

Protocol Test Racal Instruments Wireless Solutions

6401 AIME/CT ISHO -

GSM/GPRS-UMTS Handover Conformance/Protocol Analysis Test Solution

AEROFLEX
A passion for performance.



- 6401 AIME/CT Option to support GSM/GPRS-UMTS handover requirements
- Highly modular flexible design extends use from R&D to Conformance
- 3GPPTS 34.123 and TS 51.010 Compliant
- Sample C++ and ETSI sourced 3GPP test cases
- Independent third party validation
- Fully automated testing including mobile control
- Capability to extend to GSM/GPRS and UMTS testing
- Full training and support packages included
- 2/2.5/3G-combined integrated logs

The complete deployment for the next or 3rd generation of network technology will take many years to occur. As roll-out commences, 3G services and networks will be available in localized areas only. The capability to seamlessly operate between existing 2/2.5G networks and the localized 3G networks will be key to success.

In Europe and through the majority of the rest of the world this 2G and 3G interaction will be between GSM/GPRS and UMTS networks. The Inter-System HandOver (ISHO) requirements are defined by the 3GPP (3rd Generation Partnership Project). The resultant output is a comprehensive set of specifications setting out the requirements to which equipment must conform, and the scenarios against which equipment must be verified.

To reduce the time it takes to deliver a mobile to market, the R&D process is accelerated if the user can test against these conformance specifications whilst still in development.

EXPERTISE IN DIGITAL CELLULAR TEST

Aeroflex has been closely involved in providing test solutions since the launch of digital cellular systems. These have delivered users significant time and cost benefits in technologies such as GSM, GPRS, EDGE and CDMA.

Aeroflex develops its own hardware and software and works with industry leaders in areas such as conformance test cases. This approach ensures the integrity and reliability of the test systems.

MEETING CUSTOMER NEEDS

Aeroflex delivers a total solution where elements such as reliability, support and customisation are recognized to be of equal importance. This approach enables solutions to be offered that can be tailored to meet the specific needs of the user.

PRODUCT OVERVIEW

The 6401 AIME/CT ISHO solution is Aeroflex's latest ProCLAIME family offering and provides an ISHO protocol and conformance test solution. The solution combines the mature industry validated RIL 2/2.5G 6103G platform with the 3G 6401 platform.

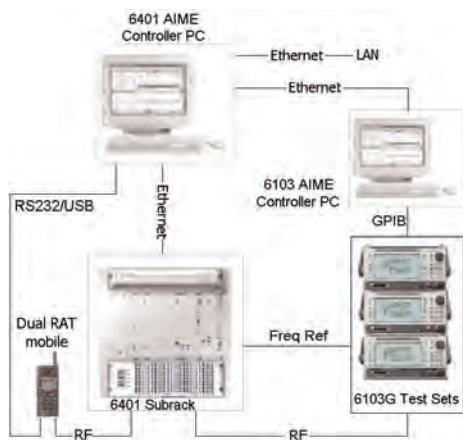
The solution leverages the capability of both platforms, to deliver all required functionality from the outset.

PLATFORM AND SOFTWARE ENVIRONMENT

The 6401 AIME/CT provides the protocol analysis capability to allow a user to observe the protocol behaviour of a mobile at the Uu interface whilst operating against a simulated 'perfect' UMTS network. The faithfulness of the network simulation is achieved within the 6401 by embedding a 3GPP compliant network protocol stack solution at Layers 1 and 2.

The 6103 AIME (E)GPRS mobile terminal protocol tester provides the user with full Layer 2 and Layer 3 monitoring and emulation capability for the Um interface. The features of this test and development tool allow the (E)GPRS software designer to monitor, debug and fault find protocol interchanges on the Um interface.

The ISHO solution uses both 6401 AIME and 6103 AIME systems to respectively provide the required UMTS and (E)GPRS cell emulations.



The master control is provided by the 6401 AIME/CT product (6401 AIME Controller PC plus 6401 chassis) within the ISHO solution. The 6401 AIME/CT combines its own RF signals with those from the 6103G test sets to provide a duplex connection to the UE.

The minimum configuration supports emulation of one UTRAN cell and 2 GERAN cells. The product allows simple hardware expansion to support emulations of multiple UTRAN and GERAN cells on different frequencies if required, up to the maximum of 3 UTRAN and 3 GERAN cells needed by the standard 3GPP Inter-RAT test cases.

The AIME/CT software environment is run on the 6401 and can be used to address two distinct applications:

- Conformance testing
- Research and development

For conformance testing, the AIME/CT software environment can be used to run the various test cases and provides an independently validated fully compliant 3GPP UMTS mobile conformance test solution.

The AIME/CT software can also be used as a protocol test tool for those involved in research and development (R&D), system integration and interoperability testing for UMTS mobiles. A number of additional software components are available as options to extend the functionality and flexibility of the 6401 for these R&D applications.

AUTOMATION

The test system supports the automation of test campaigns. Test cases and scripts can be assembled into test campaigns and then automatically executed where separate log and report files are generated for each test in the campaign.

To fully automate testing, the mobile under test can be controlled via a serial interface. This improves the efficiency of testing as it removes the need for manual intervention.

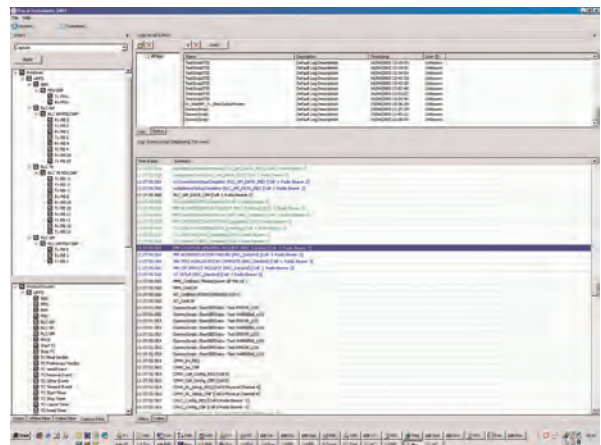
CONFORMANCE TEST APPLICATIONS

The AIME/CT software allows a user to execute validated 3GPP conformance test cases. Operation of the software is very simple. The MMI is built on core ProCLAIM customer proven features:

- Ease of use.
- Clear display of pertinent information.
- Separate on-screen windows to show information such as available test cases, system status and generated log files.
- High level summary of the status whilst the test is being executed.
- Dialog boxes 'pop-up' to prompt the user during test execution.

The user selects the appropriate test case or test campaign. To run, only a single click action is required. A new test campaign is easily built through clicking and selecting on the desired test cases.

On test completion the test case verdict is displayed and a test report file generated. The report file contains summary information of the test conditions and test verdict. The report can be either printed or exported in a standard file format.



TEST CASE PACKAGES

For conformance testing Aeroflex delivers fully compliant 3GPP 34.123 and 51.010 Conformance Test cases approved by the Global Certification Forum (GCF).

The effectiveness of the conformance test solutions is defined by the integrity of the supplied test cases.

Only ETSI sourced TTCN is used thus avoiding the compliance issues associated with using TTCN independently derived from the specifications and therefore subject to misinterpretation and ambiguity.

Aeroflex works closely within the 3GPP and GCF forums to deliver Conformance Test cases in packages based on the GCF prioritisation.

R&D APPLICATIONS

The AIME/CT software is also designed to address applications in R&D and interoperability testing. The powerful software environment provides access to features such as:

- Detailed protocol signaling exchange between the mobile and the network with diagnostic capability

- Real time logging, decoding and filtering of the information

- Filtering capability to capture desired information down to specific 3GPP primitives

- Colour coding of the information to improve readability of screens

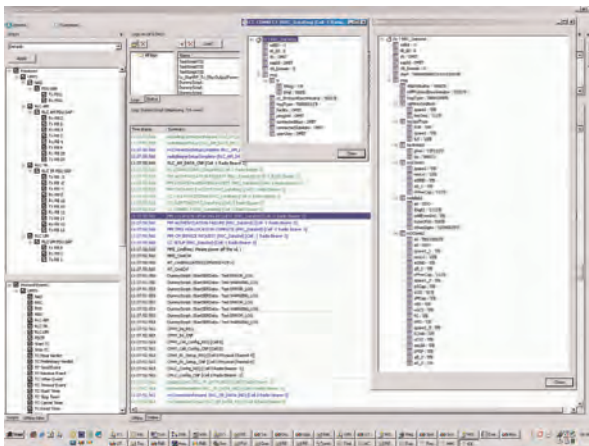
- Generation of log files to allow off-line protocol analysis - log files contain both 2G and 3G messages.

- Modification of TTCN conformance test cases

- Development of TTCN test cases

- Development of new test cases in any COM based language

Thus, a user can configure the 6401 AIME/CT ISHO to emulate specific network configurations and quickly identify incorrect protocol behaviour within the mobile. From either the on-screen display or the log-files detailed information can easily be understood.



FUTURE PROOF

The 6401 AIME/CT is a highly modular and flexible test solution. The hardware is designed to support all the major telecommunication standards, focusing first on 3GPP UMTS FDD testing.

The hardware design uses compact PCI architecture, controlled and configured from an external PC. Baseband and RF transceiver modules are used to generate channels and RF carriers. The modular system architecture allows many different configurations. This results in a test solution easily upgraded if additional capability is required. The user has the capability to emulate highly complex network scenarios or generate multiple channels as test needs evolve.

For conformance testing, the 6401 is focused to first meet the higher priority GCF identified UMTS protocol conformance test cases. The

more complex test cases that require emulation of up to 6 UMTS cells and generation of multiple RF carriers can easily be accommodated.

SUPPORT

Support of the system hardware is an essential element in maximizing efficiency and return on investment of your equipment. Aeroflex offers several comprehensive hardware support packages, which are tailored to typical usage profiles.

The 6401 AIME/CT ISHO comes with a comprehensive worldwide hardware, software and test case support package. Two tiers of support packages are offered to the user. Regardless of the level of support chosen, users have access to a helpdesk facility where any faults or issues can be logged, and are guaranteed to receive a response from Aeroflex within the next working day.

The support also covers issues such as specification tracking and any changes in the 3GPP versions of the standard. To fulfil specific support needs, the user is able to customize any of the support packages.

Further details about support can be found in the support section on the Aeroflex website

TECHNICAL INFORMATION

Please refer to separate 6401 and 6103 AIME/CT Conformance Test System product information sheets.

ORDERING INFORMATION

6401 MOBILE AIR INTERFACE TEST SYSTEM

| | |
|----------|---|
| 6401-007 | 1 UMTS Carrier, 3 cells plus 1 GSM/GPRS Cell |
| 6401-008 | 2 UMTS Carriers, 4 Cells, plus 2 GSM/GPRS Cells |
| 6401-009 | 3 UMTS Carriers, 5 Cells, plus 3 GSM/GPRS Cells |

6401 CONTROL PC

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|-----------|----------------|
| 6400-250 | Control PC |
| option 93 | PC Workstation |

SOFTWARE ENVIRONMENT

| | |
|----------|------------------------------|
| 6401-100 | UMTS Capability |
| 6401-502 | ISHO Capability |
| 6401-110 | TTCN Target Adapter software |
| 6401-120 | COM API software |

3GPP 34.123/51.010 CONFORMANCE TEST CASES

| | |
|----------|--------------------------------------|
| 6401-260 | GCF ISHO CS & PS GSM-UMTS test cases |
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GPRS/EGPRS TEST CAPABILITY

Please refer to separate 6103 AIME/CT Conformance Test System product information sheet.



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