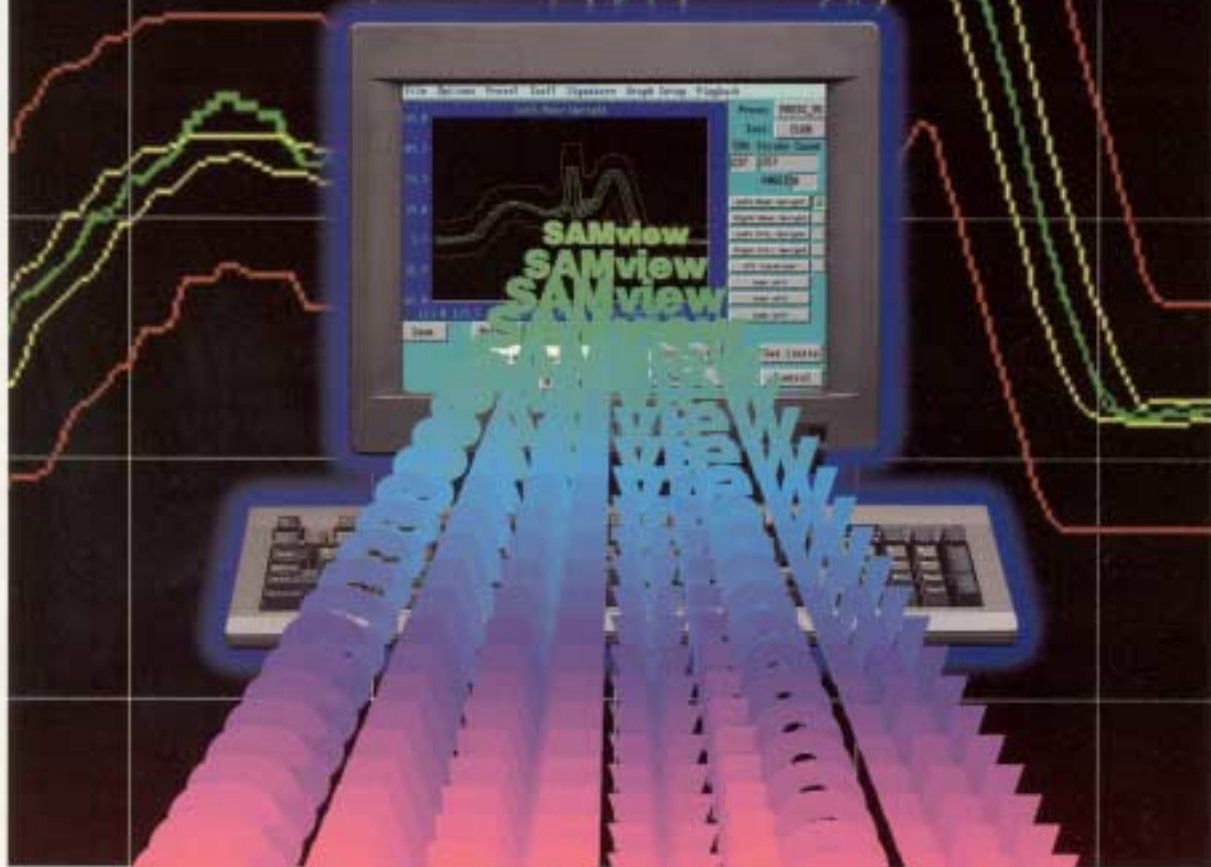


SAMview™

Signature Analysis Software



SAMview

The Process Control Window To Total Quality Management

ST SIGNATURE
TECHNOLOGIES
...Bringing Process Control Out of the Dark

The familiar look of a peak-load monitor, plus...

SAMview™ Signature Analysis Software

A friendly process-control window that gives operators self-paced involvement

Because the SmartSAM™ and SAMview systems are installed with preset "smart" control parameters, a new operator can start out using the traditional load-monitor window and still receive the benefits of real-time signature-based process control. As familiarity and confidence build, the operator can explore each SAMview window and discover a new world of productivity and process-control tools.

Since it's software, new features and benefits install with a disk

SAMview is a real-time, graphic-software extension of the SmartSAM Statistical Process Controller®. Operating on a standard DOS or Windows®-based PC, this operator-friendly software

provides a full range of graphic views using touch-screen or universal point-and-click devices to change data and views. Entire new products can be installed with a disk instead of adding additional "black boxes" to your press.

Programmable peak load-monitor window

The Peak Monitor window shown is ideal for new operators. Since this window can show up to 11 load values at the same time, experienced operators can easily monitor long runs while viewing multiple combinations of sensor channels that provide information, not just data. Regardless of the view chosen, the SmartSAM Statistical Process Controller continues to compare the high-resolution signature from each sensor to preset

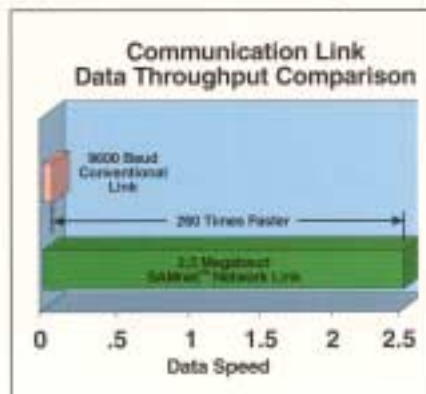


safety limits to protect the equipment while using different limits for verifying process consistency.

The Peak Monitor window also includes current run information such as strokes per minute (SPM), **Stroke Count** and rotation **Angle**. On-screen controls facilitate immediate access to any or all of six preset signature views, **Control** and **Reset Fault** activation buttons, and a **Set Limits** button that will recalculate full signature warning and fault limits for parts currently running.

True local area network supports real-time signature analysis and control.

Unlike other products, networking capabilities designed into SAMview and SmartSAM are truly real-time. Instead of relatively slow serial networks, our products feature SAMnet™, an ARCNET®-based network much like most PC office networks except that it has been optimized for transferring signatures immediately. With SAMview you can download an entire press setup file, including all signature limit sets, instantly instead of waiting minutes like with other systems. Some systems actually downgrade signature resolution substantially to gain acceptable network performance.

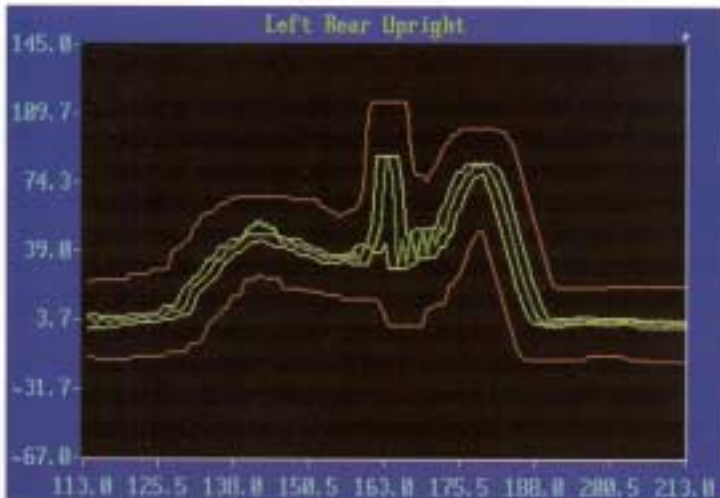


The chart above shows the dramatic throughput improvement SAMnet provides over conventional communications ports. Even with slower press speeds, the

communication speed is important since it determines how quickly the system responds to operator interface. If the system is busy trying to send signature information through a slow link, there will be delays in both the data shown and system control functions requested by the operator. With SAMnet, you can watch the signature while the part is actually being formed. This real-time window into the process is an exclusive feature from Signature Technologies.

SAMview's database design supports remote access over plant LANs using copies of SAMview to view data on the local PC.

Real-time signature-based process control.



The rest of the story about peak load monitors

The conventional peak load monitor provides limited protection for tools and equipment, and even less capability to detect defective parts. The reason is that the peak load can represent only one of a number of peaks. For example, the signature sample here shows the first peak crossing the yellow warning limit, alerting the operator to a potential process problem. Notice how the red fault limit also follows the complete signature which provides tool and press protection throughout the forming cycle. The conventional load monitor must be set to fault only when the very maximum peak is exceeded at the center of the press cycle.

Process control tools that empower operators to make a real difference in performance and quality.

Tool database increases productivity with much faster and consistent press setups

SmartSAM and SAMview provide productivity enhancements by allowing the operator to save and record press setup information, including master signature files that represent good part runs.

On subsequent runs with the same tool, setup times can be reduced since all setup information is available at the press in the SAMview display. In fact, correct setup and part quality verification can now be assured by comparison of master and setup signature.

In-Die Dimensional Measurement provides 100% part checks before the part leaves the press...

Using dimensional sensors such as analog proximity or lasers one can get dimensional "profiles" of the parts "on the fly" without the need for special stations in the tool for part presentation. This feature provides a lower cost approach to meeting customer demands for real-time part measurement and reduces scrap considerably.

A productivity "window" into the process

In metalforming industries, the critical process is not the entire cycle but that very short hit time when metal is actually transformed into product. SAMview captures sensor data during the hit and displays an understandable visual picture of the process while protecting the press and enforcing control limits on each part.

More significantly, this "live" window into the process gives the operator visual feedback, understanding and the ability to respond to a problem before it becomes critical. SAMview enhances training, improves diagnostic skills, increases confidence and improves productivity.

100% process consistency... quality monitoring & control

Once a set of good test parts has been run, the SmartSAM system automatically computes operating parameters and signature limits. During continued operation

the system will instantly warn the operator about signature deviations and take corrective action as determined for your specific installation. Use of in-die sensors can provide precise 100% part inspection and verification of critical dimensions or other features.

Process control is not limited to equipment shutdown or operator intervention. Control interface options are available to operate down-line equipment. For example, an air ejector could remove defective parts without stopping equipment.

Machine and tool protection

The ability of SmartSAM and SAMview to help protect investments in expensive tools and machines is a definite bonus. Signature analysis provides instant reaction to damaged or broken tools as well as a visual reference for an "early-warning" of tool wear while the press is running.

Expanded signature analysis tools.

- Real-time local or remote operation
- Save master or sample signatures for quicker setup and in-process verification
- Save information about presses and tools on disk
- Names for sensor channels, presses, tools, etc., can be set by the operator—no number or letter codes to remember
- View combined (virtual) signature channels—sum, difference, average, etc.



Press database

Specific information required by the SmartSAM system is saved for each press including **Press ID** and **Press Description**. SAMview can accommodate multiple SmartSAM systems connected to one press for up to 32 sensor channels. Also saved is resolver **Resolution** and **Position Offset**. Each sensor is identified by channel number, description, calibration factor and capacity.

Virtual channel setup

Selecting **Virtual Channel Setup** from the drop-down **Options** menu allows definition of up to eight unique channels as a combination of two or more sensor outputs from the SmartSAM Controller. For example, the sample **Total Force** is a virtual channel that is the sum of the **Left Frame** and **Right Frame** sensors. Likewise, several sensor outputs can be summed, subtracted and averaged to produce nearly any signature view desired by the operator.

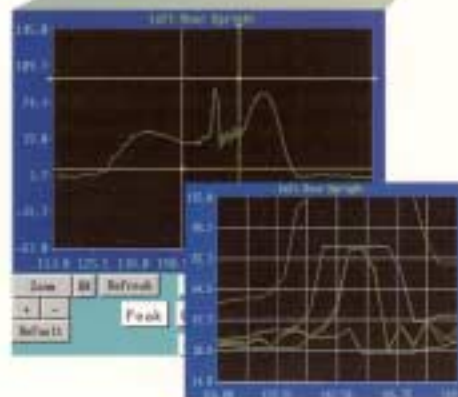


Advanced Feature Extraction Tools

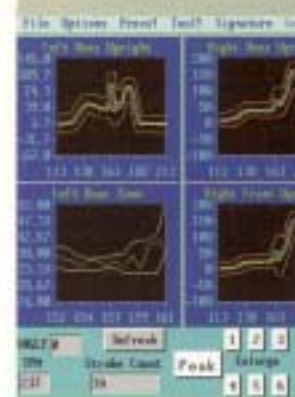
Using special tools one can extract critical portions of the signature which can be tracked and plotted on an SPC screen or a Dimensional Measurement screen. These features are alarm/event logged and can be assigned to outputs for control purposes.

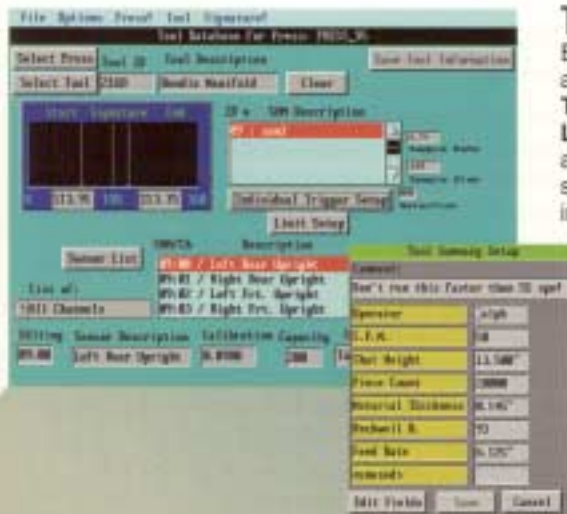
Zoom in for detail

Each of the six signature views can be customized to show any view of the signature curve via the **Zoom** button. Just move the yellow lines to frame the desired portion of the signature curve. Touching the **Zoom** button again enlarges the framed image to fill the signature window as shown in the inset screen. Use the + and - buttons for coarse view enlargement and reduction or use **Default** to return to system base view. **OK** returns to normal signature view.



Peak load monitor view (shown on left page)





Tool database

Each tool setup can be saved according to **Tool ID** and includes a **Tool Description** field. The **Sensor List** menu is also available to record additional in-die or removable sensors unique to the tool. Special installation notes and specifications recorded by the operator in the **Tool Summary Setup** window can shorten setup time and allow production to begin quickly.

Signature save/playback

Signature sample groups can be automatically saved to disk files with the **Save Signature** feature. The operator can then **Playback** and study the signatures to help determine process conditions prior to a detected warning or fault. Each signature sample includes date and time so the operator can even study a previous run.



Sensor channels

Signature sensor channels from the SmartSAM Controller are selected with the eight buttons on the right. One or more sensor channels can be activated from each of the six signature views. The operator can set a different color for each channel or combine channels with the virtual channel setup.

SAMnet™ high-speed network

Automatic limits

Activates recomputation of warning and fault limits as shown by the yellow and red traces.

Process control ON/OFF

Places the SmartSAM system in Control mode such that a fault will interrupt the machine or activate other process control functions.

Six programmable signature views

SAMview allows each of up to six signature views to be shown by buttons **1** through **6**, or all six views can be shown at one time with **Overview**. Each of the six views can be controlled by selecting the signature source with one or more of the eight source channels on the right side of the screen. Add a title, turn on grids and add scale information with the drop-down **Graph Setup** menu at the top of the screen. Display of Fault and Warning limits is controlled from the drop-down **Signature** menu.



SmartSAM™ Statistical Process Controller®

The high-speed signature processing techniques used by the SmartSAM Controller sample up to eight sensors on a real-time basis. On operator command, the controller recalculates two limit sets for each sensor using small-sample statistical analysis. Integrated control functions provide immediate response capabilities that can change machine operation at any point in the process. The operator not only has a visual window into the process but an untiring guardian to help produce higher-quality parts in less time.

Advanced SmartSAM Features:

- **PartTrack™**—Tracking of individual parts for auto-eject of bad parts.
- **RampWatch™**—Automatic modification of control limits to allow for press-speed variations.
- **Living Limits™**—Forward projection of statistical variation in past variability in order to automatically adjust limits to conform with normal process drift.

For more information

When you want improved productivity, faster setup times and superior quality control, call 972-488-9777

SIGNATURE TECHNOLOGIES

...Bringing Process Control Out of the Dark

SAMview™, the PC complement to a host of products and services.

Complementing SAMview are a number of related products that provide the end user with flexibility in pricing, performance, packaging and custom services. SmartSAM products offer a modular and easy upgrade path to SAMview-based systems. Options are available for stand-alone process control, local touch screen interfaces, part tracking and ejection, industrial and desktop computers, enclosure systems and advanced high-end software analysis tools. Complementing our products are custom InSitu™ sensor services and



system installation. SAMview is available in versions that service a single press, multiple presses,

multiple SmartSAMs within one press and other types of manufacturing processes.

A commitment to service, support and leadership.

Signature Technologies has dedicated over one decade to research, development and application of signature-based process control. We have received and have pending worldwide patents and have established signature analysis as a viable means of closed-loop process control in the metalforming industries. We have invested significantly in demonstrating the value of signature-based process control. Implementation of this technology has now become a strategic manufacturing objective of many major manufacturers.

If you want the best in closed-loop discrete process control, look for this symbol. It represents both the power and simplicity of technologies developed and continually improved by the staff at Signature Technologies, Inc. It also assures you that the product you have purchased is protected by properly licensed U.S. and foreign patents, which ensure its continued development and support.



SAMview, SmartSAM, SAMnet, InSitu, PartTrack, RampWatch, GearShift, Signature Technologies and the ST symbol are trademarks and Statistical Process Controller is a registered trademark of Signature Technologies, Inc. ARCNET is a registered trademark of DataPoint Incorporated. MS-DOS is a registered trademark of Microsoft Corporation. Statistical Process Controller® technology is protected under U.S. Patent 4,987,428 with additional U.S. and foreign patents pending.



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