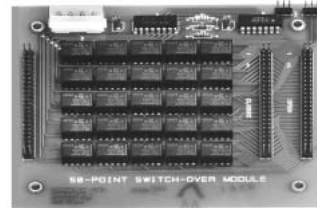


## Product Features

*In order to accommodate the complexities of testing, CheckSum offers a selection of accessories. Some of these mount into controller (PC) expansion slots, while others are typically mounted inside the test fixture (in close proximity to the UUT connections). The fixture-mounted accessories are installed with screws through provided standoffs. Connections are made with standard ribbon-cable connectors or wire-wrapping.*

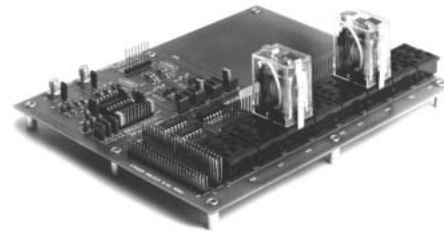
### FIX-50P-SWO Switch-Over Module

The FIX-50P-SWO is a ganged, 50-pole double-throw relay module. It can be used to disconnect test points to eliminate loading, prevent overvoltage at the test inputs, switch test points between analog and digital signals, or to discharge the UUT prior to testing. A single TTL input signal controls all the relays. The relays are powered by a +12VDC source such as the PC's power supply.



### TR-6-2 Interface Module

The Model TR-6-2 Fixture Interface Module provides various special functions in the test fixture. It includes two double-contact 10A power relays for switching UUT power. Optionally, it can be populated with six additional TR-6-2-RLY power relays, a dual-channel counter-timer buffer/prescaler (TR-6-2-CT), two DMM differential buffer/amplifiers (TR-6-2-DMM), and up to four 17-point switch-over modules each using two power relay sockets (TR-6-2-SWO). A breadboard area provides room for custom circuitry such as DC-DC converters. Other TR-6-2 accessories include cabling for direct connection to CheckSum's vacuum receiver interface (50-pin is TR-6-2-THC, 17-pin is TR-6-2-SWC). All the FUNC-2 back panel connections (fused power, digital and analog I/O, relay-switching) are available on the TR-6-2.



The Fixture Interface includes standoffs for easy mounting inside the fixture or on any flat surface. The 50-pin ribbon cable from the Model FUNC-2 back panel can be directly plugged into the Fixture Interface. Alternatively, when used inside a Model TR-3A vacuum test head, the special Model TR-6-2-THC plugs directly from the Fixture Interface to the inside of the fixture wiring block connected to the FUNC-2.

The basic Fixture Interface contains two power relays, connectors and interface circuits. You can install your own components to tailor it to your application or purchase kits from CheckSum to populate it as necessary:

- The Model TR-6-2-RLY is an additional power relay (up to 8 can be installed).
- The Model TR-6-2-CT is the counter/timer interface parts.
- The Model TR-6-2-DMM is the DMM signal conditioner interface parts.

#### Mechanical

Size	8" x 6.9" x 3"H (with relays installed)
Mounting	8 - 3/4" x #6 screws (not included)

#### Relay Switching (TR-6-2-RLY)

Provisions for up to 8 DPDT (2 form-C) relays
Contact rating 10A, 250VAC, 240VA
Remotely controlled by Model FUNC-2

#### Counter/Timer Interface (TR-6-2-CT)

Inputs	2 via wire-wrap or SMA connectors
Frequency	2, 4, 8, 16
Divider Ratios	
Sensitivity	100 mV
Freq. Response	50 MHz

#### DMM Signal Conditioner Interface (TR-6-2-DMM)

Dual 2-input buffer amplifiers	
Amplification Ratios	1 to 1000
Max input voltage	±6 volts, differential

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## Test Accessories

- The Model TR-6-2-SWO switch-over modules install into the power-relay sockets. Each TR-6-2-SWO, which uses two relay sockets, allows change-over of up to seventeen test points to select different source/measurement electronics or to locally isolate test points in the fixture to minimize capacitive loading on selected UUT points during power-on testing.

### Test Point Switch-Over Modules (TR-6-2-SWO)

Each module allows up to 17 ganged points to be switched. Up to four modules can be installed on a Model TR-6-2 if no TR-6-2-RLY relays are installed.

Points can be disconnected or switched-over

Wire-wrap or connect with TR-6-2-SWC cable to 17x1 header

Contact rating 1A, 250VAC, 30VA

### Model RM-1 Relay Module

The Model RM-1 general purpose Relay Module can be installed in an unused controller (PC) slot. It provides eight undedicated relays, four form-C and four form-A, rated at 1A. This relay module can be used for switching UUT power or signals, and also includes eight optically-isolated, high-voltage digital inputs. The Model RM-1 installs in a short PC expansion slot and has a 37-pin D-Sub back-panel connector.

### G-80 Digital I/O Module

The Model G-80 Digital I/O Module can be used to add 96 bits of digital I/O to CheckSum test systems, or as a stand-alone module. Each bit can be individually set as an input or an output, and it is controlled on a byte by byte basis. It is commanded by DIGA, DIGI, DIGO commands, and documentation is included if you would like to control it directly with custom-written software.

- Each bit can source 2.5mA high or sink 24mA low
- LS-TTL logic with 10K pull-up resistors
- I/O mapped
- Full length ISA form-factor
- +5V VCC and GND (not fused) available with jumper selection

*Notes:* If the Model G-80 is connected directly to UUT circuitry during MDA test, the pull-up resistor will interfere with passive testing. Therefore, they should be switched-in with a SWO module. The Model G-80 includes an instruction manual and two 50-pin cables.



### G-80-ODM Overdrive Module

The Model G-80-ODM can be used with the Model G-80 (or other digital source) to provide high-current digital signals for overdriving UUT digital outputs such as during in-circuit digital testing. Its 50-pin input connector controls 24 output bits that can each serve as inputs or drive high or low with up to 350mA current. The G-80-ODM has a separate input connector for +5V power from the PC.

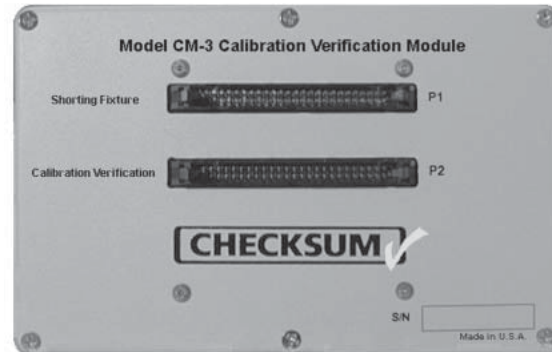


## GPIB IEEE-488 Interface Module

The Model GPIB allows you to connect external instrumentation to a Model TR-4, FUNC-2, or TR-8. It can directly control GPIB instruments from within the CheckSum System software or you can write your own software using the included documentation. The Model GPIB includes a GPIB cable and installs in a short PC expansion slot.

## Model CM-3 Calibration/Verification Module

The Model CM-3 Calibration/Verification Module provides external confirmation of MDA system operation. The Model CM-3 includes precise components that check the accuracy of the Model TR-4 or TR-8 with included software. The CM-3 can be used for test system traceability to the National Institute of Standards and Technology (NIST). The unit can be purchased separately or with traceability documentation (-CAL option). The Model CM-3 reference components can also be characterized in your calibration lab for traceability. The CM-3 provides the traceability typically required in ISO 9000 certified sites.



## Operator's Keypad

The Model TR-8-KEYPAD allows the operator to use the TR-8 system without a standard keyboard. The keypad provides three system status LEDs (green for pass, red for fail, amber for busy). The keypad has eight keys for operator control. F1 through F7 keys are used for most operations such as next-test or retest, and the ESCape key aborts most operations. The keypad is connected directly to the TR-8 System Module back panel.



## Model DM-1 Discharge System

The CheckSum Model DM-1 Discharge System isolates and protects the MDA test system electronics from an electrically charged unit-under-test (UUT). Normally, UUTs do not become electrically charged during the manufacturing process, however, functional or system testing may leave an electrical charge on a UUT. The DM-1 will protect the test system from a UUT that may have become electrically charged with up to 250 volts. The CheckSum DM-1 also protects the test system from severe static charges on a UUT.

The Model DM-1 is connected between the test fixture and the MDA test system electronics. Special internal circuitry in the DM-1 prevents the MDA electronics from being connected if a charge exists. The CheckSum test system software can detect a charged UUT and wait for the discharge. The overvoltage charge is automatically dis-



Front View



Back View

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# Test Accessories

## Model DM-1 (continued)

charged. Once the UUT voltage has been discharged to a safe level, normal testing with the MDA test system can proceed. The standard CheckSum test system multiplexer cables connect to the rear of the Model DM-1. A second test cable is provided with each 50-pin discharge module to connect to the fixture.

Installing additional discharge modules in the Discharge System is quick and easy. Each DM-1-SW plug-in card protects 50 test points in the test system. The Model DM-1 can accommodate twenty Model DM-1-SW Switch Modules. A completely configured Model DM-1 Discharge System allows isolation and protection of 1000 test points. Additional Discharge Systems can be daisy-chained for higher pin-count systems.

## Model DM-1 Specifications

Front Panel LEDs	Power-on, Discharging, Unprotected
Front Panel Control	Discharge, Auto (Remote), Bypass
Rear Panel Control	On/Off Power Switch
Software Control	Fixture Control, FIXCT is described in the TR-8 manual/supplement
Weight	~16 lbs. (shipping wt. ~20 lbs.)
Overall Size	17"W x 9"D x 6.25"H
Capacity	1000 Points
Output Cables	36 in.
AC Input	100-120VAC 50/60Hz 200-230VAC 50/60Hz
AC Power	75VA maximum

## Model DM-1 Ordering Information

Model	Description
DM-1	Discharge System (with 4 DM-1-SW 50-Point Discharge Switch Modules)
DM-1-SW	50-Point Discharge Switch Module
DM-1-RM	Rack Mount Kit for Model DM-1

## Model AC-1 Pneumatic Control Unit

The Model AC-1 Pneumatic Control unit is designed to allow automatic control of pneumatic air cylinders. A single TTL/CMOS signal or contact closure actuates an electric solenoid inside the AC-1 directing air from the Input port to either the engage or disengage the output ports, while providing a vent to the de-engerized output.

## Model AC-1 Specifications

Air Switching	Dual action, 50-120 PSI Quick Connect Air In, Engage and Disengage Ports
Manual Control	Engage, Remote, or Disengage
Remote Control	5V CMOS/TTL signal (pull low) or contact closure to engage air
Interlock Control	5V CMOS/TTL signal (pull low) or contact closure to inhibit air
Air Ports	Air In: 0.25 inch industrial interchange male fitting, or 0.125 inch NPT female connection Engage: 0.25 inch O.D. tubing Disengage: 0.25 inch O.D. tubing
Weight	~5 lbs. (shipping wt. ~9 lbs.)
Overall Size	3.25" W x 10.5" D x 4.25" H
Rear Panel	On/Off Power Switch, RCA jack for remote input, RCA jack for interlock input, VAC input power, and Quick-disconnect air input and output ports
VAC Input	100-120VAC 50/60Hz 200-230VAC 50/60Hz
AC Power	25VA maximum



## Model VC-1 Vacuum Control Unit

The Model VC-1 Vacuum Control unit is designed to allow automatic control of vacuum. It is typically used to control bed-of-nails test fixturing.

The VC-1 is a small, standalone unit with a switch for manual operation or it can be controlled remotely. A single TTL/CMOS signal or contact closure actuates a 3-way vacuum valve inside the VC-1 to either connect or disconnect vacuum from the test fixture. When vacuum is disconnected, the test fixture side of the valve is vented to ambient air, allowing the fixture to quickly disengage.



## Model VC-1 Specifications

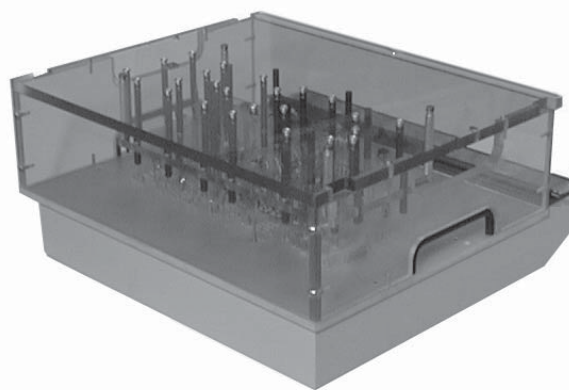
Vacuum Switching (3 way)	Connect vacuum and close exhaust Disconnect vacuum and open exhaust to test fixture
Manual Control	Engage, Remote or Disengage
Remote Control	5V CMOS/TTL signal (pull low) or contact closure to engage vacuum
Vacuum Ports	Input has 0.75 inch NPT female connection Output has 0.75 inch NPT female connection
Weight	~10 lbs. (shipping wt. ~15 lbs.)
Overall Size	6" W x 8" D x 5.5" H
Rear Panel	On/Off Power Switch, RCA jack for remote input, and VAC input power
AC Input	100-120VAC 50/60Hz 200-230VAC 50/60Hz
AC Power	25VA maximum

## Model Fix-P-Storage

The Model Fix-P-Storage is a fixture storage system with built-in handles. This option replaces the four tubes and bolts used to assemble the pneumatic fixture kits for storage.

The storage system can be used with the KIT1000-QC fixture kits used with the TR-7-1000, TR-7-1000-QC, TR-7-2000-QC, or TR-9-1000-QC.

To use it, simply place the storage system on the bottom of the fixture kit (it slides into existing holes on the probe plate), then place the fixture's Lexan plate onto guide pins on top of the holder. No screws or spacers necessary. With its built-in handholds, you can easily pick up and move the fixture kit with the storage system in place. As an added benefit, the storage system helps protect the delicate fixture probes and parts from dust and damage. Since the storage system is clear, you can see inside to identify the fixture.



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