

Analytics

Drilldown to view data
across SMT production lines

Product Introduction

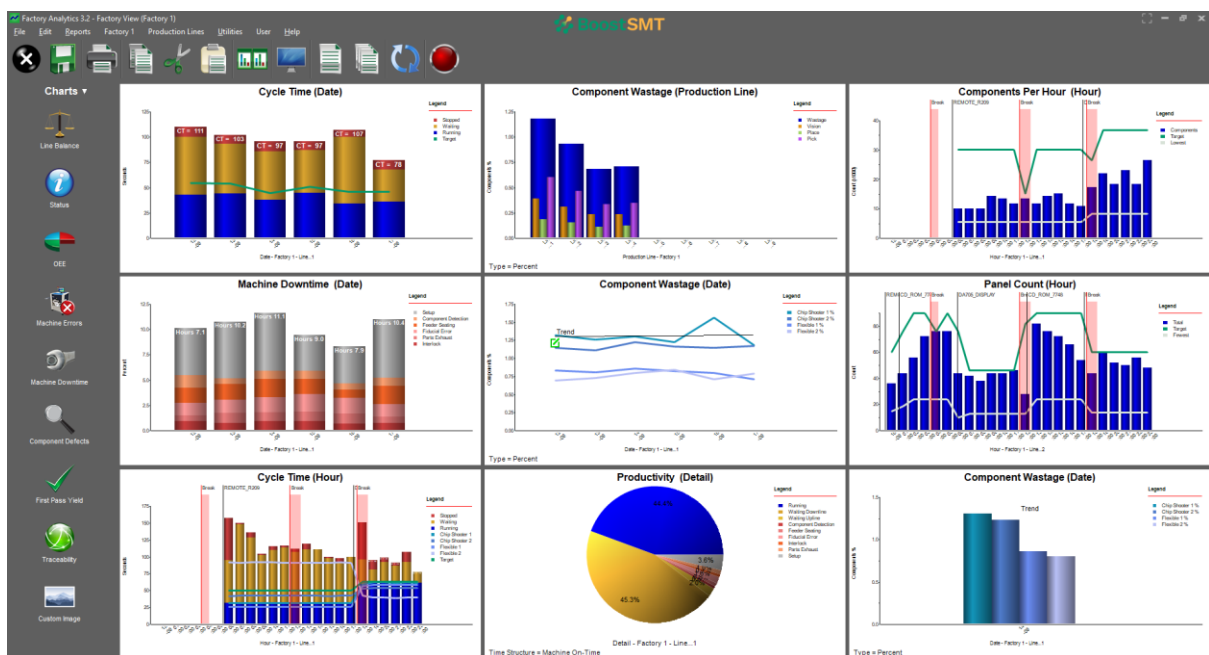
Introduction

BoostSMT Analytics is a time-based machine performance data collection system.

Linechart Analytics is designed so that different machine types and brands can have their performance data recorded and displayed in a common form.

Data is collected and converted to the SMX / XML / Binary database. Charts are then created by the user using the Linechart viewer modules to objectively display the data.

Charts can be displayed using a range of standard metrics across any number of lines with any date range. Data can be drilled down to the lowest level reported by the equipment it is connected to.



Depending on what you want to examine, Linechart can be used in the following ways. The categories shown below can be turned on or turned off as determined by the target audience.

- **Process Cost Analysis** Where is money being wasted?
How much money is being thrown away?
- **Component Usage and Waste** What is the real usage?
Which parts are causing the most problems?
- **Process Monitoring** Is target being made?
When will jobs be finished?
- **Machine Operation Performance** What are the machine errors?
Is something likely to fail?
- **Quality** What is the yield from the assembly process?
Which parts are having assembly quality issues and why?

Linechart Available Charts

Process Cost Analysis Component Usage and Wastage

Linechart has a series of charts that allow you to see where you are losing production. The production loss can be represented as cost (your currency), percentage or items.



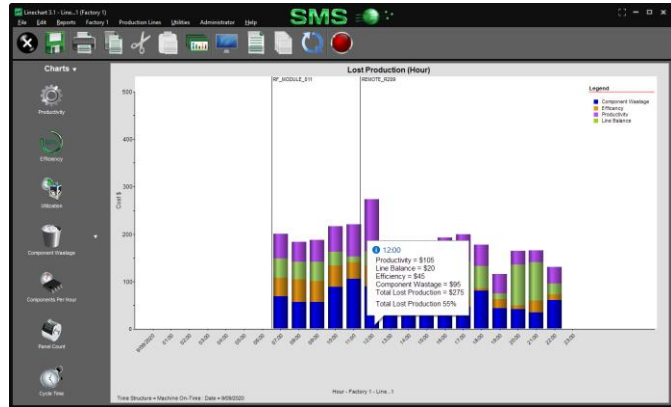
Lost Production (Macro View)

In this overview chart you are able to see all the production analysis charts shown below in one interface:

- Productivity
- Efficiency
- Line balance
- Component Wastage

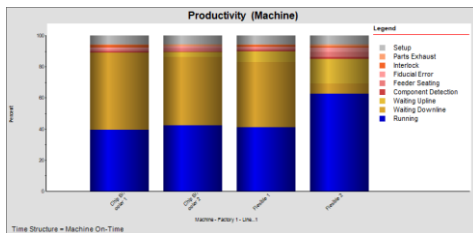
This can show lost production as:

- Cost
- Percentage
- Time



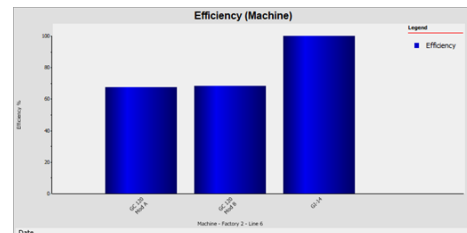
Productivity

Productivity is a measure of the time being used split up by time activities. The time activities are displayed as percentages out of 100%



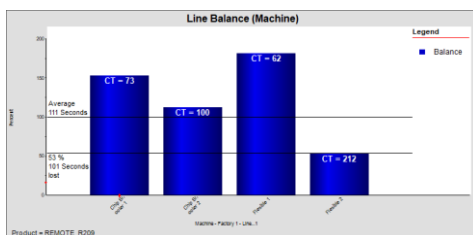
Efficiency

By comparing CPH you can see how fast products run on your machines. This is displayed as a percentage of the ideal machine CPH.



Line Balance

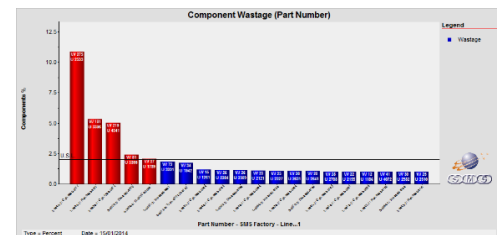
Using actual production data this will show you how much time is lost as a percentage and time.



Component Wastage

Machine rejected parts are expressed as:

- Percentage.
- Cost.
- Count.

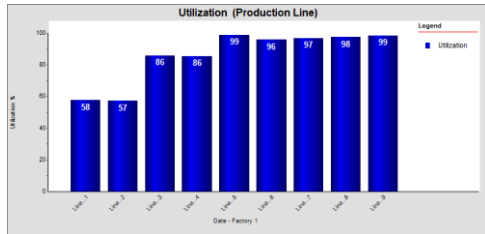


Process Monitoring



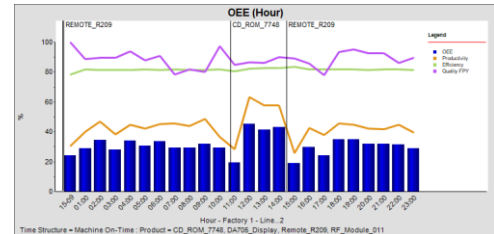
Utilization

Utilization is a measure of how much time the machines are actually running against how much time is available for production.



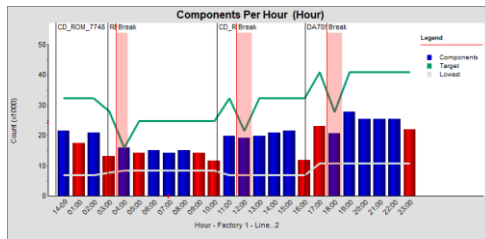
OEE

OEE (Overall Equipment Effectiveness) is a metric that is used to get an overall view of the process. Inputs can be customized.



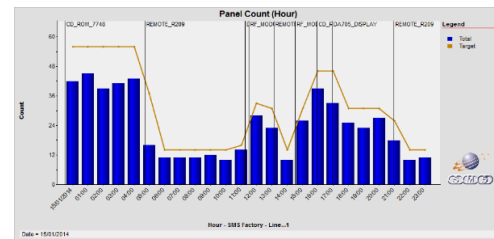
Components per Hour

Components Per Hour takes the total number of components placed and divides this by the time it could be producing product (In hours).



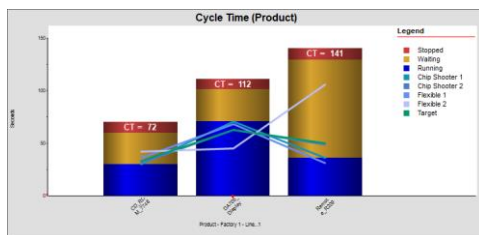
Panel Count

Panel Count shows the total number of boards produced on any given day as well as the number of boards produced per hour.



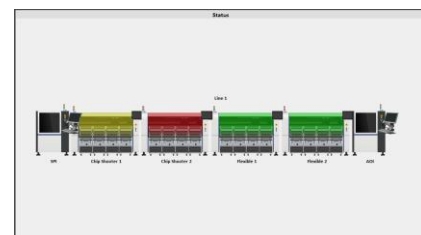
Cycle Time

Cycle Time shows the average time a product takes to build a Panel.



Machine Status

Machine status shows if the connected machines are Running, Waiting or Stopped.



Machine Operation Performance

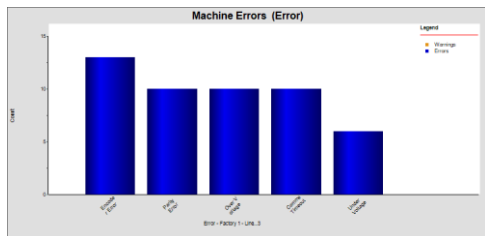


Machine Errors

Machine Errors displays a raw count of various machine error states.

You can see if something is happening more frequently, maybe leading to a breakdown.

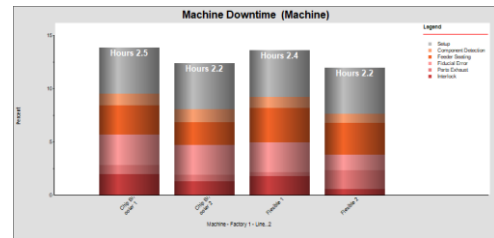
Note. This is not available for all machines.



Machine Downtime

Machine Downtime displays what caused machines downtime in hours.

This allows you to understand how much time in a day is being wasted by machines due to reasons outside of operator control.



Inspection Machines (Quality)

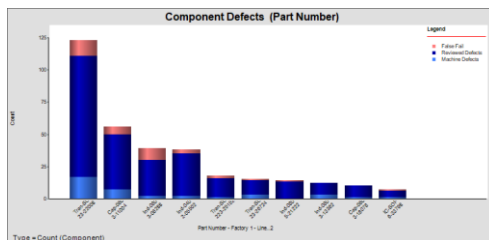


Component Defects

These charts record the defects attributed to components for AOI, SPI, X-Ray and manual inspection.

Data graphed down to lead defect level. False fail and review data is available.

This allows you to instantly see components are causing the most defects so you can fix the problem as result reduce rework.

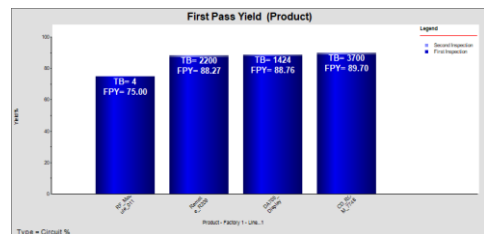


First Pass Yield

These charts record how many complete boards have been built without any faults.

This allows you to see how many circuits are being built defect free.

First pass yield is a good measure of the effectiveness of a process and the elimination of waste from that process.



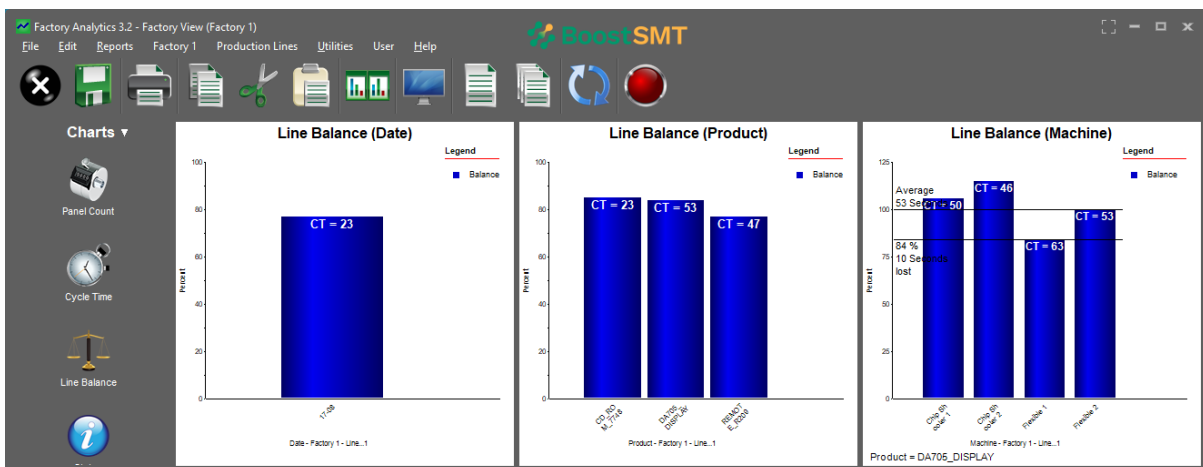
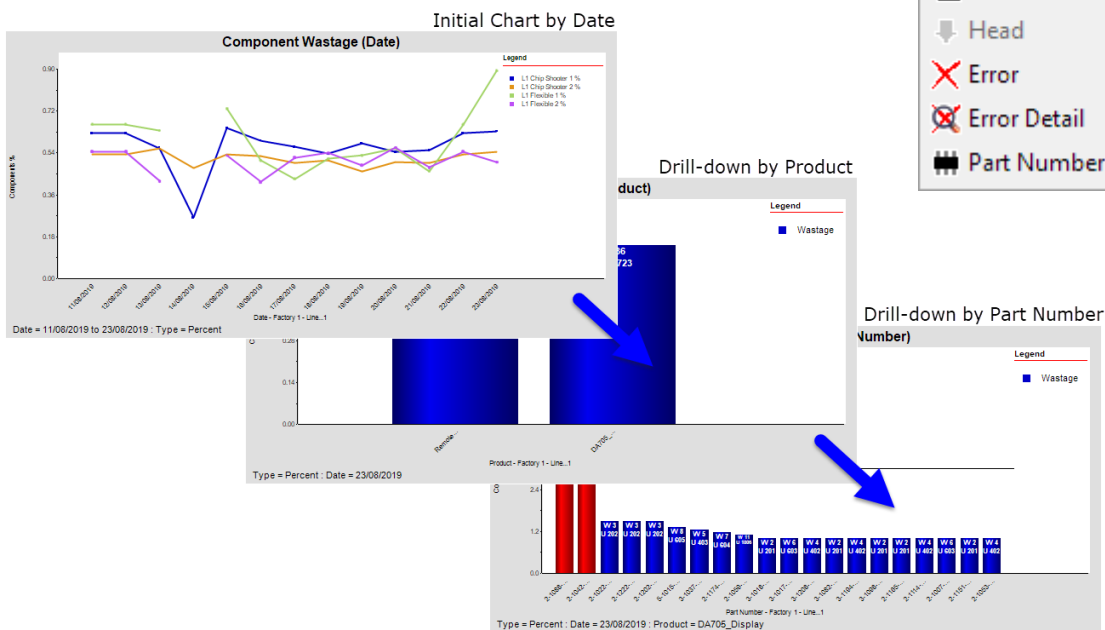
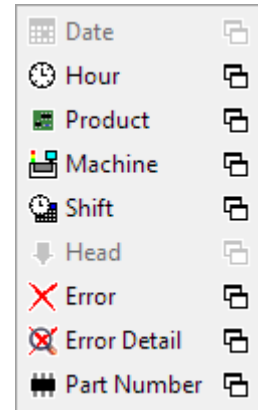
Drill-down process

All charts in Linechart Analytics use a drill-down process to get to specific details for each of the available graph categories; this is achieved using a simple select and click function provided in the chart area.

You may select a day or a date range. Then view information at the next level through a sub menu. The sub menu allows you to drill down to view more detail. You have full control of the drill-down path.

The following drill-down options are available:

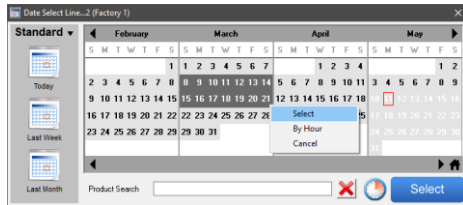
- Date
- Hour
- Spindle
- Detail
- Product
- Shift
- Feeder
- Error
- Machine
- Head
- Error



System Features

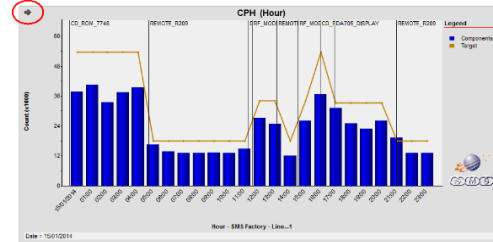
Date and Time Selection

Charts can cover any time period. Charts can be selected by the day, multiple days or by the hour.



Date Tracking

Graphs can either be Static or Dynamic. With "Date Track" the graphs automatically follow the date range selected.



Action Notes and Alerts

The end user can associate an "Action Note" with a given data point on a chart in the system. Alerts are sent when something is out of spec.

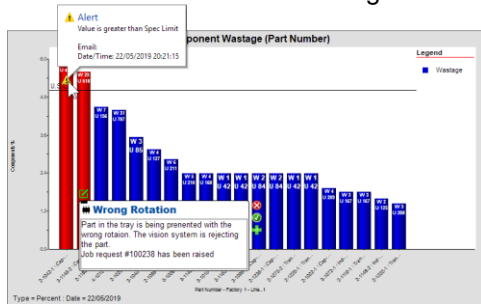


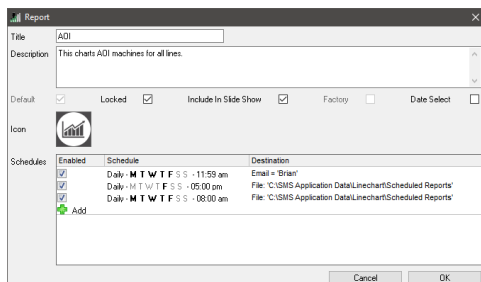
Table Reports

All charts can be exported to any of the Microsoft Office tools so that they can be included in management reports.

Component Waste (Machine) - Table			
Linechart Viewer			
Component Waste (Machine)			
Machine - SMS Factory - Line_1	Wastage(%)	Wasted (Actual)	Used (Actual)
Chip Shooter 2	0.96	2884	211748
Chip Shooter 1	0.79	1931	246701
Flexible 2	0.71	467	67437
Flexible 1	0.96	356	54316
Stats			
Mean	0.774		
Std Dev	0.110		
U.S.L	0		
L.S.L	0		
Type = Percent		Date = 15/01/2014	

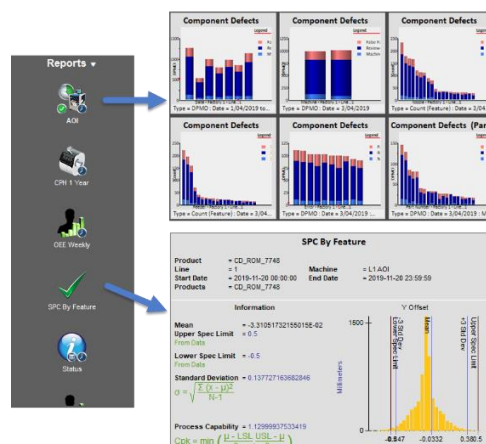
Scheduled Reports

Reports can be generated by schedule. The reports can be a single chart or multiple charts determined by you.



User Define Reports

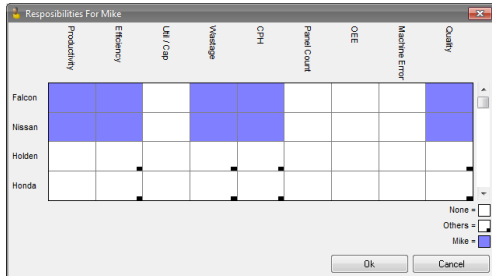
Any combination of charts and layout can be set and reused by selecting a single button.



Out of Spec Warnings

BoostSMT has an extensive system for reporting when a process goes out of spec.

You can completely control when, how and what warnings are sent to people.



Remote Alerts

Out of spec warning can be sent to various devices.

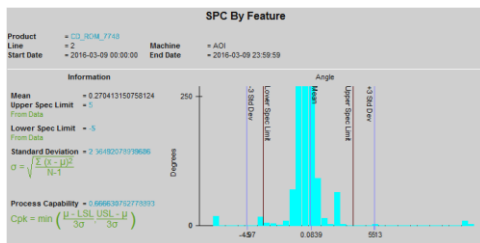
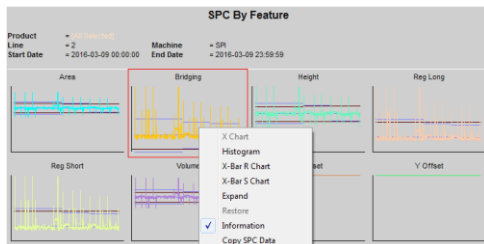
- Email. Message, picture and chart link.
- Mobile text message



SPC Tools

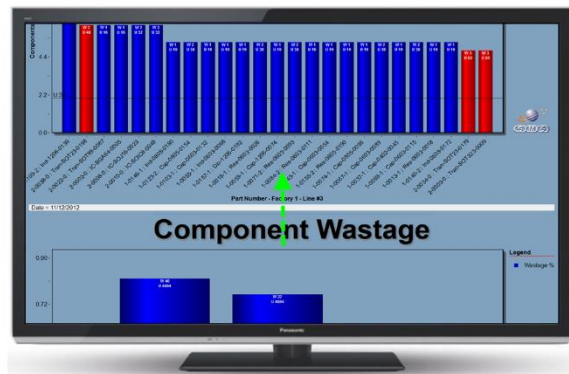
Depending on the quality of the data provided by the machines we read, for AOI and SPI statistical tools are available.

These tools allow you to analyse the data to see if the process window is being maintained.



Slide Show

This can be a single report or multiple reports. The slide show has selectable transitions that Scroll, Sweep, Reveal or Fly through to provide the visual impact you require.



System Overview

Linechart uses multiple systems to collect and distribute data. The whole system is controlled by the Linechart Servers (one is required for each factory).

Detailed data for each factory is stored locally, summary data is stored centrally. Detailed data can be transferred centrally when requested.

SMX Database

All data is saved to the SMX database. This allows Linechart to graph the data obtained from multiple sources no matter what the original format was.

The SMX database file system is also used by other BoostSMT products. It is the platform for the BoostSMT Traceability suite of products.

Supported Equipment

Linechart is able to get data from any machine or process that has access to the factory network, directly or indirectly.

Current inputs that we have worked with include:

SMT Machines

- ASM / Siemens. IOS, OIB.
- Fuji. FujiCAM, FujiFlexa.
- K&S / Assembleon. iFlex, A, M, GEM series.
- Mycronic / Mydata.
- Panasonic. NPM, CM, FA.
- Sony. E, F, G series.
- Universal Instruments. Fuzion, Genesis, Advantis.
- Yamaha. YV, YG, YS, YSM series.

- Manual input.

AOI and SPI Machines

- CyberOptics.
- Koh Young.
- TRI.
- Mirtec.
- Viscom.
- Vi Technology.
- Yestech.
- BoostSMT smInspect (Graphical inspection system).

Our capabilities are not limited to the above list.

If your particular equipment is not listed, please contact BoostSMT. We are adding new machines and systems constantly. In many cases customization of existing modules is very quick. In all cases we have had 100% success getting data out of all the machines we have worked with.