and then Load in order to be able to start Testing.
2) It is best to RESTART the System AFTER a NEW Test Program is developed. This ensure that ALL settings are RESET to their defaults. Since this System have the interactive capability, some settings may have been set and have not been taken cared of in the Test Program.

-INS	TRUMENT PA	ANEL				
			PARAMETERS			1 []
	OPTO	0	List of Variables	List of Constants	Values	TEST NO 1
	CAL	0	S2_MA	S1_MA	10	Del Inc.
	VMU	0				Der Ins
$\overline{\mathbf{v}}$	S1 V/I 204	0				Next
$\overline{\mathbf{v}}$	S2 V/I 204	0				Keen
$\overline{\mathbf{v}}$	S3 V/I 204	0				
		0				
$\overline{\mathbf{v}}$	S5 V/I 1000	0				FAGE NO JI
		0				Del Ins
$\overline{\mathbf{v}}$	RM2001-4	0	·	,	· ·	Previous
$\overline{\mathbf{v}}$	RM200 5-8	0				Next
$\overline{\mathbf{v}}$	RM200 9-12	0				Keep
	RM20013-16	0	Variable Name	Constant Name	_	TECT DECC C
	THD RLY	0	S2_MA	S1_MA	Value of Constant	VARIARIES (
		0		10		KELVIN C
		0		1.0		DELAY O
		2			Austrations I	MEASURE O
		2	Delete Add	Delete	Baa	FAIL BIN C
		¥I.				1 PASS BIN C
		0	[PARAMETERS]			SEQ END O
			52_MA S1 MA = 10			

3.5.6 USING THE FORMULA FUNCTION

The Formula function allows calculation to be performed with the measurement values returned by the VMU and the V/I Sources.

For example the Current Transfer Ratio (CTR) is given by: -

 $CTR = S2_MA / S1_MA * 100$

Where $S2_MA$ (variable) = the measured current of S2,

 $S1_MA$ (constant) = 10 mA, the force current of S1

Its used is preceded by the definition of the variables and constants (step 2 or Page 2) of a Test Program as above. These become the parameters for which calculations are performed.

OPTO C Result (P3) Variables (P1 or P2) Constants (P1 or P2) CAL C CTR	TEST NO 1
✓ VMU C ✓ S1 V/I 204 C	Previous
▼ S2 V/I 204 C ▼ S3 V/I 204 C	Keep
C Delete Add e.g. P3 = P1 + P2	PAGE NO 1
	Del Ins
₩ 1M200 1-4 C	Next
NC Formula to be used RM200 13:16 1	
THD RLY C 2	VARIABLES C
	FORMULA (
	PASS BIN C SEQ END C

FORMULA FUNCTION (Step 1)

Click the (FORMULA) and the above will be shown. The name CTR is created by entering it in the empty field and clicks the [Add] button. It will display in the 'Result (P3)' field. This will be used to store the results of the calculation. Add more if required. Note: 1) This section's variable are different from the previous (step 2). However, they can also be used as a Pass/Fail parameter for Binning purpose.

-INSTRUMENT PA	ANEL				
		- FORMULA			
	0	Result (P3)	Variables (P1 or P2)	Constants (P1 or P2)	TEST NO 1
	0	ICTR	S2_MA 🗨	S1_MA	Del Ins
					Previous
S1 V/1204	č.				Next
IV S3 V/I 204	c l	CTB			Keep
Г	C	joini	1		
IV S5 V/I 1000	C	Delete Add	e.g. P3 = P1 + P2		PAGE NO 1
Г	0		-		Del Ins
RM200 1-4	0	CTR = (S2_MA /S1_M	A) × 100		Previous
RM200 5-8	0				Next
M RM200 9-12	2	Nc Formula to be	used	<u>^</u>	Keep
	2	1			TEST DESC C
	c	2			VARIABLES O
Γ	C	3			DELAY C
Г	C	4			MEASURE C
Γ	C	5		×	FORMULA
Γ	C				PAIL BIN C
	0	[FORMULA]			SEQ END C

FORMULA FUNCTION (Step 2)

Click the following in sequence 'Result (P3)' select CTR, 'Variables (P1 or P2)' select S2_MA & 'Constants (P1 or P2). The formula box will becomes [CTR = S2_MA S1_MA] Add the mathematical symbols it becomes [CTR = (S2_MA / S1_MA) x 100]

-INSTRUMENT PANE	iL	
	FORMULA	
🔽 OPTO 🛛 🔿	Result (P3) Variables (P1 or P2) Constants (P1 or P2)	TEST NO 1
CAL C	CTR S2_MA 🗸 S1_MA 🗸	Doll Inc.
🔽 VMU 🛛 🔿	, , , , , , , , , , , , , , , , , , , ,	Der ins
S1 V/I 204 C		Next
🔽 S2 V/I 204 🛛 🔿		Next
S3 V/I 204 C	CTR	Keep
C 0		
S5V/11000 €	Delete Add e.g. P3 = P1 + P2	PAGE NU [1
E 0		Del Ins
🕅 RM2001-4 C	CTR = (S2 MA /S1 MA) X 100	Previous
🔽 RM200 5-8 🔿		Next
🕅 RM200 9-12 🔿	No Formula to be used	Keep
🔽 RM200 13-16 🔘		
THD RLY C		TEST DESC O
E 0	2	VARIABLES O
Г С	3	
E 0	4	MEASUBE O
E C		FORMULA @
E C		FAIL BIN 🔘
E C		PASS BIN 💭
	$CTB = (S2 MA / S1 MA) \times 100$	SEQ END O

FORMULA FUNCTION (Step 3)

Copy the formula with [Shift]+click. Paste it to the 'Formula to be used' field with [Shift] + Click on No. 1, the first formula to be used: -

TEXT BOX	REMARKS
[FORMULA]	Instruction to do a calculation with parameters
$CTR = (S2_MA / S1_MA) X 100$	The formula to be processed

Click [Keep] as before to save this as a Page in the Test Program.

Note: 1) 50 formulae are allowed in a Test Program. Just repeat step $1 \sim 3$.

- 2) Clicking the Nos. will display the formula for editing.
- 3) [Shift] + {Right} click will delete the formula.

-1	NSTRUME	NT PAN	IEL									
			_	- PASSING B	3IN						_	
	🔽 OPTO	0			Parameter		ι	Jpper Limit		Lower Limit		TEST NO 2
	🔽 CAL	0	5	VF		_	2		0.5			
	✓ VMU ✓ S1 V/L2 ✓ S2 V/L2	04 C 04 C		VF		·	,		, ,	Jump to if Fail		Previous Next
	S3V/12	04 0		Select the E	Bins that the T	est will	l qualif	y if Passed I	the Limits	;]10		Keep
				Bin 1	R B	in 9 🏼		Bin 17	Γ	Bin 25 🔲		PAGE NO 13
	S5 V/I 1	000 (Bin 2	E Bi	n 10		Bin 18	Γ	Bin 26 🦵		Del Ins
	RM200 1	-4 0		Bin 3	□ Bi	n 11		Bin 19	Г	Bin 27 🔲		Previous
	☑ RM200 5 ☑ RM200 5	5-8 (9-12 (Bin 4	🗖 🛛 Bi	n 12		Bin 20		Bin 28 🦵		Next Keep
	RM2001	13-16		Bin 5	E Bi	n 13 👖		Bin 21	Γ	Bin 29 📄		TEST DESC C
		r (Bin 6	⊟ Bi	n 14 👖		Bin 22	Γ	Bin 30 🦵		VARIABLES C
	Ξ	Ċ		Bin 7	🖂 Bi	n 15		Bin 23	Γ	Bin 31 🔲		DELAY
		0	3	Bin 8	🗖 🛛 Bi	n 16 👖		Bin 24	Γ	Bin 32 🦵		MEASURE C FORMULA C
		0	21									FAIL BIN O
	Γ	0		[PASSING B PARA = VF,	IN] HIGH = 2, LO	W = 0.	.5					SEQ END
				JMP = 10, B	IN = 1							

3.5.7 USING THE JMP (JUMP) FUNCTION

This function is part of the PASS BIN instruction. When the value fail the PASS BIN limits, the selected BIN is disqualified. JMP allow another set of Test limits to compare: -

TEXT BOX	REMARKS
[PASSING BIN]	Pass Bin instruction
PARA = VF, HIGH = 2, LOW = 0.5 $JMP = 10, BIN = 1$	Check if VF is within $0.5 \sim 2$. If YES then Bin 1 will remain. If NO, disqualify Bin 1, then go to Test No. 10 and use other Bins if passed.

-INSTRUMENT PANEL

		PASSING BIN				
🔽 OPTO	C	Paramet	er	Upper Limit	Lower Limit	TEST NO 10
🔽 CAL	0	VF	2.5	-(0.5	Doll Inc.
VMU 🔽	0	DVE				Previous
🔽 S1 V/I 204	0	JVF	_		Jump to if Fail	Nevt
S2 V/I 204	0	Select the Bins that	the Test will quali	ifv if Passed the Lin	nits 0	Keen
S3 V/I 204	0					
	0	Bin 1 🕅	Bin 9 🗖	Bin 17 🕅	Bin 25 📄	PAGE NO 3
S2 22 22 22 22 22 22 22 22 22 22 22 22 2	2	Bin 2 🕅	Bin 10 🕅	Bin 18 🔲	Bin 26 🔲	Del Inc.
RM200 1-4	č	Bin 3 🗖	Bin 11 🕅	Bin 19 🔲	Bin 27 🔲	Previous
🔽 RM200 5-8	0	Bin 4	Bin 12 🗖	Bin 20 🔲	Bin 28 🗔	Next
I RM200 9-12	0		Dia 10 🖂	Dia 01 🖂	Dia 20	Keep
		Bin 5 J	Bin 13 J	Bin 21	Bin 29	TEST DESC C
	č.	Bin 6 🔽	Bin 14 🔲	Bin 22 🔲	Bin 30 🦵	VARIABLES C
Γ	õ	Bin 7 🗖	Bin 15 🔲	Bin 23 🔲	Bin 31 🦵	DELAY C
	0	Bin 8	Bin 16 🔲	Bin 24 🔲	Bin 32 🗖	MEASURE O
	0					FURMULA C
	물					PASS BIN 💿
	0	[PASSING BIN]	261004-05			SEQ END 🔘
		JMP = NIL, BIN = 6	2.5, LOW = -0.5			

JMP to if Fail

The above is the picture of Test No. 10, which will be executed if Test No.2 failed. This should have looser limits so that it could pass. A new Bin No. 6 is selected. The 'Jump to if Fail' is set to 0 (or NIL) to signify that there is NO branching if this Test Failed.

TEXT BOX	REMARKS
[PASSING BIN]	New Pass Bin instruction
PARA = VF, HIGH = 2.5, LOW = -0.5	Looser limit. If Pass Bin 6 or else then disqualifies
JMP = NIL, $BIN = 6$	Bin 6. There is NO jump to other Test.

KELVIN TEST SEQUENCE

Test	Page	FUNCTION	SELECTION OF PARAMETERS	REMARKS
1	1	[TEST 1]	<kelvin>, Unit = <null>, <kelvin test=""></kelvin></null></kelvin>	Fields NOT optional
	2	[THD RLY]	<k9, k10,="" k12,="" k13,="" k14=""></k9,>	Connect required relays
	3	[KELVIN CHECK]	<s1 204-="" i="" v=""> 1,3,4,5,6,> Reject Bin = <16></s1>	Each pins to be checked
	4	[SI V/I 204]	OFF	Required
	5	[THD RLY]	OFF	Required
	6	[SEQ END]		Required

FIRST TEST SEQUENCE

Test	Page	FUNCTION	SELECTION OF PARAMETERS	REMARKS
2	1	[TEST 2]	<fv>, Unit = <volts>, <forward VOLTAGE></forward </volts></fv>	Fields NOT optional
	2	[PARAMETERS]	<vf> <ir> <vce_sat> <vbe_on> <ic> <></ic></vbe_on></vce_sat></ir></vf>	Declare before use in this Test and the subsequent Tests
	3	[RM200 1-4]	<(S1) Line 3 to Pin 1> <(DSG) Line 6 to Pin 3>	Connect as required
	4	[THD RLY]	<k9, k10=""></k9,>	Connect relays
	5	[SET DELAY TIME]	<5>	Time in milliseconds
	6	[S1 V/I 204]	Force Range = <20mA>, Force Value = <20.00>, Meas. Range = <2V>	Select as required. Force I Measure V.
	7	[SET DELAY TIME]	<5>	Time in milliseconds
	8	[MEASURE]	S1 V/I 204 -> <vf></vf>	Measure and store into VF
	9	[S1 V/I 204]	OFF	Required
	10	[THD RLY]	OFF	Required
	11	[RM200 1-4]	OFF	Required
	12	[FAILED BINNING]	PARA = <vf>, HIGH = <2>, LOW = <0> Bin = 16</vf>	When VF failed the 2 limits, stop and Bin as 16.
	13	[PASSING BIN]	PARA = <vf>, HIGH =<2>, LOW = <0> Jmp = <nil>, BIN = 1</nil></vf>	If VF pass the 2 limits, it will be Bin 1 at end of Test
	14	[SEQ END]		Required

3.5.8 SAMPLE OF TEST PROGRAM LISTING

The above is a listing of the Test Program that was build earlier in this manual. The actual listing can be viewed using 'Notepad', 'Wordpad' in the file stored in the 'C:\Addt\Data' directory.

ITE	EM	DE	SCRIPTION/C	CONNECTI	ON/SEL	ECTION]
TEST	「	ID:	_UNIT:					REMARKS
		DES:						
	RELAY	<u>′S : K1, K2,</u>	K3, K4, K5,	K6, K7, K	(8			
		K9, K1	0, K11, K12,	K13, K14	, K15, I	K16		
	MATRI	X : L	<u>-[P][P][P</u>	<u>)][P_][P</u>	<u>][P]</u>	<u>[P][P</u>][P]	
		<u> : L</u> -	- <u>[P_][P_][P</u>][P][P	<u>][P]</u>	<u>[P][P</u>][P]	
		<u> : L</u> -	<u>- [P_][P_][P</u>	<u>][P][P</u>	<u>][P]</u>	<u>[P][P</u>	<u>][P]</u>	
		: L	<u>- [P][P][P</u>		<u> </u>	<u>IN 115</u>	<u>IIP I</u>	
		: L	<u>- [P_][P_][P</u>			<u> </u>		
		<u> </u>	<u>- [P] [P] [P</u>			<u>[P][P</u>		
		<u> : L</u> -	<u>- [P][P][P</u>					
		 	<u>-[P][P][P]</u>					
		· L						
		CE3 E·	$\Delta \Delta / \Lambda$		۸/۱/		MQ	2)
	<u> </u>	<u>г</u> Е·	A/V_IVI A/V_M·		A/V	DELAT DELAV:	IVIS	a)
	<u> </u>	<u> </u>	A/V_IVI A/V_M·		Α/ν Δ/ν/	DELAT DELAV:	WS	
	<u>s</u>	<u> </u> F [.]	Α/ν IVI Δ/\/ Μ·		Λ/ v Δ/\/	DELAT DELAY:	NS	() ()
	<u>o</u> . S ·	<u> </u>	/\/_M:		/\/	DELAT DELAY:	MS	e)
	<u>o</u> . Parai	METERS	/ / / / ///		/ \/ \/			
	a)		f	;)				
	<u>b</u>)		() a)				
(c)		Ĭ	<u>ן</u> ר)				
(d)		i)				-
	e)		j)				
	FORM	ULA						
	1)							
	2)							
:	3)							
4	4)							
	ANSW	ER :						
<u> </u>	FAILE	D BINNING :	HIGH:		LOW: _			
	BIN :							
└ 	PASSE	D BINNING	HIGH:		_LOW: _			
└ ·	JMP : _		BIN :					

3.5.9 WORK SHEET (1) FOR TEST NO,

PROGRAMMING FORMAT FOR ADDT PROGRAM

Test	Page	FUNCTION	SELECTION OF PARAMETERS	REMARKS
-				
-				
-				
<u> </u>				
	İ			

WORK SHEET (2) FOR TEST NO,



The above show the overall System Test Flow (Software.)

4. FILES STRUCTURE



Notes: 1) [C:\] Root directory of PC System.

- 2) [C:\ADDT] directory for [DATA], [LOG], [SUMMRY], [SYSTEM] and System Program.
- 3) [DATA] directory for Test Programs. [LOG] directory for datalogging files. [SUMMARY] for Test Summary and [SYSTEM] directory for System resources.

<< Except for the [DATA] directory files, which are User changeable, the [SYSTEM] files are NOT meant to be meddled with. Use the Explorer to copy data for off-line use. >>

5. PCI CONTROLLED TESTER

The System requires a PCI Based Digital input/output Card. This card is plugged into the PCI slot of the PC. There is a 100-pin connector that brings the Digital signals to the Test System Hardware of the Tester. This PCI card is a replacement of the previous control card, which is ISA based. The difference is that the PCI card is able to read and write 16-bit data directory as against the ISA, which can do so in 8 bit data, double the time taken.

The Control Software for the PCI Card is Windows based and it can be used with the latest Windows XP. As a Windows based software, the method of execution is by the use of the mouse cursor.

Hence, there are many User Interfaces that provide the necessary functions and utilities for the proper operation of System Operations. These include loading, using and saving Test Programs. Setup and calibration of the System Hardware.

A very notable capability of this System is the interactive way to use the Test sequences directly. This means that a Test can be setup by using the Instruments Panel. This takes away any of the need to build a separate prototype Test circuit to measure the parameter before putting the Test sequences to make up a Test Program.

Once the parameters and limits are determined in the interactive mode, it can be transferred into the Work sheets provided and subsequent coded as illustrated earlier. These Test Programs are in ASCII codes and can be edited off-line using a Word Editor like NotePad. A default directory stored them neatly.

These Test Programs are easily loaded by click of the mouse cursor. Pass/Fail results are shown distinctly with the Bin LED which can be custom coloured.

The Debug mode has features that allow stopping at ALL/FAILED/PASSED tests. Looping allow a DUT to show intermittent values so that better conditions/limits will be set to improve test yield.

There is also FULL/PARTIAL Summary and Datalog which can set to log ALL/FAILED/PASSED. They are also conveniently as ASCII files in default directories for easy retrieval and review.

Finally, the PCI Card only replace the controller, which is in the PC, it will NOT change the way the Tester Hardware behave. It retains the speed of execution as compared to the previous card.

<< END >>

6.1 ADDENDUM

6.2 ADDENDUM

6.3 ADDENDUM