

# 964i

## High Voltage Switching System



### The Perfect Solution for Automated Multi-Conductor, Multi-Point Hipot Testing

You have a job to do – you have to hipot test a 16 conductor medical cable at 8500V to ensure that each conductor is properly isolated from every other conductor. You have two choices, you can try to do it manually or you can use the Vitrek 964i to automatically route the HV and return signals to the proper test points.

The manual method is extremely problematic. Slow, error prone, labor intensive, operator hazardous – don't even think about recording the test results. The 964i on the other hand, is purpose built to fully automate all of your HV switching needs. You choose the 964i, partner it with a Vitrek 95X Series Industrial Strength Hipot Tester and QuickTest Pro test automation software. The company wins the Malcolm Baldrige National Quality Award, you get a promotion and that corner office you've always wanted. Choose carefully.



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# The 964i HV Switching System is built precisely to meet **Your** HV Switching requirements



The 964i holds up to 8, eight channel HV switching cards. That's up to 64 test points in a single mainframe - multiple units can be combined to increase capacity

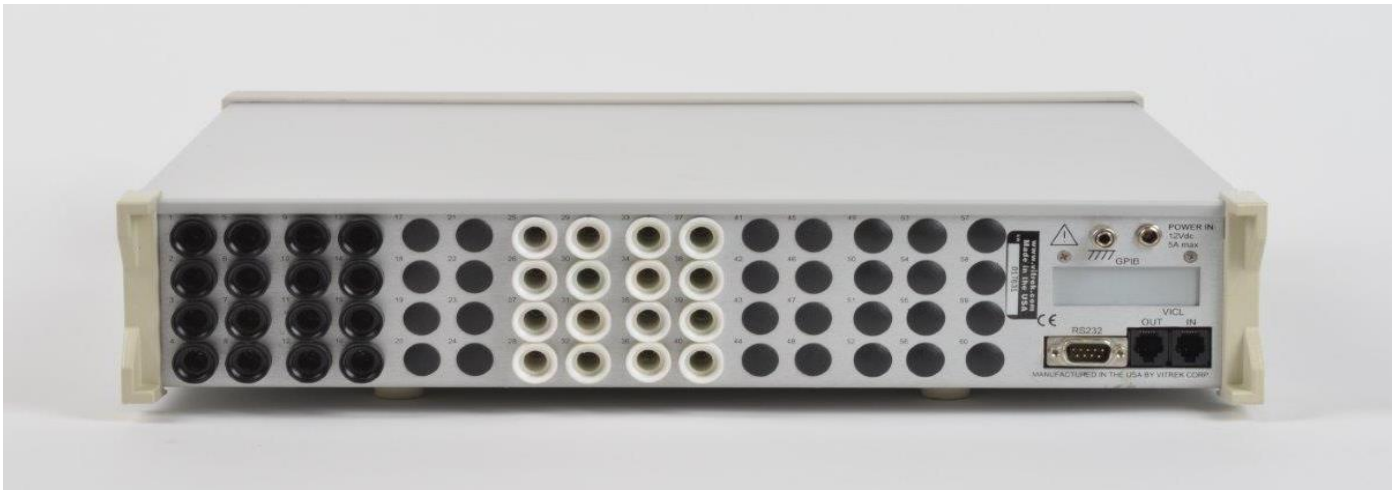
Whether you have to hipot an 8 pin connector, a 64 conductor cable or an entire tray of SMD capacitors - the 964i has the capacity to automatically route test points to your tester, so you don't have to. The 964i is easily configured to handle your test specifications. First, select from 4 different voltage ratings - 3KV, 7KV, 10KV and 15KV. Next, decide on how many cards you need. And finally - choose the input, either + (HV bus) or - (return bus) for each card. It's that simple. If you have any questions, contact a Vitrek application specialists for assistance in configuring your ideal switching solution.

## High Voltage Switching doesn't get any easier

The 964i is simple to set up. Standard front inputs connect directly to your Hipot/Continuity Tester and up to 60 rear panel terminals connect with your test fixture or DUT. Up to four 964i's can be controlled directly by a single Vitrek 95X or V7X Series Hipot Tester or up to 10 via PC through the 964i's built-in RS232 (serial) port or available GPIB interface. The 964i's LCD display confirms system status and switch activation at a glance.

## Try the 946i HV Scanner; you will never manually switch again

The Vitrek 964i Automated Switching System routes high voltage test signals and return signals to any desired test points. This unique capability gives you control over each individual relay, unlike typical cable testers which restrict you to a fixed pattern. With available mux cards, you can also access the matrix with other equipment such as an LCR meter or DMM. The result is a highly repeatable, rapid switching test system with no operator intervention and fully automated data acquisition. With voltage switching capability up to 15,000 volts or current switching as high as 40 amps - the 964i can handle just about any test requirement that comes along. Give it a try, you will never switch back to manual testing again.



The 964i rear panel accommodates up to 60 output terminals. Unit shown above with 16 + terminals (HV) and 16 – terminals (return). The 964i ships with mating connectors for all +/- HV terminals 7KV and higher. Custom length HV lead sets are optionally available.

## Features & Benefits

- High Voltage Ratings to 3KV, 7KV, 10KV or 15KV
- High Current Ratings to 40 Amps
- Reduces hazardous operator exposure to high voltage
- Improves test quality, consistency and repeatability
- Enhances end product quality and reliability
- Up to 64 channels in a single compact unit
- Vitrek Hipot Tester control ports and RS232 interfaces standard
- GPIB optionally available
- May be controlled directly by Vitrek Hipot Tester
- Available QuickTest™ graphical software with full data acquisition
- CE mark certified to EN 61010
- Made in the U.S.A.

## Specifications

### HV Series Relay Boards

**Max Voltage** (Between any two connections or ground)

HV7: 7KVDC 5KVAC, HV10: 10KVDC 7KVAC, HV15: 15KVDC 10KVAC

**Frequency:** <500Hz.

**Carrying Current:** <1Arms continuous, <2Arms for <1 second.

**Switching Power:** HV7 and HV10: <50W (resistive). HV15: <10W (resistive).

**Switching Time:** <5ms (including bounce).

**Expected Life:** <1mA, <100V resistive 500,000 operations. At max switching power: 1,000 operations

**Contact Resistance:** At terminals, <50% expected life operations (add 0.1Ω for <100% life)

<0.25Ω (uncompensated), <0.1Ω (compensated), <±0.1Ω difference between lowest and highest.

**Leakage Resistance:** Any individual connection to ground: >500GΩ at <30C. Common connection to ground: >100GΩ at <30C. Between any two connections: >1TΩ at <30C.

**Leakage Capacitance:** Any individual connection to ground: 15pF (typical). Common connection to ground: 50pF (typical). Between any two connections: 5pF (typical).

**Thermal EMF:** <1mV.

**Coil Power:** Holding closed: 0.3W (typical), Closing: 1.25W for 5ms (typical)

### LV Series Relay Boards

**Max Voltage** (Between any two connections) 3KVDC 2KVAC (between any connection and ground) 5KVDC 3KVAC

**Frequency:** <500Hz.

**Carrying Current:** <1Arms continuous, <8Arms for <1 second.

**Switching Power:** <500W (resistive)

**Switching Time:** <10ms (including bounce).

**Expected Life:** <1mA, <100V resistive 5.000,000 operations. At max switching power: 100,000

**Contact Resistance:** At terminals, <50% expected life operations (add 0.05Ω for <100% life)

<0.175Ω (uncompensated), <0.05Ω (compensated), <±0.075Ω difference between lowest and highest.

**Leakage Resistance:** Any individual connection to ground: >1GΩ at <30C. Common connection to ground: >200MΩ at <30C. Between any two connections: >1GΩ at <30C.

**Leakage Capacitance:** Any individual connection to ground: 15pF (typical). Common connection to ground: 50pF (typical). Between any two connections: 10pF (typical).

**Thermal EMF:** <200uV.

**Coil Power:** Holding closed: 0.12W (typical), Closing: .5W for 5ms (typical)

### HC Series Relay Boards

#### High Current Relay Specifications -

**Max Voltage:** Between any two connections: 1.5KVdc/1KVrms.

Any connection to ground: 1.5KVdc/1KVrms.

**Frequency:** <500Hz.

**Carrying Current:** <40Arms continuous, <60Arms for <1 second.

**Switching Power:** <500W (resistive).

**Min Switching Current:** >0.5Arms.

**Switching Time:** <20ms (including bounce).

**Expected Life:** 1 to 10Arms resistive 500,000 operations. At max power: 10,000 operations.

**Contact Resistance:** <0.025Ω (at terminals, <100% expected life operations).

**Leakage Resistance:** Any individual connection to ground: >20MΩ at <30C. Common connection to ground: >5MΩ at <30C. Between any two connections: >20MΩ at <30C.

**Coil Power:** Holding closed: 0.6W (typical), Closing: 2.5W for 25ms (typical)

#### **Low Current Relay Specifications -**

**Voltage:** Between any two connections: 1.5KVdc/1KVrms. Any connection to ground: 1.5KVdc/1KVrms.

**Frequency:** <500Hz.

**Carrying Current:** <1Arms continuous, <2Arms for <1 second.

**Switching Power:** <30W (resistive).

**Switching Time:** <5ms (including bounce).

**Expected Life:** <1mA, <100Vdc 5,000,000 operations. At max power: 100,000 operations.

**Contact Resistance:** At terminals, <50% expected life operations (add 0.05Ω for <100% life), <0.15Ω (uncompensated), <0.05Ω (compensated).

**Leakage Resistance;** Any individual connection to ground: >100GΩ at <30C. Common connection to ground: >10GΩ at <30C. Between any two connections: >100GΩ at <30C.

**Leakage Capacitance:** Any individual connection to ground: 15pF (typical). Common connection to ground: 50pF (typical). Between any two connections: 10pF (typical)

**Thermal EMF:** <100uV.

**Coil Power:** Holding closed: 0.06W (typical), Closing: 0.25W for 5ms (typical)

## **General Specifications**

**Relay Card Capacity:** Eight cards

**Front input Terminals:** 5 inputs terminals

**Rear Panel Terminals:** 60 terminals

**Interfaces:** RS232 and VICK (Vitretek Hipot Control) standard, GPIB optional

**Nominal Dimensions:** 89mmH x 432mmW x 457mmD (3.5" x 17" x 18")

**Nominal Weight:** Mainframe only 3.5Kg (8lb) net, 7Kg (16lb) shipping. Add 0.75Kg (1.5lb) per relay card

**Storage Environment:** -20 to 75C (non-condensing)

**Operating Environment:** 0 to 50C, <85% RH (non-condensing), Pollution Degree 2

**Operating Altitude:** 0 to 10000ft ASL

**Line Power:** 105-265Vrms, 45 to 450Hz, Category II using provided external power module

## Ordering Information

| Item               | Description   |
|--------------------|---|
| <b>964i</b>        | High Voltage Switching System Mainframe (8 card capacity)       |
| <b>964i-8X2MX</b>  | Pre-built 964i w 2 ea 7KV 8 Ch. Cards and a Hipot/Cont Mux Card |
| <b>964i-16X2MX</b> | Pre-built 964i w 4 ea 7KV 8 Ch. Cards and a Hipot/Cont Mux Card |
| <b>964i-24X2MX</b> | Pre-built 964i w 6 ea 7KV 8 Ch. Cards and a Hipot/Cont Mux Card |
| <b>LV3-8R</b>      | 3KV Single (+) Input Bus 8 Outputs, Red Banana Jacks            |
| <b>LV3-8B</b>      | 3KV Single - Input Bus 8 Outputs, Black Banana Jacks            |
| <b>LV3-8S</b>      | 3KV (-) Bus Input 4 Outputs Blk, (+) Bus Input 4 Outputs Red    |
| <b>LV3-MX2</b>     | 3KV Dual Input (HV/Cont) Single Output (+) Bus                  |
| <b>HV7-8W</b>      | 7KV Single (+) Input Bus 8 Outputs, White HV Terminals          |
| <b>HV7-8B</b>      | 7KV Single (-) Input Bus 8 Outputs, Black HV Terminals          |
| <b>HV7-8S</b>      | 7KV (-) Bus Input 4 Outputs Blk, (+) Bus Input 4 Outputs White  |
| <b>HV7-MX2</b>     | 7KV Dual Input (HV/Cont) Single Output (+) Bus                  |
| <b>HV10-8W</b>     | 10KV Single Input Bus 8 Outputs, White HV Terminals             |
| <b>HV10-8B</b>     | 10KV Single Input Bus 8 Outputs, Black HV Terminals             |
| <b>HV10-MX2</b>    | 10KV Dual Input (HV/Cont) Single Output (+) Bus                 |
| <b>HV15-8W</b>     | 15KV Single Input Bus 8 Outputs, White HV Terminals             |
| <b>HV15-8B</b>     | 15KV Single Input Bus 8 Outputs, Black HV Terminals             |
| <b>HV15-MX2</b>    | 15KV Dual Input (HV/Cont) Single Output (+) Bus                 |
| <b>GP-964</b>      | GPIB Interface Option   |
| <b>GP-1</b>        | GPIB Cable, 1 meter length                                      |
| <b>VICL-2</b>      | Replacement Vitrek Hipot Communication Cable 7ft                |
| <b>RM-1</b>        | Rack Mount Kit  |
| <b>HVC-MW</b>      | Additional Male HV Mating Connector, White                      |
| <b>HVC-MB</b>      | Additional Male HV Mating Connector, Black                      |
| <b>HVC-FW</b>      | Female HV Panel Mount Receptacle/Connector, White               |
| <b>HVC-FB</b>      | Female HV Panel Mount Receptacle/Connector, Black               |
| <b>TL-HVW</b>      | 20KV Rated 18 AWG Test Lead 4ft , HVC-MW to Alligator Clip      |
| <b>TL-HVB</b>      | 20KV Rated 18 AWG Test Lead 4ft , HVC-MB to Alligator Clip      |
| <b>HVW-20</b>      | Bulk 20KV Rated 18 AWG Test Lead Wire, price per ft             |