DATA SHEET

DS-11094

Shielded Extender Module

- **Used for Calibration & Troubleshooting**
- **Fits all Reedholm Test Systems**
- **Provides Access to all Test Points**
- **Physical Support for Modules Under Test**
- **Wide Land Patterns for Critical Paths**
- **Test Points for all Supplies & Signals**
- **Fully Guarded Analog Nodes**
- **Shielding Against Node Coupling**

By extending the analog nodes, power supply lines, and digital signals from the test system back plane, the shielded extender module simplifies calibration and troubleshooting within a Reedholm test system. The extender module has minimal impact on signal and power levels yet permits probing all points on instrument modules.

While manual calibration is seldom required by customers running Reedholm self-calibration software, some means of manual calibration is sometimes required for quality certification. The SelfCal Module (SCM) provides an automatic means of updating gain factors and offset corrections for almost all Reedholm instrument modules.

There are some Reedholm modules on which calibration adjustments and test points are not brought to the edge of the instrument module circuit board. In most of those cases, the circuit requiring adjustment is too sensitive, or contains a signal too large, to permit routing to the edge of a board. Thus, some calibration procedures require access to much more of the instrument module than is possible when the module is inserted into a test system back plane.

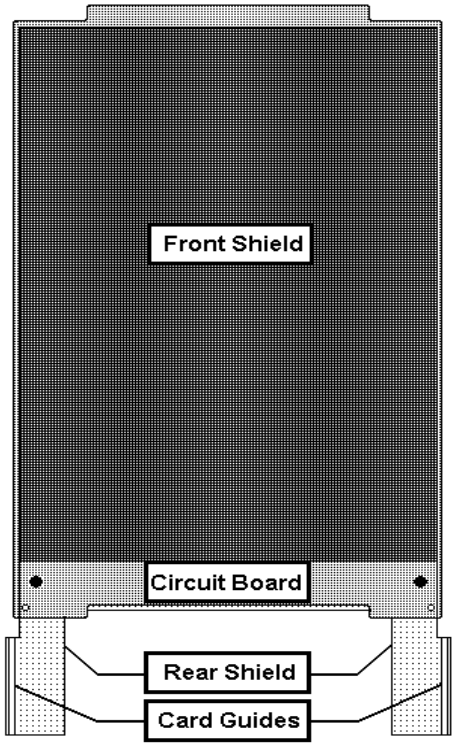

Figure 1 – Extender Diagram

Same Solution for All Systems

The shielded extender module is used for all Reedholm systems. Card guides are put on the sheet metal so that both vertically and horizontally installed modules will be properly supported. For example, the same performance is provided in a bench-top RI-40 modular chassis as in a seven-foot RI-51 TDDB system.

In the diagram above, the module under test would slide through the card guides and plug into a card edge connector similar to those used on the back plane. Circuit board test points are arranged near the edge of the top shield with white silk-screened legend for easy viewing and access. Extractor levers (not shown) used on other Reedholm modules provide leverage when installing and removing the extender module.

Tougher Test Pins

All signals and voltages on the backplane are brought to swaged and soldered posts on the extender circuit board. These test pins are identical to those used on modules, so they are much tougher and won't bend and break.

Fully Guarded Nodes

Surface and bulk guarding is used so that performance when using the extender module is no different from when a module is plugged directly into the back plane. Although solder masking is now the standard process in printed circuit board fabrication, masks are a source of electrons that cannot be guarded against. Therefore, the mask has been eliminated and the copper lands coated to prevent corrosion.

A potential problem with current leakage and dielectric absorption was averted by using an array of guard vias to prevent current flow through the printed circuit board to the through holes used for test points. Except for the area permitting test point access, the analog and digital signals are shielded to analog ground. This eliminates feedback from the signal nodes that might otherwise result in positive feedback to adjacent modules at high frequencies. In addition to eliminating feedback that could cause oscillation or ringing, the shield eliminates possible coupling of digital signals from the extender into sensitive analog circuitry on those modules.

Entire Board is Accessible

The card edge connector soldered to the end of the extender board is flush with the end of the card. Thus, when a module under test is plugged into the extender module, all points on the module can be probed with a voltmeter or oscilloscope. Customers with a 1MHz CMM are able to adjust the signal phase for high capacitances.

Shielded Front and Back

The front shield can be removed by taking out two screws. This permits additional access to signal paths and current-carrying supply paths on the extender board. This can help isolate problems when unexpectedly high current flow is observed on a module under test.

No Effect on DIAG and Other Tests

Despite the length of the extender module, wide circuit traces for the node signal paths and power supply traces have a resistance lower than that of the card edge connectors being used. As a result, those Main Diagnostics tests that isolate faulty wiring and relays are not affected when a module under test is plugged into the extender module.

Since the resistance contribution is so low, there is negligible effect on any application testing done with a module placed on an extender module.

Figure 2 – Extender Board without Front Shield