CORELIS

ScanTAP Relay

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TAP Signals Isolation Pod

User's Manual

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Preface

PRINTING HISTORY

New editions are complete revisions of the manual. Update packages, which are issued between editions, contain additional and replacement pages to be merged into the manual by the customer. The dates on the title page change only when a new edition is published.

A software code may be printed before the date; this indicates the version of the software product at the time the manual or update was issued. Many product updates and fixes do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one to one correspondence between product updates and manual updates.

Revision A, April 2004

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Chapter 1
Product Overview

Introduction

The ScanTAP Relay pod is an add-on accessory that contains electro-mechanical relays for engaging and dis-engaging boundary-scan Test Access Port (TAP). The ScanTAP Relay pod is operated under host software control and provides electrical isolation of all the TAP signals, including Ground. It is compatible with the various Corelis ScanTAP intelligent modules and is mostly used when integrating the Corelis boundary-scan test tools with in-circuit testers such as the Agilent 3070. By coupling the power of the ScanPlus boundary-scan tools with that of an in-circuit tester (ICT) such as the Agilent 3070 or the Teradyne Test Station, a complete, integrated solution is now available that offers the best advantages of both technologies.

Boundary-scan (JTAG) operates as the complementary companion to the ICT. Boundary-scan is the preferred solution for testing areas of printed circuit board assemblies that are difficult to access due to physical space constraints and lack of physical access, which is often due to fine pitch components such as Ball Grid Array (BGA) devices. Additionally, the ICT is able to check the non-boundary-scan compatible portion of the unit under test (UUT) such as analog circuitry.

Integrating the Corelis ScanPlus boundary-scan tools with the Agilent and/or the Teradyne ICT into a single test system forms a powerful and cost-effective solution that virtually eliminates each of the obstacles that are presented to the individual test technologies. By utilizing the benefits of both boundary-scan and the ICT, complete test procedures can be created in a minimal time frame that provide outstanding test coverage of the entire printed circuit board assembly.

Before power is applied to the target by the ICT during testing it runs several diagnostic checks. To prevent ground loops from disturbing unpowered testing, the boundary-scan TAP signals are connected through the ScanTAP Relay module. The ScanTAP Relay utilizes electro-mechanical relays to physically disconnect and isolate the TAP and ground signals so they do not interfere with the ICT power-off UUT tests. The ScanTAP Relay module is shown in Figure 1-1.

Figure 1-1. ScanTAP Relay

ScanTAP Relay Specifications

Controller Interface

Host Connector	20-pin header, AMP part no. 104130-4 or equivalent
Host Cable Length	20-pin to 20-pin (12”), Corelis P/N 15312-2 (standard) 20-pin to 20-pin (8”), Corelis P/N 15312-1 (optional)

TAP Interface

TAP Connector	20-pin header, AMP part no. 104130-4 or equivalent
Mating TAP Connector	20-pin IDC (flat cable), 3M part no. 3421-6620 or equivalent
TAP Cable Length	20-pin to 20-pin (8”), Corelis P/N 15312-1 (optional) 20-pin to 20-pin (12”), Corelis P/N 15312-2 (standard) 20-pin to 10-pin (8”), Corelis P/N 15310-1 (optional) 20-pin to 10-pin (12”), Corelis P/N 15310-2 (optional) 20-pin to 16-pin (8”), Corelis P/N 15311-1 (optional) 20-pin to 16-pin (12”), Corelis P/N 15311-2 (optional)

Physical

Enclosure Dimensions	4.0 in. × 2.0 in. × 0.80 in.

Power Requirements

No external supply is needed	Power is provided by the host controller (draws 25mA maximum at 2.5V)

Operating Environment

Temperature	0°C to 55°C
Relative Humidity	10% to 90%, non condensing

Storage Environment

Temperature	-40°C to 85°C

Chapter 2
ScanTAP Relay Installation and Usage

When you receive the ScanTAP Relay product it should contain the following items:

- ScanTAP Relay Module
- Host Cable, 20-pin to 20-pin Cable (12 inch), Corelis P/N 15312-2
- TAP Cable, 20-pin to 10-pin Cable (12 inch), Corelis P/N 15310-2

Please ensure that all materials listed are present and free from visible damage or defects before proceeding. If anything appears to be missing or damaged, contact Corelis at the number listed on the title page immediately.

NOTE: The actual hardware shipped with the ScanTAP Relay may vary depending on the customer order.

When this manual was published, the following optional target interface TAP cables were available from Corelis:

20-pin to 10-pin TAP cable (8”), Corelis P/N 15310-1
20-pin to 10-pin TAP cable (12”), Corelis P/N 15310-2
20-pin to 16-pin TAP cable (8”), Corelis P/N 15311-1
20-pin to 16-pin TAP cable (12”), Corelis P/N 15311-2
20-pin to 20-pin TAP cable (8”), Corelis P/N 15312-1
20-pin to 20-pin TAP cable (12”), Corelis P/N 15312-2

The Corelis ScanTAP Relay module connects to the ScanTAP family of intelligent pods (ScanTAP-4, ScanTAP-8, ScanTAP-32) through a 20-pin flat ribbon cable. No external power supply is required - the ScanTAP pod supplies it. The connections between the components in a typical boundary-scan system are shown below in Figure 2-1.

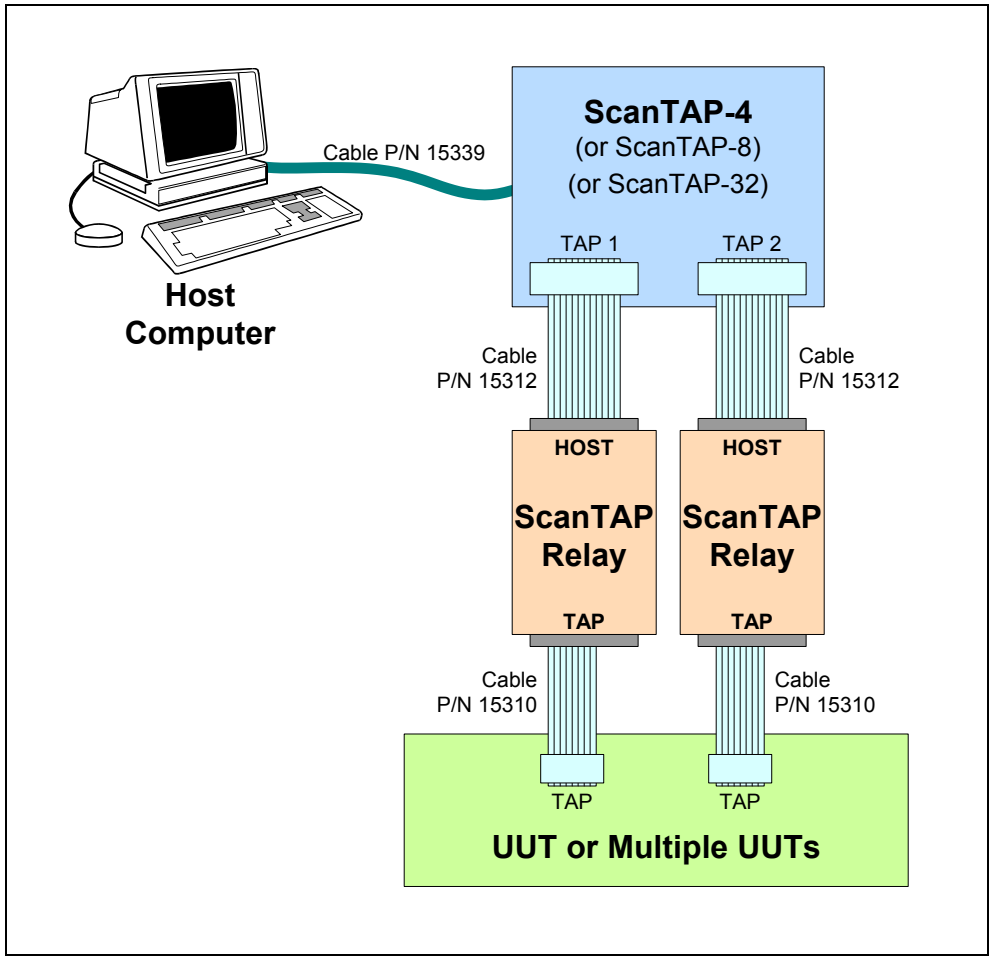

Figure 2-1. ScanTAP Relay Connection Diagram (2 Units shown)

There are two 20-pin connectors on the ScanTAP Relay. The connector marked **Host** connects to the boundary-scan controller (ScanTAP pod) and the connector marked **TAP** connects to the target (UUT).

Connecting to the Host Controller

The Corelis ScanTAP Relay module connects to the ScanTAP family of intelligent pods (ScanTAP-4, ScanTAP-8, ScanTAP-32) through a 20-pin flat ribbon cable. The top view of the 20-pin host connector (0.100" x 0.100" spacing) is shown in Figure 2-2 below.

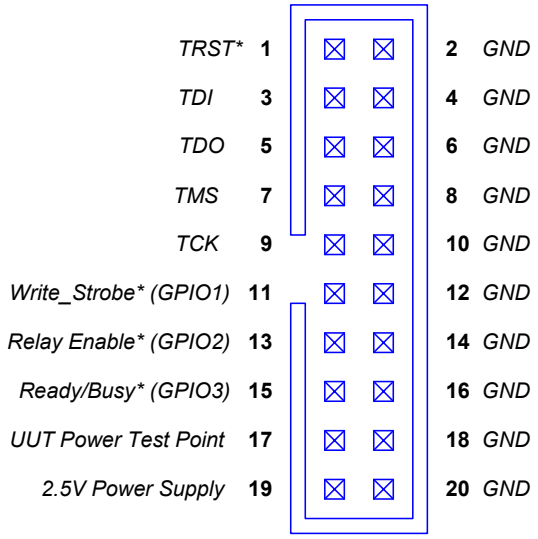

Figure 2-2. 20-Pin TAP Host Connector (top view)

Connecting to the Target

The ScanTAP Relay connects to the target via 10-pin, 16-pin or 20-pin flat cables, P/N 15310, 15311 or 15312. The top view of the 20-pin target connector (0.100" x 0.100" spacing) is shown in Figure 2-3 below.

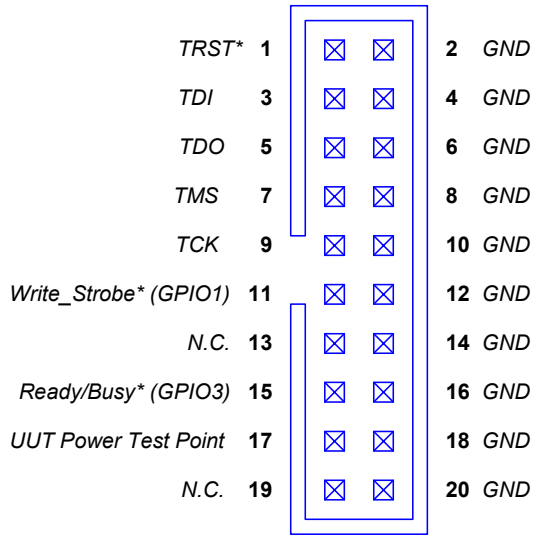

Figure 2-3. 20-Pin TAP Target Connector (top view)

The connector pin descriptions are shown in Table 2-1. The first 5 signals on pins 1 through 9 are the standard IEEE-1149.1 signals. Corelis Flash Programming software supports two additional signals: the external write strobe signal (Write_Strobe*) and the external Ready/Busy* signal.

The Write_Strobe* signal is active low and should be pulled up with a 1K resistor on the target board. It needs to be logically OR-ed with the flash Write-Enable (WE*) signal so that assertion of either the flash Write-Enable (WE*) signal or the external write strobe will assert the flash WE* input.

The Ready/Busy* signal is an open-collector/open-drain signal which is directly tied to the same signal(s) on the Flash device(s).

The signal Vcc1 (pin 17) is used to test a power supply rail of the UUT for shorts between power and ground.

Pin	Host Signal	Target Signal	Direction
1	TRST*	TRST*	Input to the UUT
2	GND	GND	
3	TDI	TDI	Input to the UUT
4	GND	GND	
5	TDO	TDO	Output of the UUT
6	GND	GND	
7	TMS	TMS	Input to the UUT
8	GND	GND	
9	TCK	TCK	Input to the UUT
10	GND	GND	
11	Write Strobe* (GPIO1)	Write Strobe* (GPIO1)	Input to the UUT
12	GND	GND	
13	Relay Enable (GPIO2)	N.C.	Active high enables the ScanTAP Relay
14	GND	GND	
15	Ready/Busy* (GPIO3)	Ready/Busy* (GPIO3)	Output of the UUT
16	GND	GND	
17	VCC1	VCC1	UUT Power Test Point
18	GND	GND	
19	2.5V	N.C.	Power Supplied to ScanTAP Relay
20	GND	GND	

Table 2-1. 20 Pin Connector Pinout

The internal relays are disabled (TAP and ground signals are disconnected) when GPIO2 (bit 1) is "**1**". The relays are enabled (TAP and ground signals are connected) when GPIO2 (bit 1) is "**0**".

To setup the parallel I/O, go to the ScanPlus Runner or ScanExpress Runner main window. Select ***Parallel I/O*** from the ***Setup*** menu as shown in Figure 2-4***.***

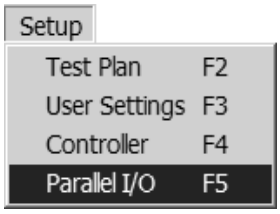

Figure 2-4. ScanPlus Runner Setup Menu

Check the box labeled "***Set Initial Hex Value to:***" and enter the hex value "***0xFFFD"*** into the text field. Configure the rest of the settings as shown in Figure 2-5. Please note that it is necessary to wait a short amount of time (~10 ms) once the GPIO2 signal has been set for the relays to activate.

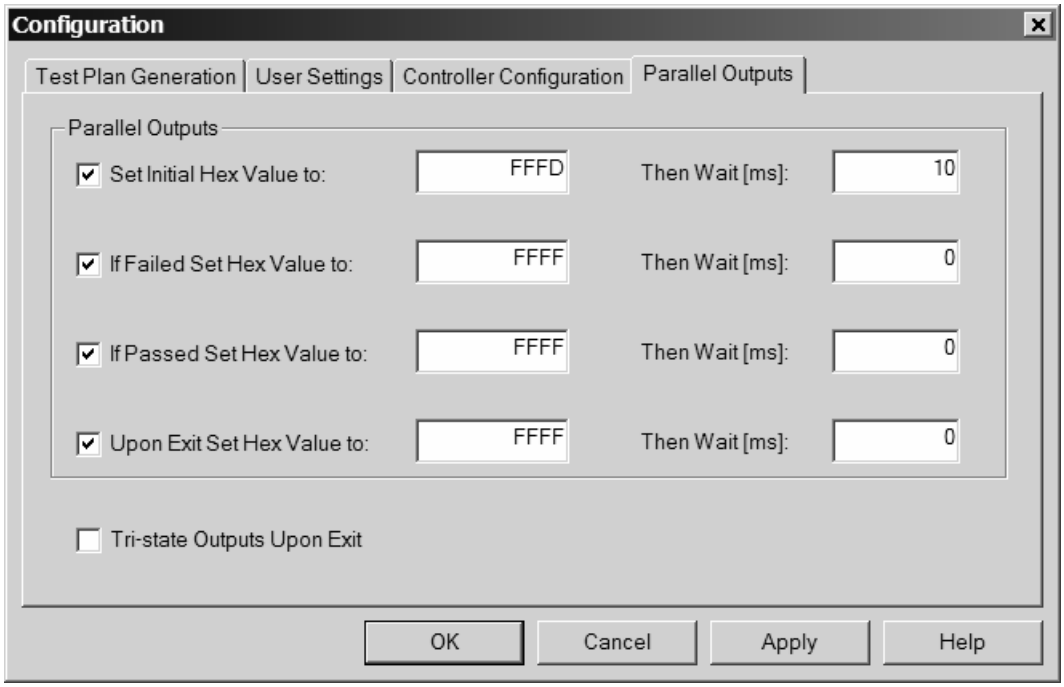

Figure 2-5. Parallel Output Configuration Dialog

ScanTAP Relay LED

The green LED on the top cover of the ScanTAP Relay will illuminate when the relays are enabled. Note that the power to the ScanTAP-Relay is provided from the host adapter (PCI-1149.1/Turbo, NetUSB-1149.1, etc.) via a current limiting fuse on the host adapter.