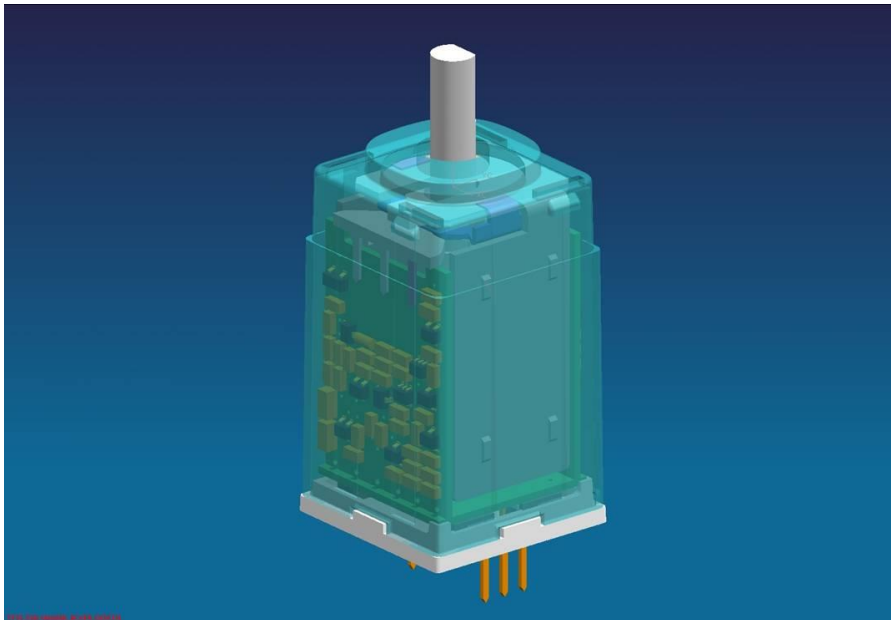

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Qualification of 30Mech Dimmer



Clipsal 30 MECH Dimmer

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1. Introduction

1.1. Scope

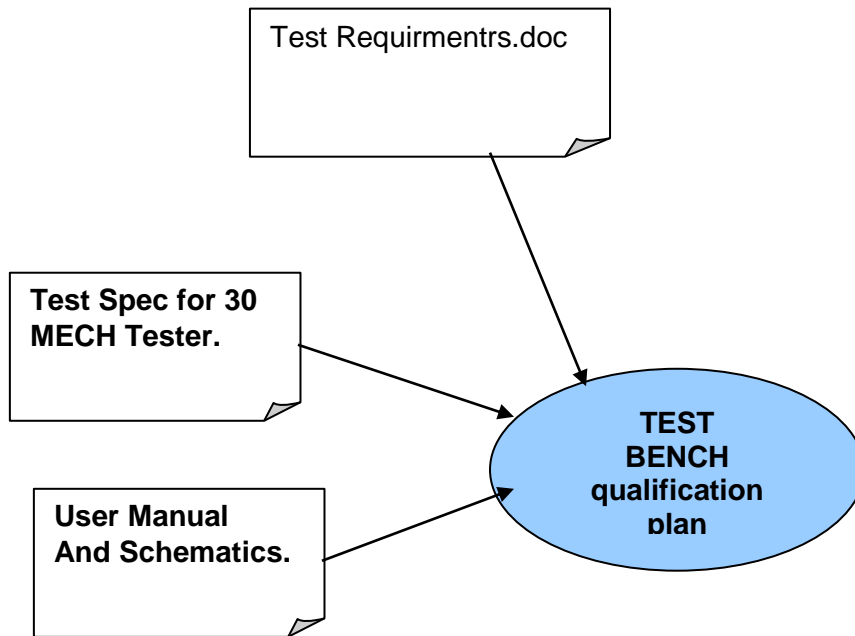
The purpose of this document is to set out some guidelines to qualify the 30MECH tester built by DayStar.

1.2. Revision control

Version	Date	Author	Description
1.0	28-Feb-2008	Kevin O'Brien	Created


1.3. Documents Referred to

The following is a list of documents used to develop and carry out the qualification plan.



1.4. Qualification by reference

Reference	Product	Status	Remark
30Mech Clipsal	Universal dimmer Mechanism Clipsal		
30Mech PDL	Universal dimmer Mechanism PDL		

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1.5. Qualification Check List

This table will help ensure that all checks are done and verified to ensure the tester is accepted correctly.


All of these items are discussed later in this document.

Item	Description	Status	Comment	By	Date
1	Safety Check				
2	Hardware Check				
3	Document Check				
4	Calibration and Certs				
5	Training				
6	Test Times				
7	Reliability Testing				
8	Validating Each Step				
9	Detecting Faulty Product				
10	Initial Acceptance at Daystar				
11	Final Acceptance at Daystar				
12	EMS Reliability (Gage RnR)				
12	EMS Acceptance				
13	TARs files				
14	Out of Box Audit				
15	Action Plan				

1.6. Not Checked by Tester

This table shows what not tested by the tester

Item	Description	Status	Comment	By	Date
1					
2					
3					
4					

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2. General Tester Checks

2.1. Safety Checks

Item	Description	Result	Comments
1	Emergency Stop		
2	Keys Working		
3			
4			

Item 1: Emergency Stop

Method: During a product being tested hit the "EMERGENCY STOP" button.

Expected Result: a) The test may fail.
b) Testing should stop (not ask for another serial number)

Item 2: Keys Working


Method: Locate all of the keys, and ensure all are working.

Expected Result: Verify that they are all working correct.

2.2. Hardware Checks

The following are checks to be carried out on the Hardware.

Hardware Type	Description	Status	Comment	Date
Cabling neat?	All cables tied up and not likely to get caught in anything			
Metal Work OK	Verify no dangerous metal in tester			
Fixture interface	Remove and connect fixture 3 time to make sure all is good			
All instruments secure	Are all instruments bolted onto something? No move in transit			
Nut and Bolts tight	Check Hardware put together good.			

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2.3. Documentation check

The following documents are expected from the contractor:

Doc Ref	Description	Status	Comment	Date
User Manual	Description on how to use the tester from operator point.			
30MECH Bench Drawing	Mechanical drawing of tester and fixtures.			
30MECHwiring diagram	Schematic of Tester, and schematic of fixture.			
Wear parts list	A list of suspect wear parts, part numbers and source			
Maintenance Manual	Description of how technical person can debug the tester.			


2.4. Training

Level 2 maintenance training
 Troubleshooting trainings

2.5. Calibration & Certificates

This section is to verify that all instruments have calibration certs, and that the software on the tester is all legal.

Tpye	Description	Number	Status	Comment	Date
XP software	License Agreement				
Lab View	Run Time Engine				

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3. Initial Acceptance at Contractor Site

3.1. Products Tested

Verify that each product is actually functioning correctly before beginning the Qualification Process.

Five of each of the two different power variants is to be used for the qualification process.

All units should be Known Good Units, (KGU)

The following is a list and description of each product type.

The products are to be labelled with special numbering so they can be traced if there is a problem, use the table below to label each product using column "Unit Number".

Qty	Product Type	Description	Unit Number
5	30MECH Clipsal	30MECH Dimmer Clipsal	1.1 to 1.5
5	30MECH PDL	30MECH Dimmer DDL	2.1 to 2.5

Note:

3.2. Test Time

Each variant to be tested 10 times in row, this will give 50 results for 30MECH Clipsal & 50 results for 30MECH PDL.

Test one variant at a time, so prepare the 5 of whichever variant is being tested.

For Example: Test DUT 1.1 first, record results, then DUT 1.2, DUT, 1.2, 1.4 & 1.5. Then start testing DUT 1.1 again, 1.2, 1.3, 1.4 & 1.5..etc..

Each test time & cycle time is to be recorded. Times can be got from either using a stopwatch or else the CT (Cycle Time) & TT (Test Time) from the GUI and be recorded each time.

After the first variant has been completed, do all of the other 5 variants the same as the first.

Fig 1 shows a portion of the GUI, which the operator will use while testing the DUTs.


Prod	30MECH Clipsal	30MECH PDL
Times		
Test Time		
Cycle Time		

Conclusion:

3.3. Recycle And Repeatable

This section is to determine how many "No Fault Founds", NFF, the tester generates, and ideally it should be 100% yield because all products are known to be good.

Prod	30MECH Clipsal	30MECH PDL
Times		
Expected yield	96%	96%
Actual Yields		


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3.4. Validating Each Step

This section verifies that each step is doing what it is supposed to be doing. The results file of each product to be used to get the results. A histogram will be made for each measurement that is numeric.
 UL → Upper Limit, LL → Lower Limit.

Step Name	Product	LL	UL	Unit	Result CP	Result CPK	Comment

Conclusion:


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3.5. Validating Correct Measurements

This section verifies that the correct conduction angles are being measured.

Angle Type	Expected Angle	Measured Angle	Comment
Minimum Angle			
Maximum Angle			
DC Current measure			

Conclusion:

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4. Detecting Faults Product at Contractor Site.

4.1. Detecting Faulty Product

This section attempts to simulate faults in product & to verify if the tester will detect each fault.

Fault	Prod	Product	Description	Step Failed	Comment
<u>1</u>					
<u>2</u>					
<u>3</u>					
<u>4</u>					
<u>5</u>					
<u>6</u>					
<u>7</u>					
<u>8</u>					
<u>9</u>					
<u>10</u>					
<u>12</u>					
<u>13</u>					
<u>14</u>					
<u>15</u>					
<u>16</u>					
<u>17</u>					

Fault 1: Earth Pin missing

Method: Remove the Earth cage.

Expected Result: Fail on the step "Measure resistance from Line E to Outlet1 E", once failed, test a KGU again.

Fault 2: Earth busbar behind plastic.

Method: Remove the busbar from the cage of the earth, put behind plastic part.

Expected Result: Fail on the step "Measure resistance from Line E to Outlet2 E", once failed, test a know good product again

Fault 3: Measure Line LED OFF voltage.

Method: Disassemble a unit, and remove the TEST Button, i.e., the 30MECHmodule ON.

Expected Result: Fail on the step "Measure Line LED OFF voltage", once failed, test a know good product again

Fault 4: Measure Line LED ON voltage.

Method: Cover the LED.

Expected Result: Fail on the step "Measure Line LED ON voltage", once failed, test a know good product.


Fault 5: Measure OUTLET LED OFF Voltage

Method: No sure.

Expected Result: Fail on the step "Measure OUTLET LED OFF Voltage", once failed, test a know good product.

Fault 6: Measure 30MECHOFF isolation between Line and Outlet1&2

Method: Turn ON one of the switches at the beginning, or else simulate short on switch..

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Expected Result: Fail on the step “Measure 30MECHOFF isolation between Line and Outlet1&2”, once failed, test a know good product again

Fault 7: Measure OUTLET LED ON voltage

Method: Cover the “Outlet” LED with tape.

Expected Result: Fail on the step “Measure OUTLET LED ON voltage”, once failed, test a know good product again

Fault 8: Measure 30MECHON isolation between Line and Outlet1&2

Method: Put a short on one of the switches.

Expected Result: Fail on the step “Measure 30MECHON isolation between Line and Outlet1&2”, once failed, test a know good product again

Fault 9: Measure resistance from Line A to Outlet1 A

Method: Put a short on one of the switches.

Expected Result: Fail on the step “Measure resistance from Line A to Outlet1 A”, once failed, test a know good product again

Fault 10: Measure resistance from Line A to Outlet1 A

Method: Put a short on one of the switches.

Expected Result: Fail on the step “Measure resistance from Line A to Outlet1 A”, once failed, test a know good product again

Fault 12: Measure 50% RTC Line current

Method: Test a 10mA product using a 30mA sequence.

Expected Result: Fail on the step “Measure 50% RTC Line current”, once failed, test a know good product again

Fault 13: Measure 100% RTC Line current

Method: Test a 10mA product using a 30mA sequence, the 50% step might have to be skipped.

Expected Result: Fail on the step “Measure 100% RTC Line current”, once failed, test a know good product again

Fault 14: Measure 30MECHON Line current1

Method: No sure


Expected Result: Fail on the step “Measure 30MECHON Line current1”, once failed, test a know good product again

Fault 15: Measure self test trip current

Method: Remove the Test button.

Expected Result: Fail on the step “Measure self test trip current”, once failed, test a know good product again

4.2. Conclusion

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5. Final Acceptance at Contractor Site

5.1. Products Tested

Verify that each product is actually functioning correctly before beginning the Qualification Process, KGU.. Fifteen (15) of each 30MECH variants is to be used for the qualification process.

Each unit to be tested 10 times

Qty	Product Type	Description	Unit Number
15	30MECHClipsal	30MECH Clipsal	1.1 to 1.15
15	30MECH PDL	30MECH PDL	1.16 to 1.30

Note:

5.2. Test Time

Each variant to be tested 10 times in row, this will give 150 results for 30MECH Clipsal & 150 results for 30MECH PDL.

Test one variant at a time, so prepare the 15 of whichever variant is being tested.

For Example:

Each test time & cycle time is to be recorded. Times can be got from either using a stopwatch or else the CT (Cycle Time) & TT (Test Time) from the GUI and be recorded each time.


Prod	30MEC Clipsal	30MECH PDL
Times		
Test Time		

Conclusion:

5.3. Recycle And Repeatable

This section is to determine how many "No Fault Founds", NFF, the tester generates, and ideally it should be 100% yield because all products are known to be good.

Prod	30MECH Clipsal	30MECH PDL
Times		
Expected yield	96%	96%

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5.4. Gage R&R First Run

6. Final Acceptance at JABIL

6.1. Products Tested

Verify that each product is actually functioning correctly before beginning the Qualification Process, KGU.. Fifteen (15) of each 30MECH variants is to be used for the qualification process. Each unit to be tested 10 times

Qty	Product Type	Description	Unit Number
15	30MECHClipsal	30MECH Clipsal	1.1 to 1.15
15	30MECH PDL	30MECH PDL	1.16 to 1.30

Note:

6.2. Test Time

Each variant to be tested 10 times in row, this will give 150 results for 30MECH Clipsal & 150 results for 30MECH PDL.

Test one variant at a time, so prepare the 15 of whichever variant is being tested.

For Example:

Each test time & cycle time is to be recorded. Times can be got from either using a stopwatch or else the CT (Cycle Time) & TT (Test Time) from the GUI and be recorded each time.

Prod	30MEC Clipsal	30MECH PDL
Times		
Test Time		

Conclusion:


6.3. Recycle And Repeatable

This section is to determine how many "No Fault Finds", NFF, the tester generates, and ideally it should be 100% yield because all products are known to be good.

Prod	30MECH Clipsal	30MECH PDL
Times		
Expected yield	96%	96%

6.4. Gage R&R Second Run

Run the same products again that were ran at contractors site.

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7. Other Checks

This section is for other test that does not fit into the above system

7.1. TARs Files

The 30MECH tester while in Jabil it will generate a TARs file, this file is only for Jabil's use, for doing analysis of the performance of the tester.

Take a copy of a TARs file for products that PASSED & for a product that failed, and past both of them in here for review with Jabil Test Team.

Verify that for every product tested it generates a TARS file, and stores it in the C:\TARS\ drive under & C:\TarsBackUP\xx...xxx.TARS folder, twice.

The TARs file for each UUT takes the format of serial NO then date & time tested & finally an extension on .tars, e.g: 00123456789_080225_103035.TARS.

7.2. Test Results.MDB file.

The TU800B also loads an Access Data Base file with all of the units tested & their respective results.

This file can be found under the C drive in directory results/Test Results.mdb.

First, verify they the results are being loaded in here, then once all of the qualification has been completed, take a copy of this file and this can be used for later analysis.

This will tell us things like test times & yields, with the aid of some simple SQL statements.

7.3. Out of Box Audit

Method: Get someone who knows how the product should arrive at the customer to do an out of box audit.

This test is not there necessary to verify that all of the correct bits are in the box, because production might not have all of the bits, it's just to check that the configuration is what the customer would expect.

Not all products have to be done, only a sample of the variants.

Expected Result: It should pass this test


Test	Expected result	Result
1. Connect a lamp load and mains Via a current Sense Transformer	Load turns ON	
Rotate Trim POT	The Load should turn off	
Verify correct serial number	Same serial numbers as on DUT	

Conclusion:

7.4. Australian Verification

Method: The entire pilot builds to be sent to Australia for verification.

7.5. Failures from Verification Process

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8. Appendix

8.1. Yet another Heading

8.2. Conventions used

- DUT → Device Under Test.
- UUT → Unit Under Test.
- DMM → Digital Multi Meter.
- mSec → milliseconds.
- TT → TestTime (Run time of program)
- CT → CycleTime (Time it takes to load, run sequence & unload DUT).
- LL → Lower Limit.
- UL → Upper Limit.
- NFF → No Fault Found.
- GPO → General Purpose Output

Action plan

	Action	Level	Owner	Date planed	Status	Date close
1						
2						
3						
4						
5						
6						
7						
8						
9						