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TETRA Interoperability and Certification explained

TETRA 互用性及认证说明

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This paper explains the background to the development of the TETRA Interoperability process, its benefits to users and manufacturers, makes some recommendations for users and potential users of TETRA systems and finally includes a set of frequently asked questions.

本文解释说明 TETRA 互用性研发的背景，对用户和制造商的益处，为 TETRA 系统的用户和潜在用户提供建议，最后回答一系列常见问题。

This paper is broken down into the following sections:

本文分为以下几个部分：

1. Why the Interoperability (IOP) process was developed
- 1、为什么要进行互用性（IOP）的研发？
2. The role of the European Telecommunications Standards Institute (ETSI) in TETRA
- 2、欧洲通讯标准协会（ETSI）在TETRA中发挥的作用
3. A brief introduction to the TETRA standard
- 3、TETRA标准简介
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5. TETRA Interoperability Certification process
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6. TETRA IOP Certificates
- 6、TETRA IOP证书
7. Frequently asked Questions and Answers
- 7、常见问题及回答

1. INTEROPERABILITY DEVELOPED FOR GOOD REASONS

1、互用性的研发的裨益

The TETRA Association developed the Interoperability Certification process in order to ensure users and equipment suppliers would benefit from a truly open multi-vendor market for TETRA systems and equipment.

TETRA协会进行互用性认证，其目的是为了确保用户和设备供应商能够从向TETRA系统和设备真正开放的多厂商市场中受益。

A healthy, competitive, open, multi-vendor market brings proven benefits to users such as choice of equipment, choice of supplier, continuous development of new products with increased functionality and improved price performance. For manufacturers, it provides a growing market, eliminates different and incompatible implementations of the TETRA standard and the Interoperability Certification process provides a formal test forum that enables competing manufacturers to test that their products are compatible.

一个健康、开放、拥有多家厂商、充满竞争的市场能够给用户带来种种的利益，如可以选择不同设备、供应商和新产品的不断研发，功能更加强大，性价比提升。对制造商而言，这能够提供不断扩大的市场，清除不同和不兼容的TETRA标准，并且互用性认证也提供了一个正式的测试平台，使得相互竞争的制造商可以测试他们的产品是否兼容。

Users can be confident that products awarded an IOP certificate have been rigorously tested and the functions listed in the certificate fully meet the TETRA standard. This allows users who select equipment from a number of suppliers to reduce the amount of system integration and testing that they need to undertake.

用户可以确信，获得IOP认证的产品经过了严格的测试，证书上所列功能完全符合TETRA标准。如此，用户可以从一系列的供应商中选择设备，减少为系统整合和测试而支付的费用。

2. ETSI - EUROPEAN TELECOMMUNICATIONS STANDARDS INSTITUTE

2、ETSI—欧洲通讯标准协会

The European Telecommunications Standards Institute (ETSI) is an independent, non-profit making organisation, whose mission is to produce telecommunications standards for today and for the future.

欧洲通讯标准协会（ETSI）是一个独立的、非赢利性组织，其使命就是制定现在和将来的通讯标准。

Based in Sophia Antipolis (France), ETSI is officially responsible for the standardisation of Information and Communication Technologies (ICT) within Europe.

ETSI总部位于法国Sophia Antipolis，正式负责制定欧洲信息通讯技术（ICT）的标准。

ETSI's standards are created by consensus amongst its members.

ETSI标准的制定由其成员一致通过。

ETSI has, amongst many other standards, created the TETRA standard.

ETSI制定了包括TETRA标准在内的许多标准。

Further information about ETSI can be found at its web site: www.etsi.org.

详情请访问ETSI网站www.etsi.org

3. TETRA – TERRESTRIAL TRUNKED RADIO

3、TETRA—陆地集群无线电

TETRA is the modern digital Private Mobile Radio (PMR) and Public Access Mobile Radio (PAMR) technology designed for police, ambulance and fire services, security services, utilities, military, fleet management, transport services, closed user groups, factory site services, mining and many other organisations that have a need for secure private radio communications.

TETRA包括现代数码个人移动无线电（PMR）和公共接入移动无线电（PAMR）技术，用于有安全私密无线电通讯需求的组织机构，如警察、救护车和消防服务，安全服务，公共事业，军事，车/船队管理，交通服务，闭合用户群，工厂场地服务，采矿等等。

TETRA supports point-to-point and point-to-multipoint communications over a TETRA infrastructure and, by the use of Direct Mode, without a TETRA infrastructure.

TETRA支持经由TETRA基础设施点对点以及点对多点通信，在没有TETRA基础设施的时候，可使用直接模式进行上述通信。

TETRA provides many advantages over other digital and analogue systems. More details can be found at:

www.etsi.org/tetra and at

www.tetra-association.com.

TETRA比其他数字或者模拟系统拥有许多优势，详情请见www.etsi.org/tetra和www.tetra-association.com。

4. THE TETRA ASSOCIATION – AN ETSI PARTNER ORGANISATION

4、TETRA协会—ETSI伙伴机构

The TETRA Association, also known as the TETRA MoU (Memorandum of Understanding) Association, was established in December 1994 to create a forum which would act on behalf of all parties wanting to encourage the development and use of TETRA systems. This included user organisations, manufacturers, application providers, integrators, operators, test houses and telecom agencies.

TETRA协会，又名TETRA MoU协会（MoU即谅解备忘录），始建于1994年12月，其目的是为了代表所有希望鼓励TETRA系统研发和使用的各方，包括用户机构、制造商、应用提供商、集成商、运营商、测试机构和电讯机构。

Today, January 2008, the TETRA Association represents over 150 organisations from all continents of the world.

截止2008年1月，全世界各大洲150多个机构成为了TETRA协会的会员。

TETRA is now widely established with more than 1600 contracts placed for TETRA equipment. These contracts are for equipment that is in use in over 97 countries.

目前TETRA已经得到了广泛地运用，TETRA设备的定单来自97个国家，合同数超过1600个。

Interoperability Certificates have been issued by the TETRA Association to ten manufacturers and a growing number of manufacturers have equipment under development and are preparing to enter the certification process. As a measure of the success that the TETRA Association has had with this process, it is estimated that well over half of the operational TETRA network fleets use terminals from more than one manufacturer.

TETRA协会已经给10个制造商颁发了互用性证书，越来越多的制造商也在研发设备，准备进入认证测试。TETRA协会在认证方面取得了很大的成功，据估计，一半以上使用中的TETRA网络中的终端不只由一个制造商提供。

A goal of the TETRA Association is to provide a forum for all parties interested in TETRA that will enable them to encourage the adoption of the standard and support initiatives to obtain appropriate levels of spectrum such that growth in operational TETRA systems is not restricted by regulation.

TETRA协会的目标是提供平台，鼓励所有对TETRA感兴趣的所有各方采用TETRA标准，并且支持各种努力获准恰当频谱，因而已投入使用的TETRA系统的发展不会因监管而受到限制。

Further information can be found at: www.tetra-association.com.

详情请登陆网站: www.tetra-association.com。

5. TETRA INTEROPERABILITY CERTIFICATION PROCESS

5、TETRA互用性认证

The official TETRA interoperability testing and certification process is managed by the Technical Forum (TF) of the TETRA Association. The TF's targets and priorities are set each year in agreement with the Operators & Users Association (OUA) which is another sub-group of the TETRA Association.

TETRA互用性正式的测试和认证由TETRA协会的技术论坛（TF）进行管理。TF每年的目标和工作重点的确定由TF和TETRA协会下设的机构运营商和用户协会（OUA）共同协商确定。

For each TETRA feature that is to be certified, a TETRA Interoperability Profile (TIP) specification is created in the working groups established under the TF. The draft TIP specification is subjected to open Members' Enquiry (ME) to give all the members of the TETRA Association an equal opportunity to comment before the TIP is approved by the TF. Each TIP is based on ETSI TETRA standards. As they constitute an agreed interpretation of the ETSI TETRA standards they may reduce the number of available implementation options of TETRA functionality when compared to the ETSI standard. This is to ensure that all manufacturers interpret the TETRA standards in a consistent fashion and that TETRA equipment from different manufacturers is interoperable.

TF下设的工作组对须验证的TETRA的特征制定TETRA互用性规范（TIP）。TIP的草案接受公开的会员质询（ME），所有TETRA协会会员都有公平的机会在TF批准TIP之前进行评论。每个TIP都是基于ETSI的TETRA标准。这些构成了达成一致的ETSI TETRA标准的解释，因而，较之ETSI标准，可能会减少TETRA功能可操作的选择。其目的是为了确保所有的制造商对TETRA标准进行一致的解释，不同制造商的TETRA设备具有互用性。

The interfaces covered, or planned to be covered, by TIP specifications and certification are the Trunked Mode (TMO) air interface between the infrastructure and a radio terminal, the Direct Mode (DMO) air interface between two radio terminals, the Inter-System Interface (ISI) between two infrastructures and the Peripheral Equipment Interface (PEI) between a radio terminal and a data terminal. Currently, TIP specifications have been produced for the TMO and DMO air interfaces, PEI and ISI whilst IOP certificates have only been issued for the TMO and DMO air interfaces.

TIP和认证包括或计划包括的接口有基础设施和无线电终端之间的集群模式（TMO）空中接口、无线电终端之间的直接模式（DMO）空中接口，基础设施之间的系统内部接口（ISI）和无线电终端和数据终端之间的外围设备接口（PEI）。目前，TIP已包括TMO和DMO空中接口、PEI和ISI，IOP证书仅颁发给TMO和DMO空中接口。

In addition to a TIP, a detailed Interoperability Test Plan document is produced for each feature using the same procedure. The Test Plan contains a detailed list of test cases to be run on the products to be tested. The Test Plan is a detailed document that ensures that the tests are repeatable and identical in all test sessions. After the TIP and Test Plan have been approved, test sessions can be conducted for that feature between manufacturers.

除了TIP，还有一份按相同流程为每一的特性制定地详尽的互用性测试计划文档。测试计划包括了测试产品的详尽的测试清单。测试计划十分详尽，确保测试可重复，具有一致性。TIP和测试计划批准之后，制造商之间可以对该特性进行测试。

The TETRA Association has contracted ISCOM (Istituto Superiore delle Comunicazioni e tecnologie dell'Informazione), a laboratory of the Italian Ministry of Communications to act as an independent certification authority for TETRA. ISCOM is responsible for scheduling and supervising IOP test sessions and for issuing IOP certificates.

TETRA协会与意大利通讯部的实验室ISCOM签约，该实验室为TETRA的独立认证机构。ISCOM负责安排和监督IOP测试，颁发IOP证书。

After each test session, ISCOM analyses the test results and will then issue a detailed official Interoperability Certificate which will list each feature and function that has successfully passed its test.

每次测试之后，ISCOM分析测试的结果，颁发详尽的正式互用性证书，证书上将列有通过测试的每一项特性和功能。

The IOP certification testing is carried out in a multi-vendor environment and tests the interaction between products from different manufacturers.

IOP认证测试过程多厂商环境中进行，测试不同的制造商的产品之间的互动。

Currently all certification testing focuses on functionality on the OSI model layer three and is therefore frequency band independent. The physical layer functionality is not evaluated in interoperability testing.

目前，所有认证测试主要是OSI模型第三层的功能，因此波段是独立的。互用性测试不评估物理层功能。

Test sessions and the whole certification process are funded by the participating manufacturers.

测试和认证全过程的费用有制造商承担。

6. TETRA IOP CERTIFICATES

6、TETRA IOP证书

The results presented in the TETRA Interoperability Certificates are derived from evaluating the signalling information over the air interface between live TETRA terminals and live TETRA infrastructures (in the case of TMO air interface certification). This detailed analysis of the signalling across the interface ensures compliance with the TIP specification and also compliance with the standard. Hence the IOP certification also serves as standards compliance testing even though the main target is to ensure interoperability between manufacturers' products.

TETRA互用性证书所列的结果来自于评估TETRA终端和基础设施通过空中接口进行信息传送（TMO空中接口认证）。通过接口进行信息传送可以确保符合TIP规格和标准。因此，IOP认证同样也是符合标准测试，尽管其主要目的是为了确保持造商产品之间的互用性。

Certificates are hardware platform specific and software release specific. This means that all new releases of a protocol stack will require products using this stack to be retested and before an Interoperability Certificate can be issued.

证书上所列为专用的硬件平台和软件版本，也就是意味着所有新发布协议栈要求产品使用这些协议栈时要进行重新测试，之后才能颁发互用性证书。

To reduce unnecessary re-testing, a manufacturer may officially declare that a certain protocol stack (software version) is used in several products by issuing a "Statement of Commonality". This declaration means that all products using this stack will exhibit the same protocol behaviour. This is verified through a process known as "spot check testing" which is faster to complete. The specific tests performed under "spot check testing" are decided by ISCOM who ensure that sufficient testing is undertaken to provide a level of confidence that the products listed in the "Statement of Commonality" do behave identically. Each specific terminal will still require its own specific Interoperability Certificate.

为了减少不必要重复测试，制造商可通过发布《共同声明》，正式宣布某种协议栈（软件版本）可以用于数种产品。该声明也就意味着所有使用该协议栈的产品将表现出相同的协议行为。“抽样测试”对此进行验证。ISCOM决定“抽样测试”的具体内容，确保测试的充分性，《共同声明》上所列产品有一致行为。每个终端需要其专有的互用性证书。

7. FREQUENTLY ASKED QUESTIONS AND ANSWERS

7、常见问题及回答

a. Does that mean that a user organisation can only purchase equipment with IOP Certificates?

a. 用户机构只能购买拥有 IOP 认证的设备？

a. No. This is a voluntary process, and an organisation is free to purchase a solution from one or more vendors. However the user organisation will have greater confidence in purchasing equipment that has undergone Interoperability testing. It is therefore recommended by the TETRA Association that user organisations always require formal IOP Certificates from their vendors.

a. 否。这完全自主自愿。用户机构可以自由选择，从一个或多个购买厂商进行采购。但是，用户机构购买通过互用性测试的设备会更加放心。因此，TETRA 协会推荐用户机构在从销售商采购时要求正式的 IOP 证书。

b. Does the Certificate guarantee compliance to TETRA standards?

b、证书是否确保符合 TETRA 标准？

a. The IOP Certificate only certifies that the two tested products are compatible as detailed in the Certificate text. IOP Certificates are produced as a result of detailed analysis of the signalling log files which verifies that the signalling is in compliance with the TIP specification(s). As the TIP specifications are refinements to the standard and often reduce the options available within the standard, the Certificates also serve as evidence of compliance to relevant part(s) of the TETRA standards.

a、如证书详情所示，IOP 证书仅颁给两种兼容的产品。只有详细分析信号传送日志之后，证实信号传送符合 TIP 规格，才能颁发 IOP 证书。TIP 为标准的改良，往往在标准的范围内减少可能的选择，证书也可以表明符合 TETRA 标准的有关部分。

- c. How often are Certificates issued?
- c、证书颁发的频度如何？
- a. Manufacturers are encouraged to perform Interoperability Certification testing at major software releases, and when new features are being introduced. Time for a test session is reserved with the Certification Authority (ISCOM), who will invite other interested manufacturers and witness the tests. The goal is that Certificates are then published within 2 months after the test session is completed.
 - a、我们鼓励制造商对主要的软件版本和新引入特征进行互用性测试。认证机构（ISCOM）确定测试的时间，邀请其他有兴趣的制造商观摩测试。其目标是在测试完成后 2 个月之内能够公布证书。
- d. Where can a user organisation get visibility of planned test session and available Certificates?
- d、用户机构如何获得测试计划和已有的证书的信息？
- a. Certificates are posted on the TETRA Association website, <http://www.tetra-association.com/> -> [Using TETRA -> Interoperability](#). A schedule of planned test sessions can be found in the same area of the web site.
 - a、TETRA协会网站上公布了证书，详情请查：<http://www.tetra-association.com/> -> [Using TETRA -> Interoperability](#)。在网站同一区域列有测试计划安排。
- e. Does the interoperability certification restrict competition?
- e、互用性认证是否会限制竞争？
- a. No. On the contrary, the purpose of the interoperability certification process is to encourage competition. It creates a market of multiple and mutually compatible products. It enables customers to have the ability to select the most appropriate products for their needs and be confident that these products are compatible with each other. The process is not intended to be used as means to artificially restrict competition.
 - a、否。相反，互用性认证的目的是为了鼓励竞争。这能创建一个拥有多样、相互兼容产品的市场，使得顾客能够选择满足需求的最恰当的产品，并且确信这些产品可以相互兼容。本认证并非是为人为限制竞争的方式。

f. When customers want to purchase certified products, how can they find out what features and products have already been certified?

f、顾客需要购买经过认证的产品时，如何才能了解那些特性和产品已经经过认证？

a. All Interoperability Certificates are public domain documents and available on the Association website at:

<http://www.tetra-association.com/> -> [Using TETRA -> Interoperability](#)

a、所有互用性认证都是公共文件，可查看协会网站

<http://www.tetra-association.com/> -> [Using TETRA -> Interoperability](#)

b. Customers preparing tenders are encouraged to check which features are covered by existing certificates before specifying their requirements in order to ensure that certified products are available with the features that they require. Customers will find that for some features there are certificates available for most manufacturers' products, whereas for some new features the certification process is still underway and testing and certificates are in the process of being produced manufacturer by manufacturer.

b、客户在准备招标时，可先核实现有证书中已包括的特性，之后再确定要求，以确保经过认证的产品的特性可以满足需求。客户可发现大部分制造商的产品的某些特性都已经包含在认证之内，而对于一些新的特性，认证过程仍在进行之中，并且测试和认证在制造商之间逐一进行。

- g. In case that there are none or only a few certificates issued for a specific feature, how can a customer evaluate which certificates may be issued in near future?
- g、如果某一具体的特性没有或仅有不多的证书，客户如何评价哪个证书是最近颁布的？

a. The Association's website, <http://www.tetra-association.com/> -> [Using TETRA -> Interoperability](#), has a publicly available list of recently conducted test sessions and the participating manufacturers. As the evaluation process will still be ongoing it does not guarantee which manufacturer or product will achieve a certificate for which feature. But it can be used as an aid to evaluate the possible availability of new certificates during a tendering process. The Association's website also contains a public list of future test sessions. This enables a user organisation to forecast the possible availability of new certificates during the next 6 to 9 months.

a、在协会的网站<http://www.tetra-association.com/> -> [Using TETRA -> Interoperability](#)公布了最近进行测试的名单和参加的制造商。如果评估过程仍然在进行中，就无法确保哪家制造商或哪种产品的哪种特性可以获得证书，但是在招标过程中有可能获得的新的证书可以用于帮助评估。协会的网站也公开列有未来的测试，用户机构可以据此预测未来6到9个月有可能获得的证书。

- h. How should certificates be specified in a tendering process when the availability of issued certificates for a wanted feature is limited?

h、如果已经颁发的证书中所需的特性有限，如何在招标过程中规定相关的证书？

a. The intention of the IOP process is to increase competition, not to restrict it. Customers are encouraged to adjust their requirements for IOP certificates in the tendering process so that healthy competition is maintained whilst still requiring the evidence of interoperability (an IOP certificate) from manufacturers as early as possible. This may require in some cases setting the final delivery date for certificates in different milestones of the process: prequalification, tender submission, contract signature, product acceptance etc.

a、IOP 进程的也就是为了增加而不是限制竞争。我们鼓励客户在招标过程中调整 IOP 证书的要求，如此可以保证健康的竞争，同时也仍然可以要求制造商尽早提供可互用的证明（IOP 证书）。在某些情况下，也可以要求在整个招标流程中不同关键阶段提供证书，如资质审核、标书提交、合同签字、产品接受等。

- i. Is one single terminal Certificate valid for all TETRA Infrastructures?
- i、某个终端证书是否适用于所有的 TETRA 基础设施？
- a. No. A Certificate is only valid for the terminal and infrastructure which were used during the test. The hardware and software release of both terminal and infrastructure are detailed in the Certificate.
- a、否。一个证书仅使用于在测试中已用过的终端和基础设施。证书上会详尽列有终端和基础设施的软件和硬件的版本。
- j. Does a Certificate guarantee full compatibility?
- j、认证是否能确保所有都兼容？
- a. A Certificate applies to the interface between two specified products and for the specified functions only. A user organisation should ensure that its functionality requirements are covered by the Certificates. Functionality requirements that do not relate to signalling interfaces such as the user interface and language are not covered by the IOP process and if required need to be verified by other methods.
- a、认证适用于两个具体的产品接口，仅为具体的功能。用户机构应明确应有功能要求已包含在证书之中。与信号传送接口无关的功能要求，如用户接口和语言要求等，并未包括在 IOP 认证中，如有需要，须以其他方法进行验证。
- k. Does an IOP Certificate mean that the product is type approved?
- k、IOP 认证是否意味着该产品经过审批？
- a. No, all products needs to be type approved according to local regulation as appropriate.
- a、否。一切产品都必须按照当地法律法规进行审批。

l. How can my company participate in the IOP process?

l、如何参加 IOP 认证？

a. Your organisation needs to be a member of the TETRA Association. Membership details can be found at the Association's website: www.tetra-association.com. If you are a member then contact the Chairman of the Technical Forum via email at tfchairman@tetra-association.com.

a、贵单位必须是TETRA协会的会员。欲成为会员，详情请见协会网站：www.tetra-association.com。如果贵单位已经是会员，请通过email联系技术论坛（TF）的主席：tfchairman@tetra-association.com。

m. More information?

m、更多信息？

a. For further details or to have any other questions answered please contact the Chairman of the TF via email at tfchairman@tetra-association.com.

a、欲知更多信息或还有其它问题，请通过email联系TF主席，地址如下：tfchairman@tetra-association.com。