

adaptronic Prüftechnik GmbH

Off-the-shelf and customized wiring test systems

Application Example NT 800-5

Competence in Testing.

adaptronic Prüftechnik GmbH is proud to present a completely new and innovating testing family!

NT 800-5

Following presentation will show and explain the differences to conventional distributed testing systems

Introduction

In order to improve the actual way of testing the electrical systems installation in aircraft section there is the need to replace the existing electrical test hardware by a new technology.

Main subject

- Test system for work order time and lead-time savings purposes

Test system for aircraft section test like

- Fuselage
- Wing
- Tailplane
- FAL

Major objectives

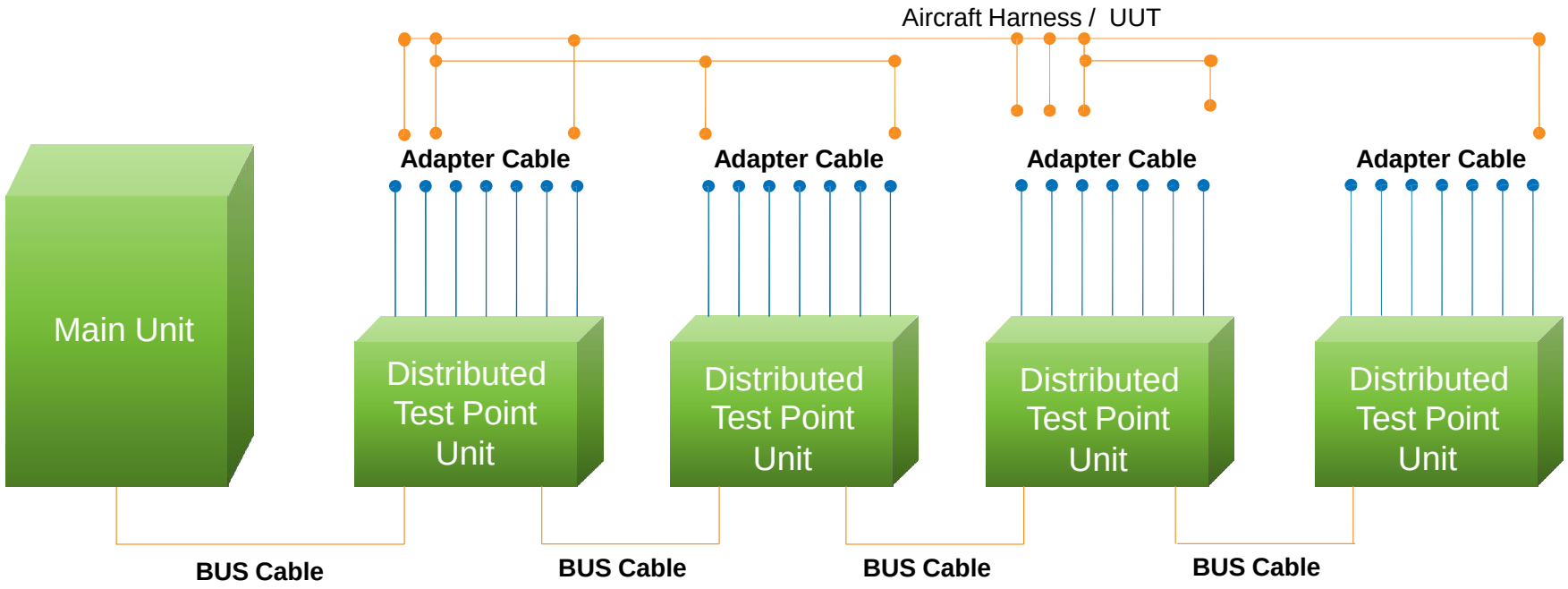
- Simple to use and to install end-2-end solution for electrical wiring test
- Parallel activities in the aircraft shall not be disturbed by the test system
- The cost and size of the modules shall be reduced to a minimum

Conventional / Standard Testing Systems

Hardware Setup

Main Unit:

- Measurement devices
- Interfaces
- Controller



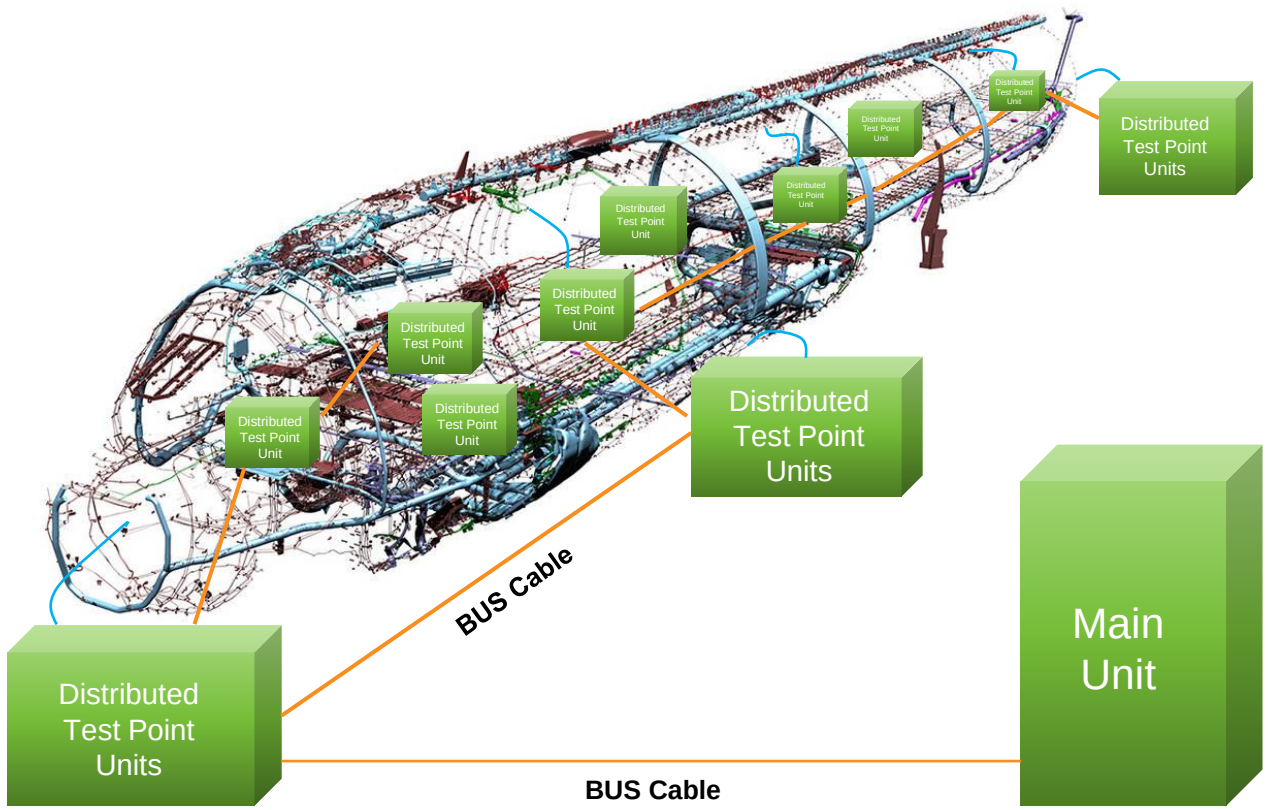
Conventional distributed test systems, which are mainly used for large harnesses (UUTs) like aircrafts, railways, ships etc. consist of a main unit and de-centralized test point units. Test point units are connected to the main unit via bus cables and with the UUT via adapter cables.
→ Each harness connector is connected via adapter cables to the test system.

Conventional / Standard Testing Systems

Depending on the tests, size and quantity of test points, the test system has to be configured individually.

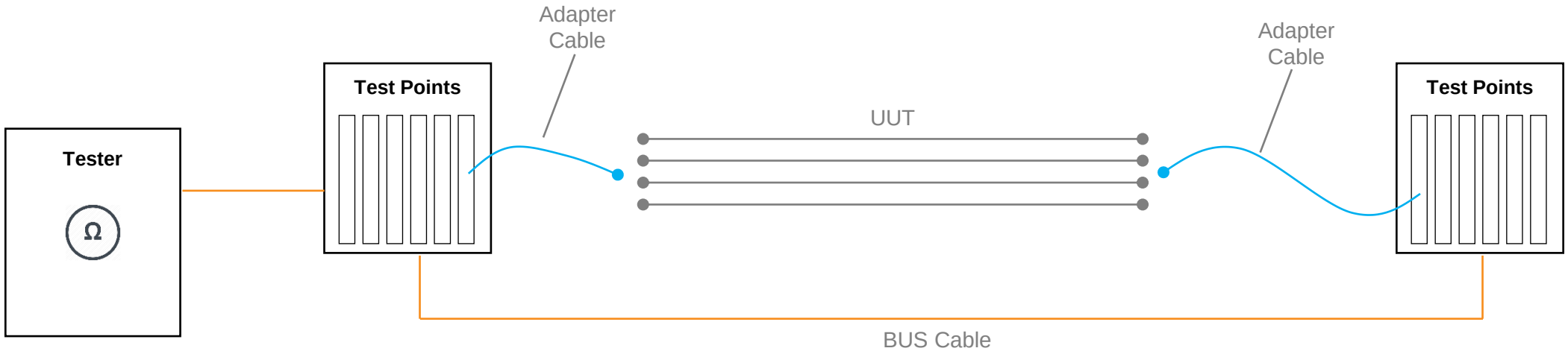
The test boxes needs to be placed directly at/in the UUT.
All wires (which needs to be tested) must be connected to the test points.

Test Setup



Conventional / Standard Testing Systems

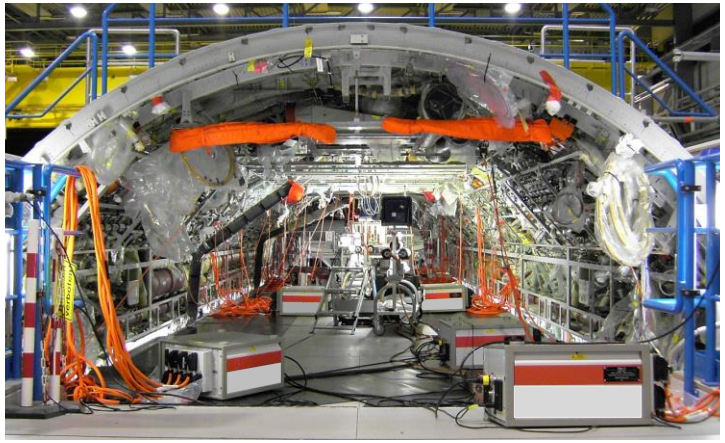
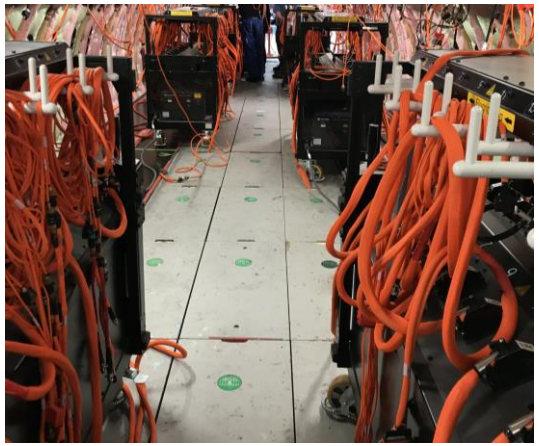
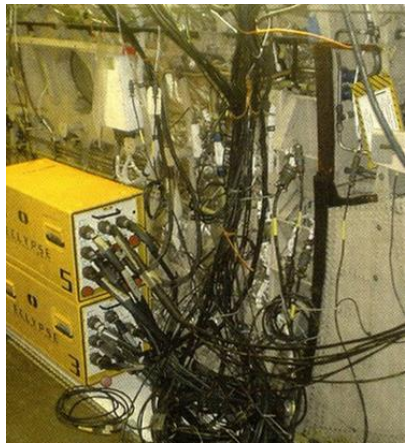
Physical Test Setup



The UUT /wires needs to be connected to the tester from both sides. The measurement signals are generated in the main unit and distributed over a bus cable.

Conventional / Standard Testing Systems

Examples - Test Setup


Disadvantages:

- Big footprint of test devices
- During tests the aircraft / section is fully occupied
- Complicated setup requires high skill staff

adaptronic presents

the next generation of testing possibility

NT 800-5

What´s new?

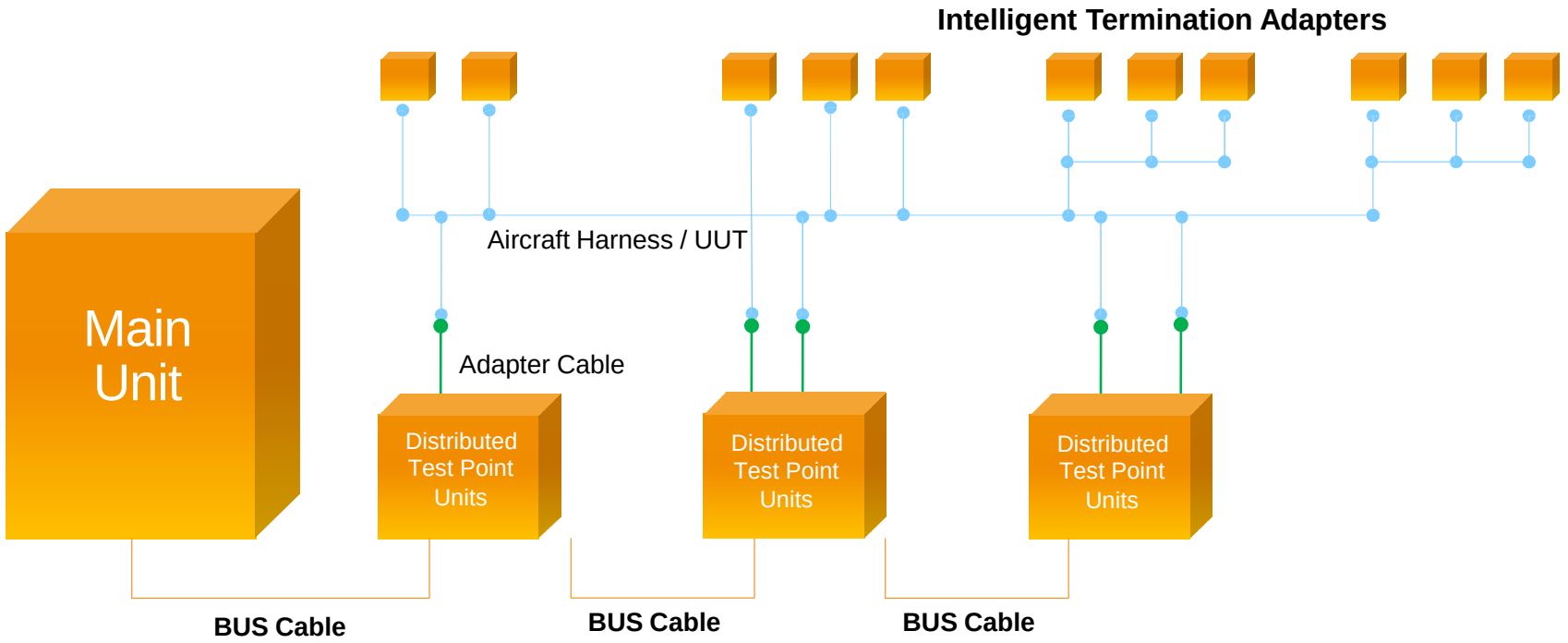
- Through intelligent testing adapters, no “back” connection of the harness to the tester is required!
- Guided testing setup
- Compact footprint of testing devices
- Flexible architecture

NT 800-5 Testing System

Hardware Setup

Main Unit

- Measurement devices
- Interfaces
- Controller

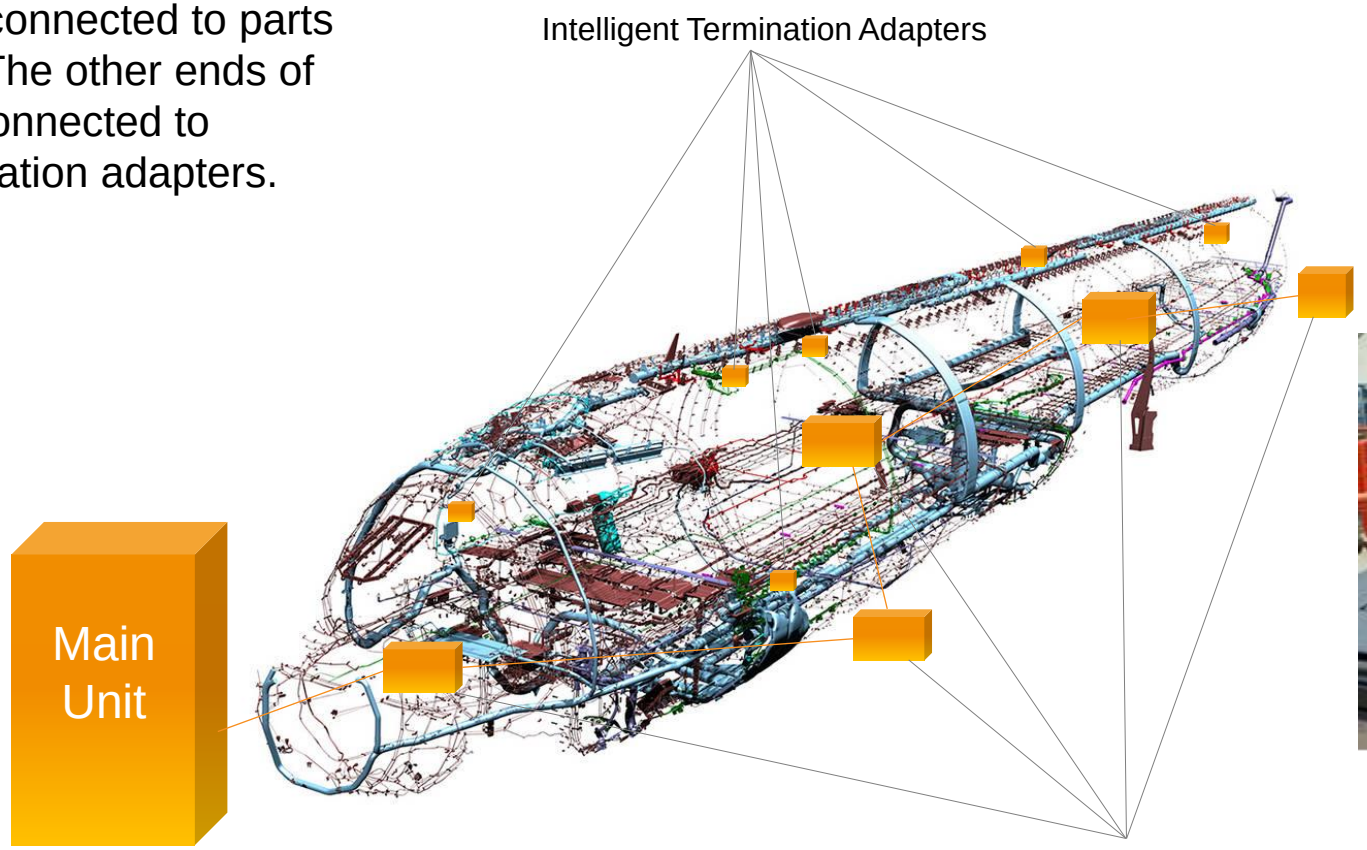


The new NT 800-5 test system, which is designed for large harnesses (UUTs) like aircrafts, railways, ships etc. consists of a main unit with de-centralized test point units and intelligent termination adapters in place of additional test point units and cabling. The UUT is connected via adapter cables from only one side to the test point units.
→ Harness connectors are partly connected via adapter cables to the test system or via termination adapters

NT 800-5 Testing Systems

Based on the UUT the components of the test are selected. The test point units are distributed through the aircraft and connected to parts of the harness. The other ends of the cables are connected to intelligent termination adapters.

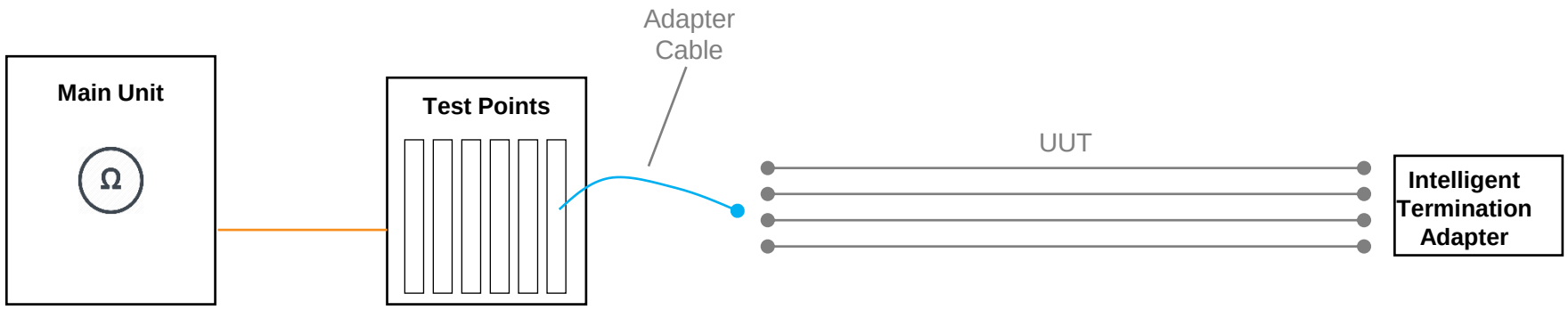
Test Setup





NT800-5 – Connection Topology

Physical Test Setup

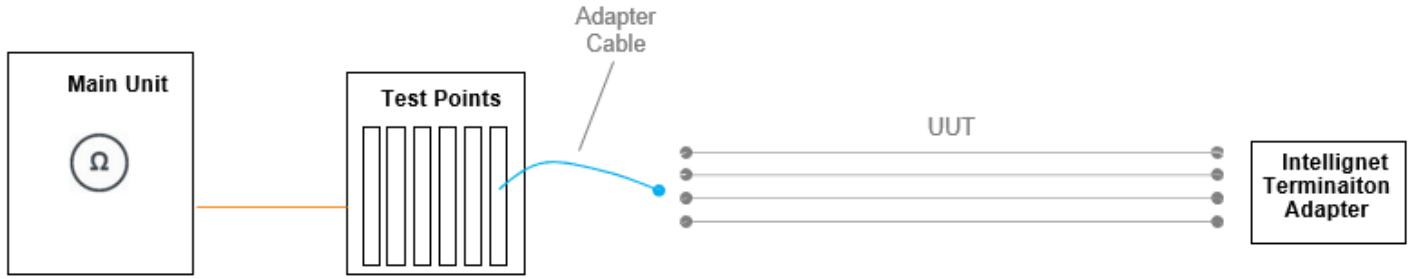


One side of the cable is connected to a test point unit. The other side is connected to an intelligent termination adapter.

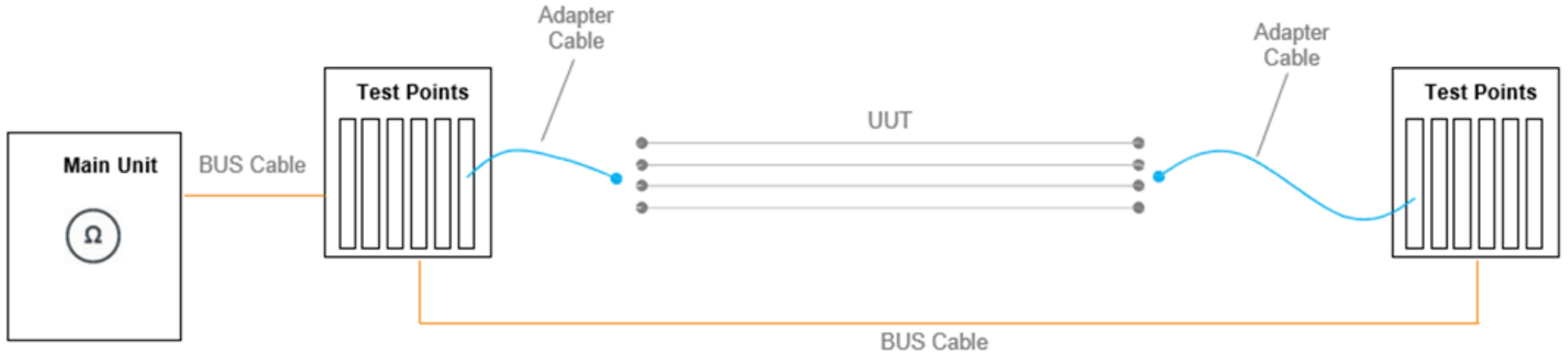
Comparison

Physical Test Setup

NT 800-5



Standard Tester



Comparison

Physical Footprint

Test Point Unit

NT 800-5



Standard Tester



Comparison

Physical Footprint

Adaptation

Active Termination Adapter



Passive Termination Adapter



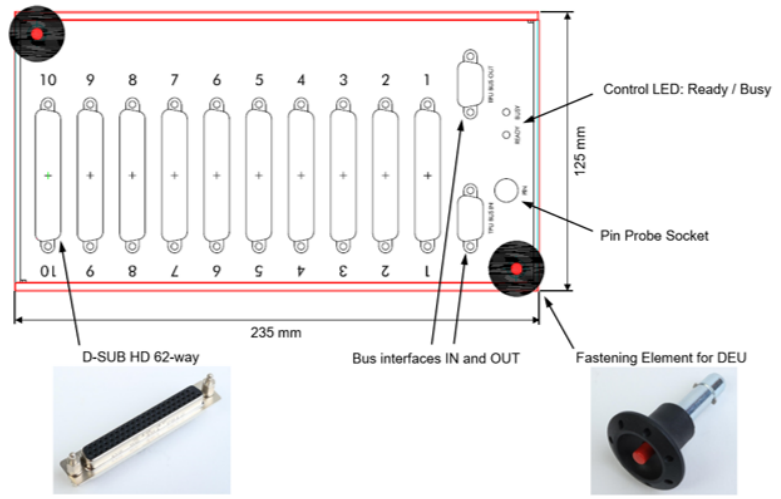
Note: Each termination adapter replaces an adapter cable.

Test Point Unit



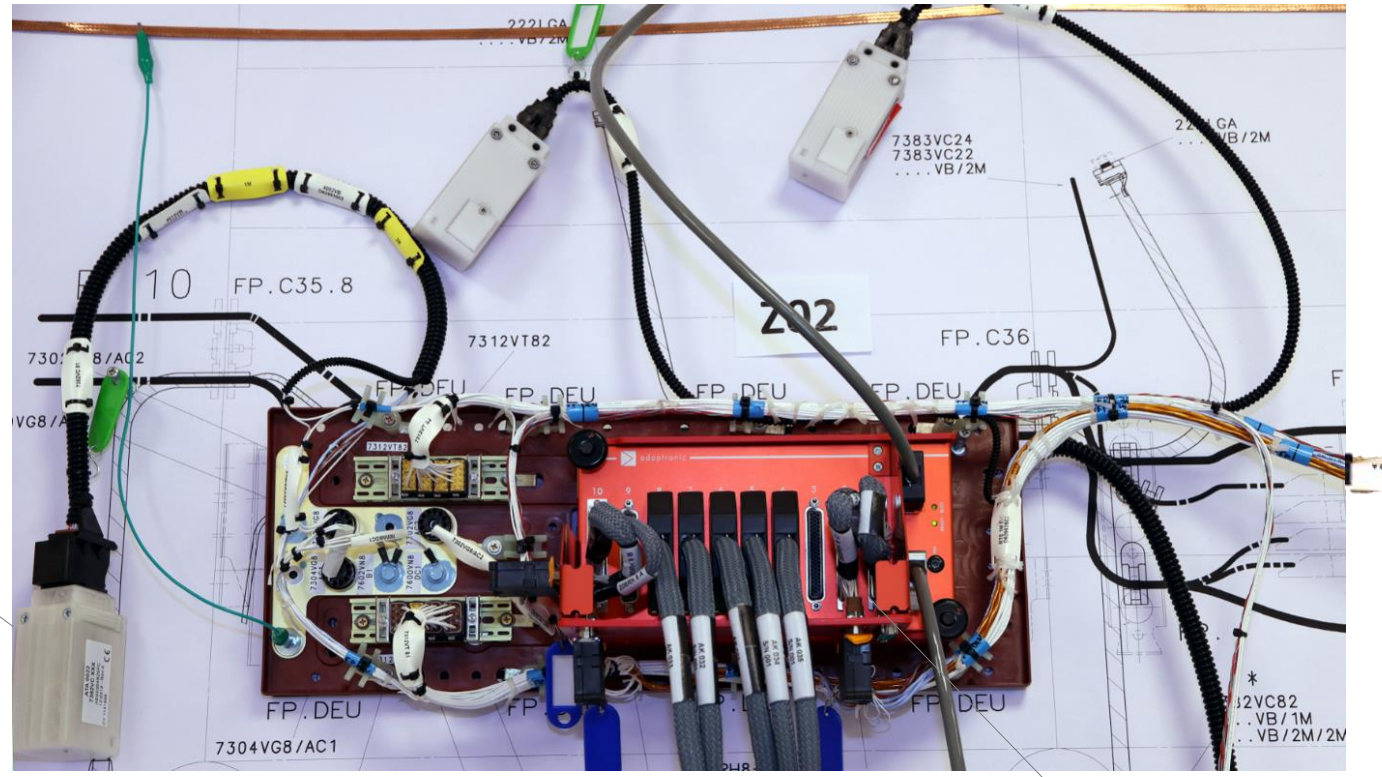
Comparison

Physical Footprint

Technical Features	
Available sizes	125 x 61 x 235 mm (W x H x D)
Power supply	Via system bus
System interfaces	Bus IN/OUT
Weight	< 2kg
Compatible tester	NT 800-5
Control software (version)	NT Control V6.20 or higher
System Topology	

Example

Physical Connections with Aircraft Harness in DEU (UUT)



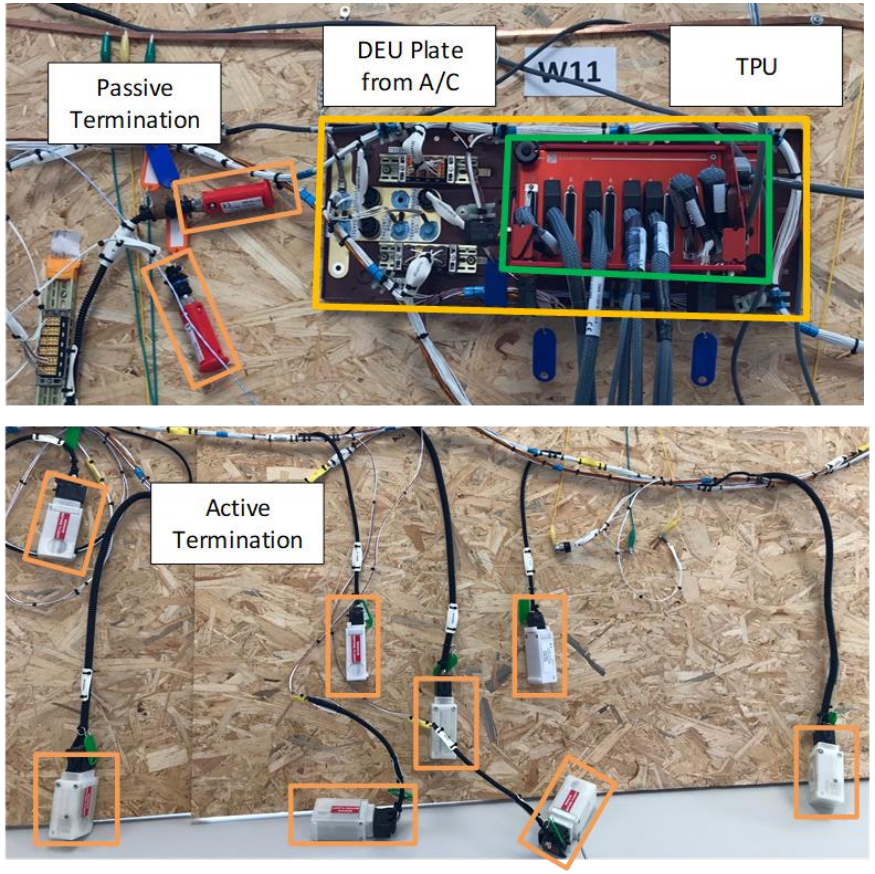
Active Termination Adapter

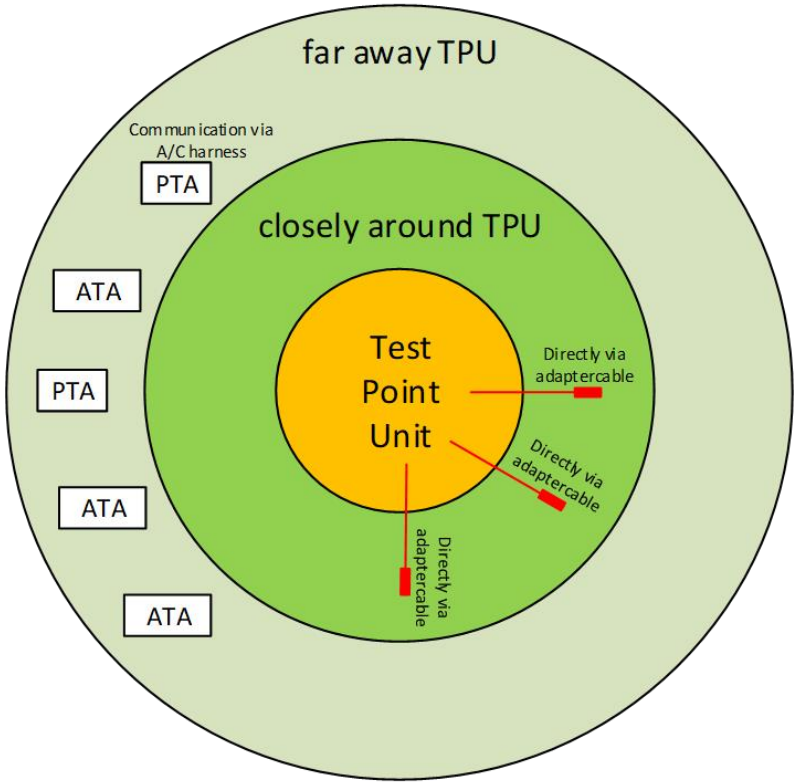
Passive Termination Adapter

Test Point Unit with Adapter Cable

Example

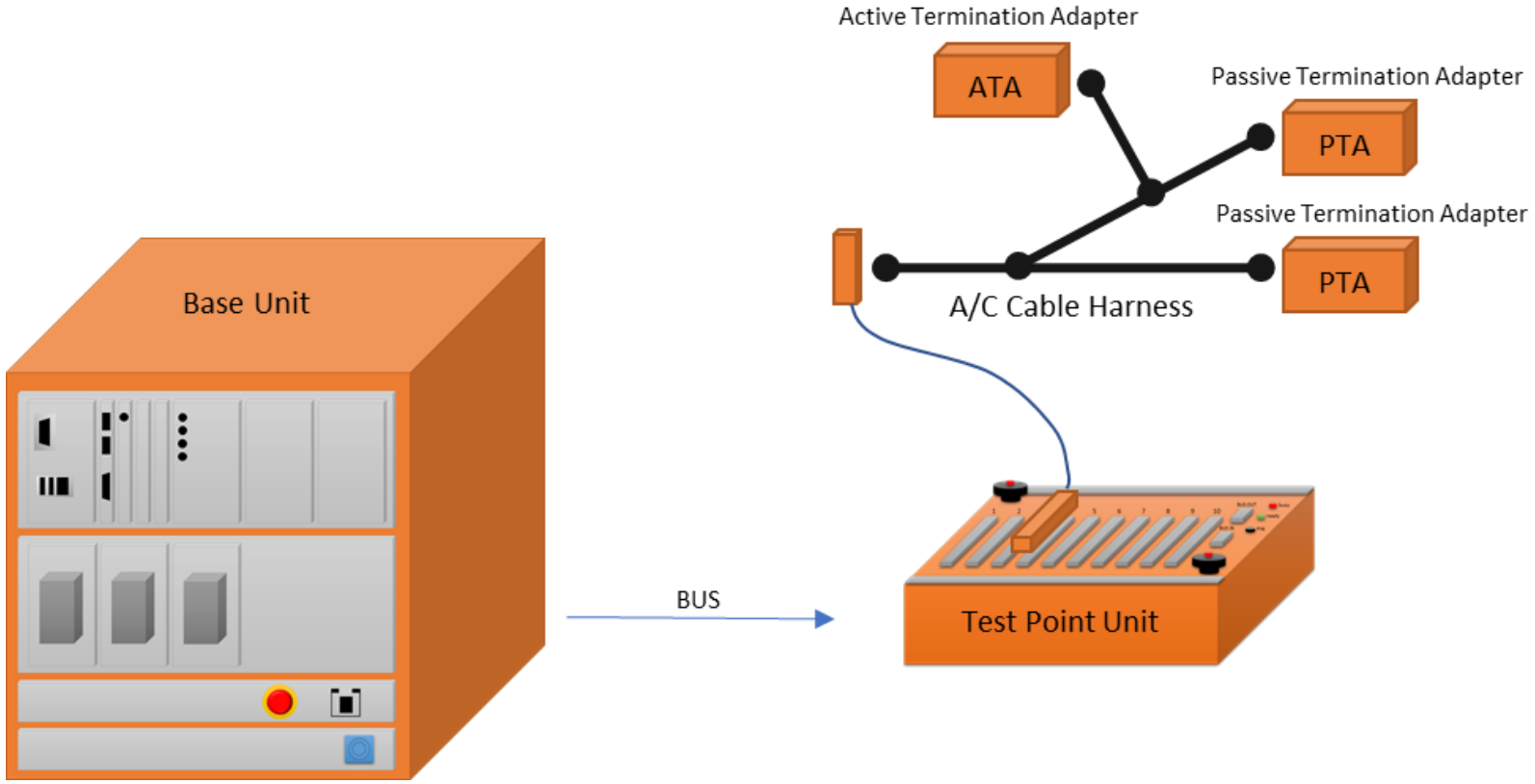
Topology





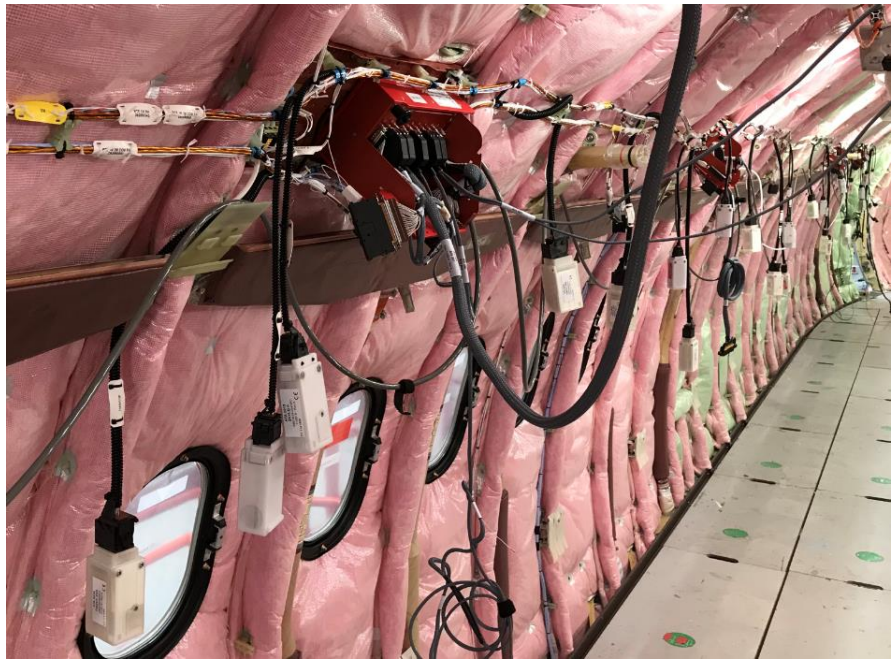
Example

Topology



NT800-5

Examples - Test Setup





Advantages:

- Small footprint of test devices
- Parallel activities in the aircraft are possible

NT 800-5

SOFTWARE

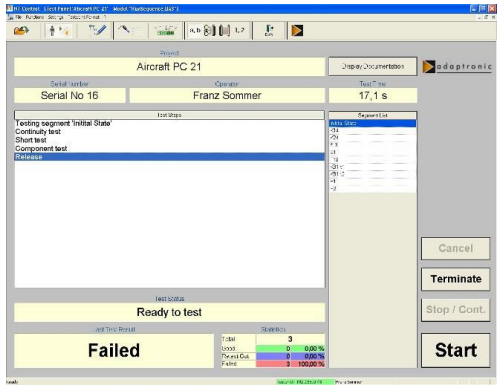
NT Control

NT Control

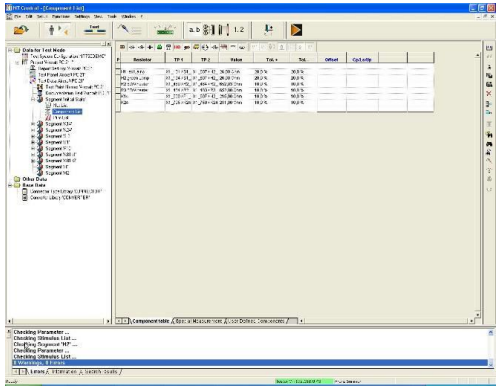
Significant simplification of the test procedure, reduced programming and debugging time

- graphical user interface
- easy and time-saving generation of test programs
- reliable visualized user
- unique support of detailed error localization

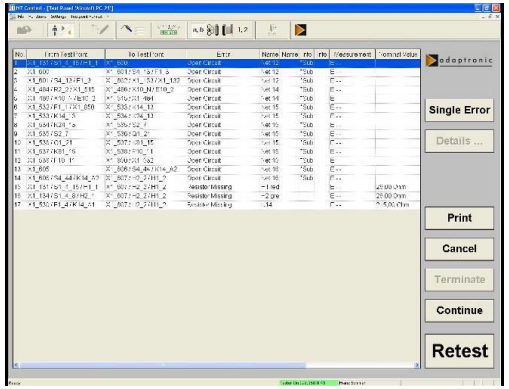
Test mode:
Example of a test panel



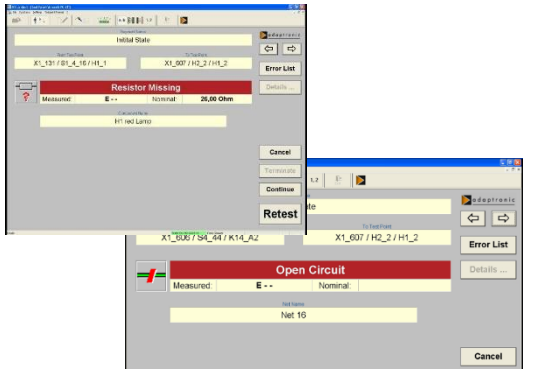
Programming mode:
Component list



Error list



Single error display



NT 800 - 5

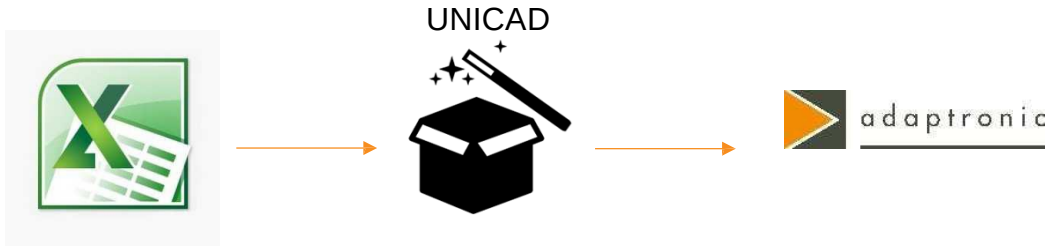
Automated Test Program Preparation

With the UNICAD Converter you have the ability to convert customer-specific input data like Excel, xml, ASCII formats into NT Control format.

At present the converter supports:

- Link data (connection of two test points)
- Splices (non-contactable test points)
- Component data (resistances, diodes, switches) Documentation data (general text sections)
- Generation of connector types by information about the used connectors

Data sources can be table-orientated files in MS-Excel, ANSI or ASCII format



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Competence in Testing.

adaptronic Tester for Aerospace

NT 800-1 / Distributed Tester up to 1500 VDC



Test Point Units

NT 800-5 / Distributed Tester up to 28 VDC



Active Termination
Adapter (ATA)



Passive Termination
Adapter (PTA)

Test Point Units



Main Unit





Main Unit incl. Test Points

NT 600 / Tester up to 1500 VDC





Main Unit incl. Test Points

NT 700-1 / Tester up to 6000 VDC

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Competence in Testing.

Overview

	Max Testing Voltage	Max Testpoints	Topology	Continuity	Isolation Resistance	Dialectric Withstand	Component Test	Functional Test
NT600	1500 VDC 1060 VAC	5.120	Central	0.5 Ohm – 20 K Ohm up to 2A	Max 2 G Ohm	1060 VAC	Resistors, Diods, Capacitance, LED, etc	Functional test of relay activation, signal lamps, LED, etc
NT700	6000 VDC 5000 VAC	32.768	Central	0.5 Ohm – 20 K Ohm up to 2A	Max 2 G Ohm	5000 VAC	Resistors, Diods, Capacitance, LED, etc	Functional test of relay activation, signal lamps, LED, etc
NT800-1	1500 VDC 1060 VAC	131.072	Distributed	0.5 Ohm – 20 K Ohm up to 2A	Max 2 G Ohm	1060VAC	Resistors, Diods, Capacitance, LED, etc	Functional test of relay activation, signal lamps, LED, etc
NT800-5	28VDC	131.072	Distributed	0-100 Ohm up to 100mA	Max 10 M Ohm	-	Resistors, Diods, Capacitance, LED, etc	-
NT800-5 Extension	1500 VDC	512	Distributed	0.5 Ohm – 20 K Ohm up to 2A	Max 2 GOhm	-	Resistors, Diods, Capacitance, LED, etc	-

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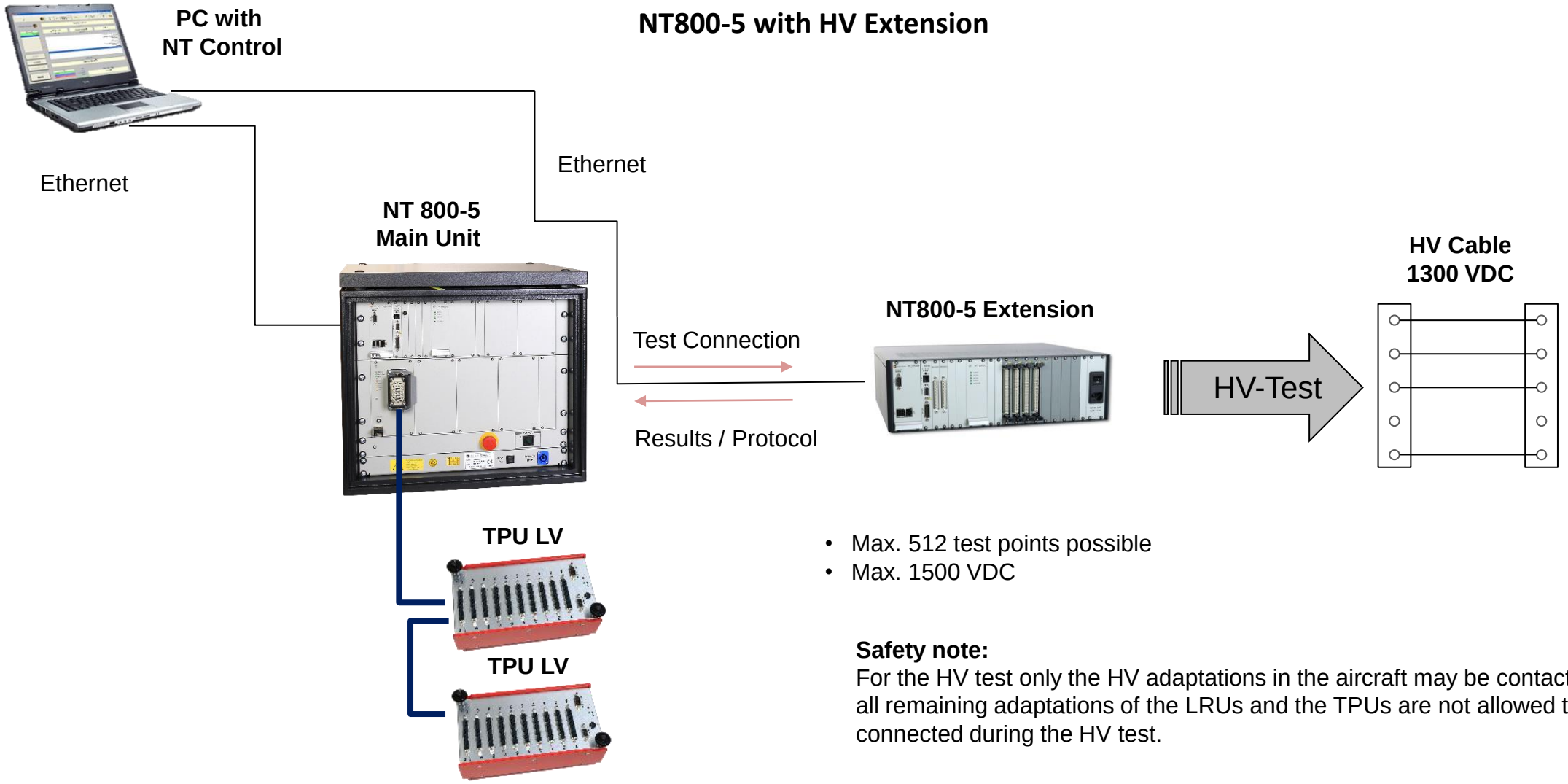
Competence in Testing.

NT800-5 with HV Extension



- Max. 512 test points possible
- Max. 1500 VDC

Safety note:
For the HV test only the HV adaptations in the aircraft may be contacted, i.e. all remaining adaptations of the LRUs and the TPUs are not allowed to be connected during the HV test.

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Competence in Testing.

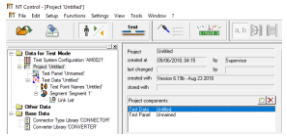
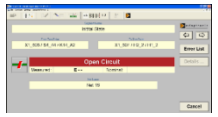
Scope of possible Supply

Tester Hardware





Software

Programming Software	NT Control 
Control Software	NT Control 
Converter	Data sources can be table-orientated files in MS-Excel, ANSI or ASCII format → UNICAD → adaptronic
Importing Functions	Circe, ASTERIX → UNICAD → Adaptronic Tester
Interfaces	Profinet, Profibus, EtherCAD, OPC UA, MES
Reporting	PDF, XML, ODBC, SQL

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Competence in Testing.

Adapter Cables



LRU Adaptations



Storage Solutions



Pre-equipped Structures

Working Benches



Services:

- Concept studies
- Project based product development
- Inhouse harness testing (contract testing)
- Engineering / project management
- Preparation of test programs
- Commissioning
- Technical support
- Calibrations
- Local support
- Training

adaptronic = turnkey provider



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Competence in Testing.