

Remote service

**Which tools can be used to provide service on
palletising equipment without travelling**



SUMMARY

What if remote working and servicing is needed for whatever reasons? How can we achieve this? CSi has found an excellent solution, and has started working with smart glasses.

In this white paper, we explain how using smart glasses can be of great benefit to you, our customer.

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COVID-19 catalyst for remote services

The COVID-19 virus has had a deep impact on all of us in our day-to-day work. For CSi, it has also had consequences for various projects abroad. Travel restrictions have meant that installation and commissioning activities, as well as other on-site services, had to be stopped or were postponed.

Below, we offer you up to date information about how CSi is able to continue working on your projects during these challenging times. The use of the latest tools for Virtual Reality and Smart Glasses are discussed, and we share our findings concerning our first full **remote Factory Acceptance Test**. This FAT was conducted using these modern techniques.

Would you like to know how we can keep your project on track? Would you like to find out how we provide services to our customers while we cannot go on site for whatever reason? Would you like to explore other use cases we see in the field of remote services? We will try to give answer to these and more questions.

Have a look at this video, recorded during the FAT on a Taros Palletiser:

<https://www.youtube.com/watch?v=0T9CJUpj-yY>

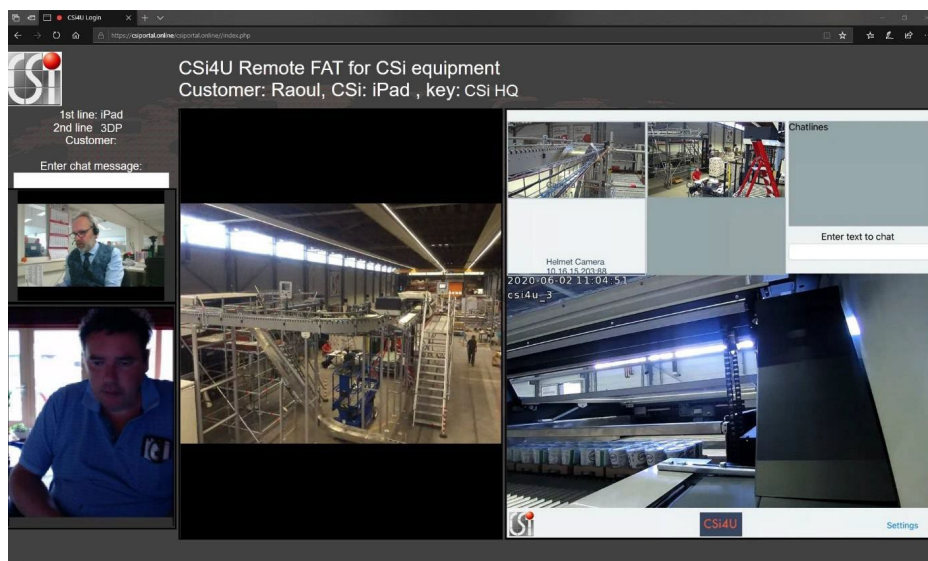


Factory Acceptance Tests without travelling

In many of our projects, we test and validate new equipment together with our customers at our location in the Netherlands. In the case shown below, we also built a test rig for our customer, in order to demonstrate its proper functioning and to validate that the machine was built to match the agreed specifications. However, due to COVID-19, the planned FAT could unexpectedly no longer be witnessed by the customer, due to travel restrictions imposed by governments and company policies.

Back in 2015 we trialled the use of Industrial IP Cameras and an Apple IPAD application to stream both images and sound via the internet. A secure connection could be established through a website. The proof of concept was trialled at a CSi customer, but we decided not to roll it out any further, as camera systems were often not accepted on customer sites.

Now, because of the COVID-19 situation, the necessity for remote working has become of the utmost importance. As a result, modern techniques in factories are now increasingly accepted.



In addition to the website, and the IPAD application (termed CSi4U), another initiative was set up. We started working with modern VR/AR smart glasses. These smart glasses look like a head-mounted tablet, but without a touch or input device. The model we use is the Realwear HMT-1. These smart glasses are of the monocular type, meaning that a display is positioned just below your normal field of view under the dominant eye.

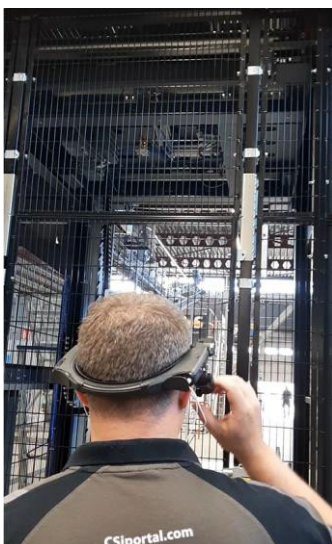


This small display shows the actual HD camera feed, or the information that the contact person on site wants to share with the field engineer who is wearing the glasses. The smart glasses can be controlled by voice commands.

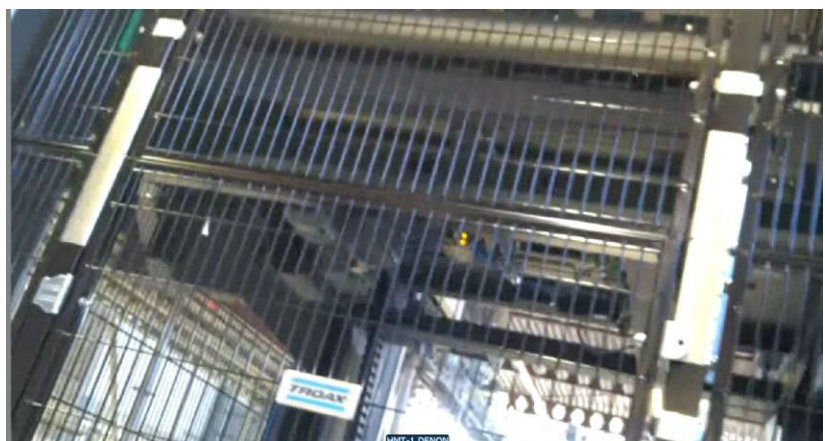
The HMT-1 comes with an HD camera on a head-mounted frame. With the correct software application, images can be streamed via the internet to meeting attendees around the globe. With the help of both the CSi4U website and the Realwear HMT-1, we carried out the remote FAT with only a team of three people in our headquarters in the Netherlands. At the same time, attendees around the world dialled in. These were project team members from both our company and the customer, as well as members of the central engineering team from the customer's headquarters elsewhere.

Based on a test protocol for factory acceptance, all related items were checked one by one. For instance, static inspection of the mechanical and electrical works was performed. Instant feedback from the customer to the technician wearing the glasses was possible, and extra checks could be initiated via the video and voice conference.

Real world



Customer camera feed



How do smart glasses work?

The HMT-1 model can be used in our typical environments.

A camera is mounted together with a microphone for voice commands and transmission during video calls.

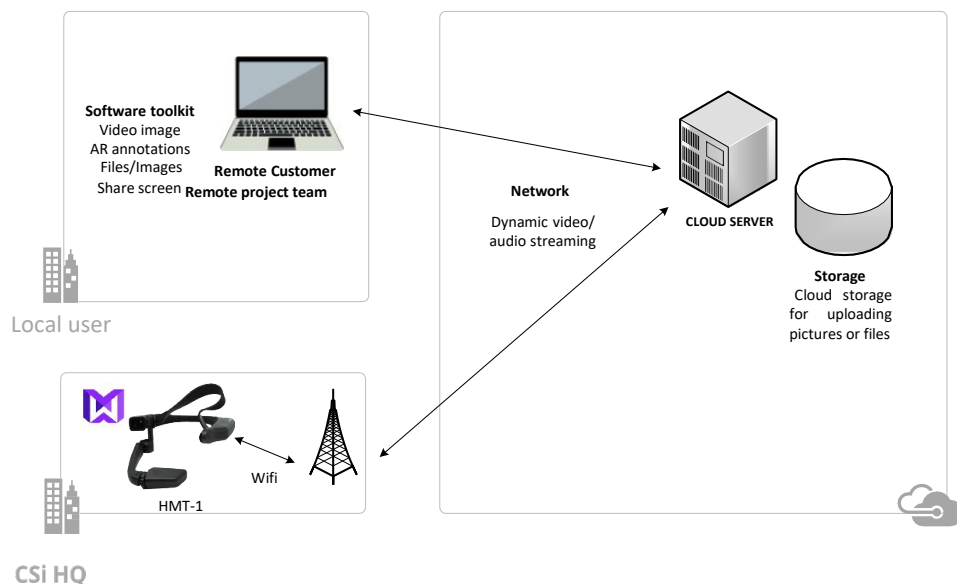
A second microphone is incorporated in order to suppress ambient noise. This noise cancelling feature helps greatly.

The HMT-1 is battery powered, and the battery lasts around 6 hours while transmitting images. Wi-Fi is used to stream the data from and to the HMT-1.

As an alternative, LTE/4G SIM solutions or a wireless hotspot from your phone can be used. This may be useful in production environments where external devices are not allowed on the company's Wi-Fi network. Video up to 1080P and pictures with a 16MP resolution are possible.



In addition to the internet, the HMT-1 needs software. To date, we have tested XMREALITY 6, HP-e MyRoom, Teams Preview, Teamviewer Pilot and Remote Eye software packages. In all situations, the device is logged on via the application to a server, which hosts the streaming from the device and distributes it to the attendees and vice versa.



The software toolkit that connects the smart glasses to others is a separate package. Often this is based on an SaaS (software as a service) annual contract. If your company has Microsoft 365, you can use the free Microsoft Teams version, depending on the desired application. As an alternative you can purchase licenses for your whole company.

The following items are included in the kit:

- HMT
- Smart glasses
- MSA front brim hard hat with clips
- Wall charger
- Spare battery (3250mAh Li-Ion)
- Earbud earpieces
- Protection headphones (noise cancelling)
- Earbud foam tips, sample pack (small, medium and large)
- Semi-rigid carrying case
- 64GB MicroSD card (SanDisk Extreme®)
- LTE connectivity pack included
- License for 12 months



Other use cases

Obviously, smart glasses can be used for more applications than just a remote factory acceptance test. There are multiple uses when you can benefit from the mobility and comfort of the smart glasses.

A good example of this would be remote mentoring of field engineers during an inspection or an on-site installation. An expert can be contacted if the field engineer needs a specialist in a certain topic.

Smart glasses can also be of use if a breakdown occurs and the customer needs urgent support. Through the glasses, a 24/7 service organisation can take a look at the issue, swiftly resolve the problem and thus minimise downtime.

What about remote inspections, during which the checklist and the step-by-step inspection method is shown on the display of the glasses?

If a connection to SCADA systems is established, visual cues are directly shown in the operator's field of vision. These can then be directed to an alarm on the line or give access to real-time performance data.

If we look at the speed at which the VR/AR area is developing, we can expect many more use cases in the short term.

Conclusion

To conclude, we would like to mention that the remote FAT shown above was passed successfully and the machine was signed off with only a few minor remarks. Subsequent to FAT approval, the other four machines were also released for shipment. The project is now on track for on-time hand over.

We have found that the most important benefits of the use of smart glasses for our customers are the following:

- downtime is reduced;
- there is a faster and less costly intervention, as there are no travel costs and time;
- complex problems can be solved in a more efficient way;
- there is an intuitive way of operational use;
- sharing information is easier.

How can we help you?

Please click on the video and see for yourself how remote services and a remote factory acceptance test works.

<https://www.youtube.com/watch?v=0T9CJUpj-yY>

If you would like to receive more information, please do not hesitate to contact us.

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