Voyantic

Tagsurance®

Technical Catalogue

UHF and HF Tag Performance Testing
for RAIN RFID and NFC Quality Assurance

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Contents

TAGSURANCE SYSTEM

What is Tagsurance?

Voyantic Tagsurance RFID production testing and measurement system is specifically designed for fast tag testing in a production line - a task where both RFID and NFC readers and laboratory systems often fall short in requirements.

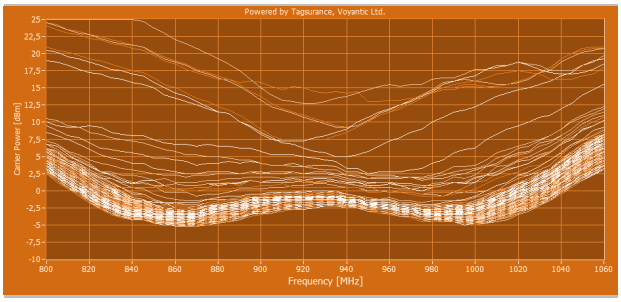
SYSTEM COMPONENTS

- Test device(s) for UHF RFID and NFC testing
- Settings and interface software (GUI)
- Functionality-specific software; and
- Accessories for manual testing or machine integration.

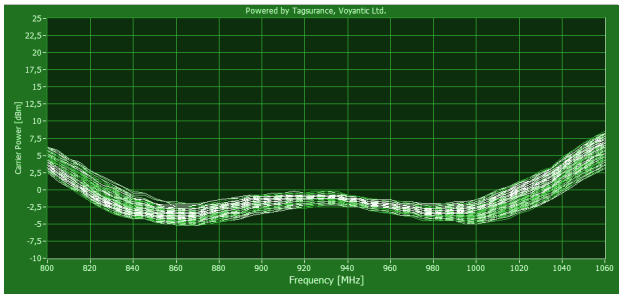
Accessories include test antennas (coupling elements) for UHF RFID and NFC testing. The coupling elements are designed for testing use.

Accessories are supplied as separate components or accessory kits designed for various uses, from manual test stations to different machine integration scenarios.

Tagsurance UHF



Production outcome with high variance



Delivery with low variance

The Tagsurance UHF characterizes UHF RFID Class 1 Gen2 tags in a predetermined time frame. Testing with the Tagsurance is based on communication with the tag on several frequencies on a wide frequency range. This allows verifying the tag's performance, not only checking if it is functional.

The Tagsurance has excellent feasibility for different implementations.

Due to its well-considered signal connections and communication interfaces, it can be easily adapted to various production processes.

The open communication protocols enable full control of all functions and settings of the Tagsurance to be integrated into the customer production control software. Alternatively, the Tagsurance can be solely operated with its own GUI software as an independent test system.

When operated by a machine control unit, neither a dedicated control PC nor the Tagsurance GUI is required. The serial commands for the Tagsurance unit provide a reliable interface to any control software.

In case the level of programming is wanted to be kept lower, host software can remotely control the Tagsurance GUI via TCP/IP connection, allowing the serial communication to be handled, as well as the results to be visually presented by the Tagsurance GUI.

HARDWARE SPECIFICATIONS

Output power:	+25 to -10 dBm +-0.25 dB resolution +-1 dB absolute accuracy	
Frequency:	860 to 960 MHz (standard) 800 to 1100 MHz (optional) 100 kHz resolution	VUT-HW-SR VUT-HW-ER
Interface:	RS-232 serial command interface (38400 bps):test data, commands, settings	
I/O port D15:	5-24V compatible optocoupled inputs and outputs: trigger, busy/ready, pass/fail, power input load and run predefined test sequences	
Protocol:	EPC Class1 Gen2	
Weight:	2.3 kg	
Dimensions:	23 x 17 x 9 cm (9.1 x 6.7 x 3.5 inch)	
Power input:	110-230 V, 50-60 Hz (power supply) 18 VDC (tester unit) - I/O port or DC connector	

AVAILABLE RAIN RFID TAG QUALITY TEST METHODS

Test Method	Purpose	Time needed per tag
Point Test	Pass/fail with definite criterion	5.1 ms per test point
Sensitivity Test	Quality variance	25.4 ms (typical)
Read Test	Collecting tracking information	21.2 ms (typical, TID96)
Write Test	Programming data to memory	40.5 ms (max, EPC96)
Sweep Test	Full Threshold data	3 sec (typical)

Supported Protocols

- ISO18000-62
- ISO18000-63
- GB/T 29768.

Tagsurance HF

Voyantic Tagsurance HF system is designed for fast tag testing in a production line. Unlike in typical passive characterization of an HF antenna, the Tagsurance HF uses protocol defined communication to verify the performance of HF RFID tags. Available protocols are ISO15693, ISO14443A, ISO14443B, FeliCa, and ISO18000-3M3.

The Tagsurance HF can handle testing of the tag on several frequencies using frequencies across the whole bandwidth of the tag. This allows verifying the tag's active performance, not only checking if it is functional.

In many cases, the resonance frequency of an HF tag is tuned a bit higher than 13.56MHz to compensate for material detuning effects. Unlike with an RFID reader, with Tagsurance, high-speed testing can be done with accurate power adjustment right on the resonance frequency.

HARDWARE SPECIFICATIONS

Output power:	+25 to -10 dBm +-0.1 dB resolution +-1 dB output power accuracy	
Frequency:	12 to 16 MHz (standard) 10 to 30 MHz (optional, extension) 0.01 kHz resolution	VHT-HW-SR VHT-HW-ER
Interface:	Ethernet: test data, commands, settings	
I/O port D25:	5-24V compatible optocoupled inputs and outputs: trigger, busy/ready, pass/fail, power input	
Protocol:	ISO15693, ISO14443A, ISO14443B, FeliCa, ISO18000-3M3	
Weight:	2.8 kg	
Dimensions:	23 x 19 x 9 cm (9.1 x 7.5 x 3.5 inch)	
Power input:	110-230 V, 50-60 Hz (power supply) 18 VDC (tester unit) - I/O port or DC connector	

AVAILABLE NFC TAG QUALITY TEST METHODS

Test Method	Purpose	Time needed per tag ms (typical)	Protocol
Point Test - frequency: 13.6MHz - carrier before command: 5 ms	Pass fail with quality limit	21 9 20 22 10	ISO15693 ISO14443A ISO14443B FeliCa ISO18000-3M3
Sensitivity Test - frequency: 13.6MHz - range: 0 to 25dBm - resolution: 0.5dBm - carrier before command: 5 ms	Quality variance	159 77 151 169 84	ISO15693 ISO14443A ISO14443B FeliCa ISO18000-3M3
UID Read Test - frequency: 13.6MHz - carrier before command: 5 ms - word count: 6 - available for: ISO15693, ISO14443A, ISO18000-3M3	Tracking information	28 34 *Not supported* *Not supported* 78	ISO15693 ISO14443A ISO14443B FeliCa ISO18000-3M3
Sweep Test - range: 13-15MHz - carrier before command: 5 ms	Full Threshold data	*Testing will take several seconds and is depending on the chip type*	ISO15693 ISO14443A ISO14443B FeliCa ISO18000-3M3

Supported Protocols

- ISO15963
- ISO14443-A
- ISO14443-B
- ISO18000-3M3
- FeliCa

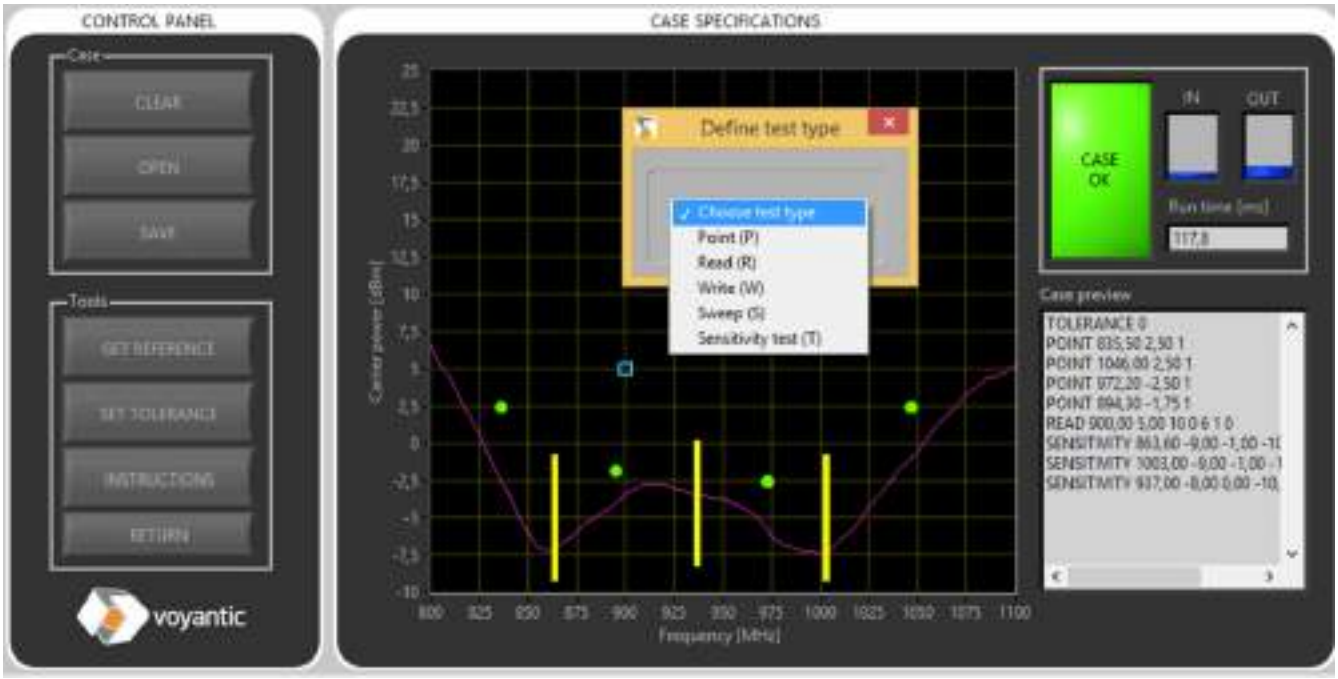
SOFTWARE

Tagsurance UHF GUI

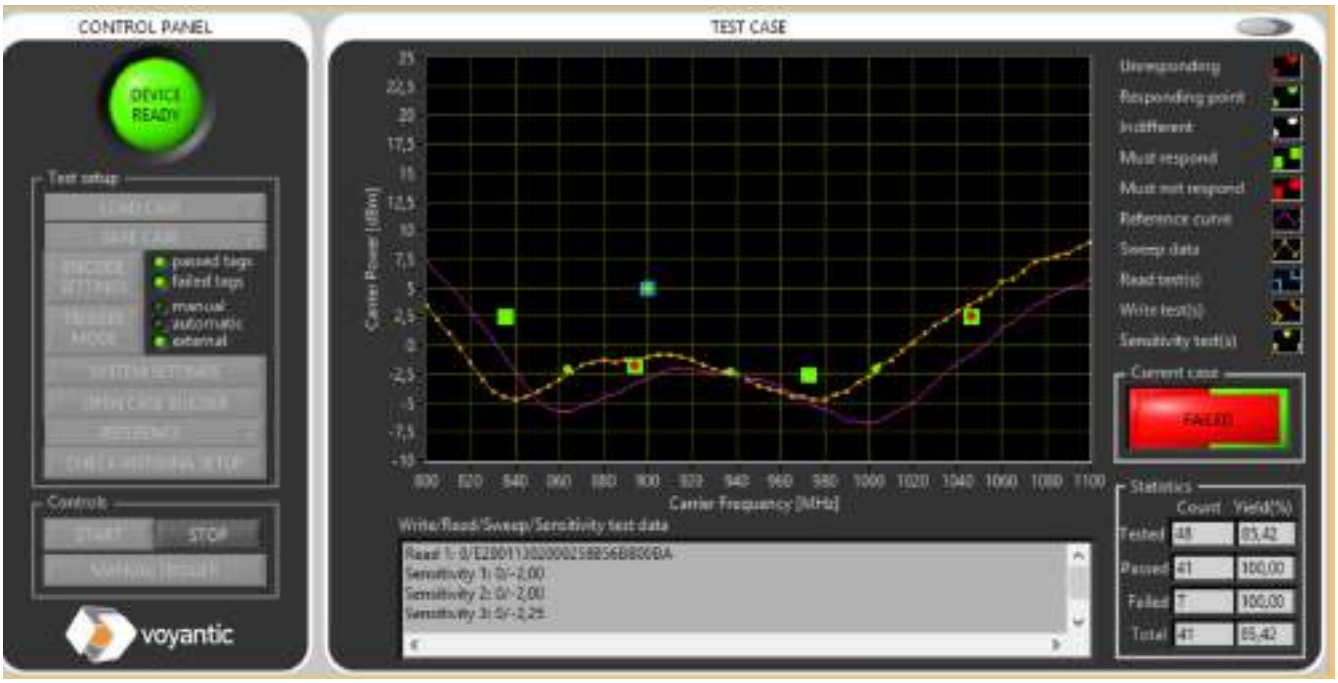
With the Tagsurance Graphical User Interface (GUI), the tester unit can be operated by a Windows PC. The software and drivers are easy to install, and the GUI is straightforward to use.

The Tagsurance GUI software provides interfacing for control software via TCP/IP remote access, or it can send just the test results to a third-party software through UDP broadcast. The UDP allows the following process to use the information for further purposes, like encoding the tag.

The Tagsurance GUI includes a possibility to create test sequences on a visual interface. In the Test Case Builder, all the different test modes can be used to compile and adjust the optimal test. The Test Case Builder tool calculates automatically the estimated overall time consumed for executing the particular test sequence.



In the Test Case Builder view the user can determine the test sequence



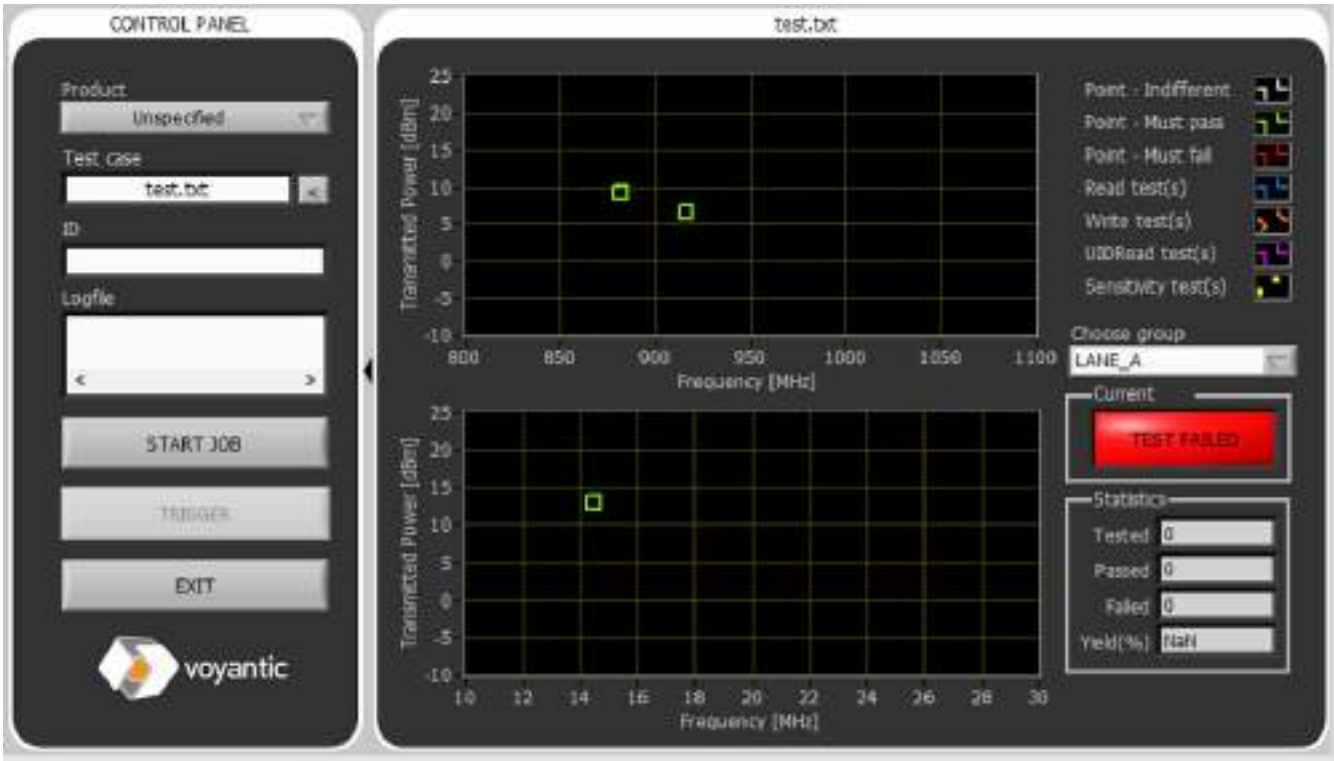
Graphical User Interface view during testing and encoding

When the test is running, results can be monitored on the GUI. The square indicators on the graph are the defined tests. The green and red dots represent the test results. The statistics field gives the amount of tested, passed, and failed tags and the total amount of tags successfully tested and encoded.

In case the Threshold Sweep Mode is used, the response curve is drawn in the graph for each tested tag. The read and written data are shown in the text field below the graph, together with the measured threshold power value on each sensitivity test frequency. All the results are logged in a file as below.

Test results log file gathered by the Tagsurance GUI

Tagsurance 2 GUI



Tagsurance 2 Graphical User Interface (GUI) is used for operating Tagsurance UHF and Tagsurance HF units. It can be used in a single line or multilane system, with one or more test devices, and with RAIN RFID or HF RFID.

Tagsurance 2 GUI is delivered either with

- UHF license: VUT-SW-GUI2;
- HF license: VHT-SW-GUI2;
- Both UHF and HF licenses.

The software includes settings managers for

- Devices: for managing connections and settings of the connected tester devices
- Test cases: Case Builder for creating test recipes
- Interfaces: for configuring operator interface components.

The software also includes an operator interface for testing use, and a remote access interface. Data collection is built into the Tagsurance 2 GUI.

Tagsurance 2 GUI supports the following functionalities with Tagsurance UHF:

- RAIN RFID
  - Point Test Mode (VUT-FN-PT)
  - Read/Write Test Mode (VUT-FN-RW)
  - Threshold Sweep (VUT-FN-SWP)
  - Sensitivity Measurement (VUT-FN-SM)
- Protocol support can be extended
  - ISO 18000-6B extension: point, sweep, sensitivity, and read test (UID read-only) modes (VUT-FN-6B)
  - GB/T29768 Protocol extension: point, sweep, and sensitivity modes (VUT-FN-GB)

Tagsurance 2 GUI supports the following protocols with Tagsurance HF: ISO15693, ISO14443A, ISO14443B, ISO18000-3M3, and Sony FeliCa.

Following functionalities are supported with Tagsurance HF:

- Point Test Mode (VHT-FN-PT)
- UID Read Mode (ISO15693, ISO14443A, ISO18000-3M3) (VHT-FN-RE)
- Threshold Sweep (VHT-FN-SWP)
- Sensitivity Measurement (VHT-FN-SM).

Launcher

Tagsurance 2 launcher is used for opening other user interface applications.

Interface Manager

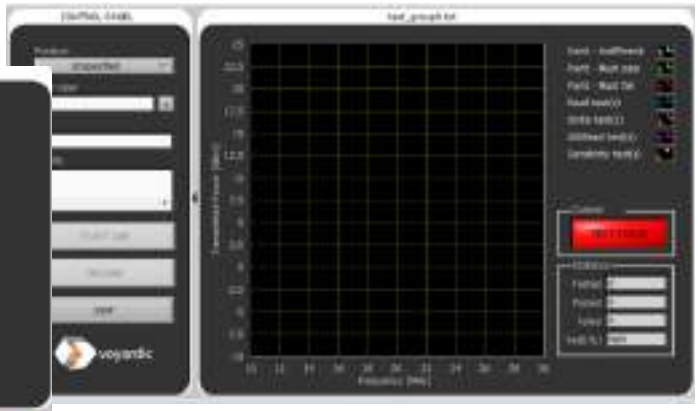
Interface Manager is a tool for defining how the operator interface is shown to the user, for example, which plugins are enabled and where GUI windows open on the screen.

Operator Interface

Operator Interface is used during the testing. It provides tools for selecting the test recipe, monitoring the test, and for logging test data. Operator Interface views can be extended with plugins.

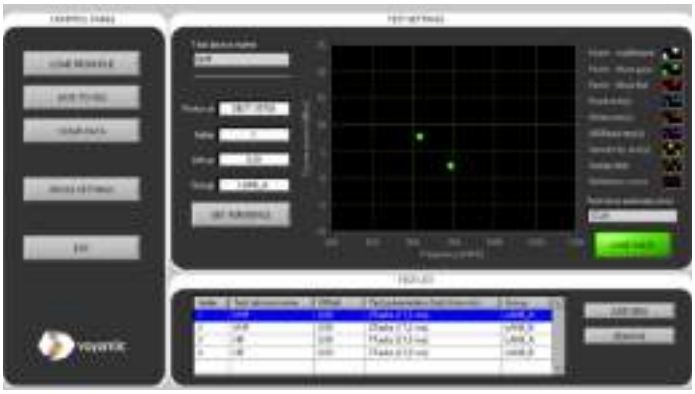
Device Manager

Device Manager is used for managing test device settings and connections.



Case Builder

Case Builder is used for creating test recipes that can include test functionalities depending on the acquired options. A recipe can utilize multiple test devices, and include tests on UHF and HF frequencies.



Plugins

Plugins can be used to view test data in different formats. A multilane result viewer is included as an example plugin. The multilane plugin shows yield and statistics for each lane. Tagsurance 2 can be extended with custom-built plugins, which for example, visualize reports and result data in a format matching the manufacturing requirements.

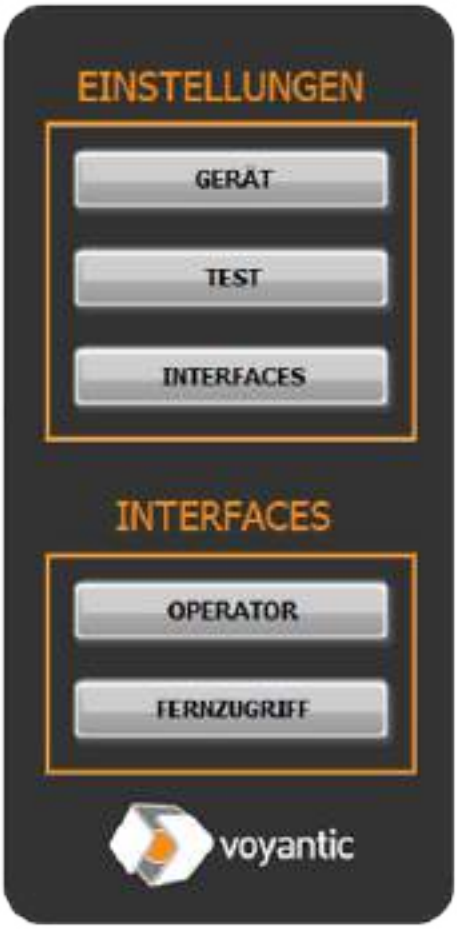
Tagsurance 2 GUI Language Support

Translated interface available in English, Chinese, Spanish, Finnish and German!

已有中文版本!
Jetzt auch auf Deutsch!
Ahora disponible en espanol!
Nyt saatavilla suomeksi!

The new Tagsurance 2 GUI provides a localized user interface with translated control panels. Localized user interfaces enable operators to work in their native language, increasing efficiency and reducing uncertainty.

Translated user interfaces are available in English, Chinese (Simplified Chinese), Spanish, Finnish, and German. Other translations can be done upon request.



Frequency Range

- Standard frequency range 860 MHz - 960 MHz
- Extended frequency range 800 MHz - 1100 MHz (optional) VUT-HW-ER

Test Modes

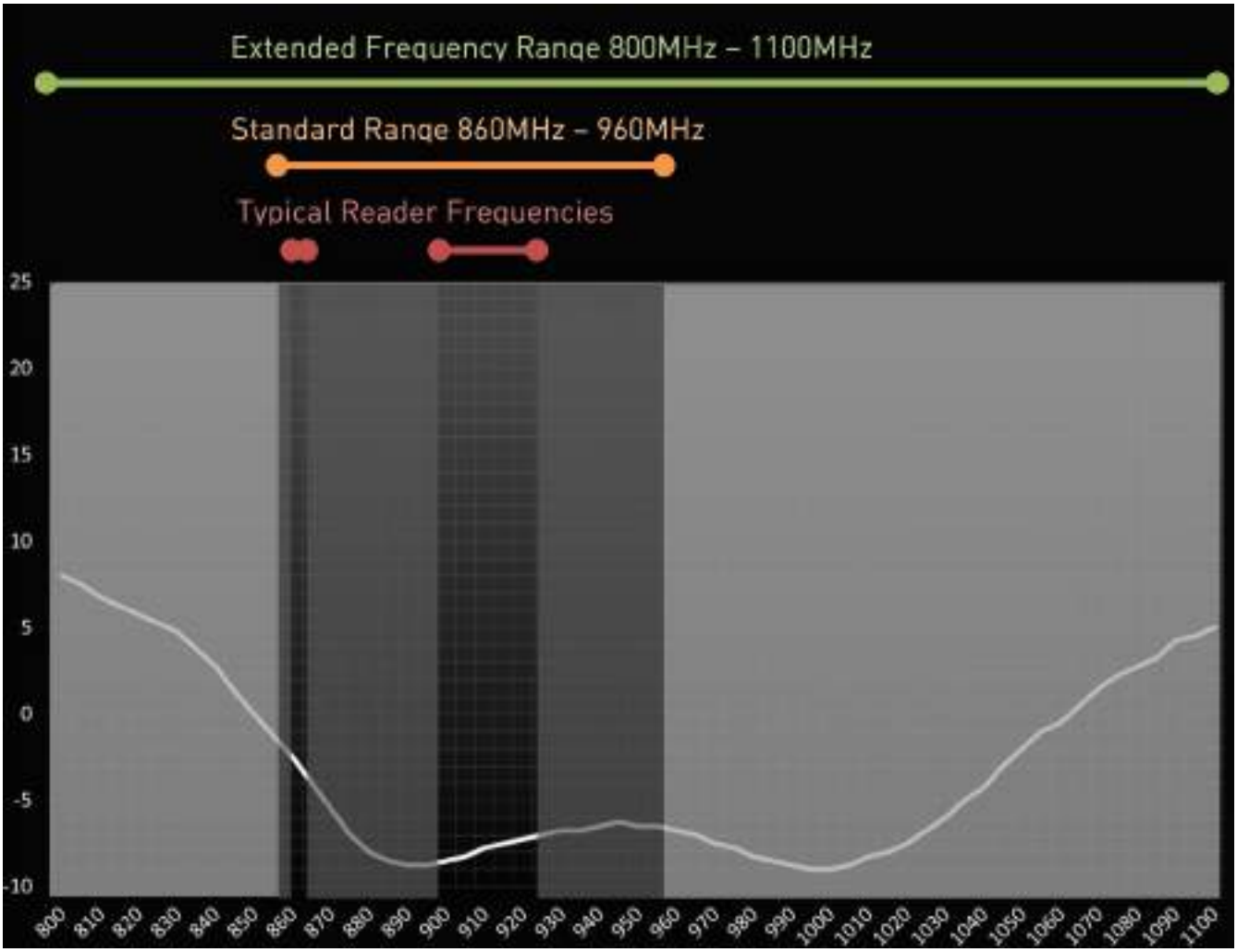
- Point Test Mode VUT-FN-PT
- Sensitivity Measurement Mode (optional) VUT-FN-SM
- Threshold Sweep Mode (optional) VUT-FN-SWP
- Read/Write Test Mode (optional) VUT-FN-RW
- Encoding Mode (optional, not supported in Tagsurance 2 GUI) VUT-FN-EN

The Tagsurance test modes can be combined to create a test sequence that meets the test requirements. Creating a test sequence is the optimization between the amount of data provided and the time available for testing.

UHF FUNCTIONALITIES

Extended Frequency Range

VUT-HW-ER



Comparison of typical reader and Tagsurance frequency ranges

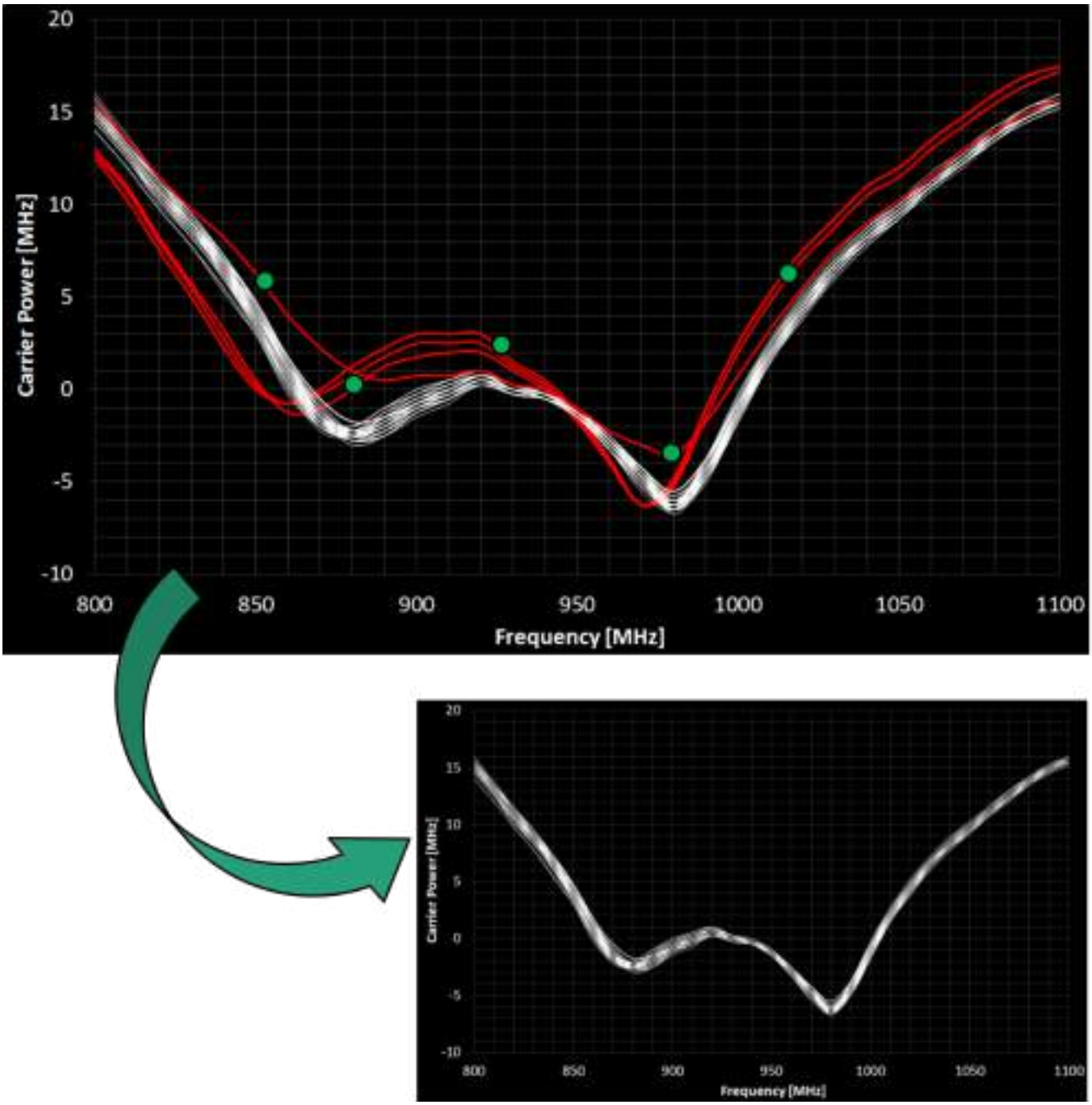
The standard operating range is 860 MHz – 960 MHz. In some cases, when testing an end product, the standard frequency range is sufficient for testing the response of a tag.

The extended frequency range is a valuable tool in cases where further processing or the use environment is expected to tune the response. With the extended frequency range of 800 MHz – 1100 MHz, the Tagsurance provides visibility over the entire operating bandwidth of a typical inlay or a tag, allowing the detection of the variance far beyond the typical read frequencies.

Generally, UHF tags need an operating range from 860 MHz to 1000-1100 MHz (when tested on air), even though the readers most typically operate at ~866 MHz & 902-928 MHz ranges. When a tag is placed on a material, the tag sensitivity response is detuned to lower frequencies.

For electrically light materials, like cardboard, detuning is small ~20 MHz. Heavier materials, like plastics, can shift the tag response over 100 MHz, and even more challenging materials, like glass in windshields, can induce a 200 MHz shift.

Point Test Mode



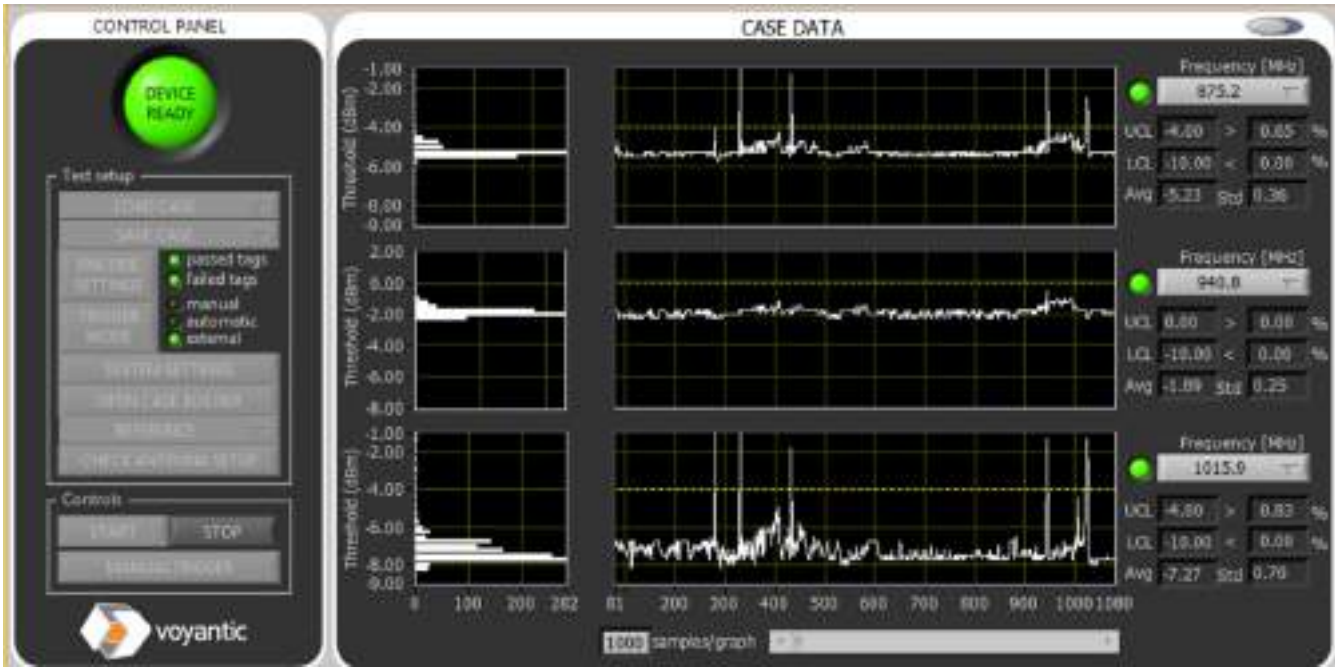
Screening out the detuned tags with five test points in only 25 ms

The Point Test function is close to traditional Go-NoGo testing. However, unlike a reader-based test, which is typically done on a single reader limited frequency, the Tagsurance can to perform multiple tests on user-defined frequency/power combinations to test the tag sensitivity on a wide frequency range efficiently.

The user can define the number of test points to achieve sufficient accuracy for screening out detuned and low sensitivity tags. The test can be run with high throughput as only 5ms of time is required per each test point. The green points in the graphs are "Must Respond" points, where the tag is expected to respond.

Sensitivity Measurement Mode

VUT-FN-SM

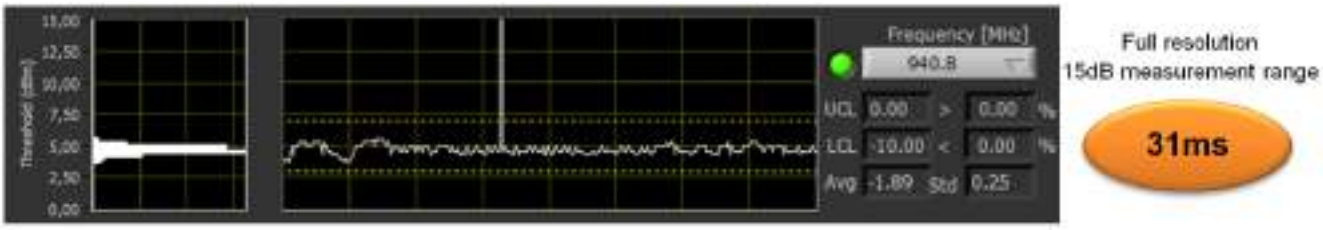


Example of a test sequence where three defined frequencies are monitored

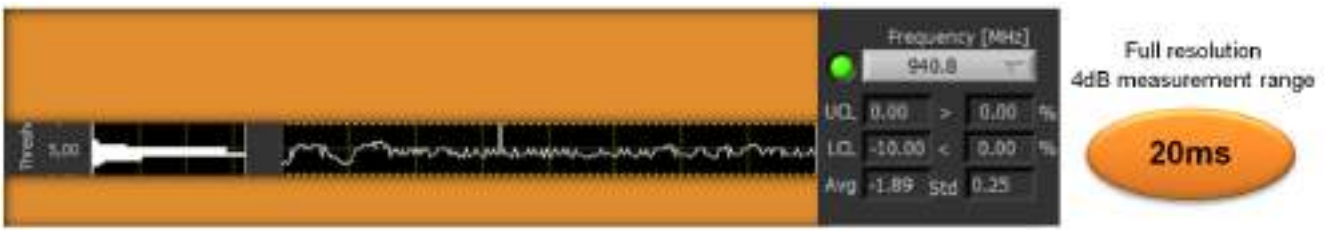
In addition to screening out failed units, the Tagsurance is can measure the lowest response power. The threshold power can be measured on multiple defined frequencies.

One measurement on a defined frequency with a maximum power range takes 41ms. The test duration can be further reduced by adjusting the resolution or the power range used in the measurement.

Often the interest is on the variance inside control limits, and the exact measured sensitivity of failed units is not significant. In this case, narrowing down the power range helps to minimize the test duration. This is illustrated in the figures below.



Real-time process monitoring by measuring the threshold power



Measuring the threshold power between control limits

Treshold Sweep Mode

VUT-FN-SWP

Tagsurance Sweep Data Analyzer

The Threshold Sweep function enables the user to obtain the complete response curve for each tag tested. The frequency range and step for the test are adjustable. With a separate analysis software, the results can be studied after the testing.

The Tagsurance Sweep Data Analyzer allows screening the results with different conditions, finding out more about the variance, and searching tags representing certain levels of variance, like the median tag.

Read/Write Test Mode

VUT-FN-RW

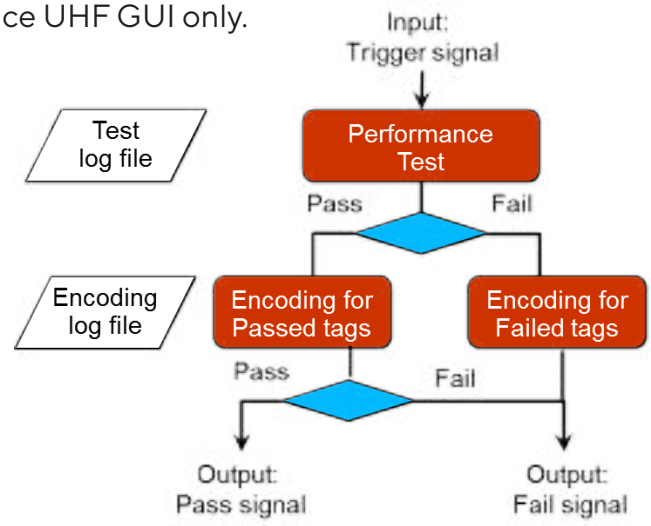
The Read and Write Test can be performed at a chosen memory location with defined word length.

The Read function is a valuable tool for traceability with the collected data. The Write function is a block write command where the user can define the written data as well as an increment to identify each tag.

The data written to the tag or read from the tag is saved to a data log file and is also shown at the Graphical User Interface for each tag after a test sequence execution.

Encoding Mode

Available for Tagsurance UHF GUI only.



Tagsurance testing and encoding process flow

The Tagsurance can encode and lock the tags after testing. Different encoding procedures can be defined based on the outcome of the performance test. Failed tags can even be killed.

The encoding is done using block write command. In addition to that, the chosen memory locations can be locked either permanently or protected with a password. If the tag is already locked, it can be accessed and re-encoded. The encoded data is imported from a text file enabling unique data for each tag.

The encoding mode includes the functionalities of the Read/Write Mode.

Tagsurance encoding settings

Frequency Range

- Standard frequency range 12 MHz - 16 MHz
- Extended frequency range 10 MHz - 30 MHz (optional) VHT-HW-ER

Test Modes

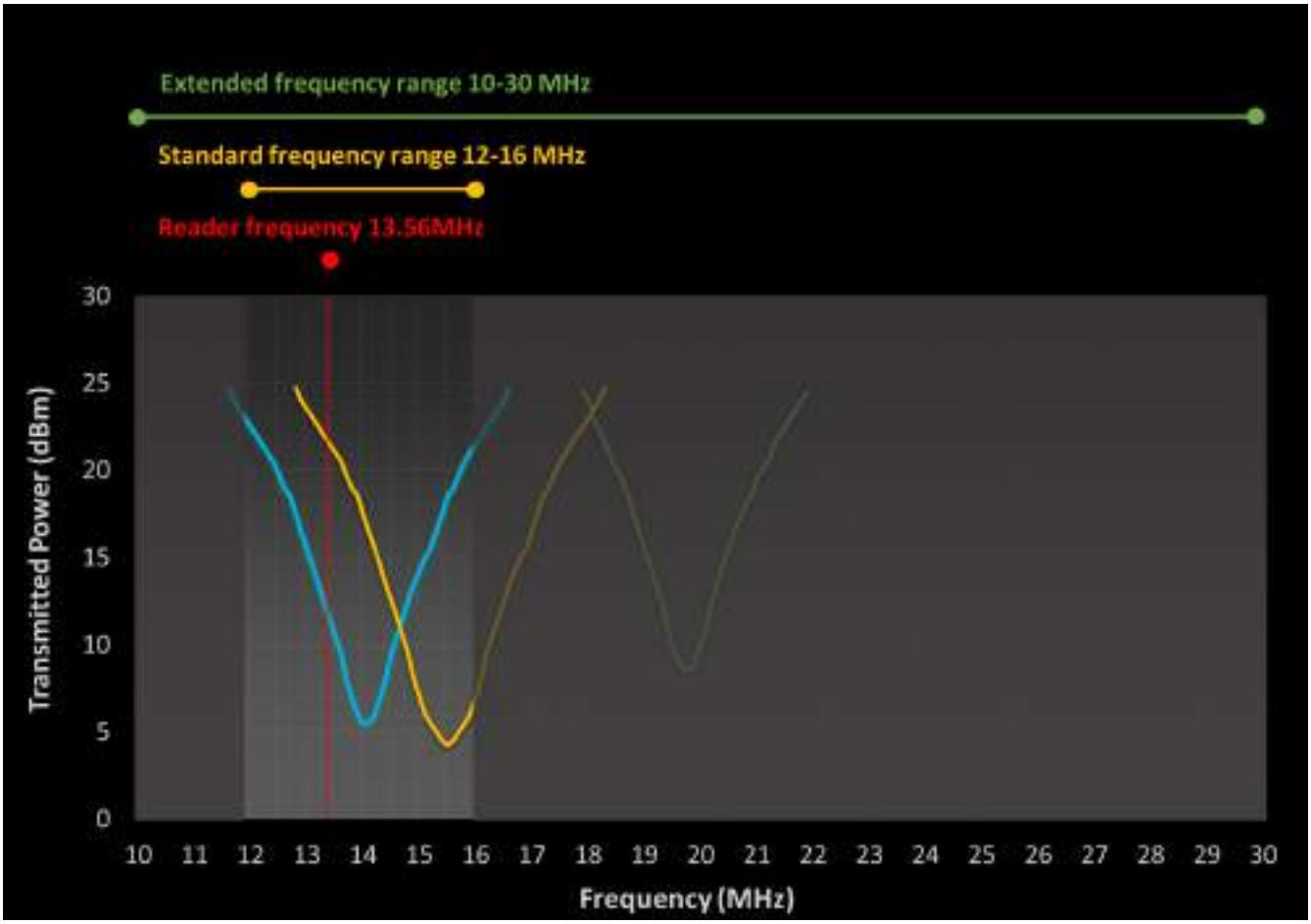
- HF Point Test Mode VHT-FN-PT
- HF Sensitivity Measurement Mode (optional) VHT-FN-SM
- HF Threshold Sweep Mode (optional) VHT-FN-SWP
- HF UID Read Mode (optional) VHT-FN-RE

The Tagsurance test modes can be combined to create a test sequence that meets the test requirements. Creating a test sequence is optimization between the amount of data provided and the time available for testing.

HF FUNCTIONALITIES

Extended Frequency Range

VUT-HW-ER



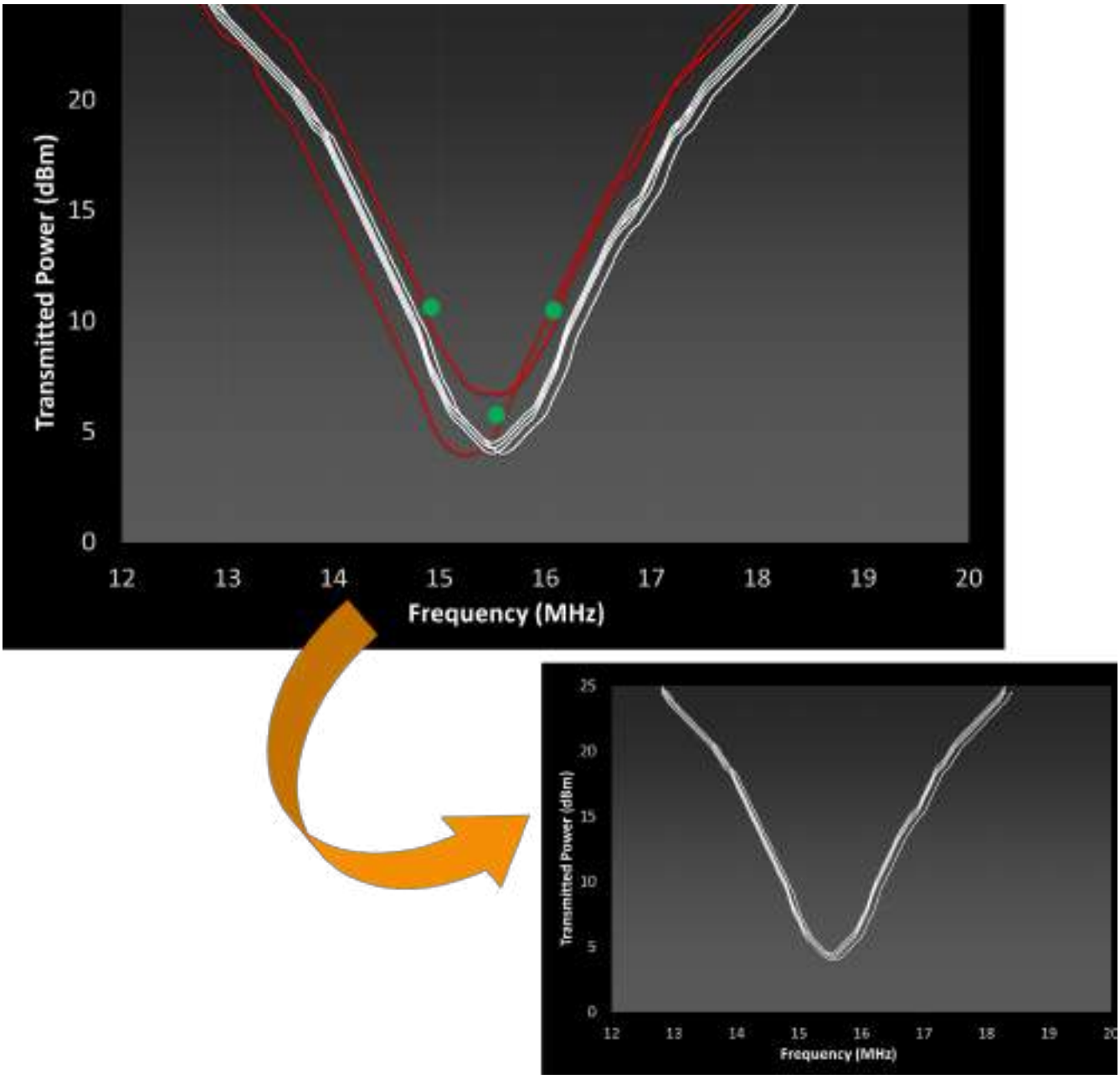
Example of a test sequence where three defined frequencies are monitored

The standard frequency range of 12 MHz – 16 MHz is often sufficient when testing a tag applied on the item intended, or a packaged tag. The extended frequency range is a valuable tool in cases where further processing or the use environment is expected to tune the response. With the extended frequency range of 10 MHz – 30 MHz, the Tagsurance HF provides visibility over the entire operating bandwidth of an inlay or a tag. This allows detecting the variance also far beyond the typical read frequencies.

The operating frequency range of an HF tag is highly dependent on the use case. The reader uses 13.56MHz frequency, and this is targeted to be the center frequency of the tag; the frequency, where the tag is most sensitive and least power is required from the reader to wake up the tag in the end application.

When an HF tag is placed on the material, or near to other tags, the tag frequency response changes. For example, in document tagging, the individual HF tag's resonance frequency is tuned up to 15 MHz higher than the reader frequency to compensate the effect of other tags in the stack and to provide the best application performance.

Point Test Mode



Screening out the detuned tags with three test points in only 24 ms (ISO14443A)

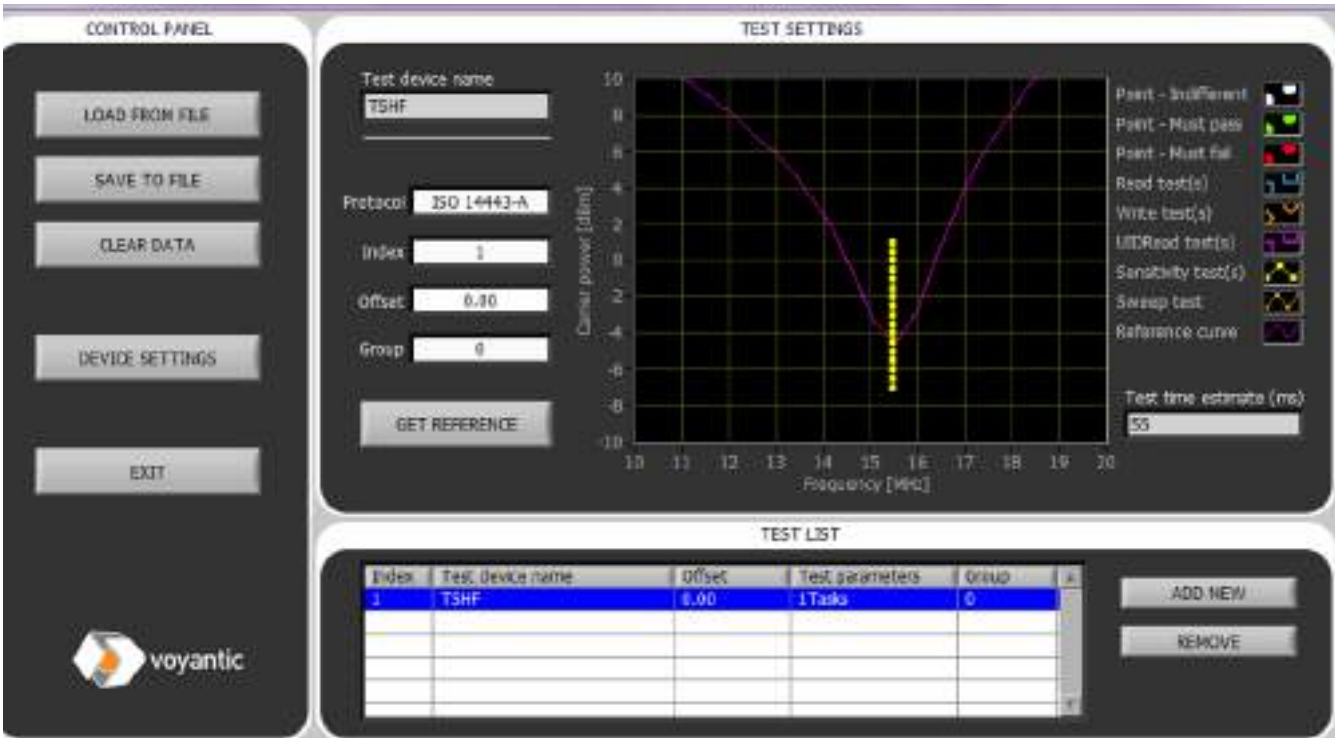
The Point Test function is close to traditional Go-NoGo testing. However, unlike a reader-based test, which is done on 13.56MHz frequency, the Tagsurance HF can perform the test on any given frequency, usually the exact resonance frequency of the tag. Using multiple frequency/power combinations enables efficiently testing the active bandwidth by verifying the tag sensitivity on a wide frequency range.

The user can define the number of test points to achieve sufficient accuracy for screening out detuned and low sensitivity tags. The green points in the graphs represent "Must Respond" points, frequency/power combinations, where the tag is expected to respond to be approved.

The Point Test Mode also includes the UID read test for ISO15693 and ISO14443A tags.

Sensitivity Measurement Mode

VUT-FN-SM

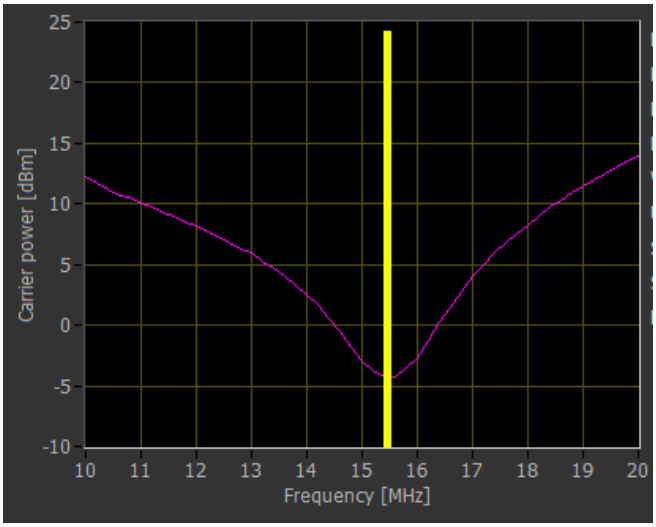


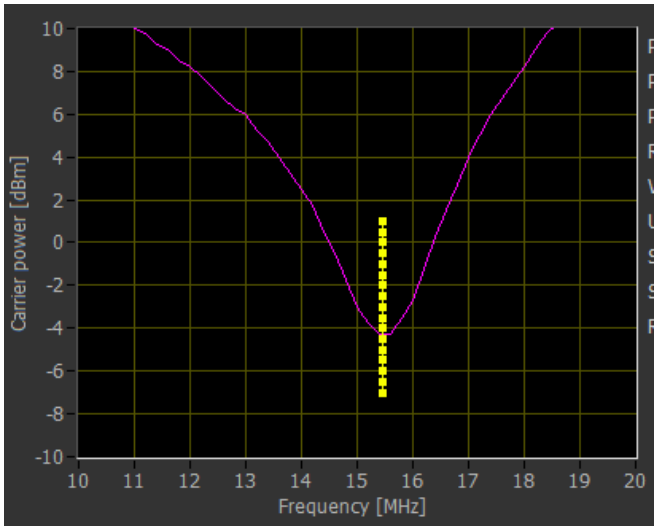
Defining a sensitivity test on single frequency in Test Manager interface

With the Sensitivity Measurement Mode, the Tagsurance HF can measure the lowest response power on a defined frequency. You can set the sensitivity to be measured on multiple defined frequencies.

The test duration is dependent on the protocol used and can be reduced by adjusting the resolution or the power range used in the measurement.

Often the interest is on the variance inside control limits, and the exact measured sensitivity of failed units is not of interest. In this case, narrowing down the power range helps to minimize the test duration. This is illustrated in the figure below for an example tag with ISO14443A protocol.

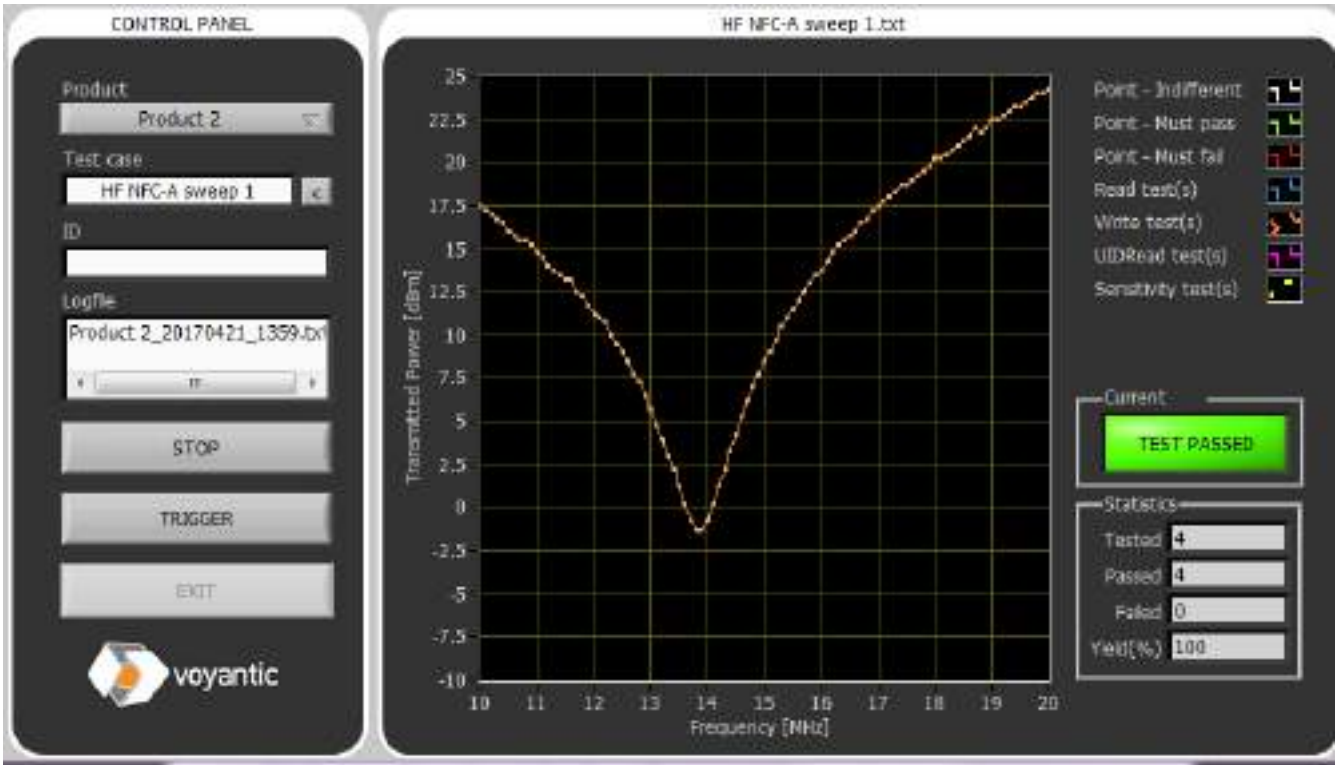




Sensitivity test takes 108 ms with full 35 dBm power range and 0.1 dBm resolution, but only 55 ms with 8 dBm power range and 0.5 dBm resolution (ISO14443A)

Treshold Sweep Mode

VUT-FN-SWP

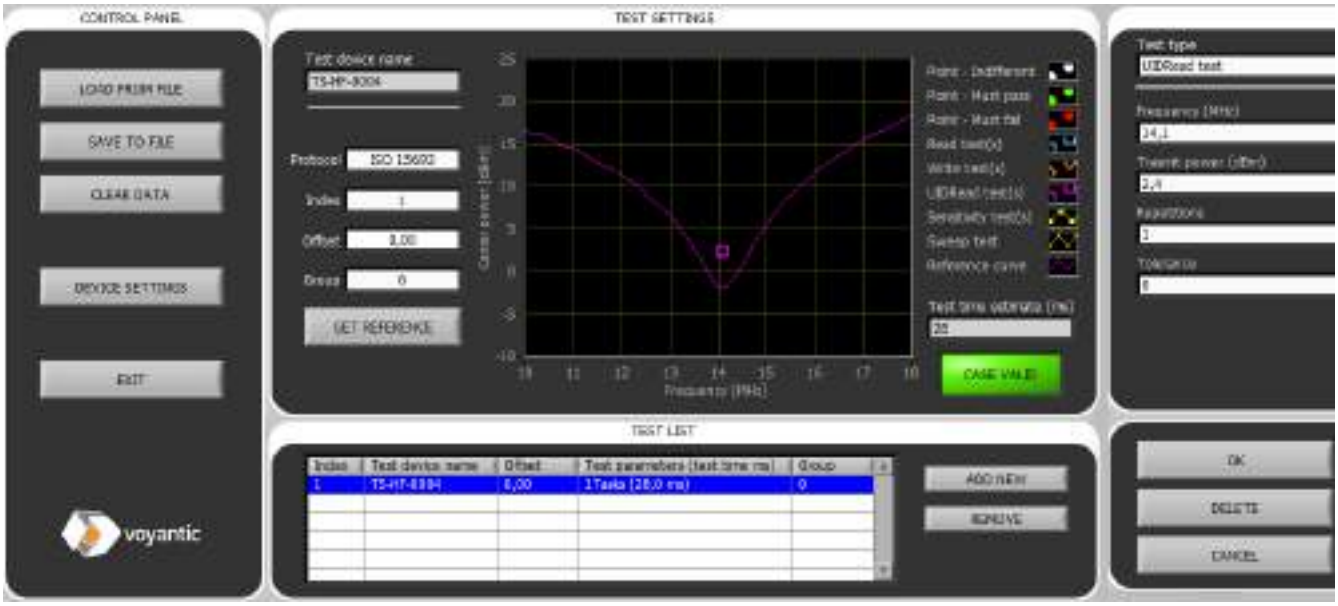


The Threshold Sweep function enables the user to obtain the complete response curve for each tag tested. The frequency range and step for the test are adjustable. The time consumption for this test method is several seconds and dependent on the protocol used.

Threshold Sweep Mode is intended to be used for sample-based, more comprehensive analysis. Based on the information achieved with this test mode, the high-speed production test that uses Point Test Mode or Sensitivity Test Mode is easier to be defined.

UID Read Mode

VUT-FN-RE



The UID Read Mode reads the UID code from memory at a set frequency and power combination. This tool is valuable for data logging purposes, as it connects the tag's unique ID with the other test data from the NFC tag.

UID Read Mode can be used with the following NFC protocols:

- ISO15693
- ISO14443A
- ISO18000-3M3

Result data is shown in the Tagsurance graphical user interface.

Accessory Kits

• Tagsurance Delivery Kit	VUT-HW-DK
• Tagsurance Starter Kit	VUT-HW-SK
• Tagsurance Manual Test Station Kit	VUT-HW-MK
Transferable Test Setup UHF	VUT-HW-TS VUT-HW-TSP
Multilane Test Setup UHF	
Snoop Pro Coupling Elements	
Tagsurance Multi-User Manual Test System	

UHF ACCESSORIES

Accessory Kits

Tagsurance Delivery Kit

VUT-HW-DK

- Rugged carrying case
- 18V AC power supply and cord
- RS-232 cable
- I/O screw terminal adapter
- Mounting brackets
- USB to RS-232 adapter

Tagsurance Starter Kit

VUT-HW-SK

- Rugged carrying case
- 18V AC power supply and cord
- RS-232 cable
- I/O screw terminal adapter
- Mounting brackets
- Antenna cable
- Snoop Pro coupling element with 5 plates and a reference tag for setup verification
- USB to RS-232 adapter

Tagsurance Manual Test Station Kit

VUT-HW-MK

- Rugged carrying case
- 18V AC power supply and cord
- RS-232 cable
- I/O screw terminal adapter
- Mounting brackets
- Snoop Pro coupling element
- Manual tag alignment platform
- Foot pedal for measurement triggering
- USB to RS-232 adapter

Transferable Test Setup UHF

VUT-HW-TS, VUT-HW-TSP

The Transferable Test Setup UHF is compiled to enable Tagsurance device installation to a single line machine with minimal effort on the machine integration. The mounting assembly can be attached to a machine as a single unit. When necessary, moving the assembly to a new location is easy.

The trigger sensor can be used for triggering the testing and/or encoding depending on the inlay, label, and tag type being tested. The printer can be used for bad tag marking.
There are several vertical and horizontal position adjustment possibilities for the antenna, trigger sensor, and printer.

MAIN COMPONENTS

- Mounting frame
- Throughbeam sensor with cable and connector
- Snoop Pro UHF antenna element
- Antenna cable, 6 ft
- Contrast trigger sensor with cable and connector
- I/O controller (not shown in photo) to control:
  - which sensor to use
  - bad tag marking offset (min 1 tag)
  - timeout after which the result buffer is cleared after last trig received

OPTIONAL COMPONENTS

- HSA Jet printer for bad tag marking (ink and cartridge are not included)

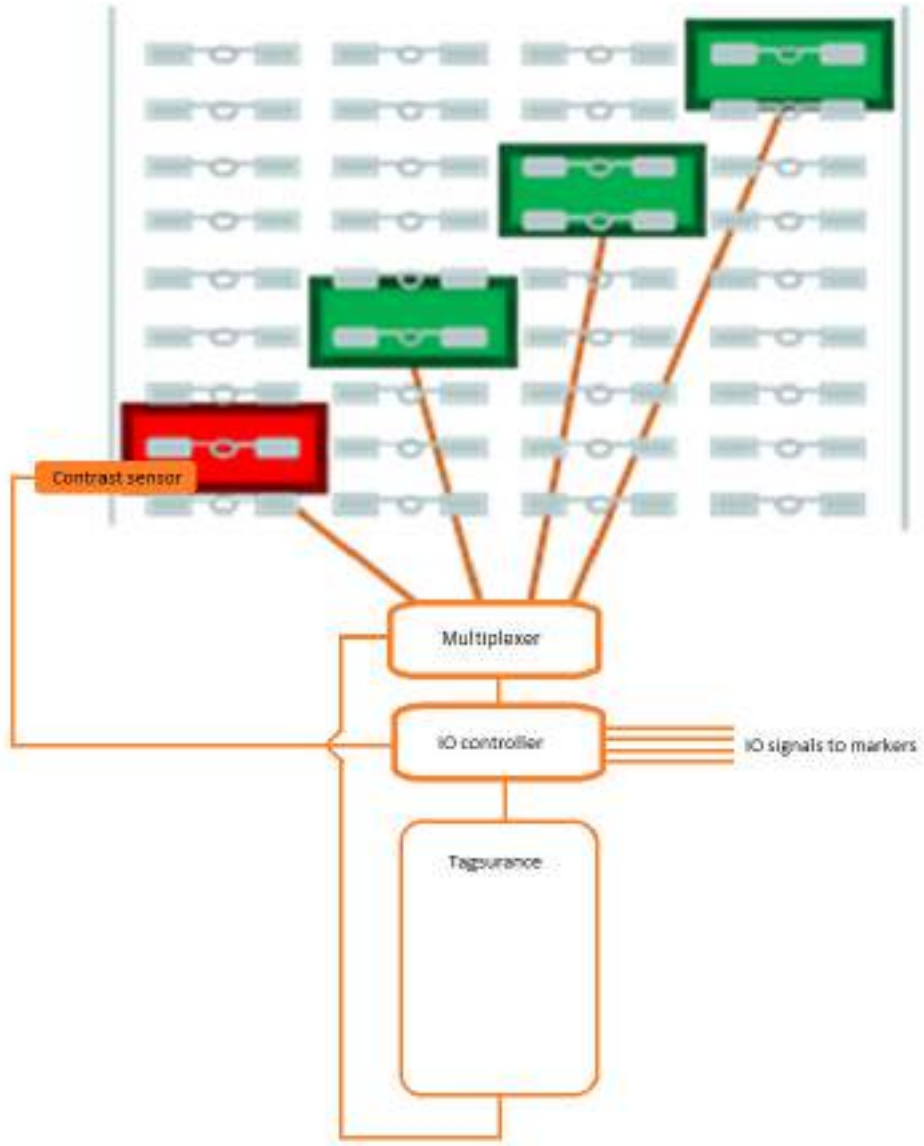
In addition to the transferable assembly, the entire system requires
- Tagsurance UHF device with software
- Tagsurance Delivery Kit

Transferable Test Setup UHF with Contrast Sensor and Printer VUT-HW-TSP

Transferable Test Setup UHF with Contrast Sensor VUT-HW-TS

Multilane Test Setup UHF

The Multilane Test Setup is used for testing tags on multiple lanes using one Tagsurance UHF device. In a typical production setting, the tester is idle a large portion of time, for example, on times when the tag is not correctly positioned on top of the antenna. Multilane system utilizes these idle times for testing on another lane, with another antenna.



Multilane system for up to 6 lane testing is built from following components:

- Tagsurance UHF device and software
- Multiplexer handling up to 6 lanes (VUT-AC-MUX)
- Contrast sensor for triggering (VUT-AC-KT4)
- RF cable from Tagsurance to I/O controller (TF-AC-CB6)
- Snoop Pro antenna (TF-SP-D10) and 6 ft antenna cable (TF-AC-CB6) (one of each per lane)
- HSA Jet printer for bad tag marking (ink and cartridge are not included), one per lane
- Throughbeam sensor with cable and connector
- I/O controller (not shown in photo) to control:
  - which sensor to use
  - bad tag marking offset (min 1 tag)
  - timeout after which the result buffer is cleared after last trig received

Snoop Pro Coupling Element

Voyantic has developed a dedicated coupling element for testing of inlays and tags with dipole type antenna. The Snoop Pro has a unique structure that enables accurate measurement based on the electrical field.

Unlike with many other near-field antennas, the response throughout the wide frequency range of 800 MHz – 1100 MHz corresponds to the far-field response. Analyzing the correspondence between far-field and near-field results is straightforward, which enables reliable testing in the near-field.

The Snoop Pro has a changeable shielding plate that shields out the adjacent tags and enables testing only the one of interest. The opening size in the plate is chosen according to the tag, label, or inlay size to enable optimal test setup for each product and process step.

The standard delivery of Snoop Pro includes 5 changeable shielding plates. There are four plates with different standard opening sizes (30 x 115 mm, 35 x 90 mm, 45 x 115 mm, 50 x 70 mm) and one plate without an opening. Unopened plates are available for customized tooling. Also, custom tooled plates are available. There are different Snoop Pro coupling element versions available for different tag designs.

Snoop Pro Coupling Element

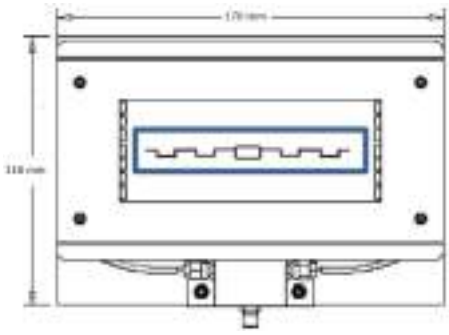
Snoop Pro coupling elements are used as antennas with quality testing and encoding.

AN-SP-D10

SNOOP PRO UHF

The standard Snoop Pro model is suitable for most dipole antenna tag designs. Tagsurance Starter Kit and Manual Test Station Kit are delivered with this Snoop Pro version unless otherwise requested.

Maximum tag antenna dimension:
50 mm x 100 mm

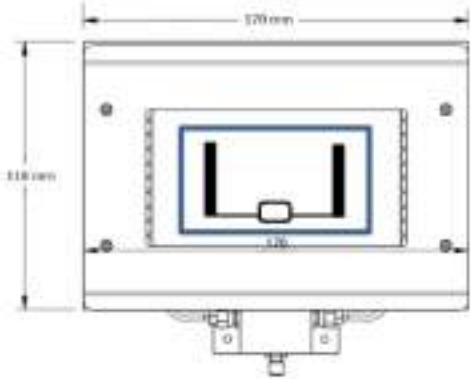


AN-SP-D1W

SNOOP PRO UHF rev. W

The W revision of the Snoop Pro antenna is used for wide dipole tag designs.

Maximum tag antenna dimension:
73 mm x 100 mm

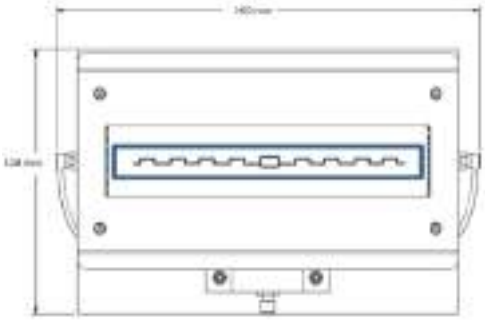


AN-SP-D1C

SNOOP PRO UHF rev. C

The C revision of the Snoop Pro antenna is used for long dipole tag designs.

Maximum tag antenna dimension:
26 mm x 130 mm

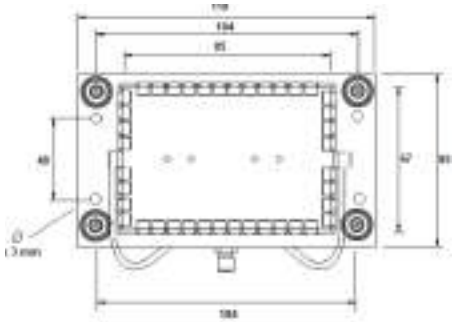


AN-SP-MIN

SNOOP PRO MINI

The Snoop Pro Mini coupling element is used when there is limited space available and tag size allows to use smaller coupling element.

Maximum tag antenna dimension:
50 mm x 65 mm

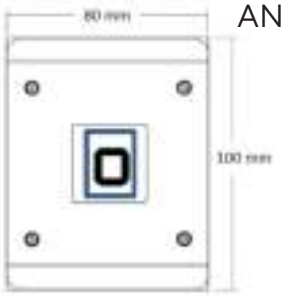


AN-LS-L10

UHF LOOP SNOOP

The Loop Snoop coupling element is used with loop type UHF RFID tags.

Maximum tag antenna dimension:
32 mm x 32 mm



Tagsurance Multi-User Manual Test System

One Tagsurance can power multiple manual test stations.
The Tagsurance multi-user manual test system consists of:

- Tagsurance tester and SW
- Lane Extender (VXT-HW-MLK)
- The required amount of Manual Operator Stations (VUT-HW-MMK)

Each operator station uses the same test recipe, but multiple operators can utilize the same Tagsurance tester. The system queues trigger signals from Operator Stations and forwards them to Tagsurance when the Tagsurance is ready to start a new test.

When the test finishes, the test data is logged to file. Summary statistics are shown in the centralized system GUI. Each operator sees feedback in Traffic Light Unit, which displays green for the passed test, red for the failed test, and yellow when the test is in the queue.

Efficient test system for hard tag and special tag testing
One system can be used by multiple users reducing the investment cost per test station.
System is extendable by adding Operator Stations (up to 6 pcs)
Flexible arrangement of the test stations in different work environments

TAGSURANCE LANE EXTENSION KIT

VUT-HW-MMK

Tagsurance Lane extender connects Operator Stations to the Tagsurance unit. The Lane Extender forwards IO signals and RF signals between Tagsurance and Operator Stations. Lane extender can be used with 1 – 6 Operator Stations.

Tagsurance Lane Extension kit includes

- Lane Extender unit for up to 6 Operator Stations
- Power supply and power cord
- RS-232 cable and RS232/USB adapter
- IO cable
- RF cable, ~0.5 m long, N-N
- Reference tag and Jig

TAGSURANCE UHF OPERATOR STATION

VXT-HW-MMK

Operator Station connects to Tagsurance Lane Extender. It includes devices for user interactions.

Operator Station includes

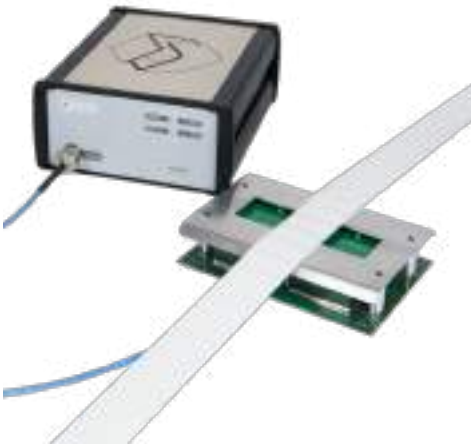
- Snoop Pro UHF Coupling Element with tag alignment foams (no shielding plates)
- RF cable, ~2 m length, N-SMA
- Foot pedal with ~5 m long cable
- Traffic light module with ~ 2 m long cable

Snoop Pro HF Coupling Element	AN-SP-HF
Accessory Kits	
• Tagsurance HF Delivery Kit	VHT-HW-DK
• Tagsurance HF Starter Kit	VHT-HW-SK
• Tagsurance HF Manual Test Station Kit	VHT-HW-MK
Transferable Test Setup HF/NFC	VHT-HW-TS VHT-HW-TSP
Multilane Test Setup HF/NFC	

HF ACCESSORIES

Snoop Pro Coupling Element

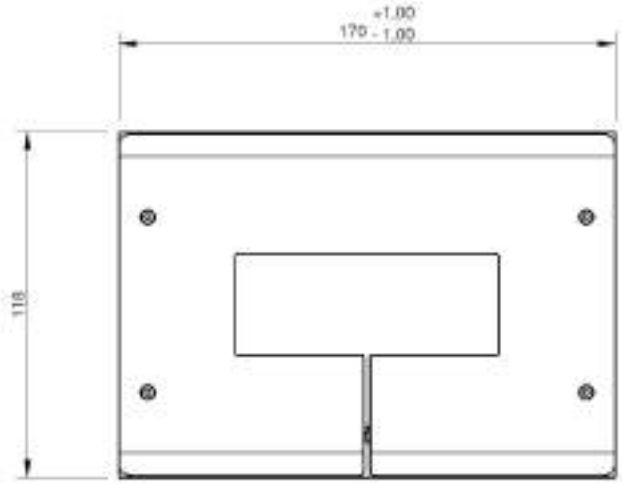
AN-SP-HF

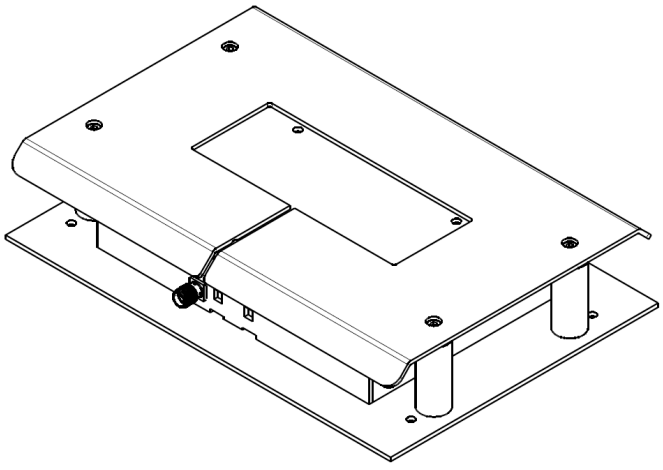


Voyantic has developed a dedicated coupling element for testing HF inlays and tags. The Snoop Pro HF has two different sized coupling coils integrated into the same element to provide optimal coupling for both larger and smaller HF tags. There are separate antenna ports on both sides of the Snoop Pro HF, of which the correct one is chosen depending on the tag size.

The Snoop Pro HF has a changeable shielding plate that shields out the adjacent tags and enables testing only the one of interest. The opening size in the shielding plate is chosen according to the tested tag, label, or inlay size to enable optimal test setup for each product and process step.

The standard delivery of Snoop Pro HF includes 5 changeable shielding plates. There are four plates with different standard opening sizes and one plate without an opening. Unopened plates are available for customized tooling, as well as custom tooled plates according to the customer requirements.





Accessory Kits

Tagsurance HF Delivery Kit

VHT-HW-DK

- Rugged carrying case
- 18V AC power supply and cord
- Ethernet cable
- I/O screw terminal adapter
- Mounting brackets
- D15-25 adapter

Tagsurance HF Starter Kit

VHT-HW-SK

- Rugged carrying case
- 18V AC power supply and cord
- Ethernet cable
- I/O screw terminal adapter
- Mounting brackets
- Antenna cable
- Snoop Pro HF coupling element with 5 plates and a reference tag for setup verification
- D15-25 adapter

Tagsurance HF Manual Test Station Kit

VHT-HW-MK

- Rugged carrying case
- 18V AC power supply and cord
- Ethernet cable
- I/O screw terminal adapter
- Mounting brackets
- Snoop Pro HF coupling element
- Manual tag alignment platform
- Foot pedal for measurement triggering
- D15-25 adapter

Transferable Test Setup HF/NFC

VHT-HW-TS, VHT-HW-TSP

The Transferable Test Setup HF is compiled to enable Tagsurance device installation to a single line machine with minimal effort on the machine integration. The mounting assembly can be attached to a machine as a single unit. When necessary, moving the assembly to a new location is easy.

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There are several vertical and horizontal position adjustment possibilities for the antenna, trigger sensor, and printer.

MAIN COMPONENTS

- Mounting frame
- Throughbeam sensor with cable and connector
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- Antenna cable, 6 ft
- Contrast trigger sensor with cable and connector
- I/O controller (not shown in photo) to control:
  - which sensor to use
  - bad tag marking offset (min 1 tag)
  - timeout after which the result buffer is cleared after last trig received

OPTIONAL COMPONENTS

- HSA Jet printer for bad tag marking (ink and cartridge are not included)

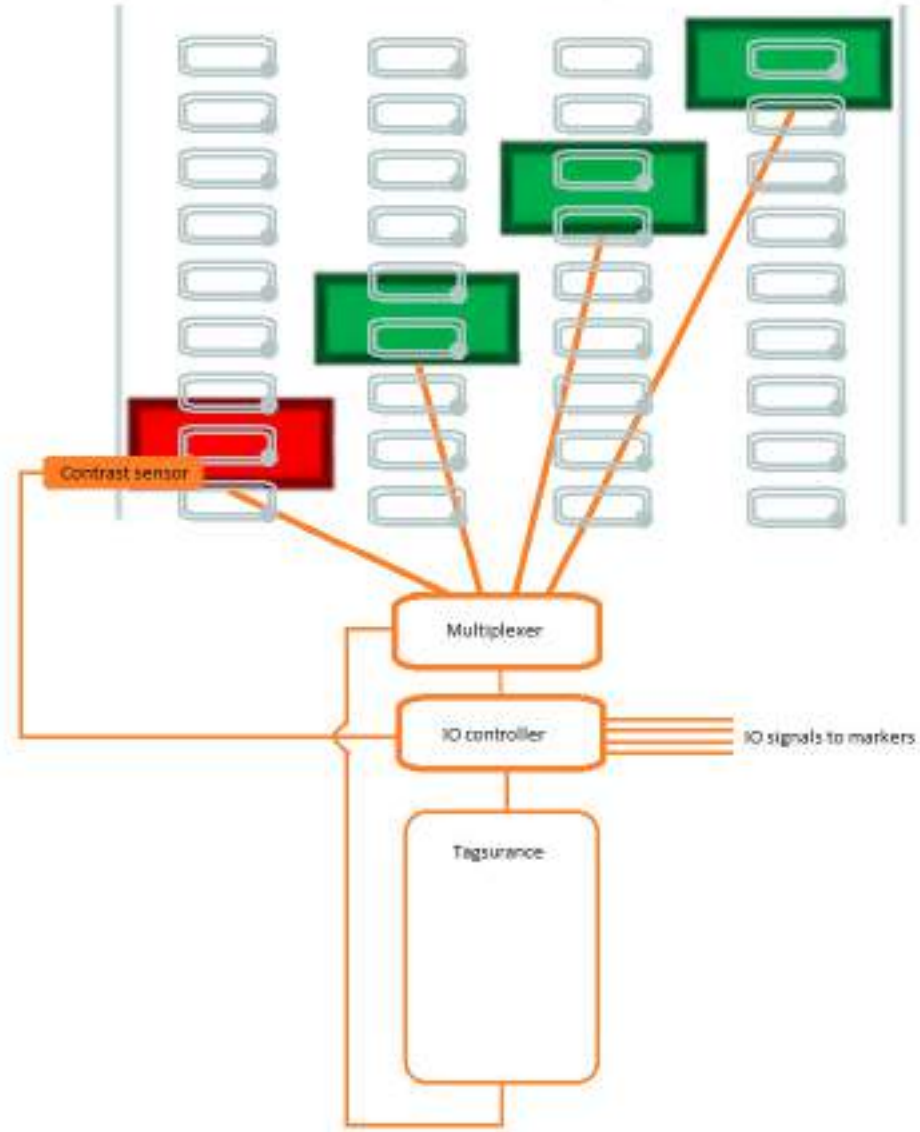
In addition to the transferable assembly, the entire system requires
- Tagsurance HF device with software
- Tagsurance Delivery Kit

Transferable Test Setup HF with Contrast Sensor and Printer VHT-HW-TSP

Transferable Test Setup HF with Contrast Sensor VHT-HW-TS

Multilane Test Setup HF

The Multilane Test Setup HF is used for testing tags on multiple lanes using one Tagsurance HF device. In a typical production setting, the tester is idle a large portion of time, for example, on times when the tag is not correctly positioned on top of the antenna. Multilane system utilizes these idle times for testing on another lane, with another antenna.



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UHF Software Extensions

GB extension adds support for GB/T20768 protocol.
Support is applicable for Point Test, Sensitivity Test and Sweep Test modes — VUT-FN-GB

6B extension adds support for ISO18000-6B protocol.
Support is applicable for Point Test, Sensitivity Test and Sweep Test modes — VUT-FN-6B

Tagsurance UHF (D15) to Tagsurance HF (D25) I/O Logic Converter — VUT-AC-AD

The Logic Converter can be used for replacing tagsurance UHF with Tagsurance HF.

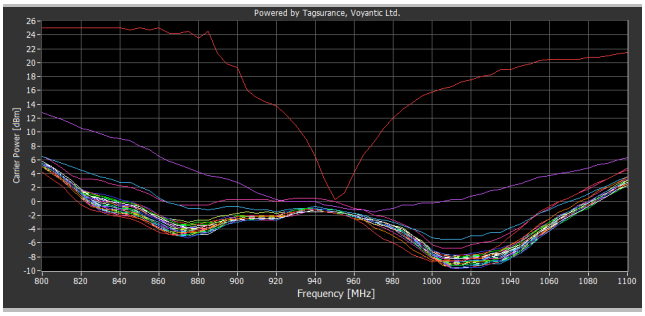
Bendurance

The Voyantic Bendurance is a system for testing durability of RAIN RFID and NFC labels.

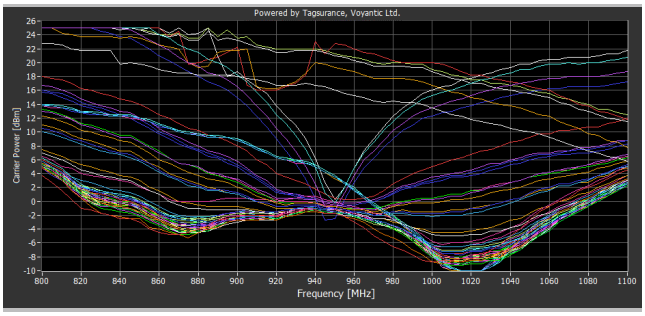
Test and evaluate tag durability
Benchmark tag reliability
Verify new manufacturing methods and materials before mass production
Compare and communicate tag reliability easily

Key Functionalities

- Run tags continuously through a stressing system
- Apply pressure and bending to chip connection
- Accelerate the effects of environmental conditions to tag performance
- Benchmark tag durability
- Evaluate the effect of chip attachment methods and materials to reliability
- See how performance decreases before tag fails, not only when it fails



Tag model 1 at the start of the test



Tag model 1 after 1000 rounds; clear changes in the performance of many tags

BENDURANCE

System components

- Bendurance platform
- Tagsurance and SW (UHF or HF)
- Recommended SW
  - Extended frequency range
  - Point Test
  - Sensitivity Test
  - Threshold Test
  - Read test (Read/Write test for UHF and UID read for NFC)
  - Test Data Analyzer
- Tagsurance Starter Kit (UHF or HF)
- PC for the Tagsurance SW

Bendurance platform

VUT-HW-BT14

- Machine dimensions: L 65 cm x H 50 cm x D 40 cm
- Machine weight: 40 kg
- Power supply 100 – 240 VAC, 50 – 60 Hz
- Compressed air required (6mm Ø hose, 6bar, 0.5 l/min)
- Maximum web width 135 mm
- Web length 1900 – 2260 mm
- Rolls: 40 mm Ø bending rolls, 60 mm Ø driving roll, 6 mm Ø press roll
- Liner speed adjustable from 1 m/min to 30 m/min, or indexing (stop and go) mode
- Web-guide precision +/- 0.2 mm
- Pneumatic tension control 5-60 N
- Compression stress with nip force 10 – 180 N

Tagsurance Maintenance Program

MAINTENANCE PROGRAM

Voyantic has established the Maintenance Program to make owning and using our measurement systems as easy and carefree as possible. We let you concentrate on your core business as we take care of the measurement equipment and train you to use it efficiently.

TECHNICAL SUPPORT

The online support and training are available through web conferencing, email and phone for our maintenance customers. Whenever you face a problem, uncertainty or just want to have a second opinion, we are pleased to consult your case. We are also prepared to measure your tags once or twice a year in our lab. Any feedback on our systems is also gladly received and used in planning our own development, prioritizing the needs of our maintenance customers.

EXTENDED WARRANTY

The Tagsurance hardware has a one year warranty, but we will grant an extended warranty as long period as the device is enrolled in the maintenance program. The extended warranty covers any hardware issue induced in normal use. We will either repair or replace your device and provide you a replacement unit to be used during the troubleshooting.

ANNUAL CALIBRATION

As a maintenance customer, you are entitled to send your unit once a year for annual calibration to Voyantic. You don't have to worry about the timelines, as we will send you calibration calls each year when the device calibration is due. For the period the device is in calibration, you are entitled to a free replacement unit sent to you on Voyantic's account and sent back on your own account. Similar policy yields to the shipments of the device sent to be calibrated.

Alternatively, you can decide to receive a Calibration Kit onsite to perform the calibration yourselves with the automated Tagsurance calibration software. In this case, the full data provided by the calibration software on the procedure, needs to be sent to Voyantic for verification. After receiving and analyzing the data we will send you the certificate of calibration proving the unbroken chain of calibrations.

SOFTWARE UPDATES

To better serve the industry, we strive towards continuous development. Aiming to keep on pace with the customer requirements for the tag testing, we release software updates frequently. As a maintenance customer, you will be notified of all the updates and will receive a link for a free download each time an update is available.

Notes

Voyantic solutions are designed to speed up development, improve production quality, and increase sales of RFID technology. We have a proven track record with 1000+ solutions delivered to more than 30 countries around the globe. We continuously invest in R&D and improve the technology. Our distributor network brings our products & support to customers worldwide.

Voyantic

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