

### What WheelWatcher can do for you

WheelWatcher is Keeva's patented solution for monitoring real time, critical blow mold parameters. By using state of the art embedded controller, radio modem, data visualization and computer technologies, WheelWatcher gives you the data and flexibility to meet the demands of today's blow mold industry. Increasing quality demands coupled with improved offerings in materials, molds and processes make getting information from your blow wheel vitally important.

### Standalone or networked

Keeva's WheelWatcher (WW) can be standalone or networked among several blow wheels. This allows economy of scale where dedicated monitoring stations are not required. Data acquired from your blow wheels can be monitored, logged and trended based on your needs. Bottles that fail one or more profile settings can be rejected at the machine.

### No re-manufacturing required

With WheelWatcher, you get all this capability with no need to re-manufacture your machines. Typical installations take two to four days. WheelWatcher installs incrementally and can even be installed during scheduled down times so there is no impact to your production schedules!

### A product for all departments

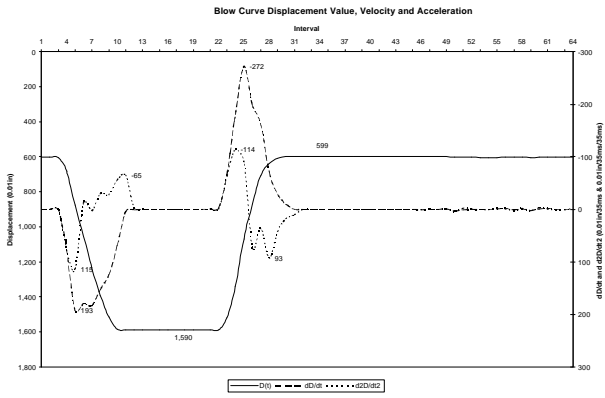
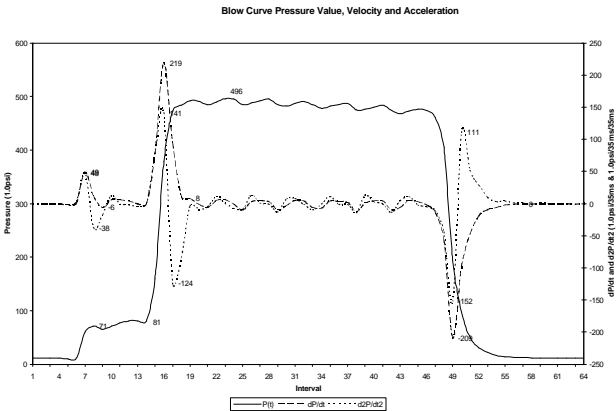
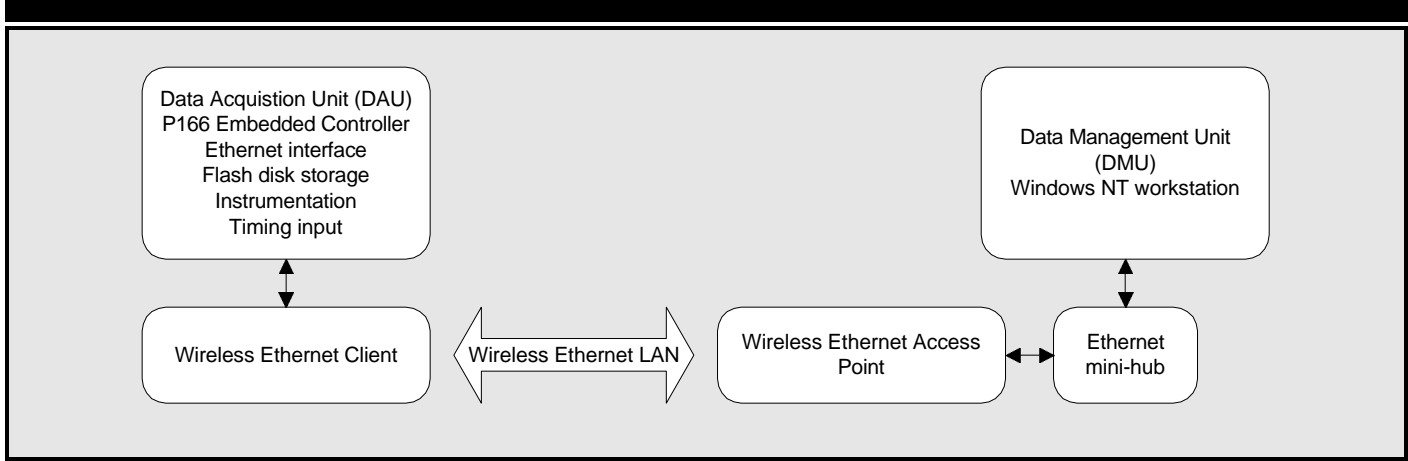
WheelWatcher is one of those rare investments that cuts across all plant departmental boundaries. The benefits to Production, Quality Control and Maintenance are immediate and obvious. Your Engineering, Research and Development departments also benefit from WW data. WW is able to provide, built-in SPC and SQL capabilities. Moreover, WW can become a member of enterprise-wide data strategies and can even act as a data server to all departments.

### Best of the best

Ease of installation, user configured and defined monitoring levels, real time data acquisition, programmability, remote communications and low maintenance all add up to a measurable and meaningful addition to your blow molding application!

### Benefits

- Increases uptime
- Rejects bad bottles to reduce off-specification production
- Saves rework sorting / picking through suspect bottles
- Reduces scrap
- Provides predictive maintenance indicators
- Real-time troubleshooting tool
- Improves station-to-station consistency
- Reduces spare parts cost; no longer replace good parts with good parts trying to correct a problem
- Statistical Process Control (SPC) integration
- Allows improved process designs (heat, blow pressure settings, blow pressure timing, stretch timing, stretch speed, etc)
- Provides a platform for advanced Design Of Experiments (DOEs)
- Troubleshoot without stopping the machine
- Automated and manual log files
- Reduces maintenance labor costs
- Reduces QC labor costs
- Eliminates data gathering errors
- Production data available to enterprise
- Allows improved preform designs
- Allows improved mold designs
- Allows improved process designs
- Integrated control solution
- Provides data not previously available
- Can control processes on the wheel (optional)
- Reduces upstream equipment capital costs
- Reduces downstream equipment capital costs
- Aids capital project prioritization
- Ambient / seasonal parameter tracking
- Global support available
- One year warranty



Radial orientation of the polymer chains help give the bottle its strength. In the graph above, the blow pressure instantaneous, velocity and acceleration values are shown. WheelWatcher analyzes the blow curve data of every bottle formed. Some of the indicators calculated from the sampled data are listed below:

- Pressure Reference
- Minimum Low Blow Pressure
- Maximum Low Blow Pressure
- Minimum High Blow Pressure
- Maximum High Blow Pressure
- High Pressure Bypass
- Shut-In Pressure Drop
- Low Blow Velocity
- High Blow Velocity
- Blow Pressure Ratio
- Blow Spread
- Exhaust Ratio
- Exhaust Velocity
- Low Blow Attack Ratio
- High Blow Attack Ratio
- Exhaust Attack Ratio

WheelWatcher uses the velocity and acceleration data to determine and validate the start of the low blow, high blow and exhaust interval. It is much more reliable to use zero crossings than to use instantaneous data values and compare them to threshold values to determine the start of an interval. WheelWatcher also correlates the pressure intervals with the displacement intervals to ensure the two are properly synchronized in time.

The displacement curves are used to measure the effectiveness of the axial orientation of the bottle. Once again, this orientation gives the bottle its properties. The stretch rod extends to push or stretch the preform to the bottom of the mold. Once there, the stretch rod holds the preform down near the mold bottom to allow the high-pressure air to form the bottle. Once the high pressure has been applied, the bottle cools to the point where it is rigid. The stretch rod then retracts and the bottle continues to cool since the high pressure holds the bottle against the water-chilled mold. With the stretch rod out of the way, the high-pressure air is exhausted and the bottle is removed from the mold.

WheelWatcher provides the following displacement related parameters:

- Displacement Reference
- Maximum Stretch Displacement
- Extension Velocity
- Retraction Velocity
- Stretch Bilateral Resistance Ratio
- Stretch Spread
- Retraction Settle Index
- Extension Roughness Index
- Retraction Roughness Index
- Extension Attack Ratio
- Retraction Attack Ratio

WheelWatcher also monitors and calculates ratios that compare the radial and axial orientation properties.

**For more information contact...**

