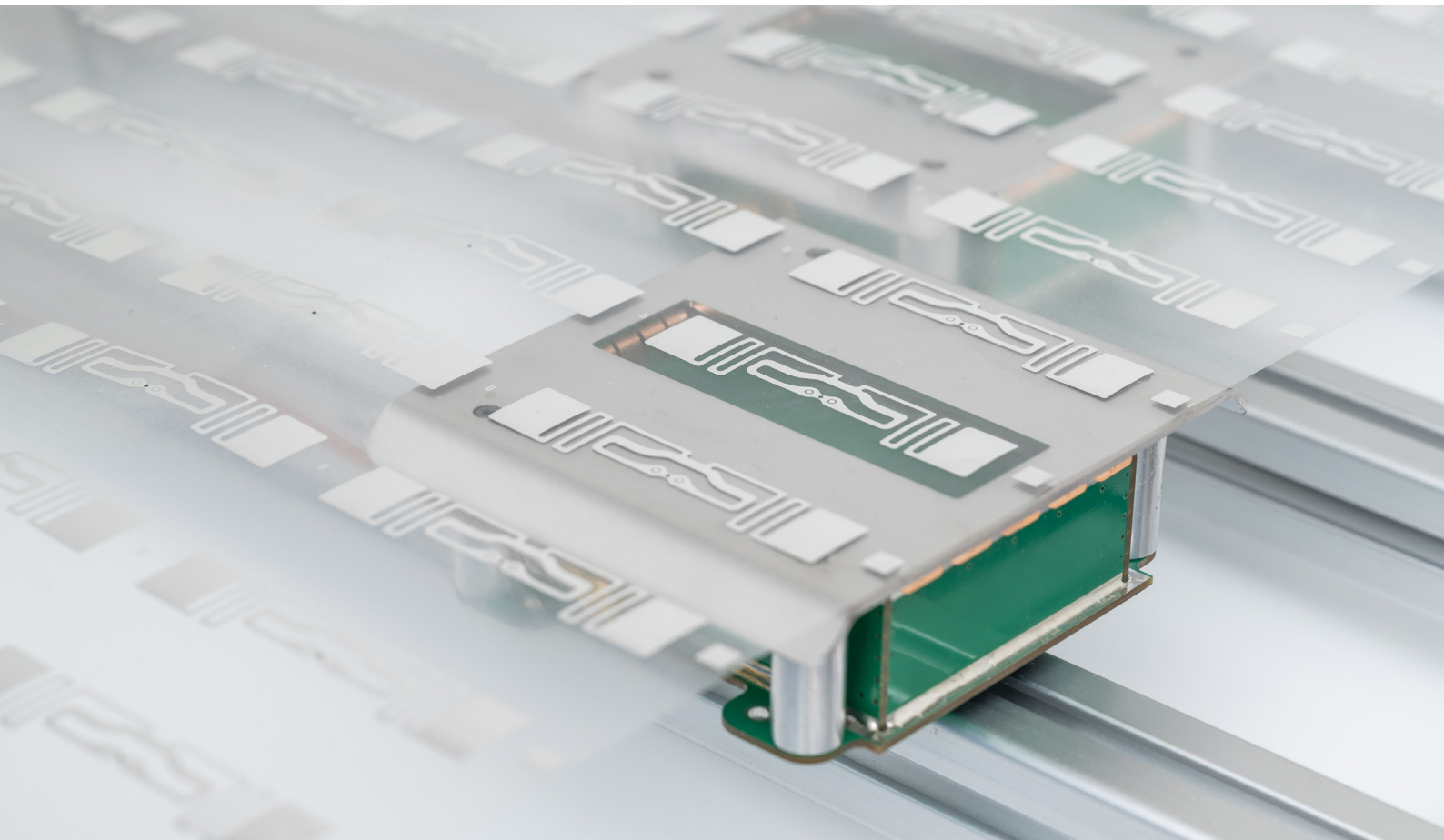




Voyantic

# Tagsurance® 3

Inline Quality Testing System for RAIN RFID (UHF)  
and NFC (HF) Tag Production



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System Catalogue

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# System Overview

## What is Tagsurance 3?

Voyantic Tagsurance 3 is a quality control system for measuring the performance of UHF and HF RFID inlays, tags, and labels in different stages of the production process, from chip attachment to label converting and incoming inspection.

Tagsurance 3 enables tag manufacturers to improve quality and yield by giving full visibility into RFID tags' performance, not only checking if they are functional.

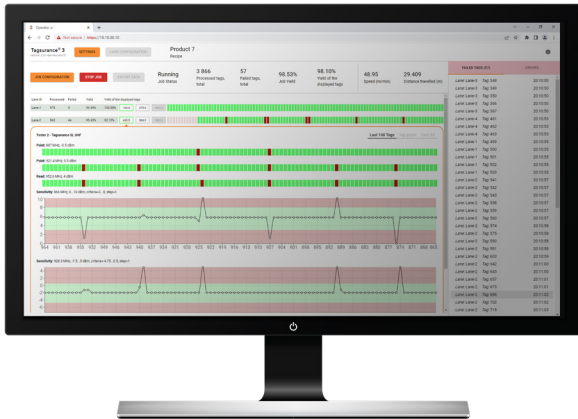
The system is modular and easy to integrate into tag production lines and processing machines where testing is needed.



## MAIN SYSTEM COMPONENTS

- Tagsurance Controller rack for triggering, sequencing, REST API, and operator UI
- Measurement devices
- Coupling elements
- Cabling
- Trigger and rotary encoder

# Tagsurance 3 Primary Use Cases



## RAIN RFID / UHF RFID

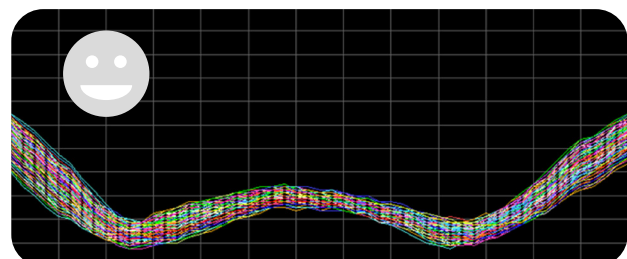
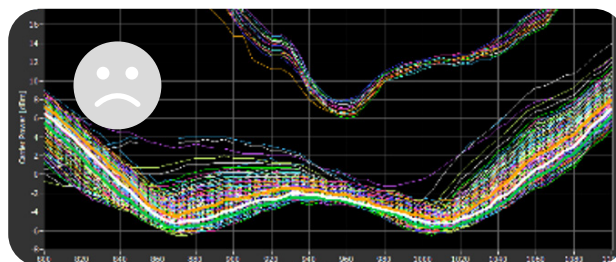
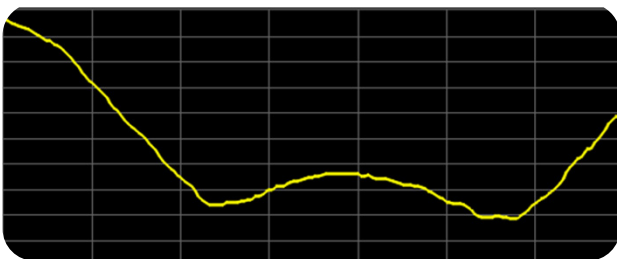
Tagsurance 3 is a complete system for high-speed, high-accuracy quality testing in UHF RFID chip attachment and label conversion machines, as well as for quality testing in reel-to-reel machines.

## HF / NFC

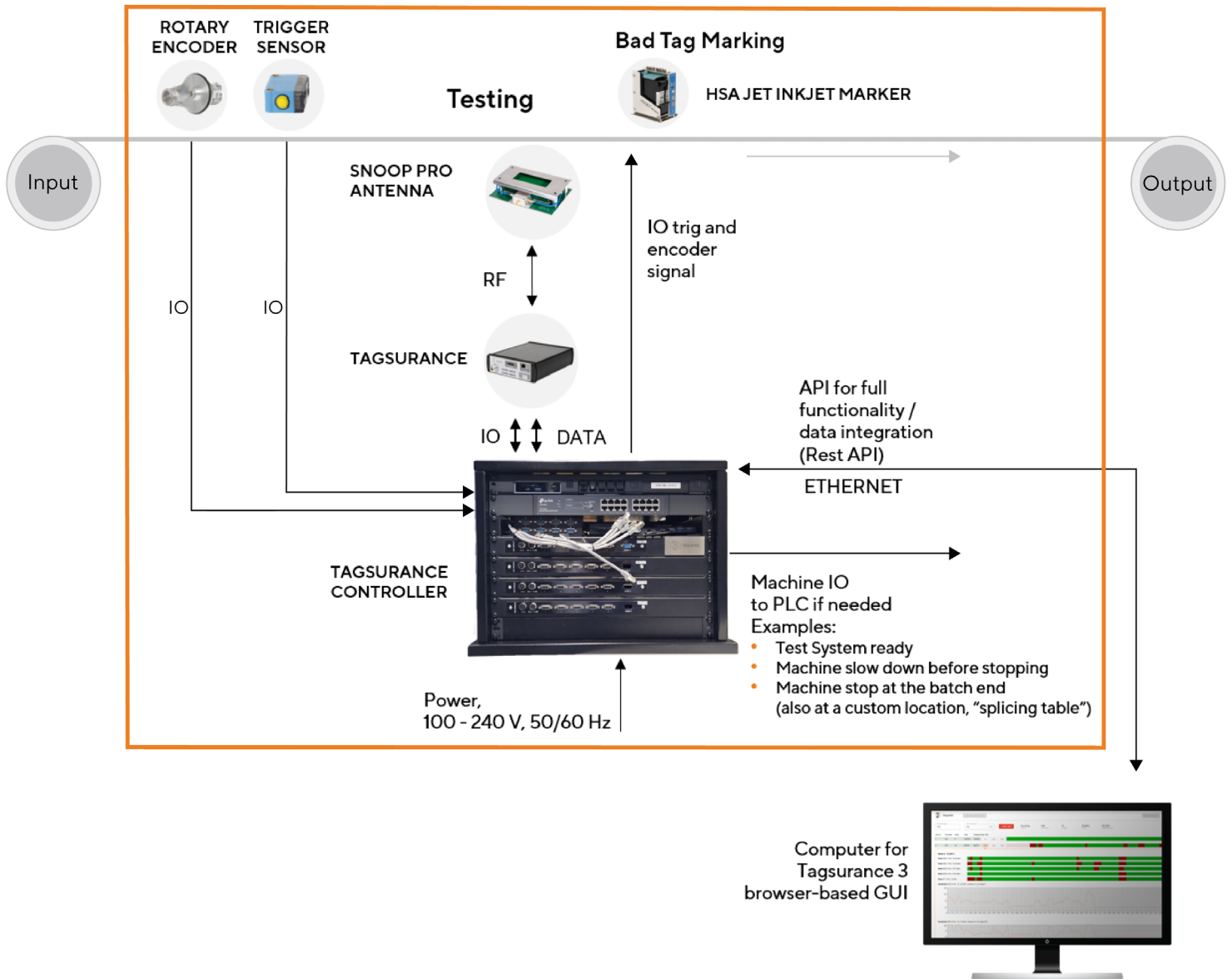
Tagsurance 3 is a complete system for high-accuracy quality testing in HF RFID chip attachment and label conversion machines, as well as for quality testing in reel-to-reel machines.

## Tagsurance 3 can be integrated to:

- Chip attachment machines
- Label converting machines
- Reel-to-reel machines for offline testing
- Other tag processing machines



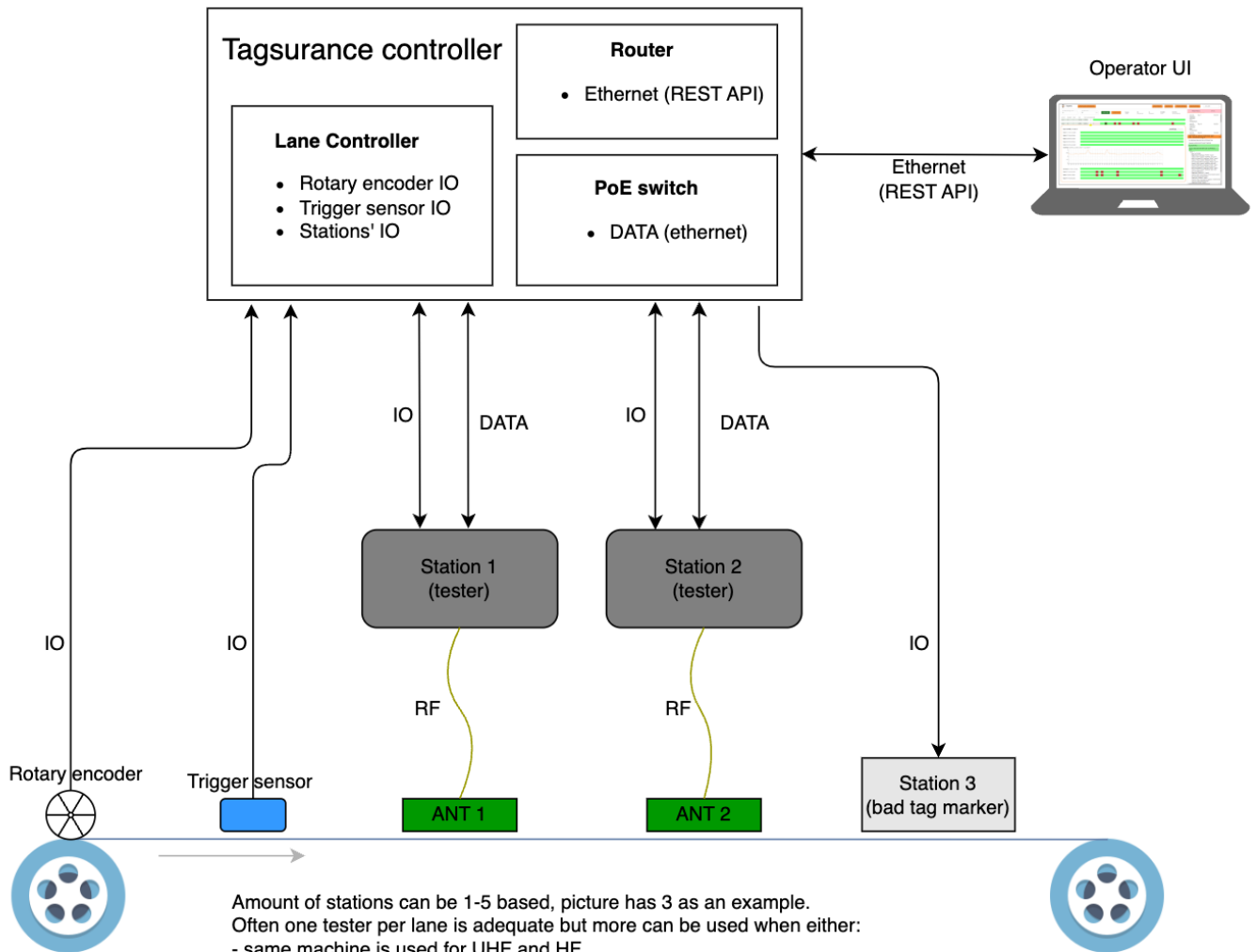
# Example System Setup



# Terminology

Component	Description
<b>Tagsurance 3</b>	The whole system is called Tagsurance 3.
<b>Lane Configurator</b>	Tool used to specify to the system how it is intalled to the machine, e.g. number of lanes, stations and each station distance from trigger.
<b>Recipe Builder</b>	Tool used to specify to the system what is done to each tag, e.g. "2 point tests and TID read" and "mark failed tags".
<b>Operator UI</b>	Browser application used by operator to use Tagsurance 3 system in production.
<b>REST API</b>	REST has been employed throughout the software industry and is a widely accepted set of guidelines for creating stateless, reliable web APIs.
<b>Tagsurance Controller</b>	The whole rack with everything that is inside.
<b>Station</b>	A device that takes part in testing or marking / punching the tag. For example: Tagsurance SL UHF and HSA JET Micron.
<b>Lane Controller</b>	A device that controls the stations on each lane. There is one Lane Controller per lane.
<b>PoE</b>	Power over Ethernet. This is how Lane Controller and Tagsurance SL UHF are powered to reduce cables and power bricks needed.
<b>Tagsurance SL UHF</b>	UHF tester device.
<b>Tagsurance HF</b>	HF tester device.
<b>Trigger</b>	Sensor that is used by Lane Controller to sense when tags enter the process.
<b>Rotary Encoder</b>	Sensor that is used by Lane Controller to sense accurately how the material is moving.
<b>Pitch</b>	The "repeat" material movement wise, meaning: from start of an inlay to start of next one.
<b>Tag Antenna Length</b>	Largest dimension of the tag antenna material movement wise.
<b>Tag Antenna Width</b>	Largest dimension of the tag antenna perpendicular to material movement.
<b>Lane Pitch</b>	In a multilane scenario the "repeat" across lanes, perpendicular to material movement, meaning: from start of tag antenna to start of next one

# System Structure



Amount of stations can be 1-5 based, picture has 3 as an example.  
 Often one tester per lane is adequate but more can be used when either:  
 - same machine is used for UHF and HF  
 - there is need to gather more data without slowing down the speed

## Software Updates and Hardware Upgrades

Voyantic regularly improves and adds functionality by releasing new software versions and upgraded hardware components. Software updates are free of charge for all customers as long as their hardware versions are supported by the new software version. Any changes to the hardware support statuses and details will be included in the software release notes.

When a hardware upgrade is needed to update to the latest software version, the hardware upgrades are available as a package deal containing all the components which need an upgrade.





## LIFECYCLE POLICIES

System component type	Description	Versioning scheme	Lifecycle policy
<b>API</b>	REST API ASYNC API	semantic versioning <ul style="list-style-type: none"> <li>x.y.z</li> <li>x = major (break backward compatibility)</li> <li>y = minor (new feature(s))</li> <li>z = patch</li> </ul> see <a href="https://semver.org">semver.org</a>	12 months for x when x+1 is released: <ul style="list-style-type: none"> <li>availability of x in new software releases</li> <li>tech support</li> <li>critical patches</li> </ul>
<b>Hardware</b>	Stations <ul style="list-style-type: none"> <li>Tagsurance SL UHF</li> <li>Tagsurance HF</li> </ul> Controller rack <ul style="list-style-type: none"> <li>Server</li> <li>Router</li> <li>Lane Controller</li> </ul>	x.y <ul style="list-style-type: none"> <li>x+1 means that the Tagsurance 3 software will need to be updated (can be x or y update)</li> <li>y+1 means that hardware may enable new feature or improved non-functional feature (e.g. speed, receiver sensitivity, etc.).</li> <li>patch releases are not indicated in the version number on the device.</li> </ul>	When a new replacing hardware is released: 12 months <ul style="list-style-type: none"> <li>new features still added if old hardware allows*</li> </ul> 5 years <ul style="list-style-type: none"> <li>tech support**</li> <li>critical patches**</li> </ul> 7 years <ul style="list-style-type: none"> <li>spare parts</li> <li>calibration service (test stations)</li> </ul>
<b>Software</b>	A software release such as 3.4 or 4.1	semantic versioning <ul style="list-style-type: none"> <li>x+1 means there is need to upgrade some hardware in the system to install; Voyantic will explain in a new major version release notes which hardware this applies to.</li> <li>y = minor (new feature(s))</li> <li>z = patch</li> </ul>	12 months for x when x+1 is released: <ul style="list-style-type: none"> <li>tech support</li> <li>critical patch</li> </ul> 12 months for x.y when x.y+1 is released <ul style="list-style-type: none"> <li>tech support</li> </ul>

\* with the exception when Tagsurance 3 version 4.0 comes out the new feature work for Tagsurance 3 version 3.\* will be stopped; meaning Voyantic diverges on this rule on Lane Controller 0.3 and 1.1 in favor of Lane Controller 2.0 which will be required with Tagsurance 3 version 4.0.

\*\* with the exception of tech support and critical patches 3 years for Tagsurance 3 version 3.\*; upgrading to version 4.\* will require upgrading Lane Controller 0.3 / 1.\* to 2.0; Voyantic will provide affordable upgrade deal in return of offering shorter life cycle than normally

# System Specifications

## Absolute Maximum Ratings

This section outlines the absolute maximum ratings for the system setup. In many cases, the limiting factor may be reached before any of the below parameters. Often the limiting factor is a combination of required test coverage, pitch, tag length measured from material movement direction, and material speed.

- Number of lanes: 8
- Number of stations per lane: 5
- Material speed: 200 m/min
  - Tag speed: new tag every 8 ms
- Pitch
  - Min: 4 mm
  - Max: 1000 mm
- Length of assembly (max distance from trigger to last station / location), which ever limitation is reached first:
  - 10 m
  - 2000 tags
- minimum distance between stations: 50 mm

## Maximum Speed Examples

The below calculations are assuming 3 mm spacing between the tag antenna and shielding plate opening edge during the movement and 1.5 ms Carrier Before Tasklist.

Please treat them as examples and check any hard requirements in specific cases with Voyantic technical sales.

### SIMPLE QUALITY TEST (UHF)

Two point tests with given frequency and power.

	Pitch, mm	Tag length in material movement direction, mm	Material speed, m/min	Shielding plate opening in material movement direction, mm	UPH (Per Lane)
Tag example 1	22	16	60	30	163k
Tag example 2	38	30	110	50	173k
Tag example 3	60	22	200	60	200k

## QUALITY TEST WITH TID GATHERED FOR TRACKING (UHF)

Three point tests with given frequency and power AND reading a 6-word long TID for tracking. The EPC code can also be

read as a side product of TID read without a speed penalty.

	Pitch, mm	Tag length in material movement direction, mm	Material speed, m/min	Shielding plate opening in material movement direction, mm	UPH (Per Lane)
Tag example 1	22	16	25	30	68k
Tag example 2	38	30	46	50	72k
Tag example 3	60	22	120	60	120k

# System Features

Different 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.

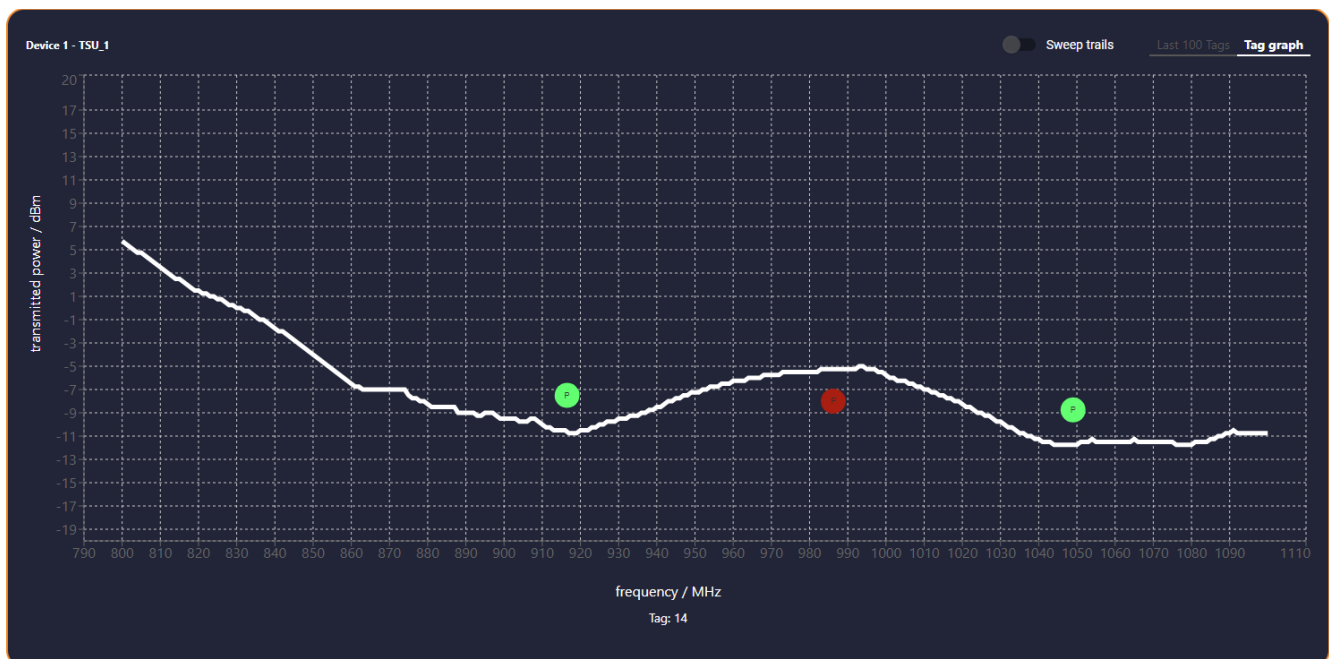
System features also require a corresponding test station hardware.

## Point Test

Point test checks if a tag responds with given frequency and power combination. Used command depends on protocol. Query command is used for 18000-6C (UHF). For NFC, the used command depends on the protocol. This is the most used high speed quality test that can be used practically in any machine to ensure tags accurately meet the given criteria.

Criteria can be:

- must respond;
- must NOT respond;
- indifferent; useful for gathering extra data but tags will not fail based on the result.



**Note:** Sweep curve has been added to image for more understandable visual presentation.

# Sensitivity Test

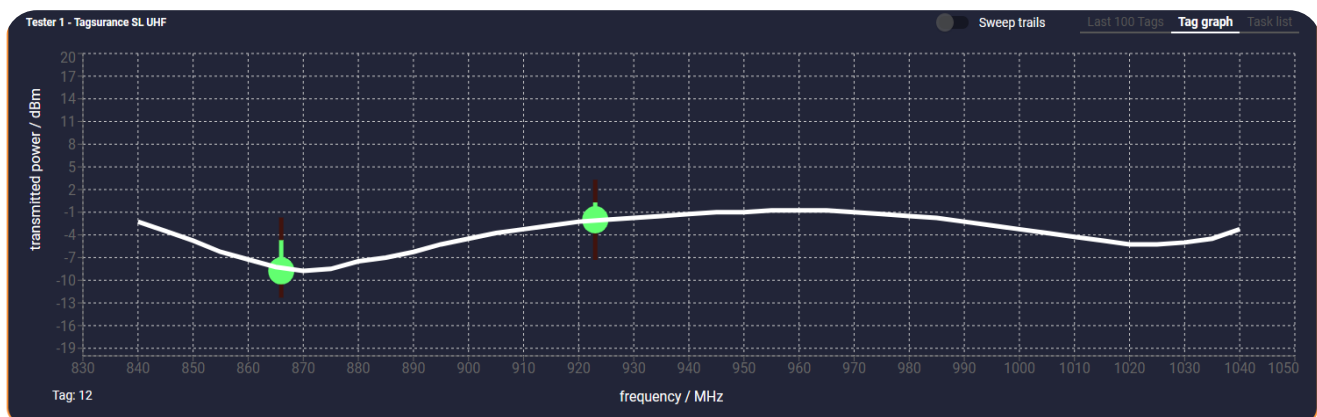
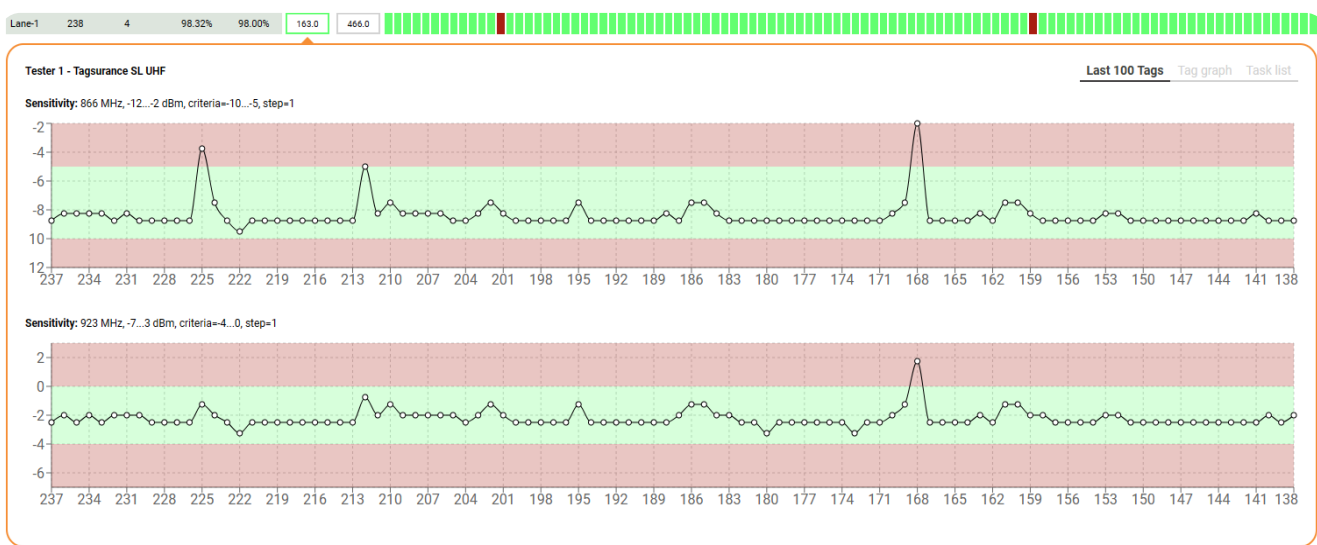
The sensitivity test finds the tag sensitivity on given frequency using binary tree search. The sensitivity test is fairly fast way to gather trend data while still being able to accurately sort the tags out that do not meet the given performance criteria.

The test duration can be reduced by adjusting the resolution or the power range used in the measurement. Usually the range can be somewhat narrow as often it is adequate to simply sort out the clear outliers and the

main interest is in the variation within the control limits.

Criteria can be:

- Define accepted sensitivity range within the test range
- OR acceptance range defined same as the test range to use results purely as indication and to gather data



**Note:** Sweep curve has been added to image for more understandable visual presentation.

# Frequency Sweep

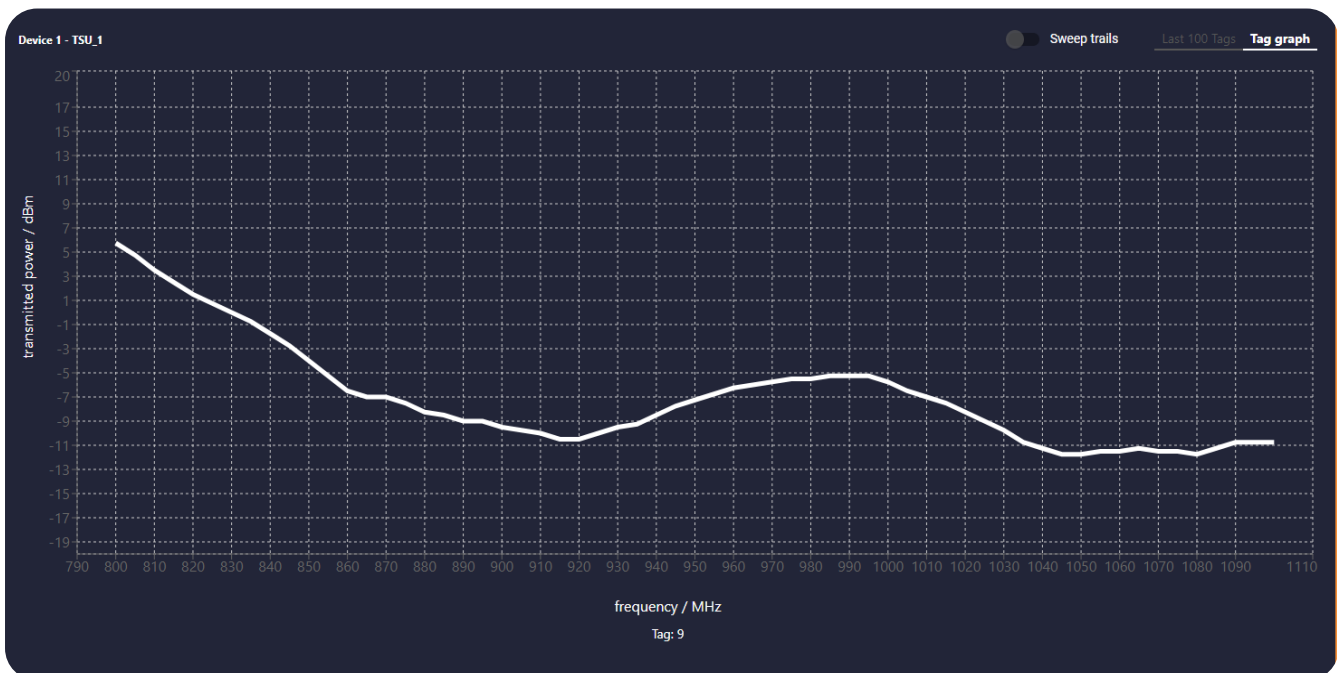
The frequency sweep test is a frequency response measurement. This measurement gathers the most amount of data and is more of a sample testing tool than a production test as time that is needed is too long to be practical in testing all produced tags.

Based on the information achieved with this test mode, the high-speed production test

that uses Point Test Mode or Sensitivity Test Mode can be defined more easily.

No criteria, only used as indicative measurement.

NOTE: this test is not deterministic in its test time! Usually this can only be used in stop&go operation or very slow movement.



## Inventory (UHF only)

Inventory test checks if a tag responds with EPC code with a given frequency and power combination. Used commands are query + ack. Read data is included in the result file.

Read data can be verified with user-definable arbitrary mask.

## Read (UHF only)

Read any memory bank and optionally also return the EPC code (no cost of extra test time) with given frequency and power combination. Read data is included in the result file.

Read data can be verified with user-definable arbitrary mask

## UID read (HF only)

Read tag UID with given frequency and power combination, and include data in result file.

## Lot Configuration

Count:

- All tags
- Good tags (pass)
- Minimum per lane
- Total across lanes did the tag respond with UID

Criteria:

- did the tag respond with EPC code and was CRC checksum valid
- did the read mask match the data

Criteria:

- did the tag respond with asked data and was CRC checksum valid
- did the read mask match the data

Criteria:

- did the tag respond with UID

The screenshot shows a 'Job configuration' window with two tabs: 'Recipe' and 'Lot'. The 'Lot' tab is active. It contains the following configuration options:

- Batch size:** 10 000
- Results to count:** Pass
- Size target:** Total across lanes (selected)

A dropdown menu is open for the 'Size target' field, showing three options: 'Total across lanes' (highlighted with an orange border and a hand cursor), 'Total across lanes', and 'Minimum on all lanes'.

## Supported Protocols and Available Tests

### UHF

TEST	RAIN RFID (ISO 18000-6C)
Point Test	✓
Sensitivity Test	✓
Frequency Sweep	✓
Inventory	✓
Read	✓

### HF

TEST	ISO 15693	ISO 14443-A	ISO 14443-B	FeliCa	ISO 18000-3M3	NFC Bar-code (tag talks only)
Point Test	✓	✓	✓	✓	✓	✓
Sensitivity Test	✓	✓	✓	✓	✓	✓
Frequency Sweep	✓	✓	✓	✓	✓	✓
UID Read	✓	✓	n/a	<b>X</b>	✓	✓



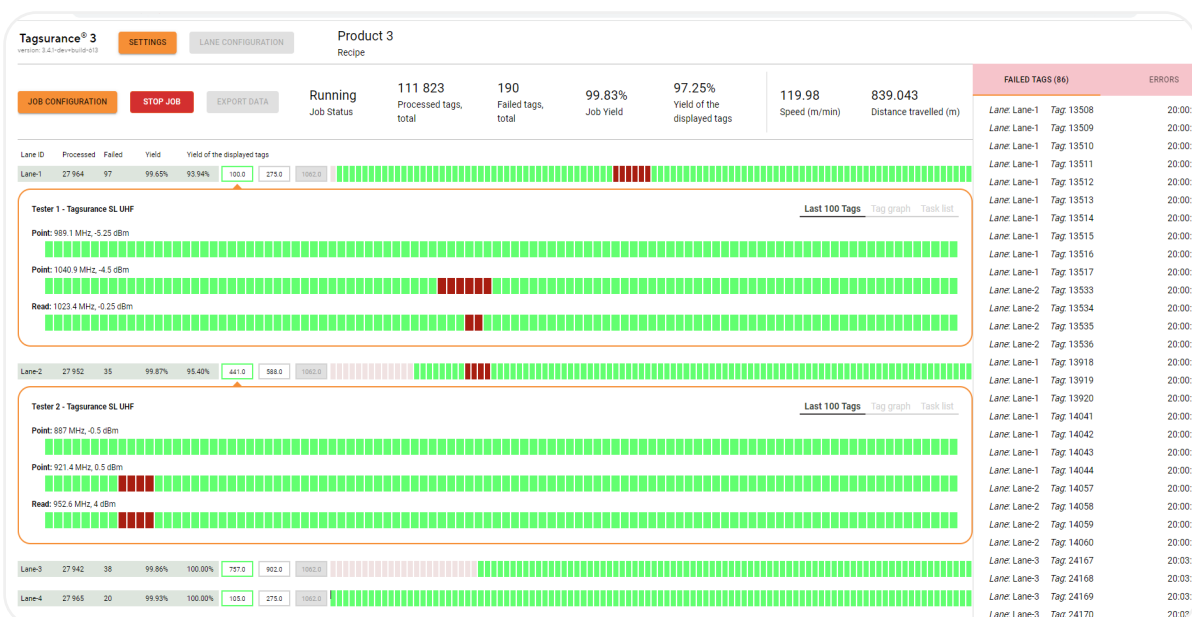
# System Interfaces

## User Interface

The user interface is currently going through an architectural change. All user interfaces will be moved to browser and the access to the Tagsurance 3 server will be restricted.

Currently the system is still used by accessing Windows and by connecting an HDMI display, a keyboard and a mouse to the controller.

CURRENTLY	UPCOMING (planned availability during 2023)
<b>USER INTERFACES</b>	
<p>All user interfaces can be run locally on Tagsurance Controller and Recipe Builder needs to be run locally to be able run "reference sweeps".</p> <p>A FULL HD (1920 x1080) HDMI display, keyboard and mouse are needed to operate Tagsurance 3 (not included in delivery)</p> <p><b>Operator UI and Lane Configurator:</b> run in browser (either on separate computer connected via ethernet or on Tagsurance Controller)</p> <p><b>Recipe Builder:</b> Windows executables that can be either installed on separate computer or run on Tagsurance Controller. Recommendation is to run on Tagsurance Controller due to otherwise missing reference sweep measurement (for recipe building) in Recipe Builder.</p>	<p>All user interfaces will be run on customer-provided separate computer connected to Tagsurance Controller via ethernet and Tagsurance Controller is regarded only as a headless server.</p> <p>This update will be necessary for subsequent future SW updates. This update will be free of charge (excluding Lane Controller 2.0 hardware and possible assembly work where specifically requested).</p>
<b>Details can be found in user manual.</b>	



## Internet

Currently the Tagsurance 3 system must not be connected to the internet as Windows may download updates and restart when not suitable. It is also not hardened for production grade online use.

Voyantic will be releasing a major upgrade to the system (planned schedule: during 2023) that will enable connecting Tagsurance 3 safely to the internet. Later on connecting to the internet will also unlock online features such as effortless updates and licensing.

## Rest API

- Versioning follows Semantic Versioning 2.0.0
- Open API specification available in the product (<https://localhost/api-docs>) and by request.

```

827         additionalProperties: false
828         properties:
829           carrierBeforeTaskMs:
830             type: number
831             example: 3.0
832         tasks:
833           type: array
834           items:
835             allOf:
836               - $ref: '#/components/schemas/TagsuranceUHFTask'
837               - type: object
838                 properties:
839                   id:
840                     type: string
841                     format: uuid
842                     readOnly: true
843
844     TagsuranceUHFTask:
845       anyOf:
846         - $ref: '#/components/schemas/TSUHF-18000-6C'

```

POST	/oauth2/token	Token authentication endpoint	▼
GET	/lanes	Returns current lanes information	▼ 🔒
PUT	/lanes	Update lanes configuration (existing will be overwritten)	▼ 🔒
PUT	/lanes/{laneId}/devices/{deviceId}	Adjust device's parameters	▼ 🔒
POST	/jobs	Start a new Job	▼ 🔒
GET	/jobs/{jobId}	Returns the definition used for starting a job with jobId	▼ 🔒
GET	/jobs/{jobId}/results	Returns the results from a job	▼ 🔒
POST	/jobs/{jobId}/export	Create CSV export of the results from a job	▼ 🔒
POST	/jobs/{jobId}/action	Action for a job, E.g. stop a running job	▼ 🔒
GET	/status	Returns the current state of the system with information about the lanes and job status	▼ 🔒

# Tagsurance Controller

## Operating Environmental Conditions

- **Temperature:** 15 to 28 degrees Celsius
- **Tagsurance Controller rack:** air temperature measured at the Controller rack back panel at the top of the rack
  - Stations and all other components: air temperature measured 3-5 cm from device (from side, not top)
- **Relative humidity (non-condensing):** 30 to 50 %
- **Altitude:** we do not perform altitude testing on Tagsurance 3; atmospheric pressure is lower at higher altitudes so cooling is less efficient; reduce 1 degree Celsius from maximum environmental temperature for each 300 meters

above 700 meters above sea level (e.g. for 1000 m reduce 1 degree C, for 2200 meters, reduce 5 degrees C).

Exceeding the given conditions moderately may result in (in order of severity):

- Downtime of system due to overheating (shutdown during a production run due to overheating)
- Slight measurement accuracy degradation
- Shorter life-span of equipment, especially the server in the Controller Rack

## Tagsurance Controller Options

Number of Lanes	Rack size (U=rack unit=44.45 mm)	Dimensions (h * w * d) mm Note: allow 150 mm in front side and 100 mm in back side for cables and air circulation	Product code for controller including one lane	Product code for additional lane*
1	4U	225 x 490 x 300	TSC-HW-4U1 + TSC-SW-XUX	TSC-HW-LAD + TSC-SW-LAD
1-4	8U	440 x 530 x 460	TSC-HW-8U1 + TSC-SW-XUX	TSC-HW-LAD + TSC-SW-LAD
1-8	12U	620 x 535 x 455	TSC-HW-12U1 + TSC-SW-XUX	TSC-HW-LAD + TSC-SW-LAD

\*) add one for each additional lane, e.g. 6 lane system: TSC-HW-12U1 + TSC-SW-XUX + 5 \* (TSC-HW-LAD + TSC-SW-LAD)

4U



8U



12U



## Power Cable

Included in the standard delivery of TSC-HW-4U1/8U1/12U1.

Please specify the needed option.

Length: 3.0 m

Tagsurance 3 comes with replaceable locally suitable power cable. Power requirements are 100-240 VAC 50/60Hz. Max current consumption 10A in 230VAC, 20A in 115VAC.

All other power cables and system internal cabling are included in the delivery.

### Type F, EU



### Type B, US



### Type G, UK



### Type I, China



## Rotary Encoder

10 pulses per mm.

Included with cable in the standard delivery of TSC-HW-4U1/8U1/12U1.



## Trigger Sensor

### CONTRAST SENSOR

Included with cable in the standard delivery of TSC-HW-4U1/8U1/12U1.



# Digital IO

## LANE CONTROLLER

By default, the Tagsurance controller is always equipped with one lane controller (1 lane). Additional lanes can be added as an option.

### Station Connector

- Used to connect to Voyantic provided stations, markers, and punchers
- In most cases, use Voyantic provided cabling.

## MACHINE IO

- 3 Outputs
- Available action triggers (refer to manual for full functionality):
  1. system status change: e.g. job running or not
  2. batch: e.g. slow down before batch completed and stop when last tag on splicing table
  3. yield: e.g. if yield of last 1000 tags is below 99.27 %



Machine IO

CANCEL
SAVE

Action name	Pin pair	Initial state	Target state	Type	Duration	
Job running	14/15 ▼	Passive ▼	Active ▼	Latch ▼		×
Job stopped	14/15 ▼	Passive ▼	Passive ▼	Latch ▼		×
Lot completed	16/17 ▼	Passive ▼	Active ▼	Pulse ▼	20 ms	×
Low yield	18/19 ▼	Passive ▼	Active ▼	Pulse ▼	100 ms	×
+						

Machine IO CANCEL SAVE

Action name	Pin pair	Initial state	Target state	Type	Duration	
6 consecutive fails	14/15	PASSIVE	ACTIVE	PULSE	5 ms	×
Low yield	16/17	PASSIVE	ACTIVE	PULSE	5 ms	×
+						

Job configuration CANCEL SAVE

Recipe		Lot		Trigger settings		Action triggers	
Type Status change	Target status Running	Action Job running	Select action				×
Type Status change	Target status Stopping	Action Job stopped	Select action				×
Type Lot completion	Amount before 0 pcs	Observing location Cutting table	Action Lot completed	Select action			×
Type Yield	Scope Lot	Yield type Per lane	Window size Not set	Trigger when yield below 98.76 %	Action Low yield	Select action	×
+							

## STATIONS

- Standard Voyantic D15 digital IO (see manual for details and pin out)
- Operated via Voyantic provided cables by Lane Controller
- In special cases integration from machine PLC is possible but usually not recommended

# Test Stations

**TAGSURANCE SL UHF**

TSC-HW-TSL



Output power:	-25 to +20 dBm +/-0.25 dB resolution +/-1 dB absolute accuracy
Frequency:	800 to 1100 MHz 100 kHz resolution
Protocols:	See <i>features</i>
Interface:	Data: Ethernet I/O port: standard Tagsurance 3 device IO (D15)
Weight:	2.3 kg
Dimensions:	23.9 x 17.2 x 5.5 cm (9.4 x 6.8 x 2.2 inch)
Power input:	PoE ( $\leq 15$ W)

A 3.5 m station IO cable from Lane Controller to Tagsurance SL UHF and ethernet cable for data and power are included.

## Notes:

- Tagsurance SL UHF devices must NOT be stacked and need either free air (not exceeding 30 degrees C) on top of them OR air circulation. Voyantic offers a holder rack with cooling fans, see next page.
- Tagsurance SL UHF cannot be used without the Tagsurance Controller.





Tagsurance SL UHF devices must not be stacked directly on top of each other. The minimum requirement is to have free air directly above each device. Adequate air circulation for cooling must be ensured. Air

temperature around the device (measured at 30 mm above the top surface) must not exceed 30 degrees Celsius. Voyantic offers a holder rack with cooling fans for the purpose.

Dimensions:	4U rack
Weight:	8.1 kg
Power input:	PoE (registers as 15 W device, power consumption is below 5 W)



Output power:	-10 to +25 dBm +/-0.1 dB resolution (0.25 dB in frequency sweep) +/-1 dB absolute accuracy
Frequency:	10 to 30 MHz 100 kHz resolution
Interfaces:	Data: Ethernet I/O port: standard Tagsurance 3 device IO (D15)
Protocols:	See <i>features</i>
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)

A 3.5m station IO cable from Lane Controller to Tagsurance HF and an ethernet cable for data is included.

## IO ONLY STATION

This feature can be used when a test device that is not provided by Voyantic needs to be included into the process and its result (PASS/FAIL):

- must be shown in tag results (on operator UI and in output data)
- must affect the bad tag marking

Such station works like any other station except without the following features:

- no data connection
- no initialization by Tagsurance 3
- no other results on Operator UI or output data other than PASS / FAIL / ERROR

Trig signal from Tagsurance 3 Lane Controller is NPN (active on GND) type and PASS and FAIL must be returned from the "IO only device" in separate wires, PNP type (active on +5 to +24 VDC). Details for wiring can be found from user manual.

## Bad Tag Marking

### BAD TAG MARKER

TSC-HW-HSA

HSAJet Micron Bad Tag Marker including IO cable.

Note: Ink cartridges or ink are not included in the Voyantic delivery or price.



### HSA JET MICRON IO CABLE

TSC-AC-HSC

The HSAJet Micron can be purchased locally. In this case, only the IO cable is needed from Voyantic.

Includes the rotary encoder signal to the marker.

Length: 4.0 m



## Other Markers or Punchers

### GENERIC IO CABLE

TSC-AC-GIC

Other markers or punchers can be attached with a generic IO cable from Voyantic.

Used, for example, for connecting a bad tag marker (other than HSA Jet).

Other end connects to Lane Controller's Station connector (DE15) and other has marked wires available:

- +24 VDC
- +5 VDC
- Trig (NPN)
- GND

# Coupling Elements

## UHF

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

Unlike many other near-field coupling elements, 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 nearfield 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 tag on top of the shielding plate opening. 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.



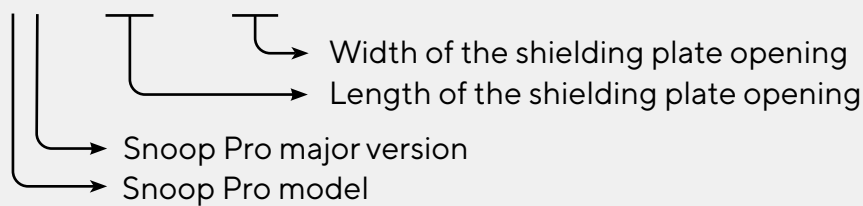
### Snoop shielding plate opening dimensions explained

Width	Size of the opening in the shielding plate perpendicular to material movement.
Length	Size of the opening in the shielding plate parallel to material movement.
Material movement	Material moves over the plate so that the bent edges smooth the movement of the material.

For each Snoop Pro model the shielding plates are available from a large selection.

The ordering codes explained:

### S1 - 40 X 90



#### Examples:

##### S1-40X90

- Snoop Pro
- major version 1.\*
- Length of the shielding plate opening 40 mm
- Width of the shielding plate opening 90 mm

##### M2-20X60

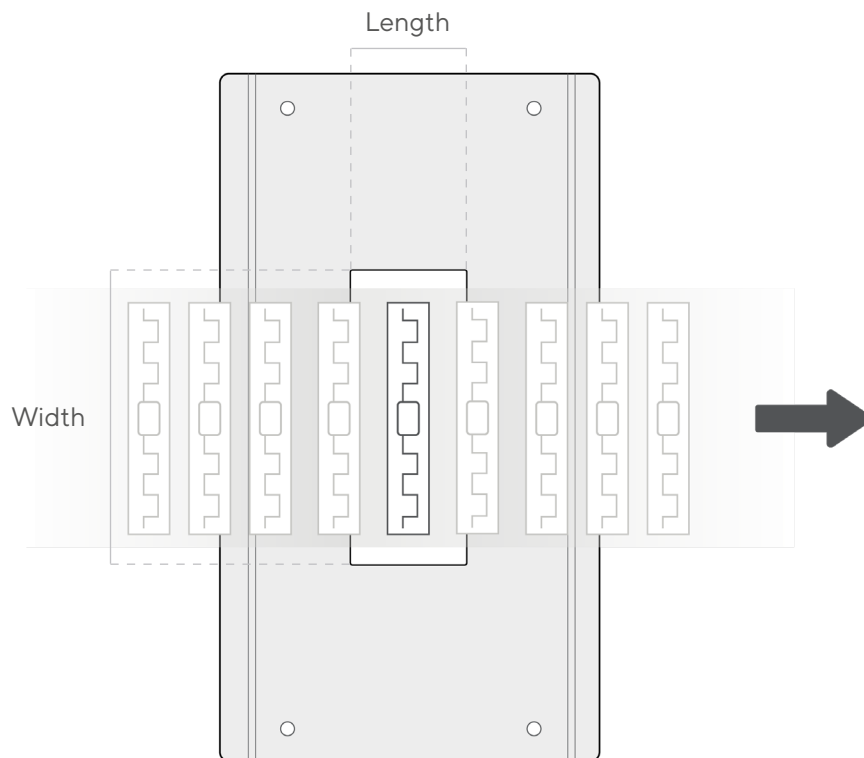
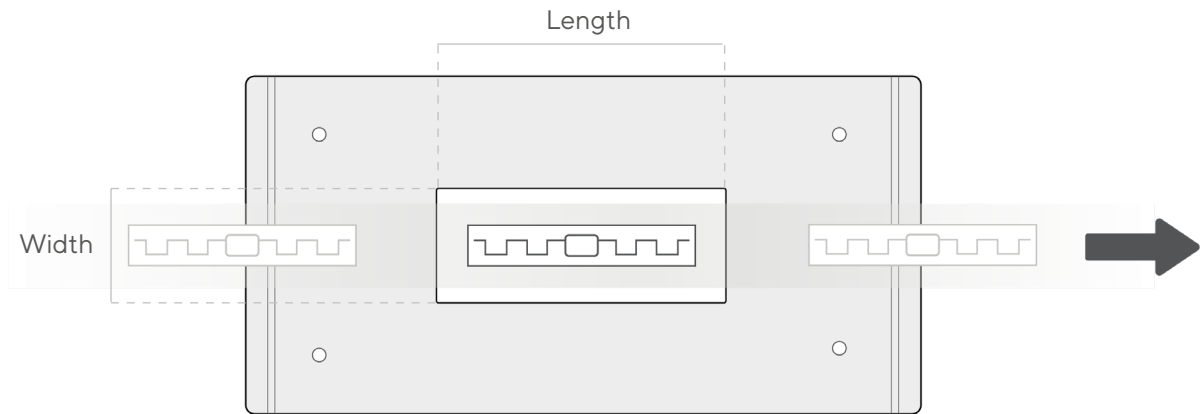
- Snoop Pro Mini
- major version 2.\*
- Length of the shielding plate opening 20 mm
- Width of the shielding plate opening 60 mm

#### Snoop Pro models:

- S = Snoop Pro
- M = Snoop Pro Mini
- H = Snoop Pro HF
- L = Loop Snoop

Versions and available widths and lengths can be found on each Snoop Pro coupling element's catalogue page.

Width and length measures of the Snoop Pro Shielding Plate openings illustrated.

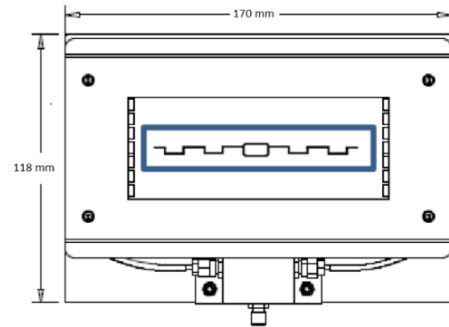


**SNOOP PRO UHF 1.0**

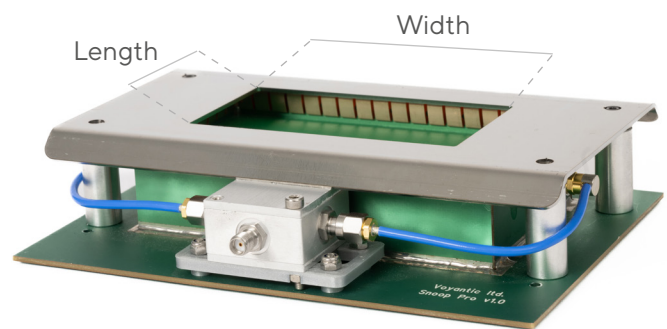
AN-SP-D10

The most used Snoop Pro model is suitable for most dipole antenna tag designs.

Maximum tag antenna dimension: 50 mm x 100 mm.



Width (mm)	Length (mm)
70	Options from 24 to 60 mm in 2 mm steps.
90	Options from 20 to 60 mm in 2 mm steps.
115	Options from 24 to 60 mm in 2 mm steps.



Standard shielding plates included in delivery:

- S1-50x70
- S1-30x90
- S1-40x90
- S1-24x115
- S1-50x115

Shielding plates are available based on the table above. Minimum order quantity 10 pcs.

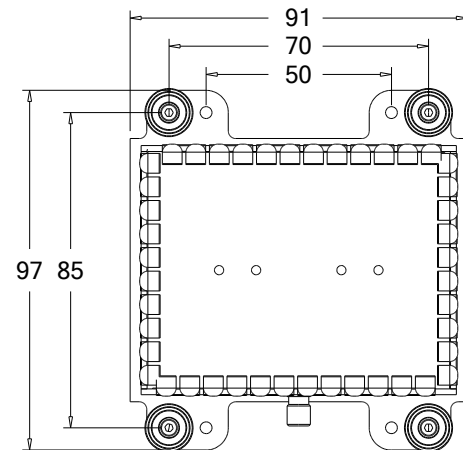


**SNOOP PRO UHF MINI 2.0**

AN-SP-MIN2

The Snoop Pro Mini coupling element is ideal when there is limited space available and the tag size allows to use a smaller coupling element. In terms of coupling efficiency, the Snoop Pro Mini is often a better option for small tags when there is no need to also test larger tags in the same system.

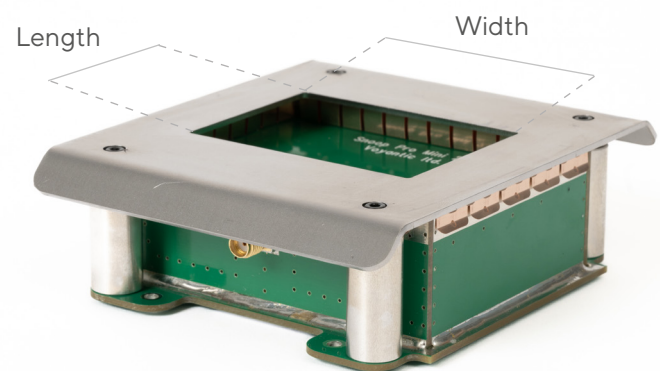
Maximum tag antenna dimensions: 50 mm x 65 mm.



Snoop Pro Mini 2.0.0

**Shielding Plates Selection**

Width (mm)	Length (mm)
60	Options from 16 to 60 mm in 2 mm steps.
80	Options from 16 to 60 mm in 2 mm steps.



Standard shielding plates included in delivery:

- M2-20x60
- M2-40x60
- M2-30x80
- M2-50x80

Shielding plates are available based on the table above. The minimum order quantity is 10 pcs.

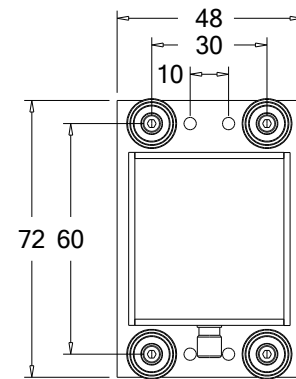
**UHF LOOP SNOOP 2.0**

AN-LS-L20

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

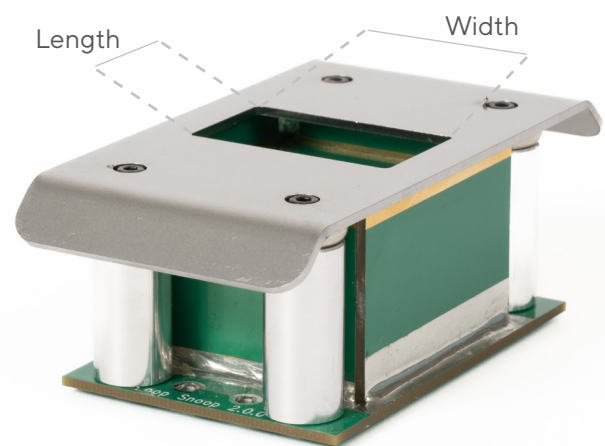
Maximum tag antenna dimensions:  
32 mm x 32 mm.

Standard shielding plates included in delivery:



Loop Snoop Pro 2.0.1

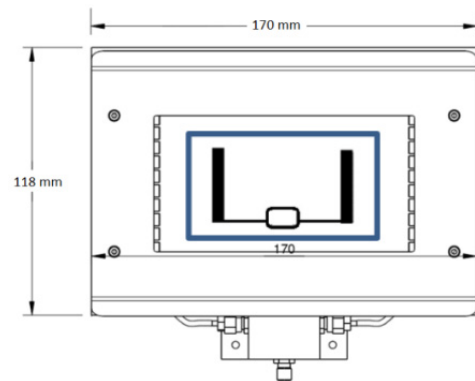
Width (mm)	Length (mm)
35	20
35	25
35	30
35	35

**SNOOP PRO UHF rev. W**

AN-SP-D1W

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

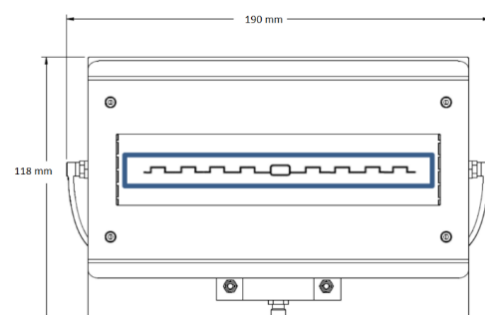
Maximum tag antenna dimension:  
73 mm x 100 mm

**SNOOP PRO UHF rev. C**

AN-SP-D1C

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

Maximum tag antenna dimension:  
26 mm x 130 mm



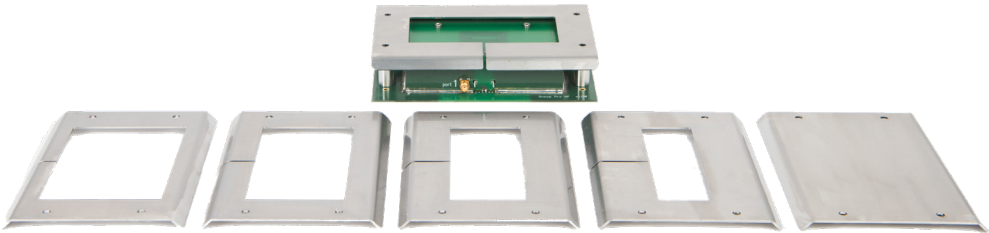
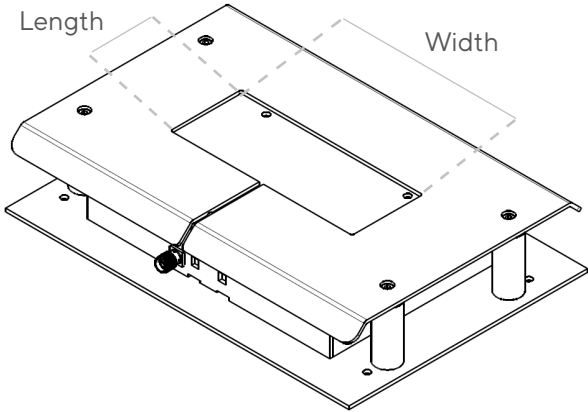
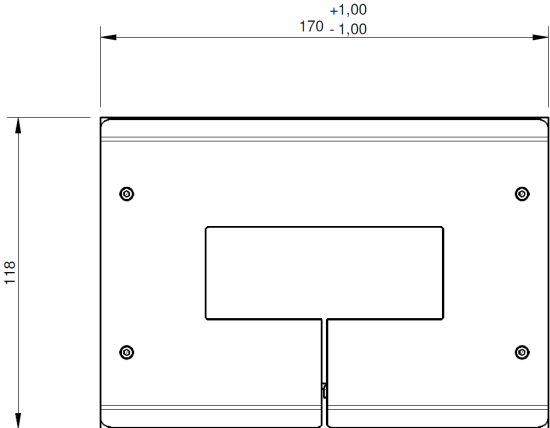
Voyantic has developed a dedicated coupling element for testing HF inlays and tags. The Snoop Pro HF has two different sized coupling coils integrated into the same element to provide optimal coupling for both larger and smaller HF tags. There are separate coupling element ports on both sides of the 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 directly above the shielding plate. 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.

**Shielding Plates Selection**

Standard shielding plates included in delivery:

Width (mm)	Length (mm)
115	35
115	50
115	65
115	80



## Snoop Pro RF Cables

**N(MALE) - SMA(MALE) 1.8M (6 FEET)**

RFC-180-N2SMA90-M-FL

90 degree SMA connector.



**N(MALE) - SMA(MALE) 2.3M (7.5 FEET)**

RFC-230-N2SMA-M-FL

Straight connectors.



# Packing

## SHIPPING BOX

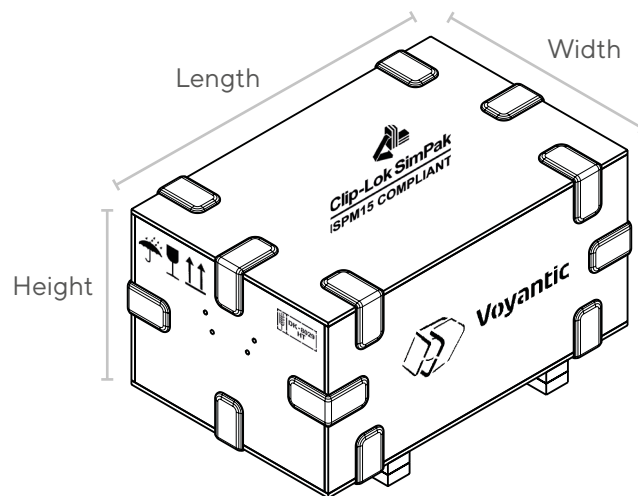
SH-TSC-XUX

The Tagsurance 3 Systems are shipped in a high-quality wooden transport boxes. The Clip-Lok box panels are made out of robust plywood and are ISPM 15 treatment certified to ensure the safe delivery of the products.

The box size is automatically selected based on the rack size selection (code and price is always the same).

### Box for 4U

	Length (mm)	Width (mm)	Height (mm)
External dimensions	552 mm	363 mm	316 mm
Internal dimensions	530 mm	341 mm	258 mm
Amount of QIK plastic clips:	16		

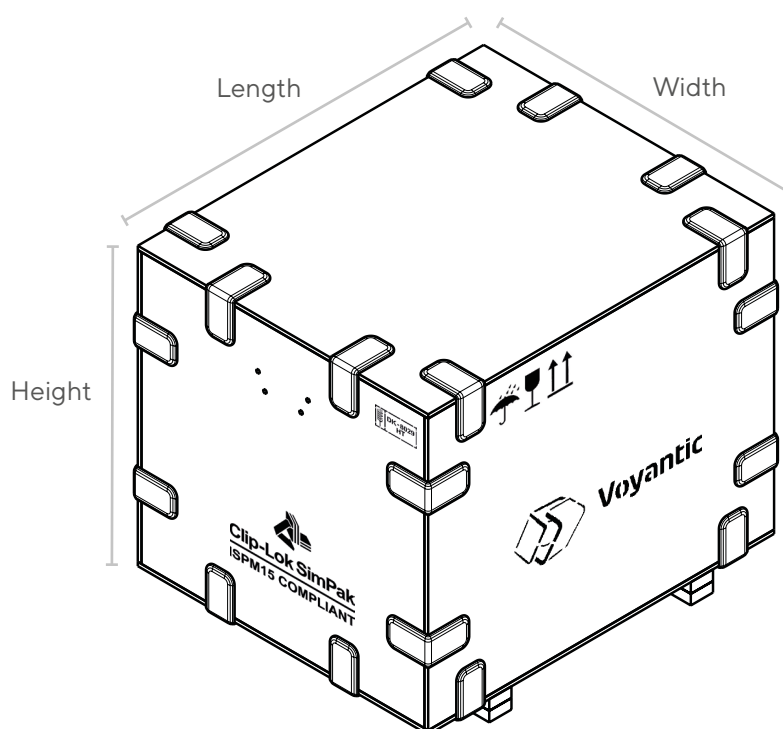


## SHIPPING BOX

SH-TSC-XUX

## Box for 8U

	Length (mm)	Width (mm)	Height (mm)
External dimensions	623 mm	523 mm	533 mm
Internal dimensions	601 mm	501 mm	475 mm
Amount of QIK plastic clips:	24		

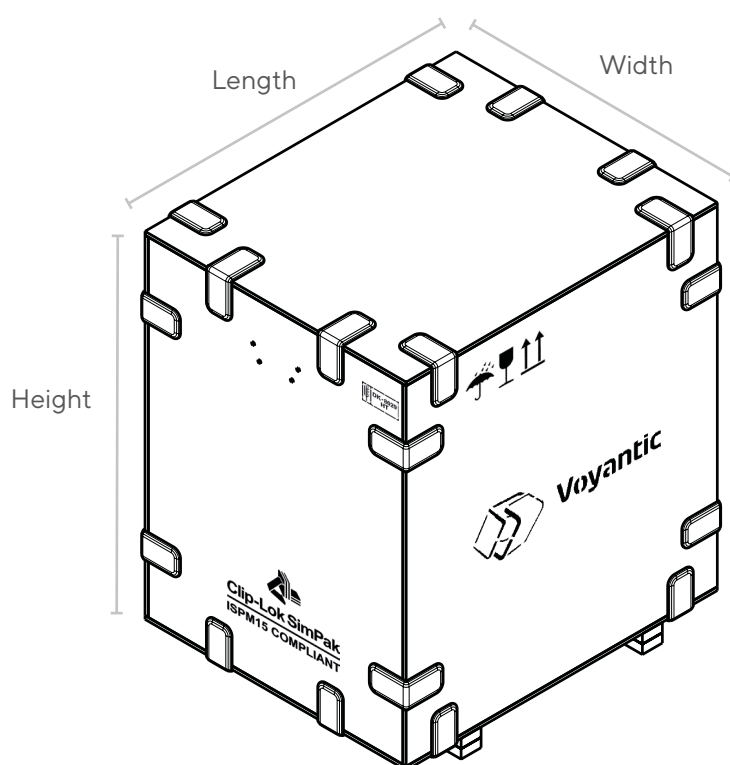


## SHIPPING BOX

SH-TSC-XUX

## Box for 12U

	Length (mm)	Width (mm)	Height (mm)
External dimensions	623 mm	523 mm	709 mm
Internal dimensions	601 mm	501 mm	651 mm
Amount of QIK plastic clips:	24		



# Optional Accessories

## COLOR CONTRAST SENSOR

TS3-AC-KT4

Can be bought additionally. Not included in the standard delivery.



## IO Breakout

TSC-AC-IBR

The IO Breakout can be used, for example, when the trigger signal sent to Tagsurance station or the pass/fail signal received from the station are needed, for example, to the machine PLC. Usually this is not needed and not recommended unless absolutely necessary. Please check with technical sales first.

Available signals (both NPN and PNP type):

- Trig signal going from Lane Controller to a station
- Busy/ready signal coming back from a station (where applicable)
- Pass/fail signal coming back from a station (where applicable)

Includes 1.2 m Lane controller to IO Breakout cable. The station IO cable is connected to IO Breakout as it normally would be connected to the Lane Controller.



## PEDAL FOR MANUAL TEST STATION USE

EMS-AC-FPD

Pedal for trigger test start.

Compatible with Tagsurance test station  
D15 IO connector.  
Cable length: 3 meters





**STROBE LIGHT**

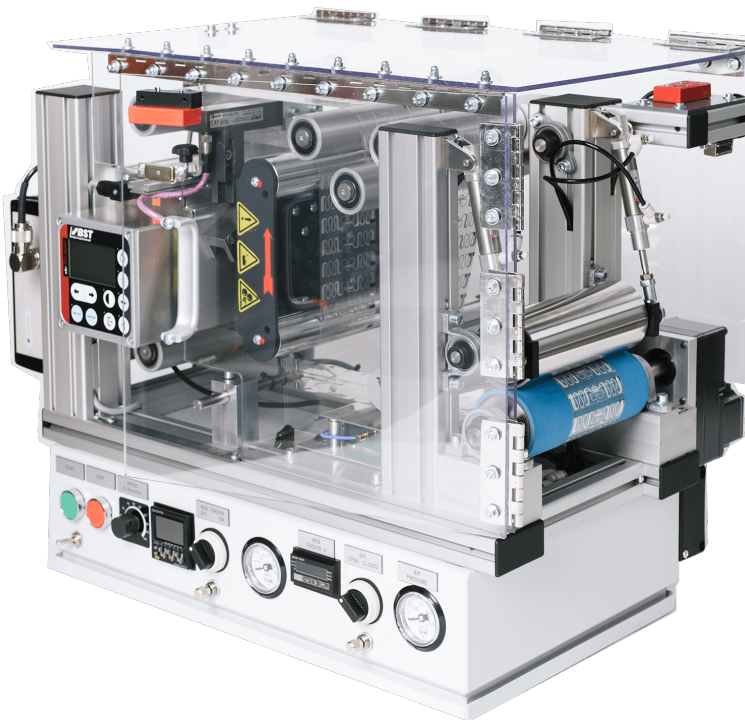
TSC-AC-SBL

For observing the trigger positions (correct distance from the trigger). Connects between the "Station IO cable" and the Test station.



# Bendurance

VUT-HW-BT14



## Key Functionalities

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

## Benefits

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

### NOTES:

- additional packing and shipping will be quoted
- triggering is by Bendurance integrated trigger and Tagsurance 3 triggering features are not currently available (hold off distance, pattern trig, etc.)

## Tag Durability

RAIN RFID and NFC systems have different tag durability requirements: the tag may just pass through the supply chain and be discarded, or the tag may be used over a long period of time. Depending on the application, the tag may also be exposed to different conditions - bending, pressure and temperature changes, all of which have an effect on the tag durability.

## Benchmark Tag Reliability

With Bendurance™ it is easy to benchmark tags. You can select a tag that has enough durability for the planned use, and avoid costly system failures. Select the best tag for each RFID or NFC system.

## Evaluate Durability of Designs

With Bendurance™ you can verify that changed materials or new manufacturing methods do not decrease the tag reliability. You can easily compare designs and see how any change affects the tag durability.

## BENDURANCE SPARE PARTS

### BENDURANCE RUBBER DRIVE ROLLER

BT14-PART-RRL

- Standard drive roller spare

### BENDURANCE ALUMINUM ROLLER

BT14-PART-ARL

- Ø40mm x 160mm
- standard roller spare

### BENDURANCE ANTI-STATIC RUBBER ROLLER

BT14-PART-RCL

- Ø40mm x 160mm
- alternative to the aluminum roller

### BENDURANCE SPARE PART SET

BT14-PART-SET1

- 1 pcs Proximity Trigger Sensor
- 1 pcs Pneumatic Speed Controller Valve
- 1 pcs pressure regulator for nip and web-tension
- 1 pcs 5 port valve for nip and tension
- 1 pcs air supply filter/regulator
- 1pcs bearing unit for rubber roll
- 1pcs bearing unit for stainless steel nip roll
- 1pcs bearing unit for tension roll joint
- 1pcs bearing for Ø40 mm aluminum roll
- 1 pcs bearing for stainless steel nip roll
- 1 pcs start/Stop switch
- 1 pcs index mode selector switch
- 1 pcs index mode switch contact block



**SPARE PARTS**

<b>Product</b>	<b>Code</b>
Tagsurance Controller Server	TSC-SPA-SRV
Ethernet Switch (PoE), size, power output and number of ports varies based on rack (ESW1/8/12) where the number matches the rack U-height.	TSC-SPA-ESW1/8/12
Ethernet Router	TSC-SPA-ERT
Lane Controller	TSC-SPA-LCC
Controller Rack Power Strip	TSC-SPA-POW
SICK Rotary Encoder	TSC-SPA-ROT
SICK Contrast Trigger Sensor with Cable to Lane Controller	TS3-AC-KT3
SICK Color Contrast Trigger Sensor with Cable to Lane Controller	TS3-AC-KT4
Ethernet Cable, specify the length(s) needed	VHT-AC-EC
Rotary Encoder cable, 8-pin, 5,0 m	TSC-SPA-ROC
Trigger cable, 4-pin, 5,0 m	TSC-SPA-TRC
Power Source and Power Cable for Tagsurance HF	VUT-AC-ACP
Racks	4U: TSC-SPA-4UR 8U: TSC-SPA-8UR 12U: TSC-SPA-12UR
Station IO Cable	TSC-AC-SIO
<b>Services</b>	<b>Code</b>
System Commissioning and Training	TSC-EN-SCT
Packing, robust, recyclable plywood crate	SH-TSC-XUX

# Buying Guide

## 1. How many lanes?

- 1. Select the controller in suitable rack size:**
  - 1 LANE TSC-HW-4U1
  - 1-4 LANES TSC-HW-8U1
  - 1-8 LANES TSC-HW-12U1
- 2. Add System License** TSC-SW-XUX
- 3. Add additional lanes (add both codes for additional lane)** TSC-HW-LAD and TSC-SW-LAD
- 4. Example product codes for 5 Lanes**
  - TSC-HW-12U1
  - TSC-SW-XUX
  - 4 x TSC-HW-LAD
  - 4 x TSC-SW-LAD

## 2. Select Test Stations

- UHF, NFC, or both
- One of more stations per lane
- Bad Tag Marker
- Other stations

## 3. Select Coupling elements and Cables

## 4. Select Other Accessories and Spare Parts

- Additional triggers
- IO Breakout

## 5. Add Services

- 1. Optional**
  - System commissioning and training TSC-EN-SCT
- 2. Mandatory**
  - Packing, robust, recyclable plywood crate SH-TSC-XUX
  - Shipping

## Key Questions for Use Case Definition

To help us prepare an accurate quote, and to help select system components, please be prepared to discuss the following items with Voyantic technical sales.



### MACHINE AND TAG MATERIALS

#### Speed

- m/min OR tags per second
- pitch (min/max)
- tag antenna dimensions
- chip(s) used (may affect speed)
- affects:
  - available test time, how many tests can be conducted
  - whether more than one station of the same type is needed on one lane to achieve the wanted speed

#### Lanes

- 1-8
- How many stations are needed, usually one per lane but in special cases where demanding speed requirements, may be two or even more?
- Controller rack selection

#### Available space in the machine

- Will the coupling elements and potential bad tag marker fit?
- Where to install the trigger and the rotary encoder?

# We help companies **excel** in RFID.

Voyantic solutions are designed to speed up development, improve production quality, and increase sales of RFID technology. We have a proven track record with 1500+ 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 Taiwan Office & Lab  
APAC Director\_Mr. Smoos PENG  
亞太區總監\_彭建賓先生

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