WELCOME TO OUR PRESENTATION :

TAGTEC

Taggant Technology

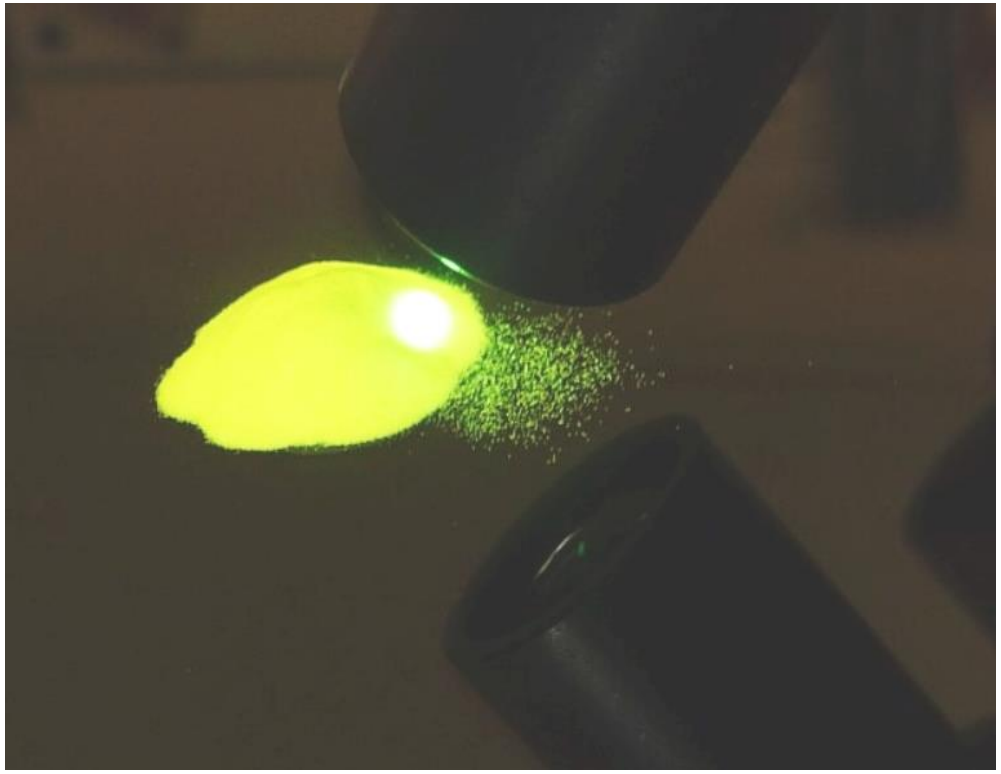
Sensor Instruments

Let's make sensors more individual

A brief introduction into the basics of taggant technology (TAGTEC)

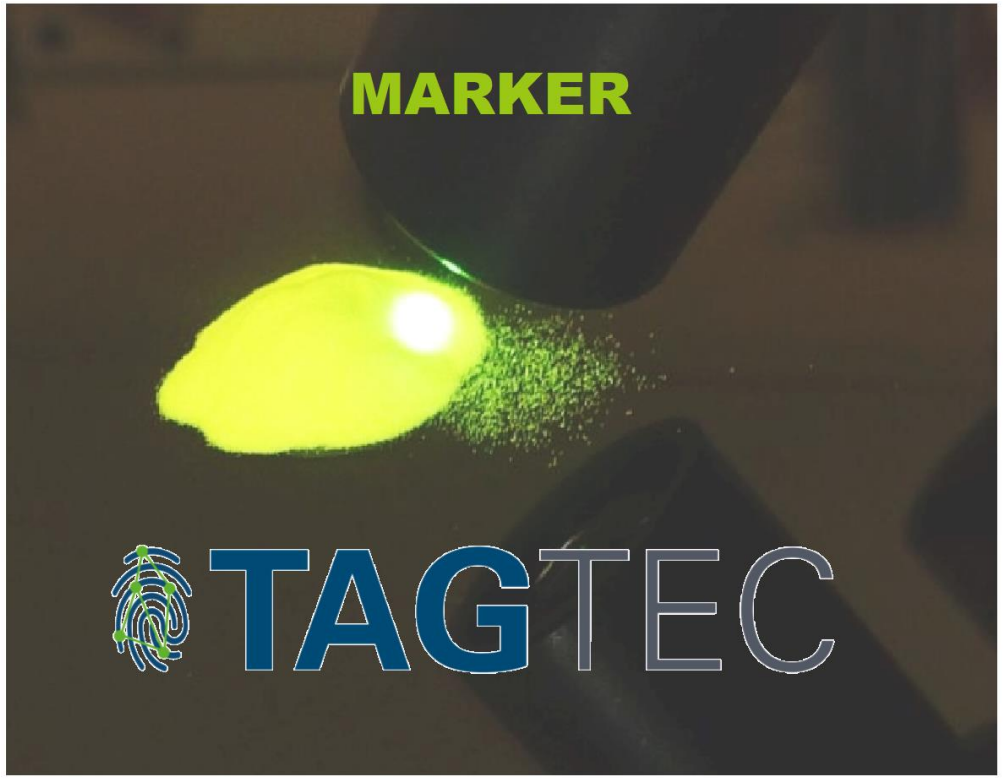
Realized by:


Sensor
Let's make sensors more individual
Instruments
GABRIEL-CHEMIE
GROUP
TAGTEC



It all begins with taggants, chemical markers with luminescent properties …

TAGTEC



with **TAGTEC** markers …

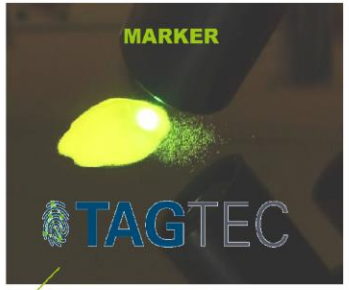
TAGTEC

TAGTEC
TAU-MARKER

TAGTEC
STAR-MARKER

with phosphorescent or fluorescent characteristics.

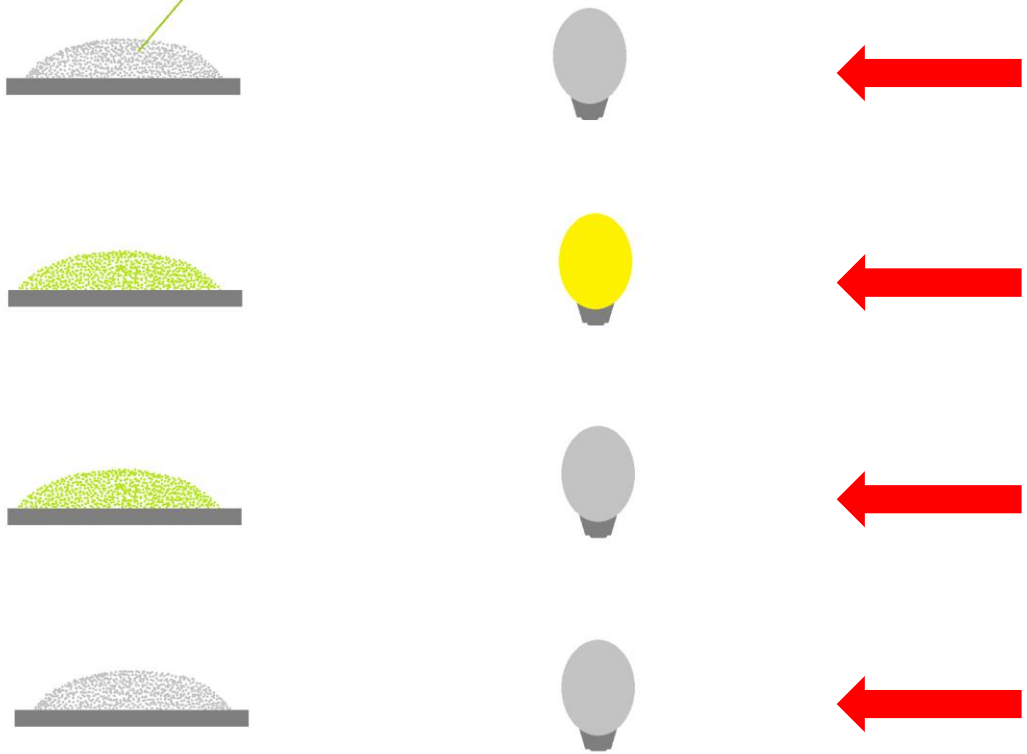
TAGTEC



TAGTEC
TAU-MARKER

phosphorescent

excitation
light source



Phosphorescent **TAGTEC** markers (TAU-MARKERS) are characterized by the afterglow effect, which means that the TAU-MARKER is still shining, even if the primary lightning source (excitation light source) is not present anymore.
Nevertheless, the emission of the excited **TAGTEC** TAU-MARKER approaches zero after a certain length of time (a few hundred microseconds).

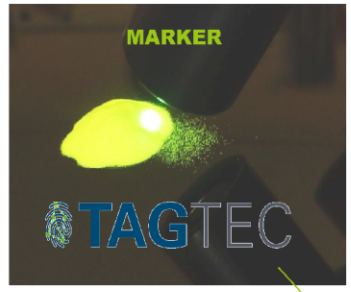
TAU-MARKER does not light,
excitation light source is off

TAU-MARKER is shining,
excitation light source is switched on

TAU-MARKER is still shining,
excitation light source is switched off

The shining of the TAU-MARKER extinguishes,
excitation light source is still off

Fluorescent **TAGTEC** markers (STAR-MARKERS) are shining as long as the excitation light source is on and the glow of the STAR-MARKERS disappear immediately after the excitation light is switched off.



TAGTEC
STAR-MARKER
fluorescent

excitation
light source

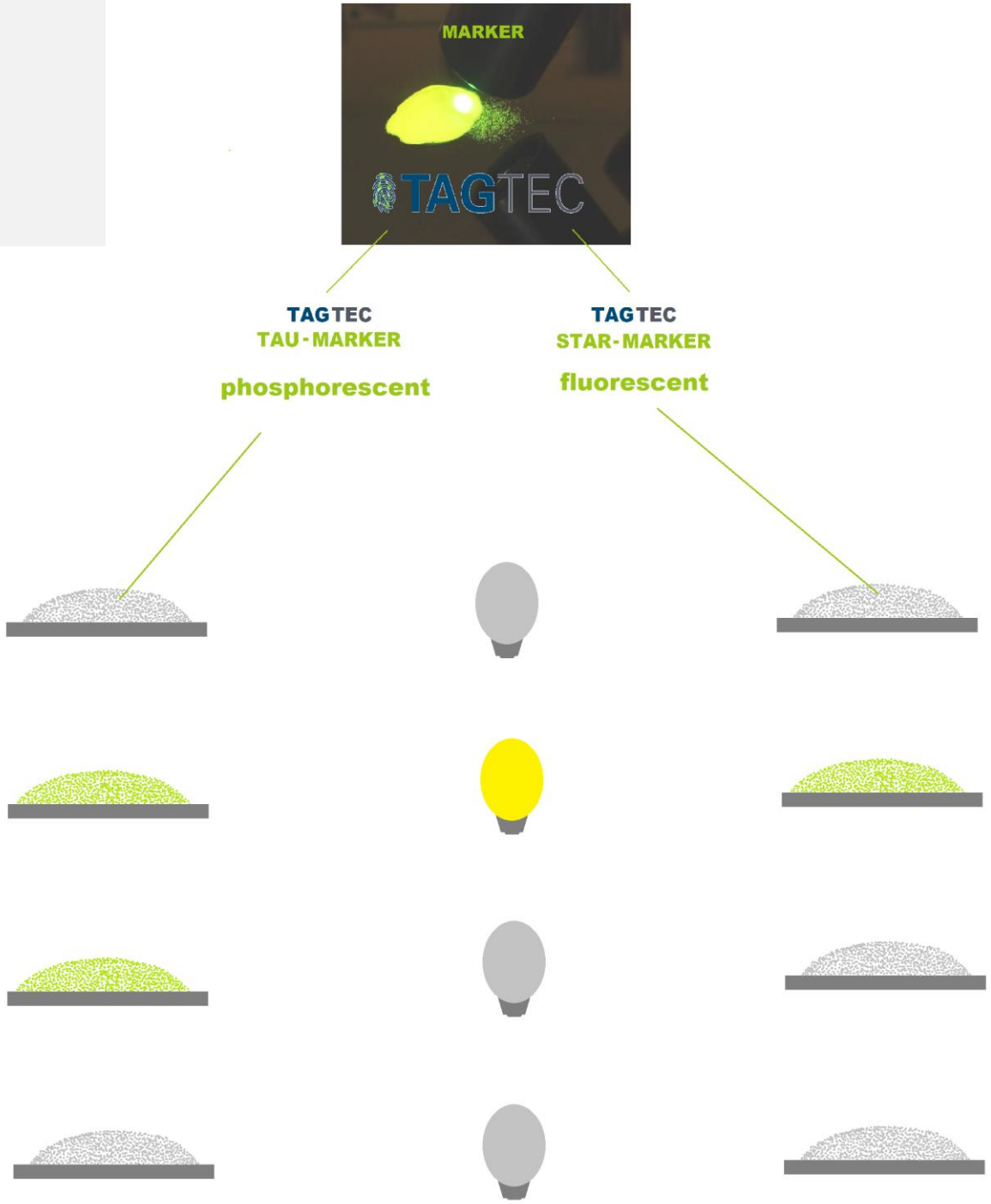
STAR-MARKER does not light,
excitation light source is off

STAR-MARKER is shining,
excitation light source is on

STAR-MARKER does not light,
excitation light source is switched off

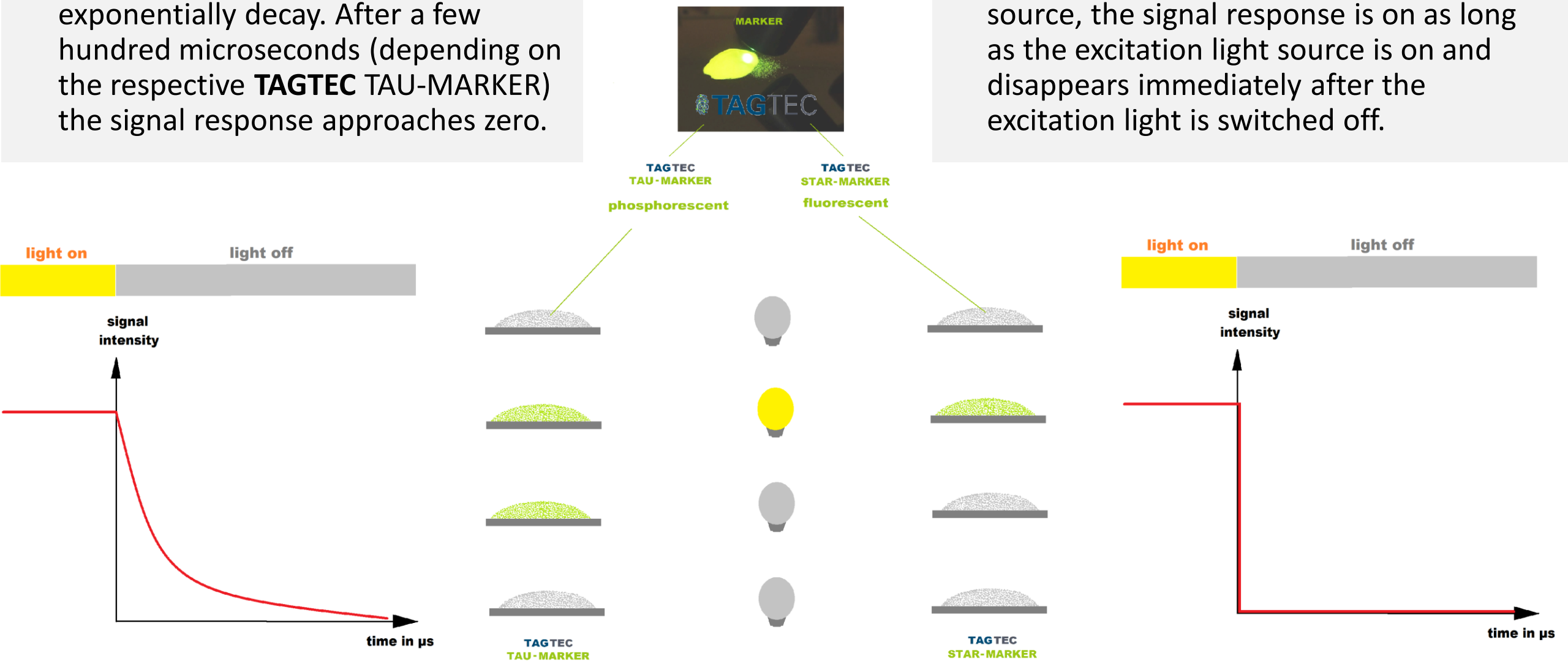
STAR-MARKER does not light,
excitation light source is off

Comparison of the two marker types:
TAGTEC TAU-MARKER / **TAGTEC** STAR-MARKER



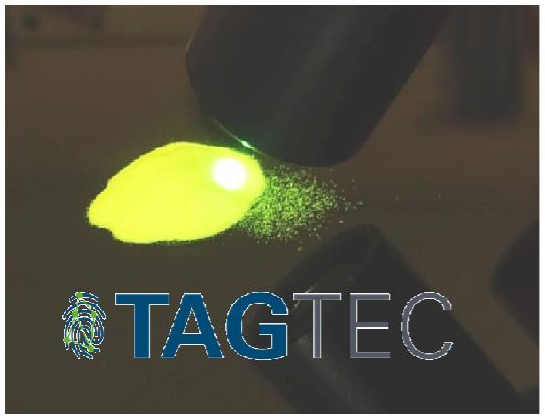
The decay behaviour of the **TAGTEC** TAU-MARKER after switching off the excitation light source is an exponentially decay. After a few hundred microseconds (depending on the respective **TAGTEC** TAU-MARKER) the signal response approaches zero.

The optical signal response of the **TAGTEC** STAR-MARKER has digital behaviour. Synchronously to the excitation light source, the signal response is on as long as the excitation light source is on and disappears immediately after the excitation light is switched off.



Now it is time to add the **TAGTEC** MARKER into the **TAGTEC** MASTERBATCH:

TAGTEC - MARKER

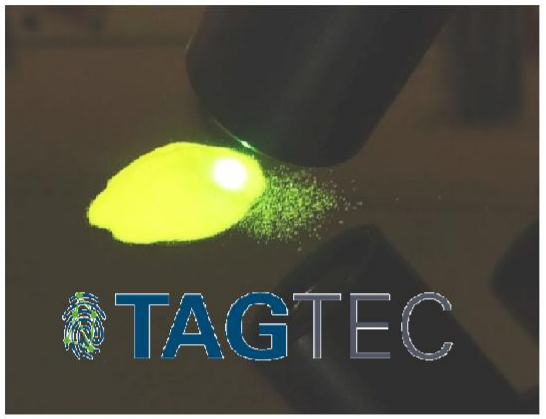


TAGTEC - MASTERBATCH

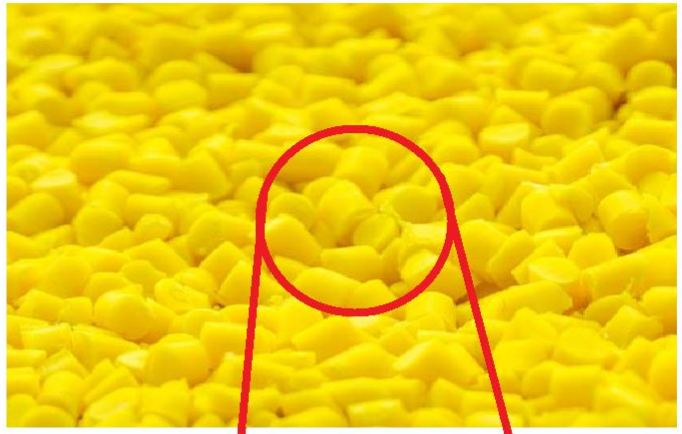
TAGTEC

Let’s have a look onto the **TAGTEC** MASTERBATCH with an excitation light source and a suitable camera:

TAGTEC - MARKER



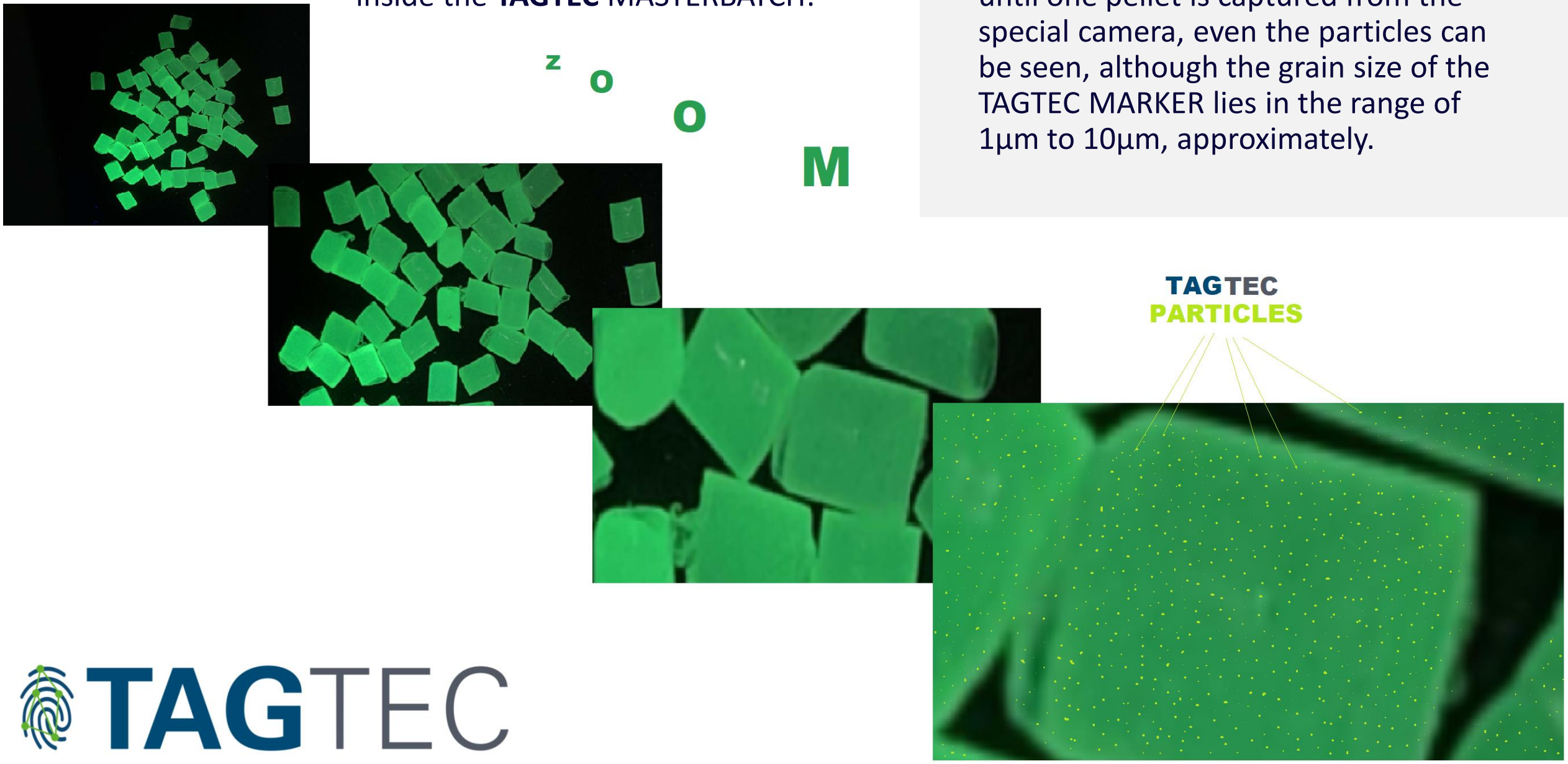
TAGTEC - MASTERBATCH



Das Granulat leuchtet in einem definierten Wellenlängenbereich:

Let’s have a look onto the pellets inside the **TAGTEC** MASTERBATCH:

z o o M

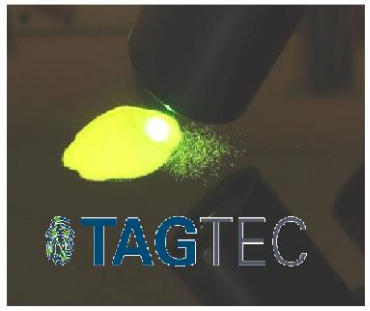


Zooming into the **TAGTEC** MASTERBATCH until one pellet is captured from the special camera, even the particles can be seen, although the grain size of the TAGTEC MARKER lies in the range of 1µm to 10µm, approximately.

TAGTEC

Time to create a product, more precise a plastic product with **TAGTEC** technology incorporated:

TAGTEC - MARKER



TAGTEC - MASTERBATCH

PRODUCT + TAGTEC

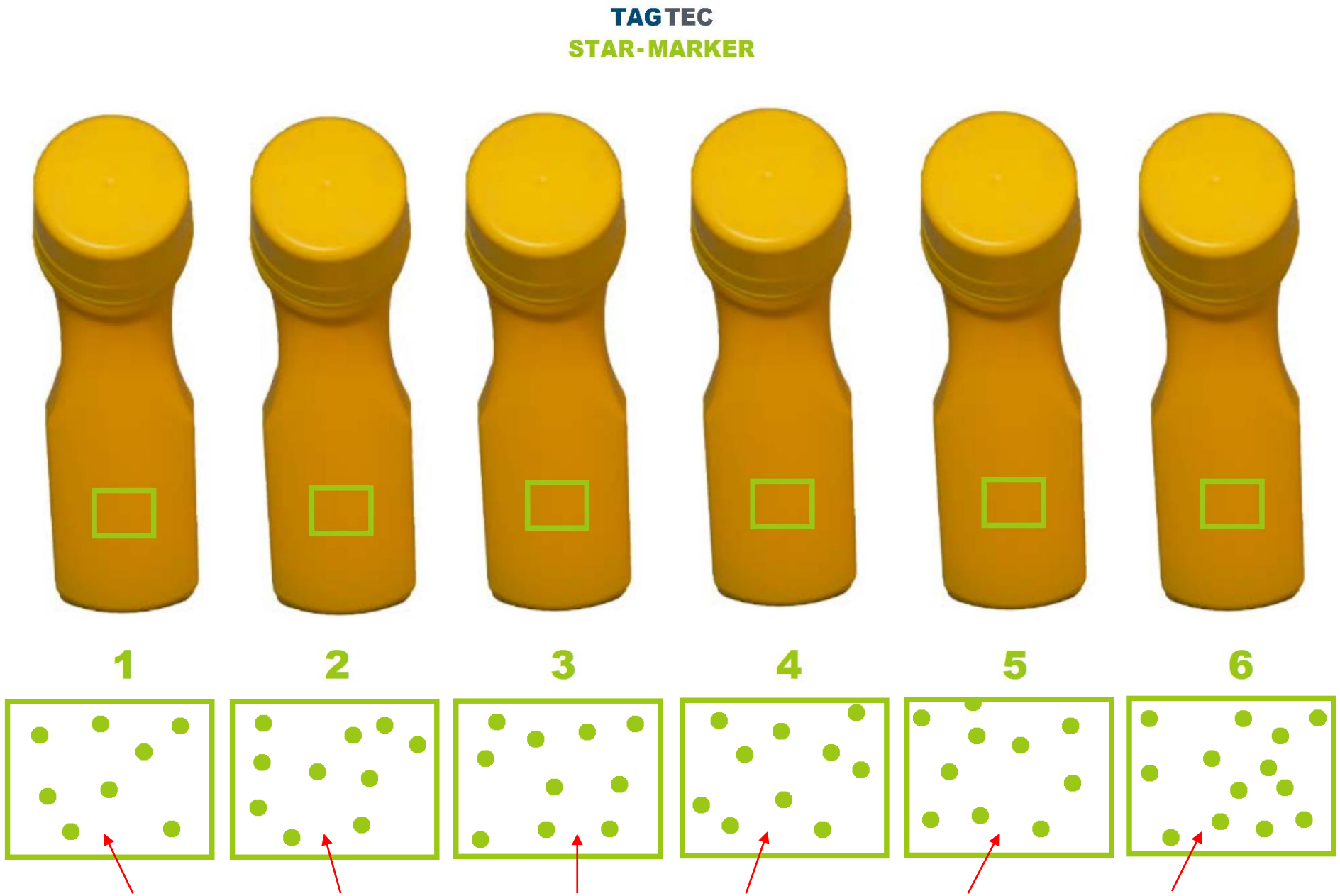
TAGTEC

It can be one **TAGTEC** TAU-MARKER, or for example three different **TAGTEC** TAU-MARKERS:

Or one of the available **TAGTEC** STAR-MARKERS is used:

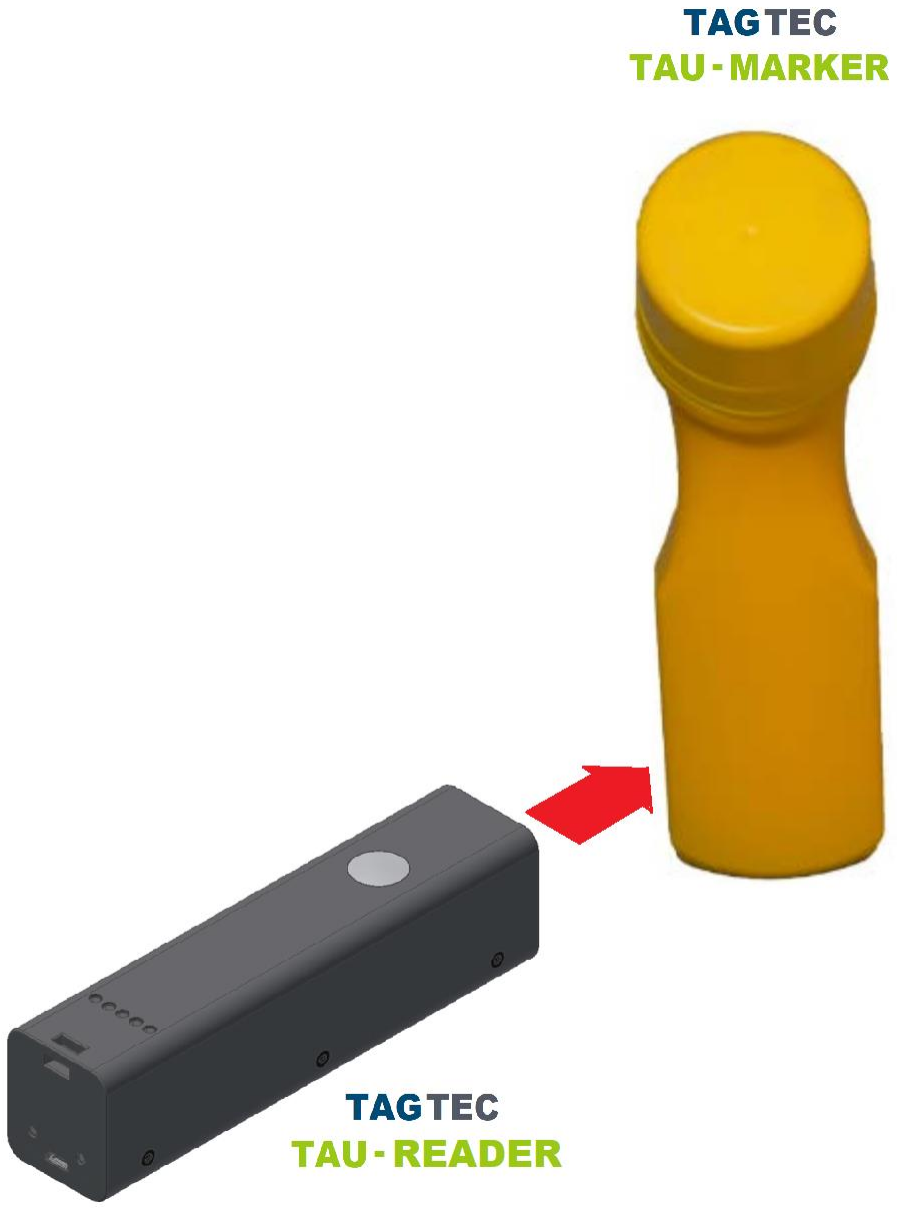
In case of using a **TAGTEC** STAR-MARKER, an individual encoding and decoding is given, because of the randomly distributed fluorescent marker particles inside the plastic matrix.

It must be ensured to use the same area (e.g. green frame) for coding as well as for encoding:



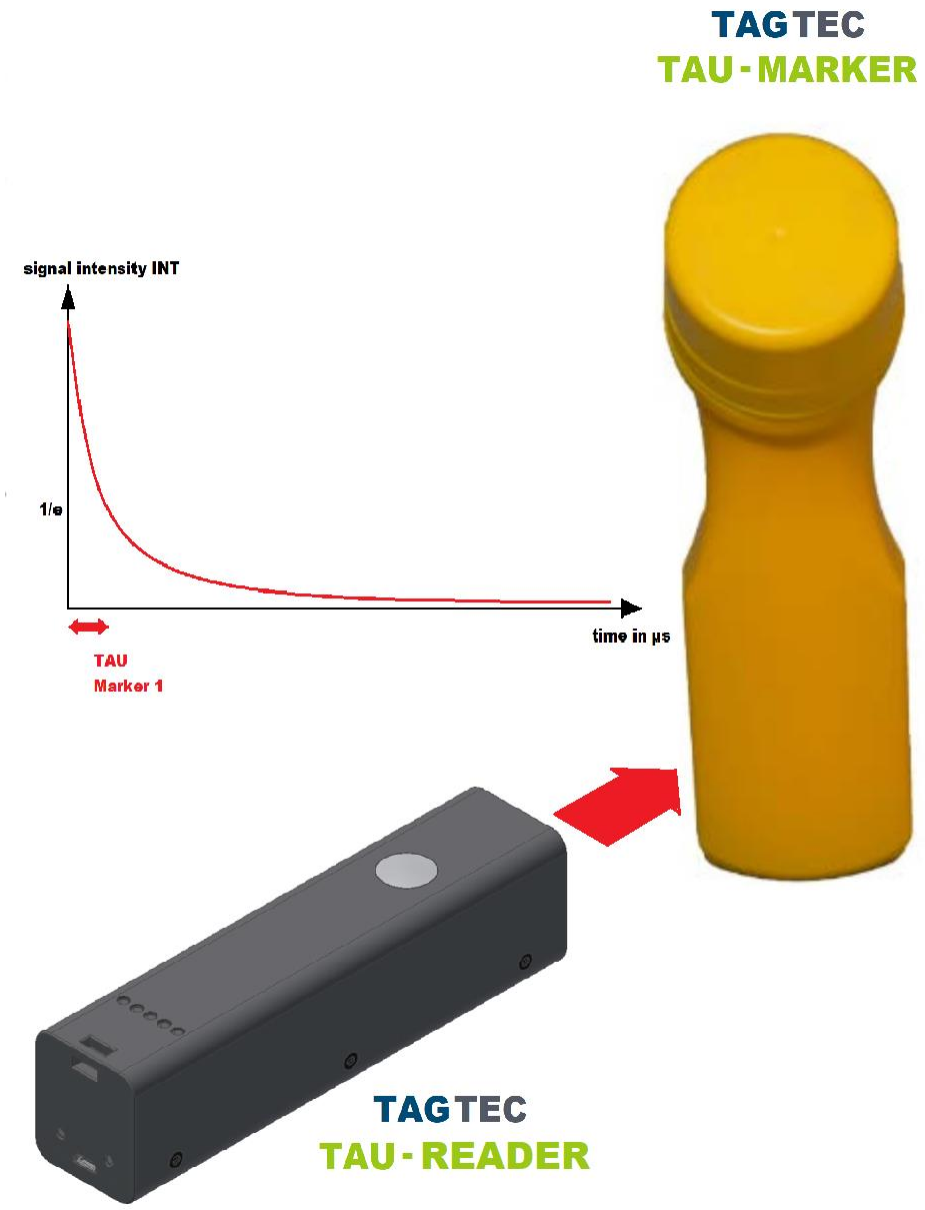
The **TAGTEC** particles are randomly distributed in the respective green frame, this fact allows the creation of an individual code, the so-called STAR–Code.

In addition to the **TAGTEC** MARKERS, there are several **TAGTEC** READERS available, for the **TAGTEC** TAU-MARKERS of course the **TAGTEC** TAU-READER:

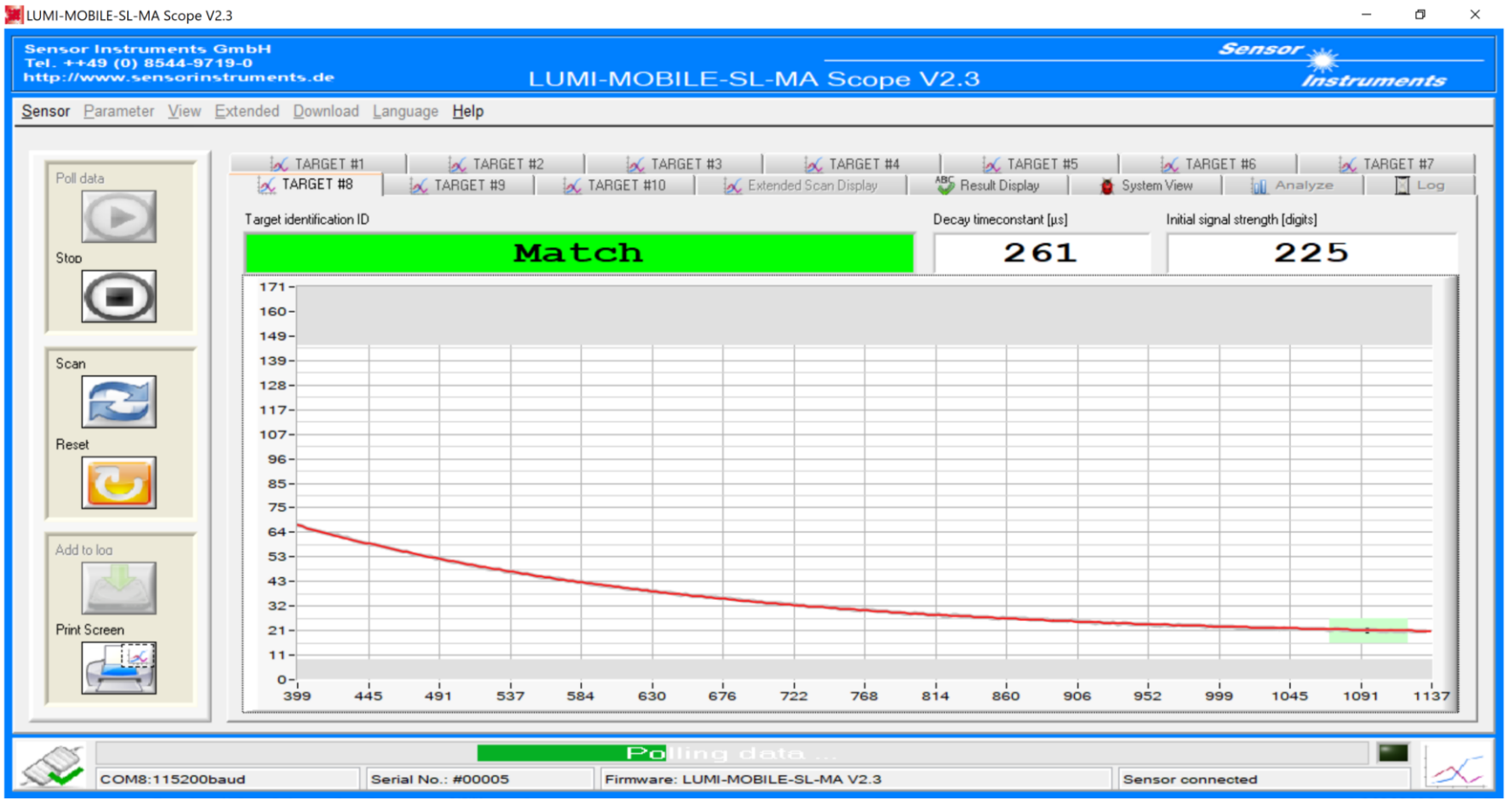


The **TAGTEC** TAU-READER informs about the time constant and intensity of the signal response. Once, the product is taught from a master unit, a slave unit shows the presence of the correct **TAGTEC** TAU-MARKER on its LEDs.

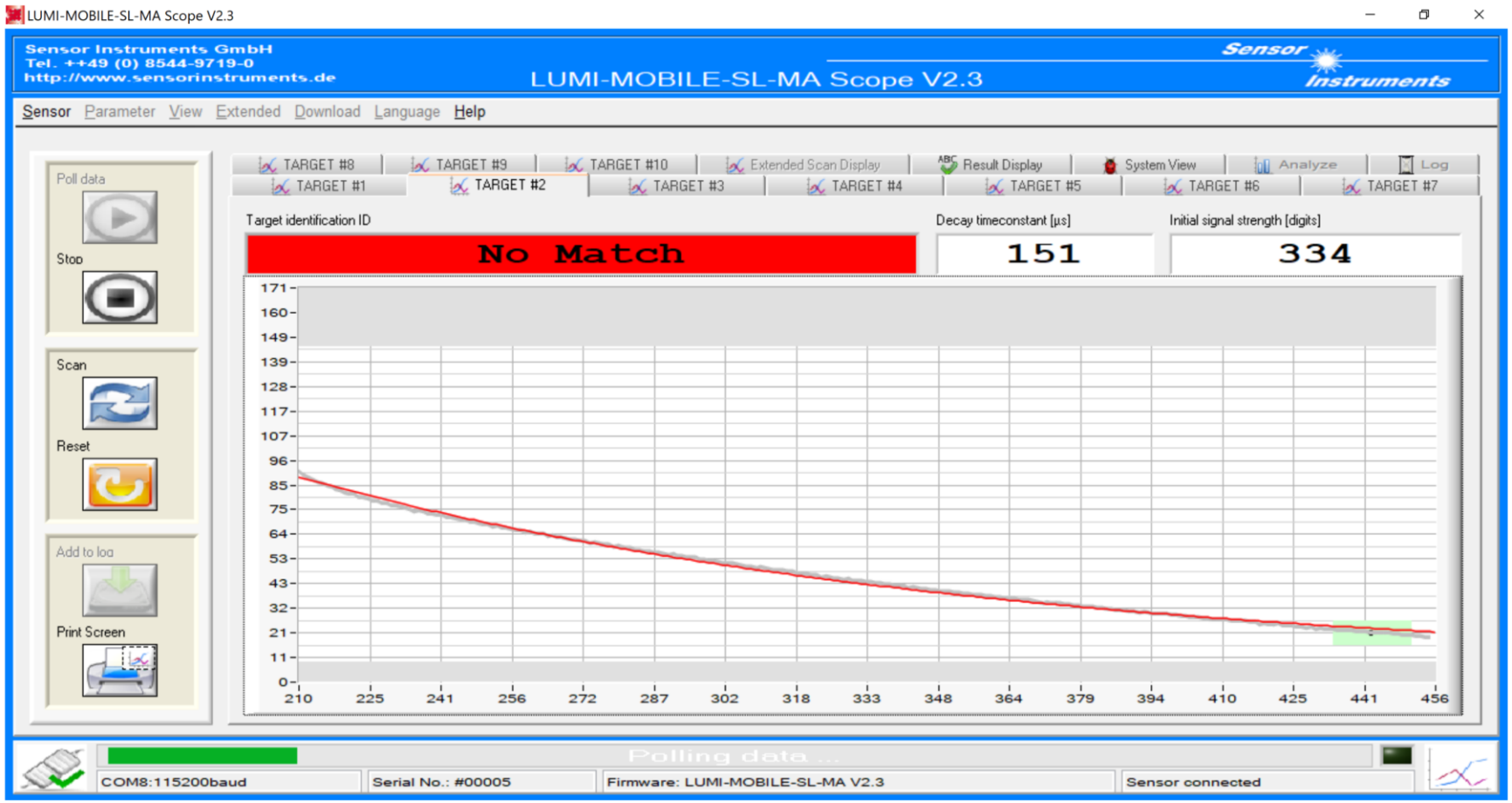
Furthermore, via a USB cable, the complete data can be read out in using the LUMI Scope Windows® software.



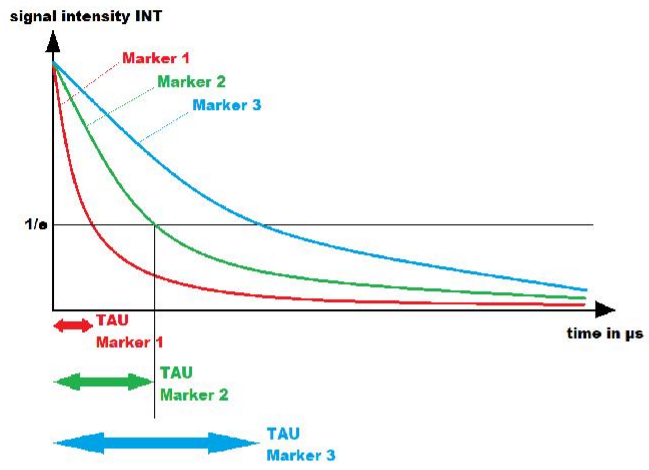
Detection of a valid TAU-MARKER:



Detection of an invalid TAU-MARKER:



The **TAGTEC** TAU-MARKERs taught by the **TAGTEC** TAU-READER (master) are displayed by the respective LED at the **TAGTEC** TAU-READERS (slaves):



TAGTEC
TAU-READER

TAGTEC
TAU-MARKER

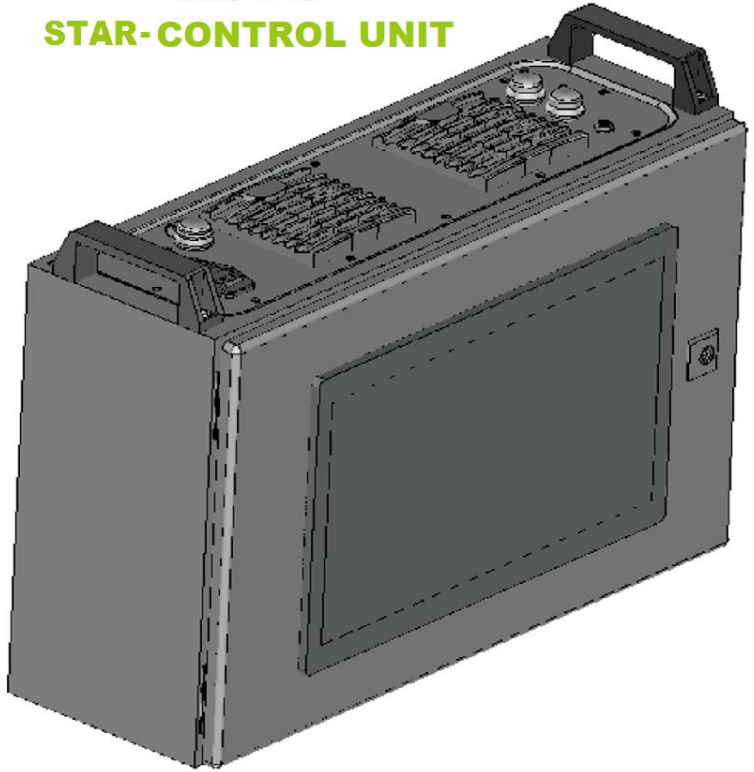
TAU 1

TAU 2

TAU 3

For the encoding process of **TAGTEC** STAR marked plastic products,
the inline unit of the **TAGTEC** STAR-READER is used:

TAGTEC
STAR-CONTROL UNIT

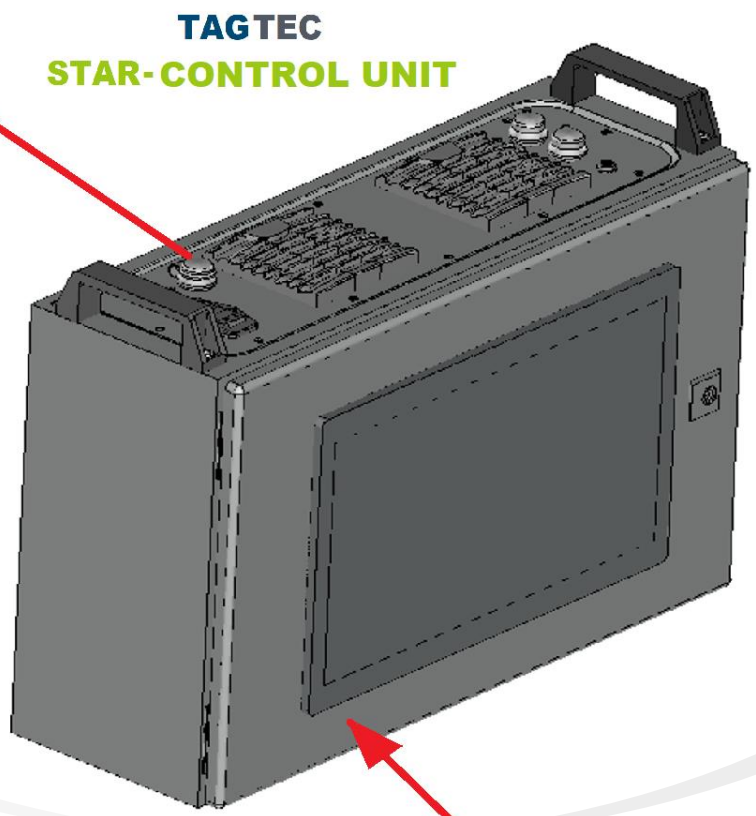


TAGTEC
STAR-MARKER

TAGTEC
STAR-READER

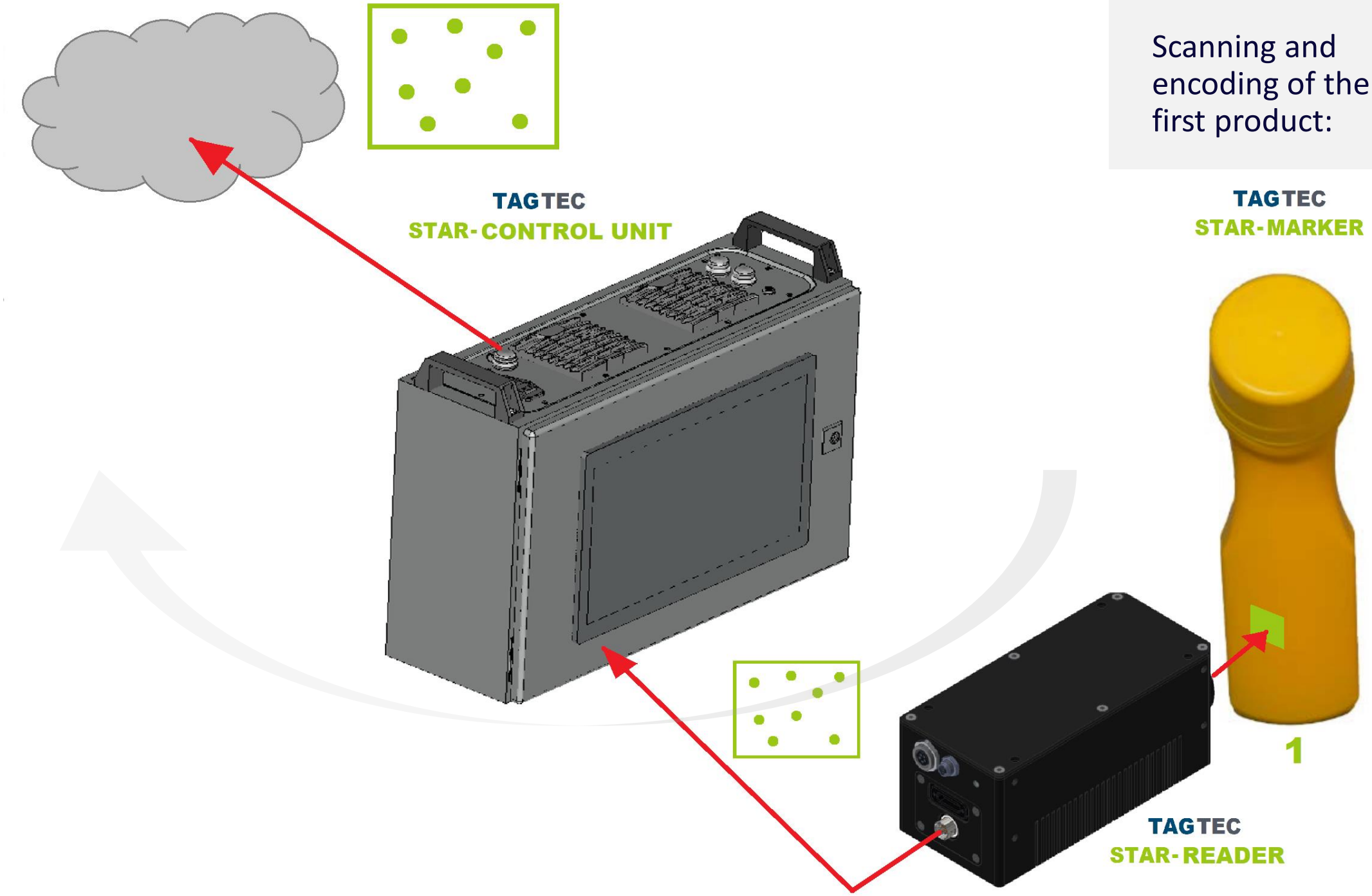
At this, the **TAGTEC** STAR particle distribution will be read out at a certain position with the **TAGTEC** STAR-READER frontend, which contains a vision system and a suitable excitation light source:

Finally, the code will be transferred into the **TAGTEC** CLOUD.

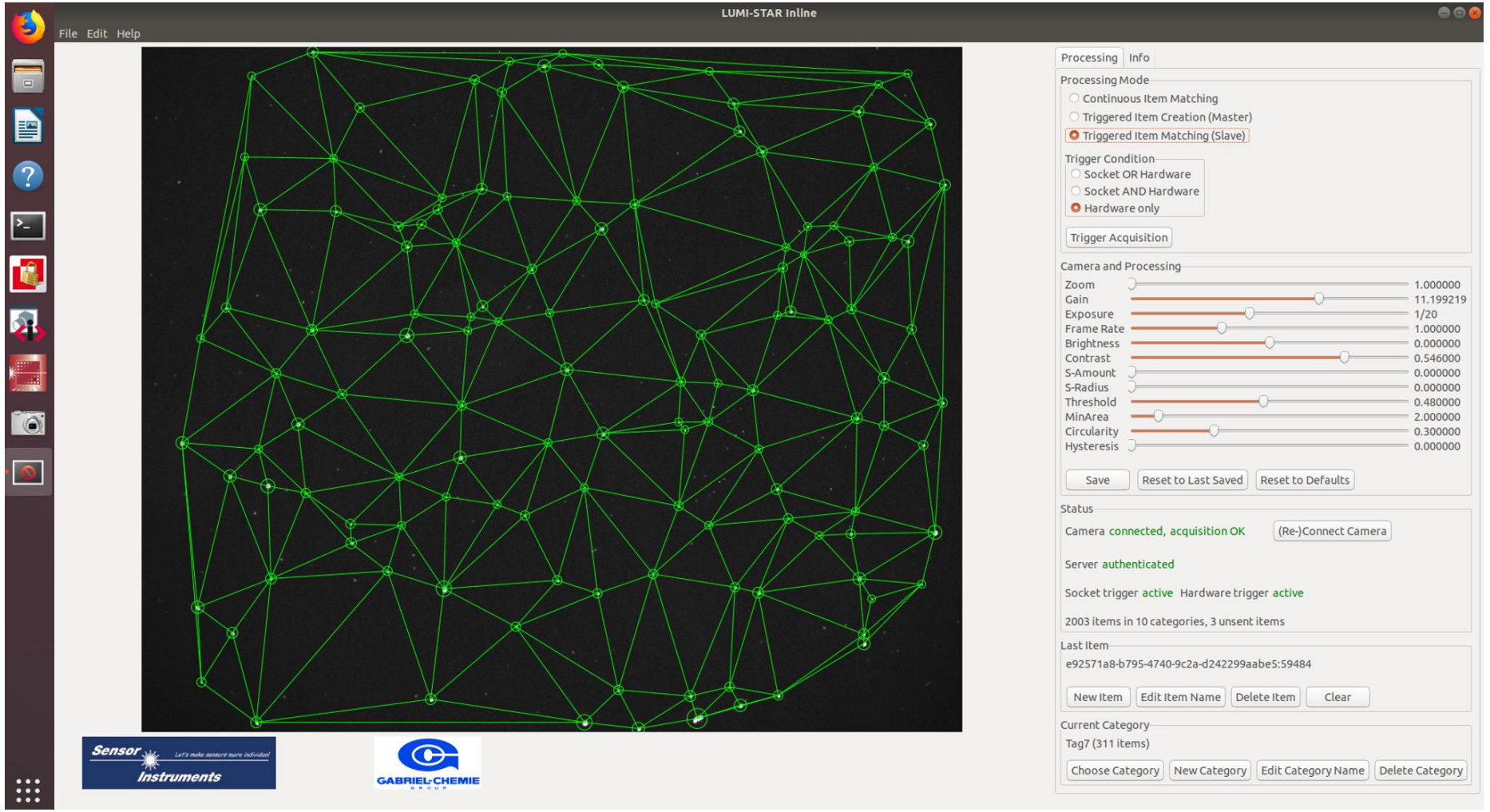


In the next step, the data will be sent to the evaluation unit (**TAGTEC** STAR-CONTROL UNIT), followed by an encoding of the data.

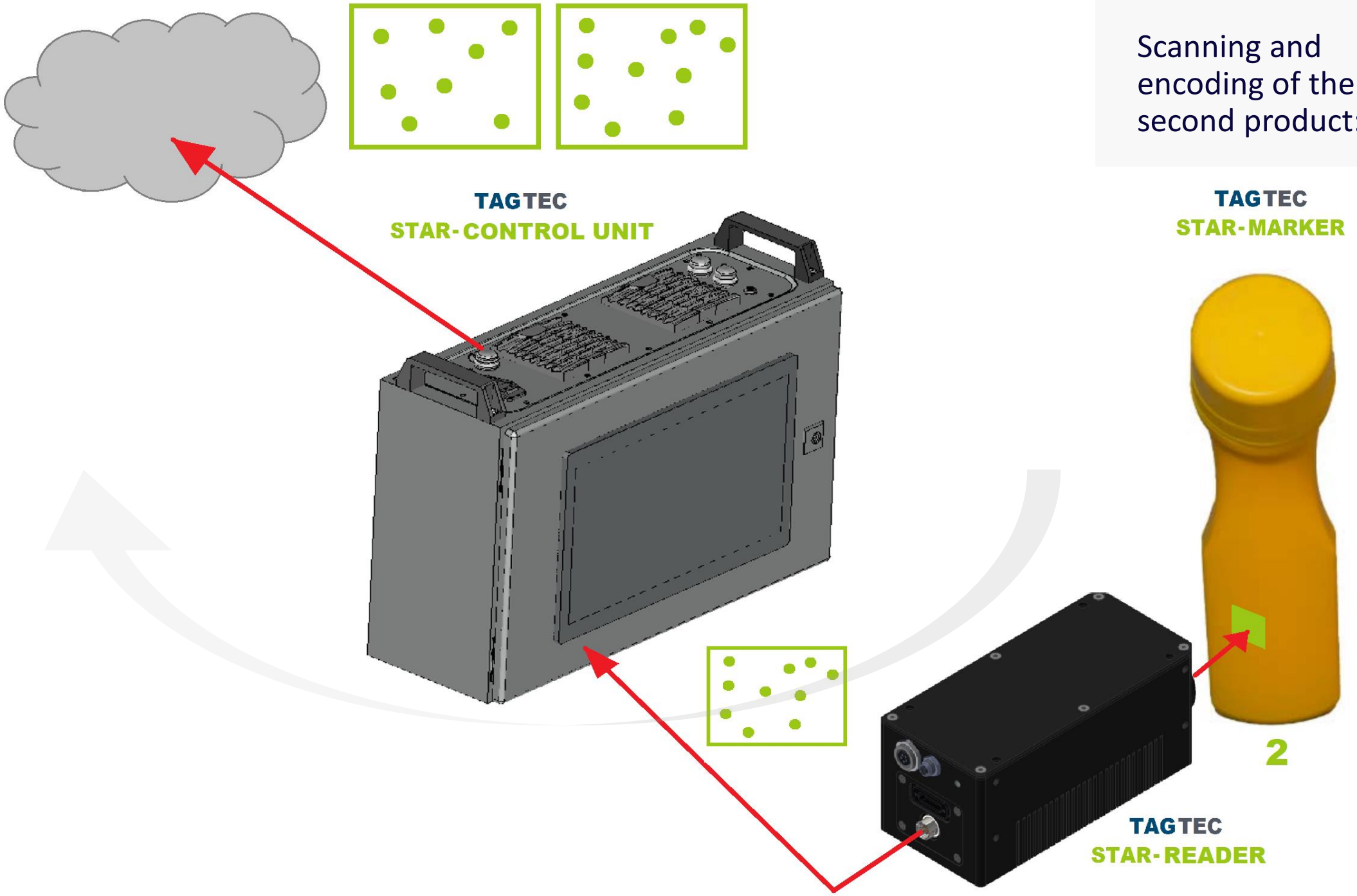
Scanning and encoding of the first product:



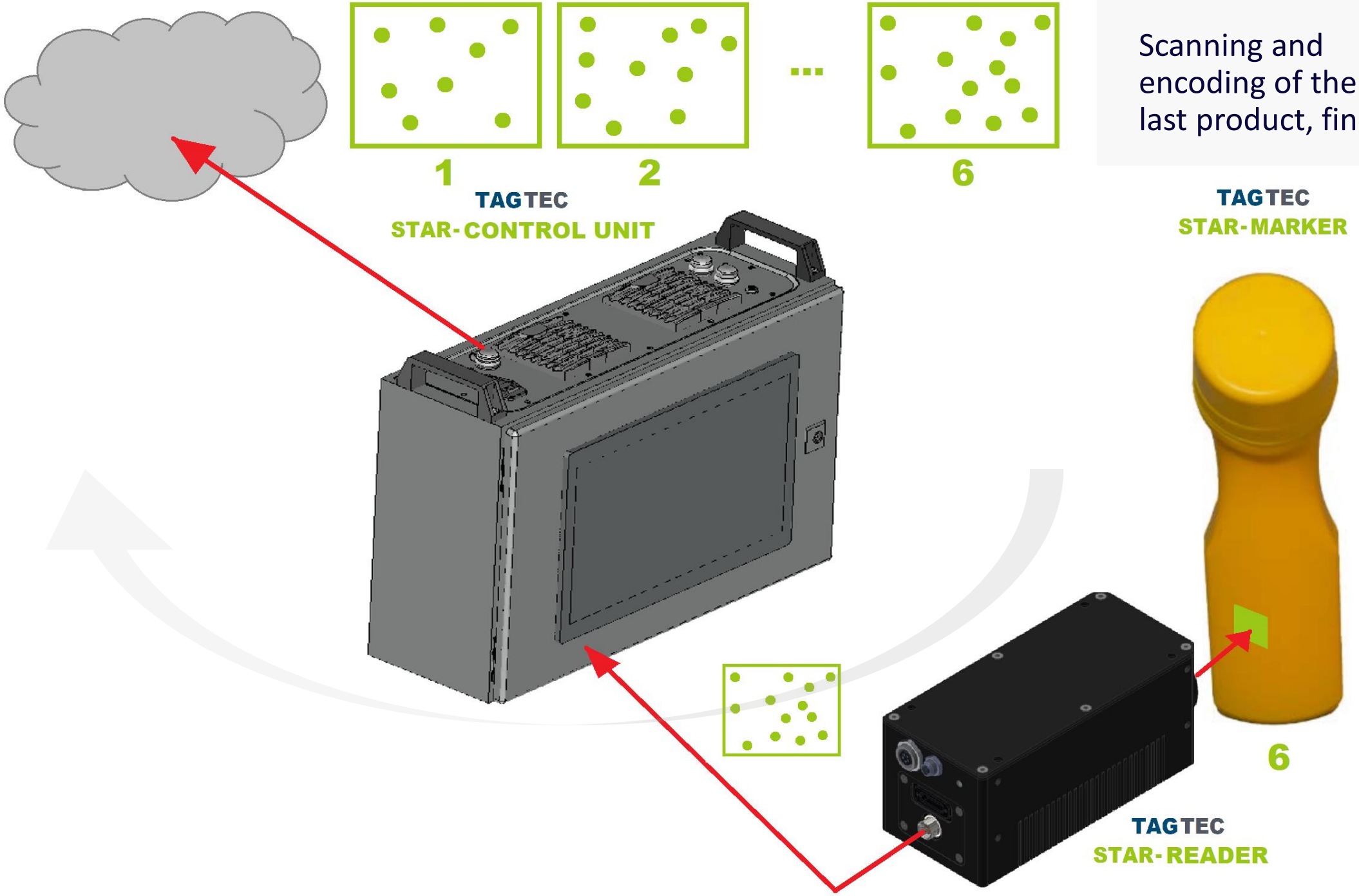
GUI of the STAR-INLINE unit:



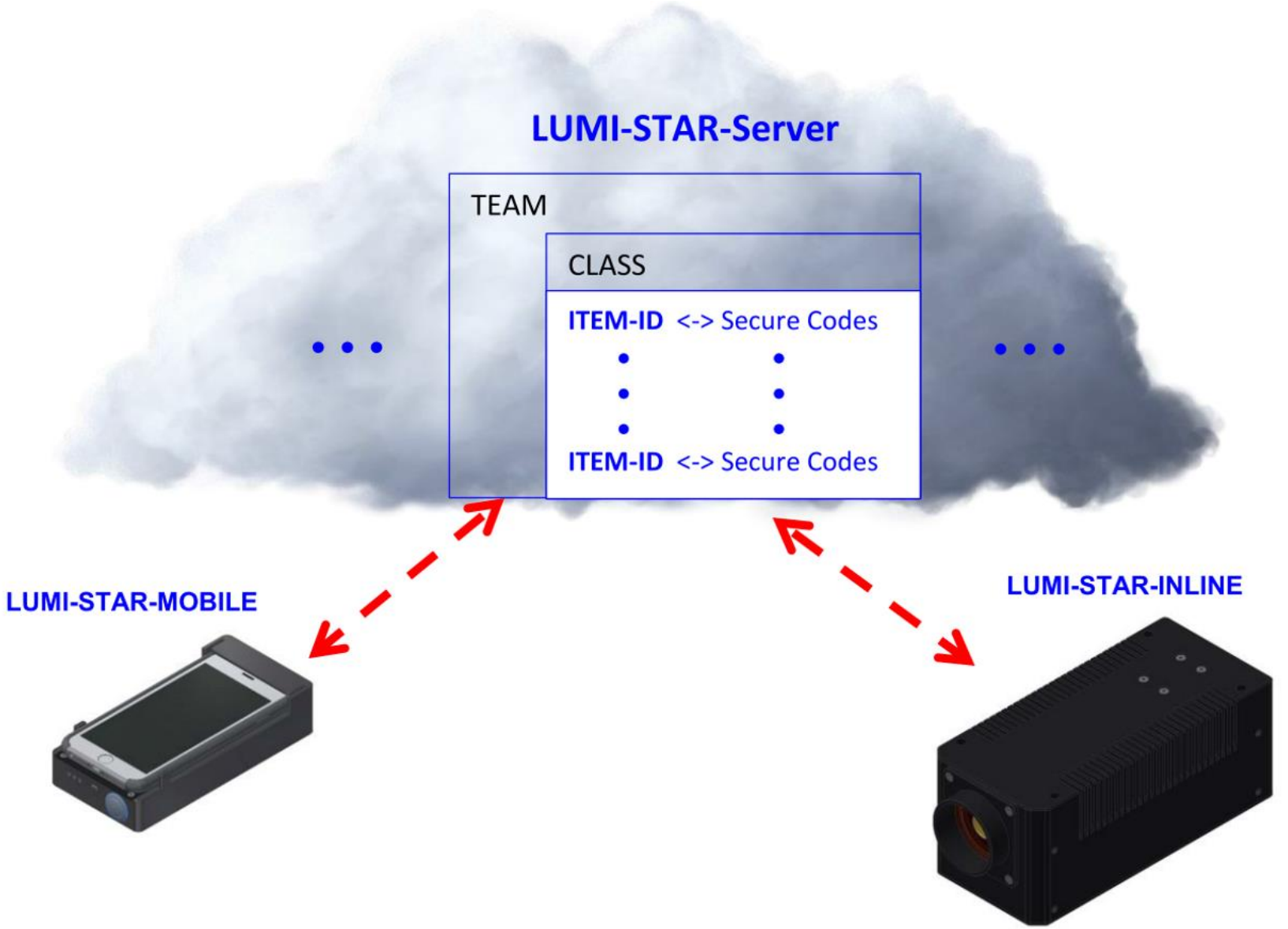
Scanning and encoding of the second product:



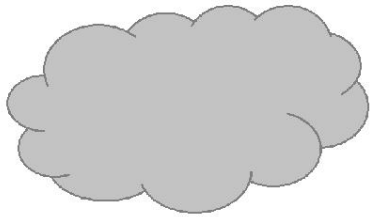
Scanning and encoding of the last product, finally:



STAR-MOBILE unit / CLOUD / STAR-INLINE unit:

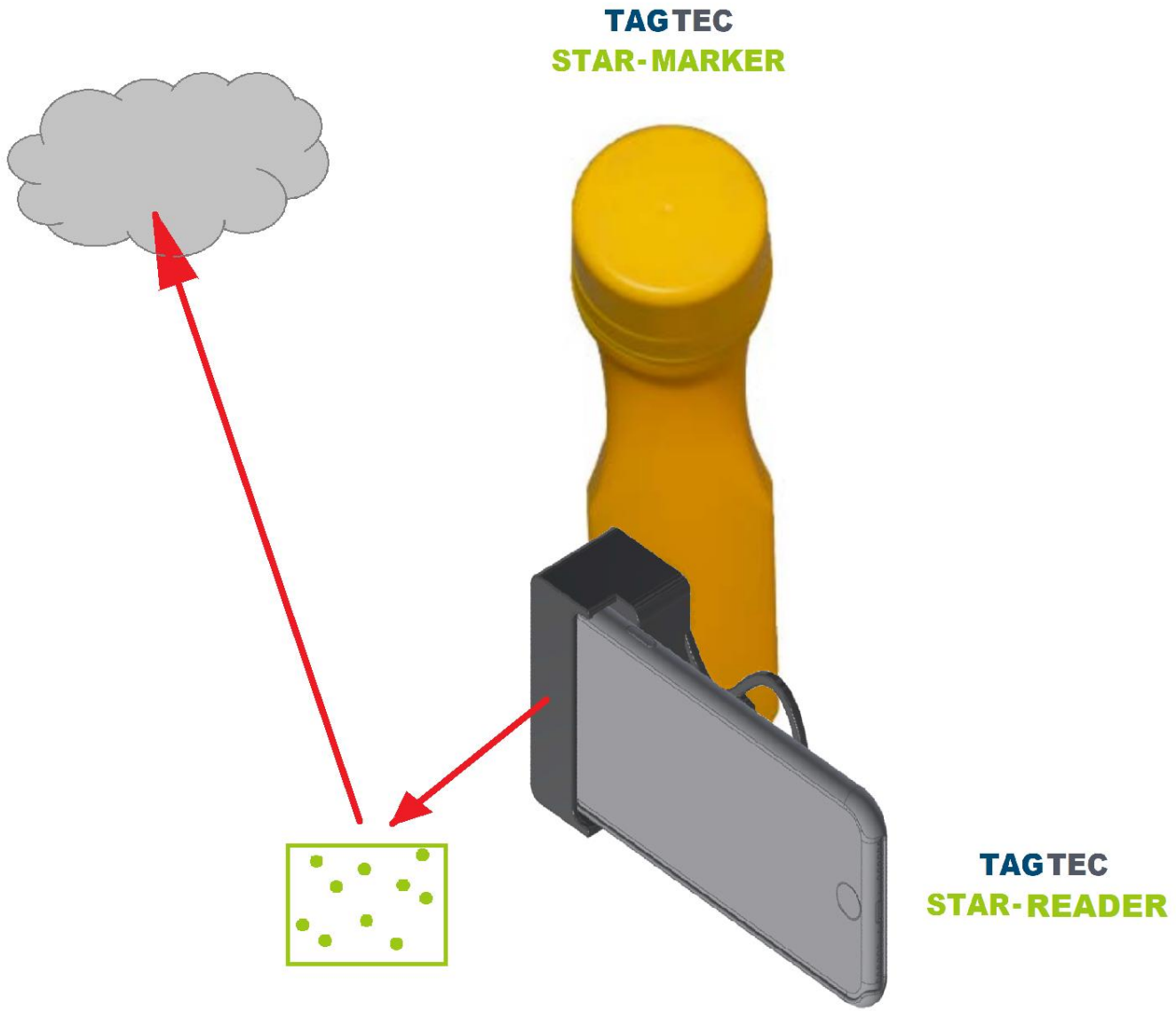


For the decoding process of the **TAGTEC** STAR-MARKER the mobile unit of the **TAGTEC** STAR-READER is used (**TAGTEC** STAR-MOBILE-READER):

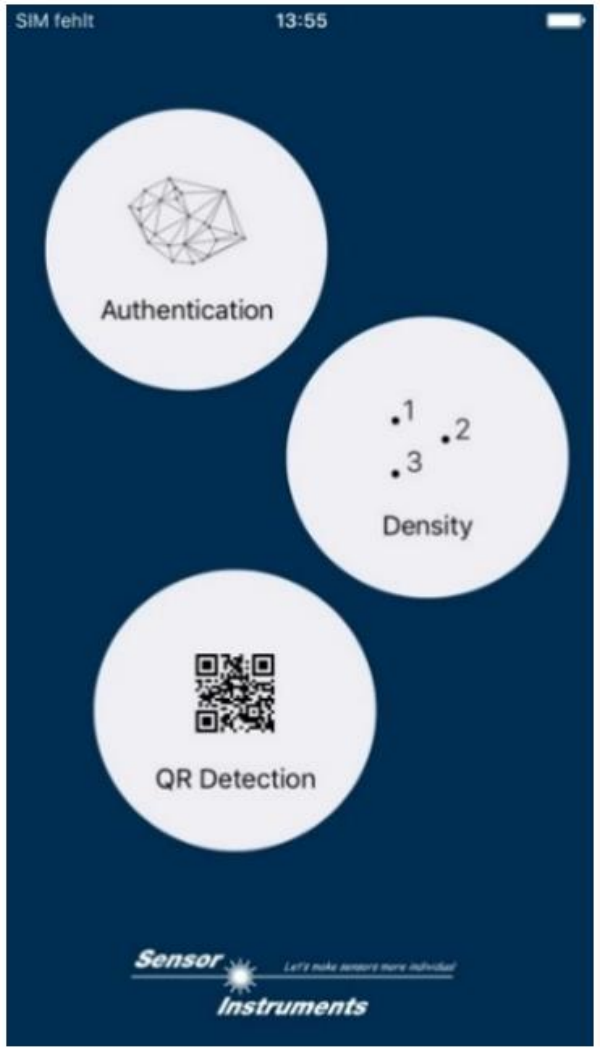


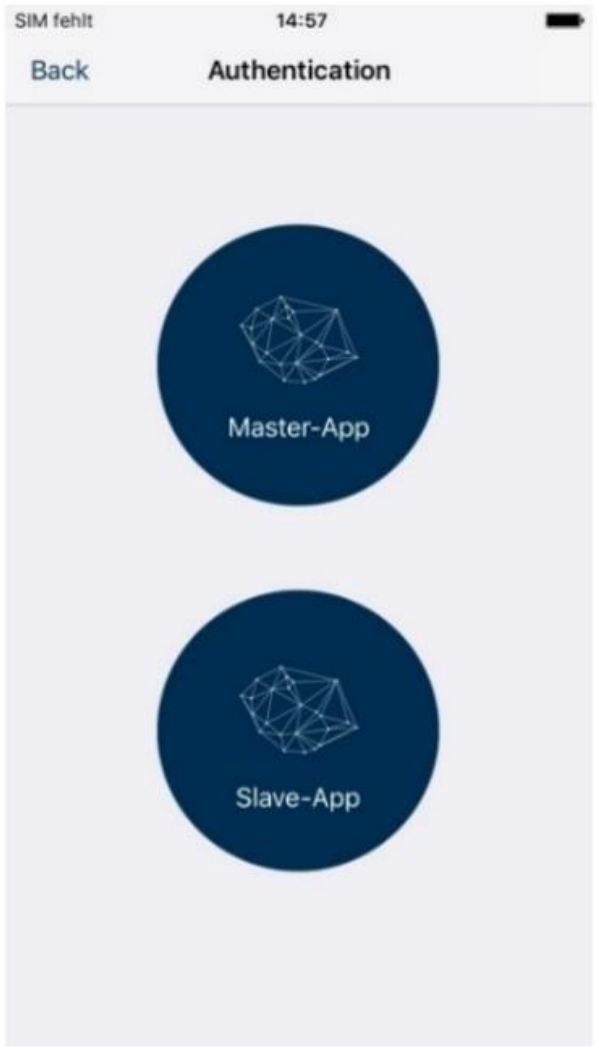
As the **TAGTEC** STAR-MOBILE-READER is equipped with an adequate excitation light source and suitable optical filters in front of the camera vision system from a smart phone, the **TAGTEC** STAR pattern can be captured from the smart phone with the **TAGTEC** APP:

Furthermore, the **TAGTEC** APP is used for transferring the respective **TAGTEC** STAR particle distribution from a defined section of the plastic product via WLAN (or e.g. 4G) into the cloud. Subsequently decoding will be performed and finally the product data will be displayed on the **TAGTEC** APP of the smart phone.

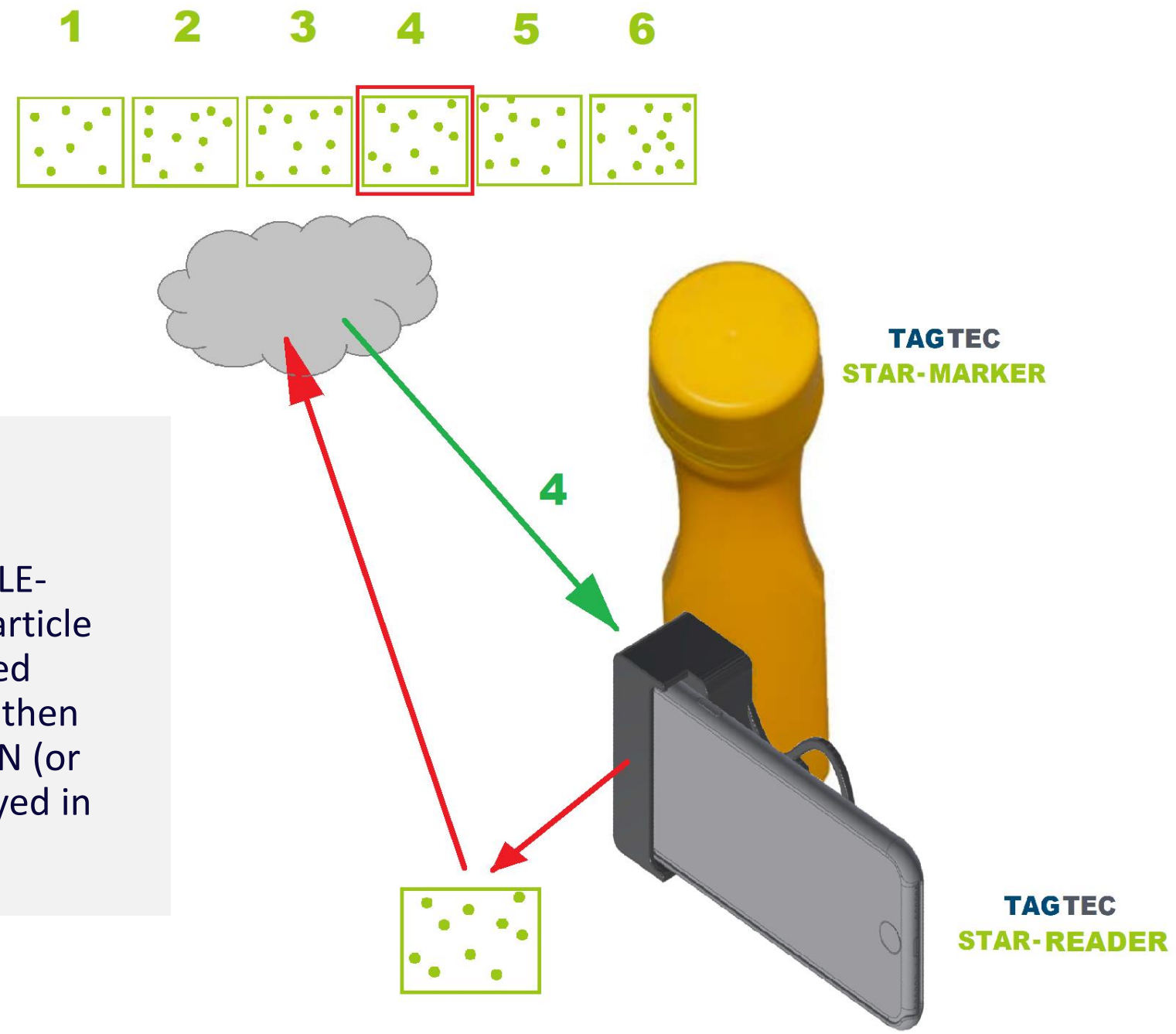


For this task the STAR-MOBILE APP is used:

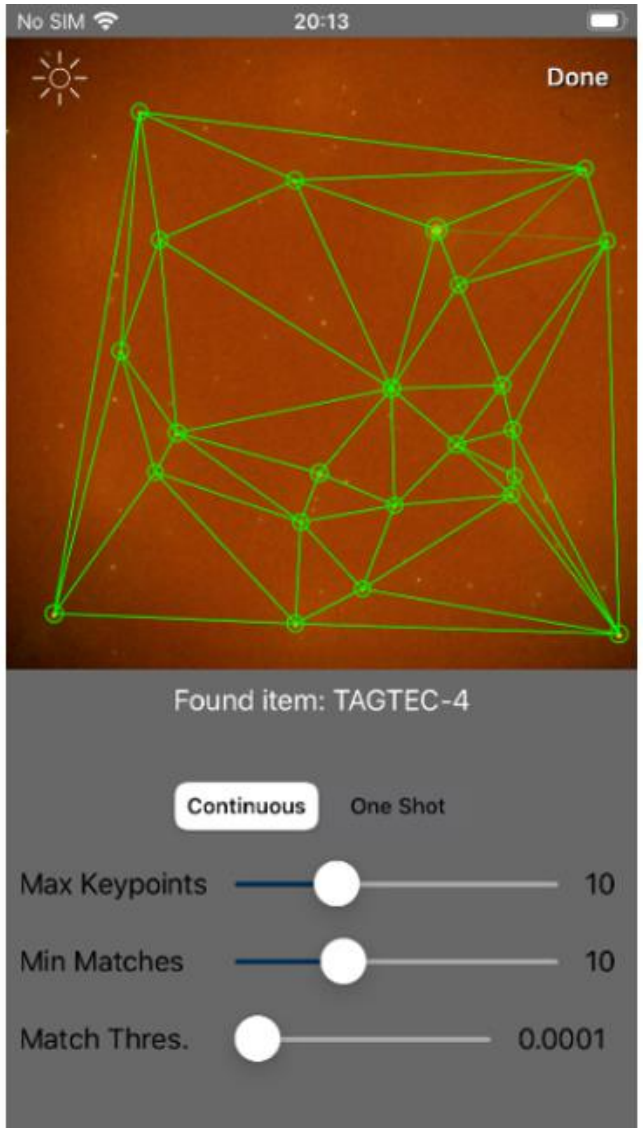




In the **TAGTEC** CLOUD all taught codes are stored.
Upon request of a **TAGTEC** STAR-MOBILE-READER, the currently existing STAR particle distribution is compared with the stored codes. The result of the comparison is then sent from the **TAGTEC** CLOUD via WLAN (or e.g. 4G) to the smartphone and displayed in the **TAGTEC** APP.



STAR Code 4 is detected!



Product Overview

TAGTEC TAU-READER MOBILE

LUMI-TAU-MOBILE-...-SL

LUMI-TAU-MOBILE-...-CL

TAGTEC

Product Overview

TAGTEC TAU-READER INLINE

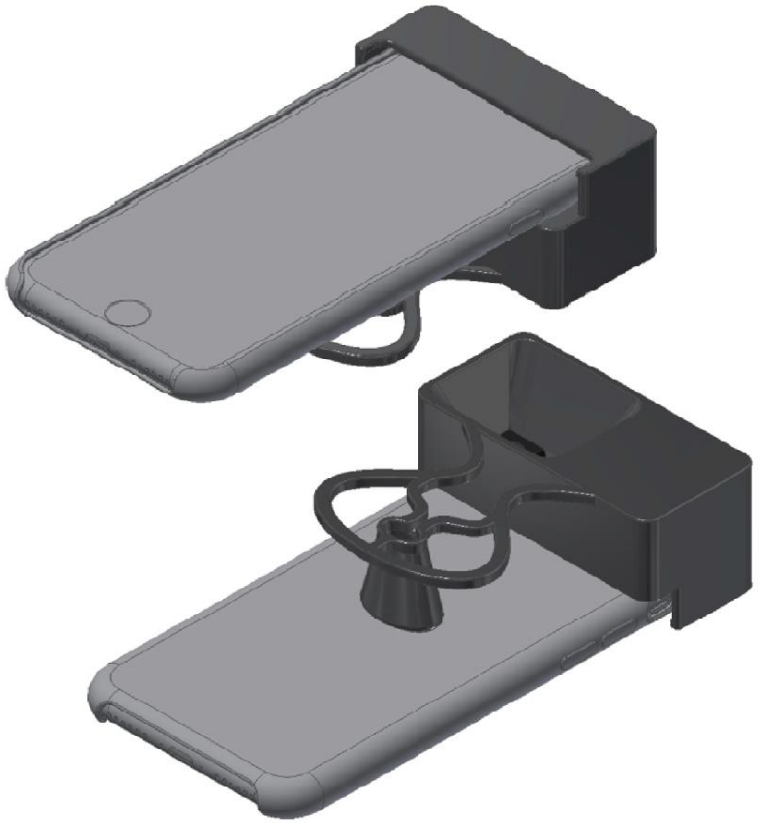
LUMI-TAU-INLINE-SL-...

TAGTEC

Product Overview

TAGTEC STAR - READER MOBILE

LUMI-STAR-MOBILE-...-SE

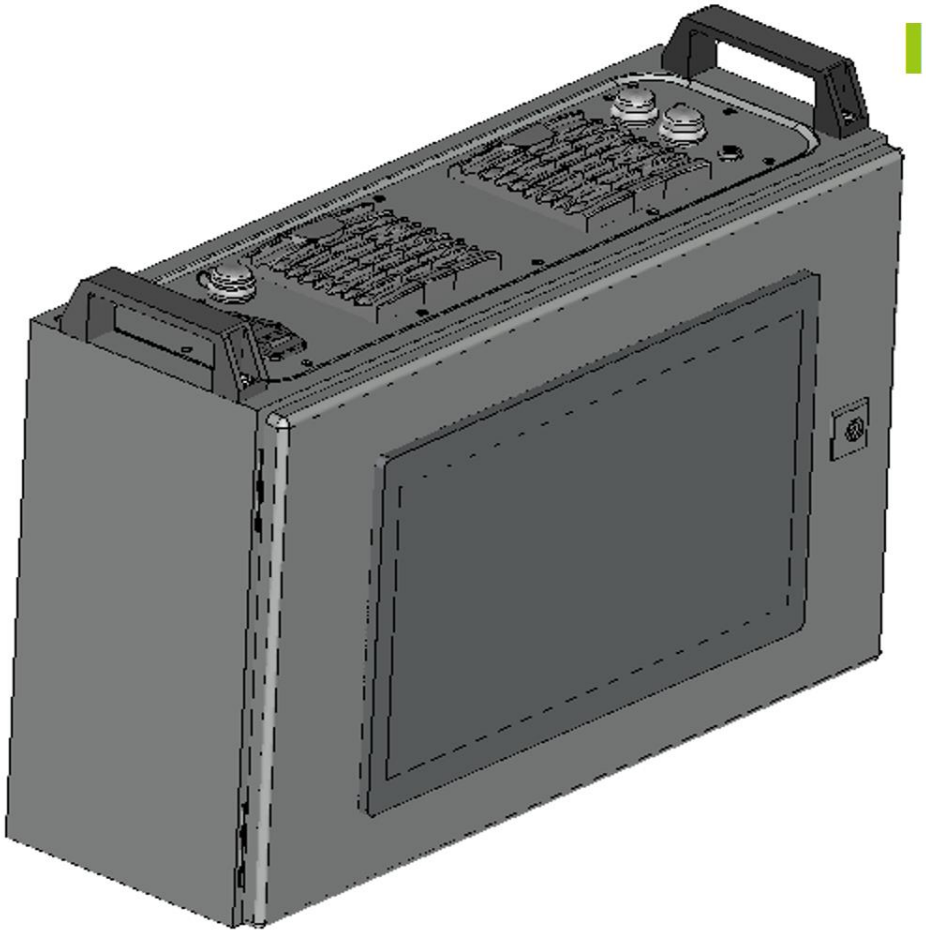


LUMI-STAR-MOBILE-CL-...-SE

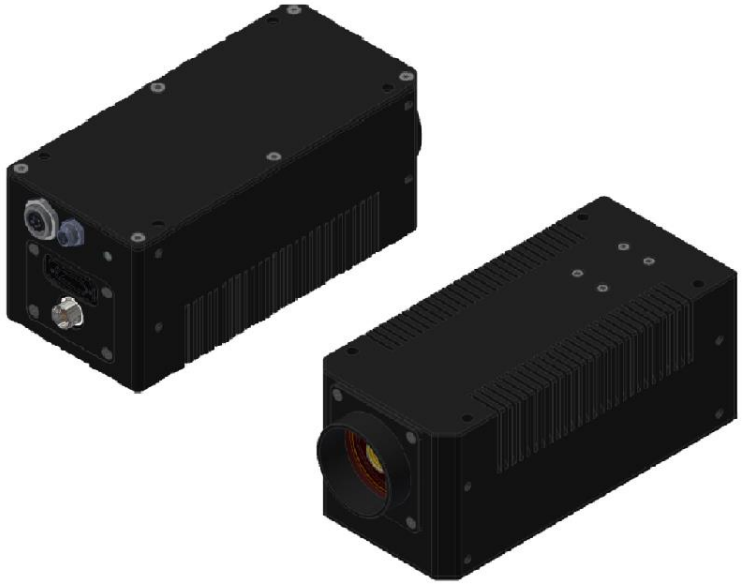
TAGTEC

Product Overview

TAGTEC STAR - READER INLINE



LUMI-STAR-INLINE-CON



LUMI-STAR-INLINE-FE-...

TAGTEC

Product Overview

TAGTEC TAUSTAR - READER MOBILE

LUMI-TAUSTAR-MOBILE-...-SE

TAGTEC

THANK YOU FOR YOUR ATTENTION!

Sensor Instruments

Let's make sensors more individual

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