BUCHER
emhart glass

Technical News Bulletin

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GOBRadar

Integral part of SMARTFEEDER™

- Real time online measurements
- Improved stability
- Process automation

Introduction

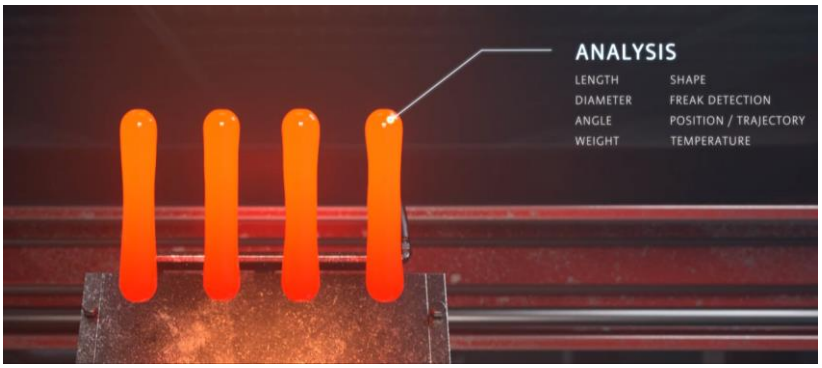
GobRadar is a camera-based gob observation and measurement system (sensor) providing a number of measurements for each and every single gob such as weight, length and shape allowing closed loops like **closed-loop weight control**.

Two separate high-speed matrix cameras in cooled housings are installed on the feeder platform monitoring the gobs just after the cut. These images from two angles are used to create a 3d-model of each gob.

The real time data acquired includes:

- Weight
- Length
- Diameter
- Angle
- Position
- Trajectory
- Shape
- Freak detection

GobRadar is suitable for all manufacturing processes and can offer automatic weight control in Blow & Blow where the PPC weight control is not usable.



Each gob is taken into account in real-time. **Closed-loop weight control** stabilizes the process and herewith avoids problems related to weight deviations. Reducing weight deviations can eventually also save glass. Monitoring of all process relevant parameters in real-time allows to detect trends and to further optimize the production.

With the GobRadar and **FlexIS** additional future closed-loops will be enabled.

Only **GobRadar** will work seamlessly with these new advanced technologies.

System Description

The camera housings of the **GobRadar** are specifically designed to withstand the harsh environment in the feeder area. The cooled camera housings avoid soiling of the camera lens through a special design and flushing with air. The unique design, protecting the optical inlet from contamination, makes the cameras virtually maintenance-free.

The two cameras are installed at a 90° angle to obtain images to create a real 3d model of the gobs (angles from 70° to 110° are possible, different distances to the gobs for the two cameras are also possible). The two cameras achieve an almost 360° view of the gob and avoid false measurements that can destabilize the process (bending to the far side of the camera).

All connections from the cameras run through cable hoses and end in a connection box located on/or close to the feeder platform. From this connection box all cables lead to the dedicated **GobRadar** processing computer in the IS control room.

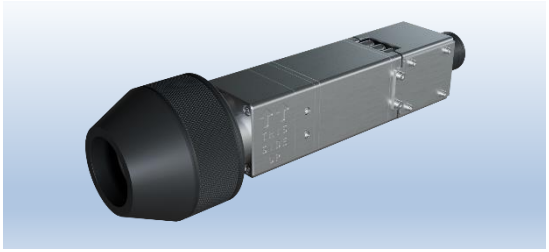
The GobRadar interfaces with any line information system, the PPC or an existing scale. It is delivered with its own dedicated scale to obtain gob weight information in one of two versions, either an integrated weighing station or a separate touch screen and scale.

In addition to the dedicated touch screen the **GobRadar** web user interface can be displayed and used over an Ethernet connection or wireless on a mobile device.

With the appropriate hardware the **GobRadar** can control the tube and all needles for optimal automated weight control.

The **GobRadar** standard delivery consists of

- Two camera units
- Camera mounting brackets
- Connection box
- GobRadar control cabinet



One of two touch screen and scale options are included in the standard delivery:

- Option: Scale station (scale and touch screen integrated into one complete station)
- Option: Separate touch screen (with mounting arm) and separate scale

Available as option:

- Option: Needle Adjustment Drives
- Option: Interface to PPC

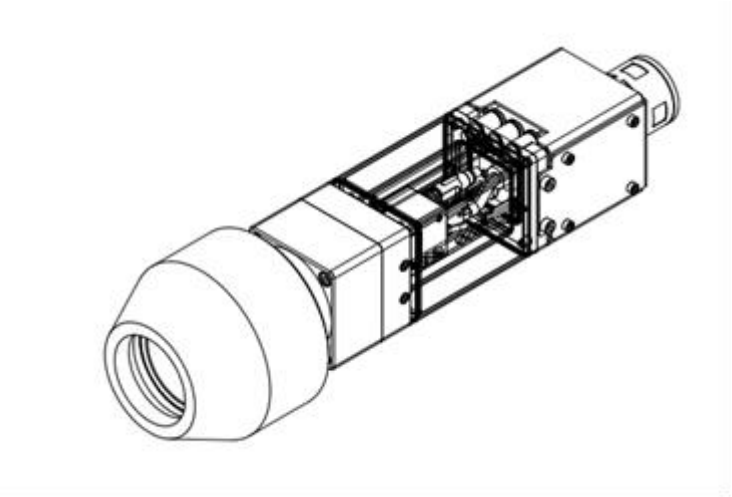
System Upgrades

The following upgrades are now part of the GobRadar standard supply and do not need to be specifically added or requested when quoting new systems.

GobRadar Camera Housing upgrade SY-022022

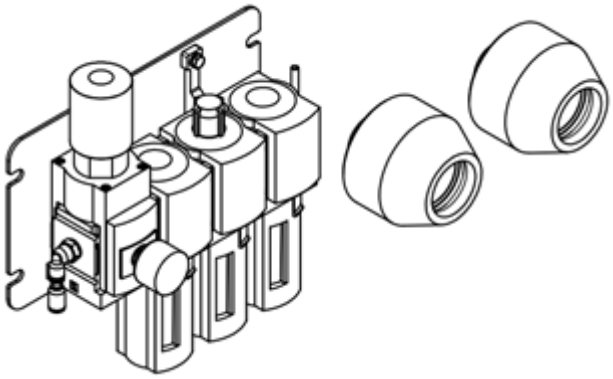
The GEN2 concept features distinct and separate internal chambers for the cooling fluid and the power/signal camera exchange cables. This improves the cooling efficiency and eliminates any possible damage to camera components due to leaks.

This enhancement also simplifies any procedure that might require disassembling the cameras either for cleaning or exchange of parts, by making it easier to put the complete assembly back together.



The external dimensions and all connectors remain unchanged, ensuring full compatibility with the existing bracket, thereby eliminating the need for cable or cooling tube adjustment during retrofitting.

Nozzle and filtration unit upgrade kit SY-022079



The kit includes the filtration unit and two nozzles. It is particularly recommended for existing installations requiring frequent cleaning of the GobRadar cameras.

The nozzle is designed to fit directly on the front camera optic, ensuring the highest cleaning efficiency with 0.4 bar air pressure building up an overpressure. This results in an air curtain that prevents external contamination of the optical part of the system.

The regulation and filtration unit must be installed between the user's compressed air distribution and GobRadar utility box. Its main function is to regulate the required air pressure to 0.4 bar and to clean the compressed air from any oil and particles.

GobRadar computer upgrade kit SY-022680

The next-generation computer boasts increased CPU efficiency and computing capacity. This kit includes all necessary licenses and software. The computer upgrade is necessary for fast machines and to enable the SQL database.

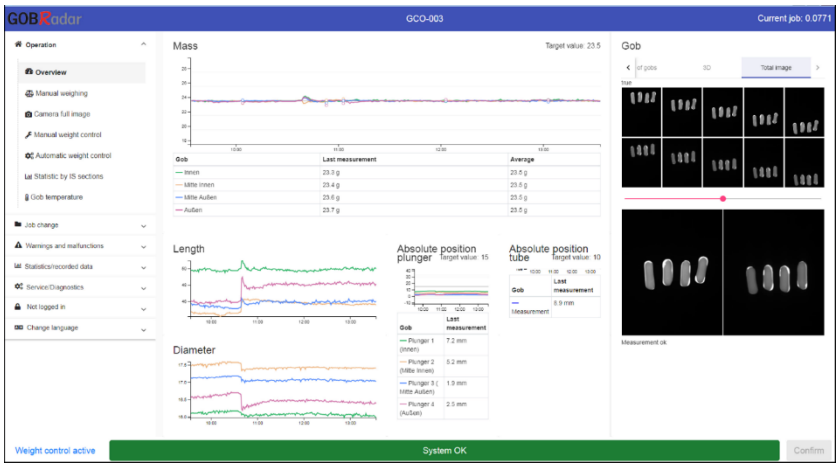
Weighing station upgrade kit SY-022238

The industrial grade scale has been introduced to increase stability. This kit includes a new software update and new Power supply unit. The software update needs to be performed by BEG service.

User Interface Screens

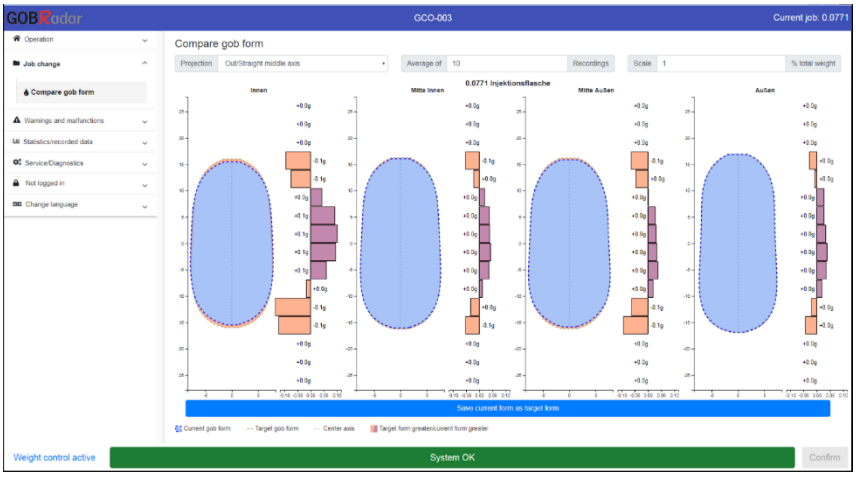
The user interface is web based and can be displayed on a wide range of devices. The only requirement is that the devices must have access to the same network as the GobRadar computer.

Main Screens - One or more main screens can be configured by the customer to display relevant process parameters. One screen is mostly configured to show mass, length, diameter and closed-loop control signals. The user can view the 3D-model of the gobs from all angles.



Compare gob shape Screen - The shape of the gobs can be stored for reference and compared to current production. This is especially helpful during job change to reproduce the “last-time best shape” but also for continuous monitoring during production.

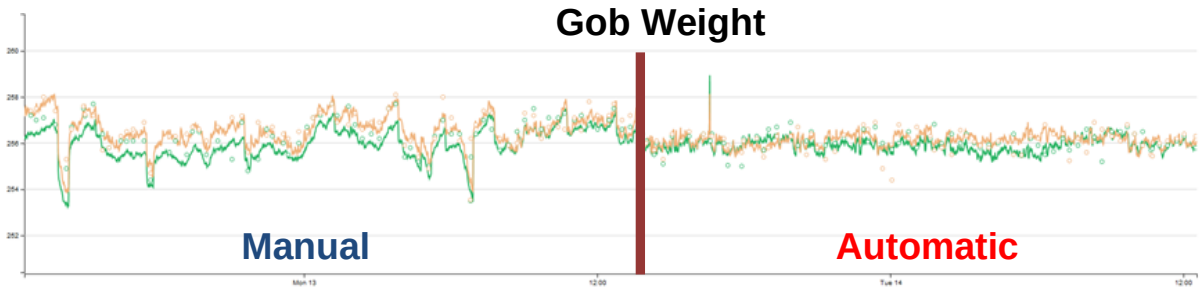
Different sectional views can be shown (straight middle axis, front, side, max. curvature).



Statistics Screens - A wide range of parameters are recorded, and statistics can be displayed for further analysis. Malfunctions and warnings are stored and shown on a clear timeline for reference.

GobRadar fully supports **multi-weight production** and can help reduce job change times significantly.

Closed-loop weight control – Comparison of the gob weight using only manual weight measurement and **GobRadar** with continuous weight measurement and adjustment.



Availability / Application

GobRadar can be integrated into all new machine projects. It can also be installed in virtually all existing installations. Existing drives can be used under certain conditions.

Installation Requirements

Control cabinet

Electrical power 230VAC 50/60Hz

To be installed in air-conditioned room (HxWxD: 935x600x385mm)

Connection box

Compressed air, cooling water *

Camera brackets

Must be bolted or welded to a solid structure

Scale station

Electrical power 230VAC 50/60Hz

Touch screen

Electrical power 230VAC 50/60Hz

Scale

Electrical power 230VAC 50/60Hz

Signal Exchange

At least the shear cut signal must be provided and additionally at least the main timer for multi weight. Integration depends on FlexIS version and can also be done for legacy controls (e.g. T600).

(*) for detailed specs please refer to the product manual

Summary

- **GobRadar** measures important properties of each gob (weight, length, diameter, temperature, …)
- Enables **closed-loop weight control** improving the process in real-time
- Typically allows to keep the weight within 0.25% (typically ±0.5g)
- Continuous measurements of 100% of the gobs
- High speed cameras allow operation with restricted view (only part of the gobs visible)
- Real-3D view through large view angle, 3D-model of the gobs
- Works for Press & Blow, NNPB, and also for Blow & Blow
- Reduces the workload through less manual weighing
- Compares to “ideal gob shape” improving job change time
- Monitors critical parameters including limit geometry values (shape)
- Possibility to reject gobs outside pre-defined parameters
- Eventually allows to further improve the process and save glass
- Allows to identify trend developments for important process parameters
- Fully supports multi-weight production greatly improving job change time
- Interfaces with **FlexIS** and **PPC**
- Will enable further advanced applications with the Emhart **SmartFeeder**
- Quality assurance and traceability right from the start when the gobs are cut
- Innovative design to protect from contamination in the harsh conditions in the feeder area
- Intuitive web operator interface allows to display on the factory floor and on mobile devices

Features	Benefits
Real-time online measurements	Continuous measurements allow insights into the process in real-time. This enables monitoring and traceability right from the start and allows to detect trends at an early stage. **Real-time data = better process information**
Closed-loop weight control	Measuring each gob allows to take live control over the process and not merely every time a manual weight measurement is performed. **Improved stability = increased efficiency** Reduced workload for the operators – less manual weight measurements **Less demand on operator = increased efficiency**
Compare gob shape	Comparing the gob to a previously saved “best” shape allows to reduce the job change time. Continuous monitoring ensures process stability. **Improved job change = increased efficiency**
Multi-weight support	Especially the demanding task of multi-weight production and job change is improved. **Improved job change = increased efficiency**
Process automation	A key sensor for **End to End** enabling future applications such as the **Emhart SmartFeeder!**