



Bundesrepublik Deutschland

Federal Republic of Germany

Bundesamt für Seeschifffahrt und Hydrographie

Federal Maritime and Hydrographic Agency



**BUNDESAMT FÜR
SEESCHIFFFAHRT
UND
HYDROGRAPHIE**

Conformance test report of an

AIS system

Equipment under test:

FT-TEC

Type:

Seaangel SA14-SART

Applying test standards:

IEC 60945 Ed4 (2002), Sections 6,11.1, 13-15

Test Report No.:

BSH/4543/001/4552802/14-6

Applicant:

FT-TEC GmbH
Werner von Siemens Strass 5
7343 Neutal
AUSTRIA

Hamburg, 12 December. 2014

For the Federal Maritime and Hydrographic Agency

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Germany



Deutsche
Akkreditierungsstelle
D-PL-12084-01-01

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**Bundesamt für Seeschifffahrt und Hydrographie
Bundesoberbehörde im Geschäftsbereich
des BMVBS
Bernhard-Nocht-Straße 78
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die Kompetenz nach DIN EN ISO/IEC 17025:2005 besitzt, Prüfungen in folgenden Bereichen durchzuführen:

Schiffsausrüstung (Navigationsausrüstung, Funkausrüstung, Rettungsmittel)

Die Akkreditierungsurkunde gilt nur in Verbindung mit dem Bescheid vom 08.03.2013 mit der Akkreditierungsnummer D-PL-12084-01 und ist gültig bis 07.03.2018. Sie besteht aus diesem Deckblatt, der Rückseite des Deckblatts und der folgenden Anlage mit insgesamt 9 Seiten.

Registrierungsnummer der Urkunde: **D-PL-12084-01-01**

Frankfurt am Main, 08.03.2013

Siehe Hinweise auf der Rückseite


Im Auftrag Dipl.-Ing. (FH) Ralf Egner
Leiter Abteilung 2

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General

Applicant: FT-TEC GmbH
Werner von Siemens Strass 5, 7343 Neutal, AUSTRIA

Equipment under test:

Type: Seaangel SA14-SART
Manufacturer: FT-TEC GmbH
Werner von Siemens Strass 5, 7343 Neutal, AUSTRIA
Place of test: BSH test laboratory Hamburg, Room 916
Start of test: 03 December, 2014
End of test: 12 December, 2014

Test standards¹:

IEC 60945 Ed 4 (2002), Sections 6,11.1, 13-15

Maritime navigation and radiocommunication equipment and systems-
General requirements – Methods of testing and required test results

¹ Numbers listed in the titles of the test sections of this report refer to the respective sections of IEC 60945 if not stated otherwise.

Summary

| Test No. | Reference | Section | Result (passed/ not passed / not applicable / not tested) |
|----------|-----------|---------------------------------|--|
| 2 | IEC 60945 | 6 Operational checks | Passed |
| 2.1 | IEC 60945 | 6.1 Ergonomics and HMI | Passed |
| 2.2 | IEC 60945 | 6.2 Hardware | Passed |
| 2.3 | IEC 60945 | 6.3 Software | Passed |
| 2.4 | IEC 60945 | 6.4 Inter-unit connection | Not applicable |
| 3 | IEC 60945 | 11.1 Acoustic noise and signals | Passed |
| 4 | IEC 60945 | 13 Maintenance | Passed |
| 5 | IEC 60945 | 14 Equipment Manuals | Passed |
| 6 | IEC 60945 | 15 Marking and identification | Passed |

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1 General

1.1 Equipment history

For each Transponder unit under test an numbered entry is provided here.

1.1.1 EUT system no 1

| SART unit | | | | |
|---|-------------------|------------|---------------|---------------|
| Type | SEAANGEL SA14 | | Part No.: | |
| Delivery date | 2014-08-21 | | Serial number | 130037 |
| Test version, internal VHF antenne replaced by an antenna connector | | | | |
| HW Version: | Delivery date | 2014-08-21 | Version no | No indication |
| | Installation date | 2014-08-21 | | |
| SW Version: | Delivery date | 2014-08-21 | Version no | Version 1.2.5 |
| | Installation date | 2014-08-21 | | |
| SW Version: | Delivery date | | Version no | |
| | Installation date | | | |

1.2 Test environment

This Test environment is completely equipped as described in the main test report..

| | |
|---------------|--------------------------------------|
| Room | BSH Room 916 (9 th floor) |
| Test engineer | H. Bartels |
| Location | 9° 59,103 E 53° 32,822 N |

Here it is recorded for which time which EUT system is under test.

| Equipment no | Start of test | End of test | Test engineer |
|--------------|---------------|-------------|---------------|
| 1 | 2014-12-03 | 2014-12-03 | Bartels |
| Manual | 2014-12-12 | 2014-12-12 | Bartels |

1.3 Legend

Result marking (in the “result” column)²:

| | |
|------------|---|
| Passed | Item is ok, test was successful |
| Not passed | Test of a required item was not successful, change required |
| N/T | Not tested |
| N/A | Not applicable |

Specific remarks (in the “remark” column, marked “bold italic”):)

| | |
|------|---|
| REC | recommendation (in terms of IEC17025 “opinion”); an improvement or change is Recommended |
| Note | note or comment (in terms of IEC17025 “interpretation”) ; rationale for specific results or interpretation of requirements as appropriate |

This table is a template for more general remarks for some test items and should be copied if required

| Date | Result | Status |
|------|--------|--------|
| | | |
| | | |
| | | |

Issue of this template: 2014-03-07

² Test items maybe colour marked in draft versions of the report as follows:

| | |
|------------|-------------------|
| Passed | no colour marking |
| Not passed | yellow |
| N/T | blue |
| N/A | no colour marking |
| REC | green |

2 6 Operational checks

2.1 6.1 Ergonomics and HMI

2.1.1 6.1.1 General

| No | 60945 | Requirement | Note | Result |
|----|-------|--|-------------------------------------|--------|
| 2 | 6.1.1 | A check shall be made that all modes of operation required by the equipment standard are available, and that they may be controlled over the required range. Use shall be made of every position of every control provided to ensure that it performs the function for which it is identified and that it operates in the expected manner. | Covered by IEC 61097-14 test report | N/A |

2.1.2 6.1.2 Design of control facilities

| No | 60945 | Requirement | Note | Result |
|----|-------------|--|-------------------------------------|--------|
| 3 | 6.1.2 a) | Check that the number of operational controls, their design and manner of function, location, arrangement and size provide for simple, quick and effective operation of the EUT. Check that the controls are logically grouped according to their function. | Covered by IEC 61097-14 test report | N/A |
| 4 | 6.1.2 b) | Check that the shape and size of each control is appropriate to its mode of operation. In the case of trackballs, joysticks and mice check that the controller can produce any combination of x and y axis output values and that the controller does not drive the follower off the edge of the screen. In the case of joysticks, check that there is a "home position" with a capability for a return to that point. | Covered by IEC 61097-14 test report | N/A |

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| No | 60945 | Requirement | Note | Result |
|----|-------------|---|---------------------------------------|--------|
| 5 | 6.1.2 c) | In the case of touch screens check that the dimension of the response area for a push to activate operation is a minimum of 15 mm height and width and the force required for operation is a maximum of 1,5 N where applicable. | No display | N/A |
| 6 | 6.1.2 d) | Check that information presentation is suited to the maximum expected rate of change of information. Analogue presentation is generally more suited to rapid change than digital. | No information presentation available | N/A |
| 7 | 6.1.2 e) | Check that rotating controls and indicators turn clockwise for increased function. | No rotating controls and actovators | N/A |
| 8 | 6.1.2 f) | Check that linear controls and indicators move upwards or to the right for increased value or effect. | No linear controls and indicators | N/A |
| 9 | 6.1.2 g) | Check that where users must rapidly discern directional change, digital displays are provided with indications of directions of change. | Not applicable for a SART | N/A |
| 10 | 6.1.2 h) | Check that equipment elements relating to control, and indicators associated with control, are readily distinguishable from elements provided for other functions, such as equipment set-up. | Not applicable for a SART | N/A |

2.1.3 6.1.3 Operation (See 4.2.1.3)

| No | 60945 | Requirement | Note | Result |
|----|-------------|---|-------------------------|--------|
| 11 | 6.1.3 a) | Check that all operational controls permit normal adjustments to be easily performed, and are arranged in a manner which minimises the chance of inadvertent operation. | No operational controls | N/A |
| 12 | | Check that controls not required for normal operation and which may affect performance are not readily accessible. | No operational controls | N/A |

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| No | 60945 | Requirement | Note | Result |
|----|-------------|---|--|--------|
| 13 | 6.1.3 b) | Check all operational controls and indications for ease of use and correctness, and for general suitability related to their function and environment, for example expected ambient illumination and sound. | No operational controls | N/A |
| 14 | 6.1.3 c) | Check that the operation of a control does not cause obscuration of its related indicator where observation of the indicator is necessary for making the adjustment. | No operational controls and indicators | N/A |
| 15 | 6.1.3 d) | Check that in all operations there is a clearly marked or consistent simple action to recover from a mistaken choice or to leave an unwanted state. Check that it is always possible for a user to start, interrupt, resume and end an operation. | Covered by IEC 61097-14 test report | N/A |

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2.1.4 6.1.4 Identification

| No | 60945 | Requirement | Note | Result |
|----|-------------|---|---|--------|
| 16 | 6.1.4 a) | Check that all operational controls and indicators are easy to identify and read from the position where the equipment is normally operated. | | Passed |
| 17 | 6.1.4 b) | Check that instrument and indicator character type is simple and clear. The character height (mm) shall not be less than 3,5 times the reading distance in metres, and the nominal character width shall be 0,7 times the character height. | There are no instruments and indicators with characters | N/A |
| 18 | | Check that instruments meant to be operated, or fitted in connection with controls are readable from a distance of at least 1 m, and that other instruments are readable from a distance of at least 2 m. | There are no instruments | N/A |
| 19 | 6.1.4 c) | Check that the controls and indicators are identified in English, and that the identifications provided in the equipment standard are used. | | Passed |
| 20 | 6.1.4 d) | Check that indicators are satisfactorily positioned relative to the operator line of sight, and are not obscured when operating associated controls under normal operating conditions. | Not applicable for a SART | N/A |

2.1.5 6.1.5 Screen display

| No | 60945 | Requirement | Note | Result |
|--------------|-------|----------------|---------------------------------------|--------|
| 21 ... 41 | 6.1.5 | Screen display | A SART does not have a screen display | N/A |

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2.1.6 Voice announcement (see 4.2.1.6)

| No | 60945 | Requirement | Note | Result |
|----|-------------|--|--------------------------------|--------|
| 41 | 2.1.6 a) | Check that voice announcements are in plain language, using marine terminology conforming with the SMCPs where appropriate, and in the English language. | There is no voice announcement | N/A |
| 42 | 2.1.6 b) | Check that it is possible to adjust the volume to extinction and that sudden changes in loudness do not occur. | | N/A |
| 43 | 2.1.6 c) | Check that voice announcements stop when their associated indication or alarm is acknowledged. | | N/A |
| 44 | 2.1.6 d) | Check that failure of the voice announcement system by disabling the loudspeaker, does not degrade the operation of the provided indicators and alarms. | | N/A |

2.1.7 6.1.7 Safety of operation (see 4.2.1.7)

| No | 60945 | Requirement | Note | Result |
|----|-------------|---|-------------------------------------|--------|
| 45 | 6.1.7 a) | Check that the system attempts to prevent ascertainable user-action error from occurring. | Covered by IEC 61097-14 test report | N/A |
| 46 | 6.1.7 b) | Check that all actions that may be irreversible, require a confirmation before proceeding. | Covered by IEC 61097-14 test report | N/A |
| 47 | 6.1.7 c) | Check that when an action causes a detectable error the system gives clear feedback such as by including UNDO and/or REDO options where possible. | Not applicable for a SART | N/A |
| 48 | 6.1.7 d) | Check that the EUT makes use of any quality indication contained in the input from other systems or sources. | Not applicable for a SART | N/A |
| 49 | 6.1.7 e) | Check that the user has available means to return to a known safe state with a single action. | Covered by IEC 61097-14 test report | N/A |

2.1.8 6.1.8 Distress alert

| No | 60945 | Requirement | Note | Result |
|------------------|-------------|----------------|--|--------|
| 50 55 | 6.1.8 a) | Distress alert | The SART does not provide a distress alert | N/A |

2.2 6.2 Hardware**2.2.1 6.2.1 General (see 4.2.2.1)**

| No | 60945 | Requirement | Note | Result |
|----|-------------|---|---|--------|
| 56 | 6.2.1 a) | Check that provision has been made for the removal of, or for blocking off, the position of controls of any optional facilities which are not fitted. | There is an optional telescopic pole to extend the height of the unit | Passed |
| 57 | 6.2.1 b) | Check that operational controls, the inadvertent exercise of which could switch off the equipment, lead to performance degradation, or to false indications not obvious to the operator, are specially protected against unintentional operation. | Covered by IEC 61097-14 test report | N/A |
| 58 | 6.2.1 c) | Check that the design of the EUT is such that misuse of the controls required for normal operation, and which are accessible to the operator, shall not cause damage to the equipment or injury to personnel. | | Passed |
| 59 | 6.2.1 d) | Check that where a digital input panel with the digits "0" to "9" is provided, the digits are arranged to conform with ITU-T Recommendation E.161 (4x3 array) or, alternatively, where an alpha-numeric keyboard layout, as used on office machinery and data processing equipment, is provided, the digits "0" to "9" are arranged to conform with ISO 3791. | A SART does not provide a digital input panel | N/A |

2.2.2 6.2.2 Alarms and indications (see 4.2.2.2)

| No | 60945 | Requirement | Note | Result |
|----|-------------|--|---|--------|
| 60 | 6.2.2 a) | Check that the EUT is provided with facilities which permit the testing of all operational indicators (alarm, warning and routine), displays and audible devices. Check audible alarms as described in 11.1. | Covered by IEC 61097-14 test report | N/A |
| 61 | 6.2.2 b) | Check that alarm indications are red, or if on displays, red or otherwise highlighted. | A SART does not provide alarm indications | N/A |
| 62 | 6.2.2 c) | Check that warning and alarm indications show no self-illumination, except to outline the alarm area on CRT or LCD displays, in the "safe" condition, and that any indirect illumination is low enough to avoid false indications. | A SART does not provide warning and alarm indications | N/A |

2.2.3 6.2.3 Illumination (see 4.2.2.3)

| No | 60945 | Requirement | Note | Result |
|-----------------|-------|--------------|--|--------|
| 63 ... 70 | 6.2.3 | Illumination | A SART does not provide or require an illumination | N/A |

2.3 6.3 Software

2.3.1 6.3.1 General

| No | 60945 | Requirement | Note | Result |
|----|-------|---|--|--------|
| 72 | 6.3.1 | <p>Check documentation for compliance with 4.2.3.1.:</p> <p>The code of practice employed in the design and testing of the software integral to the operation of the equipment under test shall be specified and conform to a quality control system audited by a competent authority.</p> <p>The code of practice shall define the methodology used in the development of the software and the standards applied. It shall, amongst others, include the following criteria:</p> <ul style="list-style-type: none">– complex software shall be structured to support separate testing of single modules or of groups of associated modules. Functions of safety protection linked with control functions shall always give priority to safety.– the structure shall support maintenance and up-dates of software by minimizing the risk of undetected problems and failures. <p>The manufacturer shall supply documentation demonstrating that the software of the EUT is Developed and tested according to the code of practice and the requirements of 4.2.3 e.g. by block, data flow or status diagram.</p> | <p>The manufacturer provided a questionnaire form.</p> | Passed |

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2.3.2 6.3.2 Safety of operation (see 4.2.3.2)

| No | 60945 | Requirement | Note | Result |
|----|-------------|---|---|--------|
| 73 | 6.3.2 a) | Check documentation for compliance with 4.2.3.2.: | | |
| | | Facilities shall be provided to protect all operational software incorporated in the equipment.. | | |
| | | Any software required in an equipment to facilitate operation in accordance with its equipment standard, including that for its initial activation/reactivation, shall be permanently installed with the equipment, in such a way that it is not possible for the user to have access to this software. | The equipment has no interfaces and cannot be opened | Passed |
| | | It shall not be possible for the operator to augment, amend or erase, during normal use, any program software in the equipment required for operation in accordance with the equipment standard. | The equipment has no interfaces and cannot be opened | Passed |
| | | Data used during operation and stored in the system shall be protected in such a way, that necessary modifications and amendments by the user cannot endanger its integrity and correctness. | A SART does not provide means to modify any data | N/A |
| | | Default values shall be inserted whenever relevant to facilitate the required operation of the equipment. | Not applicable because there are no means to modify data. | N/A |
| | | Display and update of essential information available in the equipment as well as safety related functions shall not be inhibited due to operation of the equipment in any particular mode, for example dialogue mode. | A SART does not provide a display of data. | N/A |
| | | When presented information is uncertain or derived from conflicting sources, the equipment shall indicate this | A SART does not provide a display of data. | N/A |

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| No | 60945 | Requirement | Note | Result |
|----|-------------|--|--|--------|
| 74 | 6.3.2 b) | Check that software defaults, where applicable, are inserted in all modes of operation and that the default value: <ul style="list-style-type: none">– facilitates the preferred or expected operation of the equipment in accordance with the applicable equipment standards– does not lead to an unexpected or invalid operation, and– has the effect of minimising the number of inputs or transmissions into the system– under which it operates. | A SART does not provide means to modify any data | N/A |
| 75 | 6.3.2 c) | Check that the software prevents an operation or warns an operator when attempting an input that leads to an invalid operation of the equipment. | A SART does not provide means to modify any data | N/A |
| 76 | 6.3.2 d) | Check that the operator has the possibility to choose a value other than the default value. | A SART does not provide means to modify any data | N/A |
| 77 | 6.3.2 e) | Check that operations not required for normal operation, or which may adversely affect system performance, are not readily accessible. | A SART does not provide operations not required for normal operation | N/A |

2.3.3 6.3.3 Monitoring (see 4.2.3.3)

| No | 60945 | Requirement | Note | Result |
|----|-------|---|---------------------------|--------|
| 78 | (1) | Check documentation for compliance with 4.2.3.3. The manufacturer shall provide information on how to produce a non-recoverable error. | Not applicable for a SART | N/A |
| 79 | (2) | Carry out the non-automatically recoverable error according to the above information. Check that the alarm can be recognized as noted in the manufacturers documentation. | Not applicable for a SART | N/A |

2.3.4 6.3.4 Operation (see 4.2.3.4)

| No | 60945 | Requirement | Note | Result |
|----|-------|---|---------------------------|--------|
| 80 | 6.3.4 | Check documentation for compliance with 4.2.3.4. : The system may allow function keys to speed up selection of common sequences. | Not applicable for a SART | N/A |

2.4 6.4 Inter-unit connection (see 4.2.4)

| No | 60945 | Requirement | Note | Result |
|------------------|-------|-----------------------|---|--------|
| 81 85 | 6.4 | Inter unit connection | A SART does not provide interfaces to other equipment | N/A |

3 11.1 Acoustic noise and signals

3.1.1 11.1.3 Required result

| No | 60945 | Requirement | Note | Result |
|--|-------|---|--------------------------------|--------|
| (all equipment intended for installation in wheel-house and bridge wings) see 4.5.2) | | | | |
| | | 4.5.2 (A.694/6.2) <i>Mechanical noise from all units shall be limited so as not to prejudice the hearing of sounds on which the safety of the ship might depend.</i> | | |
| 86 | (1) | The acoustic pressure shall not exceed a level of 60 dB(A) at a distant of 1 m from any part of the EUT. | There is no source of noise | Passed |
| 87 | (2) | With audible alarms switched on, the acoustic noise pressure of an alarm shall be at least 75 dB(A) but not greater than 85 dB(A) at a distant of 1 m from any part of the EUT which is accessible for ist operation. | A SART does not provide alarms | N/A |

4 13.1 Maintenance

| No | 60945 | Requirement | Note | Result |
|----------------------------|-----------|---|--|--------|
| (all equipment categories) | | | | |
| | | The EUT shall be checked for conformity with the requirements of 4.7, paying due regard to any restriction likely to be imposed by the installation spatial environment. | | |
| 88 | 4.7.1 (1) | Maintenance of hardware (A.694/8.1) The equipment shall be so designed that the main units can be replaced readily, for on-board repair, without elaborate recalibration or readjustment. | The equipment cannot be repaired. It has to be replaced by new equipment | Passed |
| 89 | 4.7.1 (2) | (A.694/8.2) Equipment shall be so constructed and installed that it is readily accessible for inspection and maintenance purposes. | The SART is portable | Passed |
| 90 | 4.7.2 (1) | Maintenance of software <ul style="list-style-type: none"> Equipment shall be so designed that maintenance of software can be readily carried out on board. Maintenance shall be supported by labelling in accordance with 4.9 (Marking and identification). No user retraining shall be necessary after maintenance. | The software cannot be updated. For an update the complete unit has to be exchanged | Passed |
| 91 | 4.7.2 (2) | On board documentation shall be updated with the software maintenance to reflect any changes introduced. | A software update is not possible. | Passed |

5 14 Equipment manuals

| No | 60945 | Requirement | Note | Result |
|----------------------------|--------|--|--|--------|
| (all equipment categories) | | | | |
| 92 | | The equipment manuals shall be checked for compliance with 4.8. Examples of typical operational and equipment setting up procedures shall be checked for ease of use and effectiveness, and examples to typical fault-finding routines shall be checked for ease of use and effectiveness under simulated fault conditions. (A.694/8.3) Adequate information shall be provided to enable the equipment to be properly operated and maintained by suitably qualified members of the ship's crew. | | Passed |
| 93 | 4.8 a) | Operating and servicing manuals shall: be written in English | The manual is in German <u>2014-12-12 Ba:</u> A manual in English language is provided | Passed |
| 94 | 4.8 b) | identify the category of the equipment or units to which they refer (4.4); | | Passed |
| 95 | 4.8 c) | - (A.694/8.3.1) in the case of equipment so designed that fault diagnosis and repair down to component level are practicable, provide full circuit diagrams, component layouts and a component parts list; | Not applicable, unit cannot be repaired | Passed |
| 96 | 4.8 d) | - (A.694/8.3.2) in the case of equipment containing complex modules in which fault diagnosis and repair down to component level are not practicable, contain sufficient information to enable a defective complex module to be located, identified and replaced. Other modules and those discrete components which do not form part of modules shall also meet the requirements of 4.8 c) above. | Not applicable, there are no complex modules | Passed |

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| No | 60945 | Requirement | Note | Result |
|----|---------|---|-------------------------------------|--------|
| 97 | 4.8 (2) | Moreover adequate information shall be provided to allow equipment to be installed so that it operates in accordance with the requirements of the relevant equipment standard, taking into account limitations imposed by the operation of other equipment also required to be installed on the bridge. | Covered by IEC 61097-14 test report | N/A |

6 15 Marking and identification

| No | 60945 | Requirement | Note | Result |
|----------------------------|----------|---|---|--------|
| (all equipment categories) | | | | |
| | | The EUT shall be checked for compliance with 4.9. (A.694/9) Each unit of the equipment should be marked externally with the following information which, where practicable, should be clearly visible in the normal installed position: | | |
| 98 | 4.9 1) | – identification of the manufacturer; | | Passed |
| 99 | 4.9. 2) | – equipment type number or model identification under which it was type tested; | | Passed |
| 100 | 4.9 3) | – serial number of the unit. | | Passed |
| 101 | 4.9. (2) | Alternatively, the marking may be presented on a display at equipment start-up. | No display | N/A |
| 102 | 4.9 (3) | The equipment shall be marked either before delivery to the ship, or on the ship at the time of installation. | Before delivery | Passed |
| 103 | 4.9 (4) | – The title and version of each software element included in the installed software system shall be either marked or displayed on command on the equipment. | The software version will be provided on the type label | Passed |
| 104 | 4.9 (5) | When the marking and the title and the version of the software are displayed only on the display, such information shall also be included in the equipment manual. | No display | N/A |