



Voyantic

Integration Guide

Tagsurance 3

10/2026

1. Table of content

Contents

- 1. Table of content 1
- 2. Introduction..... 1
- 3. Overview 2
- 4. Mechanical integration..... 3
 - 4.1. Mounting of Tagsurance 3 controller and (SL-UHF and/or HF) testers 3
 - 4.1.1. Heat management 3
 - 4.1.2. Cable management 3
 - Standard trigger sensor installation..... 4
 - 4.2. Rotary encoder installation 4
 - 4.3. Snoop Pro coupling element installation 5
 - 4.4. HSAJET Micron marker installation..... 7
- 5. AC Power 7
- 6. User Interface, Network, and Data Integration 8
- 7. Automation - I/O Integration..... 9
- Appendix A Alternative trigger sensor selection 10
- Appendix B Installation cable diagram examples 11

2. Introduction

The Tagsurance 3 system is a turnkey solution for testing UHF and HF RFID tags in tag production machines. It is optimal but not limited to being used in chip attachment, label converting, and final personalization stages.

Voyantic delivers the Tagsurance 3 system with stations conducting tag testing. The trigger signal to the system can come either from the machine or from a trigger sensor delivered by Voyantic. Depending on the use case, we strongly recommend connecting the trigger sensor to Tagsurance 3, as trigger filtering features, such as pattern filtering, are then available. Tagsurance 3 comes with its own rotary encoder for location sensing. All IO signals necessary for operating the system are handled within the system itself and do not need interfacing with the machine. Optionally, IO signals can be generated to interface with a wide selection of machines (slow speed, normal speed, stop, warning, etc. etc.).

The purpose of this document is to describe the integration of the Tagsurance components in detail, helping you to make the installation a success. The focus is on mechanical integration since I/O and network integration are not necessary, although they are mentioned as well.

While some of the information is also shared in the Tagsurance 3 manual, this document does not replace it. We recommend that you also read the Tagsurance 3 manual for the integration. The Tagsurance 3 manual is available from <https://voyantic.com/download/user-manuals/>.

3. Overview

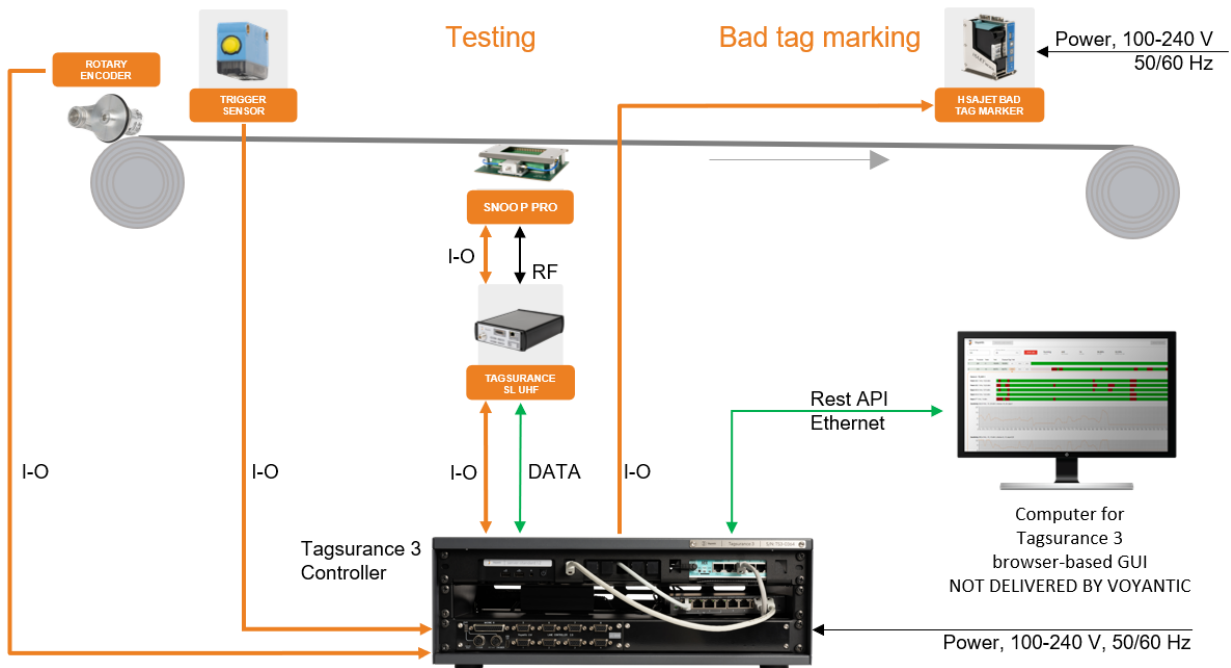


Figure 1. Overview of a single lane Tagsurance 3 system

Figure 1 shows the overview of a typical 1-lane Tagsurance 3 system. We will use this as an example.

Voyantic also sells multi-lane systems, in which case the rack will contain more lane controllers, and the “Testing” and “Bad tag marking” components are multiple as well (Trigger sensor and Rotary encoder are always singular).

The 1-lane Tagsurance 3 system’s main components are:

1. General: Tagsurance 3 controller rack with one-lane controller
2. Lane movement and location sensing:
 - Rotary encoder
 - Trigger sensor
3. RF Testing:
 - UHF or HF Snoop Pro coupling element
 - Tagsurance tester (SL-UHF or HF)
4. Bad tag marking: (always after the stations in the testing area)
 - Puncher or marker
5. Computer for User Interface (**NOTE: Not delivered by Voyantic**):

Connection to the Tagsurance 3 controller via Ethernet.

System requirements for the separate computer & display are:

 - Intel Core i5-10210U or equivalent in single and multi-thread performance based on <https://cpubenchmark.net>
 - Full HD (1920*1080) or higher screen resolution
 - keyboard and mouse

4. Mechanical integration

While each manufacturer has its own accessories for mounting its sensors, there is also a choice of generic mounting solutions. Some examples:

- Aluminium profiles offer an easy way to create custom mounting solutions. They are available from a wide selection of vendors.
- **Balluff** has a flexible mounting system that we have seen used successfully by some of our customers: <https://www.balluff.com/en-de/products/areas/A0017/groups/G1706/products/F17610?>
- **SICK** offers generic mounting solutions: <https://www.sick.com/il/en/accessories/c/accessories#g113368>

4.1. Mounting of Tagsurance 3 controller and (SL-UHF and/or HF) testers

It is important to consider several factors when installing the Tagsurance 3 controller and testers:

- Heat (and to a lesser extend dust) management
- Cable management

4.1.1. Heat management

When installing the Tagsurance 3 controller and testers, please be aware that their maximum allowed environmental temperature is 30° Celsius (86 Fahrenheit). We recommend that they are not placed in an enclosed small area without any active cooling. Stacking of testers is not allowed, since this will increase the internal temperature of each tester.

NOTE: While both the HF and SL-UHF testers are fully enclosed, the Tagsurance 3 controller is an open rack, which can collect dust internally.

TIP: Voyantic offers a holding rack with cooling fans (TSC-AC-HRC) which can house 4 testers (HF and/or UHF) in it.



4.1.2. Cable management

The Tagsurance 3 system is delivered with as good as all the cables that are needed for a standard installation. Some cables cannot be standardized (for instance: special station cables, Machine I/O cables, or unknown marker cables)

When installing components, please make sure that they are easily accessible, to ensure easy fault finding in case that is needed.

The system does not come with cable managers or labelling systems or other accessories to organize the cable management. For a structured installation we recommend (especially for multi-lane systems):

- Cable managers (horizontal and vertical) for clean routing
- Cable ties and fasteners for secure bundling
- Labelling systems for cable identification
- If needed, pass-through panels and grommets for protected entry point



In Appendix B you will find examples of cable diagrams for single and multi-lane installations, including estimated cable lengths. These will help you with finding a good location for the Tagsurance 3 controller rack and testers.

Standard trigger sensor installation

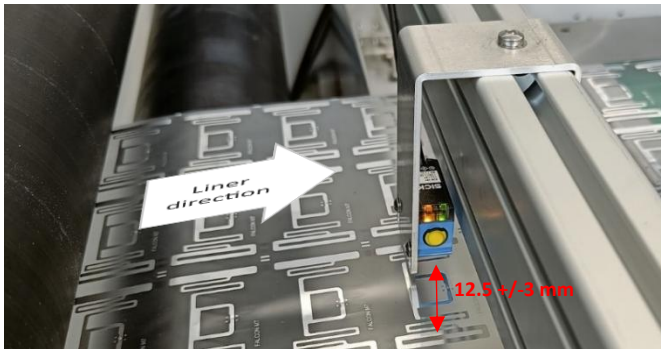


Figure 2. Trigger sensor: SICK KTM-WP11172P

The product datasheet, mounting accessories, and other integration accessories for this sensor can be found here:

<https://www.sick.com/ch/en/contrast-sensors/ktm-prime/ktm-wp11172p/p/p455245>

In case the contrast sensor is not suitable for your material, there is an appendix with alternative trigger sensors at the end of this document.

TIP:

To support easy triggering setup on different layouts, mount the trigger sensor so that you can easily adjust its lateral position over the liner (from the “gear” side to the operator side on the machine) without altering any other distances.



4.2. Rotary encoder installation

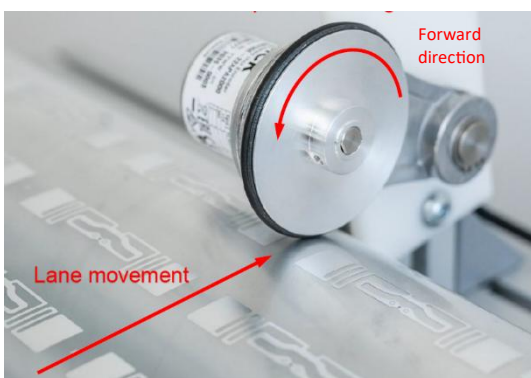


Figure 3. Rotary encoder

Place the Rotary Encoder against a roll that rotates at the liner speed. Check that both the Rotary Encoder and the liner do not slip against the roller.

Figure 3 shows the forward rotating direction. You can also configure the “Reverse” direction in the Tagsurance 3 Lane configuration, so you are free to install the rotary encoder in any way that suits you best.

As long as there is no slip between the roller and liner, you can position the rotary encoder directly against the roller or against the liner.

The cable between the rotary encoder and the Tagsurance 3 rack is 5 meters (15 feet).

TIP:

The original rotary encoder wheel is working very well on metal or any hard surface rollers. We recommend using a measuring wheel with a larger surface area for rubberized rollers to prevent the wheel from pushing too deep into it. For example, the SICK BEF-MR08200AP.



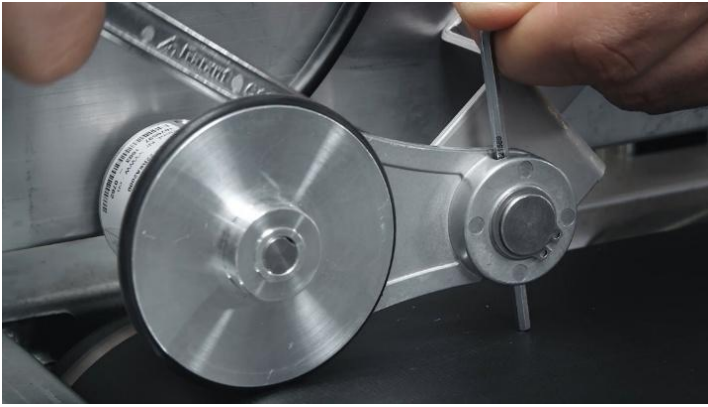


Figure 4. Mounting of the rotary encoder

TIP:

The Rotary Encoder has a spring-loaded mount which helps to keep the rotary encoder pushed against the roller. Make sure that this is installed correctly: <https://youtu.be/e30oN7FJsfc?t=50>

4.3. Snoop Pro coupling element installation

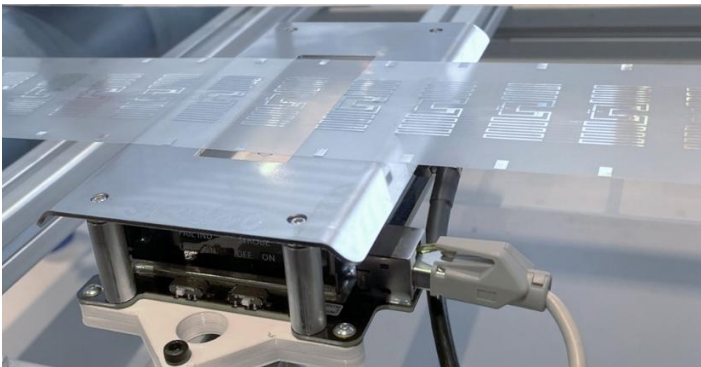
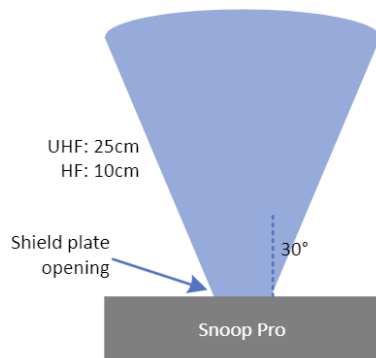


Figure 5. Snoop Pro 2.0 coupling element mounted under the liner.

NOTE:

Ensure that there is enough space for the Strobe light connector and the RF connector and cable.

Recommendations and considerations when installing a Snoop Pro coupling element:



- The centre line of the inlay coupling element should cross the Snoop Pro coupling element's centre line (as in Figure 5).
- It is recommended to have the area above the coupling element free (or have a minimum) of conducting materials. The recommended “free” area is a 3-dimensional conical shape area above the coupling element opening:
 - UHF: 25 cm (10 inches)
 - HF: 10 cm (4 inches)
- It is very important to have a “consistent environment” of conducting and reflecting materials in this area so that measurements are comparable.

Figure 6. Coupling element shield-plate opening and ideal free area

- The liner with the tags should touch the shielding plate of the coupling element. A gap between the liner and coupling element creates a risk of cross-reading. On “naked liners”, to prevent damage to the IC, the IC side of the liner must not be on the coupling element side.
- The cable between the Snoop Pro coupling element and the Tagsurance test device is 1.8 meters (6 feet). The Snoop Pro has an SMA-type coupling element connector. When connecting the cable, make sure to fully tighten it, yet not exceeding 1 Nm torque.
- The Snoop Pro coupling elements are wider than the antennas on the inlay. In multilane applications, coupling elements need to be “staggered” (Figure 7).



Figure 7. Snoop Pro mini coupling element mounted staggered under a multi-lane liner.

- Coupling elements can be close to each other (shielding plates touching). But a 15 mm gap is recommended for usability, for making small adjustments, mounting, and dismounting easier.

TIPS:

Latest versions of Snoops have a Strobe/Fault light connector. Ensure that the cable can be connected to this in your installation.

For easy setup of different layout jobs, especially important for multi-lane:

- Mount the coupling element(s) in a way that they can easily be moved 90 degrees on the liner direction without changing the other dimensions, such as the distance from the trigger sensor and height.
- Adding an indicator showing the coupling element's location enables documenting the location of the coupling elements for each job. This simplifies and speeds up the setup process each time the machine needs to be set up for a similar job.
- Document the shielding plate (opening size) you use for each job.

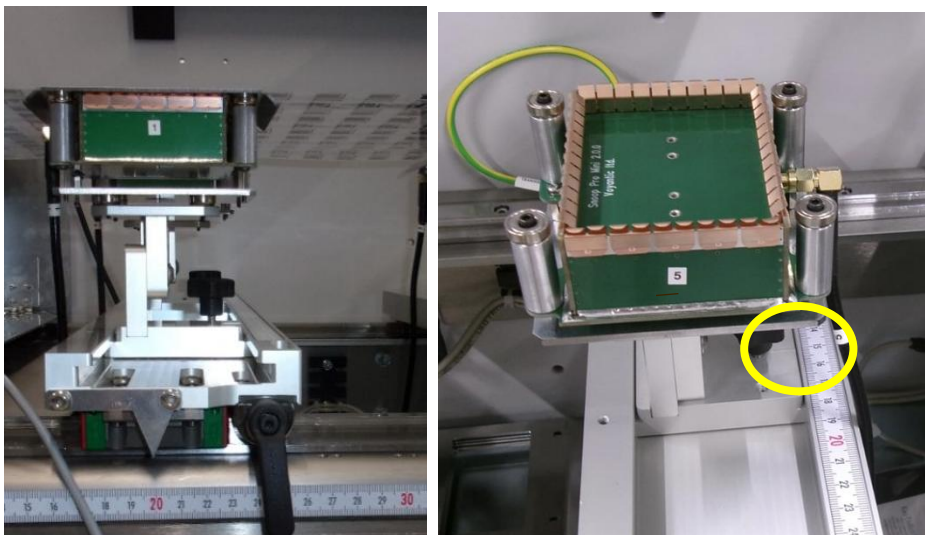


Figure 8. Easy setting up of coupling element positions with location indicators.
Pictures taken from the Voyantic Station Installation Kit

4.4. HSAJET Micron marker installation



Figure 9. Example of bad tag markers with location indicators and height adjustment

Bad tag markers should be installed after the test stations (with some exceptions), so that the bad tag marker can mark tags based on the test stations' PASS/FAIL results.

While many bad tag markers can be used with the Tagsurance 3 system, we will only describe the installation of the HSAJET Micron, which is also available from Voyantic.

Installation considerations for the HSAJET Micron:

- The official distance from the web is 0.5-2mm. However, ENSURE that the bad tag marker will never touch the liner-material. It is better to have slightly more distance than to touch the material and possibly damage tags.
- Make sure to have the side with the buttons and LEDs facing the operator. The operator needs to see the LED indicators and press some of the buttons now and then.
- Leave space for a USB stick to be inserted, which is needed to set up the marker for different ink types.

NOTE:

The bad tag markers come without ink cartridges. Please make sure you have ink cartridges before testing the system.

TIP: For easy setup of different layout jobs, especially important for multi-lane:

- Mount the bad tag marker(s) in a way that they can easily be moved over the liner without changing the distance from the trigger-sensor and height dimensions.

5. AC Power

The Tagsurance 3 system comes with a replaceable, locally suitable power cable:

- **Voltage rating:** 110 – 240 VAC, 50/60Hz
- **Maximum current consumption:** 10A in 230VAC, 20A in 115VAC.

There are 4 different power cords available:

Type F, EU:



Type B, US:



Type G, UK:



Type I, China:



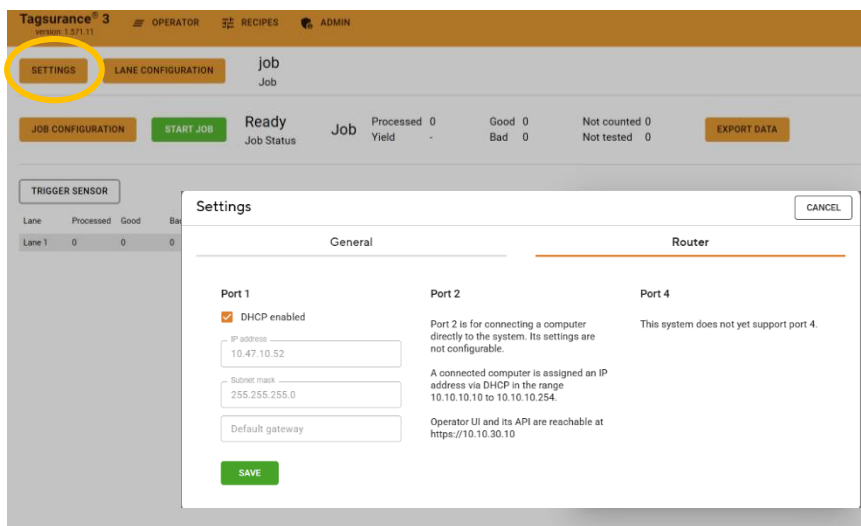
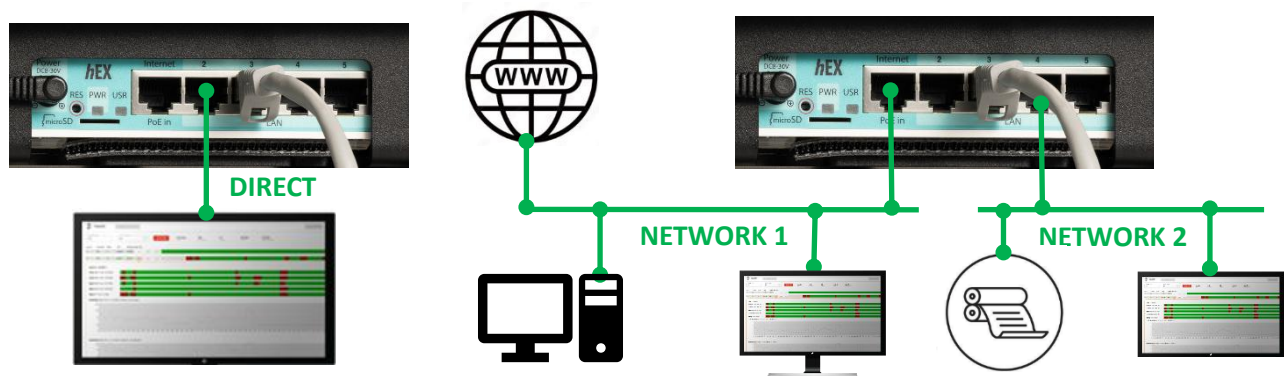
In case you use HSAjet Micron bad tag markers; please note that these have their own AC power supply (one for each HSAjet). This power supply has also a voltage rating of 110-240VAC,50/60Hz. Check Appendix B for cables lengths.

6. User Interface, Network, and Data Integration

An easily accessible and well-designed installation of the User Interface will be of great benefit for the operator to use the Tagsurance 3 system. While the computer and display specifications are mentioned in the Overview (chapter 2), ensuring that the User Interface is big enough and mounted in a good location is one of the easiest and cost-effective ways of making sure that the Tagsurance 3 system will be used effectively.

To access the user interface, a separate computer needs to have browser access to the Tagsurance 3 server:

- **Direct connection** through port#2 of the router. The Ethernet port on the computer needs to “Obtain an IP address automatically” (DHCP). Navigating the browser to <https://10.10.30.10> will access the Tagsurance 3 (password-protected) User interface.
- **Network connection** through port#1 (internet) and/or port#4 of the router. On both these ports, DHCP and static IP configuration is supported (settings in GUI), however **internet access is only supported through port#1**. Navigating the browser to the secure IP address “https://” will access the (password-protected) User Interface. If the Tagsurance 3 IP address on the network is unknown, connect directly to port#2 and set and/or access the network address from the “settings” button in the operator UI.



NOTE: Port #4 is in use only on systems delivered after September 2026. In the older systems, the port is not yet in use. Settings in the operator UI indicate whether the port is in use.

Figure 10. Direct and network connection to external computers, including network settings

A REST API interface is available to communicate with the system instead of (or in parallel with) the Voyantic GUI. If you want to utilize the REST API, don't hesitate to contact Voyantic for more information.

7. Automation - I/O Integration

No extra electrical IO is needed for many standard tag/label solutions.

However, the Tagsurance 3 has an additional DB25 connector, “Machine IO”, that can be used for more advanced electrical machine integrations.



Figure 11. Machine IO connector

Available signals on the Machine IO connector (both 24Vdc PNP and NPN):

- Tagsurance 3 status: Job running or not running
- Lot ready: Can be determined at a definable position on the line, for instance, a splicing table or an auto splicer. The machine can be slowed down before this event and stopped at the correct location if needed. (needs extra inputs in the PLC)
- Yield signals: Depending on the yield, warnings can be given, and/or the machine can be stopped
- Station status: Ready and Pass/Fail signals coming back from a test station.
- Lot failure limits: Take actions when the desired lot yield can no longer be met.
- Consecutive failures: depending on a set number of consecutive failures, the machine can be stopped, or other actions can be taken.

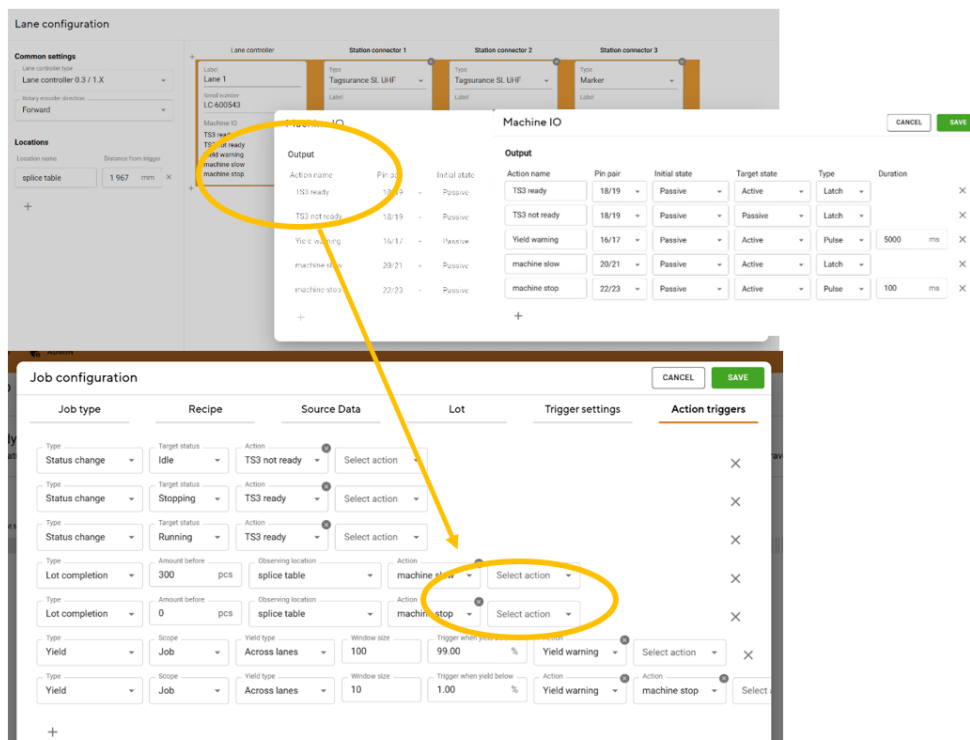


Figure 12. Location, Output definition, and Action trigger settings for the Machine IO

More signals are constantly being developed; if you are interested in utilizing these, we recommend you read the latest version of the Tagsurance 3 user manual: <https://voyantic.com/download/user-manuals/>.

You can also contact Voyantic for more information or a demonstration.

Appendix A Alternative trigger sensor selection

While the standard trigger sensor has been selected for its ease of use and versatility, some liner materials might need a different trigger sensor. We have tested several trigger sensors, all of which can be connected directly to the Tagsurance 3 controller without special cabling.



The standard trigger sensor (*SICK KTM-WP11172P Part nr. 1082138*) is always delivered with the Tagsurance 3 system. This is an easy-to-set-up contrast sensor with a light spot size of 1.5 x 6.5mm.



Color contrast triggering: this is offered by the *KTS-WB9114115AZZZZ* from SICK (part nr.: 1078126) or also available from Voyantic (part nr. TS3-AC-KT4). Through TwinEye-Technology, this sensor works more reliably with glossy and/or jittering materials. It can also detect more details through a smaller light spot size (0.9x3.8mm) and color recognition. More information here: <https://www.sick.com/ch/en/contrast-sensors/kts-prime/kts-wb9114115azzzz/p/p505059>



SICK WF Fork sensors are a very good option if you have (full or semi) transparent liner material that needs very precise object recognition (for instance, detailed pattern recognition) since this optical sensor can detect objects as small as 0.2mm. We have tested with the *SICK WF15-40B41CA00 (Part nr. 6058596)*, but other sizes will probably also work. Be aware that the liner material needs to have enough “look-through” contrast for this sensor to function properly. More information can be found here:

<https://www.sick.com/ch/en/fork-sensors/wf/wf15-40b41ca00/p/p417055>

Note: This sensor has a 4-pin M8 connector. You will need a “female 4-pin M8 to 4-pin M12 cable” to connect it to the Tagsurance 3 trigger input.



Capacitive triggering: We have tested the *Lion Precision LRD6300C*. This is a very good option when you have no visible marks on your material. It senses material changes within the liner. **This sensor has an accuracy of 0.05mm.** Please note that the liner material needs to go through a gap of 0.8mm with this sensor! So, special care should be taken, especially with exposed ICs on naked liners. More information on this sensor can be found here:

<https://www.lionprecision.com/products/lrd6300/>

Make sure you order the correct version with the 4-pin connector: LRD6300C.



Ultrasonic detection sensors like the *SICK UFN3-70P415 (Part nr. 6049679)* are another good option for liner material with no visible marks. With a fork opening of 3mm, it can detect labels or gaps between labels of 2mm or greater. More information: <https://www.sick.com/ch/en/fork-sensors/uf/ufn3-70p415/p/p291692>

This sensor needs a 4-pin female M8 to 4-pin M12 cable to connect to the Tagsurance 3 trigger input.



Inductive sensors like the *SICK IME08-04NPSZC0S (Part nr. 1051209)* are good options when you have no visible marks (or mixed marks) on the liner material. They work well with the conductive material of the tag antenna. This sensor has a range of approximate 3mm. More information is available from the SICK website: <https://www.sick.com/ch/en/catalog/products/detection-sensors/inductive-proximity-sensors/ime/ime08-04npszc0s/p/p228400>

Appendix B Installation cable diagram examples

Power cable: Connected to the rear of the Tagsurance 3 controller

Single-lane Tagsurance 3 controller: rear

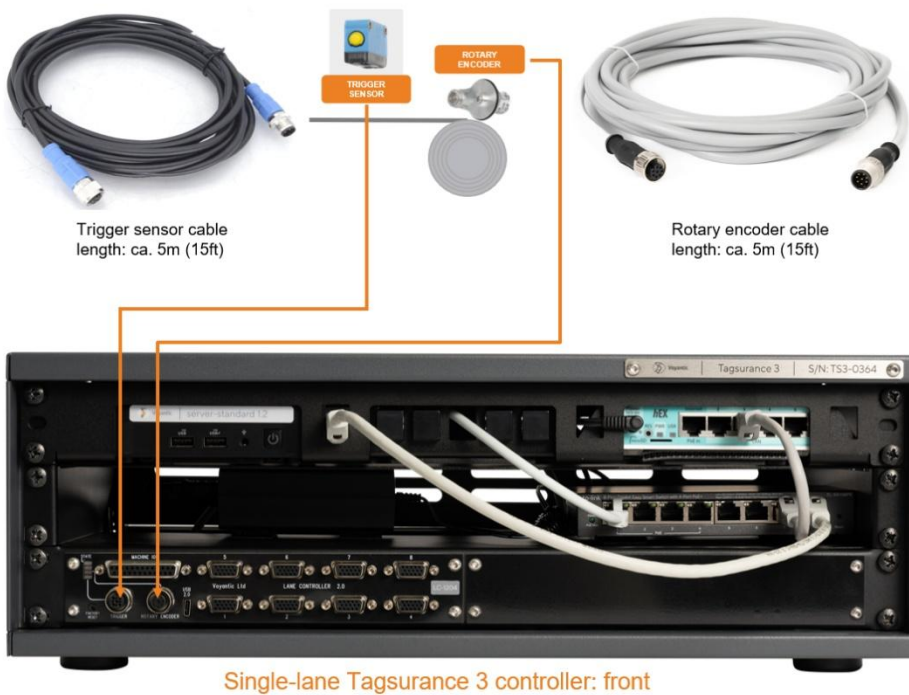


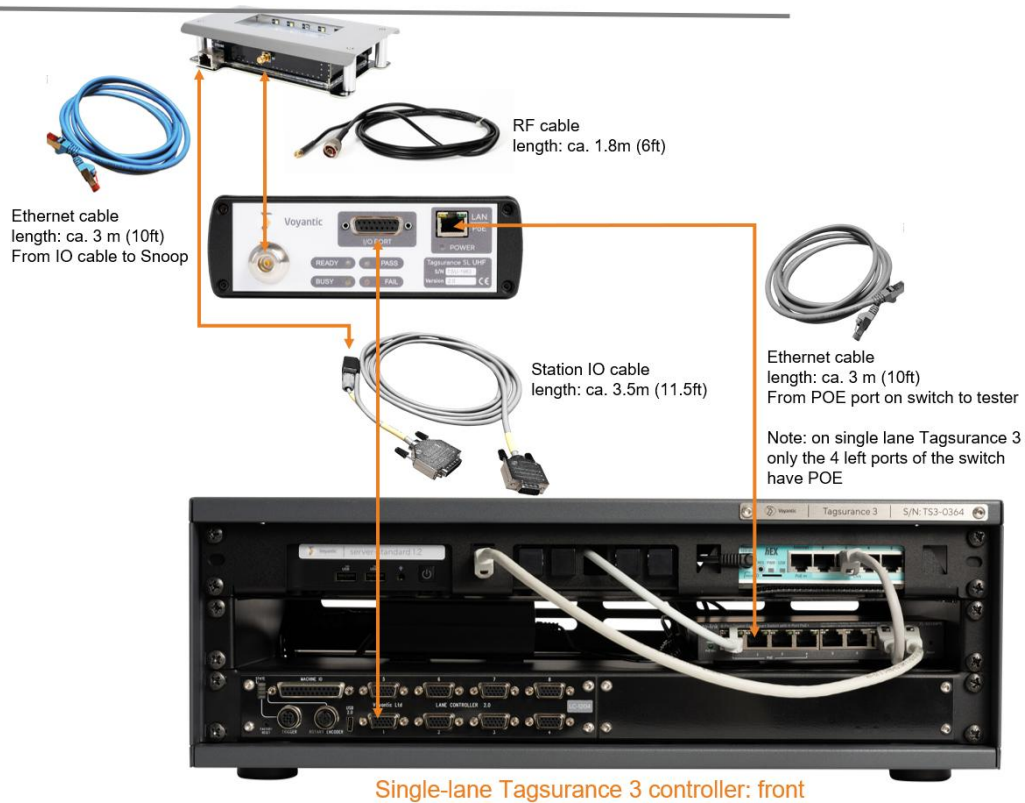
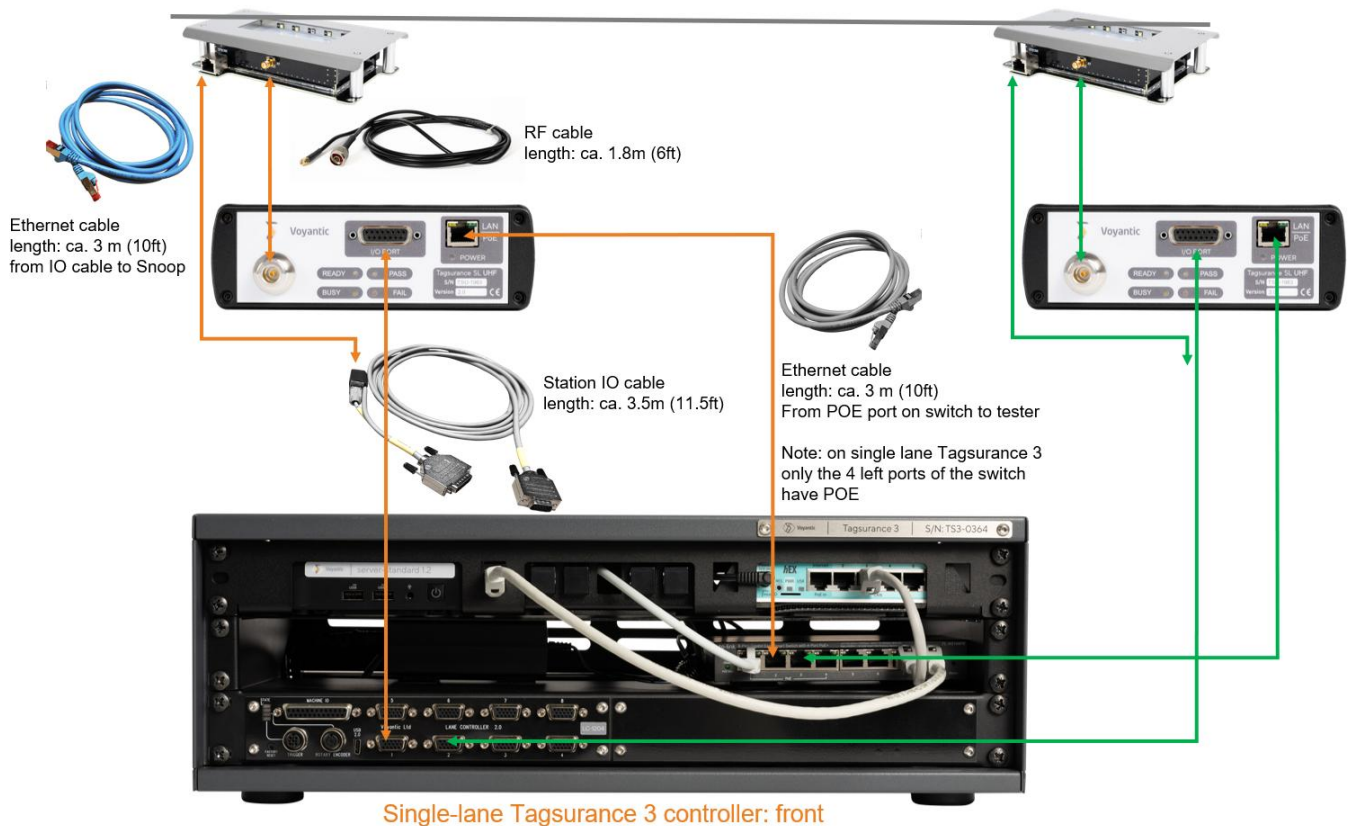
Multi-lane Tagsurance 3 controller: rear



Trigger sensor and rotary encoder cabling

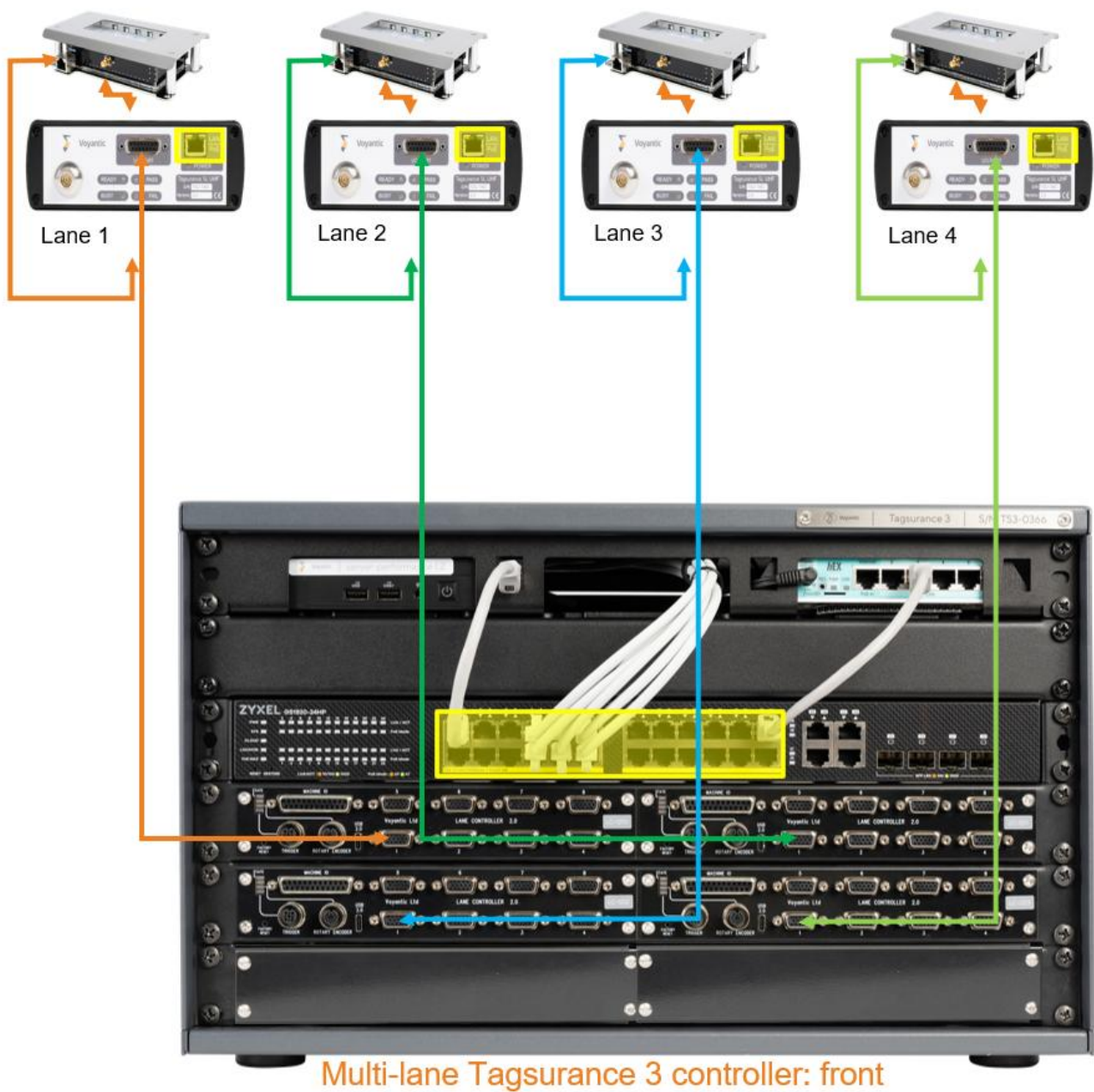
NOTE: on multi-lane systems, only one Lane controller needs to be connected (number not important)



SL-UHF (or HF) Tester cabling: single lane, single tester:**SL-UHF (or HF) Tester cabling: single lane, 2 testers:**

SL-UHF (or HF) Tester cabling: 4 lanes, 1 tester/lane: IO cables

NOTE: Each tester Power/Ethernet connector (marked yellow) needs to be connected to any of the yellow marked POE Ethernet switch ports.



HSA jet micron bad tag marker cabling

NOTE: The bad tag marker is generally the last station. In this example there are 2 testers used, so the bad tag marker is connected to the first free station connector: station connector 3.

For a comparable multi-lane system, each Lane controller would have the bad tag marker on station connector 3.

