

Reflex 51 - a flexible solution to high-power life-testing.

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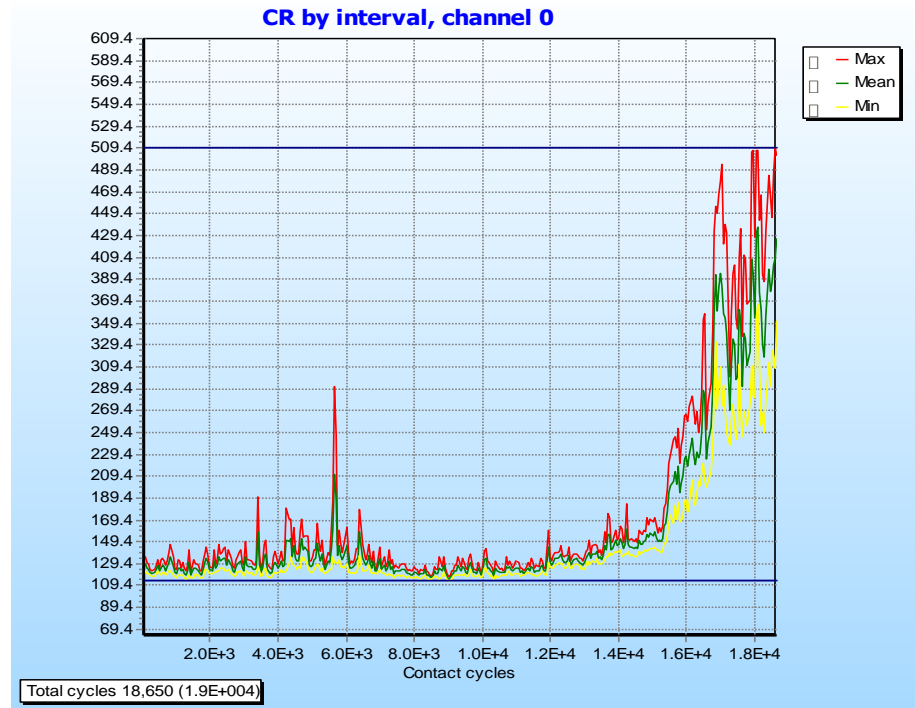


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REFLEX 51

Power Relay Life Test System



Monitors & collects contact behaviour - Contact Voltage Drop, CR, Stick etc. on EVERY cycle

Power relay life testers present some difficult design challenges...



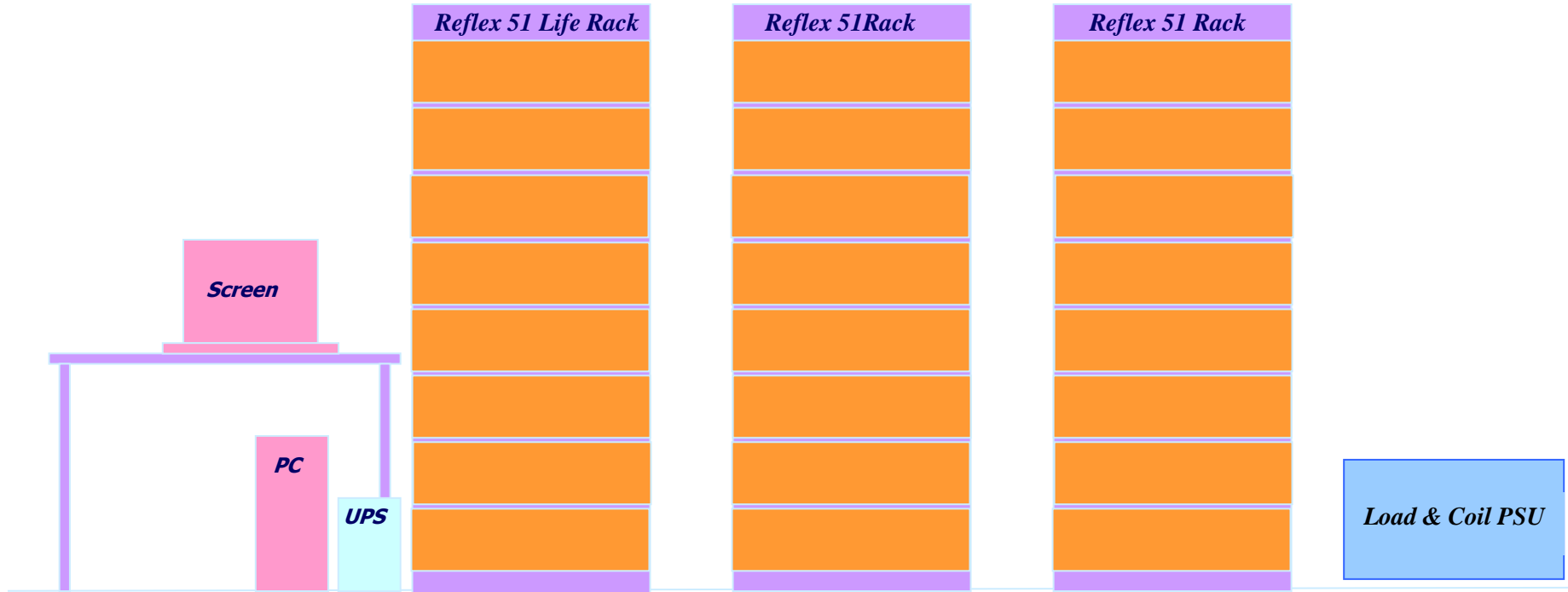
- Systems are often physically & electrically large
- Often requiring large numbers of relays & contacts to be tested e.g Automotive relays > 100 relays
- Wide range of load types, e.g. inrush, motor etc, not always known at time of equipment purchase.
- Power loads are often complex with high voltages & currents. Heat dissipation can be significant (kW)
- Flexible load-circuit configuration, easy to construct, easy to change, depending on application

Reflex 51 Offers a highly flexible ground-up approach to life test...



- Select from a collection of simple modular Life Test System components, available individually or as a turnkey package
- Build up a SINGLE power life test chassis to do exactly what you want for life testing one relay
- Then ADD more chassis for the relays to be tested
- Maximise the system flexibility & capability with software

Larger systems can easily be built using the flexibility of Ethernet to interconnect individual chassis



Display & Control Module Provides...



- Essential front panel display of chassis status
- Providing information on CR & Stick, Load Current, Load Voltage
- Communications to host PC Controller
- Control of measurement & Switching modules

Measurement Module Provides...



- 4 independent ADC measurement channels
- Used for measurement of Contact Voltage Drop (CR), Stick, Load Current, Load Voltage
- Multiple Modules can be configured per chassis

Power Switching Module Provides...



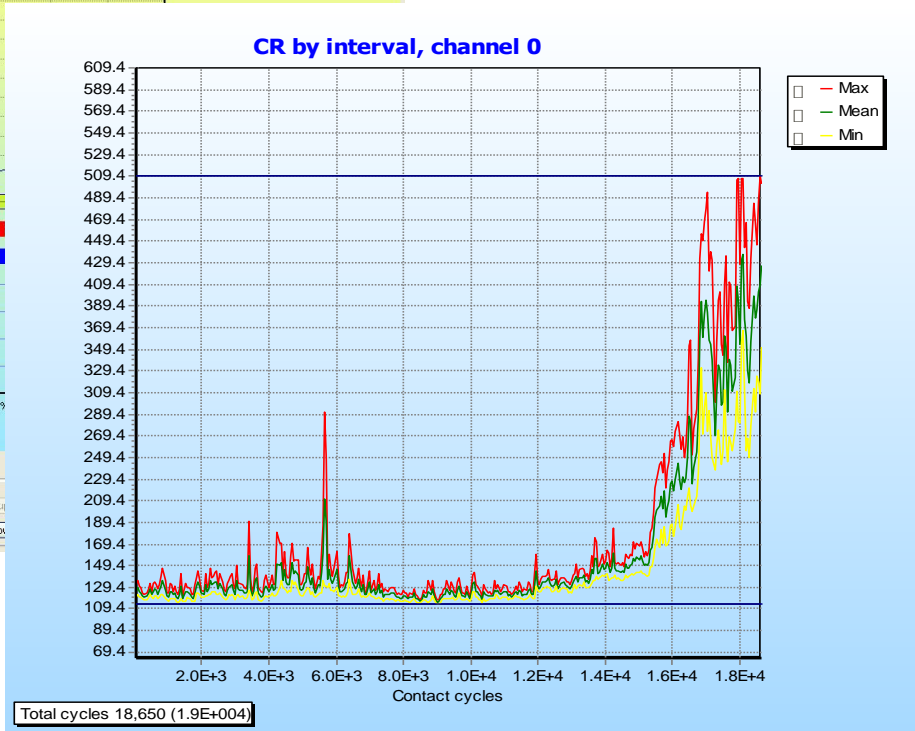
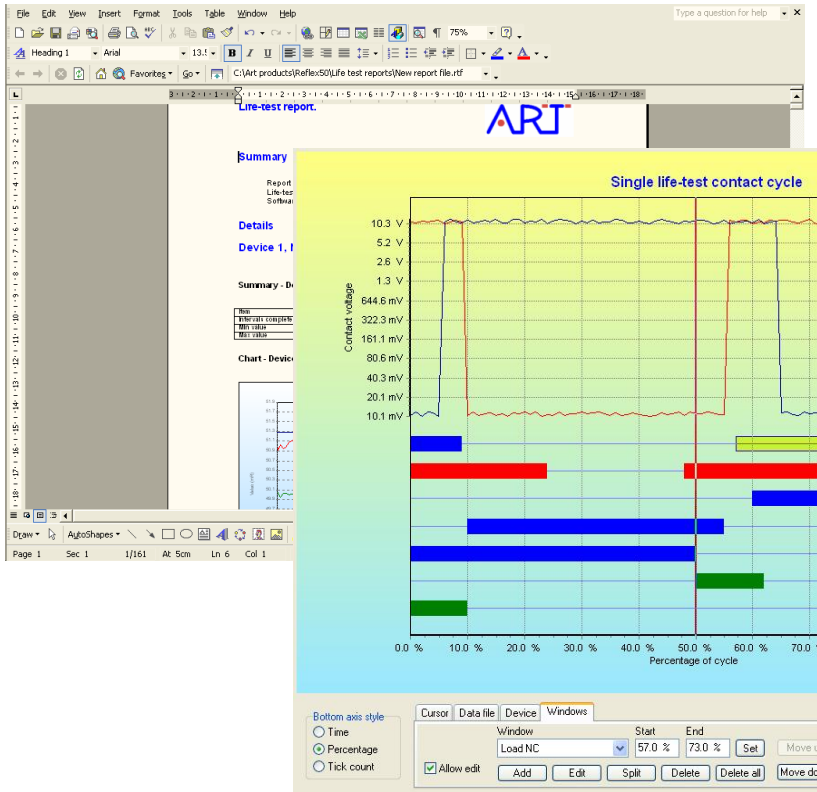
- Power switching for loads or load power
- Power switching for coil drive and coil power
- Multiple modules can be configured per chassis
- Each module provides two high-power solid state switches

Benefits of a modular Ethernet based architecture...



- Solutions can be quickly built from standard Reflex51 component parts for a rapid engineering response focused tightly on cost.
- Using Ethernet, systems can be easily cascaded to create large distributed power relay life-test systems
- Chassis can be updated or reconfigured & modules re-used when test requirements change.
- Reflex51 measurement and control could easily be added to existing customer load investment or load circuitry.

Modern Modular Architecture - Software



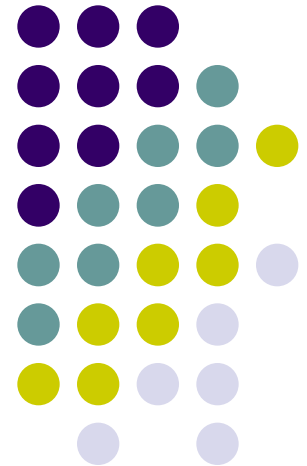
Reflex 51 software – a detailed look.

Brian Frost

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Reflex 51 is based on hardware 'components'



- Main components are power switching and voltage measurement.
- You program the switching activity.
- You program the measurement points.

Simple, customisable web format Operator screen



Operator

Summary

Date: 18 April 2004
Time: 17:54:33

Status: Stopped
Totals: Cycle 56 of 100 (56.0%) duration 44 s
Interval 57 of 100, cycle 0 of 1 (0.0%) duration 1.0 s

ART

Start new Stop Continue

Load file Save file Make report

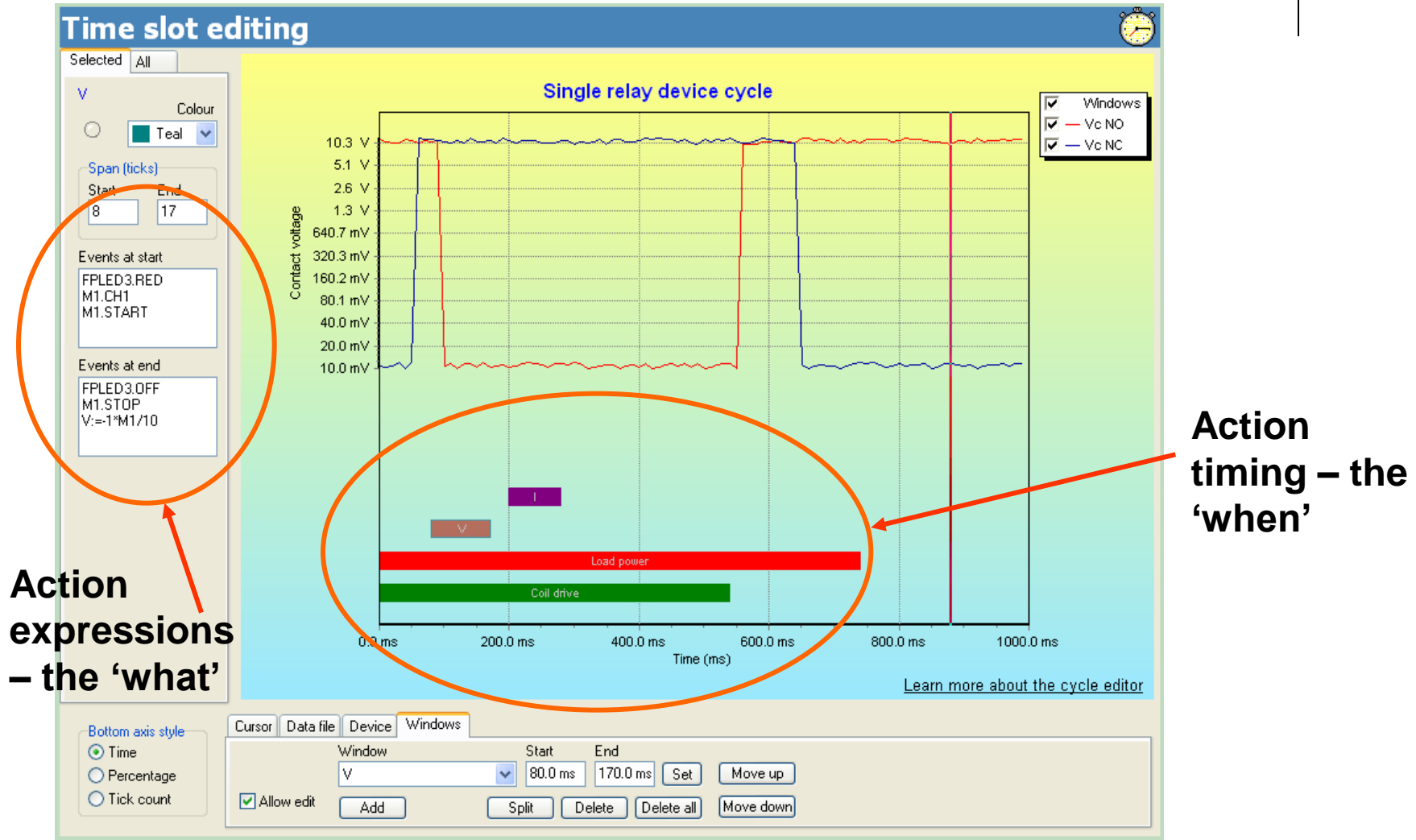
Stopped
Cycle 56 of 100 56% Duration 44 s
Interval 57 of 100 0% Duration 1.0 s
Cycle 0 of 1

5:54 PM

Ready

The screenshot displays a web-based operator interface. On the left is a vertical navigation menu with icons and labels for 'Operator', 'Shell log file', 'Resource explorer', 'Web page', 'Time slot editing', 'Cycle engine', and 'Result output'. The main content area is titled 'Operator' and shows a 'Summary' section with the date '18 April 2004' and time '17:54:33'. The status is 'Stopped', and it provides cycle progress information: 'Cycle 56 of 100 (56.0%) duration 44 s' and 'Interval 57 of 100, cycle 0 of 1 (0.0%) duration 1.0 s'. A large 'ART' logo is in the top right. Below the summary are two rows of buttons: 'Start new', 'Stop', 'Continue' in the first row, and 'Load file', 'Save file', 'Make report' in the second. At the bottom, there are two progress bars: the top one is labeled 'Stopped' and shows 56% completion for 'Cycle 56 of 100' with a duration of 44 s; the bottom one shows 0% completion for 'Interval 57 of 100' and 'Cycle 0 of 1' with a duration of 1.0 s. A digital clock in the bottom right shows '5:54 PM' with a clock face graphic. The status 'Ready' is shown in the bottom left corner.

Cycle programming is easy yet flexible like a PLC



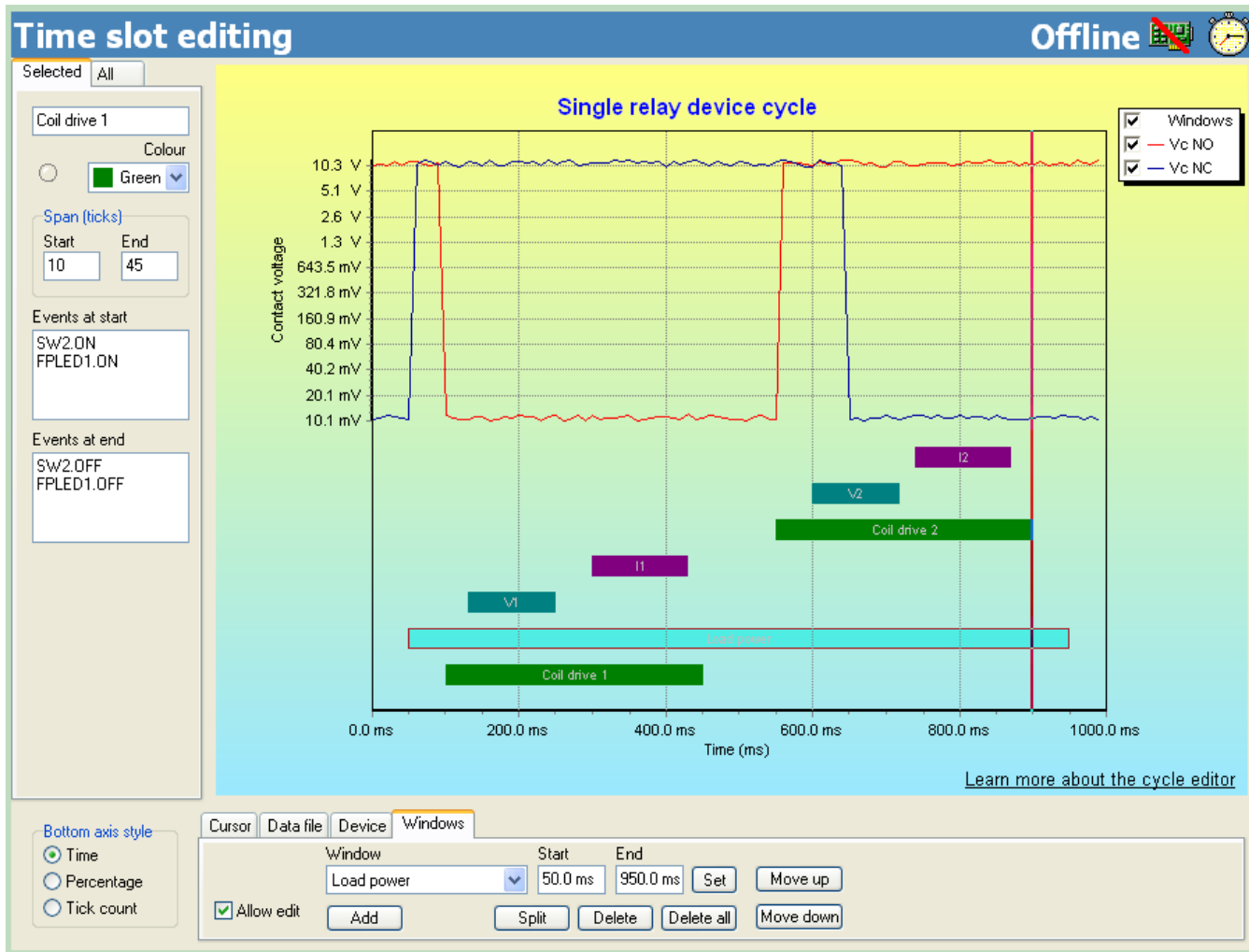
Fully graphical results, for example this Vcontact result



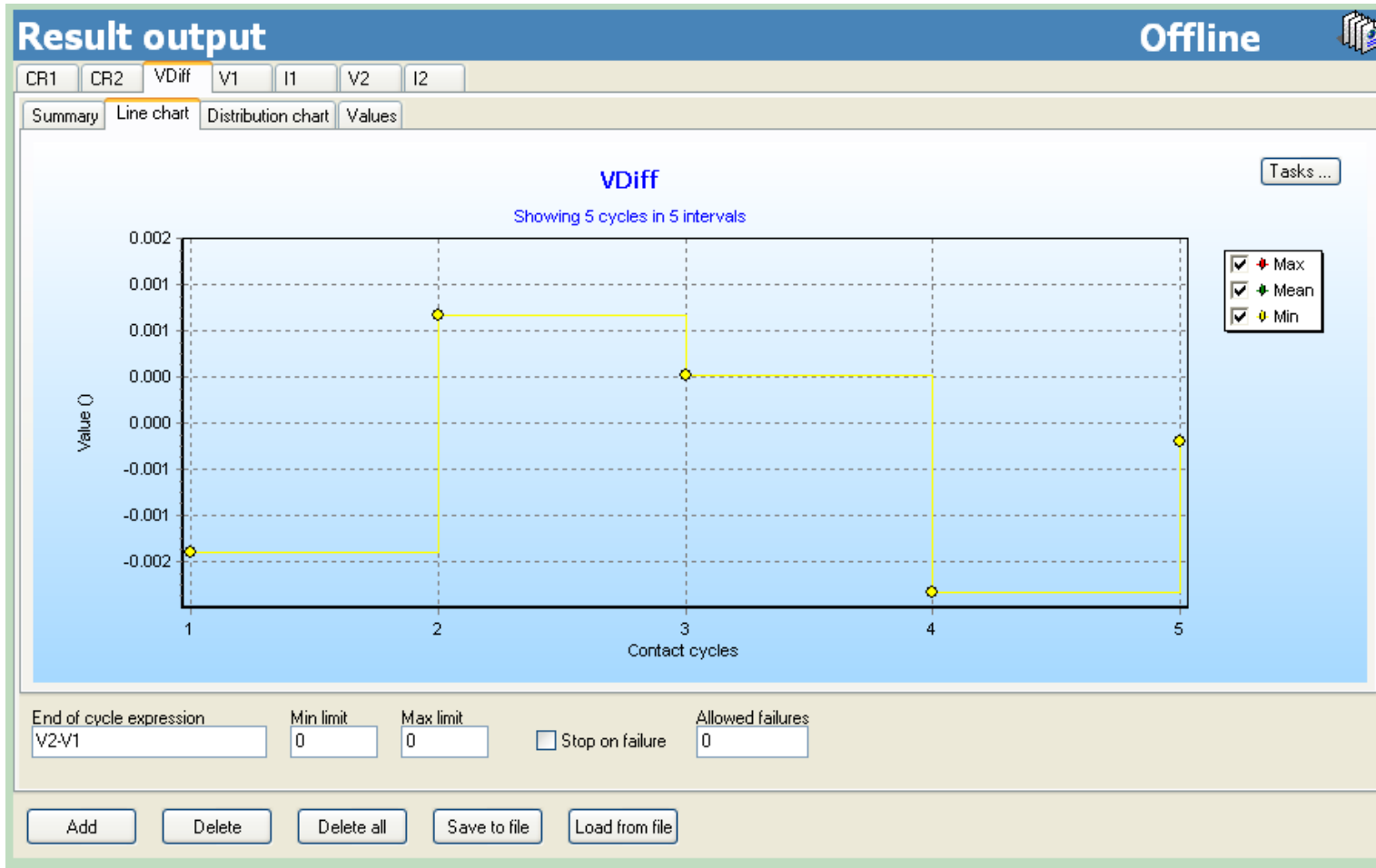
Any number of derived results can be added, e.g. this CR result



Use the same concept for a special dual-relay for example



When run, the dual-relay results are comprehensive



Load-circuit can be debugged directly using an 'Explorer'



The screenshot displays the 'Resource explorer' application window. The left pane shows a hierarchical tree view of the system components under 'Reflex51', including 'System log file', 'System', 'Reflex51 data files', 'Time slot data', 'Art 5730 front panel PCB' (with sub-items like 'Art 5731 measure module' and 'Switch 0' through 'Switch 15'), 'Art 4x40 LCD display', 'ArtCardNIEEPROM', 'ArtI2CTempSensorLM75', 'Text summary', 'Results', 'Time slot engine', 'Device cycle editor', 'Reporting', and 'Life test setup'. The right pane is titled 'Art 5730 front panel PCB' and contains tabs for 'Controls', 'Properties', 'Resources', and 'Info'. The 'Controls' tab is active, showing 'Main controls' for 'ART5730A Front Panel PCB' and 'Art5731A Measure Module PCB'. It features buttons for 'Open hardware', 'Write panels leds green', and 'Write panels leds red'. A 'Test hardware function' section includes a 'Function to perform' dropdown set to 'SW2.OFF', a 'Copy >' button, a 'Result' field showing '0.000', and a 'Duration' field. A 'Function group' box contains 'SW2.ON', 'FPLED1.GREEN', 'M1.VALUE', and 'SW2.OFF', with 'Record' and 'Clear' checkboxes and an 'Execute group' button.

Entire system view provides full control even at low level



Resource explorer

- Reflex51
 - Settings manager
 - Chart reports
 - System log file
 - System
 - Reflex51 data files
 - Time slot data
 - Art 5730 front panel PCB
 - Art 5731 measure module
 - Switch 0
 - Switch 1
 - Switch 2
 - Switch 3
 - Switch 4
 - Switch 5
 - Switch 6
 - Switch 7
 - Switch 8
 - Switch 9
 - Switch 10
 - Switch 11
 - Switch 12
 - Switch 13
 - Switch 14
 - Switch 15
 - Art 4x40 LCD display
 - ArtCardNIEEPROM
 - ArtI2CTempSensorLM75
 - Text summary
 - Results
 - Time slot engine
 - Device cycle editor**
 - Reporting
 - Life test setup

Device cycle editor

Controls Properties Resources Info

Selected: All

Coil drive: Colour: Green

Span (ticks): Start: 0 End: 54

Events at start: SW2.ON, FPLED1.ON

Events at end: SW2.OFF, FPLED1.OFF

Bottom axis style: Time Percentage Tick count

Single relay device cycle

Legend: Windows, Vc NO, Vc NC

Cursor Data file Device Windows

Window: Coil drive Start: 0.0 ms End: 540.0 ms Set Move up

Allow edit Add Split Delete Delete all Move down

[Learn more about the cycle editor](#)



In summary

- The Reflex 51 provides a high-power life-test system that has uniquely flexible hardware and software.
- Its design for high-power makes it ideal for automotive and high power AC line testing.



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Thank you.