TRONRUD
ENGINEERING

INSIGHT

Internet of Things

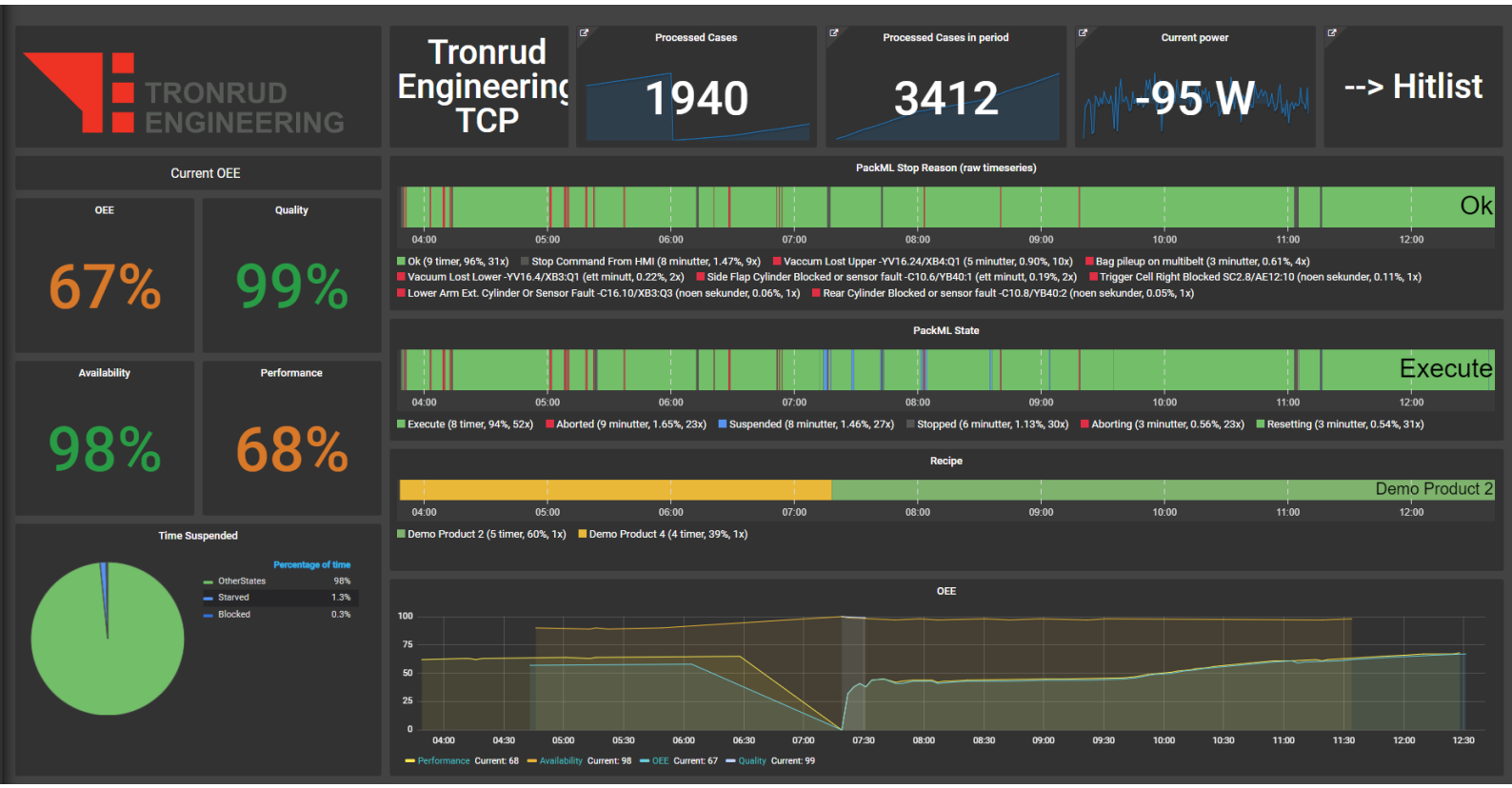
Adding more information to our minds is important in our constant strive to learning more. In this way we are getting smarter as our knowledge base increases. Similarly, we like to think this way about the machines we supply. Storing data and learning from them will enable us to build smarter machines in the future. IoT enables our machines to connect and send data to a cloud service. Machines supplied from us can easily be connected to this service. In this way, both parties can collect data for analysis, diagnostics and future improved smartness.

Analytics

Performance

Availability

Indusyry 4.0



What can we offer?

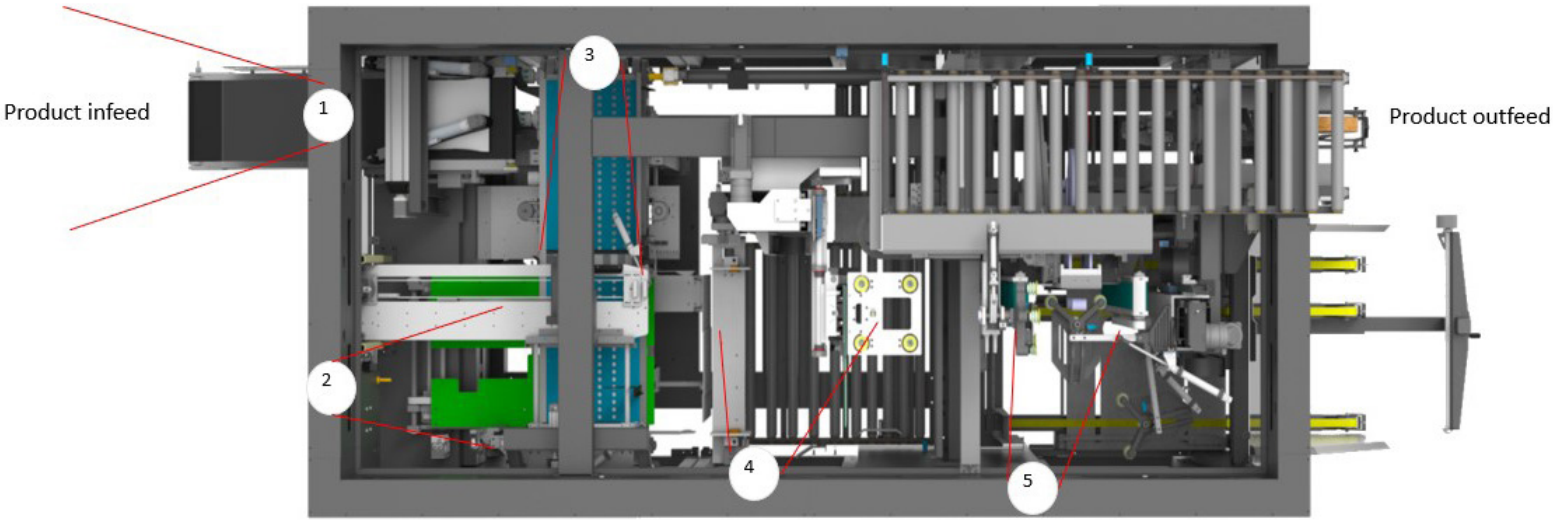
IoT is a tool that is extremely useful for your everyday strive to improve production. Our service department and engineers can track and follow up on issues and you can be fully up to date on the machine's performance. As IoT makes it possible to store current and historical data, real time and past issues can easily be diagnosed, and our service team can follow up on the machine's performance. Tronrud Engineering is also using IoT to develop future smartness such as predictive maintenance and further automation and improvements.

For you IoT makes it possible to track the machine's performance, analyze data and use the IoT capabilities to develop a more efficient and cost saving production. We collect key data i.e state/mode, stop reasons, OEE data, key counters and motor torques. We also supply a dashboard where the IoT data is analyzed and displayed. The dashboard acts as your vision to the cloud and machine, and is accessible from everywhere. The Dashboard is easily customizable.

Additionally, we offer an optional sensor package, where we collect data for ambient temperature, humidity, power consumption, air consumption, compressed air pressure and vacuum level to further improve diagnostics.

Remote Commissioning

Remote commissioning is one of the key benefits of digitalization. We offer remote commissioning as an add on service, which means that we can install and commission machines without being on site. Our machines are equipped with remote cameras systems, IoT data collection, remote VPN connection and we can supply HoloLens to ease the communication.



Remote commissioning is made possible by various technology installed in our machines.

1. Camera Systems

Camera systems give us access to important areas in the machine and give our customers the benefit of guidance while we also view the same as you. The Camera system is equipped with the possibility of storing data based on time or timestamp given from you on site.

2. Microsoft HoloLens

We use HoloLens to guide personnel on site during the installation of the machines. Through HoloLens we can establish good communication with the user on site.

3. Iot Data Collection

IoT data collection gives us the possibility to store historical data. This makes it possible to track and analyze all aspects of the machine operation.

4. VPN Connection

Our machines are equipped with VPN/NAT connection for remote support of the control systems.

Benefits

Remote commissioning enables a more flexible commissioning phase and realization of most projects. Remote commissioning lowers the travel costs and enables installation where travel is difficult. We have flexible solutions for the commissioning and installation process of the machines, and in addition, the technology can be used in multiple ways. With Microsoft HoloLens we also have the ability to do factory acceptance tests remote.

Green Technology

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SUSTAINABLE DEVELOPMENT GOALS

The global climate changes is a shared social responibility. We are comitted to contribute and are constantly working on minimizing our environmental footprint in every aspect of our value chain. We wish to contribute to the realization of the UN's sustainable development goals and we have choosen to have five focus areas.

The chosen goals are targeted at environment and climate, economy and social responsibility.

Tronrud Engineering are working towards creating solutions that are based on good sustainable values.

We will develop solutions with reduced environmental impact and cooperate with organisations and companies that promotes sustainable production and consumption.

We all put our footprint on this planet, and each causes impact on our environment. Have you ever thought that you also can contribute to reducing the impact on the environment? Well, our part, helping you in this, is building technology that reduces consumption, can live for as long as possible and can be recycled, this is core thinking in our everyday work. So, what can we do together:

1. Machines are servo driven, with automatic change over. This means smaller motors, less parts, and fewer stops due to faulty change over. In this way we reduce power consumption and need for parts changes. As an example, we have reduced power consumption by 60% on newer models compared to older.

2. Machines have integrated vacuum pumps or can be connected to centralized vacuum. This means lower air consumption and reduces the need for producing compressed air with low efficiency and at a high cost. As an example, we have reduced the need for compressed air by 50% compared to older technology.

3. Machines are manufactured in recyclable materials. This means that when the job is done you can put the materials back in the circular value chain for others to use.

4. Machines are manufactured with maintenance in mind. This means that fewer parts reduce the need for changes. Motors in stead of pneumatic cylinders lasts longer. All in all, this reduces parts consumption and cost.

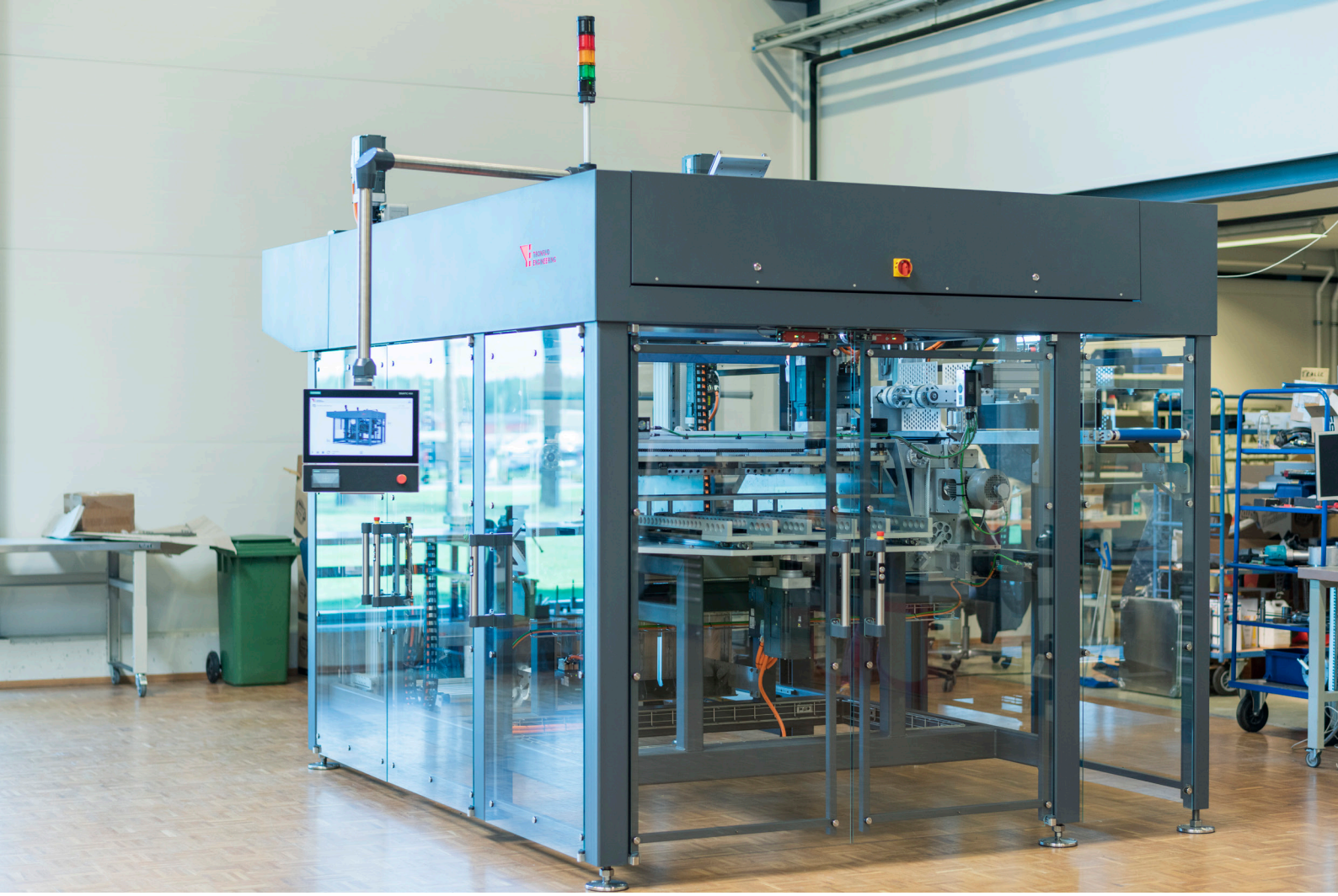
Knowledge is what we all need, to be able to do actual changes to the environmental footprint we cause. That's why we have made the machines smarter and able to deliver you knowledge and data to improve your processes. IoT make it possible to track and log the machines data – we can be one step ahead and guide you in the maintenance process. Combined with remote support (i.e., digital video handbooks, HoloLens, and cameras) the need for traveling to site is reduced, keeping machines operating at high performance at low cost. For the future to come these data can be used to give you even smarter machines by adding AI technology that use these data. How about automatic adjustments based on camera reading of products, weather conditions or surrounding machinery? Well, this is not just a dream anymore, it is being developed as we speak.

The use of more sustainable and environmentally friendly processes in the manufacturing of our machines, means that our customers also receive a product more suited for the future. Digitalization offers flexible solutions which create smarter machines, as well as smarter and more efficient manufacturing. As a result, you receive better technology for the future to come.

With the use of innovative and smart technology, our production and delivery of our machines are more sustainable and causes as minimal impact on the environment as possible. This adds value to the machines while it also reduces your cost in owning it.

PackML

As a member of OMAC, all our software complies with PackML (Packing Machine Language) standardized guidelines. PackML is an automation standard that makes it easier to transfer and retrieve consistent machine data. This means that we can easily integrate into existing lines and factory management systems. The PackML standard defines machine status, OEE (Total Equipment Effectiveness), RCA (Root Cause Analysis), flexible recipe schemes, and common SCADA and MES inputs.



PackML industry standard is applicable to all types of converting and packaging machines. This means that when choosing a machine from Tronrud Engineering, you get all the benefits of the PackML standard. PackML enables:

- More robust and reliable software
- Easier to troubleshoot, reduced mean-time-to-repair
- Faster startups
- Operational consistency
- Reusable training
- Consistent tools to track and manage machine performance
- Effective use of limited engineering resources
- Reduced costs

For our customers this means shorter integration time, easier data output, shorter operator training, better value for you as our customer, cost saving and easier production.

PackML an OMAC standard

OMAC.org

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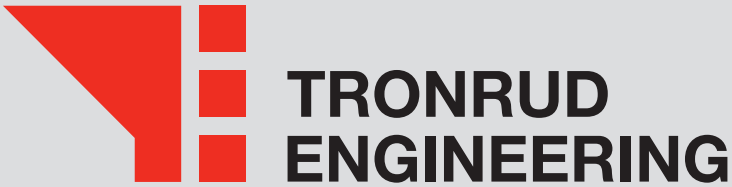
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