Calibration Tool

Quick Start Guide

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The information contained in this document is subject to change without notice.

This tool must be used according to the user guide. Any operation related to maintenance, repair or calibration must be carried out by qualified personnel. Consequently, in case of failure, contact Riscure to find out about the procedure to follow.

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Manufactured by

Riscure BV

Delftechpark 49,   2628 XJ Delft,   The Netherlands

Phone: +31 15 251 40 90, Fax: +31 15 251 40 99

Email: inforequest@riscure.com

Web: www.riscure.com
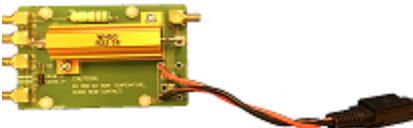
What is in the box

The box contains the Calibration Tool and all accessories to connect it to a computer and an oscilloscope.

Box content checklist

Qty [1]	Description		Identifier [2]
1	Calibration Tool		CT
1	15V DC Power Supply Unit, input 100 - 240 V, AC 50 - 60 Hz		PSU
-	Power cable (included with PSU)	Country specific	
1	Communication cable: USB-A - USB-B, 2 m		USB
1	Dummy smart card		DSC

Qty [1]	Description		Identifier [2]
6	Dummy smart card cable: SMB - SMB, 50 Ω, coaxial, 3 ft		SMB2SMB
1	Spider loopback adapter		SIOP
1	40cm 2.54mm pitch 10-way IDC cable		IDC
1	Resistive dummies adapter		RDMY
1	SMB - SMB 50 Ω output impedance adapter		50OHMOA
1	SMB Tee adapter		SMBTA
2	BNC-BNC coaxial cable		BNCCBL
-	This "Calibration Tool - Quick Start Guide"		

[1] The amount or number of registered items (quantity, Qty)

[2] Identifier used in this document to refer to the item.

Running a calibration procedure requires a PicoScope 3206D as the oscilloscope for measurements, which is sold separately and is not included in the Calibration Tool package.

What does it do

The calibration tool

The Calibration Tool v1 is a hardware device that plays a central role in Riscure device calibration procedures. The Calibration Tool v1 routes the relevant signals between the calibration target devices and the oscilloscope. It is also capable of generating test input signals and communicating to the calibration target device hardware.

The operation of Calibration Tool v1 is automatically controlled by the Inspector calibration module, and no user interaction is required besides connecting signals from the calibration target device to the Calibration Tool.

The Calibration Tool v1 functions as a component of Inspector calibration modules. There is no SDK support to this device at the moment.

The dummy card adapter

The dummy card is an adapter used to translate the smart card interface signals (VCC, CLK, RST, IO) to the SMB connector format native to the Calibration Tool device.

In addition to the smart card signals, the dummy card has 2 control signals to operate internal switch circuitries in order to conduct necessary testing procedures.

The Spider loopback adapter

It is used to loopback Spider gpio signals and uart signals to verify their functionalities.

The 50Ω input impedance adapter (NOT included)

Figure 1 50Ω input impedance adapter

This impedance adapter has a 50Ω resistor in parallel to the signal input and is necessary in some calibration setups to reduce the input impedance of PicoScope to 50Ω.

The 50 Ω output impedance adapter

Figure 2 50Ω output impedance adapter

This impedance has a 50Ω resistor in series to the input and is necessary in some calibration setups to increase the output impedance of a device to 50Ω.

The SMB Tee adapter

This adapter is used by some calibration setup to split a signal and feed it to 2 other SMB connectors.

The resistive dummies adapter

WARNING:

Component R1 and R2 of this adapter could become hot when calibration is running. Avoid skin contact with these 2 resistors as a safety precaution.

The resistive dummies adapter has 3 different resistors (see Figure 3), which are used to draw a specific amount of current from the calibration target device.
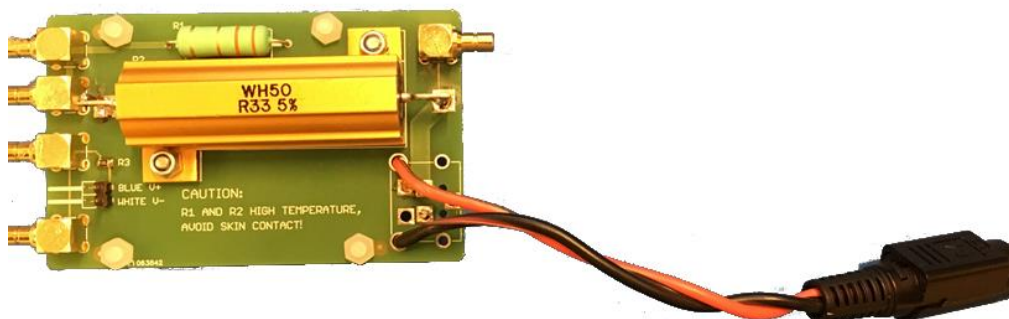
Figure 3 Top view of the resistive dummies adapter

The ports are grouped into different sections meant for different calibration target devices: the Glitch Amplifier 1&2 section, the High Power Glitch Amplifier section, and the Current Probe section (See Figure 4).
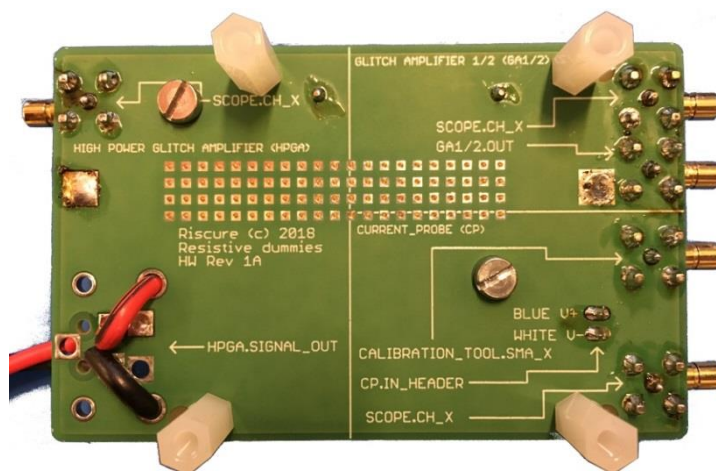
Figure 4 Back view of the resistive dummies adapter

Sections are separated by solid white lines. And functionalities of the ports are annotated by texts and arrows.

How to build a calibration setup

⚠️ **WARNING:**

Ports of the calibration subject device and the Calibration Tool that are not mentioned in the corresponding calibration setup diagram should be left unconnected. Otherwise the calibration subject might be damaged.

Preparation

- Connect Calibration Tool to 15V DC power supply, and the power supply to a wall socket.
- Connect the USB cable to Calibration Tool and the PC running Inspector software.

Calibration setup for the icWaves 3

icWaves 3 calibration setup

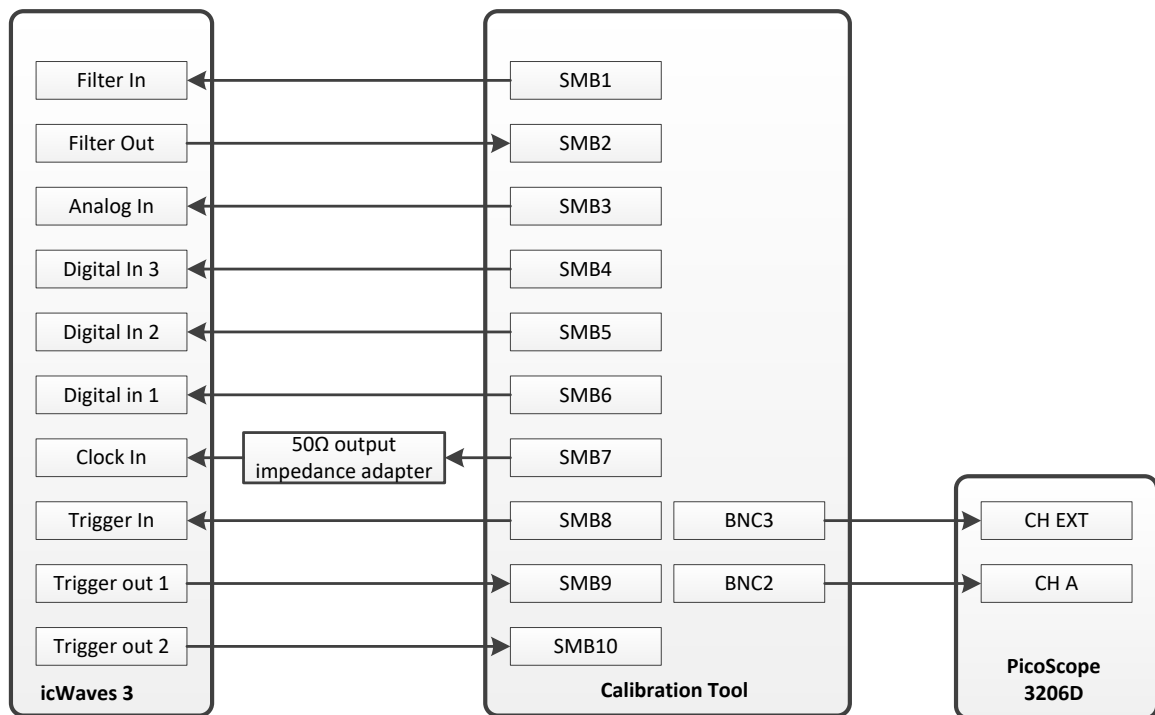| icWaves 3	Calibration Tool		PicoScope 3206D
Filter In ←	SMB1		
Filter Out →	SMB2		
Analog In ←	SMB3		
Digital In 3 ←	SMB4		
Digital In 2 ←	SMB5		
Digital in 1 ←	SMB6		
Clock In ←	50Ω output impedance adapter ← SMB7		
Trigger In ←	SMB8	BNC3 →	CH EXT
Trigger out 1 →	SMB9	BNC2 →	CH A
Trigger out 2 →	SMB10		

*USB and power supply connections are not shown in the diagram
*The length of SMB and BNC cables must be 3 feet
*The output impedance adapter must be directly connected to the Calibration Tool

Figure 5 Connection diagram of icWaves 3 calibration setup

Calibration setup for the Power Tracer 4

Power Tracer 4 Calibration Setup

*USB and power supply connections are not shown in the diagram

*The length of SMB and BNC cables must be 3 feet

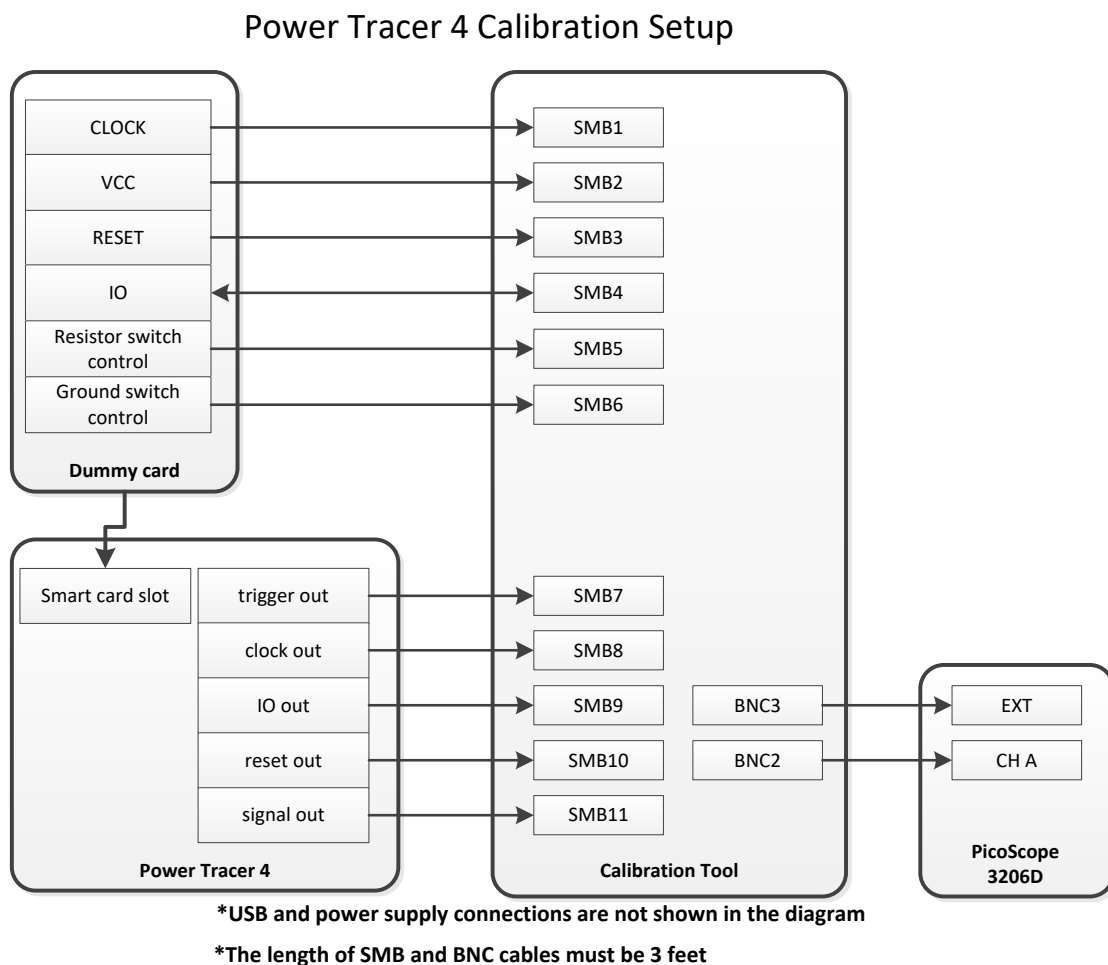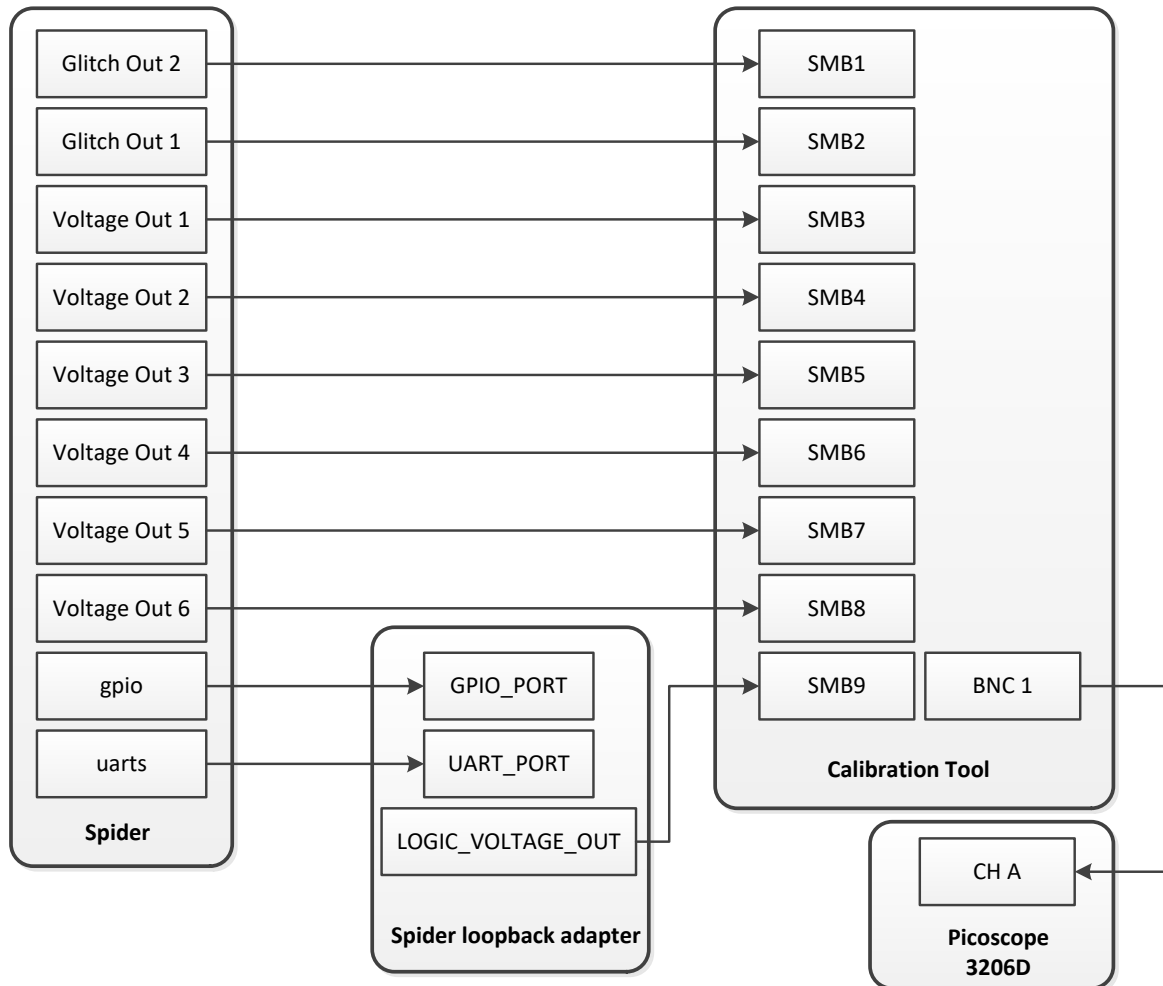*Figure 6 Connection diagram of Power Tracer 4 calibration setup*

Calibration setup for the Spider

Spider calibration setup

Figure 7 Connection diagram of Spider calibration setup
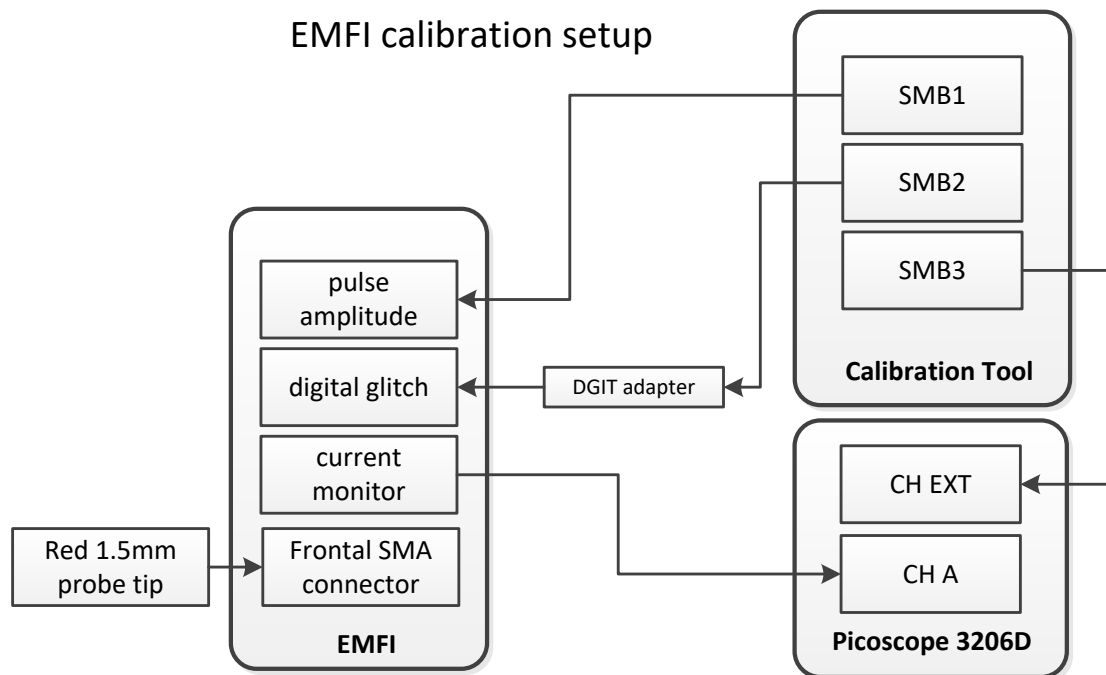
Calibration setup for the EMFI transient probe driver

EMFI calibration setup

*USB and power supply connections are not shown in the diagram
*The length of SMB and BNC cables must be 3 feet
*The DGIT adapter must be direclty connected to the "digital glitch" port
*Do not mistake the 50Ω output impedance adapter for the input impedance adapter

The Digital Glitch Input Transformer (DGIT) adapter

An adapter required for EMFI calibration. It raises the voltage level of trigger signal of the calibration tool in order to trigger an EMFI transient device.

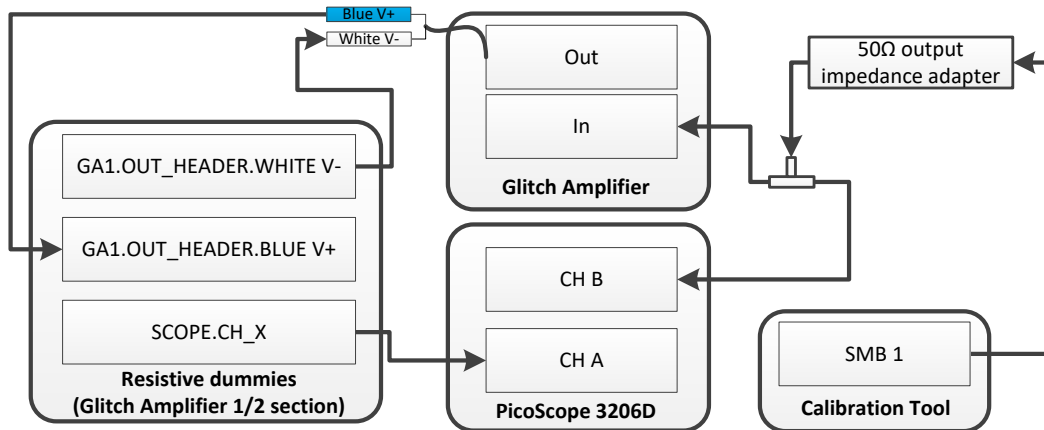Note that the DGIT is part of the EMFI transient probe package, therefore not included in the Calibration Tool package.

Figure 8 DGIT adapter shipped with EMFI transient probe

Calibration setup for the Glitch Amplifier 1

Glitch Amplifier 1 Calibration Setup

*USB and power supply connections are not shown in the diagram
*Do not mistake the 50Ω input impedance adapter for the output impedance adapter

Calibration setup for the High Power Glitch Amplifier

High Power Glitch Amplifier (HPGA) Calibration Setup
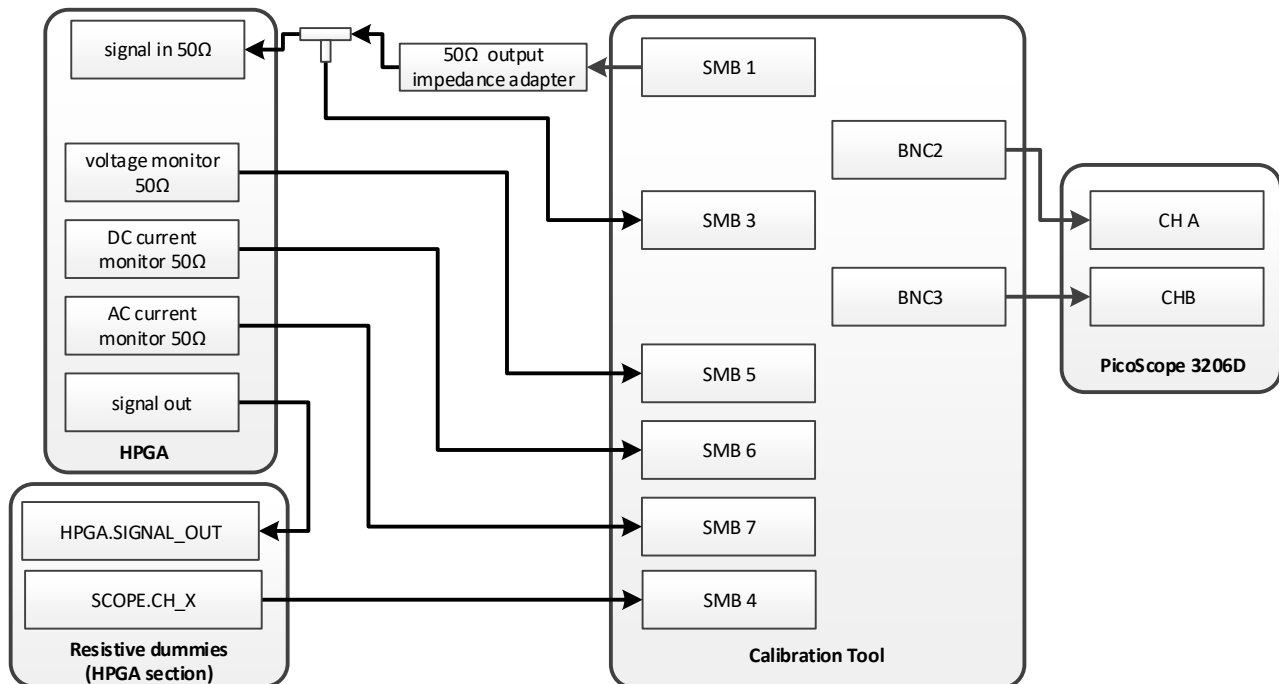
*USB and power supply connections are not shown in the diagram
*Do not mistake the 50Ω input impedance adapter for the output impedance adapter

The voltage outputs of HPGA power supply units have to be configured to +5V and +8V separately to allow a proper device operation state for calibration.

Figure 9 HPGA power supply voltage settings for calibration

Calibration setup for the Current Probe

Current Probe Calibration Setup
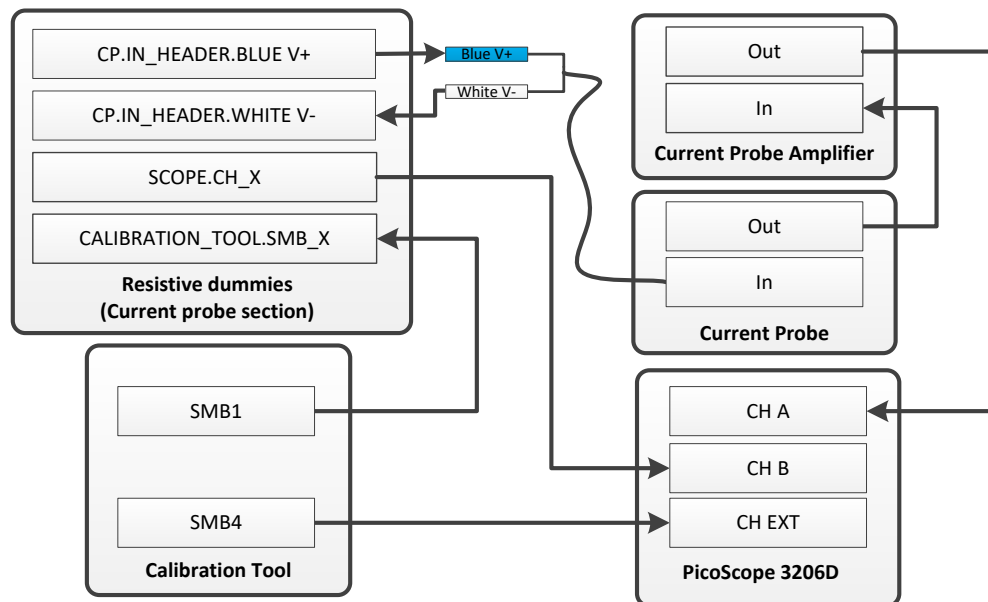
*USB and power supply connections are not shown in the diagram
*The length of SMB and BNC cables must be 3 feet

Verification of the setup

Follow the next checks to verify a correct setup:

1. Is the Calibration Tool powered?
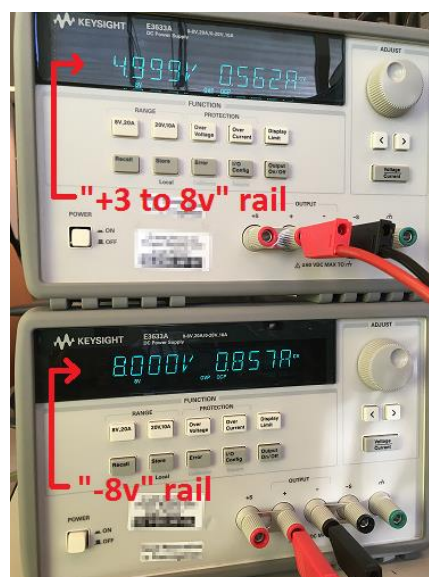2. Is the Calibration Tool recognized as an USB device?

The checks are described in detail in the following sections.

Check 1 - Is the Calibration Tool powered?

After power on, the LED located in the front panel of the Calibration tool will light up.

Check 2 - Is the Calibration Tool recognized?

1. The Calibration Tool must be recognized as a USB device. The device driver is included in the installation of the Inspector application and is available for Windows only.
2. Windows automatically recognizes the device when the Calibration Tool is connected to the PC.
3. Verify the registration of the Calibration Tool device in Inspector in the Hardware manager.

   To open the Hardware Manager:

   select Tools >> Hardware Manager
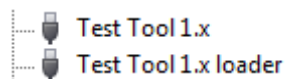
How to run Inspector calibration modules

- Launch Inspector software (version >= 2018.3)
- Inspector menu >> Calibration
- Select and click on the suitable calibration module for your device
- Select the output location and specify the name of the report HTML file
- Start the calibration module execution
- Calibration progress will be printed to the "out" panel at the bottom of Inspector application
- After the calibration module execution is finished, a HTML report will be produced at the selected directory.

Help and troubleshooting

Common problems

	Connecting USB cables	**First** fully connect the USB cable with the computer at both ends, **then** power the Power Tracer.

Still have questions?

1. The Inspector Help menu has detailed information on the Calibration Tool.
2. Visit the Riscure Support Portal: http://support.riscure.com

Technical specifications

Operational conditions

- Room temperature 20 – 30 °C, (68 – 86 °F).

> ⚠️ Do not block the ventilation holes. A blocked air flow may cause malfunction or break down.

> ℹ️ Maintain stable environmental conditions (temperature, humidity, airflow etc.) in order to reliably repeat tests and compare test results.

> ℹ️ Unplugging the PSU from the product is not required, but recommended when not used for an extended time.

Power supply input

- 15 V DC, current rating 2.4 A
- Center-positive plug, inner-Ø 2.5 mm, outer-Ø 5.5 mm.

> ⚠️ Use of a PSU other than supplied by Riscure is not supported. Power spikes may cause internal damage and loss of accuracy.

Calibration Tool SMB/BNC port maximum ratings

- Voltage input +/-5 V
- Continuous current through any port +/- 150 mA
- Voltage output 0 to +5 V

Product case

The Calibration Tool

- Dimensions L x W x H: 220.00 x 169.50 x 34.63 [mm], 8.661 x 6.673 x 1.363 [inch].

Port	Description
SMB1 – SMB14	Device ports for SMB connectors
BNC1 – BNC4	Device ports for BNC connectors
USB	USB port
15V DC	DC power supply port

The Dummy Card Adapter

- Dimensions L x W x H: 104.94 x 61.84 x 7.7 [mm], 4.13 x 2.43 x 0.31 [inch].

Port	Description
CLK	Smart card interface CLK signal
VCC	Smart card interface VCC signal
RST	Smart card interface RST signal
IO	Smart card interface IO signal
Resistor switch control	Control signal to the resistor switch
Ground switch control	Control signal to the ground switch

The Resistive Dummies Adapter

- Dimensions L x W x H: 80 x 50 x 19.25 [mm], 3.15 x 1.97 x 0.76 [inch].

Section	Port	Description
Current Probe	CALIBRATION_TOOL.SMB_X	Signal port to be connected to a Calibration Tool SMB port.
	CP.IN_HEADER	Header to be connected to Current Probe input cable.
	SCOPE.CH_X	Signal port to be connected to a scope
Glitch Amplifier 1/2	GA1/2.OUT	Signal port to be connected to the signal out port of a Glitch Amplifier 1/2
	SCOPE.CH_X	Signal port to be connected to a scope
HPGA	HPGA.SIGNAL_OUT	Plug to be connected to the HPGA signal out port.
	SCOPE.CH_X	Signal port to be connected to a scope

The Spider Loopback Adapter

- Dimensions L x W x H: 37.4 x 104 x 19 [mm], 1.48 x 4.10 x 0.75 [inch].

Port	Description
GPIO_PORT	Port that should be connected to the 'gpio' port of a Spider device
UART_PORT	Port that should be connected to the 'uart' port of a Spider device via the IDC cable
LOGIC_VOLTAGE_OUT	Port that should be connected to the Calibration Tool device

Declaration of conformity

The Calibration Tool implementation complies to the directives and standards mentioned in the EC Declaration of Conformity.

EC-DECLARATION OF CONFORMITY

Suppliers Details

Name

Riscure B.V.

Address

Frontier Building, Delftechpark 49, 2628 XJ Delft, The Netherlands

Product Details

Product Name

Inspector

Model Name(s)

Calibration Tool

Trade Name

Riscure

Applicable Standards Details

Directives:
- LVD (2006/95/EC) - EMC directive (2004/108/EC)

Standards:
- IEC 60825-1; IEC 320 C8; IEC 60950-1; 21 CFR 1040; ANSI/ESD S20.20:2007; BS EN 61340-5-1:2007; EN55022-B; EN61000-4-2, 4-5; CISPR 11; CISPR22-B; UL 1950

Supplementary Information

The appliance fulfils the relevant requirements of the EMC-directive and the LVD-directive according to our technical documentation TCD-Calibration Tool.

Declaration

I hereby declare under our sole responsibility that the product(s) mentioned above to which this declaration relates complies with the above mentioned standards and Directives

Riscure B.V.
Frontier Building
Delftechpark 49
2628 XJ Delft
The Netherlands
Tel.nr.: +31 (0) 15 251 4090

Name	Issued Date
Dr.ir. F.G. de Beer / Technical Director	02 / 27 / 2018

Signature of representative